

- Fitness
- Lights
- Water
- Mil Pay
- Parking
- TV

## Mini Computers, Wave of the Future

These little flecks of silicon gold and a minute variety of other materials are changing the world. Better known as microprocessors, they are in everything from wrist-watches that play music to avionics systems that can navigate to destinations and be accurate to within a few feet. At NADC microprocessors are incorporated in many important projects and systems. Because of their size and weight, microprocessors are very attractive to the aviation community. Equipment such as ring laser gyros, computers and flight controls all use microprocessors. Because of the widespread use of these little marvels an increase in the demand for training has been seen at NADC. In the past, attempts to satisfy this need have been made by offering in-service courses, university programs and contracting commercial companies to teach microprocessor concepts. Problems arose when it was found that these courses were not always matched to NADC's needs and that they were expensive both in terms of travel and cost of teachers.

To overcome the problems, NADC went inside to find employees who had experience with microprocessors. Two of the on-Center instructors are Eric Alfonsi and John McFadden who have established a national reputation in the area of microprocessors. Both have taught an advanced course in Microprocessor Interfacing for the Continuing Education Institute which sponsors courses taught by the best people in their respective fields. McFadden explained that because of the variety of microprocessors on the market a general overview course with hands-on training was developed for use at NADC.

The seminar material covers the principles of microprocessor hardware structure, architecture, software, and the functional capabilities and merit of the microprocessor. Microprocessor fundamentals are introduced with step-by-step instructions and hands-on participation, at a level anyone without any computer background can understand. The hands-on exercises are unique to digital design techniques utilized and applicable to the Center's systems applications. The individual lectures and hands-



John McFadden points out details of microprocessors to his class of Center employees.

on exercises introduced by the seminar provide the NADC participants with sufficient insights and knowledge into how microprocessors function as components and how they can be applied to solve engineering problems unique to the Navy platforms.

Alfonsi stated that, "we haven't even scratched the

surface with microprocessor technology. Our aim," he added, "is to help the engineers develop the tool so they can take the knowledge and use it for their own applications."

If you are interested in attending this course contact George Wynnycky at x3076.

## Electromagnetic Leaks Plugged

Have you ever been driving in your car listening to the radio and noticed that you get interference from some other guys motor? Or say you're watching TV and someone in the house turns on the mixer which fuzzes up the picture and the sound? These are examples of electromagnetic interference (EMI). To us is just a temporary annoyance but to Navy aircraft it can be sometimes fatal. Both internal and external electromagnetic forces play upon the avionics of today's aircraft. With miles of wire and thousands of circuits the complex problem of isolating interference is being tackled by NADC under the sponsorship of the Naval Air Systems Command. Ron Lane of the Systems Directorate is Director of NADC's Electromagnetic Compatibility Project.

Probably the most dense environment for EMI is the aircraft carrier deck, Lane said. The deck presents a jungle of radar signals. Sometimes instruments fluctuate and communications become garbled.

NADC is involved in three programs to identify Electromagnetic Environmental Effects (E<sup>3</sup>). They are the Air Systems Electromagnetic Interference Corrective Action Program (ASEMICAP), the Electromagnetic Compatibility Aerospace Research and Development (EMCARD) program, and the Systems Engineering—System Platform Acquisition (SESPA) program, each of which is designed to assure the implementation of E<sup>3</sup> control techniques, design requirements, and development

during the life cycle of an aircraft system or platform.

In slightly more than one year, NAVAIRDEVCEEN has made considerable progress in promulgating the E<sup>3</sup> programs. In the ASEMICAP, the first class evaluation currently is being performed on the F-14A aircraft. In addition, an EMI "hot-line" telephone reporting system is in place for fleet personnel to report E<sup>3</sup> problems. Special test and measurement equipment as well as parts, materials and devices have been identified and are being assembled to support the class evaluation and quick reaction teams. The F-14A class evaluation, coordinated by NAVAIRDEVCEEN, includes the participation of other naval activities as members of the EMTAG team and as active contributors to the class evaluation. An E<sup>3</sup> data base system also is being developed to permit NAVAIR naval activities to use this data in working their E<sup>3</sup> programs. E<sup>3</sup> technical data has been collected for the F-14A, A-4M, A-6E, EA-6B, and EC-130Q.

NAVAIRDEVCEEN's progress in the EMCARD program has been equally impressive despite the fact that the major effort did not begin until FY-81. The EMCARD planning effort has been formulated with support from various NAVAIR naval activities. In addition, NAVAIRDEVCEEN along with the Air Force Flight Dynamics Laboratory (AFFDL) at Wright-Patterson Air Force Base is jointly supporting two programs in the lightning area. The first program, "The In-Flight Lightning

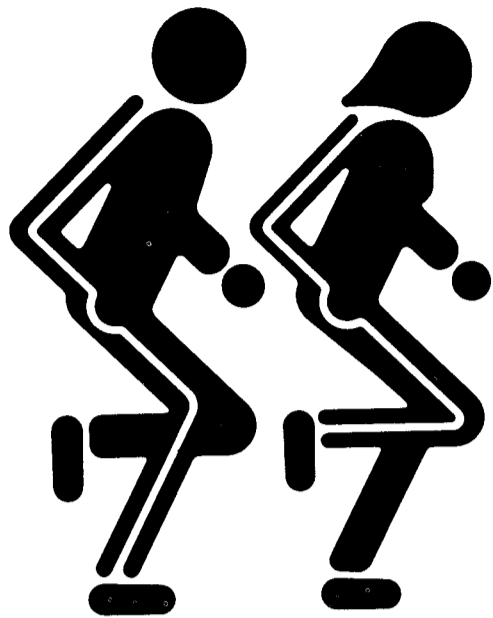
Measurements Program," is designed to acquire statistical measurement data to characterize the amplitude and wave form of nearly cloud-to-cloud lightning flashes. Resulting data will be compared to existing cloud-to-ground measurement data so that the worse case threat can be defined and aircraft lightning protection and test techniques can be improved.

NAVAIRDEVCEEN's SESPA program effort has included support of in-house project offices such as F-18, LAMPS MK III, Phoenix and TACAMO, as well as direct support to the NAVAIR PMA's such as EA-6B, A-6E, A-7E, Sparrow, HARM, and HARPOON. The support effort includes preparing E<sup>3</sup> control program plans, resolving specific E<sup>3</sup> problems, establishing and convening of EMCABs, reviewing contractor prepared E<sup>3</sup> control documentation and performing Electromagnetic Vulnerability (EMV) testing on various avionic systems.

The E<sup>3</sup> control programs at NAVAIRDEVCEEN are a long-term commitment by the center to incorporate E<sup>3</sup> philosophy into the acquisition, design, development, test, evaluation, production and deployment of aircraft platforms and avionics systems. This commitment is totally supported by the Chief of Naval Operations to assure the continued improvement of navy systems readiness.

# Have A Fit . . . Exercise

by Sylvia Waslyk



Welcome readers. I have been a participant in a wide range of activities and have worn many hats—athlete, coach, observer, director, administrator, co-ordinator, official, and trainer. All of this stems from a great love of being active—of participating, if you will. It is this appreciation that brought about the idea for this column. My objective will not be to turn you into a “jock”, but rather to assist those who are looking for a method that will allow them to become more active while at the same time have some fun. Hopefully, you’ll be having so much fun that the sudden realization of firmer muscles, a healthier glow, a reduction in undesired weight and your steadily improving performance will come as a pleasant surprise.

Whether you read this column as a serious athlete or as a typical person looking for something different, I invite you to examine these future issues. I will have a wide range of topics, varying from a training schedule for a competitive road racer to hints to better enjoy life through

slight alterations in your normal schedule.

Questions are welcome; some will be incorporated as a future topic, the others dealing with a personal inquiry will be handled individually. The main goal I hope to achieve will be to allow you to have fun as you pursue your activities. The end result will be a healthier and happier you, and that may be just enough to help save a life . . .

Maybe yours.

**Editors Note:** Ensign Sylvia Waslyk has graduated from the University of Delaware as a Physical Education major. She has participated extensively in both competitive and recreational sports. She served for six years as a county recreation instructor. A champion track and field competitor she has also competed on the U.S. National Women’s Ice Hockey team, a team she formed and coached. Sylvia is currently a member of the Eastern and National Athletic Trainers Association.

## Water, Water Everywhere?

The ever increasing demand for water coupled with an acute water shortage has resulted in the designation of a section of southeastern Pennsylvania as a ground-water protected area by the Delaware River Basin Commission. This area includes all municipalities surrounding NADC. Certain conservation measures are required by the Commission’s ruling. Since NADC is sited within the water protected area, it is imperative that we all do our share to conserve water. The following water conservation tips are offered:

- **Stop using your toilet as an ashtray** . . . every butt or tissue you flush away costs you five to seven gallons of water.

- **Plastic bottle in your toilet tank** . . . an inch or two of sand or pebbles in the bottom of a quart bottle to weigh it down and fill the rest of the bottle with water . . . put in your toilet tank, safely away from the operating mechanism and in the average home this will save five gallons or more of water every day without harming the efficiency of the toilet. In the event your tank is large enough, you may be able to use two bottles.

- **Take shorter showers** . . . Limit your showers to the time it takes to soap up, wash down and rinse off . . . a typical shower uses five to ten gallons of water a minute.

- **Install water saving devices** . . . flow restrictors that can be obtained from your hardware or plumbing supply store will cut your shower flow to about three gallons a minute instead of five to ten. They are easy to install, and your shower will still be cleansing and refreshing.

- **Turn the water off while you are brushing your teeth**—before brushing, wet your brush and fill a glass with water to rinse your mouth . . . stop letting water run down the drain unused.

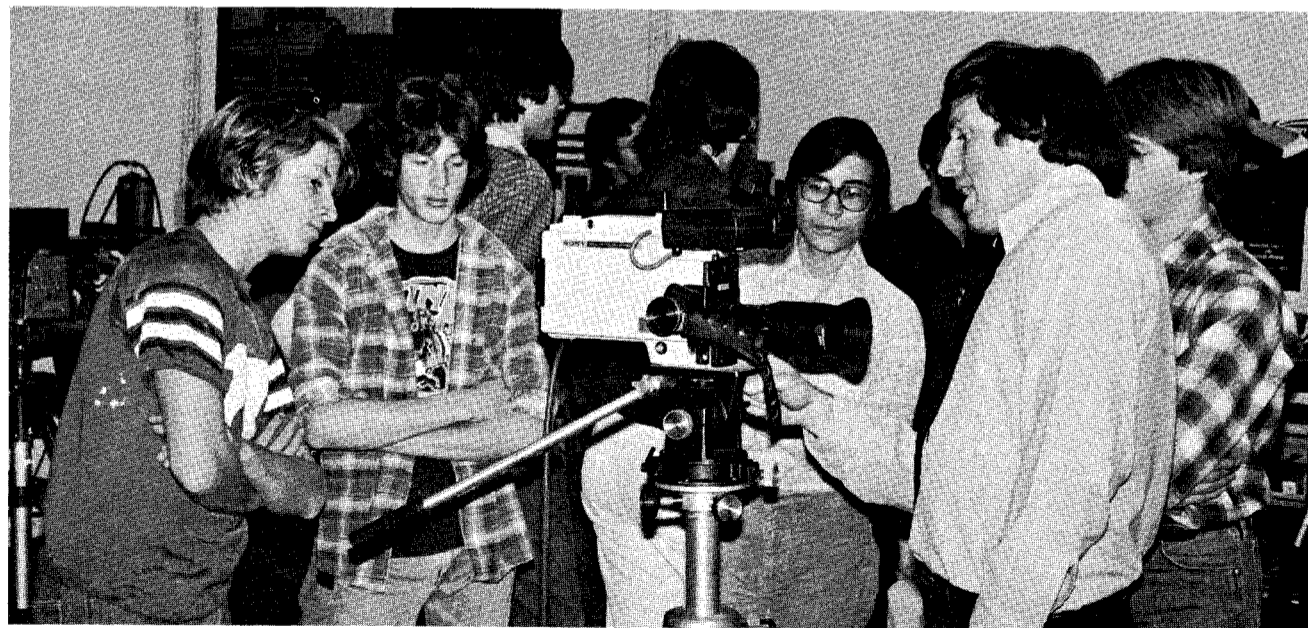
- **Turn off the water while shaving** . . . fill the bottom of the sink with a few inches of warm water to rinse your razor . . . that is what sinks have stoppers for.

- **Check faucets and pipes for leaks** . . . the smallest leak can waste 50 or more gallons of water a day!

- **Use automatic dishwasher only for full loads** . . . every time you run your dishwasher, you use about 25 gallons of water.

(Continued on Page 3)

## Scouts Tour Studio



Bob Larr, right, explains the operation of TV camera to visiting scouts.

Explorers (the Boy Scout variety), as you may or may not know, have begun to adapt their program to the needs of today’s young people. One way of doing this is to establish posts with a specific career orientation.

One such post has recently been established in the Center’s TV studio. The Explorers contacted the Center about the feasibility of such a program, then wrote to area students already involved in audio-visual classes or clubs at local high schools.

The TV studio staff volunteers their time twice a month to meet with the students. Once some basic training is completed, each of the twelve students will direct his or her own production. The topics they have selected range from science fiction to documentaries on alcohol abuse.

Two other career oriented posts have been meeting on-Center for some time in the Fire Department and the Computer facility.

## Switching to Light

Does a fluorescent light have to be turned off for a half-hour before the energy saved equals the energy used in initially energizing the light? Many people think so, but this is a misconception.

The total starting current of a two-tube rapid-start fluorescent light lasts for about one second. The initial in-rush current lasts for only one-half cycle (1/120 second) and has a peak value about five times as large as the steady state peak. This in-rush current does not use a significant amount of energy since it lasts for such a short time. Thus, fluorescent lights have to be turned off for only *one second* in order to save the amount of energy that will be expended when the lights are initially turned on again.

Detailed economic studies of trade offs between fluorescent lamp replacement and electric costs have shown that anytime a room is to be vacated for more than a couple of minutes, the fluorescent lights should be turned off. Therefore, turning off lights as you leave a room is a good habit to develop.

What about other types of lamps? Since short operating periods have little effect on the life of incandescent lamps, they should *always* be turned off when a room is vacated.

High intensity discharge (HID) lamps, such as mercury vapor, sodium vapor, and metal halide, require several minutes to warm up. In addition, when they are turned off, they need several minutes to cool off before the ballast will restart them. Consequently, HID lamps should not be turned off unless the shut-off period is longer than 20 minutes.

Naval Air Development Center

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CAPT Paul L. Dudley, Jr. — Commander, NADC  
Dr. R. Kenneth Lobb—Technical Director  
Joseph P. Cody — Public Affairs Officer  
David Polish — Editor



# Improved Changes in Military Pay

The President signed the Military Pay and Allowances Act of 1980 (Fair Benefits Bill) on 23 Dec. 1980. This law will result in significant improvements in military compensation for officers and enlisted personnel, particularly those assigned to fleet units.

The bill contains the following features:

**A. Enhanced Sea Pay.** Authorizes sea pay at substantially increased rates for enlisted personnel E4 and above on sea duty. Rates are based on paygrade and cumulative years of sea duty and range from \$50 to \$310 per month. It also authorized sea pay to officers (W-1 to W-4, O-1 and O-2 with over four years of enlisted service, and O-3 to O-6) with over three years of cumulative sea duty. Rates range from \$130 to \$310 per month. Additionally the bill provides Presidential authority to pay Navy officers and enlisted personnel a \$100 per month bonus for over three consecutive years of sea duty.

**B. Submarine Duty Incentive Pay.** Increases sub pay levels for both officer and enlisted personnel. Additionally, sub pay will be paid to officer and enlisted personnel serving ashore provided certain criteria are met. These criteria include accumulating a prescribed amount of operational submarine duty within a fixed period of time. Enlisted personnel must also have sufficient obligated

service for a follow-on sea tour. Enlisted rates range from \$55 to \$265 per month. Officer rates range from \$130 to \$440 per month.

**C. BAQ Option for E-7 and above:** authorizes personnel in paygrade E-7 and above: including members without dependents assigned to shipboard duty, to elect to receive BAQ in lieu of accepting government quarters. Eligibility for BAQ will terminate if the ship is deployed for more than 90 days.

**D. Nuclear Officer Bonus Level Increase:** increased the accession bonus for nuclear submarine officers from \$3000 to \$6000 and authorizes splitting the bonus so that half is paid when a candidate is selected for this program and the remainder on completion of nuclear training. Increases the continuation bonus level for all nuclear trained officers from \$20,000 to \$28,000, to be paid in installments for a four year obligation. Increases annual incentive bonus from \$4,000 to \$6,000 for officers beyond initial obligation and not drawing continuation pay.

**E. Incentives for Enlisted Personnel to Extend Overseas Tours.** Provides a monthly bonus of \$50 to enlisted members who extend an overseas tour for at least one year. In lieu of the bonus, a member may elect 30 days non-chargeable leave, or 15 days non-chargeable leave plus travel to and from CONUS.

**F. Save Leave.** Allows the accumulation of up to 90 days leave for service under conditions as designated by the Secretary of the Navy.

**G. Trailer Pad Spaces.** Department of Justice ruled that trailer pads on government installations met the definition of quarters and as such must be rented to occupants at fair market value. This bill removes trailer pads from the definition of quarters and maintains the current system of charging members a rental fee sufficient to cover utilities, maintenance and the amortized share of the cost of construction.

**H. BAS for members of Marine officer candidate programs.** Deletes the 30 September 1982 termination date and provides permanent authority for payment of BAS to Marine PLC's.

This piece of legislation caps the major compensation improvements begun earlier this year with the enactment of the Nunn/Warner amendment followed by the initiatives contained in the FY-81 Defense Authorization Bill. These improvements in compensation are the most significant in recent years and provide clear evidence that the Congress recognizes the vital contribution of our people to the readiness of the Navy and to defense of this nation.

## Letter to Editor Parking Poem

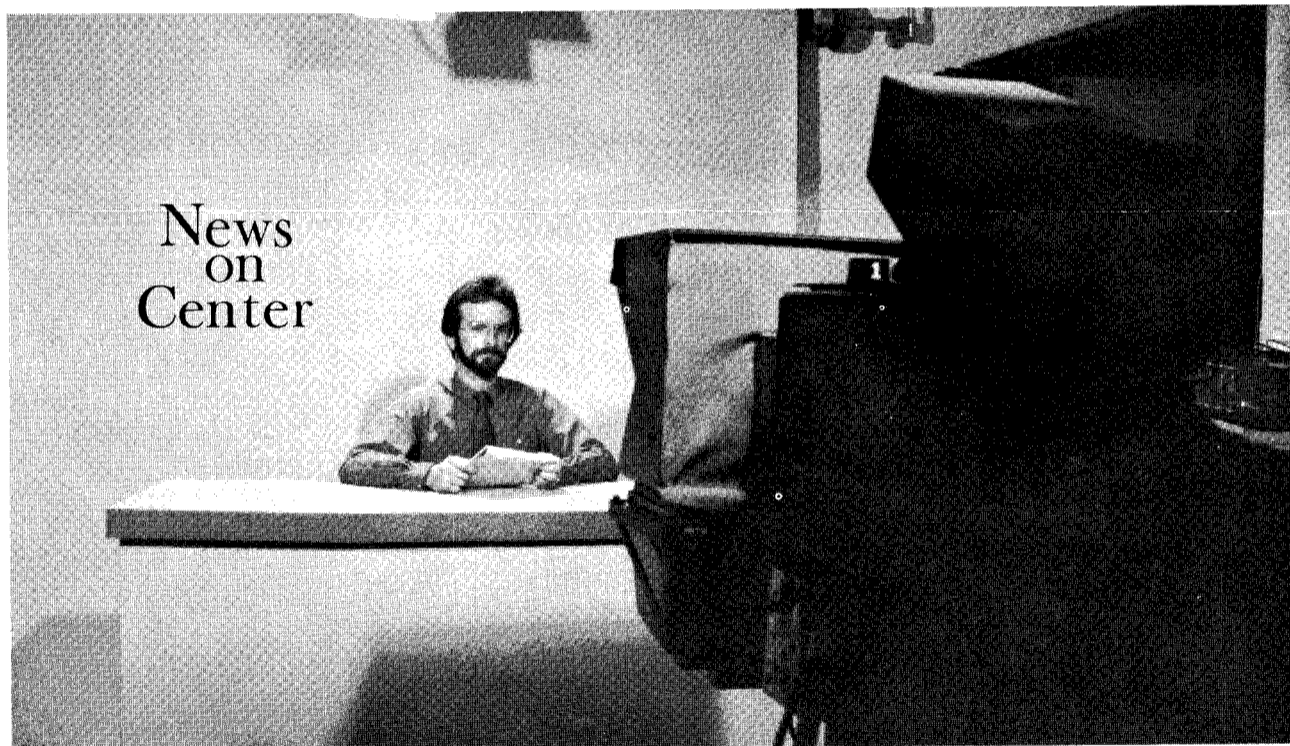
<p>"Save fuel" was the message for all Navy bases, Just car pools will rate inner compound spaces.</p> <p>It's your personal choice to flex in at eight, The guard had to leave early so he closed the Street gate.</p> <p>Parking lot "One" has gates everywhere, They're locked all the time so who put them there?</p> <p>They're more cars than spaces to serve building one, If you've flexed in at eight you're in for some fun.</p> <p>Your temperature rises as you survey each lane, See ten wasted spaces for a gate with a chain.</p> <p>You're late for a meeting it's eight twenty-three, So you wind up parking at the old IVB.</p> <p>You walk all the way back through isles so grand, They needn't be wider for a P-3 to land.</p> <p>You look at the spaces as few as there are, Designed for a van and not for a car.</p>	<p>Of course you're aware that spaces abound, The fact of it is they're in the next town.</p> <p>You watch one man car pools all parking inside, You know that this system is hurting your pride.</p> <p>You've filled out a form for two in a car, That's all your old Vega can carry this far.</p> <p>The pile of forms for pools wanting in, Are three inches high in a table top bin.</p> <p>To acquire a space as part of a pool, Six members first then five, that's the rule.</p> <p>You've changed to a "four" the mileage is great, To park near the door you must have an "eight."</p> <p>"Save fuel" was the message top management hale, This "car pool" parking had answered the mail.</p> <p>But privilege of rank exempts from the mess, They just can't relate to this problem, I guess.</p>
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Anonymous

## Toastmasters Elect Officers

The 1981 Officers of the Toastmaster have been elected. They will govern the group whose aim is to increase skills for public speaking. Rebecca A. Gray was elected President with Larry M. Smith serving as Educational Vice President and Bulletin Editor. Robert D. Mayes is Administration Vice President with Robert E. Dolcemore as Secretary and Treasurer. The Sergeant at Arms is Anthony L. Hodges. Their meetings are held every second and fourth Tuesday at 1145. If you want more information call Rebecca Gray at x2749.

## It's News to You



David Polish, Editor of the REFLECTOR prepares to introduce the "News on Center" closed circuit television program.

Seen and heard the latest news? You will if you tune in NADC's closed circuit TV system. "News on Center" debuts this month with several stories about projects here at NADC. The idea for a news program came from Bob Larr who is a script-writer assigned to NADC's Television Production Facility. Bob sees "News on Center" as a medium with the "potential to improve communications with employees."

"News on Center" offers the opportunity for employees to share valuable info about their project office or job. Not only can we learn ourselves but one lab can learn about technical improvements made by another lab. In

addition, films and informational material can be shown to a large group in the auditorium or any of the conference rooms equipped with monitors. Live broadcasts of tests in progress or special events can be made by a remote TV crew. A number of short programs have been produced and will be shown over selected monitors on-Center. In the future a program guide with up coming features will be issued. If you have any ideas, programs, courses or personalities you would like to see on "News on Center" please contact the Public Affairs Office, Code 091, x3068 or the Television Production Branch, Code 81331, x2720.

(Continued from Page 2)

- **Don't leave water running for rinsing dishes . . .** when you are washing dishes by hand, if you have two sinks fill one with rinse water. If you have only one sink, gather the washed dishes in a dish rack first and then rinse them quickly with a spray device or a pan of water.
- **Use a broom to clean driveway, steps, sidewalks, etc.** . . . the practice of using a hose wastes hundreds and hundreds of gallons of water.

- **Don't wash cars . . .**
- **Don't water lawns . . .**
- **Don't fill pools . . .**
- **Don't use garbage grinders . . .**
- **Don't prewash dishes for automatic dishwashers** unless absolutely necessary.

## Commander Salutes

CDR Lawrence G. Elberfeld, CDR Leino B. Corgnati, LCDR Robin C. Wood, LCDR James K. Kersey, ADAN Errol Johnson, Jr., and ADAA Michael Lindsey, also Major Jay C. Lillie, USMC, William E. Myers, PAR, and David E. Bischoff, ACSTD, all for their support provided during tests of Advanced Flight Controls.

Jules Z. Lewyckyj, ACSTD, for his outstanding drive in developing and implementing the FLU-8/P automatic life preserver inflator.

Marie Powell and James Zollo, both of Supply, for their assistance in moving household goods.

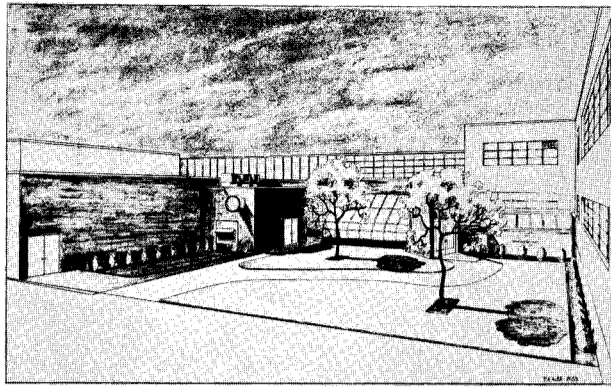
Vincent Novielli, ACSTD, for his assistance to the U.S. Army Armament Research and Development Command.

Douglas Bagwell, ACSTD, for his participation on the Cold Weather Technical Evaluation Support Team.

John Carlyle, ACSTD, for his support of the Defense Advanced Research Agency's "Inflight Acoustic Emission Research" program.

M. Bronson and Calvin Harvey both of TSD for their presentation on fire prevention to the Thomas Fitzwater School.

Roger A. Holler, SATD, for his presentation on "Electromechanical and Fiberoptic Kevlar Cables for Advance Sonobuoys" given at the Marine Technology Society's meeting 1980 Technical Session.



Artist's concept of what the area outside the solarium will look like when construction is completed in 1981.

## Save Leave

NADC will be closed from Christmas to New Years in 1981 giving everyone a long holiday break. According to the notice signed by Captain Dudley, three days will be charged to annual leave. If you do not have annual leave to use you may request to be placed on leave without pay or you may work. The work you may be assigned to could be in the range of your classification or you may be assigned duties which are in line with Center Management. In addition, NADC will be open on the day after Thanksgiving, 27 November. The idea is to reduce the number of "forced" annual leave days. For that day a liberal leave policy will be in effect allowing you to take the day off.

# Tech Transfer Accomplishments

NADC is a member of the Federal Laboratory Consortium for Technology Transfer which includes over 200 federal R&D laboratories and centers representing the Department of Defense, Department of Transportation, National Aeronautics and Space Administration, Department of Commerce, Department of Energy, Department of Agriculture, Environmental Protection Agency, Department of Interior, Department of Health and Human Services, and the Department of Justice. A brief summary of this year's program at NAVAIRDEV-CEN includes:

### U.S. Department of Agriculture/U.S. Forest Service

— Contracted with Piasecki Aircraft Corporation to design, fabricate, test, and demonstrate a short-haul, heavy vertical lift, aerial logging vehicle (named Helistat) under an Interagency Agreement between the U.S. Department of Agriculture/U.S. Forest Service and the U.S. Department of Navy/Naval Air Systems Command.

### U.S. Department of Transportation/U.S. Coast Guard

— Development of an active-gated television system to provide identification of ocean vessels at night and providing technical support for the U.S. Coast Guard Medium Range Surveillance aircraft sensor system.

### Mid-Atlantic Region and Local Activities

#### Environmental Protection Agency, Region III Office

— Initiated and is coordinating a response to the Environmental Protection Agency's request to: (1) assist in locating technical resources, facilities, and expertise in the federal R&D laboratories and centers to test and identify organic compounds, including toxic and hazardous wastes, for potential use in emergency situations; (2) identify new technology to assist in locating potential waste dump sites by remote sensing; and (3) assist in emergency field investigations.

#### U.S. Department of Energy, Region III Office

— Providing assistance to the Delaware State Energy Office in developing a program that would provide technical assistance from federal R&D laboratories and centers to state energy offices in the Mid-Atlantic Region.

#### Federal Laboratory Consortium for Technology

**Transfer, Region III**—Coordinated the region's activities to improve cooperation in technology transfer efforts among federal R&D laboratory representatives.

#### Federal Regional Council, Region III

— Participated in the meetings and activities of the Federal Regional Council, Region III, with representatives of all federal agencies in the Mid-Atlantic Region to explore the uses of technical resources of federal R&D laboratories to assist state and local officials and private industry. Activities included meetings with the Governor and Executive Department of the State of Delaware and the Mayors and Executive Departments of the cities of Philadelphia and Baltimore.

#### Pennsylvania Technical Assistance Program Advisory Council/Philadelphia Mayor's Science and Technology Advisory Council

— Participated in activities.

#### Warminster Township, Pennsylvania

— Provided technical information, reports, and contacts on the conversion of police vehicles from gasoline to liquid propane usage.

#### Institute for Cancer Research, Philadelphia, Pennsylvania

— Assisting in the development of a high-speed film camera/microscope set to which high-sensitivity light amplifiers are attached to measure the speed of propagation of membrane changes by determination of fluorescence responses.

#### Personnel Mobility Program

— Participated in a personnel mobility program authorized by the IPA (Intergovernmental Personnel Act). An IPA has been in effect with the Franklin Research Center, Philadelphia, during FY/1979/1980 and permits the detail of a Federal Regional Council employee to assist NAVAIRDEV-CEN in developing technology transfer conferences.

#### Others

— Provided technical information and/or technical resources to Horsham Air Ambulance Service, Bucks County, Lower Merion Township, Pennsylvania League of Cities, Marine Science Consortium, New Jersey Office for Promoting Technical Innovation, Baltimore Public Works Department and numerous other public and private organizations.

## Paramedics

NADC's Fire Department has accepted the responsibility of handling the ambulance services for the Center—24 hours a day, 7 days a week. Call X3333 in case of emergency.

Compliments to Al Keiss (Emergency Medical Technician-Paramedic) for developing this worthwhile program and thanks to the following firefighters who have qualified as Emergency Medical Technicians-Ambulance:

M. Bronson, T. Davis, J. Myers, K. Haggerty, F. Matthews, M. Gindele and E. Copper.

## Christmas Show



Yes indeed, the "Littlest Broadcast of 1944" was enjoyed by one and all—performers and audience alike. For a lot of us, it was the best show yet. The theme was an attempt to turn the clock back to a time in our nation's past when we were really "united" in these United States. It provided a nostalgic trip down memory lane for some; for others, it was an opportunity to hear a "big band" live and up close, and to "see" a radio show and how a broadcast might have been done.

## Nominations Wanted

Nominations are requested for the annual NADC Engineering/Scientific Award, NADC Award for Project Leadership and the Support Achievement Award. Each nomination must be accompanied by a concise statement of the achievements and contributions recognized and any supporting documentation that attests to the significance of the contribution. Please forward nominations to 031 no later than 10 February 1981. Plaques are on display in the NADC Lobby for recipients of the past awards. For additional information, call Lee Leko, EXT.3078.

## EEO Awards

Congratulations to the eight NADC people who received recognition at the eighth annual EEO luncheon held on 22 January 1981. Awards are given each year to honor those who have made outstanding contributions to the Center's EEO program. This year they are Jack Abbasi, ACSTD, Bruno Cavallo and Jay Goldfarb, SD, Gerard Goulet and Alexander Kuhn, SCD, Dr. R. Kenneth Lobb, Technical Director, Maureen Maron, CP, and David R. Morris, CNTD. All should be justifiably proud of their accomplishments.

## New Titles

Following is a partial list of books recently added to the Technical Information Branch. Visit or call your library at x2541 to reserve any of these books.

### AUTOMATIC CONTROL

"Analysis and synthesis of linear control systems" by C. Chen TJ213.C476

### COMPUTER SCIENCE

"Computer arithmetic: principles, architecture and design" by K. Hwang TK7888.3.H9

"Microwave circuit design using programmable calculators" by J. Allen TK7876.A415

"What can be automated? QA76.W49

### ENGINEERING

"Cooling techniques for electronic equipment" by D. Steinberg TK7870.25.S73

"Digital system design with LSI bit-slice logic" by G. Myers TK7888.3.M93

"Statistics for experimenters" by G. Box QA279.B68

### INDUSTRIAL SAFETY

"Modern safety and health technology" by R. DeReamer T55.D47



- ESG Director
- Fitness
- LDO
- Insurance
- Spin

## Ride Survey

Suddenly gas is up to \$1.40 per gallon and is expected to go higher by the end of the year. Ride sharing is one thing we can do to help reduce our transportation costs. Those of us who carpool already know how much money can be saved. But the majority have always had an excuse not to carpool: "I don't know anyone in my area," "How do we coordinate times," "Can I really save money?"

To help the problems and help administer the program the Delaware Valley Regional Planning Commission (DVPRC) is assisting this Center in formulating the NADC Carpool Matching Program.

To do this DVPRC

- has been provided with a list of zip code areas where our employees live.
- is presently preparing large maps of the area, which will have an appropriate gridding system. These maps will be displayed in prominent spots around NADC.
- is working on an application to participate in the program, which will then go to all employees.

Those who wish to participate may return the completed form with information on where they live and their usual working hours. These forms will then be processed by DVPRC and each participant will be provided with a list of names of other individuals living in his area who also wish to carpool to work.

The Department of the Navy has set a goal of 35% involvement in the ride sharing program. NADC, according to security, currently has about 25% of its employees sharing transportation so a 10% increase wouldn't be too hard to achieve.

The advantages of sharing rides can be substantial. Depending on the distance to NADC you can save up to \$600 a year. Wear and tear on your auto will be less because you use it less and if you drive less your insurance premiums may go down. One mental benefit of carpooling is that part of the time you can relax while someone else drives.

## Radome Maker



Betty Harvey lays fiberglass resin in mold as John Hickman looks on.

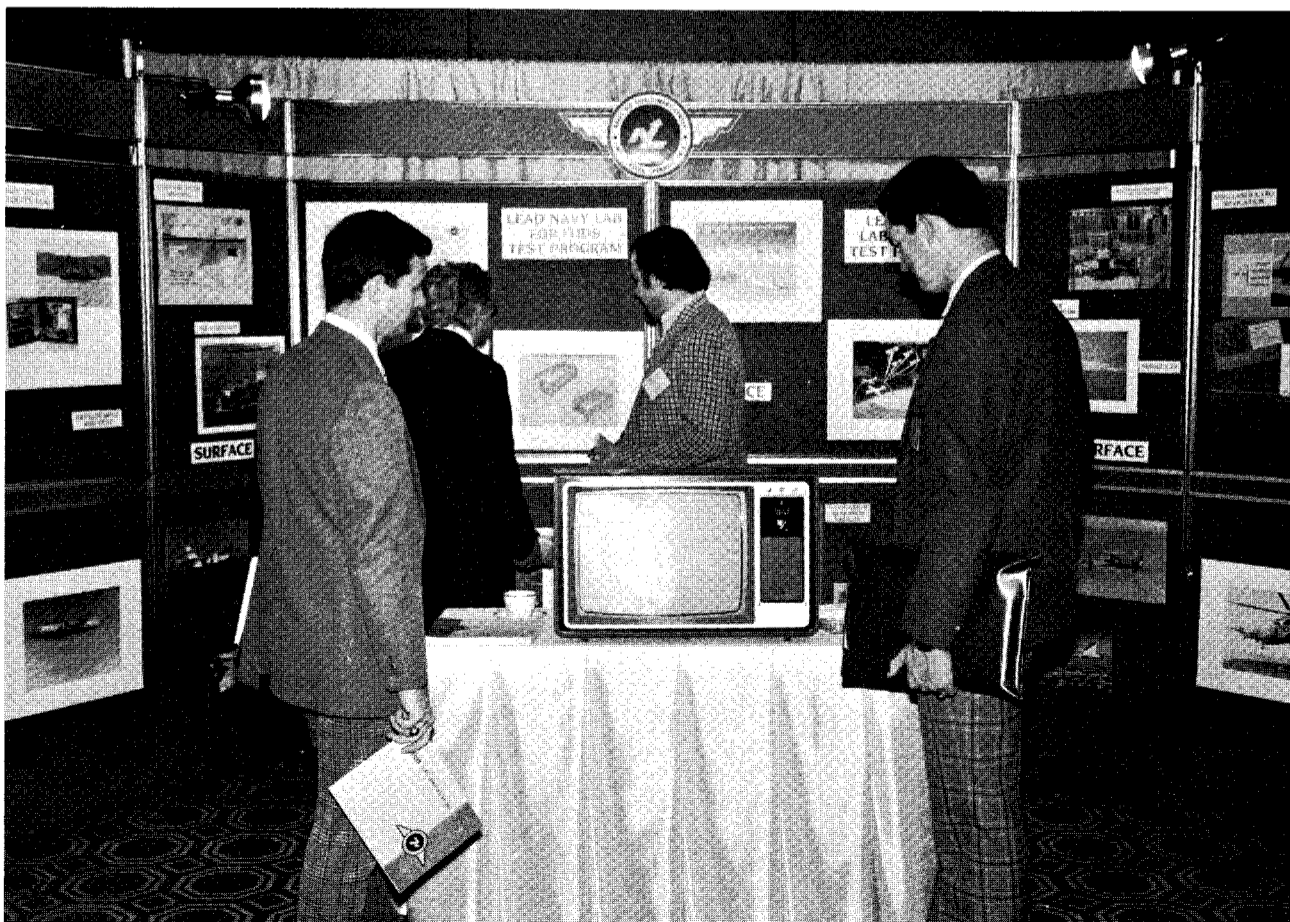
Upward Mobility can bring big changes in your career. Ask Betty Harvey she was a Supply Clerk three months ago. Now Betty works as a Materials Engineering Technician in the Microwave Technology Branch of the Sensors and Avionics Technology Directorate. In that area she is learning all there is to know about radomes (covers and fairings placed over antennas).

Betty's training includes math and computer courses at Bucks County Community College, where she is working towards an Associate Degree. On the job she is being taught how to work with the materials necessary to build prototype radomes. John Hickman, who currently is the

only person on Center building radomes, explained that since he is retiring this year a new technician was needed. Betty was selected for the job through the Upward Mobility Program. With 29 years of experience John is teaching Betty the process of building prototypes. Just this month she started laying up a radome using fiberglass cloth and resin. Eventually Betty will be able to design molds and consult with engineers as to what coatings and materials should be used in the design of radomes.

Talking about her new job Betty said, "I think it's a great opportunity to get into something other than secretarial work." "I really like to learn," she added.

## NADC hosts Meeting at Resorts



Attendees visit NADC's navigation exhibit in the Resorts International Ballroom.

"Navigation into the 21st Century" was the theme of the 1980 Position Location and Navigation Symposium, PLANS '80. The bi-annual conference was hosted by the Naval Air Development Center and the IEEE Aerospace and Electronics Systems Society.

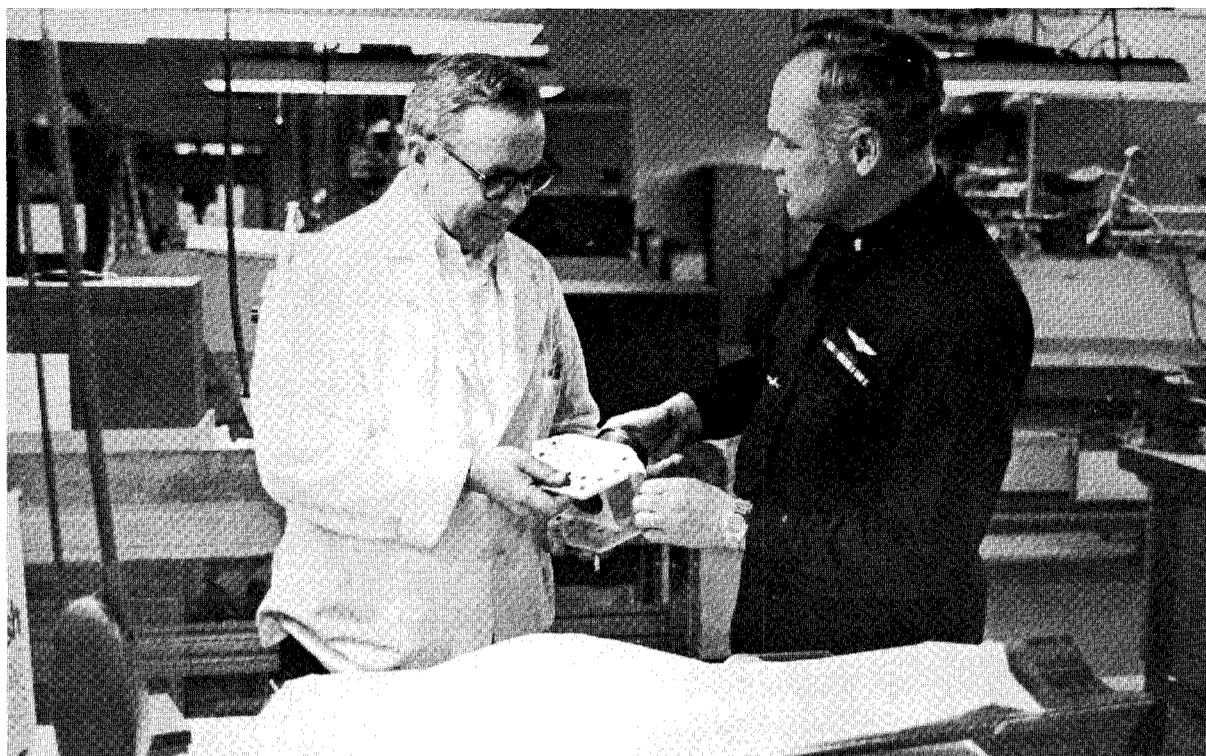
Before the end of the four-day conference, over 450 registrants had attended sessions on electronic systems, technologies and applications which are operationally important now and those that will be operationally important later in the decade and beyond.

The future for positioning and navigation systems appears very bright according to the keynote speaker, Dr. Gerald P. Dinneen, Assistant Secretary of Defense for Communications, Command, Control and Intelligence. "This symposium demonstrates the incredible breadth of the usefulness of pos/nav and I can see an increasing importance for pos/nav in the long-range planning efforts in progress in the DOD," he said.

During the four-and-one-half days of PLANS '80, representatives of nations from North and South America, Europe, Africa and Asia, including the USSR, presented papers or attended technical sessions. U.S. manufacturing companies and military service organizations showcased the latest state-of-the-art in navigation technologies, systems and applications.

In addition to the PLANS '80 technical program, the IEEE presented a one-day tutorial to explain the characteristics and potential of satellite systems for navigation, survey, geodesy and related functions. Special emphasis was placed on the NAVSTAR GPS program.

# Meet New ESG Director, CDR Mumford



CDR Mumford checks a metal work piece with Joe Belzer of the metal shop.

## AE1 Melton Selected as LDO

AE1 Martin M. Melton has been selected for appointment to Limited Duty Officer (LDO) status, an honor not given to many. Upon completion of flight training Melton will be commissioned as an Ensign. Although he applied to the LDO program in November and knew he had a good chance of making it, AE1 Melton was so excited when he got the news that he couldn't even read the message.

Currently assigned to the Quality Assurance Shop at the Naval Air Development Center, AE1 Melton began

his Navy career in 1973. He went to aviation electronics school and took two cruises, one on the USS Ranger and the other aboard the USS Independence. Key West, Florida and Rota, Spain were his two other duty stations before NADC. In 1980 AE1 Melton completed an Associate of Science Degree in Social Science from University of the State of New York. A native of Shellnob, Missouri, AE1 Melton and his wife, Patricia, have a three year old son Michael.

## Fitness: Starting a Program

by Sylvia Wasylyk

Many times people who are just starting out have questions about their training. Here are a few questions that many beginners seem to ask and their answers.

"Which is the best exercise?" Simply put, it is the one YOU enjoy the best and will pursue with some regularity. It can be as simple as an evening walk with a loved one or an afternoon of 440 intervals. Whatever turns you on!

"Is exercise safe?" At Dr. Kenneth Coopers' Aerobics Center, out of over 5000 people who participated at the center between 1971 and 1979, only 2 medical emergencies occurred—both to individuals with a history of averaging only one exercise period per week for the previous six months. (Tribute to both the safety of exercise and the need for proper supervision when undergoing a serious program.) Both men are alive and well and participating in a supervised regular exercise program.

"How often and how much?" 3 days per week is found to be the minimum level for a person to maintain a good level of fitness. Any less and the benefits are lost; any more and the risk of injury increases. Unless you are planning to participate in competitive sports, it is generally felt that the risk then outweighs the benefits. In order for your heart to work enough to become and stay fit, it is going to have to be working at an elevated rate—simply put, you're gonna have to sweat a little!

"Where do I find the time?" This is the biggie—you are going to have to MAKE the time. 30 minutes a day three times a week is sufficient, so take a good look at your daily schedule and set aside some time. Anyone who cannot find a half hour out of a day for three days a week does not sound very organized.

"How do I start?" SLOWLY, if you want to be able to keep at it. It is usually the soreness the next day that discourages people. The key is to exercise easily and gradually at first—5 minutes of walking and jogging to

start. Add to the time and distances as you feel able. A good key is to step up the activity only when what you are doing is ridiculously easy. Remember—the main objective is to do something you enjoy and will keep on doing.

"How can I improve?" To improve you must "overload". That means you have to get the body and the heart used to doing more than it has done before. You have to increase your distances and/or your pace. One helpful hint is to keep track of your times and distances on paper. Over a period of time the improvements become more tangible.

"What do I do about an injury?" See a doctor. Many more doctors are beginning to specialize in sports medicine. Local colleges with athletic trainers are often a good source for help or information. Don't play the hero and "run through it." It usually ends up not being worth the price you end up paying.

"Should I eat special foods?" A well rounded diet with all the vitamins and minerals and the basic food groups will suffice the average person.

"Should women exercise differently than men?" NO! The shapes may be different, but the composition is still the same.

"When does it become fun?" If you have to ask that, you are probably overdoing it. Go back to the first question. That gives you a pretty good guideline. The main thing to do is to determine what you want out of your program. If you are looking for fun and activity, get with others and stick to recreational activities like racketball, volleyball, basketball—team sports. Local parks and recreation departments have a wealth of activities for one who desires a night out with the boys or girls, so to speak. If it is a personal challenge that motivates you, or the chance to be competitive, then plan and expect your activities to be difficult and possibly even less than enjoyable. Either way, make up your mind and then "go for it!"

"It's my intention to poke my nose into all levels of this organization to find out what's going on. I really enjoy talking to people and hearing them explain their jobs." The new Director of NADC's Engineering Support Group, CDR Thomas F. Mumford, likes to know his people and his organization. "I have found a lot of highly dedicated people here," he added. "My biggest challenge is to manage 500 civilians and 200 military personnel. The paperwork is almost overwhelming." CDR Mumford explained that as the Director of ESG his goal is to get the dollar cost of installation down, making NADC more competitive with industry.

In a Navy career that has spanned 27½ years, CDR Mumford began in 1953 as an enlisted sailor. He completed aviation mechanic and structural mechanic schools between 1953 and 1957. Before coming to the Naval Air Development Center, CDR Mumford had three hours of duty at the Naval Weapons Evaluation Facility in New Mexico. He also was a member of the Heavy Attack Squadron 9 aboard the aircraft carrier Saratoga, on which he made 5 cruises to the Mediterranean. While with VT-24 in Beeville, Texas, CDR Mumford was commissioned on Ensign under the Limited Duty Officer (LDO) program. In 1973 CDR Mumford came to NADC as the Aircraft Maintenance Officer returning to New Mexico in 1977. He became Deputy Director of the Engineering and Support Group in NADC in 1980 and, upon the retirement of the Director, CDR Mumford assumed that position.

Originally from Carbondale, Pennsylvania, CDR Mumford and his wife Lucetta have three children, Thomas Jr., Mary and Randy.

## Letter to Editor

During the month of February 1981 NAVAIRDEV-CENNOTE #5330 was circulated to the employees here at NADC. This note promulgates that NADC will be closed Dec. 31, 1981. That particular date is a pay day and as NADC will be closed that day prior to the 31st as well as the day afterwards, how does the Dept. of the Navy intend to issue pay checks due to the 31st of Dec.??

Although it is a good idea to save the heat and electricity and energy by closing NADC for that time, it is also a good idea to inform the employees of the schedule for receiving their pay, so that their plans for that period can be formulated.

Our receiving of the Reflector is a good idea because it keeps all the employees informed of the important details of the work here at NADC.

Respectfully,  
Michael A. Kieserman

*Good news! One of two plans will be used to get checks to you. We may get our checks in the mail or the Center may be opened on the regular payday. Look for further details here.—Editor.*

Naval Air Development Center

The REFLECTOR is published monthly by the Public Affairs Office to inform Center personnel about topics of interest, and to promote the morale and general welfare of all concerned.

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CAPT Paul L. Dudley, Jr. — Commander, NADC  
Dr. R. Kenneth Lobb—Technical Director  
Joseph P. Cody — Public Affairs Officer  
David Polish — Editor



# Insurance Coverage to Double

The Federal Employees' Group Life Insurance Act of 1980. Public Law 96-427, made several changes to improve the Federal Employees Group Life Insurance (FEGLI) program. The law was signed by the President October 10.

The most significant effect of the Act was to provide Federal employees two new forms of optional insurance. In addition, the amount of Basic Insurance (formerly called Regular Insurance) will be increased in October 1981 for covered employees under age 45 at no additional cost to the employee.

In another change, any eligible Federal employee retiring since December 9 can elect an option to prevent the automatic decrease in the face value of life insurance that occurs after age 65.

The law applies to Federal employees who retire and are eligible to continue their basic insurance into retirement, or to those who become eligible to continue their basic insurance as recipients of benefits from the Office of Workers' Compensation Programs (OWCP).

Until now, life insurance was automatically reduced two percent per month after age 65, down to 25 percent of the original face value. Under the new law, employees can now elect a lesser reduction, or no reduction at all, through withholdings from their retirement annuities.

Approximately 2,350,000 employees are presently enrolled in the FEGLI program which is administered by the Office of Personnel Management.

Currently, the regular FEGLI plan provides coverage in an amount equal to the employee's salary, rounded to the next higher thousand dollars, plus \$2,000. It features a level premium, i.e., the rate per \$1,000 of insurance is the same for all employees, without regard to age.

Employing agencies contribute one-third of the cost of regular insurance, and the employee pays the rest. The Postal Service assumes the full cost for its employees.

In addition, \$10,000 of optional insurance coverage is available to those participating in the regular plan under a schedule of age-adjusted rates on an employee-pay-all basis.

An open enrollment period will be held from March 1 through March 31, 1981, during which all eligible employees (including re-employed annuitants) will be required to complete an election form setting forth their elections or declinations of the four forms of insurance which will be available.

OPM has set new premium rates associated with the new programs. The cost of the Basic Insurance has been reduced slightly from 25½ cents bi-weekly per thousand dollars of coverage to 24 cents bi-weekly.

Following is a brief summary of the four options and the rates which will be effective in April, 1981 following the open enrollment period.

## OPTION A—STANDARD

This is the new name for the insurance formerly called "option-

al insurance." The coverage is for \$10,000 and the premiums are determined by the individual employee's age. An employee must enroll for Basic Life to be eligible for this or the subsequent options.

The cost of the Option A—Standard Insurance has been reduced in some age categories, as follows:

Bi-weekly Rate for \$10,000		
	OLD	NEW
Under 35	\$ .60	\$ .60
35-39	1.00	.80
40-44	1.70	1.40
45-49	2.40	2.20
50-54	3.50	3.20
55-59	7.50	7.50
60 and over	9.00	9.00

## OPTION B—ADDITIONAL

Under this new option, an employee insured for Basic Life can purchase additional coverage in multiples of from 1 to 5 times his or her annual basic pay (after first rounding to the next higher thousand dollars).

The cost of the Option B—Additional coverage rates per \$1000 of coverage:

Biweekly	
Under 35	\$.05
35-39	.07
40-44	.12
45-49	.20
50-54	.30
55-59	.60
60 and over	.95

## OPTION C—FAMILY COVERAGE

This new option provides to employees covered under Basic Life coverage for their family members \$5,000 for the spouse

and \$2,500 for each eligible child.

The cost of the Option C—Family Coverage is as follows:

Biweekly	
Under 35	\$.50
35-39	.60
40-44	.70
45-49	.90
50-54	1.30
55-59	2.00
60 and over	3.00

## BASIC INSURANCE

The amount of basic life insurance available to each eligible employee *under age 45* will be increased commencing with the first pay period which begins on or after October 1, 1981, at no additional cost to the employee. The increase will be graduated according to the employee's age.

Employees under age 36 will be eligible for regular insurance coverage in an amount equal to their annual salary rounded to the next higher thousand dollars plus \$2,000, *multiplied by 2*.

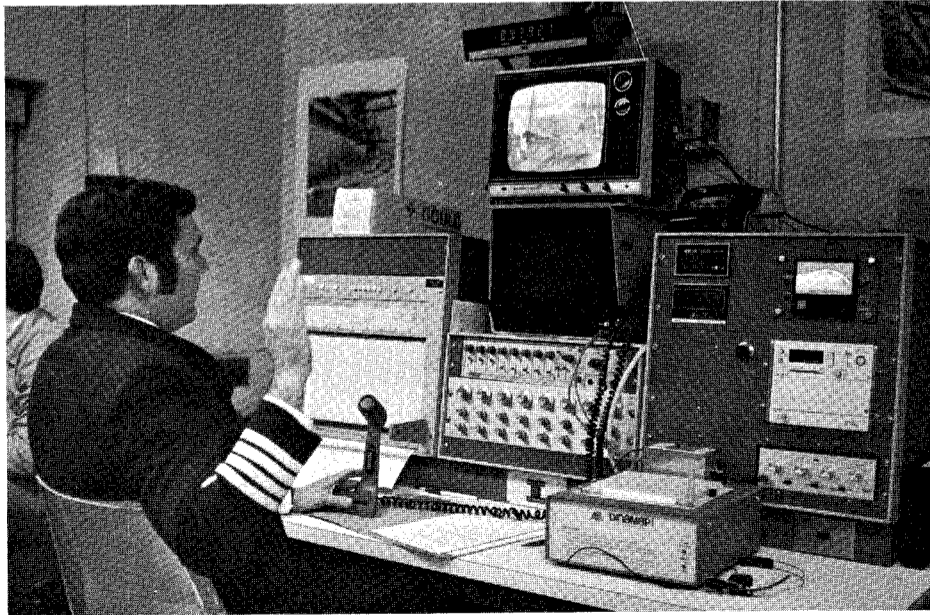
Beginning at age 36, the multiplication factor for the amount of regular insurance would decline by .1 each year, until it reaches 1.0 for employees age 45 and over. To illustrate:

At age:	
35 or under	2.0
36	1.9
37	1.8
38	1.7
39	1.6
40	1.5
41	1.4
42	1.3
43	1.2
44	1.1
45 or over	1.0

# Re-enlistment Puts Her in a Spin



There will always be a unique set of circumstances under which someone has reenlisted in the Navy. We've seen it done underwater, in the air, and in pressure chambers, but recently at the Naval Air Development Center in Warminster, PA a really unique reenlistment took place. PR3 Barbara Waugh took the oath while spinning in NADC's centrifuge. Flight Surgeon, Captain James Houghton,



administered the oath over the closed circuit television connecting the centrifuge with the flight deck. PR3 Waugh had been a test subject for NADC research in G effects. She was also detailed to the paraloft where Barbara was a parachute rigger. She recently transferred to the Naval Recruiting Command Pittsburgh PA.

## Commander Salutes

Gilbert Ridley, EEO, for his participation in the National Alliance of Business Youth Motivation Task Force.

Dr. R. Kenneth Lobb, TD, for his leadership during the recent MK-48 Torpedo Program Review.

Dr. Bruce N. Steinberg, SATD, for his support of the Council Rock Career Fair.

David Adaire, Bill Hogarth, Chuck Jacobs, Guy Nissley, Bill Gill, Bill McKenna, Fred Paulochok, Alfred Delarso and Clifford Tierney, all of PW, for their cooperation and service during the Computer Facility Expansion.

HMI Dwayne Murray, ACSTD, Alan Kaniss, Computer Department, Vincent Crusco and Raymond Meng, both of TSD, also Joanne Scherrer and Marlene Grubb, both of CP, all for their presentations to the Unami Junior High School's Career Fair.

Ronald M. Boyer, Computer Department, for his assistance to the Naval Air Technical Services Facility.

All those NADC personnel who helped during Energy Awareness Week.

Frank Smith and William G. Daymon, both of TSD, for their presentations to a visiting group from the Institute of Environmental Sciences Mid-Atlantic Chapter.

Marie Powell, for her efforts in assisting the Marines of the Philadelphia Memorial Armed Forces Reserve Center.

James Bivin, CNTD, for his role as Platform Integration Manager in the GPS (Global Positioning Satellite) A-6E integration program.

Joanne Scherrer, CP, for her management of DOD Science and Engineering Apprenticeship Program.

John J. Chmielewski and LCDR Raymond Tyler, PW, also Dr. R. Kenneth Lobb, TD, all of their participation during the CNM R&D Center Energy Conference.

Frank A. Corredine, CNTD, for his technical support during development and sea trials of a new Navigation System aboard the USNS Bowditch.

All the Directorate, Department Chairpersons and the entire NADC complement of personnel for their work in collecting \$71,064.21 for the Combined Federal Campaign.

## New Titles

Following is a partial list of books recently added to the Technical Information Branch. Visit or call your library at x2541 to inquire about these books.

### AUTOMATIC CONTROL

"Control and dynamic systems" vol. 16, 1980 QA402.3 .C6

### ELECTRICAL & ELECTRONICS ENGINEERING

"Application of digital image processing" TA1632.157 1977 vol. 2

"High frequency circuit design" by J. Hardy TK5103.H38

"Micro processors in military and industrial systems" TK7895.M515 1980

"Video user's handbook" by P. Utz TK6642.U89

### MATERIAL SCIENCE

"Crack arrest methodology and applications" TA 490.C7

"Creep analysis" by H. Kraus TA418.22.K7

"A general introduction to fracture mechanics" TA409 .G46

"Macromolecules: an introduction to polymer science" QD381.M352

"National Symposium on Fracture Mechanics—proceedings" TA460.N34

### MANAGEMENT

"Decision support systems: current practice and continuing challenges" by S. Alter HD30.23.A44

"U.S.-Soviet military balance: concepts and capabilities 1960-1980" by J. Collins UA23.C692 1980

### PHYSIOLOGY & MEDICINE

"Regional differences in the lung" RC773.R43

"Pulmonary gas exchange" QP121.P78

"International Evoked Potentials Symposium proceedings" QP370.155 1978

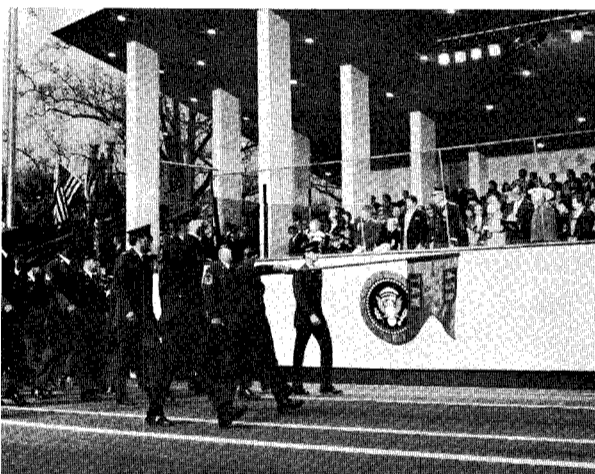


Ed Emery, CFC Chairman, and Center Commander Captain Paul L. Dudley Jr. admire a check for \$71,064.21, NADC's contribution to the Combined Federal Campaign.

## Plan Now!

The Center will hold its Open House on Armed Forces Day, 16 May 1981. All Directorates should be making plans for exhibits and presentations. Open House gives NADC a chance to show the public what goes on here and how we make use of your talents to create advanced systems. With advance planning and enthusiasm this could be the best Open House in a long time.

## Pres Pics



913th TAG parades in front of President Reagan.

Dick Refsnyder of ACSTD saw President Reagan's inauguration from an unusual position. His Air Force reserve unit was asked to march in the parade. A volunteer was needed to take pictures, so Dick accepted. As the 913th Tactical Airlift Group (TAG) passed the reviewing stand, Dick stepped out of the ranks and squeezed off several super shots.

Before leaving the Washington area the group decided to do a little sightseeing. Dick got separated from his buddies and they left without him. As he was standing near the Washington Monument a large group of police converged on the area, Dick thought he was in trouble. By this time his unit had noticed him missing and was just returning to pick him up. As they left he turned around to see the Presidential helicopter land to take former President Carter to the airport. Dick said he was sorry he missed that opportunity to get some more pictures.

## Command Move

Due to new construction in building 3 the CO, Chief Staff and TD will be moved to the New Navigation Lab. In addition the Public Affairs Office, General Counsel, Associate TD, Canadian Liaison and the Safety Office will also be located there. This move will be in effect for approximately 6 months.

**ENERGY.  
We can't afford  
to waste it.**

## Former TD Passes Away

Former NADC Technical Director, Dr. Guilford L. Hollingsworth, passed away in January. Hollingsworth was the Technical Director here from 1972 to 1974. He received his bachelors degree in 1940 and masters degree in 1941, both in Electrical Engineering, from Oregon State University. Hollingsworth also held an honorary Doctorate of Science from Pacific Lutheran University.

Beginning his career as a Development Engineer for General Electric in 1941, he joined the Boeing Corporation in 1946. From Engineer and Technical Supervisor in 1946, he became Director of the Boeing Scientific Research Laboratories in 1959. Two years were spent as Director of Technology, of the Military Airplane Systems Division and later Chief Scientist of the Aeronautical and Information Systems Division at Boeing.

After his stint as Technical Director of NADC, Hollingsworth went to the Naval Weapons Center, China Lake in 1974 where he also served as Technical Director until 1977.

A former member of the National Board of Directors of the American Astronautical Society, he has also been a member of the Seattle Board of Directors of the American Institute of Aeronautics and Astronautics. In addition, he was a member of the American Institute of Physics and of the American Association for the Advancement of Science. From 1962 until his appointment as Technical Director at NADC, he was a member of the Governor's Council on Nuclear Energy and Radiation. Hollingsworth was also a Trustee of the Virginia Mason center for Medical Research in Seattle.

## Beni Suggs Dec.

Neil S. Harewood, PW, \$25 for suggestion titled "Energy Conservation (Blowers on A/C)".

Roland Bender, SATD, \$25 for suggestion titled "Elimination of Safety Hazard".

Alfred Keiss, TSD, \$55 for suggestion titled "Hot Water Insulation".

Emanuel F. Pine, CNTD, \$50 for suggestion titled "Modification of Air Conditioner Baffles in Bldg. #125".

Mark E. Schwartz, Computer, \$25 for suggestion titled "Improving Maps of NADC".

Robert G. McFetridge, PW, \$125 for suggestion titled "Trench Type Drain".

Thomas R. Polaneczky, SATD, \$45 for suggestion titled "Automotive Oil Reclamation".

Samuel J. Giordano, PW, \$25 for suggestion titled "Access to A/C & Heating Equipment R-18-20".

Wm. G. Hogarth, PW, \$100 for suggestion titled "One Time Start for Critical A/C Units".

Michael W. Bronson, TSD, \$50 for suggestion titled "Use Purchased Films as Masters and Video Tape All Films for Showing on Video Units".

Fred W. Paulachok and Wm. E. Stumpp, PW, \$50 to be shared equally for suggestion titled "Modification to Emergency Generator Transfer Panels".

Charles J. Fichera, TSD, \$150 for suggestion titled "Percentage Scale for Copy Camera".

Gale Katz and Douglas C. Bellis, Systems Direct., \$50 to be shared equally for suggestion titled "Insulation/Replacement of Exterior Door to Roof of Bldg. #1, Floor 2, Col P1".

## Jan.

John B. Tye, A/C, \$50 for suggestion titled "Provide additional carrying handle on MK12 Life Raft".

James D. Myers, TSD, \$100 for suggestion titled "Installation of an oil bath filter for vacuum dry chemical filling unit".

James H. Murray, TSD, \$100 for suggestion titled "Electrically Operated Hydraulic Pump".

John F. Albert, SATD, \$100 for suggestion titled "Movable work platform for sonar tank".



# NADC Reflector

Volume 25, Number 3

Naval Air Development Center, Warminster, PA

March 1981

## Inside this issue

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- Letter
- EEO
- Ride Bulletin
- Peacetime Navy
- Clothing
- Dilworth

## NAVAIRDEVCCEN's Update II is World Famous



Japanese Officers get their Classroom training.

The P-3C UPDATE II aircraft is the finest land based long range maritime patrol aircraft in the world. And to prove it, a number of our allies are buying this aircraft along with the extensive computer software package that is its life's blood. Here at NAVAIRDEVCCEN a group of officers from Japan and a liaison officer from Australia are learning and monitoring the U.S. Navy's UPDATE II program for use in their own countries' maritime protection. Thomas Merkel, Foreign Military Sales Project Engineer, of the VP Program office explained that the Australians and Japanese have bought the P-3C UPDATE II platform. NADC, by the sales agreement, provides the technical people to train the Japanese cadre in the skills necessary for the development and maintenance of their own software.

Commander Yukio Ai, of the Japanese Maritime Self Defense force (JMSDF) commented that language is one of the major nuisances in receiving training. Although each person who goes through school and into college in Japan gets eight years of English study, it is a very difficult language to learn. Add the highly technical language involved in the programming of computers and you can

imagine the difficulty of their assignment. This is compounded by the inundation of learning the entire P-3C UPDATE II computer program package at one time.

All those training at NADC will become instructors back in Japan. A total of 230 Japanese plus their families have come to the United States to train. Some have been stationed in Jacksonville, Norfolk, and St. Paul, Minnesota, in addition to NADC. Japan eventually plans to have 90 P-3Cs with the first arriving this year.

Flight Lieutenant Anton Stretch of the Royal Australian Air Force discussed his governments interest in the P-3C UPDATE II Program. Australia uses the P-3C aircraft in many roles including ASW, open ocean surveillance, and control of fishing rights, since Australia does not have a Coast Guard.

Both Officers feel that the training received at NADC will be instrumental in helping each of them adapt UPDATE II advances to the special needs of his country. In the near future, NADC will begin training Officers of the Royal Netherlands Navy in the complex UPDATE II software to prepare for delivery of the P-3C UPDATE II aircraft later this year.

## New Shop Person



Grace Ward, TSD, shows how to engrave a name plate.

Grace Ward is the first woman in more than 30 years to work in the NADC shops. She currently is in an Upward Mobility Program as a WG-5, Engraved Plate Maker and has extensive machine shop experience. She started at the Frankford Arsenal in 1950.

Grace was sent to machine shop school and upon graduating she became a machine tool operator. At that time it seemed that women were not that popular in the machine shops. She later moved on to small arms then heavy artillery inspection. Over the years Grace has acquired machine skills and knows how to operate milling and automatic spindle machines along with drill press and hand tools.

After the Arsenal closed, Grace came to NADC as a telephone operator. Two years later she applied for and

got a job as an accounts maintenance clerk. With four years of accounting under her belt Grace decided it was time for a change. She had been applying for a variety of jobs when Sandi Levin, of Civilian Personnel, told her about an opening in the shops. Grace was chosen for the engravers job. She made the change from accounting to the shops because she felt there was greater opportunity for advancement. Grace said she would like to get back in the machine shop area again. When asked about the Upward Mobility Program Grace said, "I think it's great."

A resident of Croyden, Grace has 10 children, 6 girls and 4 boys, and 9 grandchildren, a feat for which someone should engrave a plaque.

## Reagan Signs

### A PROCLAMATION

We seek, in the 1980s, an era of national renewal, an era that will set loose again the energy and ingenuity of the American people.

Today there are 35 million disabled Americans who represent one of our most underutilized national resources. Their will, their spirit, and their hearts are not impaired, despite their limitations. All of us stand to gain when those who are disabled share in America's opportunities.

To increase the participation of disabled persons in our national life and in the lives of other nations the United Nations has designated 1981 the International Year of Disabled Persons. America has long been a world leader in this area, and the United States Council for the International Year of Disabled Persons and our Federal government have already responded to the United Nations challenge. Programs are underway throughout the Nation.

Through partnerships of disabled and nondisabled persons; of our private sector and our government; and of our national state, and community organizations, we can expand the opportunities for disabled Americans to make a fuller contribution to our national life. I am proud to pledge the cooperation of my Administration and the Federal agencies under my jurisdiction, including the Federal Interagency Committee for the International Year of Disabled Persons.

NOW, THEREFORE, in keeping with the goals of the International Year, I, RONALD REAGAN, President of the United States of America, do hereby proclaim 1981 the International Year of Disabled Persons in the United States.

IN WITNESS WHEREOF, I have hereunto set my hand this sixth day of February, in the year of our Lord nineteen hundred eighty-one, and of the Independence of the United States of America the two hundred and fifth.

RONALD REAGAN



# He's Still in Top Shape



Gene Wood puts the shot.

When most of us think of an athlete we think of a young person in their teens or twenties, highly trained, and motivated to a top performance level. There's somebody at NADC that is the exception to that mold, Gene Wood of the Center's Photo lab. Although he's 64, you couldn't tell it by looking at him. He has recently won a gold plaque and trophy, a silver medal and a bronze medal competing in the shotput event of the Masters Track Club meets.

Born in Boston, Massachusetts, his interest in sports goes back to his high school days. Forty-six years ago Gene held every interscholastic record in the hurdles and was state champion in the broad jump and hurdles.

After high school Gene joined a semi-pro baseball team, the Boston Wolverines. When he joined in 1935 the team was all black. At that time the major leagues were closed to black players. Gene's team barnstormed the New England area playing other teams which were almost all comprised of white players. During this time he also played left half back and drop kicker for a semi-pro football team. Gene's baseball playing lasted 18 years taking time off to join the Army in World War II.

While in Okinawa a friend introduced him to photography. After the war Gene was sent to Korea

where he met another friend who was getting out of photography so he gave Gene all his equipment. After returning to Boston and graduating from photography school, he set up his own portrait studio in 1947. A fire brought the business to a close in 1954. It was then that he moved to Philadelphia.

It wasn't long before Gene was in the photo business again working for a few different studios. Darkroom work became his specialty during four years of printing for Berry and Homer in Philadelphia. In 1968 Gene came to NADC and today is in the laboratory end of the Still Photography Branch.

Since 1956 Gene has been running four miles a day. He practices at NADC during lunch breaks for his shot put event. This spring Gene plans to start competing in the running events, something he's had to put aside because of a muscle pull last fall. It seems Gene Wood's secret to staying young is exercise, something we all can take a lesson from.

## Letter to Editor

On page one of the February Reflector, a picture titled "Radome Maker" shows Ms. Betty Harvey using fiberglass cloth and resin. In the interest of Ms. Harvey's safety and well being she should be wearing protective goggles and gloves.

Ms. Harvey may have posed for the picture (fiberglass and resin already hardened) and was in no immediate danger but lets think safety and show the correct procedures.

Bob Connison

Bob—

According to Martin Dubin of the Occupational Health Office at the Philadelphia Naval Shipyard the fiberglass cloth and polyester resin that Ms. Harvey was using in the photograph poses no health hazard. It should be noted that an exhaust hood was in operation over her work area.

Editor



The way it was back in 1936. Gene is second from the left, standing.

## EEO Up to Now *By Gil Ridley Deputy EEO Officer*

The Equal Employment Opportunity Act of 1972 (Public Law 92-261) opened a new era for EEO in the federal work sector. With the enactment of P.L. 92-261, Congress called a halt to the stepchild status of Equal Employment Opportunity federal agencies, activities and officials at all levels and brought EEO into the mainstream of management responsibilities. For the first time documentation of program direction was required in the form of Affirmative Action Plans following a format which assessed the organization, identified problem areas, set objectives, documented required actions to achieve objectives and assigned responsible officials and target dates for completion of each action.

The nine years of activity under P.L. 92-261 at NADC have been exciting and have experienced many changes. The action has sometimes been explosive, other times heartbreaking, but there has been progress. NADC has had four commanders (EEO Officers) during that period. All have demonstrated a high concern for people and have provided support to efforts to make NADC a model EEO employer. Because of the commitment of the commanders and their support to the Deputy EEO officer, top management quickly became involved and has supported all affirmative action programs on-Center. It is fair to say that the support of the program at the director/deputy director, department head levels has been outstanding. These positive elements provided a support system for the Deputy EEO Officer in carrying out the difficult task of establishing EEO/Affirmative Action as a management system beneficial to all employees at all levels. The greatest task has been to involve middle managers who see EEO as foreign to their job requirements.

Training sessions proved to be less than successful because short exposure to new ideas and behavior failed to gain commitment to decisions opposed to old established beliefs, standards and practices which often rejected affirmative action as infringement on their rights as a supervisor/manager. Patience and constant attention to positive program elements affected change for the good, even at the lower levels of management. As understanding increased and a wider population identified with the program, fewer personnel felt free to express negative generalities about EEO.

From a national point of view, it was necessary to deal with the quotas vs goals argument; then came the Bakke case which was given national coverage. Decisions on the Bakke case confused many but the Weber case followed closely on its heels and gave a needed boost to voluntary affirmative action as legal and proper.

All of the above leads us to where we are now, try as we can, changes in law and program thrust prevents us from closing the books. Program monitoring authority has moved from the Civil Service Commission to Equal Employment Opportunity Commission. That commission is case law oriented vs directives and policy at the Civil Service Commission.

New directives and requirements in the form of management directives are causing many changes. New requirements for programs are a daily occurrence, and the work load becomes greater. Most of you who are supervisors or managers are affected by the requirement to have an EEO objective for merit pay evaluation purposes. This requirement has caused many to become truly concerned with EEO personally rather than passively.

The picture is not bleak. We see constant breakthroughs in understanding. There are new types of involvement by new people. Even with a new administration at the head of our Government, the positive tide cannot change abruptly. Much new direction has been decided by law and legal precedence. A retreat to old norms is not indicated at the work place.

Together management, minority group employees, women employees and other employees have come a long way. The end is not at hand; there is a long way to go. One thing is for sure, we must all get there together.

Naval Air Development Center

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Dr. R. Kenneth Lobb—Technical Director  
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David Polish — Editor



# EXTRA-Ridesharing Bulletin

## Carter gets it Going

Executive Order 12191, which I signed on February 1, 1980, directs each of you to set federal employee ridesharing goals for each federal facility under your jurisdiction and to institute enabling actions and programs for achieving those goals.

It fulfills a commitment I made in October, 1979, to "issue an Executive Order mandating aggressive efforts by federal agencies and installations to increase carpooling, vanpooling, and use of mass transit by federal employees."

In addition to the specific requirements of this Order, I expect Agencies to take all feasible actions under current law to provide ridesharing incentives. Potential incentives include:

- providing for flexibility in working hours to facilitate employee ridesharing arrangements, if this will result in net energy savings;
- reserving the majority of conveniently located parking spaces for carpools and vanpools;
- encouraging federal employees' credit unions to establish favorable commuter vanpool financing arrangements;
- providing opportunities for employees to form vanpools through third-party leasing arrangements;
- scheduling meetings at times that will not interfere with employees' ridesharing arrangements;
- providing convenient places and opportunities for employees to meet potential ridesharers;
- facilitating the installation of public transportation information, kiosks and passenger shelters on government property;
- facilitating the distribution of monthly transit passes;
- encouraging major federal contractors to promote ridesharing at their facilities; and
- recognizing through agency awards those employees who are instrumental in establishing effective ridesharing programs or who contribute valuable ridesharing ideas.

The energy savings potential of ridesharing is enormous. Since the home-to-work commute is the most routine and predictable component of all driving, it is the most adaptable to regular ridesharing arrangements. The Federal government must provide leadership by encouraging its own employees to rideshare—and to demonstrate that ridesharing can save energy, reduce congestion, improve air quality, and expand options for safe and economical personal travel.



## Economics

Inefficient transportation is too costly. A recent study indicated that in 1976 a typical ten-mile commuting trip cost \$3.71, with 37 percent (\$1.37) borne by the commuter (vehicle capital and operating costs), 36 percent (\$1.34) assumed by the employer (parking lot capital and operating costs), and 27 percent (\$1.00) assumed by the government (highway capital and maintenance). Thus, when government is the employer, government in effect ends up paying 63 percent or \$2.34 of the commuting trip as compared to the \$1.37 paid by the commuter.

## Let Your Riders Buy It

According to a Congressional Budget Office report, the most fuel efficient form of transportation available today is the commuter vanpool. A commuter vanpool operates just like a carpool, only uses a 12-15 passenger van. By getting more people to pay their "fair share fare" it can be less expensive to ride in a luxury van than to carpool. The driver rides free and gets personal use of the van.

Vanpools are so fuel efficient that they are given priority fuel allocations like police cars, ambulances, and mass transit if fuel lines develop again. Therefore, vanpools know they will be able to get to work even if the foreign countries cut off their oil.

NADC is so convinced of vanpooling benefits that the Center is setting up VIP reserve parking spaces for all vanpools.

## NADC Survey Results

Results of a recent survey on the commuting habits of Center employees reveals that, of the 1326 people responding, slightly more than 40% usually carpool to work. Bicycling (1.8%) and walking (1.1%) proved to be more popular than public transportation. Only .6% reported using the bus and only .5% reported riding the train.

Fifty-five and one-half percent, or 736 employees, admitted driving to work alone. Some unsolicited comments revealed that reasons for driving alone varied from "only live one mile away," to "would like to carpool but no one available." For those who feel there may not be anyone else in their area interested in carpooling, the

NADC Ridesharing Program should help. When the forms, sent out earlier this month, are returned and processed by the Delaware Valley Regional Planning Commission, each person participating will receive a list of codes and office phone numbers belonging to other NADC employees who live in the same vicinity and wish to carpool.

Registration for all carpools, including those currently operating will begin on 1 May at the Security Office. All carpool passes currently in use will expire on 31 May 1981. Those registering in the new NADC Ridesharing Program will be eligible for special carpool parking permits.



## Ridesharing Defined

A technical definition of ridesharing might be "the process of increasing transportation efficiency by effective matching of vehicles and transportation needs." In general, ridesharing means using fewer vehicles to provide the transportation requirements of commuters. Simply, it is sharing the ride—commuting in groups using a single vehicle—riding together in carpools, vanpools, and buspools or using mass transit. Ridesharing is not driving alone to and from work.

No single mode of ridesharing is "the best." Each has its place; each has particular advantages and a relative efficiency in different circumstances. In most cases, for example, a bus carrying 50 people will probably be more efficient than a carpool carrying four people; on the other hand, a compact car carrying two people may be more efficient than a bus with ten passengers.

Ridesharing management is the process of promoting ridesharing by bringing people together, answering questions, eliminating concern, and taking whatever steps are necessary for people to begin to ride together more efficiently. Ridesharing is not based on coercion or heavy-handed regulations to force people to ride together, but is based rather on managing ridesharing programs so that individuals know ridesharing is in their best interest.

## Jump in, the Vanpool is Fine

Vanpooling is a more sophisticated form of carpooling and often requires much more assistance in getting started. A vanpool has been referred to as a large, well-organized carpool—only better. Basically, a vanpool consists of a single driver (with one or two backup drivers) using a 12- or 15-passenger van who picks up fellow workers within a common geographical area for the daily round trip to and from work. Riders pay a monthly (daily in some cases) fee which covers all costs of vehicle acquisition, insurance, taxes and fees, and commuting operation (gasoline, maintenance, oil, and tires). The driver rides without charge in return for driving and coordinating the pool.

Vanpooling is a most attractive form of ridesharing for several reasons:

1. There is only one driver; all other pool members simply ride, using that personal time to relax, read, or enjoy the camaraderie that normally develops within the van "family."

2. The vehicle is clean, comfortable (often equipped with extra heat and air-conditioning), and well-maintained. In company-sponsored programs, the driver is carefully screened and selected, assuring confidence and dependability. Riders usually cite these factors as advantages over carpools.

3. Preferential parking (encouraged by Presidential Memo February 1, 1980) is provided so riders receive door-to-door service almost like having their own private chauffeur and limousine.

A type of vanpool is the owner/operator vanpool. The driver purchases (or leases) a van which is then used to transport a pool. Unlike the shared expense carpool where the driver incurs a prorated share of the cost of operating the carpool, the vanpool owner should recover the entire cost of operating the van including van acquisition, licensing, insurance, taxes, and all operational expenses. The major inducement for the driver to operate the pool is the opportunity for full ownership and use of the vehicle with little or no cost.

# How Much To Charge

When a person asks for a ride, they are often checking to see if they can start carpooling with you. When they get to their home, they often ask what they owe you. Too many people feel that they are being friendly if they say "forget it". Unfortunately, a carpool cannot get started if a driver does this because the driver feels taken advantage of and the passenger feels like a free loader.

Do the person a favor—tell them you are a "fair share" pooler and that you accept the standard "fair share fare".

What is fair? The federal government and most employers reimburse employees 18.5 to 22½ cents per mile (in addition to parking charges and tolls) for a personal vehicle used in business. The Internal Revenue Service allows a person 18.5 cents per mile for a vehicle used in business. For easy calculation, it costs 20 cents per mile to operate your car. If one other person rides with you, each of you should pay 10 cents per mile. If you have three other poolers, each of you should pay 5 cents per mile, plus parking and tolls.

When your riders realize that the more riders they find, the more they will save, they will help you keep your pool full.

## Insurance

Many people are reluctant to rideshare because they do not understand the effect of ridesharing on insurance coverage. There are four things you should know:

1. If you carpool to work and drive no more than two days per week or two weeks per month, you are eligible for a discount on your insurance premium of approximately 10 to 25%. Contact your insurance agent.
2. Some people think that their insurance will be voided if someone pays them for a ride to work. This is not true. Private auto insurance policies, state that your insurance will cover you when carpooling.
3. Some people who ride with other people worry that the other driver does not have adequate insurance protection. No-fault insurance takes care of this.
4. Many people worry about insurance coverage if they carry other riders and feel that they should get very large policy limits. If you have liability insurance limits of 100/300, you have as much insurance as 97 percent of the private cars and 91.2 percent of all vehicles on the highway.

## Summary

Ridesharing provides many benefits as well as being a necessity. For you, ridesharing means personal savings (on vehicle operating costs, on vehicle wear and tear, on parking, on the tension and hassle of driving alone) and it provides a gain in personal time and an opportunity to broaden friendships. For NADC, ridesharing promotes good employee relations and can contribute to employee morale. It means a reduction of traffic congestion at and near the Center. It can reduce absenteeism and create greater access for various elements of the labor market. It sets the example for others and provides good public relations. In the national interest, ridesharing contributes to conservation of energy and the environment. Ridesharing reduces air and noise pollution, helps the nation's balance of payments by reducing its dependence on foreign oil, has significant international political aspects and promotes the common good for all Americans.

# Is Ridesharing Legal?

Many people think that it is against the law to carpool. Others think that you cannot charge people to ride with you. In 1979, the State of Virginia passed a law so that individuals could legally start carpools of up to 15 people.

There are three major types of pools. In shared driving pools, two or more people will ride to work together with one person driving one day and another person driving the next day (some pools alternate driving by the week). In shared expense pools, some people do not want to drive (or some people do not want to ride cramped up in the back seat of a small car) so one person (the one with the most comfortable car) drives every day and the remainder pay to ride. In combination pools, some people

share driving and others pay to ride.

It does not matter which type of pool you have, they are all legal as long as there are 15 or fewer people in the pool and the driver also is going to work. (The driver does not even have to work for the same employer.) The pool may ride in a car, a van, a pickup truck, or a station wagon and still be legal. Permits or special licenses are not needed—just get together and start pooling.

Not only is ridesharing legal, but any money received from people who pay the rider does not have to be treated as income on your tax return (Internal Revenue Service Ruling 55-555).

IT IS YOUR MONEY THAT YOU SAVE.

## a slightly warped history of ridesharing

### JAN. 3, 4,721 B.C. FIRST SUCCESSFUL RIDESHARING (KALAKA).

Noah shares ride with friends on ark and saves two of each each species (dinosaurs miss boat and became extinct).

### OCT. 5, 2,001 B.C. CRAMSES I INTRODUCES "REEDSHARING" for Egypt using papyrus boats.

### SEPT. 9, 612 A.D. MARCO POGO BOUNCES INTO HISTORY WITH THE FOUR-MAN POGO STICK—says, "the future is springs—forget wheels."

### MAY 4, 1775 GENERAL GEORGE WASHINGTON PROVIDES AN EARLY BOOST FOR RIDESHARING by posing for a poster as he crosses the Delaware in a boat shared with his troops.

### MAR. 20, 1849 AMOS VANPOOL SHARES HIS COVERED WAGON WITH ALL TAKERS IN THE SETTLEMENT OF THE WEST. Informed that he, "Little Big Van" (since he stands only 4'2"), has been named the father of Ridesharing, he says "Horsefeathers!"

### JUNE 29, 1904 THE SNEAD BROTHERS OF EAST OVERSHOE WOULD HAVE BEEN THE HOUSEHOLD NAME THE WRIGHT BROTHERS ARE, had they not insisted on sharing their unhistoric ride with four friends, two dogs, a keg of beer, and two dozen salami and cheese sandwiches.

### JULY 2, 1907 ENRAGED AT THE NON-PERFORMANCE OF HIS 1907 KLUTZMOBILE (the first lemon), Ed Tirebiter fills it full of water and dumps his goldfish into it—the first carpool is born.

### JUN. 2, 1915 BUSINESS BOOMS WHEN "HONEST GUNGA'S USED FLYING CAPPETS" hits on an ingenious promotion—9'x12' "rug vans" for Ridesharing.

### AUG. 29, 1952 FRUSTRATED BY TRAFFIC JAMS ON GAME DAYS, THE EAST OVERSHOE NEANDERTHALS ORGANIZES THE FIRST FOOTBALL-POOL—and carries its van through congested traffic to the stadium.

### FEB. 3, 1962 HANK HINGLE DISCOVERS THE 23-MAN COMPACT CAR-POOL—admits that the car was modified by removing the glove box door.

### JAN. 19, 1965 RUSSIANS CLAIM THAT IVAN POOLOVICH IS THE FATHER OF RIDESHARING since he pioneered the 3,000-man train pool (Minsk to Pinsk, 1939).

### SEPT. 11, 1965 U.S. SAYS POOLOVICH IS NOT THE FATHER OF RIDESHARING since Amos VanPool used conestoga wagons to do the same thing in 1849.

### OCT 23, 1965 RUSSIANS CLAIM THAT IVAN POOLOVICH INVENTED HOWARD JOHNSON'S INSTEAD.

### MAY 17, 1973 THE FIRST BICYCLE BUILT FOR 12 (FIRST 6 SEATS NON-SMOKING) IS DEVELOPED IN ALBUQUERQUE. Project was terminated when it proved impossible for the bicycle to get through downtown intersections before the light turned red.

### NOV. 19, 1976 THE U.S. DEPARTMENT OF TRANSPORTATION INFORMS "BIG BAIT" MILLER THAT CAR-POOLING IS NOT WHAT THEY HAD IN MIND.

### MAY 15, 1980 NATIONAL RIDESHARING DAY is declared, really, truly, and absolutely. Joy reigns throughout the land!

## Why Not 300,000 Miles? By John Pirch

It makes good sense to hang onto that old clunker as a second vehicle. Considering the cost of new vehicles, gasoline and car repairs, it pays to learn to do some of the repairs yourself. It pays one to change his own oil according to the manufacturers recommended intervals. The oil can be purchased during sales and the life of the engine is tripled or more.

Many high schools hold adult evening courses among which auto maintenance is becoming more popular. In one of these evening schools you can learn to change oil, pump grease into fittings, check hoses, wiring, battery water level, and the exhaust system. You can also learn to check your points, how to use a timing light and dwell tachometer in tune ups and, how to check and change the distributor cap, rotor, and PCV valve.

Also included is a session on how to prepare for state inspection. These tips can save you many dollars at inspection time. My last two inspections on two vehicles cost me the basic fee. On the third inspection I was socked \$4.00 more because a side lamp failed. Because I was too lazy to check my lights it cost me. All it took was about a 75¢ bulb and about ten minutes with a screw driver. Another stickler is wiper blades, you can change your own for three or four bucks while they do it for about eight.

Don't be surprised to see about half the class composed of women at the maintenance course. Seems everyone is tired of ripoffs on car repairs and inspections. They are eager to try setting gaps on plugs and wrench them in along with handling the grease gun. One instructor said he had a whole class of nuns once, who were taking his course. He claimed it was fun teaching them. One whole

session was on replacing a flat tire with the spare.

Auto parts, tools and repair manuals are found in almost every shopping center. One can pick up ramps and a creeper on sale at least a couple of times a year.

A worthwhile chore to perform on a nice day in September is to remove both battery posts, scrub away all corrosion from post and clamp. This will improve efficiency of the battery in cold weather. Also check electrolyte level in all cells while you are at it and if low add distilled water. For a few dollars you can buy a simple battery clamp remover and a cleaning tool with wire brushes for cleaning corroded terminals. It can be downright frustrating on a cold day to jump in your car and not even get a growl from your starter. I forgot to do mine one year and wasted two cold hours getting home. Next morning I froze fingers doing the job I should have done on a warm day.

Some people will say, "well if you keep your car for 300,000 miles you are hurting the economy." I say balogne! You must pay for parts, tools, oil, gas, tires, etc., which helps the economy. And besides many people do have a newer, later model car in addition to an older one.

It makes more sense to drive an old car on a cold, snowy, slippery workday than today's nine or ten thousand dollar non-polluter. Driving the new car on a slick day can be nerve wracking. Just one fender bender can cost at least a thousand dollars these days. So stay loose and drive your oldee.

Don't forget to change oil regularly and perform all the previous mentioned tasks along with some body upkeep. There is no reason for not getting 300,000 miles.



## ADM Train on: Peacetime Navy

*"Peacetime naval presence is a valid phenomenon historians have written about for 2,500 years. Through those years leaders have recognized peacetime naval presence gives a very, very important series of options to the leadership of nations who possess navies. These options which they can employ ensure the interests of that nation are protected." (Admiral Harry D. Train II)*

"To bring this valid phenomenon of peacetime naval presence into perspective, let me share with you the mission I am assigned as Commander in Chief of the Atlantic Fleet and Commander in Chief, Atlantic Command. My primary mission is to deter attack on the United States, and in addition, I am to protect the vital interests of the United States from attack. Those vital interests are specifically identified. They are support of allies, access to resources and markets and access to critical regions for political, economic and military purposes. It does not say that my mission is to fight a war—but rather it commits me to firmly using those forces to prevent war and to protect the U.S. interests during peacetime so there will not be a war.

"Naval forces have been that force which the political leaders of this country have used to respond to crises and have used to defend U.S. national interests in 140 cases since the end of World War II.

"Naval forces can be used in the employment of peacetime naval presence in four ways:

- As a dominant force
- As a hostage force
- As a force removed from the scene
- As an uncommitted force

"One of the ways you can use a peacetime naval presence in support of national policy is to send a dominant force to the area.

"The force that we have in the Indian Ocean is the dominant naval force.

"The second way one can use a peacetime naval presence, an equally effective way, is to send a hostage force to a crisis area. A hostage force is one that clearly could not prevail in the event of hostilities, but would nonetheless be involved if hostilities occurred. Unless the competing parties wished to involve the hostage force, hostilities would be deterred by its presence.

"The third way you can employ naval forces in peacetime naval presence is to remove your Navy from the scene so that it is not a factor. The message is the competing parties must solve their own problems.

"And finally, the fourth way you can employ naval forces in support of national policy, and in support of our national leaders, is to keep naval forces uncommitted. These forces could be maintained in a position which would indicate to those observing that we had not yet decided to commit ourselves.

"These options give our leaders very, very effective tools to use to influence events in favor of the United States and against those whose interests do not coincide with ours.

"The primary function of the Navy is not to fight but to keep you out of a war. To support my statements, let me re-emphasize my formal assigned mission as the commander in chief of the Atlantic Fleet. I protect the vital interests of the United States from attack or coercion. Those vital interests are to support allies—to support the NATO Alliance—to protect United States access to critical regions of the world for political, economic and military purposes. It does not say my mission is to fight a war; it does not say I have to conserve my forces so that I can fight a war; it commits me firmly to using those factors to prevent war and to protect the U.S. interests during peacetime so there will not be war."

## Dressing for Action by Sylvia Wasylyk

Hopefully I have been able to answer your questions regarding your training. Now let's turn to the subject of clothing. Obviously you can't leap from your desk and hit the roads. Jogging is murder on a three piece suit. There are many things to keep in mind when deciding what to wear. The biggest consideration is comfort. Your exercise clothing must be comfortable and not restrictive to ensure your well being and enjoyment. The more freedom of movement you have, the easier and more enjoyable the exercise will be. Be sure you have full range of motion in all your joints without restriction or chafing.

Today's economics makes cost another major factor. If you have the money and want "the look", outfits and shoes can run you over \$100. You can purchase a wide variety of clothing at a wide range of prices. But keep in mind that those baggy grey \$6 pants works just as well, and won't hurt quite as much when you take that frisky romp through the woods one fine spring day and rip them on a bush.

Another prime consideration is visibility. Unless you are 100% sure of doing all your activity indoors or on a

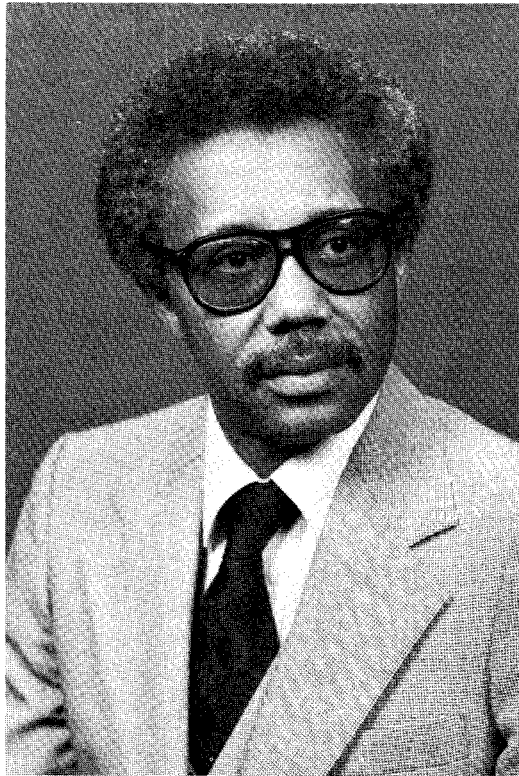
track, consider purchasing bright visible clothing. Items such as vests and jackets can be bought, but so can reflective striping and material that you can sew on yourself. This is a must for the evening enthusiasts. Next time you are out for a drive, observe the people you see out on the roads. What clothing was visible and what wasn't? Remember, in a collision between a car and a body, something has to give, and it usually won't be the fender. It could be you!

Socks should be clean, well fitting, not worn down, and comfortable. My brother-in-law will not even step outside without 4 thick pairs of cotton/wool blends, whereas some of the hockey players I skate with would rather die than wear socks with their skates. To each his own.

Other clothing accessories to be considered are the use of elastic cotton bands or scarves to absorb sweat. Eyeglass guards are very helpful in keeping my glasses in place while I exercise, especially in the summer.

Now that you have a good idea of what to wear, tune in next issue when you will find out all you need to know about footwear.

## Dilworth to be TD of Panama City



**Guy Dilworth is the new Technical Director of the Naval Coastal Systems Center, Panama City, Florida.**

The new Technical Director of the Naval Coastal Systems Center, Panama City, Florida is Guy Dilworth. He has been Director of the Software and Computer Directorate at the Naval Air Development Center for the past 2 years.

At NADC for the past 18 years, Guy has held a variety of positions. He has been the Division Superintendent for Fleet Readiness Engineering and Analysis Division; Avionics Systems and Subsystem Project Leader; Branch Head for Computer Sensor Driven Displays and Controls; and Designer for Computer to Sensor Interfaces.

Guy said that he has, "always felt comfortable here. I know the people and I have never found anything boring here because of the diversity of the work and the outstandingly competent engineers."

When asked about how he felt upon leaving NADC, Guy had these reflections, "I feel that NADC has provided me with the opportunity to express myself and I appreciate that." He added that, "NADC is an important place. All you have to do is look at Airborne ASW and see who is the world leader; the U.S. Navy. And it all emanates from the corner of Street and Jacksonville Roads. NADC also is preeminent in the navigation and materials fields," he added. Guy said that he would like to make NCSC as prominent in its designated field as NADC is in theirs.

Guy received a B.S. degree in electrical engineering from Tuskegee Institute, Alabama and a M.S. degree from Pennsylvania State University, College Park, PA. He is a member of IEEE, Association for Computing Machinery and the Naval Civilian Administrators Association. Guy and his wife Jean have three children; Michael, age 12, Martin, age 10, and Janean, age 8.

## Commander Salutes

Guy C. Dilworth, SCD, for his presentations on MPS and SES training.

Edward Hirak, John Reed, Michael Quinn, Wayne Schuessler and Donald Meadows, all of the Fire Department, for their assistance to the Huntingdon Valley Fire Company during a recent gasoline truck accident.

Stuart B. Simon, PAR, for his contributions to the MK-48 Torpedo Review Team.

Robert F. Swierczynski, PAR, for his assistance to the Planning and Facilities Division of the Naval Material Command during the assessment of R&D facilities.

Edward A. Reidinger, SATD, for his presentation on sonobuoys to the Naval Intelligence Support Center's Acoustic Intelligence Conference.

Captain Edward J. Sturm, ACSTD, for his leadership during a Tri-Service Audit of the General Electric Company Aircraft Engine Group.

Dr. Lloyd Hitchcock, ACSTD, for his many contributions to the scientific developments of this command.

## Where It Goes

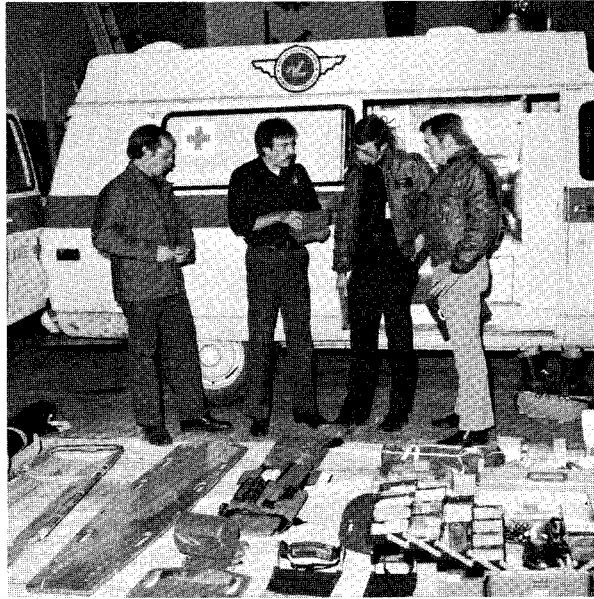
Navy Relief celebrated its 77th Birthday on 23 January, the anniversary of the Society's incorporation in 1904. In that year the proceeds of the 1903 Army-Navy Football Game were made available "for the relief of dependent widows and orphans of the officers and enlisted men of the Army and Navy." \$18,000 was divided between the two services and the Navy Relief Society was formed.

Over the years, the mission and size of the Society have expanded greatly. Today, Navy Relief provides a wide range of services and financial assistance to active and retired members of the Navy and Marine Corps and their dependents, as well as to widows and orphans. Assistance is available for valid needs such as essential living expenses, emergency transportation, medical, dental and funeral expenses as well as other emergencies. Whatever the problem, the Navy Relief Society is ready to listen and to help find a solution.

In 1980 over \$9,000,000 was provided to over 50,000 service-members. In addition, about a hundred thousand more received free layettes, nursing care, budget counseling and other types of personal services. Local statistics here at Pennsylvania Auxiliary were: 844 loans totaling \$150,861.00 and 96 grants totaling \$14,541.98; non-financial service was given to 708 servicemembers. 64 loans amounting to \$6,998.88 were later converted to grants on the basis of hardship. Layette expense was \$2,355.39 with 60 families aided. The Children's Waiting Room at the Naval Regional Medical Center cared for 2,507 children, operating expenses were \$6,661.61. The Thrift Shop incurred no expense while serving many hundred Naval and Marine Corps families.

Today's Navy Relief continues as it started—a private, nonprofit organization, supported solely by the contributions of past and present Sailors and Marines and their civilian friends. Also, just as in 1904, the Navy Relief of 1981 is a volunteer based organization. The Society keeps its paid staff to the minimum number required, currently 188 full and part-time. The real backbone of Navy Relief is the 3,000 trained volunteers who provide financial assistance and budget counseling, prepare layettes for babies, operate children's waiting rooms and Navy Relief thrift shops. It's your Society, the Navy and Marine Corps taking care of their own.

The Pennsylvania Auxiliary, which is open weekdays, is located at 3rd Street East and Preble Avenue on the Naval Base, phone 755-3028 or 4138. Its Willow Grove Branch, located in the Administrative Building at NAS, Willow Grove, phone 443-6024, is open Wednesday, Thursday and Friday, 1000-1400. If you are in need of assistance, it is suggested you call in advance for an appointment to ensure being seen promptly.



Pictured from left to right: F/F EMT-A Edward Copper; F/F EMT-P Alfred Keiss; LT. Michael J. White, MC, USN, FS; CAPT James O. Houghton, MC, USN, FS; inspecting the NAVAIRDEVCON ambulance and its new equipment.

## We Can Feel Safe

Since assuming responsibility for manning the ambulance the Fire Department has purchased equipment which provides for the handling of any medical emergency which they may incur. The ambulance is probably the best stocked vehicle in the area.

## Energy Tips From Tom Ames

Spring is the time to insure that your air conditioning system at home is ready for the summer. Here are some tips:

- A. Clean or replace air conditioning filters at least once a month.
- B. Clean the unit and remove all dirt, dust and lint which will restrict the flow of air and reduce cooling capacity as well as increase cost of operation.
- C. Central A/C units or heat pumps should be kept clean and free of plant overgrowth or leaves that would interfere with air circulation.
- D. Plant shrubs between your driveway or sidewalk and your home to block reflected solar radiation.
- E. If you are installing a new roof, consider using light colored shingles, which absorb less heat than dark colored ones.

## Brennan Selected

Thomas Brennan, past Program Engineer of the Center's VSTOL effort has been selected to head the PAR (Planning Assessment and Resources) group. He succeeds Thomas Willey who has been the Acting Director since Dino Mancinelli took the position of Associate Technical Director.

## Undersea Museum

Scheduled to open in 1984, the Naval Undersea Warfare Museum will house the history of the weapon systems designed to operate under water. The museum located at the Naval Undersea Warfare Engineering Station, Keypost, Washington plans to have exhibits ranging from early submarine developments to such things as LAMPS, P-3 and a futuristic underwater base. In addition the museum will provide a center for the study and utilization of past and present technology in the undersea weapons area.

The Naval Undersea Warfare Museum Foundation is a non-profit tax exempt organization. They are looking for support from industry and other Naval activities in the form of exhibits and funds.

## Tech Transfer

NAVAIRDEVCON is assisting the Institute for Cancer Research (ICR) in the development of a high-speed camera/microscope set to which light amplifiers are attached to measure the speed of propagation of membrane changes by determination of fluorescent responses. The goal of the project on cell surface work is to measure in vivo responses of cell membranes by non-intrusive methods. Dr. M. E. Bayer of ICR has employed novel membrane fluorescence dyes and found that the bacterial envelope reacts very fast to metabolic changes, to oxygen or uncouplers of oxidative phosphorylation. Virus infection produces, probably by injury of the cell membrane, an analogous response. NAVAIRDEVCON has been helping to film the fluorescence dye/cell reaction using combinations of special light amplifiers and high-speed 16mm cameras. Individuals from the Photography Branch (TSD) and Remote Sensing Branch (SATD) have made significant technical contributions to this project.

NAVAIRDEVCON is acting as technical program manager and contracting agent for the U.S. Coast Guard development of a 6-person VTOL airship which is planned to fly in 1983 as an experimental maritime patrol vehicle. Tilting propellers will give the blimp the ability to hover over small vessels, with fuel economy far exceeding that of the airplanes, helicopters and cutters now in use. This program is related to the Center's studies of potential application of modern Lighter-Than-Air (LTA) vehicles to the current and future requirements of Naval Maritime Patrol in terms of technical feasibility, operational effectiveness and cost.

## New Titles

Following is a partial list of books recently added to the Technical Information Branch. Visit or call your library at x2541 to inquire about these books.

### COMPUTER SCIENCE

- "International Computer Software & Applications Conference, 4th, 1980, Proceedings" QA76.I2.I68 1980
- "PL/I Structured Programming" by J. Hughes QA76 .73.P25H83 1979
- "370/360 Assembler Language Programming" by N. Stern QA76.8.I123S73

### ELECTRICAL ENGINEERING

- "Diffraction Theory & Antenna" by R. Clarke TK6553.C53 1980
- "Tektronix 5440 Oscilloscope" TK7578.7.T3

### INFRARED TECHNOLOGY

- "Modern Utilization of Infrared Technology VI, 1980" TA1570.M64 1980

### MATERIAL SCIENCE

- "Symposium on Computer Automation of Materials Testing" TA410.S92

### MATHEMATICS & STATISTICS

- "Dictionary of Logical Terms and Symbols" by C. Greenstein REF QA9.G698
- "Statistical Analysis for Decision Making" by M. Hamburg HA29.H242 1977

### MILITARY & NAVAL SCIENCE

- "Military Balance 1980-1981" REF UA17.M55
- "Naval Research Laboratory Review, 1979" V393.U57
- "Ships, Aircraft, and Weapons of the United States Navy" REF VF347.S5 1980

### OFFICE PRACTICE

- "Practical Secretary's Manual & Guide" by Y. Lovely HF5547.5.L68

### SIGNAL PROCESSING

- "Real Time Signal Processing III" QC350.S6 1980
- "Smart Sensors II" TK5102.5.S44 1980

### NEW JOURNALS

- "Concepts, Journal of Defense Systems Acquisition Management" quarterly, Defense Systems Management College, Ft. Belvoir, VA. Autumn, 1980-
- "The Hook" quarterly, Tailhook Association, Bonita, CA. Winter, 1980-81-



# NADC Reflector

Volume 25, Number 4

Naval Air Development Center, Warminster, PA

April 1981

## Inside this issue

- Editorial
- Shuttle
- ADPA
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- Military Family
- Survey
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## Center Honored for Submarine Navigation Work

By John DeMatteo

On February 11 in the Center Auditorium, NADC was awarded the TRIDENT Flag for technical contributions made to the POLARIS, POSEIDON and TRIDENT Fleet Ballistic Missile Navigation Programs. Captain Dudley accepted the flag in behalf of the Center. The presentation was made by Captain Tom Bush of Strategic Systems Project Office (SP-24) Navigation Branch. Other distinguished visitors included LCDR William Watkins and Mr. Dave Collins also of SP-24 and Captain C. O. Tuff and Jack Revenaugh of SSPO—Detachment C, a field activity of SP-24.

At the presentation Captain Bush read a letter from Admiral Clark, Head of Strategic Systems Project Office: "To: Commander of Naval Air Development Center, Warminster, PA. It is with pleasure that I present this POLARIS, POSEIDON, TRIDENT Flag to the Naval Air Development Center. As a member of the POLARIS, POSEIDON, TRIDENT Team, you have made significant contributions in the navigation subsystem error analysis, inertial instrument and system test status for navigation subsystem sonar and data processing equipment hereby contributing materially to the success of the Fleet Ballistic Missile Weapon Development and Production Program. I wish to extend my congratulations to you and your personnel. I trust you will display this Flag with pride in a job well done."

Captain Bush took this opportunity to compliment the personnel of CNTD, some of whom have been with the program since its inception some twenty-five years ago. He emphasized the importance of the work being conducted and stated that their contributions were important to the success of the Fleet Ballistic Missile Navigation Program which is recognized as a major weapon system within our defense arsenal. The role of



A view of the test set-up for the FBM program.

CNTD was reviewed, starting with its work in basic research to the operation of the USS COMPASS ISLAND and the recently completed conversion of the USS VANGUARD which replaces COMPASS ISLAND. These ships are unique in that they serve as the SSPO Navigation Test Vehicle for developing new equipments and resolving fleet reported problems. Captain Bush also described the Division's present role in the Improved Accuracy Program (IAP). The IAP is the vehicle for studying new systems, instruments, concepts and require-

ments for the future TRIDENT II Submarine Navigation System.

Following Captain Bush's speech, he presented the TRIDENT Flag to Captain Dudley. The ceremony was concluded with Captain Dudley reciprocating and presenting Captain Bush with a NAVAIRDEVCON plaque.

The TRIDENT Flag is currently on display in the Main Lobby of Building 3.

## Fuel Saved by Calculator Adds Up

Pocket calculators have invaded our lives. Those little electronic wonders total our taxes, groceries, and bills. One new use of these marvels is to save fuel in fleet aircraft. According to a report authored by Michael Herskovitz, of ACSTD, a pocket-sized Aircraft Performance Advisory Computer or APAC can be used to save millions of dollars in fuel costs over a year's time.

### Uses a Standard Calculator

Procedures for saving fuel are not new. The NATOPS manual has charts and procedures developed to help aircrews calculate the most efficient mode of operation, but the manuals were written nine years ago and new techniques have been developed since. With a standard Hewlett Packard HP-41C pocket computer and a program designed to take into account the variables for each type of aircraft, optimum performance can be obtained. Using a separate program module for say a P-3C the pilot enters the fuel load, aircraft weight, etc, and mission profile into the APAC. The APAC will then advise the aircrew of the best combination of engine power, trim adjustments and altitude.

The report estimates, at current fuel prices, the Navy can save annually between 8 to 12 million dollars. It's nice to know that little things like a pocket calculator can add up to big savings.

## NADC Open House May 16



Danny and Kelly Fleischut get an Open House Preview from LT Doug Dalrymple. The center will be open from 10 to 4. Bring your Family!



ADPA Chapter President Sid Ross, left, Congressman Charles F. Dougherty and Dr. R. Kenneth Lobb, NADC TD, all spoke to the meeting hosted by NADC.

## NADC Hosted Defense Group

NADC turned out its best for the American Defense Preparedness Association (ADPA) on Thursday night, April 9th. Displays with equipment and gear from some of NADC's projects along with personnel from the different Directorates showed the meeting participants some of what the Center is all about.

The keynote speaker was Congressman Charles F. Dougherty of the Fourth Congressional District, Philadelphia. His presentation was primarily addressed to the

subject of rapid deployment forces. Congressman Dougherty, who is a member of the Armed Services Committee, also addressed the overall preparedness of American forces. Many questions were posed by the ADPA group making for a brisk and interesting exchange.

Most meeting attendees agreed that the gathering was a success largely due to the extensive planning done by NADC personnel.

## The Shuttle a Poetic View *By Richard Housel*

Through the top of man-made cloudy vapors there arose Columbia. Almost lazily, but inevitably, the strange machine pitched over on its back—and then the maneuver of beautiful defiance—the “roll program”. Defiance above defiance. Smoothly, gracefully the Columbia, itself could be seen rolling, impervious to the forces that would tear it apart—defiant of the gravity that would bring it down. What a GESTURE! Volitional yet programmed.

Armstrong said it: “We’re required to do these things—just as salmon swim upstream”. Columbia, in and

through its programming, pitches and rolls in style. Defiance through the beauty of it—

Columbia, the “space turkey” the “lemon” showing what it’s made of—ugly, ungainly beast—pitching and rolling as it climbs the sky! So beautiful, so graceful was its climb.

And in orbit—showing the world what it is made of—so beautiful so inviting. (Why is earth so inviting from the distance we earthlings with so much effort attain?)

Events can’t be seen from orbital distance—

What is the “invitation” of this bluish spheroid? “Look,

## Editorial: A New Dream

This month has seen America return to space in a big way. The space shuttle has captured the imagination of almost everyone. It has ushered in what people have only dreamed about, a way for the common man to step aboard a vehicle in a shirt sleeve environment and fly into outer space and return to earth landing like an airplane.

The overwhelming technology takes a back seat to the human experience. I don’t mean to down play the thousands of scientists and engineers who have worked to bring about this feat. It was truly amazing to see such a vehicle, take off, fly in space and touch down with accuracy that defies human ability. What I’m trying to say is that this shuttle and its many missions to come will open up space for practical and important uses, things that will really benefit mankind. Some of the possibilities are, new combinations and processes that will result in superior materials for building and fabrication, new surgical techniques, a better understanding of the solar system including earth through a space telescope and various sensor to be placed in orbit and maybe someday a space colony.

Although the price of \$9.9 billion is a staggering amount, the shuttle’s value as a reusable tool of the future makes it all worth the cost.

It’s really heartening to see people huddled around television sets watching with wide eyed excitement as the shuttle touched down on the desert in California. Cheers from the crowds at the landing site and a feeling that America can do anything it sets out to do put smiles on everyone’s face. It may sound corny but some people cried like the engineer who was interviewed on the evening news. I think for a few days people stopped and looked at America in a patriotic sense, a broad view of how great America really is and if that’s corny then hail Columbia!

encircle, but don’t touch else you will see beauty swallowed up”?

But there was touching—Columbia’s wheels kissed so gracefully, beautifully the Earth it had so defiantly left two days before. (They had to come back to those who loved them and to those who would be their peers.) The view of Earth was, once again a picture a memory, a dream after the fact. But we saw it — all that beautiful defiance! Thanks for sharing it with us, John and “Crip”!

## Small Business Week

Two centuries ago in this country, small business owners—the merchants, the builders, the traders—rebelled against excessive taxation and government interference and helped found this Nation. Today we are working to bring about another revolution, this time against the intolerable burdens inflation, over-regulation, and over-taxation have placed upon the Nation’s 12 million small businesses, which provide the livelihood for more than 100 million of our people.

To revitalize the Nation, we must stimulate small business growth and opportunity. Small business accounts for over 60 percent of our jobs, half of our business output, and at least half of the innovations that keep American industry strong. The imagination, skills, and willingness of small business men and women to take necessary risks symbolize the free enterprise foundation of the American economy and must be encouraged.

I urge all Americans who own or work in a small business to continue their resourcefulness and successes, for these efforts contribute so much to the entrepreneurial spirit which made this Nation great. It is with justifiable pride that the American small business man can point to himself as the backbone of our Nation.

NOW THEREFORE, I, RONALD REAGAN, President of the United States of America, do hereby proclaim the week beginning May 10, 1981, as Small Business Week. I call upon every American to join me in this tribute.

IN WITNESS WHEREOF, I have hereunto set my hand this 23rd day of March, in the year of our Lord nineteen hundred eighty-one, and of the Independence of the United States of America the two hundred and fifth.

RONALD REAGAN

Naval Air Development Center

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CAPT Paul L. Dudley, Jr. — Commander, NADC

Dr. R. Kenneth Lobb—Technical Director

Joseph P. Cody — Public Affairs Officer

David Polish — Editor



# the Military Family



If you have any comments on this series contact the Public Affairs office x3067 code 091.

Many questions arise throughout a military career about the effect of the military way of life on children and families. This is the first of a series of articles that will address itself to "The Military Family." Author of the series is CDR Eli Breger, (MC), USNR, who is currently Chief, Psychiatry Service, Naval Hospital, Beaufort, S.C. If you have a question that you think would be of interest to military families around the world, you may write to Dr. Breger, c/o American Forces Press Service, Room 501, 1117 N. 19th St., Arlington, Va. 22209. Questions of general interest will appear in later issues of this series.

**Question:** Does my military career allow for a good family life?

**Reply:** It most certainly can. Although not without its drawbacks, military life offers many potential advantages for a family. As in all of life, it is what you make of it.

**Advantages:** The military takes care of its own in a broad, all-inclusive way. While civilians in increasing numbers feel estranged from their large impersonal communities and are critical of services and facilities, the military base attempts to provide a cohesive, all-inclusive "village life" which includes housing, schooling, recreational opportunities, youth facilities, clubs, medical care, legal services—just to name a few. Thus the military has a true community atmosphere, much like an "extended family" with its social and emotional supports. It is a closed, cohesive, and structured social system with shared values and clearly delineated acceptable behavior patterns.

Should family behavior be legally, morally, or militarily unacceptable, there is prompt command response. Behavior of dependent family members is thought to reflect the competence of the military parent to manage his or her own household affairs. While this response is viewed by some as meddling, by others it is seen as replacing the past traditional role of neighborhoods and relatives.

A service member is not scorned for problems within the family, but rather encour-

aged, even ordered, to seek help.

In addition, military communities offer opportunities to live with people of varying social, religious, and ethnic backgrounds. Distinct and consistent role models exist for children to identify with; the child clearly knows what his parent does and for whom it is done.

**Disadvantages:** All is not 'milk and honey' for the service member and the family. There are stresses and unfavorable factors.

Isolation from the surrounding community may create an unnatural feeling, but this can be overcome through programs designed to have military and civilian families work together on community projects.

Frequent family moves, often involving long distances and culturally different settings create a discontinuous life pattern. As stressful as this mobility may be, it does create adventures and opportunities to travel which

broaden cultural experiences and friendships. This can enhance the adaptive and coping skills of a psychologically sound family.

Frequent service deployments naturally stress the mother and children, especially boys, but shorter deployments are now being scheduled to help overcome this tension.

Finally, rank structure and the enlisted/commissioned officer dichotomy permeates work and life in the military community, but in the military—as opposed to civilian life—the path to advancement is more clearly defined and accessible.

The military life is first and foremost life. It has positives and negatives to be dealt with, and the outcome depends somewhat on good fortune, but much more on what you make of it.

A military career can indeed be an excellent growth-fostering setting for successful family life.

## Shoes By Sylvia Wasyluk

# Remember Those Surveys?

The NOSC-NWC Demonstration Project, intended to show whether the effectiveness of federal laboratories can be improved by changes in civil service personnel practices, is continuing. Assessment of the success of the project is the responsibility both of internal evaluation groups at the two Centers and of an external evaluation group from the School of Public Administration at the University of Southern California.

Evaluation efforts are focusing on measuring relative improvements over the remainder of the five year duration of the project and on relating these to changes brought about by the project. In order to help isolate Demonstration Project effects, changes occurring at the two participating Centers will be compared with those at the two control laboratories: NADC and NSWC.

Assessment of improvements in overall effectiveness is not very easy for an organization as complex as a Navy R & D Laboratory. Several assessments of this type have met with very limited success at best. In the present study, much of the evaluation activity will concentrate on work unit performance as well as individual measures, so that chances for more accurate assessment are considerably better. The Division has been selected as the primary work unit level for evaluation purposes.

A broad range of data is being collected as part of the evaluation process. Some examples are recruiting statistics, sponsor perceptions of individual project successes and failures, reasons given by employees who resign, time spent on various types of actions by the Personnel Office, and individual employee attitudes. The process of collecting much of these data has already begun. The data collected during the summer of 1979 will provide a pre-experiment baseline with which to compare data collected

during the remainder of, and after completion of the experiment. The attitude survey questionnaire distributed to randomly selected GS employees last year was primarily for the purpose of providing a measure of employee opinions and attitudes relating to job satisfaction before the project began. Results obtained from continuing attitude surveys both during and after the project, will be compared with this baseline. Some employees have expressed concern about the personal information requested. It is needed to ensure that the returned questionnaires represent a cross-section of Center employees with respect to a number of characteristics and to aid in determining whether there are adverse impacts on women or minorities, as specified under EEO uniform guidelines. This information will be strictly safeguarded.

Thus, the functions of the separate internal and external evaluation group, while related, are significantly different. The internal group will monitor discrete segments of the project to determine whether the expected improvements are occurring. This will permit early modification of project procedures if anticipated benefits are not being realized. The external evaluation group, which reports directly to the Office of Personnel Management, will provide an independent assessment of overall success. This assessment will be based on data collected with the assistance of the personnel of all the Centers involved. Your participation in this project will greatly assist the external evaluation group's effort in providing an accurate, independent assessment of the project's success. Thank you for your continuing cooperation and valuable contributions to this study.

Just as you can't expect to enter the Indianapolis 500 and do well with a go-cart, one cannot expect to run or exercise well without the correct footwear. Your selection of shoes should be influenced by a majority of factors. One of them is the activity you participate in. A road racer will want a more durable, better shock absorbing shoe than a sprinter. The tennis player needs traction, support, and strength whereas the evening strollers need comfort and good arch support. Hopefully you can see the point I am trying to make—a hard, rigorous sport needs a durable shoe, a quick, speed oriented activity requires a light weight shoe, etc. But *all* demand proper fit and support to the bones and tendons of the feet. Try to keep these guidelines in mind when making your selection.

Now that you have an idea regarding what to buy—where do you buy it from? The best place seems to be the many athletic shoe specialty shops that are springing up. They offer a wide selection and expert help. A second choice would be any reputable dealer with name brand shoes. The only drawback there is that the shoe clerk might not be as knowledgeable as the runner who works at that "jock shop." If you are a serious athlete, avoid the discount department store \$9.99 "specials." They are great for leisure wear (again—better to tear them up than your \$40 marathon racers) but offer little in terms of what an athlete needs.

The final point I want to stress here is that cost should be as little a concern as possible. Just as it takes money to make that Indy racer, it takes a little money to manufacture a good shoe. You can find excellent shoes in the \$20-\$30 range with the more serious competitors investing even more. But take it from *personal* experience, I tried to save a few bucks and as a result cost myself three months of pain. Figure out the cost of doctor bills alone for the three months and you can see how little a few extra dollars means over the long run (pardon the pun).

There are many good running and fitness magazines that provide lots of information. I encourage you to do a little research and tune in again next month when we will begin learning how to become more physically fit.

## Commander Salutes

Doris Reilly, Ann Gana, Aron Davidson, all of the Technical Director's Staff and Dr. R. Kenneth Lobb, Technical Director, NADC; all for their outstanding support and assistance to the Tomahawk Review Team.

Dr. R. Kenneth Lobb, Technical Director, NADC, for his contributions to the DOD Laboratory Management Task Force and the DOD Science and Engineering Apprenticeship Program for High School Students Summer of 1980.

David J. Rhoads, SD, for leading the technical team investigation of the Advanced Marine Assault Transport System (HXM).

Anthony J. Madera and James R. Howard both of SATD, Jerry F. Guarini, SD, and Major Dennis G. DeJager, CF, all for their presentations to Messrs. H. Merklinger and B. Trenholm of the Defense Research Establishment Atlantic.

Marvin Schwartz, ACSTD, for his concept of instrument calibration using the AN/ASM-624 cart he designed. This system will save millions of dollars each year by eliminating the need to remove instrumentation from aircraft.

Joseph M. Spodaryk, Comptroller, for his assistance in setting up a Management Information System for the Naval Ship Systems Engineering Station (NAVSSSES).

Jack Hirsh, SCD, for his excellent support to the Australians to resolving problems with the Honeywell 96 recorder.

Sally J. Ketcham, ACSTD, for her support of a visit by Neil E. Ryan of the Aeronautical Research Laboratories DOD Australia.

Captain James O. Houghton, MS, USN for his participation in the recent Flight Surgeon Report Revision Meeting.

LT David C. Johanson, USN, for his presentation on survival equipment to Training Air Wing ONE.

Albert R. Prince and Jerome S. Bortman both of PAR, and James J. Cuorato of ESG, all for their support to the Technical Readiness Acceleration thru Computer Integrated Manufacturing (TRACIM) project.

David DeSimone, ACSTD, for his participation during the 42nd Meeting of the Combat Search and Rescue (CSAR) Joint Development Committee.

Robert G. Mahorter, ACSTD, for his support to the Design Review Team for the F404 engine.

Thomas J. Brennan, PAR, for his assistance during a visit by Colonel James R. Nelson, USAF, Commander Air Force Wright Aeronautical Laboratories.

Charles W. Haney, SATD, for his outstanding support during a two year assignment with the Reconnaissance and Photographic Systems Division of NAVAIR.

ABAN Gutekunst, AMHAN Woolums, AMSAN Gayle, AMS2 Story, AMH2 Vega, and A01 Munz all for their support of the 1980 Army/Navy Game.

## More E-4 Pay

### Enhanced sea pay affects E-4 most.

Not only does making rate mean becoming a Petty Officer, it also means significant dollar increases for those new petty officers serving in qualifying sea pay billets.

Since sea pay eligibility starts at pay grade E-4, when an E-3 with three years of consecutive sea duty makes Petty Officer third class, the combination of sea pay and increased base pay increases his total income by almost \$300 per month. This is the result of an approximate \$40 raise in base pay, \$160 per month in sea pay and \$100 per month in sea pay premium, for having served more than 36 consecutive months on sea duty.

Enhanced sea pay and sea pay premium began on 1 January 1981 as part of the fair benefits package legislation passed last year by Congress. Since that time, the naval military personnel command has received many requests from sailors to reenlist or extend on sea duty.



Carmen DeCrescente, Director ACSTD, welcomes conference guests.

## Materials Meeting

Remember the Eagles and the Super Bowl? Maybe you would like to forget it, but something else was happening in New Orleans that weekend. NADC and NASA were hosting a meeting on Fiber Composites and Structural Design. The symposium featured papers presented on state-of-the-art technology in composite materials. NADC's ACSTD was well represented in the persons of Carmen DeCrescente who gave the opening address, Tom Hess, General Chairman, Jim Huang, Joe Minecci and Tony Manno who were sessions leaders. Administrative support was provided by Audrey Read and Rae Routzahn.

The meeting provided a forum for government and industry representatives to hear papers on such topics as damage tolerance and survivability, fabrication and repair and aircraft design applications.

## CNO on Budget

"The foundation for a resurgence of American naval power" was the expression used recently by Chief of Naval Operations ADM Thomas B. Hayward to describe next year's defense budget to the house armed services committee.

CNO indicated his strong support for the amended budget, which provides a significantly increased emphasis on funding for investment in ships, aircraft and ordnance items. It reflects a 14.1 percent growth over the FY81 budget—an overall increase of almost eight billion dollars.

In combination, the FY81 supplemental and amended FY82 budget fund a 1 July 5.3 percent pay raise, reenlistment bonuses and the aviation continuation bonus. Also, funding is added to correct PCS travel reimbursement deficiencies.

The CNO said, "I am pleased to say that the FY82 budget makes an excellent start toward reversing those trends which so concerned me a year ago."

The FY82 budget starts to build toward a Navy which would eventually consist of at least 15 carrier battle groups and a force of 100 modern attack submarines, have the capability to lift one-and-one-half marine amphibious forces, and the auxiliary and support forces necessary to sustain such a fleet.

## Talking Machines

Among the many meetings hosted by NADC in April was the Voice Interactive Avionics Conference. The purpose of this conference was to review current Navy programs, management philosophy, and look into the future.

Voice Interactive Systems are machines that can be programmed to understand and synthesize speech. We can see or rather listen to some of this technology in such things as toys (Speak and Spell by Texas Instruments) and the telephone company's weather and time information programs.

The Navy, along with the other DOD departments, is looking into the use of voice interactive systems to reduce the workload of aircraft crew members. Several NADC projects incorporate voice interactive systems. The AIDS or Advanced Integrated Displays program uses a speech processor and synthesizer in a cockpit mock-up that looks like something out of Star Wars. A pilot can sit in the mock-up and talk to the aircraft asking questions or giving commands and receiving data on such things as altitude, airspeed, weapon status, etc. The group toured through the centrifuge where a demonstration of voice recognition under increase G load was tested. They also saw the BASIC lab, the DEMON speech processor, a FAA presentation and a talk given by personnel from the Command Control and Communication Lab.

After the tour the group moved to the George Washington Motor Lodge where various presentations on the use of voice technology were given.

## New Titles

Following is a partial list of books recently added to the Technical Information Branch. Visit or call your library at x2541 to inquire about these books.

### CIVIL RIGHT—PRIVACY

"Privacy: How to protect What is Left of It" R. Smith JC599.U5S56.

### DEFENSE POLICY

"People, Not Hardware: The Highest Defense Priority" M. Laird UB323.L34

"The Uses and Abuses of Analysis in the Defense Environment" J. Woolsey UA23.W77

"U.S. Defense: What Can We Afford?" C. Daly UA23.U533

"Defense Industry" J. Gansler HC110.D4G36

### COMPUTER & INFORMATION SCIENCE

"Computer programming and Architecture" H. Levy QA76.8.V37L48

"Computers and Profits" J. Kleijner T58.6.K58

"Database" D. Kroenke QA76.9.D3K75

"Digital Computer Circuits and Concepts" B. Deem TK7888.4.D43 1980

"Microcomputer Interfacing" G. Lipovski TK7888.3.L49

"Programming Language Structures" E. Organick QA76.7.073

"Symposium on High Speed Computer and Algorithm Organization" QA76.5.S95 1977

"Toward Paperless Information Systems" W. Lancaster Z699.L221 1978

"Z80 Instruction Handbook" N. Wadsworth QA76.6.W356

### DECISION MAKING

"The Analytic Hierarchy Process" T. Saaty HD30.23.S19

"The Decision Science Process" HD30.23.D39

"Patterns of Problem Solving" M. Rubinstein QA63.R82

### LONG-RANGE PLANNING

"Global 2000 Report" HC79.E5G5

### NAVIGATION

"Position Location and Navigation Symposium 1980" VK560.I14 1980

### SECRETARIAL PRACTICE

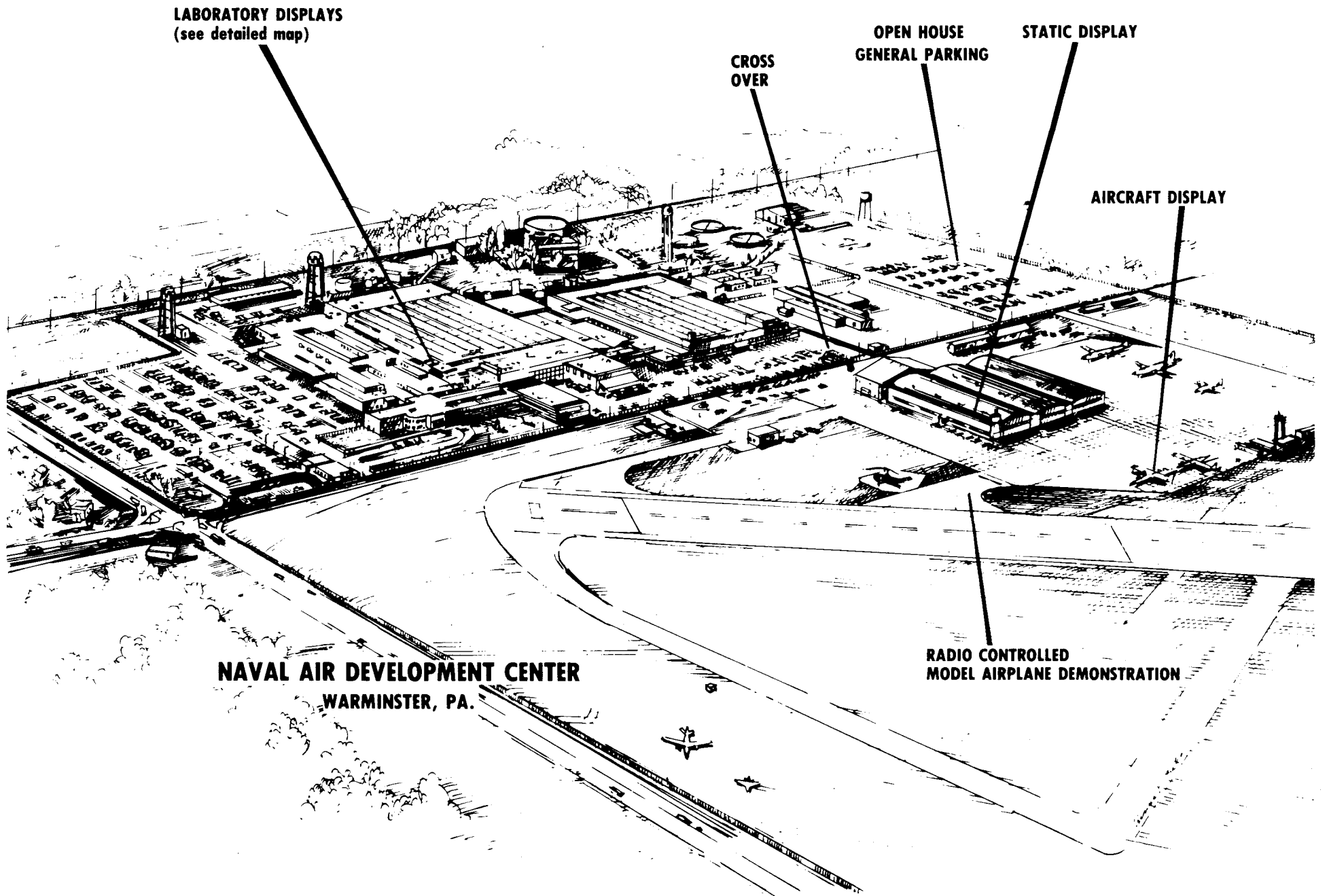
"Applied Secretarial Procedures" HF 5547.5.A66 1974



- Brief History
- Detailed Map
- Reserves
- Inside the Center
- Remembering
- TARPS
- Chestnut

## NADC Open House

# Our Report to the Public



### SCHEDULE OF SPECIAL EVENTS

Time	Area	Event
10:00	Static Display	Armed Forces Day Open House Five Mile Run
10:00-4:00	Auditorium	*Continuous Movies
10:30	Static Display	Rancocas Valley Regional High School NJROTC Drill Team, Mount Holly, NJ
11:00-3:00	Runway	Radio Control Model Airplane Demonstration
1:00	Static Display	Woodrow Wilson NJROTC Drill Team, Levittown, PA

See Inside Map Page 3

\*Movies:  
*Flight*—Various naval aircraft fly to the beat of a modern jazz sound track.

*Silk and Smoke*—The Navy Parachute Team in action.

*Wingtip to Canopy*—The Navy's world famous "Blue Angels" flight demonstration team performs precision maneuvers for the public in the A-4 Skyhawk.

## NADC:

# Largest Warminster Employer

The Naval Air Development Center is the largest employer in Warminster Township and the second largest employer in Bucks County. According to figures published in the most recent edition of the Bucks County Industrial Directory, more people come to work at NADC everyday than report to Fischer and Porter in Warminster or Rohm and Hass in Bristol. Within Bucks County only U.S. Steel in Fairless Hills has more employees than the 2470 scientists, technicians and support personnel employed by the Department of the Navy in Warminster.

NADC with its unique research facilities and professional staff represents an important financial investment in the economic health of this area. The Center has an annual operating budget of almost a quarter billion dollars. Twenty-five percent of that budget, or \$64.1 million is paid annually to NADC civilian employees. Another \$5.1 million is paid annually to the military employees of the Naval Air Development Center. That results in a total annual payroll of almost \$70 million. In other words, every two weeks employees of NADC cash almost \$2.7 million dollars worth of payroll checks at area

banks. And that area is relatively small. A look at where NADC employees live reveals that 54% reside in Bucks County while almost 20% reside in adjoining Montgomery County. The Department of Labor and Industry Bureau of Statistics provides a formula which estimates that the economic impact of these salaries on the community in which they are paid annually amounts to over \$208,000,000 million.

## Every two weeks NADC's employees cash \$2.7 Million in Payroll Checks

In addition to the economic impact from the payroll portion of its enormous research and development budget, another major financial influence is felt as a result of \$121,000,000 worth of contracts that are awarded by the Navy in Warminster. In 1980 almost twenty-five million dollars worth of contracts were awarded to

(Continued page 2)

# A Brief History of NADC's 37 Years

From deep in the ocean to far out in space the Naval Air Development Center has been at the forefront of research and technology for 37 years. With its roots planted in the Brewster Aeronautical Corporation, NADC has become the Navy's lead laboratory for the development of aircraft systems.

## In the Beginning

The Navy in 1944 took over the complex that was then



**Rush Construction of Brewster Airplane Plant**

Workmen engaged in the construction of the huge Brewster Aeronautical Corporation plant on the outskirts of Hatboro are frantically rushing to complete work on the \$5,000,000 plant. Here a powerful tractor pulls a "dig-and-carry" to level the ground.



Concrete for the foundations of the steel-and-glass one-story assembly buildings is poured into wooden forms. Eventually, 600 workers will be employed in erecting the plant and test airport on the 400-acre tract in Warminster Township. (Ledger Photos)

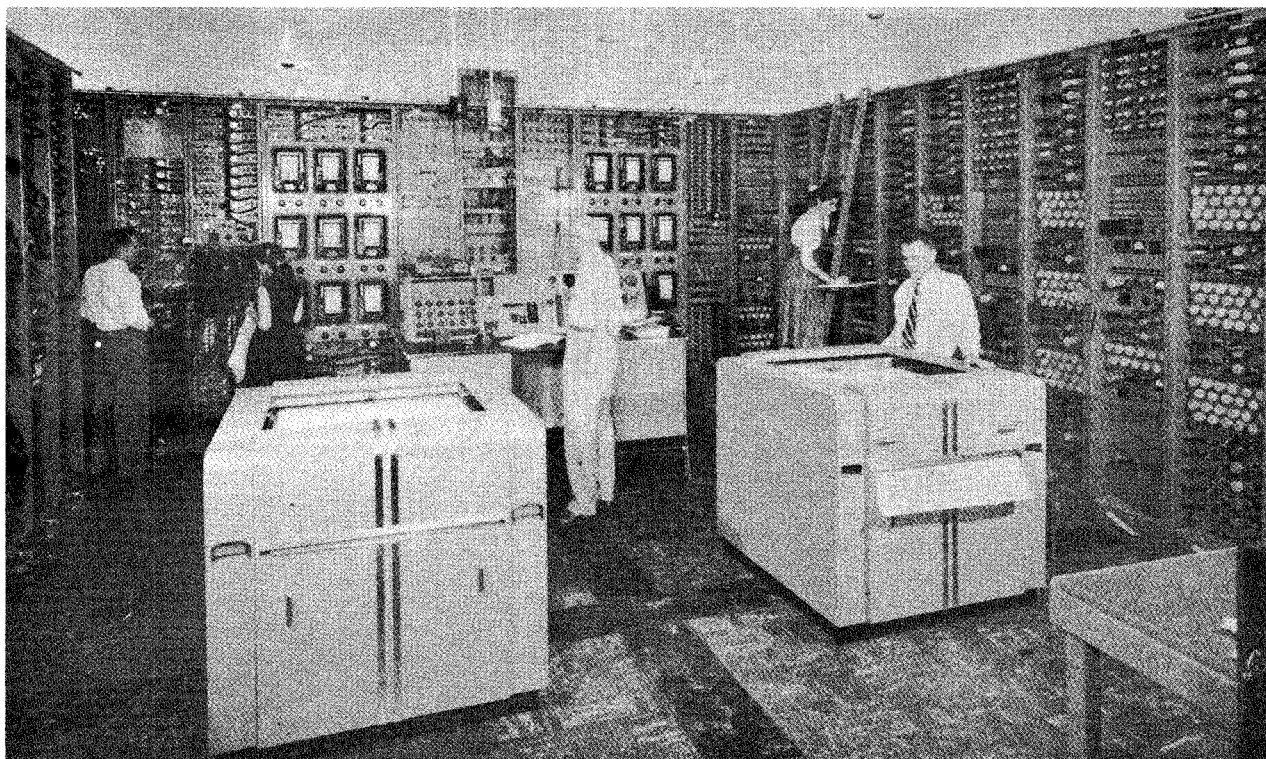
the Brewster aircraft factory in Johnsville (now Warminster), Pennsylvania. Brewster at that time was having trouble meeting its commitments. The Navy in an effort to keep production moving made the move to Warminster. Brewster at that time was building Corsairs under contract to the Navy.

First designated as NAMU (Naval Air Modification Unit), in July 1944, the base was used to modify existing aircraft to the latest configurations. NAMU continued to operate into 1947 when the base's name was changed to the Naval Air Development Station or NADS. In August of 1949 NADS was reorganized with the name being

changed again. This time to the Naval Air Development Center.

The laboratories originally comprising NADC were the Pilotless Aircraft Development Laboratory, the Aeronautical Electronic and Electrical Laboratory, and the Aircraft Armament Laboratory. These laboratories functioned in the research and development of pilotless aircraft, electronic systems and components and aviation armament. The supporting activities included the Administration, Industrial Relations, Security, Medical, Public Works, Operations, and Supply and Fiscal Departments plus a Naval Air Station. Many FGK-3/5K aircraft were converted to targets. These types of modifications became the basis for the early RPVs (Remotely Piloted Vehicles). They were used as low risk instrumentation platforms during atomic bomb testing at Bikini Atoll in the Pacific. During the Korean War the RPVs were used as strike weapons against high risk targets.

In July 1950, the Aeronautical Computer Laboratory was added, first as a small engineering team and later as a laboratory using what was at that time the world's largest analog computer, the TYPHOON.



**At the time this was the world's largest computer**

The Aviation Medical Acceleration Laboratory became part of the Center on June 17, 1952 when the world's largest human centrifuge was dedicated. It was here that the Project MERCURY astronauts received an important part of their training.

An important function arrived at the Center with the establishment of the Antisubmarine Warfare Laboratory in 1958. Currently, the function is a command project.

In July, 1963, the Naval Air Station was redesignated the Naval Air Facility.

On July 1, 1965, a reorganization combined and consolidated the existing laboratories into four functional departments (Aero Electronics Technology Department, Aero Mechanics Department, Aerospace Medical Research Department, and Air Warfare Research Department) and added a Systems Project Department. A major advance in management control was realized through implementation of a computerized Management Information System.

On July 11, 1967, three laboratories of the Naval Air Engineering Center, Philadelphia, became departments under the administrative control of NADC: Aero Materials Department, Aero Structures Department, Aerospace Crew Equipment Department.

The Systems Project Department and the Air Warfare Research Department were disestablished on February 1,

## (Largest continued)

Delaware Valley firms. This policy of relying on civilian industry to provide necessary services has resulted in a substantial and beneficial spin-off effect from the work done at NADC.

In Warminster that effect has been particularly great. At least 17 businesses that are headquartered outside of the Bucks County area have opened offices in Warminster strictly to do business with the Navy. Each of these businesses provides jobs and pays taxes adding to the stability of the industrial base and the economy of the area. In addition, NADC last year solicited bids from over 400 small, minority and disadvantaged businesses and awarded them \$30 million worth of contracts.

When looked at in terms of an institution NADC is very large indeed. For example, the Navy's budget in Warminster is three and one half times greater than that of Bucks County. Each bi-weekly payroll alone represents enough silver dollars to stack 5.2 miles high. The Navy has the largest airport in Bucks County. The only full time paid fire company in Bucks County works at NADC. It employs 40 people and 10 pieces of equipment. NADC also has its own police department, hospital, bank, municipal authority and university extension program in cooperation with Penn State.

There is no getting around it, the Naval Air Development Center is big business and provides an

economic boost to this area.

This kind of community impact brings with it a certain degree of community responsibility. NADC is active in meeting those responsibilities. For example, this Center sponsors seminars for those interested in doing business with the Navy. This gives many small local firms the opportunity to secure Navy contracts. On in-service days the Center sponsors programs for area teachers and counselors to explain the opportunities available at NADC for students who will be entering the work force in a few years. Also, each summer 150 area high school students from low income families are employed at NADC. The jobs are designed to give them a positive attitude about work and school. NADC employees volunteer their time to teach young adults in the Explorer Scout Program such professions as computer science, fire fighting and motion picture television production. NADC's specialized equipment and trained personnel are also available to assist community fire, police, and local schools. Finally, the Center has made its expansive facilities available to just about every community group, school, and charitable organization in the area.

The Naval Air Development Center is proud of its contributions to both the Navy and the community. We are also proud of the opportunity to show you some of those accomplishments today.

1968 and the resources merged into a single department designated the Systems Analysis and Engineering Department.

On September 5, 1968, a Life Science and Bio-Equipment Group, comprised of portions of the Aerospace Medical Research Department and the Aerospace Crew Equipment Department, was established to develop and conduct research in human behavior and associated tangents.

**(Continued page 3)**

Naval Air Development Center

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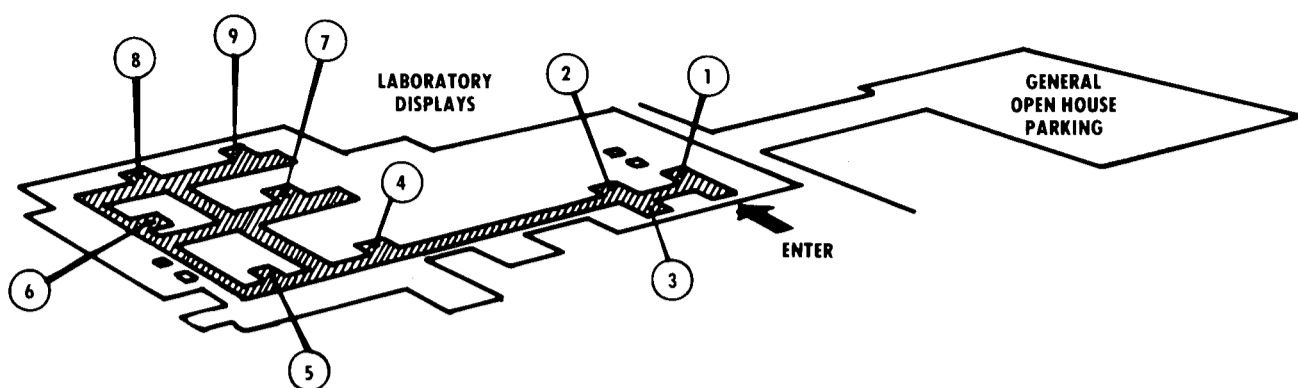
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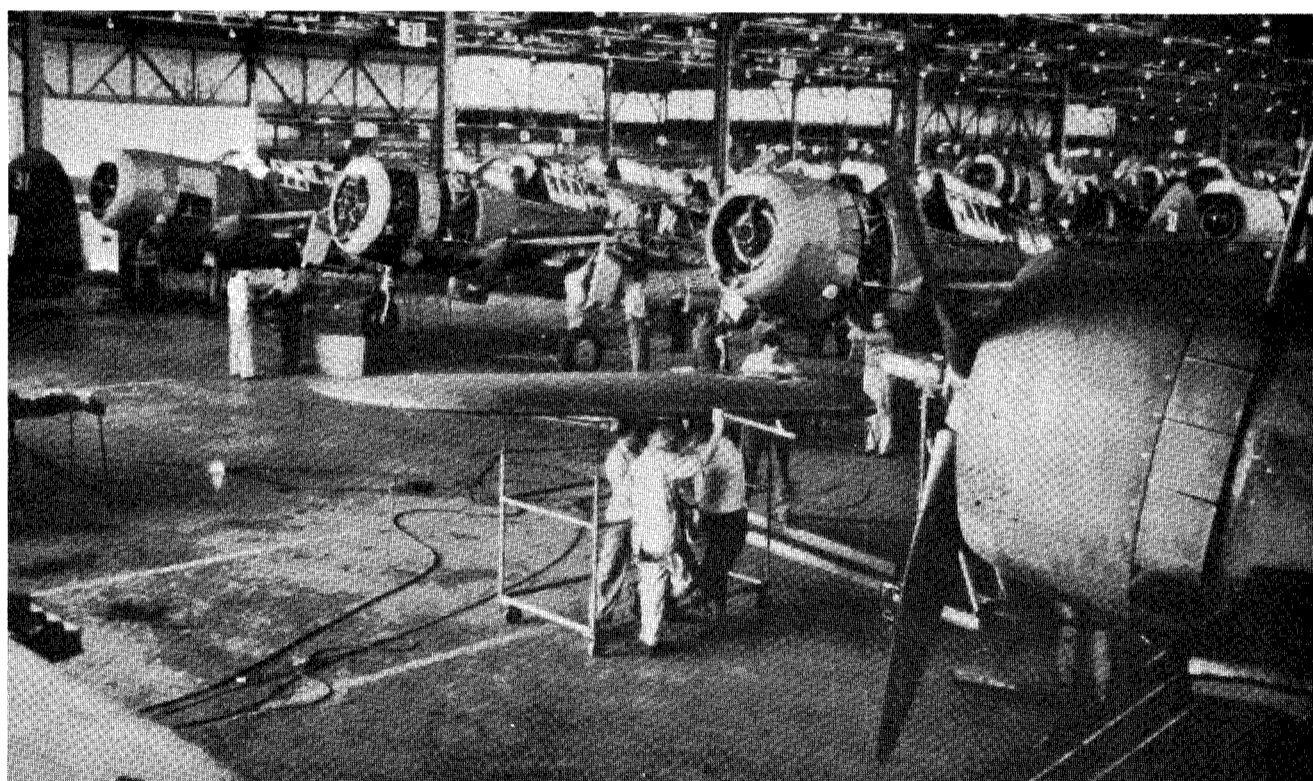
CAPT Paul L. Dudley, Jr. — Commander, NADC  
Dr. R. Kenneth Lobb — Technical Director  
Joseph P. Cody — Public Affairs Officer  
David Polish — Editor





AREA	FACILITY
1	CREW STATION EVALUATION FACILITY SURVIVAL DEMO
2	AUDITORIUM (CONTINUOUS MOVIES)
3	TELEVISION STUDIO
4	CARRIER ANTI-SUBMARINE WARFARE MODULE LABORATORY
5	COMPUTER LABORATORY
6	LAMPS HELICOPTER LABORATORY
7	S-3 AIRCRAFT LABORATORY
8	P-3 AIRCRAFT LABORATORY
9	SHIP MOTION SIMULATOR OCEAN BOTTOM MAPPING DEMONSTRATION

(History continued)



The assembly line for Brewster Buccaneers as it appeared in 1943.

More change came about on March 25, 1971. The Life Sciences and Bio-Equipment Group, the Aerospace Equipment Department and the Aerospace Medical Research Department were consolidated into the Crew Systems Department.

On November 22, 1971, the Administration Department was reconstituted to include the Public Affairs Office, and an Engineering Support Division that included most of the shops of the Aero Mechanics, Aero Structures and the Aero Electronic Technology Departments. It also included a Technical Publications and Presentations Division, and a Technical Information Division.

The Aero Material, Aero Structures, and Aero Mechanics Departments were consolidated into the Air Vehicle Technology Department on January 1, 1972.

The relocation of personnel from the Naval Strategic Systems Navigation Facility in Brooklyn, New York to NADC began on November 25, 1973. This group combined with the navigation tasks formerly assigned to the Air Vehicle Technology Department and the Aero Electronic Technology Department to form the Naval Navigation Laboratory.

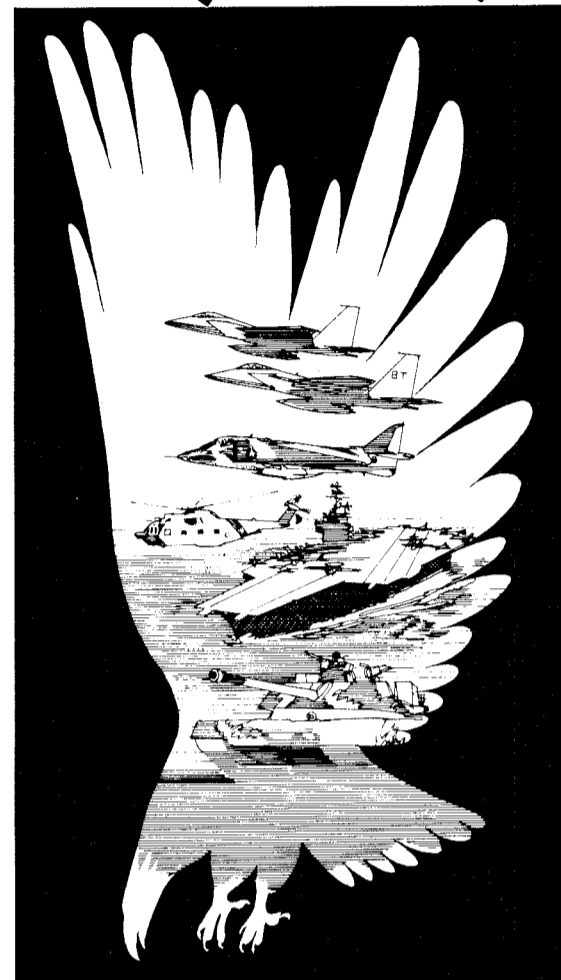
The former Administration Department was abolished and the Technical Services Department was established on June 9, 1975. The new department consists of

Administrative Services Division, the Environmental and Test Equipment Division, the Technical Information Division, the Aircraft Installation Design Division, and the Engineering Shops Division.

The Computer Services Department, formerly a part of the Systems Analysis and Engineering Department, was established on May 11, 1973 to provide general computing services required to support the Center and its technical programs.

The need for improved efficiency, due to an increased workload combined with personnel reductions, led the Center to reorganize in October, 1977. The reorganization's objective was to improve the Center's ability to satisfy its customers' needs, thereby enhancing its image and product at the same time. There are nine main organizational elements in the new organization: six technical directorates and three support groups. The six functional directorates include Systems, Sensors and Avionics Technology, Communication Navigation Technology, Software and Computer, Aircraft and Crew Systems Technology, and Command Projects. Comprising the Support Groups are the Administrative, Engineering, and Planning Assessment Resources support groups, the latter of which is responsible for project and program review. In addition, the Naval Air Facility was merged with NADC.

**ARMED  
FORCES  
DAY  
1981**



**STRONG  
& READY**

## The Center's Reserves

Naval Reserve Air Systems Facility Support Unit, NADC Warminster 0193, provides mobilization and readiness training in certain technical and management specialized fields of Naval Weapons Systems in order to prepare personnel for augmentation. In the event of mobilization the technical staff, maintenance staff and flight activity will be integrated into the Naval Air Development Center, Warminster, Pa.

The unit, commanded by Captain M. B. Comer, USNR-R is composed of 16 officers and 50 enlisted who perform drills one week-end each month at the NAVAIR-DEV-CEN. Week-end drill activity includes project work supporting center activities and maintenance of Center aircraft in conjunction with regularly assigned Navy maintenance personnel.

For two weeks each year these "week-end warriors" perform active duty for training at the Naval Air Development Center where they gain additional practical on-the-job training through the completion of assigned projects and "hands on" maintenance support of Center aircraft.

Administratively NADC Warminster 0193 is attached and supported by Naval Air Station, Willow Grove Pa. commanded by Captain Charles A. Buesener.

The Naval Reserve Air Systems Facility Support Unit NADC 0193 is a mission-capable task performing unit available for immediate mobilization in the event of war or national emergency.

## A Look at NADC from the Inside

Tomorrow's Navy is taking shape today here at the Naval Air Development Center. The large complex located at Street and Jacksonville Roads employs over 2200 civilians and 250 military, whose jobs it is to design and develop aircraft systems that are the worlds most advanced.

People are what makes NADC tick. People from every discipline—engineering, physics, mathematics, metallurgy, computer technicians, machinists, administrative and clerical support, just to name a few of the many skills that are here. The complexity of today's naval systems no longer allows for one person tinkering in a corner somewhere and coming up with a new piece of equipment. All new black boxes are designed by teams of people, industry and the government working together. When a box is designed it must be kept in mind that it has to work with the entire set of equipment in an aircraft.

The Center is broken down into six major technology directorates. Each directorate is responsible for a variety of projects and programs. To go through a detailed description of each directorates functions would take volumes of text but what follows is a brief explanation of some of their responsibilities.

### Directorate Command Projects (DCP)

This directorate oversees many of the major programs/projects at NADC. As a project is taken in by DCP the directorate establishes and tracks, schedules, budget expenditures, and configuration engineering. Engineering support managers are assigned to designated projects along with administrative staff and budget analysts. DCP acts as a single point of contact for program sponsors and Center management. They also interact with other Center directorates in negotiating work packages for the various projects DCP handles.

Some of DCP's programs are the CV/ASWM or Carrier Based Anti-Submarine Warfare Module which coordinates the tactics used by aircraft in their mission to detect submarines. TACAIR Program Office provides technical support in defining test requirements, training assistance, systems analysis and integration, and close contact with headquarters, fleet and industry. The VS Program develops and operates the facilities, capabilities and procedures for the life cycle support of the S-3 software (computer programs). New software is generated and tested at NADC before introduction into the fleet.

### Systems Directorate (SD)

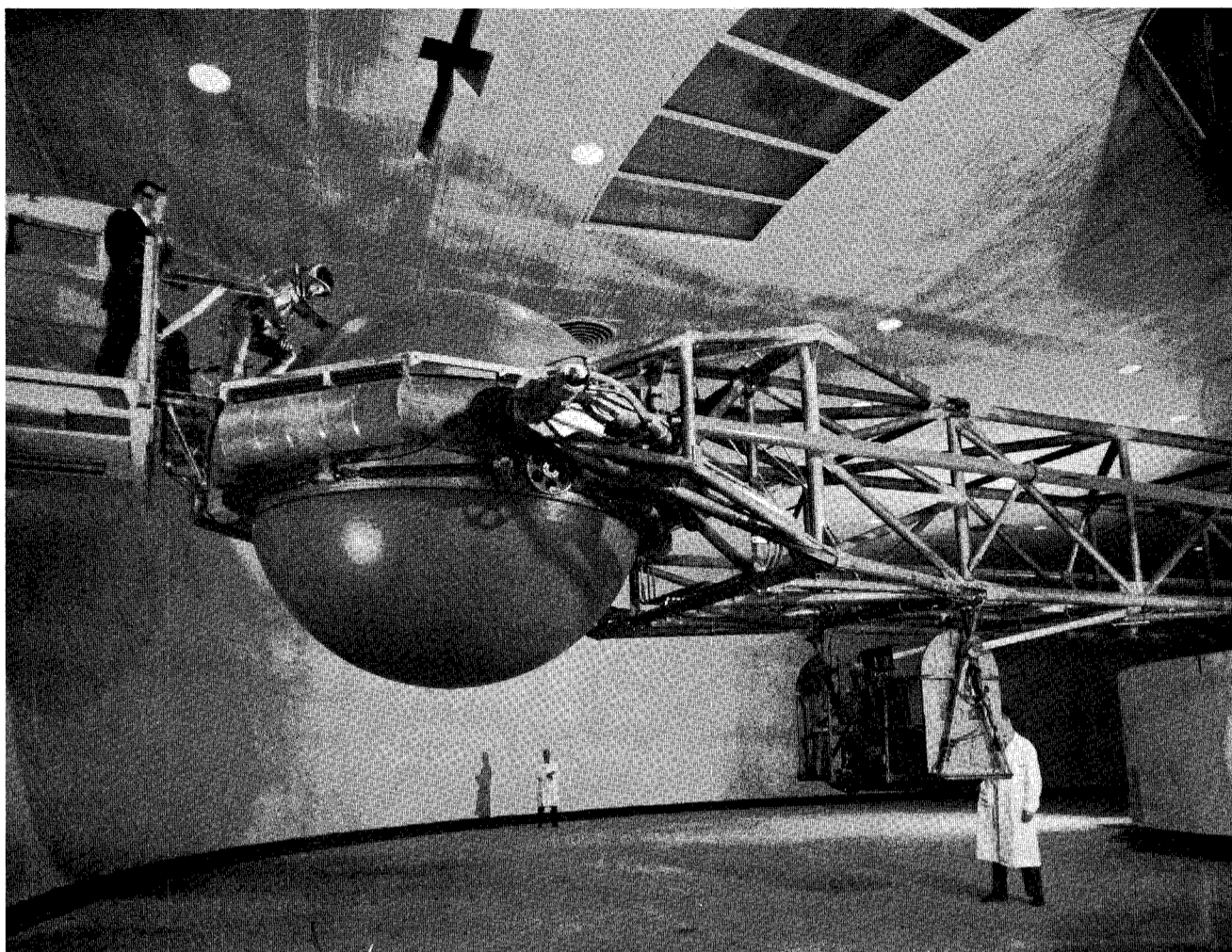
The Systems Directorate (SD) provides system engineering for Naval aircraft and aircraft support weapon systems. Systems are followed from their conception through fleet introduction. Analysis in the areas of threat definition, concept formulation, weapon system cost effectiveness and engineering are carried out by SD. Systems are tested and evaluated utilizing mock-ups, flying test beds and advanced simulation techniques.

Some of SD's divisions are involved in the following programs: The Fleet Readiness Analysis and Engineering Branch studies those areas necessary to get systems to their prescribed level of readiness. To assure that a weapon systems will remain ready the Reliability and Maintainability Branch develops R/M requirements, guidelines and hardware specifications. By designing a monitoring system the branch and the Navy can spot problems and find solutions to R/M problems in weapon systems. The Systems Integration Branch looks at the total aircraft and its support systems and then develops standards and detailed systems designs so that new equipment will be compatible with existing hardware and software.

### Sensors and Avionics Technology Directorate (SATD)

Biting off a big chunk of what Naval Aviation is all about is the Sensors and Avionics Technology Directorate (SATD). Its mission encompasses the entire gambit of sensing devices. The directorate researches, designs and develops airborne sensors and components for anti-submarine warfare, tactical air warfare, over the horizon targeting, anti-ship missile defense and tactical air reconnaissance and surveillance. Some of the technology involved touches on the areas of acoustic electro optical/electromagnetic sensors, signal processors and interfacing avionics or controls.

As with the other directorates SATD is on the leading edge of technology. The Laser/Magnetics Systems Branch looks at the use of lasers and magnetic sensors for

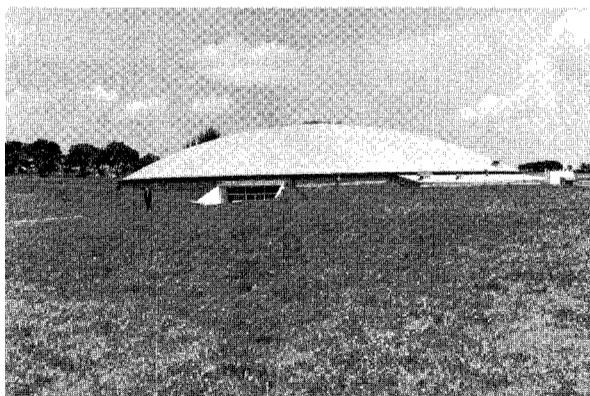


The Center has the world's most capable human centrifuge.

the detection and localization of submarines, optical communication and sensing oceanographic characteristics. Photo reconnaissance work involves day and night airborne photography of anti-submarine surveillance, surface ships and land areas. Infrared and intensified images are a large part of this important branch. The Tactical Radar Branch studies and develops radar for fighter and attack aircraft. Simulation using computers and development of systems to connect weapons to the radar system are some of the technologies and efforts used in this branch.

### Communication Navigation Technology Directorate (CNTD)

CNTD is sort of a special group. Originally based in Brooklyn, New York, they moved to NADC in the early 1970's. Not only does this group create navigation systems for aircraft but they are working on systems for surface ships and submarines despite the fact that this is



This unique building houses the laboratory for navigation system work.

the Naval AIR Development Center.

Residing in this directorate are several project offices. The Ring Laser Gyro project uses two counter rotating lasers to replace the mechanical spinning gyroscope. There are no moving parts to wear out making it extremely stable. The BASIC project or Basic Avionics Subsystems Integration Concept looks into new and emerging developments and how they can be incorporated into future aircraft. To help aircraft, ships and submarines communicate the Communication, Command and Control Division looks at and designs systems that will be compatible with advanced aircraft and be able to operate in a communications clutter such as a large and dispersed task force.

### Software and Computer Directorate (SCD)

Today computers control a wide variety of functions. Spacecraft such as the shuttle, calculators, toys and even cars have computers in them. As one can guess today's Navy is dense with computers and their supporting software (programs). SCD performs the research/development/test and evaluation for airborne computers and their support systems. They develop software in high order languages, test existing programs and manage new computer hardware programs.

The Fleet Software Engineering and Analysis Division acts as NADC's focal point for technical developments in Anti-submarine warfare, software, quality assurance and fleet software implementation. Research, exploratory and advanced development of new software are done by the Advanced Software Concepts Branch. They also analyze on going Navy, Department of Defense, industry and university based projects and conducted research to look for possible uses in future and present software work. The Information Displays and Data Recording Branch designs, researches and test controls, displays and data storage methods. Voice activated as well as graphic displays and controls are developed. Better methods for tape and disk storage of computer information are also explored.

### Aircraft and Crew Systems Technology Directorate (ACSTD)

In terms of sheer numbers of people and equipment this directorate is by far the largest. Even when talking about its responsibilities you can get overwhelmed. A simplistic way of looking at ACSTD is by saying they look at the total man and aircraft from the inside out. That is to say ACSTD is involved in the materials research of what the aircraft is made of, how it is put together and how to make it last. On the man side they look at how the man functions physically in the aircraft, how can the aircraft and the mans clothing and equipment be made better to make the man comfortable, help him perform better and protect him in case of an emergency.

The Life Sciences Research Group delves into how the man can be protected in the flight environment. Reactions to acceleration, vibration, exposure, temperature, and pressure can be evaluated using some of this directorates unique facilities. The centrifuge, ejection and drop tower, exposure chambers, biochemical labs and the vision research lab are all here at NADC to help make the

(Continued page 5)



# NADC/Brewster Employee Remembers

Remember the "good olde days?" To Ralph Tinari of the Technical Support Department they were in the 1940's when the Brewster Aeronautical Corporation occupied what is today NADC. "I was an aviation 'nut' ever since I was a kid," Ralph said in a recent interview. "I started at Brewster on February 2nd, 1942 working as an aviation mechanic."

The area surrounding the then new aircraft factory was little more than rural farm land. Brewster had hurriedly built a plant on land that was used for farming, orchards and the site of an old brick works. "If you can imagine," Ralph recounted, "Ivyland was considered a large town at that time." Before gas rationing took effect he used to commute from Huntingdon Valley in his Model "A" Ford. When rationing came Ralph would car pool with other employees. He stated that you could only get enough gas to get up and back to work with little more to travel or go shopping.

Upon being hired at Brewster, the then 28 year old, went to a course sponsored by Brewster at the local Hatboro school. There Ralph learned, to read blue prints, riveting and a little sheet metal work. "At that time there was a great feeling among workers that we were doing something for the war effort." Ralph said that he really liked working for Brewster. "It was probably the best place I ever worked because we had the best mechanics," he said. Women were also becoming an important part of the work force and Ralph was impressed with their ability to grasp new operations, their accuracy and neatness on the job. "We worked as a team, everything had to flow because it was an assembly line, if one area slacked off the whole line would suffer." Ralph worked his way up to becoming an "A" mechanic, the top grade aviation mechanic. Then Brewster closed.

Because of various problems including mismanagement and labor problems Brewster shut its doors of 1944. "It scared me at first," Ralph remembered. "We had the best. I wish people today were as dedicated." The Navy came in and took over the Brewster plant. After working for Firestone Helicopter, Ralph was called into work for the Navy because of an application he had filled out. "My father, who came to the United States as a boy always told me to do something good for this country because America had done something good for him. That's the reason I came to work here," Ralph said.

"At first we worked on helicopters, installing hoists. We put wave guides in airplanes and converted aircraft into pilotless drones." Ralph began as an Aircraft Mechanic, General, worked as a model maker and is now an Aviation Metalsmith working in the Installation Shop. Ralph is concerned because he sees the Center losing many good mechanics and machinists to retirement. "Something else my father said and it's something that I have seen in other places but it still applies," Ralph says, "You can be a good mechanic by using your hands, you can be a craftsman by using your head, but to be an artisan you must use your heart."

Although Ralph Tinari is 67 years old he doesn't look it and his wealth of knowledge about the past is something that should not be lost.

## (NADC Inside)

mans job easier. A stronger lighter less costly aircraft is a goal that the Aero Structures Division is setting its sights on. Structural designs, advanced materials and fatigue life estimation methods are some of this divisions work. To help the aircrew member maintain himself under any global environment the Life Support Engineering Division conducts research, testing and evaluation of systems and equipment to protect the man under escape crash and survival conditions.

## All Together

It's important to note that those directorates do not stand alone, they work together in an effort to turn out the best product possible.

As one can see from this rather surface look at the Naval Air Development Center we are a big and complex organization. An organization that stretches from machine to man, paper to hardware, from now into the future. But remember it is not the building, the hardware, or the facilities that make NADC—it's the people and their dedication to make the Navy of the United States of America the best Navy in the world.

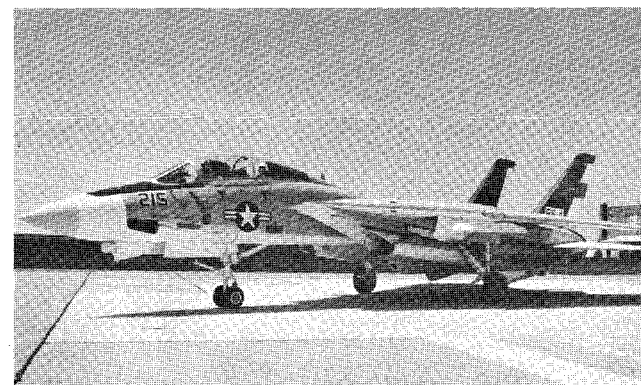


Ralph Tinari has seen NADC change in the past 37 years.

## TARPS Wins Contest

One of NADC's developments was just judged the best in the world. The Tactical Air Reconnaissance Pod System (TARPS) won the Open Class Photo Derby held at Andrews Air Force Base. TARPS was designed and built at NADC to fill a need for an interim reconnaissance capability.

Usually an aircraft has to be highly modified around the photo system leaving it incapable of functioning as a fighter/attack aircraft. But TARPS can be attached to the weapons stores rack under a F-14A aircraft with only slight modifications to the avionics. Because TARPS doesn't require any structural changes and it is removable the aircraft can still be used as a fighter. This system works so well that it beat out many aircraft that are specially designed for recon missions.



TARPS can be seen between the rear wheels of this F-14 Tomcat.

## NADC Has its Share of Special People

Most of us have a hard enough time getting to work in the morning. There are plenty of excuses, just five more minutes, it's too early, one more cup of coffee, what will I wear, etc. But imagine for a while that you are paralyzed with no use of your hands or legs.

Bob Chestnut of SATD has just such restrictions. Until recently he had the help of his father who drove him to work in a van. Bob's father passed away two years ago. From then until about three weeks ago people who worked at NADC took turns taking Bob to and from work. He finally decided that he should be able to drive himself around. Working with a specially equipped van from the Moss Rehabilitation Center Bob learned to drive using his left hand for brake and gas and his right arm to steer. He became proficient enough to pass his driving test in January of this year.

The final step was for Bob to get his own van equipped with custom made controls. Some of the new control features include electric-windows, door opener, locks, power lift, zero effort brakes and boosted power steering. The hand operated brakes presented Bob with a problem. They are so touchy, because they require zero effort, that they took some getting use to.

Bob paid the \$17,000 for the van himself but to him it was worth the price. He lives in the local area and he says that, "around here you almost have to have a car. I learned that it could be done so I did it."

One of the main reason Bob wants to get around is that he coaches two softball teams. He coaches the Warrington



Bob Chestnut at his computer terminal.

AA Team for girls from seven to nine years old and a team of adults from the Neshaminy Warwick Presbyterian Church.

When Bob was in need of rides in the past W&R helped set up a ridesharing schedule. Personnel from the firehouse now help Bob get in and out of his new van. What is really heartwarming about Mr. Chestnut is that here's a man who you would imagine as needing alot of help, but there he is coaching and helping others doing things they love.

## Commander salutes

PR1 T. Knowles, AD1 Higgins and ADAN M. Lindsey all for their support and assistance to the Navy Wives Club in raising \$353 dollars to be used at NADC's Day Care Center.

Richard Hale, James Manis and Phillip Dietz all of ACSTD for their work during the Advanced Cargo Restraint Technology for Navy Aircraft Conference held by NADC.

## Scouts hold Fest



Preparing to break the pinata.

If you think the VP Lab has a wide representation of foreign countries, you should have been at the new Navigation building on Saturday, 4 April. The Freedom Valley Girl Scouts, Centennial Service Unit, had a Juliet Lowe fund raising event. Each troop was to select a country and either learn a dance, make a craft, or bring a food. For 2¢ a Girl Scout would teach you "Tinikling," which is a bamboo poles dance from the Philippines. You could buy chili from Mexico, try some Norway Jarlsburg cheese on Norwegian flat bread, eat egg rolls from Japan, or sample a piece of German apple cake. Some of the crafts included a Mexican man made out of clothes pins, or a papier-mache frog that actually leaped. The grand finale was a pinata which sent 100 screaming little girls scrambling all over the floor to get some candy. This was not only a fund raising event, but an event where the girls had lots of fun and learned about different customs.

## Computer Searcher in NADC Library

Keeping abreast of job-related information is vital to your decision making and your research efforts. Do you know that your library has the most up-to-date rapid information retrieval systems available on-line? Three major data services, Defense Technical Information Center (DTIC), Lockheed Dialog Information Retrieval Systems (DIALOG), and OCLC, are connected to the library's remote terminals. Using these data bases the library can produce bibliographies and abstracts of technical reports, work in progress, published articles and symposia.

A major data base, DTIC, contains the collections of the central repository for the Department of Defense's research and development studies. Information is available at four stages of development:

1. Program Planning—DOD agency planning documentation at the project and task level.
2. Work Unit—Summaries of research and technology projects in progress.
3. Technical Report—Final scientific and technical results of DOD sponsored research, development, test and evaluation. The library automatically receives all reports on microfiche except those in social science and agriculture.
4. Independent Research and Development (IR&D)—Summaries of IR&D's from private industrial organizations.

DIALOG is the largest and most comprehensive collection of the non-DOD on-line services. Its 130 bases include a wide range of subjects. At NADC the most

## Beni Sugg Awards

**Beneficial Suggestion Awards - February thru April**

**Kenneth Walker, CPD**, \$25 for suggestion titled "Handicapped Parking".

**Samuel Giordano, PWD**, \$50 for suggestion titled "Roof Access Bldg. 1 L18 Column".

**James McEachern, SATD**, \$25 for suggestion titled "Reclamation of Photo Sensitive Recording Paper Containing Silver".

**Samuel Giordano, PWD**, \$100 for suggestion titled "Delta Equipment Identification".

**Fred W. Paulochock and William E. Stumpp, PWD**, \$200 (shared equally) for suggestion titled "Modification to Controls for Sewage Ejector Bldg. #70 Basement".

**Samuel Giordano, PWD**, \$50 for suggestion titled "Modification to Roof Access".

**Forrest V. Miller, ACSTD**, \$100 for suggestion titled "Survivor's Rescue Sling Modification".

**Joseph T. Griffin, NNL**, \$575 this is an additional award given by NAVSEA for suggestion titled "Automatic Alarm Notification System".

## Navy Relief Schedule

**Navy Relief Casino Night**—Watch out for a fun filled night coming on 29 May, 1980 at the NADC EM Club.

**Carvel Ice Cream**—At Cross Roads Shopping Center, Richboro will give 10% discount any purchase except sale items/fountain items, to any NADC employee or military. A matching amount will be donated to Navy Relief.

**Navy Relief Raffle**, Drawing June 5th at 12 noon, 1st prize—1981 brown Chevette, Scooter 30/39 mpg steel radials, AM radio, bucket seats, 2nd prize—microwave oven, 3rd prize—19" color TV, 4th prize—diamond pendant, 5th prize—walnut clock.

Plus over 30 more prizes to be given away during the course of the Drive, (5 every Friday) All tickets drawn are eligible for final drawings.

frequently used bases are:

**COMPENDEX**—Covers the world's engineering and technological literature from January 1970 to the present.

**INSPEC**—The largest English language database in the fields of physics, electrotechnology, computers and control—1969 to the present. Foreign language material is abstracted and indexed in English.

**CA SEARCH**—Chemical literature indexed in Chemical Abstracts—1967 to the present.

**NTIS**—Government-sponsored research, development and analysis prepared by federal agencies, their contractors and grantees—1964 to the present.

**OCEAN ABSTRACTS**—Worldwide literature in marine-related subjects—1964 to the present.

**PSYCHOLOGICAL ABSTRACTS**—World's literature in psychology and related disciplines in behavioral sciences—1967 to the present.

**OCLC**, the library's third data service, provides bibliographic data for over 7,000,000 titles held by some 1500 participating libraries across the country. Most books listed can be borrowed through the on-line interlibrary loan service.

By using these library services you can stay on top of the latest developments in your profession and enhance your productivity. The library frequently prepares timely bibliographies and keeps them on file. Recent searches include information on AWACS (Airborne Warning and Control Systems) and the MX missile. Please call x2541 or visit the library for further information.

## She's on the Navy Team



Denise is fifth from the left, standing.

The cream of the crop, that is how you could describe the Women's All Navy Basketball Team. One of it's members is stationed here at NADC. YNSA Denise Fruhling who works in the Military Personnel Office is one of the chosen few.

To become a member of the basketball team you must try out and only 28 women are selected to participate in the try-outs. Denise applied and was chosen for the group of 28. After having to show their stuff for the coach, the try-outs were cut to the final group of fourteen. The team, whose home base is San Diego, then worked together for three months playing various college teams. In March the big inter-service tournament took place in Illinois. The Navy came in second with the Air Force first, the Army third and Marines fourth.

Denise played basketball at Kearney High School in Nebraska. Each year she was on the team, they advanced to the State Championships. Next year the search for new team members will start all over again. We think Denise has a good chance of making it.

## New Titles

Following is a partial list of books recently added to the Technical Information Branch. Visit or call your library at x2541 to inquire about these books.

### AVIATION

- "Aerospace Electronics in the Next Two Decades" TL695.R69 1979
- "China Space Report" W. Pritchard TL789.8.C55P74
- "RPVs-Roles and Technology" TL589.4.S97
- "U.S. Military Aircraft Data Book" UG1243.U55

### COMPUTER & INFORMATION PROCESSING

- "Contemporary Infrared Sensors and Instruments" TA1570.C65 1980
- "Distributed Computer Systems Impact On Management, Design, and Analysis" G. Champine QA76.9.D5C43
- "Guided-Wave Optical and Surface Acoustic Wave Devices, Systems and Applications" TK5981.G82 1980
- "Image Processing for Missile Guidance" TA1620.I53 1980
- "International Directory of Acronyms in Library, Information, and Computer Sciences" P. Vaillancourt Z1006.V33

### MANAGEMENT

- "Behavior in Organizations: a Multi-dimensional View" R. Coffey HD31.C58
- "Henderson on Corporate Strategy" B. Henderson HD30.28.H46

### MATERIAL SCIENCE

- "Elastomers" TA403.4.E4 1980
- "Foams" TA418.9.F6F6
- "NACE Corrosion Engineer's Reference Book" TA418.74.N37 1980

### NAVIGATION

- "Global Positioning System" TL745.G67

### WORLD POLITICS

- "Strategic Survey 1979" D349.I6

### NEW JOURNALS

- "Journal of Energy," AIAA, bimonthly, v.5, 1981—



## Six Outstanding Employees Honored by Center

Six NADC employees were awarded certificates and checks during the Center's Fourth Annual Honors Day. The awards are a result of a nomination and screening process held each year to highlight those employees who contribute to the Center's mission in an outstanding manner. This year the winners were Theodore R. Trilling, SATD, Commander Lawrence G. Elberfield, DCP, Alan E. Cantor, ACSTD, Frank J. Drummond, Supply, Dr. Vinod S. Agarwala, ACSTD, and Roy Radzai, TSD.

For his work on nonacoustic ASW systems and infrared imaging devices, Theodore Trilling received the Engineering Achievement Award. The leadership he provided in exotic ASW detection devices and the development of the flying laboratory in a P-2 aircraft helped establish NADC as a leader in the then emerging infrared technology field. Mr. Trilling's personal expertise has been sought by the fleet in special situations. He has been asked to provide infrared recordings of an early Polaris missile launch and to participate in overflights during the Cuban Missile Crisis. The search for the USS Thresher was also a project in which Mr. Trilling participated. One of his most notable accomplishments was a deployment with Photographic Squadron Sixty-One VAP-61 during the Vietnam conflict. Mr. Trilling modified existing passive infrared imaging equipment, developed a realtime inflight display, outfitted nine squadron aircraft, and assisted in training the aircrews. He solved avionics problems on the TARPS and holds thirteen patents.

Mr. Roy Radzai received the Support Achievement Award for his supervision and strong technical leadership in the Center's Photography Branch. Since 1968 the branch has responded to Center-wide requirements by providing consistently exceptional high quality still and motion picture photography and outstanding visual presentation services in support of major Center projects. Some of the work performed under Mr. Radzai consists of portrait photography, documentary motion pictures, materials testing and evaluation, holography, and aerial photography.

Dr. Vinod S. Agarwala was presented with the Scientific Achievement Award for 1981. His innovative work in the areas of corrosion and embrittlement control has been highly creative and productive. Dr. Agarwala's Independent Research work on multipurpose corrosion inhibitors has led to the development of a corrosion monitoring probe now being tested for fleet applications. Corrosion fatigue, stress corrosion and hydrogen embrittlement of steels and alloys are adversely affecting the performance of naval aircraft. The intensity of the problem increases as greater strength demands are made on material expected to function in the high performance naval aircraft. His interdisciplinary approach utilizing metallurgy, chemistry, and corrosion expertise has produced new procedures and inhibitor systems for control of corrosion fatigue in high strength steels and for retardation of stress corrosion cracking in high strength aluminum alloys. Dr. Agarwala's expertise is sought by others and he serves as a consultant and advisor to Naval laboratories.

The second Support Achievement Award went to Frank Drummond. His outstanding managerial qualities have been applied toward reduction of the long administration lead time required to process procurements at the Center. As a result of Mr. Drummond's complete review of the acquisition cycle from generation of the requirement to award of the contract and identification and elimination of duplication and rubber-stamping, he was able to reduce the average lead time by forty days while at the same time maintaining responsibility at the necessary points throughout the cycle. This was accomplished during a period of increasing workload and



From left to right: Dr. R.K. Lobb, Ted Trilling, Alan Cantor, CAPT P.L. Dudley, Dr. Vinod Agarwala, Mrs. Lawrence Elberfield, Roy Radzai, Frank Drummond, CAPT D. Parrish, and Dino Mancinelli show their smiles at Honor's Day

declining personnel resources which make the results even more remarkable. Mr. Drummond's service as a member of the Food Service Board and as Vice-President of the Naval Civilian Administrators Association is in keeping with his dedication toward support of the effective operation of the Center.

Two awards for Project Leadership were given this year. Commander Lawrence G. Elberfield, past Program Director of the TACAIR program, received the first one. His accomplishments as program director focus on development of the former VF/VA (Fighter/Attack) program, consisting of the F-14A/Phoenix and the F/A-18 engineering support projects, into a comprehensive tactical aircraft development program. Through Commander Elberfield's aggressive leadership, persuasive interaction with existing and potential sponsors, keen understanding of fleet operational needs and engineering promise, and his effective management skills, he succeeded in expanding the scope of these two very important projects. In addition, under his direction the A-6E, AWSACS, AMRAAM, and the A-4 CILOP/SLEP have been added to the roster of important Navy TACAIR programs.

The other award for Project Leadership went to Alan E. Cantor. Mr. Cantor's successful accomplishments in the management of the Naval Air Development Center

ESCAPAC Replacement Program are providing the foundations of the Navy's efforts to improve safety of high-speed aircrew escape for many of our front-line aircraft. Through his technical and managerial leadership of this multiple laboratory project, state-of-the-art advancements in operational ejection seats have been achieved within fiscal and schedule constraints. Mr. Cantor's fine balance of engineering and management skills, combined with his understanding of operational needs, has enabled him to focus on and successfully solve the day-to-day challenges of planning, organizing and executing this large R&D program. He has established an outstanding reputation at the Center and Command Headquarters for his life-support contributions as a result of his innovative and imaginative leadership and dedication to the problems at hand.

Guest speaker Captain D. Parrish, MAT O8L, addressed the packed auditorium. His subject was the contributions of the Navy Labs and in particular the Naval Air Development Center's unique assets and how they have helped the Navy today.

Technical Director, R. Kenneth Lobb and Center Commander, Captain Paul L. Dudley concluded the ceremonies by presenting \$1500 checks and certificates to this year's group of outstanding Center employees.

## Terramoto . . . Italian Earthquake

by Sal Picard

I had just finished getting ready for dinner and was sitting in the living room of my apartment reading the newspaper. Dan Rosso, Jim Howard, John Keane, and his wife JoAnn had arrived earlier in the day and were staying at the San Germano Hotel. I had called them about 6:00 PM and told them I would pick them up for dinner at 8:00 PM.

My apartment was on the ground floor of a three story Italian villa located in Pozzocili, about twenty kilometers from the center of Naples. In the center of the living room was a very large, ornate, glass and metal chandelier. I glanced at my watch because we had reservations at a very interesting restaurant in Naples called Umberto's. At Umberto's everyone sings . . . the waiters sing, the cooks sing, the customers sing. Usually it is old, traditional

Neapolitan songs, but on occasion, a favorite aria from a well-known opera is heard. And if the voice singing is professional, all others listen quietly and then launch into loud bravos and bellisimos at the end. Dan Rosso had been there previously. It was one of his favorite restaurants. This was my first time, and I was looking forward to it. So, I was checking the time to be sure we would not be late for our reservation. It was 7:35 PM.

The glass in the chandelier began to vibrate with a tinkling sound, similar to Japanese wind chimes. My first thought was that my landlord, who lives above me, was walking across the floor or moving a piece of furniture, because I heard a rumbling sound. Almost immediately

Continued on page 3

# Waste Water Made Clear by Treatment Plant

by Patricia McMahon

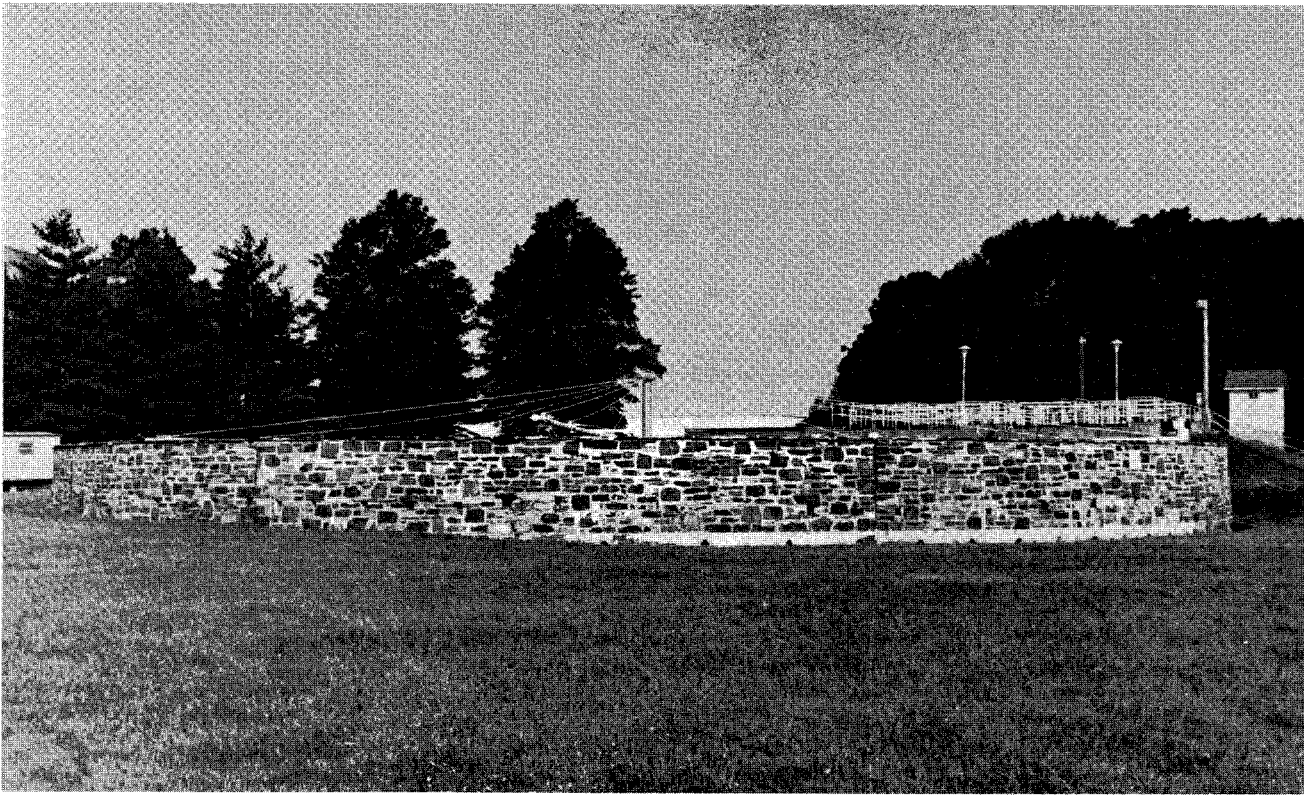


Photo shows an aerator that is part of the Water Treatment Plant at NADC

Although many people do not realize it, the Naval Air Development Center has its own Waste Water Treatment Plant, to handle the purification of its own water. There are two different types of Waste Water Treatment performed at NADC's treatment facility—domestic and industrial.

According to George Sterling and Charles Strohmeir of PW, domestic waste water is composed of the waste water from areas such as the bathrooms, cafeteria, and the BEQ. This is treated in a series of treatment units employing physical, biological, and chemical (chlorine) measures to purify and disinfect waste water before it enters into the streams.

In the preliminary treatment of domestic waste, the sewer line flows through a comminutor where solids such as paper are ground. The waste water then travels to the receiving wells, also known as wet wells, where raw sewage pumps take it into the four primary settling tanks. In these tanks the solids settle—only 3-4% of domestic waste is solids—whereupon mechanized sludge collectors scrape the solids along the bottom to sump pits from which it then flows to a conditioning well for further settling. Bicarbonate is added for pH and alkalinity control, and the sludge proceeds to be pumped into the digester. In the digester bacteria attacks the solids, reducing them still further to liquids and solids. The liquid is drained and sent back to the primary settling tank. From the primary settling tank the water is then fed to the trickling filter system where it is sprayed over a stone bed which contains bacteria. Suspended solids are absorbed by osmosis, and the water is sent to the

chlorination contact tank in which bacteria is killed. After the chlorination and before it is discharged into the streams, the water is tested to make sure it meets all federal, state, and local environmental standards.

The industrial waste comes into the treatment plant through separate lines and is treated in a batch where it is treated chemically. The chemical reaction that takes place is one of coagulation and precipitation. The chemicals used attach themselves to pollutants in the water forming solids which settle to the bottom. The water is then fed through the same system as the domestic waste, going through all the steps in the purification process. When the process is completed, this water is environmentally safe according to the strict standards set by the government, whereupon it is discharged into the streams.

The sludge drawn off domestic and industrial waste is also handled differently. Domestic sludge is drawn off into drying bins which are actually sand beds. The water trickles through, and the solids are left on top to dry. The sludge is then tested to make sure it contains no heavy metals, and then a contractor is hired to haul it away to be dumped.

Industrial waste sludge is drawn off into concrete lagoons where the solids settle, and the liquid is pumped back into the purification system. When the lagoon fills up, contractors then come to take it away to be dumped.

The samples are regularly checked for quality at the plant itself and sent out two times monthly to be checked. All operators are licensed and fully qualified to perform the testings. When the water is tested, it is in top shape and meets all the environmental regulations. The Waste

Water Treatment Plant is governed by a permit with seven basic standards to be met.

All of these regulations are more than met by the Waste Water Treatment Plant on Center. Nothing that could be harmful to the environment is sent back out into the streams. The plant operates 24 hours a day, 7 days a week. It was originally built to handle a million gallons per day during World War II. This included the water from Warminster Heights which was at that time barracks for enlisted personnel. The permit now allows for the processing of 750,000 gallons per day, although usually 150,000 gallons per day are actually processed. This amount has been even lower since efforts to conserve water have been in effect.

The Center has its own wells to supply its water. Three of these wells are used specifically for that purpose while another is used as one of the monitoring stations by Bucks County to measure the water table. They measure the water table by use of a float which, as the water level rises or falls, records the changes on a chart.

The Water Treatment Plant is located North of the Centrifuge and East of the New Navigation Lab. It has been in existence since the Center was built.

## Strohmeir Made Lifer

Charles Strohmeir, born October 3, 1914, has recently received a Life Membership from Eastern Pennsylvania Water Pollution Control Operations Association (EPWPCOA) of which he has been a member for 35 years. This organization was founded in the mid 30's and was formed for the purpose of advancing the knowledge of design, construction, operation, and management of sewage and industrial waste treatment works. It also serves to encourage the exchange of information and experiences and provide for affiliation with the Water Pollution Control Association of Pennsylvania. The EPWPCOA started with just a few members and now has a membership of thousands. They meet six times a year at different Eastern Pennsylvania plants.

Charles Strohmeir has been with the Naval Air Development Center in the Waste Water Treatment Plant since January 5, 1943. At this time the Center was an air base for Brewster Aircraft. When the Navy took over in 1944, Mr. Strohmeir transferred with them and was at NADC until July, 1958 at which time he transferred to Willow Grove in their Waste Water Treatment Plant. In July of 1964 Strohmeir returned to the Center and has been here since. He is now the engineering technician in charge of the Waste Treatment Plant in which his function is to assure a smooth and efficient operation in the plant.

## More Money for School

DOD has authorized the implementation of an Education Assistance Test Program (EATP) beginning 1 April 1981 through 30 September 1981. The program provides additional education benefits as retention incentives to second term reenlistees in specific ratings. Personnel who meet the following requirements are eligible to participate:

- Have completed a minimum of six years active duty.
- Are reenlisting for the second time.
- Reenlist for six (6) years between 1 April 1981 and 1 October 1981.
- Hold a high school diploma or hold a GED certificate.
- Are serving in the following ratings: electronic warfare technician (EW), aviation electronics technician (AT), engineman (EN), or fire control technician, gunnery (FTG), or convert into one of these ratings.
- Waive entitlement to existing GI bill benefits.

Benefits are as follows:

- 1200 dollars per year to cover costs of tuition for a maximum of 4 years (4800 dollars). Full benefits are available only after the obligated active service is completed. If the servicemember attends college part-time while in service, tuition benefits can be utilized after two years of this obligated active service is completed.
- 300 dollars monthly cost of living stipend for a maximum of 36 months (10,800 dollars). A member is eligible for this stipend only if the member is no longer in the service.
- Maximum earned benefits would have 1981 value of 15,600 dollars (adjusted annually).
- Total earned benefits may be transferred to dependents after four years of this obligated active service is completed.
- Members may cash out 60 percent of unused benefits if they reenlist again after this obligated active service is completed.

F. Educational benefits are available up to 10 years after honorable discharge or retirement.

G. If member does not complete six year enlistment, benefits will be prorated based on service completed.

The following statement must be forwarded with the Navpers form 1070/601 reenlistment contract for all personnel choosing to participate in the program: in order to establish my eligibility for educational benefits provided by Sec. 901 of public law 96-342 (10 U.S.C. chapter 107) I hereby waive any entitlement I may have under the "GI Bill" (Veterans' educational assistance—Chapter 34 of Title 38, U.S.C.). I understand that this waiver is permanent and may not be withdrawn. Name - typed or printed - signature. Witness name - typed or printed - witness signature - date.

All personnel eligible for this program (whether they participate or not) are to be reported by written communication within 30 days of reenlistment. For further information contact MILPERS.



## Earthquake continued

the chandelier began to sway and the tinkling of the glass became violently loud, and the floor began to vibrate. I have literally sat through two minor earthquake tremors in California, and I knew immediately that it was an earthquake. My first reaction as I got off the chair was to get to an archway followed immediately by a second thought and decision to get out of the house, since the door was only a few steps from the archway.

The entrance to my apartment was through a private gate, garden, and drive leading directly to the front of the house. The entire area was paved, with the garden lining the drive and paved area. I ran out into the drive and turned to look at the house. I became mesmerized. The house was swaying. Suddenly it started to shake as well, and with the sound of creaking and groaning it sounded like it was going to explode. I also became aware that the cement paving I was standing on was moving under me in a wave-like motion. The thought then occurred that if the house goes, I would be killed standing there, so I turned and ran out the drive into the street. Suddenly it became quiet, the trees were still swaying though, and I could still feel some movement under my feet.

Within seconds, the street was filled with people. Everyone was out of their houses; everyone saying the same thing. "Did you feel it? What happened?" The Italian portiere (caretaker) came running up the street from his guard post at the entrance to the Raico. "Terramoto Salvatore, terramoto." He was heading for his house to check on his family.

The earthquake lasted ninety seconds, not long in real time, but exceptionally long in earthquake time. The impact of that ninety seconds changed centuries of time for the hundreds of thousands of Italians who were left homeless by its effects. Some towns had been totally destroyed. Houses that were centuries old and families whose ancestry date as far back as the homes were left totally helpless.

I went into one town. My ancestors are from Montella, a town about ninety kilometers east of Naples. There are many people in Montella with family members who immigrated to the United States. I did not know what to expect. The TV and newspaper reports told of the extent of the damage. It was terrifying. Two towns especially hard hit were Lioni and San Angelo de Lombardi. Montella lay in a line from the epicenter of the earthquake to those towns. Communications had been cut off, and I could not get any information from the American Consulate. Finally, on Wednesday, out of desperation, I went to the Italian television studio and talked to one of the reporters. He had no news either and only told me what I already knew; that the damage was probably extensive because of the location of the town.

By that time, the Italian government had finally accepted assistance from the United States and other governments. I knew that helicopters were being staged at Capodechino airport, so after I left the TV studio, I went to the operations control center set up by COM FAIRMED and volunteered to go in with the helo's since they were going to start bringing in supplies in Thursday, Thanksgiving day.

The weather on Thursday was the worst it had been all year. It was raining heavily and the wind was gusting to forty knots. The first helo, and Army UH-1B, almost lost control taking off and then never made it to Avellino, a city only forty kilometers from Capodichino. It had to set down because the weather was so bad. Later reports on Thursday, and for the next week, from the veteran helo pilots were that it was the most treacherous flying any of them experienced. Not only the wind and rain but the tricky air currents in the mountains and the changing weather conditions all were working against them. And yet they did it. If there were any "heroes" of this disaster, it was the pilots and crews of the helo squadron. Many worked long hours and flew until they ran out of daylight.

Needless to say, I did not get on a helo on Thursday. Before I left my apartment, I gathered all of the things I needed to survive on my own or to help my relatives if I found them; canned meats, soups, tuna fish, bottled water, juices, sterno for cooking, flash light, and of course, a can opener. I even packed a suitcase with clothes just in case I would have to stay for several days. And when I found that all flights had been cancelled, I took off on my own for Montella.

The Autostrada was filled with cars from all over Italy. The cars were loaded with supplies for earthquake victims. I found out later that many of the relatives of the earthquake victims poured into the area and began helping the survivors to recover. I had expected at any time to hit check points or roadblocks along the roads leading to the town, but there were none. And after two hours, I finally reached the town.

I had expected to find the town totally devastated and was relieved to see it still standing. One of my family's close friends, an American woman, living in Montella, has a single story house just on the edge of town. It was still standing. It was my first stop. I found she was all right and in fact had been on the highway with her nephew and their families when the earthquake hit. She was sheltering twenty-five people whose houses were either damaged or destroyed. I went next to the home of a relative. I found he and his family living outside their apartment in a tent and a quickly made shelter. Fortunately, they were all right also.

My relatives insisted that I have dinner with them. They

were having a traditional Italian dish, pasta a fagolie (macaroni and beans). It does not sound like much, but it was one of the best Thanksgiving dinners I have ever had.

I have made several trips back to the town. On one I went to one of the homes that was severely damaged. The roof had caved in and the walls in the rooms were cracked and in some places separated. It was very evident why one should find an archway or doorway during a quake. Even though the walls had separated and moved, the archway held and appeared to have kept the entire wall from collapsing. Fortunately, this was one of the families on the road because the roof had collapsed into the stairwell. Had they been home and tried to get out, they would have been crushed under the rubble.

My original impression was that the town had not suffered too badly. But on my last visit on Saturday I took the time to look around more carefully. The entire center of the town had been destroyed. The piazza is the center of Italian life on Sunday afternoons. Men gather to discuss politics, and whatever else is of immediate interest. Many of the younger people stroll the streets or roads leading into and out of town. Today it was completely destroyed. And so was the main road leading to the piazza. It was like a scene from a science fiction movie. Most of the homes were still standing because much of the damage was done internally. It was a very eerie feeling. All the people were gone, disappeared.

One last thought must be shared. That is the frightening realizations of what was happening when I stood there looking at this mass of concrete and steel villa moving and the earth rolling under my feet. It was a feeling of total helplessness, of not knowing what to do or where to go, whether to stand still or to run. Will the ground just roll, or like in the movies it is going to suddenly split open? And is it over or is there more?

I later talked to an Italian who works at NSA. This was his third earthquake and the most severe. He also said he lived in Naples during the Second World War. During the war, they could hear the planes and had a warning to run for shelter from the bombs, or after the first artillery shell, they could find cover. But there are no warnings from earthquakes. Suddenly and instantly it happens. And that is the way it happened, at 7:35 PM, Sunday, November 23, 1980; ninety seconds which changed and will change the lives of hundreds of thousands of Italians for many years to come.

Sal Picard is on long term assignment in Italy serving as liaison between NADC and the Fleet. He is a member of the PAR group at NADC working out of the Air Warfare Office.

# A Training Program for New Joggers

by Sylvia Wasylyk

Well, here we are ready to go to work. I am reprinting a training schedule that appeared in the June 1980 issue of Runners World magazine. It was devised by the head track coach at Oregon University who has been responsible for training many successful runners, with the great Steve Prefontaine his most noted pupil. The program is simple and easy, and ideal for the beginner.

This 10-week training program is aimed at developing the habit of running 20 minutes comfortably every day. Moderation and progression are seen here in the hard/easy framework.

The "count" system is utilized in this schedule. For instance, on the first day the runner is instructed to jog 10 counts—counting each time the right foot contacts the ground—and then to walk for 20 counts. Though not running for the entire period, the beginner is exercising for 20 minutes.

Later on in this program, the aim is to make Tuesday, Thursday and Saturday relatively hard days with Monday, Wednesday and Friday the easy days, thus fulfilling the hard/easy philosophy. On Sundays, the runner should take an active rest.

Here is the first half of the running program. Have fun!

### WEEK ONE

**Monday**  
Jog 10 counts, right foot; walk 20 counts, right foot; continue 20 minutes.

### Wednesday

Jog 20 counts, right foot; walk 20 counts, right foot; continue 20 minutes.

### Friday

Jog 20 counts, right foot; walk 10 counts, right foot; continue 20 minutes.

### Tuesday, Thursday, Saturday

20-minute walk.

### WEEK TWO

### Monday

Jog 20 counts; walk 20 counts; continue 20 minutes.

### Wednesday

Jog 30 counts; walk 20 counts; continue 20 minutes.

### Friday

Jog 40 counts; walk 20 counts; continue 20 minutes.

### Tuesday, Thursday, Saturday

Walk five minutes; jog five minutes using count system—jog 50 counts, walk 50 counts; walk five minutes; jog 50 counts, walk 50 counts—five minutes.

### WEEK THREE

### Monday

Jog 30 counts; walk 20 counts; continue 20 minutes.

### Wednesday

Jog 40 counts; walk 20 counts; continue 20 minutes.

### Friday

Jog 50 counts; walk 30 counts; continue 20 minutes

### Tuesday, Thursday, Saturday

Five-minute brisk walk; jog 50 counts, walk 40 counts—five minutes; five-minute brisk walk; jog 50 counts, walk 40 counts—five minutes.

### WEEK FOUR

### Monday

Jog 40 counts; walk 20 counts; continue 20 minutes

### Wednesday

Jog 50 counts; walk 20 counts; continue 20 minutes.

### Friday

Jog 60 counts; walk 20 counts; continue 20 minutes.

### Tuesday, Thursday, Saturday

Five-minute brisk walk; jog 50 counts, five minutes—30-count rest; five-minute brisk walk; jog 50 counts, five minutes—30-count rest.

### WEEK FIVE

### Monday

Jog 50 counts; walk 20 counts; continue 20 minutes.

### Wednesday

Jog 60 counts; walk 20 counts; continue 20 minutes.

### Friday

Jog 70 counts; walk 20 counts; continue 20 minutes.

### Tuesday, Thursday, Saturday

Five-minute brisk walk, five-minute easy jog; five-minute brisk walk; five-minute easy jog.

Next month: Weeks Six through Ten.

## Commander Salutes

Frank J. Drummond, Alberta H. Jett, and Charles J. Williams, all of Supply, Dino A. Mancinelli, Assoc. T.D., also Edwin G. Sinnamon, Command Administration, all for their assistance during the transfer of management of NADC's duplicating facility to the Navy Publications and Printing Service Office.

Denise Byrnes, John G. Ryan, William G. Mulley, Stephen M. Filarsky, James H. Brindle, Frank B. Uphoff, Thomas D. DePasqua, Jack Eyth, William G. Cole, Harold Green and Norman Warner all of ACSTD also Bernard L. Coxhead, TSD, LCDR Stephen D. Harris, Lt. Edward Trautman all for their help in support of the Society for Information Display (SID) meeting.

Sidney McCleary, Daniel Becker, Harvey L. Sokoloff, John Smith and Eugene A. Macur all of SATD also Francis R. Reinert and Carl T. Joeckel of SCD, Louis A. Naglak, SD, and Gerald J. Palatucci, CNTD, all for their participation on the Source Selection Evaluation Board (SSEB) of the Very High Speed Integrated Circuits (VHSIC) Program.

AWCS C. T. Kaiser for his liaison services during recent LLCVLAD operations.

All the personnel who contributed toward the success of the Fleet Ballistic Missile Weapon System Program.

Stuart B. Simon, PAR, for his contributions to the Laboratory Management Task Force Personnel and Manpower Task Group.

Kenneth W. Foulke, SATD, Edward C. Lesoravage, Millard Mitchell, and Paul Young of SD, for their participation in the Combat Survivability Executive Short Course.

All those who participated in Project LINEAR CHAIR.

Michael Schultz, CNTD, was recently promoted to the rank of Major in the Air Force Reserve. Mike is a member of the 913th Tactical Airlift Group based at Willow Grove. It is through the efforts of employees such as Mr. Schultz that the reserve forces of all the military branches are staffed with dedicated and knowledgeable people.

## SecDef on Retention

During an Armed Forces Day presentation in Norfolk, Va. on 16 May, Secretary of Defense Caspar W. Weinberger said the price to have an all-volunteer force was adequate pay and allowances, and it was a small price to pay for peace and freedom.

He said, "No longer can the rest of our 220 million people reap the benefits of peace and freedom at the expense of the health, happiness and welfare of our men and women in uniform and their families."

The Secretary cited budget proposals for pay raises to be effective this year. He said, "These are not bonuses or unwarranted increases. They represent simple equity, for they are essential to bring military compensation up to the level of comparability with the civilian sector that was promised when our nation instituted the all-volunteer force almost a decade ago."

In relating improved retention figures to the increased military pay, Secretary Weinberger said, "... the retention figures so far this year give clear evidence that many careerists, who in all likelihood would have otherwise left the service, are now staying in."

He continued by saying, "At the same time, we will direct more of our attention to stemming the outflow of commissioned and enlisted personnel with the advanced, technological skills that are so essential in the modern military and so competitive in modern, industrial civilian society."



Dennis DePriest zeroes in on bullseye.

## Jumpers Hit Target

AW2 DENNIS L. DePRIEST, Club Safety Officer of NAVAIRDEVCON Skydivers, captured third place honors in the 5th Annual All-Military Nationals (Senior Division) at Fort Bragg, North Carolina, 29 May - 1 June 1981, in both style and a combination category encompassing style and accuracy.

Leaving a UH-1H helicopter from an altitude of 6600 feet, Petty Officer DePRIEST completed the six required maneuvers in the style competition for an average of 14.015 seconds in two rounds. His closest landing to the disk in accuracy competition was 0.05 meters.

The meet was sponsored by the 82nd Airborne Division at Fort Bragg, North Carolina. Competitors in the meet included representatives of all services, including the Army Full-Time Team, the "Golden Knights", and the 82nd Airborne's "All American" Parachute Club.

The NAVAIRDEVCON Skydivers have recently been chartered as the local military sport parachuting organization. For more information, contact AW1 BRIAN POWELL at ext. 2489.

## New Titles

Following is a partial list of books recently added to the Technical Information Branch. Visit or call your library at x2541 to inquire about these books.

### AVIATION

"MiG master: the story of the F-8 Crusader" B. Tillman UG1242.F5T55

### COMMUNICATION

"A handbook on mobile communications" W. Duff TK6570.M6D77

### COMPUTER SCIENCE

"Tutorial distributed data base management" P. Bernstein QA76.9.D3T87

"Structured programming: tutorial" V. Basili, T. Baker QA76.6.B375

"Tutorial, software cost estimating and life-cycle control: getting the software numbers" L. Putnam QA76.6.P892

"Tutorial on software design techniques" P. Freeman, A. Wasserman QA76.6T88 1980

"Bit-slice microprocessor design" J. Mick, J. Brick TK7895.M5M44

"SCRIBE: introductory user's manual" B. Reid, J. Walker QA76.6 R4 1980

### ELECTRO-OPTICS

"Radiometric calibration: theory and methods" C. Wyatt QC673.W9

### MANAGEMENT

"Japan as number one: lessons for America" E. Vogel HN723.5.V63

### MATERIAL SCIENCE

"Effect of load spectrum variables on fatigue crack initiations and propagation" D. Bryan, J. Potter TA409.E5

## Beacon: A Guiding Light

The Warminster Naval Air Development Center has contracted with BEACON, the Bucks Employee Assistance Consortium, to provide professional counseling services to employees and their immediate families to help them resolve any personal problems that they might be experiencing.

BEACON is a program of the Bucks County Council on Alcoholism, but its professional counselors can help you with any sort of problems that you may be experiencing. BEACON deals with alcohol, drug problems, marital and family difficulties, emotional distress, legal, financial and medical problems.

BEACON's services are absolutely free to the employee and his immediate family. They are also completely confidential. They will never report to the Naval Air Development Center that you've been in touch with them unless you request them to do so.

What will happen if you call BEACON? Depending on the situation, an appointment will be arranged with one of BEACON's professional counselors, for a day and time that is convenient for you. Either the Doylestown office or the Bristol office will be utilized, according to your preference. The counselor will see you once or perhaps more than once depending on the nature of the situation. BEACON's goals are to help you arrive at an understanding of how you might be able to deal with your problems, and then to work with you to develop an assistance plan. BEACON will continue to work with you to help you carry through the assistance plan.

BEACON uses many community resources, and can refer you to the best possible facilities for help. If, however, the concern that you feel is one that can be dealt with in a few sessions, the BEACON counselor may be able to work with you for a short time on the dilemma until it is resolved. No matter how often the BEACON counselor sees you, there is no charge for their services. If they refer you to a fee-supported community service there would of course be a charge at that service, but BEACON is aware of your insurance coverage and never refers a person anywhere that the person cannot afford.

BEACON can be contacted at 345-8577 or 757-1561; collect calls are accepted, and emergencies can be responded to 24 hours a day. If you wish to contact BEACON, please do not hesitate to do so. They are waiting to help.

### MECHANICAL DRAWING

"Drawing requirements manual" J. Lieblich T357.D68 1981

### PROBLEM SOLVING

"Thinking visually: a strategy manual for problem solving" R. McKim BF441.M19

### QUALITY CONTROL

"QC circles: applications, tools, and theory" D. Amsden, R. Amsden TS156.Q18

"Carbon and graphite fibers: manufacture and applications" M. Sittig TA418.9.C6S58

"Analysis and performance of fiber composites" B. Agarwal, L. Broutman TA418.9.C6A34

### Naval Air Development Center

The REFLECTOR is published monthly by the Public Affairs Office to inform Center personnel about topics of interest, and to promote the morale and general welfare of all concerned.

Views and opinions expressed in this publication are not necessarily those of the Department of Defense.

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CAPT Paul L. Dudley, Jr. — Commander, NADC

Dr. R. Kenneth Lobb — Technical Director

Joseph P. Cody — Public Affairs Officer

David Polish — Editor



## FY 82: CITA Studies Expanded

The Department of the Navy has announced the initiation of detailed studies at 370 field activities during FY82, including the Naval Air Development Center, to determine the feasibility and economy of converting various support functions to commercial contractor performance. This announcement is part of an annual DOD joint service program to review certain commercial and industrial-type activities (CITA) to determine if they can be performed less expensively by the private sector.

The functions to be studied at NADC, Warminster include custodial services, insect/rodent control, fire protection, guard services, audiovisual services and administrative telephone service.

Decisions to retain these functions at NADC will be made by the Department of the Navy if the detailed studies show that the work can be performed more satisfactorily in-house, and if they show no significant savings can be realized by contracting. Significant savings are defined as a reduction of at least 10% over in-house costs.

During FY-82, the Navy will study these functions to ensure that they are being performed by the government in the most efficient manner, and to determine in-house costs. The studies will be conducted by personnel at this Center. The cost results will be validated by the Navy Audit Service. The Navy will then solicit bids from private sources based on a definitive statement of work. The government will also submit a sealed bid for the same work. If the bid opening reveals the cost of in-house performance to be less expensive, the function will not be contracted.

The studies are expected to begin shortly. The time involved with each study will vary according to the size and complexity of the work to be studied. It is estimated that the studies will take approximately one year.

As announced in Washington in June 1981, these functions are being considered for contract performance because the Federal Government has a general policy of reliance upon the private sector for commercial and industrial-type goods and services. Each administration since 1954 has required all Federal Departments and agencies to rely on the private enterprise system to the maximum extent consistent with economical and effective accomplishment of their programs.

Should, at the end of the study, it be decided to contract, the Office of Management and Budget Circular A-76 directs that the contractor will give Federal employees, displaced as a result of the conversion to contract performance, the right of first refusal for employment openings on the contract in positions for which they are qualified.

NADC will make all reasonable attempts to provide the opportunity for displaced employees to be placed in existing vacancies. In addition, civilian employees affected will also receive assistance from federal placement programs including relocation to obtain transfer or reassignment to other positions in the Department of Defense or to other federal agencies, at Government expense, if necessary.

## Technical Director Talks to Group

Calling the CITA program "something that can seriously affect the livelihood, well-being and home of Center employees," Dr. R. Kenneth Lobb, Technical Director of NADC, began a discussion with those employees who are affected by CITA. The meeting held in the Navigation Building was short on seating because of the size of the group which was close to 300 people. CITA, as explained in the accompanying article, is a government-wide program designed to review and compare government functions similar to those done on the outside. The object according to OMB circular A-76 is to make sure the taxpayers are getting their money's worth. Dr. Lobb, along with Mr. Al Prince of PAR and Mr. Ron Young, Director of Civilian Personnel, fielded questions from the group. Mr. Prince also headed a 30-minute explanation of the CITA program and its specific impact at NADC.

Information about the plans and studies was stressed at the meeting. A newsletter will be distributed once a month to all Center employees, so everyone is kept up-to-date.

Dr. Lobb closed by saying top Center Management will do everything possible to assist those employees who are directly and indirectly affected by the CITA studies.

# NADC Reflector

Volume 25, Number 7

Naval Air Development Center, Warminster, PA

July 1981

### Inside this issue

- Day Care
- New CNM
- Energy
- Scouts

## Jumbo Jet is Big Hit at Center

We're strapped in as the huge plane accelerates down the runway. That wave of anticipation rolls over the passengers as the nose begins to lift off. The three giant Rolls Royce jet engines scream and we're off in a steep climb quickly leaving NADC behind. But wait a minute! Huge plane, three jet engines, just what kind of aircraft is this and why is it at NADC? That was the question everybody had on their mind on June 23rd as a Lockheed L-1011 sat on the runway making it look very much like the Center had its own airline service.

The plane, called the Advanced Tri-Star, is an experimental testbed built by Lockheed to demonstrate the latest technology in flight controls, use of composite materials, acoustic materials and energy management. Although the L-1011 looks like any other passenger plane on the outside, inside a totally different picture is presented.

In first class, some of the trappings are still there such as wall and ceiling panels and carpeting, but that's where they end. Instead of normal passenger seats, there are test consoles. Manning the equipment are Lockheed engineers who demonstrate and monitor the aircraft's functions. There is an experimental laser set-up designed to work as an airspeed indicator. A high resolution multi-color display is also set up to show engine parameters, attitude, radar and other aircraft functions. There is also a small television monitor that shows what is in front of the aircraft by using a camera and prism system mounted in the nose.

Probably the main component of this aircraft is an avionic flight control system or AFCS. This system basically flies the aircraft after the pilot has taken off. Digital computer processors control the altitude, speed, and attitude of the plane. Coupled with the Flight Management System, an automated flight plan can be accomplished. From climb out through cruise to descent and landing it's all automatic. By programming destination, flight path and arrival time into the Flight Management



Employees line up for a quick tour of the jumbo jet that visited NADC.

Photo by David Polish

System, the aircraft will fly at the best altitude and speed to save fuel and arrive on time. Landing is also accomplished by the computer. The aircraft's Avionics Flight Control System is set to the airfield's beacon frequency and the plane homes in. Putting the wheels down and reversing the engine thrust is the only thing the aircrew has to do. The plane even applies its own brakes.

In the rear of the Advanced Tri-Star is what only can be described as a flying laboratory for data collection. The area is filled with racks of recorders, mini-computers and digital displays. The purpose of all this equipment is to monitor, display and record the many functions of the aircraft's systems for analysis.

There are two areas on the wings where composite materials are being tested. Five feet of composites have been added to each wing tip and a flap in the center trailing edge which are monitored during each flight.

One of the reasons this plane visited NADC was because this Center has an active fuel management program. The program studies ways to modify aircraft structure and flight plans to save fuel. Some of aircraft that are being looked at are the P-3, A-7 and A-4.

A flight from Warminster out over the ocean and back was given to a group of Center employees to demonstrate the systems.



Photo by David Polish

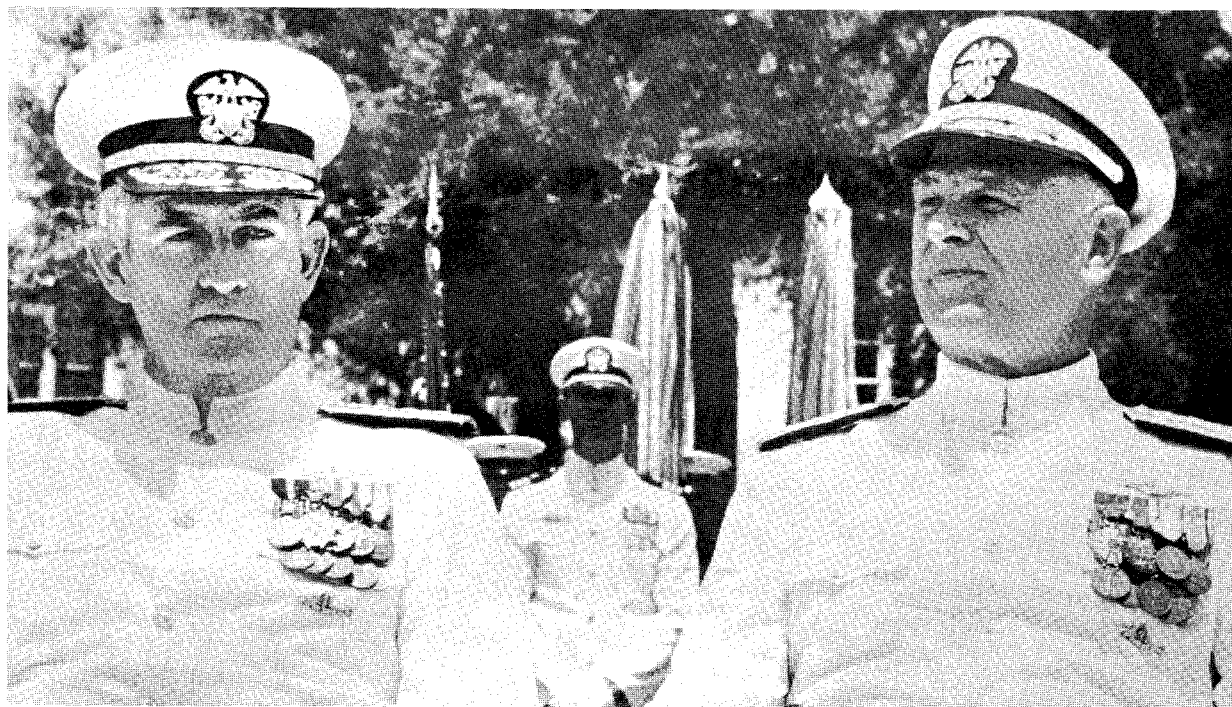
AK1 Keck, AD1 Higgins, PR1 Knowles, AMHAN Woolums and ATC Allen hold lobsters for sale.

## Sailors Help Raise Money for Kids

A small group of some very dedicated Navy people are helping to make the Naval Air Development Center's Day Care Center more financially solvent. AD1 John Higgins, PR1 Tim Knowles, AK1 Don Wilson and AK1 Bob Keck all heard of the need for funds to keep the Day Care Center running, so they pitched in. First they held a raffle for a P-3 model during the birthday celebration of the

Navy's acceptance of the first P-3. That raffle earned the Center \$353.00. A recent lobster sale saw over 2200 lobsters going into NADCers' stomachs and \$1548.10 going to the Day Care Center. It is interesting to note that only Bob Keck uses the Day Care facility, but all the men are donating their time and effort to help the Center out.

## New CNM, Williams Takes Charge



WASHINGTON, D.C.—During the Change of Command ceremony on 30 June 1981, Admiral A. J. Whittle, Jr., USN (left) and Admiral John G. Williams, Jr., USN (right) listen to the challenges of duty which Admiral

Williams is about to assume as the sixth Chief of Naval Material of the Naval Material Command. (Photo by JOC Hamrich, USN)

Expressing his pleasure at being appointed Chief of Naval Material during these exciting times of increased challenges and commitments, Admiral John G. Williams, Jr., U.S. Navy, relieved Admiral A. J. Whittle, Jr., U.S. Navy, as the sixth Chief of Naval Material of the Naval Material Command. Admiral Williams had been serving as Deputy Chief of Naval Operations for Submarine Warfare at the time of his selection, and had also served in many of the same billets as had Admiral Whittle.

During the Change of Command ceremony at the Washington Navy Yard, Admiral James D. Watkins, U.S. Navy, Vice Chief of Naval Operations, traced the long history of obstacles placed before any Chief of Naval Material, and lauded Admiral Whittle for the "miraculous job" he has done. Admiral Watkins called Admiral Whittle "a key player in achievement, a top flight leader through the toughest of times, a pillar of strength, a fine professional example, as well as a wonderful and warm being." He then presented Admiral Whittle, on behalf of the President, with the Distinguished Service Medal for his "unparalleled qualities of leadership," "astute assessment," "impeccable integrity" and consummate skill in performing his duties as Chief of Naval Material.

Admiral Whittle thanked the thousands of people in

the Naval Material Command who had helped so much over the past years, and warned against the alarming trend of taking short-term gain without looking at the long-term impact. In looking back over his more than 39 years of naval service, Admiral Whittle said that "the Navy has been wonderful to me; shipboard duty was the best." "If I could go back to sea, I might not be retiring." After reading his orders, Admiral Whittle's flag was hauled down and handed to him by the Command Fleet Master Chief.

After reading his orders and assuming command, Admiral Williams said he was confident that, working together, the Naval Material Command was equal to the task of facing all of the challenges mentioned by Admiral Watkins.

The Naval Material Command, which has about 220,000 military and civilian employees, is the Navy's single agency for acquisition and logistics support of all U.S. Navy ships, aircraft, weapons, electronic equipment and supporting systems. It is responsible for research and development, procurement, production, installation, maintenance, overhaul and modernization. Its fiscal year 1981 budget is more than \$30 billion.

## Needed: Care for Day Care

by Patricia McMahon

NADC's Day Care Center for military dependents takes some of the worry off of mothers. Children who attend range between the ages of 6 months and 10 years. They are dropped off at approximately 7:30 A.M. whereupon they are fit into a daily routine. From 9:00 to 10:00 they watch Sesame Street and from 10:00 to 11:00 are told a story. If it is nice outside they will be taken out to play and brought in by 11:30 for lunch. Nap time is at 12:30 after which they play games and watch TV. Before you know it, it's time for a snack and juice and then playtime in the Big Room, where the children have a slide and toys to amuse themselves. At around 4:00 P.M. parents start to pick their children up.

This is the daily schedule of the Day Care Center. The Center has five employees to take care of the children from 7:30 A.M. to 5:00 P.M. Two women work in the morning and two in the afternoon, while a substitute comes in from 10:00 A.M. to 3:00 P.M. if there are 16 or more children. The number of children looked after at the Day Care Center varies, although there are 12 regulars. Reservations for children must be made a day in advance.

The Day Care Center at NADC, unlike Willow Grove Day Care Center, is not operated by the government. They rent their building from the government as well as pay salaries, insurance and taxes. It is a nonprofit organization which has been run by Joanne Ramer for the last three years and been in existence for 10 years.

This Day Care Center was originated by the wives of Chiefs and Enlisted men to care for their children when they went to teas and luncheons. Gradually, as the wives began working, it was then taken over by the Officers' Wives Club. These women relied on different fund-raising activities such as bake sales. Unfortunately, the number of officers and their wives has been dwindling, and because of this, fund-raising activities have also been declining. As a matter of fact, the Day Care Center is currently having financial difficulties.

The money raised by a lobster sale and raffle for a P-3 model organized by AD1 John Higgins, PR1 Tim Knowles, AK1 Don Wilson and AK1 Bob Keck is enough to keep the Day Care going until October. After October, however, they will have to close down unless they can either bring in more children or raise more funds. Preferably more military personnel will use the facility for their children because this would mean a steady income, whereas depending on fundraising is much less reliable. However they achieve it, their goal is to stay open. If anyone would care to make any contributions—military children or money—to this worthy cause, contact Joanne Ramer at X2935 or any of the four men who organized the last fundraiser.

## Moving Day

According to John Scott of Purchasing, furniture in the new Navigation Lab is scheduled to arrive at NADC on 28 August 1981. It is to be installed by 15 September, and people are to begin moving in 16 September.

Naval Air Development Center

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CAPT Paul L. Dudley, Jr. — Commander, NADC  
Dr. R. Kenneth Lobb—Technical Director  
Joseph P. Cody — Public Affairs Officer  
David Polish — Editor



# Energy Use Lowered 14 Percent by Conservation

By Carolyn Riemer

Center-wide conservation efforts have resulted in a projected 14 percent reduction in energy consumption for NADC this fiscal year over energy consumption in fiscal year 1979.

This reduction represents a return to the Center's fiscal year 1975 level of energy usage, which is the Center's baseline year for energy usage comparisons. Although consumption has been reduced to this 1975 level, the Center's goal for fiscal year 1985 energy consumption is 20 percent below the 1975 baseline.

"We are well on the way to meeting our initial goal (of reducing energy consumption to the 1975 level)," Thomas Ames, NADC Energy Program Manager, said. Ames stressed, however, that the Center has a long way to go before the fiscal year 1985 goal is met.

The reduction in energy usage over the past two years reversed a trend of the previous four years toward increased energy consumption that had reached a high point in 1979.

With an emphasis on conservation, the Center, which spends approximately \$3.0 million annually on energy, saves about \$350,000 a year in energy costs.

These savings reduce the Center's overhead, which probably makes NADC more attractive to potential customers, Ames said. Lower overhead could mean work is assigned to NADC rather than other Navy laboratories.

Reduced costs and reduced energy consumption has come about despite the growth of facilities on Center. Although the energy consumption goals are readjusted for actual expansion of Center facilities, the figures are not revised for conversion of existing space to more energy intensive facilities, such as computer facilities.

Consequently, reduced consumption has come about as facility use is adjusted or as the facilities themselves are renovated to provide greater energy efficiency.

Many of these energy conservation projects have been conducted under the direction of the Public Works Officer, LCDR R. S. Tyler, who is also the Energy Conservation Officer.

The weekend and holiday Center shutdowns are one example. During these shutdowns, which have been conducted since last Thanksgiving, air conditioning, electricity and power are secured for most areas on Center. By securing the power for these shutdowns, NADC has achieved an estimated 5 percent a year in energy savings.

Public Works Maintenance Division personnel Charles Jacobs and William Hogarth are responsible for supervising the securing of power for the shutdowns. Other

members of the division have also consistently given up time during their weekends to secure the power.

Another project, which is in progress, is the installation of centralized air conditioning in various areas on Center. This installation allows for the replacement of the less efficient individual air conditioning units with a more efficient centralized system.

In addition, another major energy conservation project scheduled to be completed in the fall, involves the replace-

ment of the double pane windows provides for greater insulating capabilities than does the conventional single pane window.

The insulating effect of these windows reduces heat loss through window areas by 50 percent. As a result, once completely installed, the windows will save about 23,000 gallons of fuel oil during the heating season. There will also be additional savings in electricity costs during the air conditioning season.

Some of the most simple conservation measures, however, bring the biggest savings. For example, the securing of the boilers at night and on weekends will save NADC an estimated 65,000 gallons of fuel oil this year.

Another Center energy conservation project is the installation of pull chains on fluorescent lights, which enables lighting on a more specific area basis. The reduced heat load resulting from the more efficient lighting makes air conditioning of the area easier.

Also, new projects in the design stage are analyzed for energy consumption and possibilities for conservation are considered.

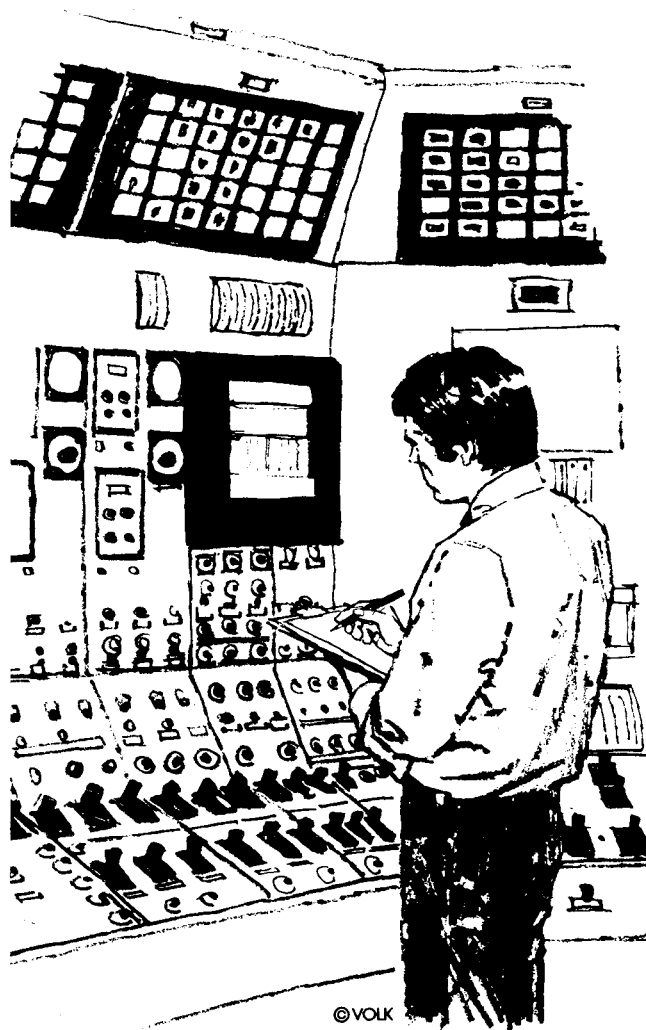
Energy Program Manager Ames noted, however, that since most of the conservation efforts to date have been facility-related, there is a limited amount of similar energy conservation projects that can be conducted in the future. Consequently, Ames said, further reduction to reach the fiscal year 1985 goal will not be easy.

Thus, in the future, energy conservation will depend, in large part, on employees being more energy conscious, he said.

Employees must be conscious of turning off desk lamps and overhead lights, and securing laboratory equipment, for instance, he explained. Employees must also adapt to the 78° F indoor temperature setting in the summer and the 65° F temperature setting in the winter.

An energy hotline, at extension 2700, is also available for employees to report areas where energy is wasted and to suggest additional ways of saving energy. After a call, the Senior Energy Coordinator for the affected area will be notified.

This energy conservation program is part of a Navy-wide effort that began at NADC in 1973. A reemphasis was made, however, on the program this year with the issuing of an energy conservation instruction by Center commander CAPT Paul L. Dudley, Jr. As a result of this reemphasis, considerable energy savings have been achieved, but meeting the fiscal 1985 energy consumption goal is quite a way off. Achievement of this goal will require a cooperative Center-wide conservation effort.



ment of all windows in Building 1, 2 and 3 with dual glazed windows. Already installed in Building 3 and parts of Building 2 by a contractor under the direction of project manager Martin McNamara of the ROICC, these dual glazed windows have two panes of glass. The design

## Scouts Learn About Survival from NADC

By Patricia McMahon

Six employees from the Life Support Division of ACSTD at NADC volunteer their time Tuesdays for a five week period to describe their survival equipment to the Boy Scouts at Camp Washington in Lambertville, New Jersey. For the most part, there are different Scouts each week. Four of the employees, Gary Whitman, George Gillespie, Brandon Johnson and Dan McCawley, who work on Center full time, alternate giving their presentations every other Tuesday. The other two employees, Nancy Holden and Natale Wolaniuk are co-ops who also give their time every other Tuesday.

As I sat in the grass watching them set up, I wondered what Dan, Nancy and Natale were going to show us. There were helmets, flight suits, rubber life rafts and other interesting articles. They started out by telling us they had with them many things that pilots need in different survival situations. Then Dan introduced himself and began by describing the different helmets and their uses. I listened carefully, as did the 54 Boy Scouts who sat around me. They ranged in age from 10 to 14 years old. Many of them had good questions and kept raising their hands to ask them. Apparently they found it as interesting as I did.

After Dan was done his talk, he introduced Nancy and she proceeded to describe the uses of the flight suits, G-suits and fire protection suits and how they protect the pilot. After she finished, Dan once again took the floor



Nancy Holden gives a shady presentation on flight gear to the Boy Scouts.

Photo by Patricia McMahon

and demonstrated how the life rafts, life vests, ejection seat and flairs operated. The Scouts' interest was most firmly captured when the flairs were demonstrated.

When Dan and Nancy were done explaining the equipment, Natale, who usually gives a talk also, joined them in assisting the Boy Scouts try the equipment on.

## Commander Salutes

Jules Lewykyj, ACSTD, for his assistance to the Philadelphia College of Textiles and Science in providing information and displays.

Edward J. Emery, SD, for his participation on the Source Selection Evaluation Board for the Anti-Submarine Warfare Standoff Weapon (ASW/SOW).

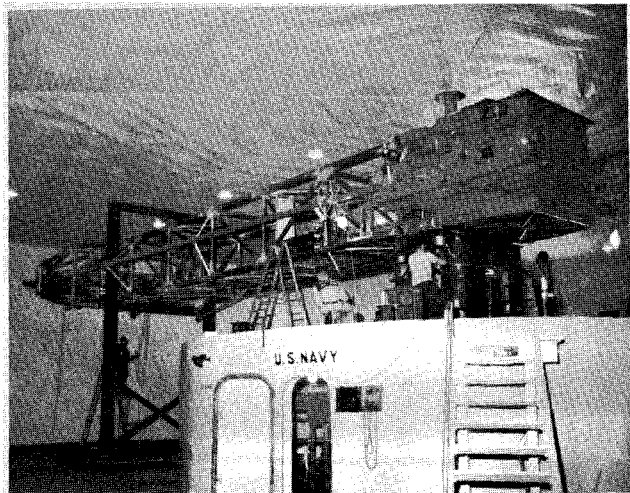
Dino Mancinelli, Associate Technical Director, William Zarkowski, ACSTD, and Donald Furmanski, SATD, for their briefing at the Naval Air Propulsion Center Merit System Pseudo Payout.

William Hogarth, Chuck Jacobs, Sam Giordano, William McKenna, William Gill, Otto Engdahl, William Heil, Charles Carter, Tom McLaughlin, Joe Quigley, William Stumpp and Fred Pauluchok, all of Public Works, for their efforts in reducing the Center's energy consumption and saving an estimated \$325,000 annually.

CDR Kenneth D. Aanerud, for his contributions to the Air ASW Symposium.

Keith L. Jerome, SATD, for his cooperation with the Naval Weapons Development Center, Korea.

AX1 James Taylor for his presentation to William Tennent High School students.



Centrifuge in mid-change. Photo by David Polish

## Wheel Gets Overhaul

The world's most capable centrifuge is getting an overhaul. After almost thirty years of use, the Naval Air Development Center's human centrifuge is having its main bearings changed. The job involves lifting the 34-ton arm of the giant machine to get to the main shaft. Using hydraulic jacks and a laser to keep everything level, workmen from Cornell and Company of Woodbury, New Jersey inched the arm upward. The bearings themselves are 45 inches in diameter and are of a tapered roller type design. Once the new bearings are in place, they should be good for another 25 years. NADC's centrifuge is capable of accelerating to 175 miles per hour in less than 7 seconds and producing 40 times the force of gravity. The device is used to evaluate stress produced in a flight environment and how humans and equipment react to that stress.

## NADC Hosts . . . Organic Coating Workshop

The Aero Materials Division of ACSTD hosted an Organic Coatings Workshop on 4 and 5 May at the George Washington Motor Lodge in Willow Grove. Engineers and scientists from sixteen government facilities participated. Represented were the Army, Air Force, Federal Highway Administration, the National Bureau of Standards and various Navy activities, including NAVAIR, NRL, and NARF, Alameda, Cherry Point, and Norfolk.

The objectives of the workshop were two-fold; first, to inform the participants as to what research and development projects are being performed and what the main concerns of the various laboratories are. The second objective was to promote discussion and future communication between the labs.

CDR James Woods, Deputy Director of ACSTD, gave the opening remarks welcoming the attendees and

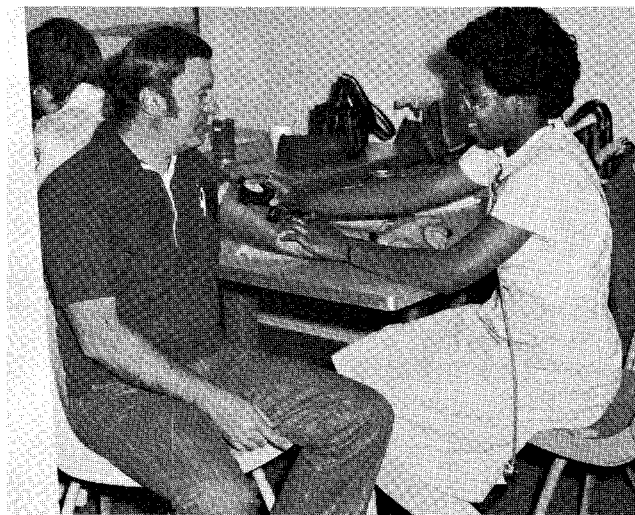


Photo by NADC Photo Lab

The High Blood Pressure Detection Program conducted by the Kidney Foundation of Southeastern Pennsylvania and sponsored by the Employee Assistance Program was held on Center May 1981. This service was utilized by 930 employees. Charles Fishera, TSD, gets his pressure checked.

## Women's Softball Team is Great



It's now 16-1

Photo by David Polish

NADC's Women's Softball Team is presently 16-1. The team is playing in the local Suburban Women's Softball League and uses the Inertial Guidance field for all home games. Games are played on Monday and Wednesday nights during this 27 game season. Other teams in the league include: the Warwick; Candlewyck; New Britain Inn; Kenny's; Village Inn; Warminster Abbey; South Perkasi; etc.

Center players include the following: **Infielders**—Debbie Erney (02); Mary Feely (30); Kathy McDonald (02); Fran McKee (02). **Outfielders**—Janet Geyer—(201); Rhea Koncz (02); Dorie Reilly—(01); Marti Snyderwine—(304); Linda Welch—(845); Karen Rozzano—(CDC). **Catchers/pitchers**—Cindy Barrow (Navy); Dianna Guarini (GRD); Lois Savage (8131). **Staff**—Jerry Guarini—Mgr.—(20P); John Bowes—coach (60); Buzz Cerino—coach (20P5); Jim Eck—coach (40) and Glenn Savage—coach/business mgr. (40).

introducing NADC and its intended mission. Mrs. Sara Ketcham, Head of the Materials Protection Branch, presented an overview of the Aero Materials Division and how organic coatings play an important role in the maintenance and protection of Naval aircraft.

Throughout the two day meeting, sixteen technical presentations were delivered. Topics such as waterborne/high solids coatings, corrosion inhibitors, countermeasure coatings, and specialty paints were discussed. Meetings were followed by informal discussion of general topics in coatings research and development.

A manuscript of the proceedings is planned to be published in July or August. It will include the presentations and discussions as well as specific conclusions and recommendations resulting from the workshop.

## New Titles

Following is a partial list of books recently added to the Technical Information Branch. Visit or call the library at x2541 to inquire about these books.

### AERODYNAMICS

"Aerodynamics, Aeronautics, and Flight Mechanics" Barnes W. McCormick, TL 570.M22

"The Aerodynamics of the Unconventional Air Vehicles of A. Lippisch" Henry V. Borst, TL 570.B67

"Viscous Flow Drag Reduction" Gary R. Hough, editor, TL 507.P75 Vol. 72

### AERONAUTICS

"Combustion Experiments in a Zero-Gravity Laboratory" Thomas H. Cochran, TL 507.P75

### COMPUTER SCIENCE

"Fundamentals of Programming in BASIC" Robert C. Nickerson, QA 76.73.BN52

"An Introduction to Software Quality Control" Chin-Kuei Cho, QA 76.6.C45

"Laboratory Experiments for Microprocessor Systems" John Crane, QA 76.5.C69

"The Logical Design of Multiple-Microprocessor Systems" B. A. Bowen, QA 76.5.B664

"Microprogrammed Control and Reliable Design of Small Computers" George D. Kraft, QA 76.6.K7

"Structured Programming, Theory and Practice" Richard C. Linger, QA 76.6L55

"6502 Games" Rodney Zaks, QA 76 8.S63Z36

### CONTROL THEORY

"Control and Dynamic Systems: Advances in Theory and Applications Vol. 9" C. T. Leondes, editor, QA 402.3C6

### ELECTRONICS

"Crystal Oscillator Design and Temperature Compensation" Marvin E. Frerking, TK 7872.07F73

"Interference Analysis of Communication Systems" Peter Stavroulakis, editor, TK 155.I57

"Microstrip Antennas" I. J. Bahl, P. Bhartia, TK 7871.6 B33

### LASERS

"Safety with Lasers and Other Optical Sources" David Sliney, TA 1677.S44

### MATERIAL SCIENCE

"Fourth International Conference in Organic Coatings Science and Technology: Proceedings G. D. Parfitt, editor, TP 1175.S6157 1978

### MATERIAL SCIENCE

"Polymer Blends" D. R. Paul, Seymour Newman, editors, TP 1087.P64

"Waterborne Coatings: Emulsion and Water-Soluble Paints" Charles R. Martens, TP 935.M29

### MATHEMATICS

"Elements of the Theory of Computation" Harry R. Lewis, QA 267.L49

### MILITARY SCIENCE

"The Illustrated Encyclopedia of the Strategy, Tactics, and Weapons of Russian Military Power" Stewart Menau, UA 770.M46

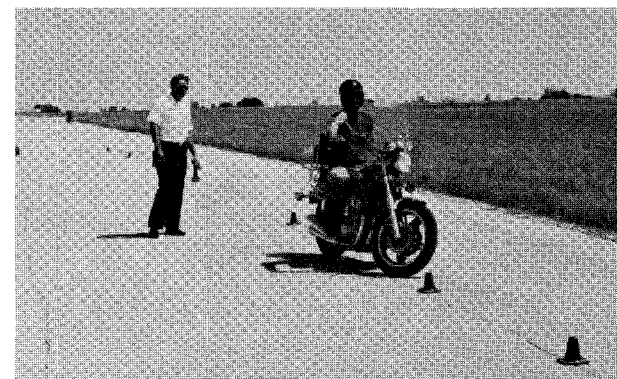


Photo by David Polish

ADI Van Horn, on-Center Motorcycle Safety Instructor shows David Varner, PW, the ins and outs of safe driving.



NADC

# Reflector

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Volume 25, Number 8

Naval Air Development Center, Warminster, PA

August 1981

## Helm Changes Hands on August 26th


**Captain James B. Anderson**

The pipes and bell sounded on August 26th as the Naval Air Development Center held its 16th Change of Command. Captain Paul L. Dudley, Jr., who retired after 28 years of distinguished service to the Navy, handed the Command of NADC over to Captain James B. Anderson. Following an old Navy tradition, guests witnessed the pomp and circumstance of the formal exchange of authority.

Captain Anderson was born on 16 October 1933 in Santa Monica, California. He attended Stanford University as a regular NROTC student and graduated in 1956 with a baccalaureate degree in Mechanical Engineering. Upon commissioning, he entered flight training and was designated a naval aviator in 1957. He then reported to VF-92 at NAS Alameda, California, where he flew F-2H and F-3H aircraft and completed two deployments to the Western Pacific aboard the aircraft carrier USS RANGER.

From 1962 to 1966 Captain Anderson attended the Naval Postgraduate School, Monterey, California, where he was awarded a doctorate in Aeronautical Engineering. He has served as an Aeronautical Engineering Duty Officer in a variety of research, development, test and evaluation programs for new weapon systems; Deputy Project Manager for a joint Navy-Air Force engine development project; Commanding Officer, Office of Naval Research Branch, Pasadena; and Director, Air Vehicle Division, Naval Air Systems Command. His last duty was that of Air Material and Engineering Officer of the staff, Commander Naval Air Force, U.S. Atlantic Fleet in Norfolk, Virginia.

Captain Anderson is married to the former Nelma Rae Muth of Saratoga, California and they have three children; David, Holly and Karen.


**Captain Paul L. Dudley, Jr.**

## What is That Plane Doing Up There?

**by Carolyn Riemer**

A new test facility—featuring an aircraft mounted on a two-story building—was put into operation at NADC this month.

This facility, called the Full-Scale Aircraft Test Facility, will be used by the Sensors and Avionics Technology Directorate (SATD, Code 30) for the testing and evaluation of the on-aircraft performance of antennas, said W. Herbert Heffner, head of the Microwave Technology Branch (3021).

An A-7 aircraft was mounted on Structure #367, which is the building located near the corner of Newtown Road and Bristol Road. The A-7 was the type of aircraft chosen since the equipment currently being tested is intended for use in an A-7. If, however, SATD needed to test equipment for an F-18, or any other type of attack or fighter aircraft, the design of the facility is such that it can be adapted to allow various aircraft to be mounted on the building for testing.

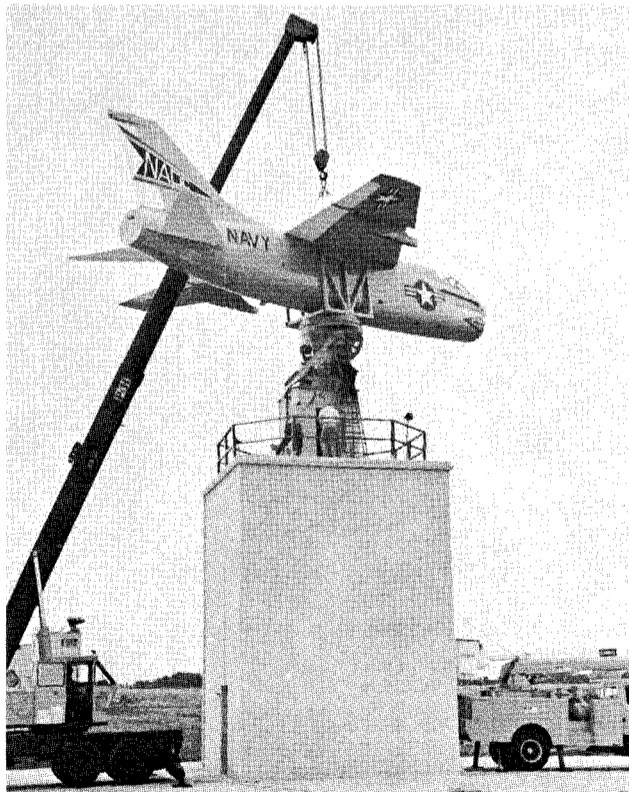
For the purposes of testing the antennas, the A-7 is mounted on a building rather than the ground to minimize interference from signals reflecting off the earth's surface. In addition, the aircraft can be mounted both upside down and right-side up on the facility to permit testing of the antenna's ability to receive and transmit signals while located in the top or bottom of the aircraft.

By mounting the A-7 either right-side up or upside down, half of the aircraft is surrounded by "free space"—that region with minimum interference from the ground, Heffner explained.

In the initial stages of the testing, the A-7 will be mounted right-side up. This positioning will provide free space for the testing of antenna performance in the region surrounding the upper half of the aircraft.

Later in the testing, however, the A-7 will be mounted on the building upside down to allow minimum interference testing of antenna performance for the region surrounding the lower half of the aircraft.

Although for the purposes of testing these antennas it is necessary to reduce interference from the ground, it is necessary to test antenna performance in the presence of


**A-7 mounted on tower**
**Photo by David Polish**

the interference generated by the actual aircraft. Flight-testing provides the best circumstances for this type of testing, with the on-ground testing in the new facility nonetheless providing a reliable model for the testing of antennas.

The on-ground testing is preferable to flight-testing because it is less expensive and less time-consuming. On-ground testing provides the opportunity to get "everything working properly and all the bugs worked out" without the expense of flight testing throughout the entire evaluation process, Heffner said. The results of the tests in the on-ground facility, Heffner added, can then be confirmed by flight-tests. Through this combined use of on-ground and flight-testing, the research and develop-

ment cycle is made less costly and less time-consuming.

Planning of this unusual facility has been underway for several years. Construction of the support structure, which was specifically designed to support an aircraft and which also houses the needed electronic testing instrumentation, was completed last summer.

But in addition to the considerations involved in the actual construction of the facility, there were the considerations of obtaining an A-7 aircraft, modifying the aircraft for use as part of a test facility, moving the plane to the testing site and mounting the aircraft on the facility.

The A-7 was provided to NADC by the Lakehurst Naval Air Engineering Center because the aircraft was considered fatigued or unsafe for flying. But before the A-7 could be used for the facility, modifications had to be made in the aircraft. Although the engine was removed at Lakehurst, The Engineering Shops Division at NADC, under the direction of Ray Meng, stripped the aircraft.

Instrumentation, gears, fuel—and anything else not necessary for the testing—was removed. The A-7 was stripped to the point where it was a skeleton of an aircraft, Meng said.

The Engineering Shops Division also designed and built the cradle that held the A-7 while it was being moved to the testing site.

Personnel from the Public Works Transportation Division moved the aircraft from the hangar where the plane was painted, to the testing facility. The A-7 was moved on a flatbed truck across the dirt area from the hangar to the testing site, Transportation Foreman Edward Linke said.

Once at the site, the A-7 was mounted by the Public Works Riggers. Hoisting the plane atop the building, through the use of a crane, was expected to be an eight-hour operation, but only took about 30 minutes, Matthew Kearney of the Riggers said. When testing requires the A-7 to be remounted upside-down, Kearney said, the remounting operation is expected to be much longer than the original process.

Testing in the facility is also scheduled to begin this month.

# Little Known Lab Makes Large Contributions

by Patricia McMahon

Little is known on Center about the Nondestructive Testing & Inspection (NDT/I) lab. Its purpose is to provide solutions for Fleet inspection problems, which range from basic research efforts to hands-on applied inspections. The NDT/I lab, supervised by Mr. Michael Stellabotte, is part of the Structural Materials Branch headed by Dr. Gilbert London. This branch is part of the Aero Materials Division of ACSTD.

The NDT/I lab is not a completely independent entity—it is related to other projects in the division as well as to other Navy organizations. The lab is involved in nearly every aspect of the total Navy inspection program, from the written instructions which govern the operation of the program, to performing inspections on aircraft. Their range of involvement, in terms of problem-solving, is anything from tires to turbine blades. They are also involved in technically reviewing specifications for nondestructive testing prior to the building of new aircraft.

One of the NDT/I lab's most important functions, however, is in the support of aging aircraft. They are asked by the Naval Air Rework Facilities, with approval by Naval Air Systems Command, to develop inspection procedures to solve Fleet or overhaul problems. They also assist in the preparation of procurement specifications for Fleet Nondestructive Inspections equipment.

The responsibilities of the NDT/I lab cover a diverse field, from production, where the lab is used to make sure material does not contain manufacturing flaws, to the detection of service-induced flaws, such as cracking and corrosion.

The importance of NDT/I is not only in the solutions to problems, but also in cost effectiveness and cost-avoidance by reducing the number of man-hours required to detect flawed materials and by increasing the readiness of the aircraft. Some procedures have been developed to prevent extended disassembly during which damage to other parts can result. A recent inspection procedure, developed by the NDT/I lab for A-3 aircraft, replaced a 1200 man-hour disassembly inspection with four hour instrumental method. This procedure is multiplied by the number of Fleet aircraft and the inspection period to give a large total cost-avoidance and reduction in aircraft down-time.

Common defects encountered by inspection personnel are different types of cracks, discontinuities, inclusions, corrosion and unbonding and delamination in the newer composite materials. The various Fleet inspection techniques used to detect these defects are visual, radiographic, magnetic particle, ultrasonic, dye penetrant and eddy current inspections.

## New on Board

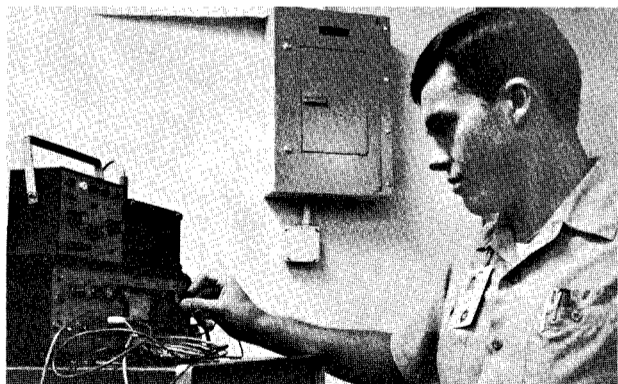
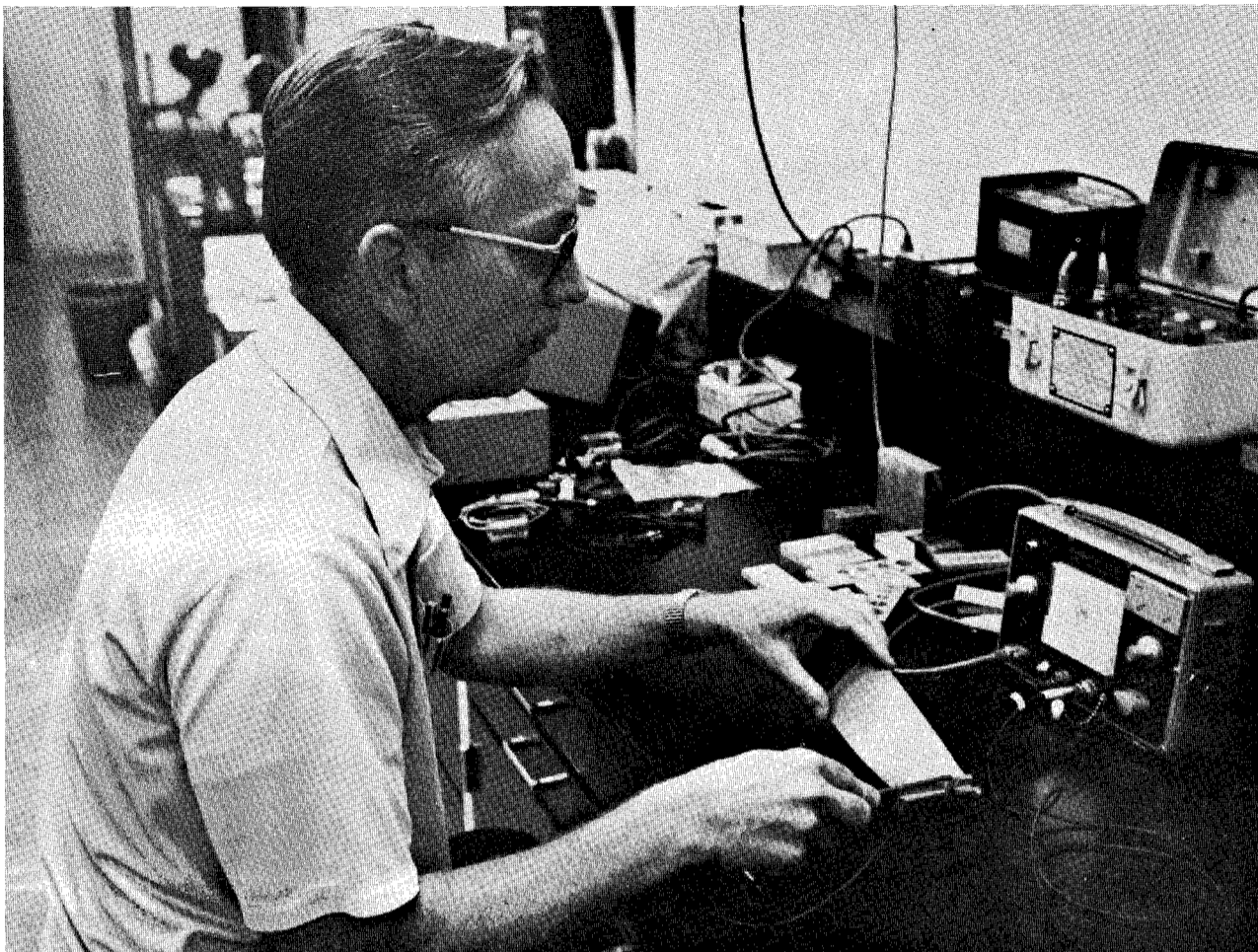


Photo by David Polish

From under the sea to in the air ETI Dennis Brant has been there. As a recent arrival to NADC, Dennis works on bio-medical instrumentation circuits for use in centrifuge testing. His last duty station was the submarine USS Layfayette. Dennis also cruised aboard the USNS Hess, a survey ship outfitted with ocean bottom mapping equipment developed at NADC.

Dennis said one of the main reasons he came to NADC is his family. He had a choice of becoming an instructor at Damneck, Virginia or coming to Pennsylvania, either Mechanicsburg or NADC. Since he is a native of Somerset, Pennsylvania, he choose Pennsylvania. He came to NADC because he heard it was an interesting place to work. The information about the Center was confirmed when Dennis arrived. He said "NADC is fantastic, so much so that I don't want to leave." He added that he's looking forward to three enjoyable years working with good people in a nice area.



Gwynn McConnell checks a turbine blade with a crack detector.

Photo by David Polish

## Beni Sugg Brings Big \$\$

by Patricia McMahon

In FY-80 Mr. Gwynn McConnell received a \$1000.00 Incentive Award for his Beneficial Suggestion titled "Improved Operating Procedure for Magnatest, Model ED-520, Crack Detector." This suggestion incorporates a complete revision of a standard operating procedure which affects the results of eddy current flaw detection inspection of aircraft parts. The recommended set-up procedure gives 10-15 times the present crack detection capability. The increased sensitivity of affected inspections will provide important increases in the readiness, reliability and safety of Naval, Marine and Air Force aircraft.

Eddy current inspection is an instrumental method of finding cracks in materials. The problem with the Magnatest ED-520 was that although the standard method of set-up gave excellent performance on aluminum aircraft parts, it had poor crack sensitivity on low-conductivity materials, titanium in particular. Such unsatisfactory crack response often restricts the use of this equipment and has caused the selection of less desirable inspection methods or the purchase of more expensive eddy current instruments for specific problems of inspections. According to Mr. McConnell, it was both these facts that led to his idea for the Beneficial Suggestion.

Mr. McConnell said that instead of going to this alternate equipment to detect cracks in titanium, the eddy current instrument already common to DOD activities could handle the job if set up differently. "I started investigating different methods of operating the equipment," McConnell explained, "The manufacturer has a certain procedure to set up the equipment to find cracks in aluminum. It didn't work for low-conductivity materials—titanium and engine alloys with a high nickel content. I tried to optimize the set-up procedure."

Mr. McConnell devised a new set-up to detect cracks in titanium parts, and it is now being used in other branches of the military. Mr. McConnell presented a paper at a Defense Conference on Nondestructive Inspection to communicate this information to others. He recently heard from personnel from an Air Force Overhaul Activity—the Sacramento Air Logistics Center at McClellan Air Force Base in California—who were pleased because this helped with problems they haven't been able to work on before and gave them more capability to perform the required inspection on titanium.

Consequently, not only has Mr. McConnell's suggestion helped the Navy avoid the cost of more expensive equipment and improve the readiness, reliability, and safety of its aircraft, but it has also benefitted other sectors of the military.

Mr. McConnell works in the Nondestructive Testing & Inspection section of the Structural Materials Branch, which in turn is part of the Aero Materials Division of ACSTD.

NOTE: Federal employees last year submitted suggestions, ideas and inventions which saved the United States government a record \$522 million. These savings were realized under the Federal Incentive Awards Program. A total \$44 million in cash awards was presented to federal workers, so for every dollar in awards the government realized benefits of more than \$12. The \$522 million saved under the 1980 Awards Program represented the highest savings in the history of the program and is equal to the average income taxes of some 281,480 Americans. At NADC 135 ideas and suggestions were submitted in FY-80. Out of these, 33 were selected for cash awards totalling \$4,665.00.

Naval Air Development Center

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CAPT Paul L. Dudley, Jr. — Commander, NADC  
Dr. R. Kenneth Lobb—Technical Director  
Joseph P. Cody — Public Affairs Officer  
David Polish — Editor



## Quality Circles

A Quality Circle is a small group of employees (usually 6-8) who perform similar work and meet voluntarily during work hours on a regularly scheduled basis to identify, analyze and seek solutions to work-related problems. Virtually anything which affects the quality of the work people do is a candidate for improvement by the Circle. General categories of problems for Quality Circles attention include: paperwork, hardware, communications, service and processes. A basic assumption behind the Quality Circles program is that most people will take more interest and pride in their work if they are allowed to influence decisions about it. The Quality Circle provides a natural vehicle to transform personal pride and interest into problem-solving. The philosophy of the Quality Circle program recognizes that the employee on-the-job is many times the best one to suggest ways to improve the product or service.

The basic objectives of the Quality Circles program are to reduce errors and to enhance the quality of the goods and services provided by the members of the Circle. The Quality Circle concept inspires more efficient teamwork, promotes job involvement and increases employee motivation. The concept builds an attitude of problem prevention, creates problem-solving capabilities and helps improve communication within the organization and with the support organizations. Through solving quality-related problems, the members of the Circle eliminate many of the factors that contribute to the dissatisfaction they have with their jobs.

Today, there are approximately 230 U.S. Firms with Quality Circle programs (e.g., Lockheed, Northrop, Westinghouse, GM, Honeywell, Hughes, etc.). Additionally, Quality Circles have been implemented within the Navy (e.g., Naval Ordnance Station, Louisville, various

## Center Commander's Views

**"It's Been  
a  
Good Tour"**

"It was not always fun, but it was always rewarding," was one of the reflections Captain Paul L. Dudley, Jr. had as he prepares to leave NADC. As the Commander of the Center for the past two years, Captain Dudley has seen many excellent products from NADC, such as the Tactical Airborne Reconnaissance Pod System (TARPS) and DICAS sonobuoys, go to the Fleet. One of the other highlights he touched on was the "excellent beginning" made on the Merit Pay System saying "we're far ahead of everyone else in the Navy."

With pride Captain Dudley stated that, "the mark of quality of this Center is that the last two Technical Directors selected for Navy laboratories were selected from NADC. By and large the people here are very dedicated. As you look at the cutbacks and ceiling limitations, it's great to see that the Center's employees have kept their spirits at a reasonable level." Captain Dudley added that he hopes everyone here keeps their enthusiasm high. "Sometimes," he said, "it's hard to do that in light of the people who are always quick to criticize government workers without knowing what they are talking about." In that same vein Captain Dudley asks us to tell our neighbor about the Center and what kind of work we do here. This type of advertising will help us "home-grow" the talent we need here at NADC. The children get interested and look into engineering as a career.

To sum his tour up Captain Dudley said that the opportunity of being a Commanding Officer added another dimension to his outlook on life. He added that he had mixed emotions about leaving both NADC and the Navy, but he plans to immerse himself in other endeavors. His current plans are to move to the Washington area where he will reside with his wife Joan.

naval shipyards, with Norfolk having approximately 40 Circles, the Aviation Supply Office, etc.). While most of the Quality Circles have been implemented in industrial/production environments, three Naval Laboratories have begun to implement a Quality Circle program on a one-year pilot project basis: NAVELEX, DTNSRDC and the Naval Air Development Center.

Quality Circles will be tested in various organizations on Center during the pilot project: Command Projects Directorate, Aircraft and Crew Systems Technology Directorate and the Engineering Support Group. Quality Circles will be implemented on a wider scale upon the successful completion of the test program. The Quality Circle facilitator, Paul Devlin (Code 7041) has begun briefing various groups on Center and will begin to train the Circle members during the coming months. A Quality Circle newsletter shall be issued periodically to keep you informed of the progress of the NAVAIRDEVCCEN Quality Circle program. In the meantime, if you want any more information on the program, please get in touch with Paul Devlin at ext. 2452.

## The Following Message is a Recording



Al Pittman and E. J. Wendell run a test on the Recording Lab's equipment.

### by Patricia McMahon

One of the most involved labs tucked away in the myriad of corridors and partitions at NADC is the Data Recording Laboratory (DRL). By involved we mean tied to almost every project. When the laboratory was founded by NADC's CDR Frank Brown to serve as technical counsel to the CNO ASW Tape Recorder Steering Group, its principal activity was direct fleet support. This has evolved into involvement in the earlier stages of development and engineering. The Data Recording Lab is involved with many major programs throughout the Navy and supports the Center's directorates in small-scale or large-scale programs, but its main thrust for the future is to encourage the Navy to invest in recording technology appropriate to its needs.

When the DRL was started in 1970, tape recording in the Navy was in disarray. Nobody had the same recorders. They were generally thought of as something in the dashboard. Handwritten logs were still kept to record submarine threats and events of the day. Crew members

were debriefed orally with the handwritten logs to reaffirm their reports. Information, the value of which could not be depended on, was sluggish to move and low in quality.

Two things happened to change this. First, the Navy wanted to improve total force effectiveness. The tape recorder became important because it was like a historian on board—recording logs, voices and time. Second, the P3-C aircraft was deployed with a new integrated system but without a tape recorder capable of handling all the information on board. They still kept the handwritten logs. To change this, an Anti-Submarine Classification & Analysis Center was fashioned to have the minimum of analysis equipment necessary for a detailed post-mission reconstruction. Audio and acoustic sensor data would be played back on the recorder and be gram analyzed. The focus of this set-up was information exchange with the recorder as the data terminal and the tape as the medium of exchange.

This set-up also functions in the measurement of the performance of the crew. The information relayed by a crew member can be rechecked by this system for accuracy. This aids in measuring the fitness, capability, proficiency and readiness of the crew. According to Mr. Richard DeFrancesco, who manages the Data Recording Lab, "We have a lot of experience, high levels of readiness and powerful centers around the world."

The Data Recording Lab is the only one of its kind in the Navy, and, says Mr. Richard DeFrancesco, "we have the unique privilege of being able to talk directly to the top." It is OPNAV's steering group which practically owns the DRL. The lab is involved in just about every part of ASW and is constantly growing. This is due to the initiative and motivation of those who operate the lab.

"We went out and sold ourselves to the sponsors and went around to each of the different projects showing how we could help them," says Mr. DeFrancesco. "We try to cure a problem before it has a chance to start. Involvement with the DRL is purely voluntary by project managers."

Some of the many programs the DRL supports are: P-3C, S-3A, SH-3H, RF-18, LAMPS, MKI and MKIII, TACTASS, TUBA, RDSS, SOSUS, and SURTASS. In addition, the lab team has provided assistance to: Australia for the P-3C and Joint Acoustics Analysis Center, Norway for P-3C and TACTASS, Canada for AURORA and the United Kingdom for NIMROD MKII. A full range of RDT&E talent is brought to bear as well as specialized magnetic tape services, analysis of fleet problems and novel procurement strategies with an industry which is largely commercial in its base.

The Data Recording Lab is divided into three groups focusing on different needs—projects, a test lab, and technologies and products—and is part of the Information Displays and Data Recording Branch headed by Mr. Bernard T. Srihel. This branch in turn is part of the Computer Systems Technology Division, which is temporarily under the management of Mr. Francis R. Reinart.

NOTE: The first Navy-procured shipboard recorder to meet the military standard requirements was developed by Bell & Howard under the close technical direction of Mr. E. J. Wendell, project engineer, and Mr. John Figgles, product specialist. The LAMPS MKIII recorder/reproducer AN/USH-32(V) is also the only Navy system capable of meeting present CNO requirements for acoustic recording. Installation and check-out for this system took place in September 1979.

## Commander Salutes

Jerry Ferguson, SATD, for his demonstrations on LASER technology given to local school groups.

AFCM Boyd F. Stodolski, USN, for his assistance to the Naval Air Propulsion Center, Trenton during their recent change of command.

Vincent Palagruto, ACSTD, for his technical assistance provided to Attack Squadron Thirty-Five during the Teamwork-80 Exercise.

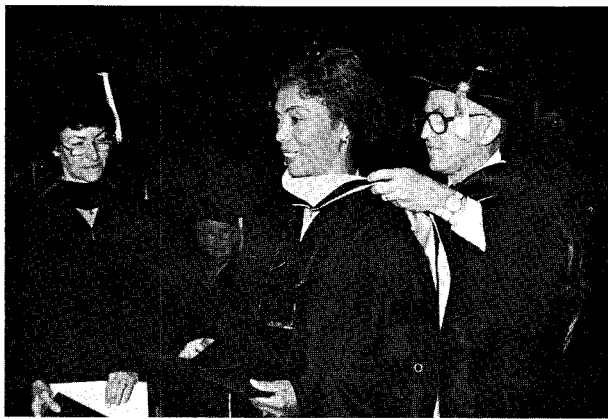
ENS Sylvia H. Wasylyk for her participation in the Interservice Track and Field Championships.

## Carpool Data

Since the time of the energy crisis in 1973, Department of Navy policy has backed the use of carpools for energy conservation. This year a carpool matching program was instituted through the combined efforts of this Center and the Delaware Valley Regional Planning Commission (DVRPC). Concurrently, a new audit of the parking program by the Naval Audit Service suggested a computerized program. The Public Affairs Office sent out questionnaires and fact sheets to find out the areas where Center employees live. A program was published to provide guidance to employees. Chief John Kupetz then contacted DVRPC. Grid maps were posted throughout the Center and the fact sheets were fed through the computer program, matching people to carpools.

In June 1981, all existing carpools had to be re-registered. They were then checked against the grid map to assure the validity of each carpool. Currently, there are 300 registered carpools with 801 employees participating in the program. It has been estimated that these carpools save a couple hundred parking spaces.

There are a few problems with the program, however. There are still those who abuse the preferred parking privileges allotted to those who carpool. In an effort to make this an honest system, there is a daily checking of cars to identify lone drivers using a carpool pass. But, for the most part, the program has been a positive one with the amount of parking spaces and gas used reduced by those who carpool.



(PHILADELPHIA, PA) Gloria Twine Chisum, Ph.D., head of the Life Sciences Research Group, Naval Air Development Center, is hooded by Alton I. Sutnick, Senior Vice-President for Health Affairs and Dean, after receiving the honorary degree of doctor of science at the 129th Commencement of the Medical College of Pennsylvania (MCP). Rosalie A. Burns, M.D., professor and chairman of MCP's department of neurology, who presented Dr. Chisum for her degree, looks on.

## Suggestions from Employees

**Robert P. Green**, TSD, \$25 for suggestion titled "Emergency Communications between NADC Fire Department and Bucks County Fire Alarm Center."

**Ensign Sylvia H. Wasylyk**, CA, \$75 for suggestion titled "Elimination of Misuse of Gate #9."

**E.J. Leibrandt**, PW, \$100 for suggestion titled "Radiator Covers."

**AT1 John W. Allen and AT1 Robert Cook**, AD, \$350 (shared equally) for suggestion titled "A368 Temporary Replacement."

**Bernard L. Coxhead**, TSD, \$50 for suggestion titled "Signal Light between TV Studio and NADC Auditorium."

**Carl E. Wagner**, TSD, \$25 for suggestion titled "Need for 'Human' Engineering in the Machine Shop."

## Meeting Here



Front row L to R

H. Hart, NAVAIR, MAJ Dippolito, COMNAVAIRLANT, LT Hux, CNAVRES, CAPT Dudley, NADC, COL Farley, FMFPAC, J. Grimes, NAVAIR.

Back row L to R

M. Truss, NAVAIR, N. Antonini, NADC, LTCOL Hershey, FMFLANT, COL Sinnott, CMC, LCDR Bianco, COMNAVAIRPAC.

How do we tell the fleet that we are concerned and can offer solutions to their problems? This was the basic theme of the C130/TACAMO Integrated Logistics Support Management Team (ILSMT) conference held at NADC in June. Those attending the conference were contractors and Navy and Marine Corps personnel from both squadrons and Headquarters. Items that were addressed consisted of:

- Providing fleet representatives with an overview of programs currently underway, and those planned for the future, which will have an impact on the logistics and maintenance support for the C-130 community.
- Soliciting fleet inputs to certain ILS programs in the formative stage of development.
- Identifying present deficiencies and problem areas of logistic support, factors which are adversely affecting the operational readiness and anticipated problems related to planned programs.
- Determining what direction the actions should take to eliminate the deficiencies and problem areas and assigning responsibility for such actions.

Center Commander Captain Paul L. Dudley, Jr. gave the keynote address, urging the attendees to "openly express their views and opinions, and more importantly, to listen to each other."

## Running Schedule Continued

Hopefully by this time all of you readers are well into some sort of an exercise program. For those who are following the ten week graduate run/walk program, weeks 6 through 10 are provided below. Good luck!

Just a reminder—during the summer months special precautions should be taken to protect yourself against the heat. DON'T play the hero and ignore your body's warning signals. Heat can kill. Consider altering your exercise periods to cooler periods of the day, such as early in the morning or evenings. Run/walk along shady cool paths. Drink lots of water—if you are thirsty, your body is telling you that it needs water. Take your water little by little throughout the exercise period. This way you won't get that bloated feeling and you will be replacing the water lost basically at the same rate that you are losing it.

Be aware of the warning signals—headache, profuse sweating, chills, weakness, dizziness. Stop at the first sign of abnormal symptoms. Get cooled off, drink small amounts of water, get out of the sun. If you haven't recovered after taking those steps, see a doctor. A good practice is to never exercise alone, especially in the heat. A little company is nice, but in the event that you stricken suddenly, having someone there to render aid or go for help may save your life.

### Week Six

#### Monday

Jog 70 counts; walk 20 counts; continue 20 minutes.

#### Wednesday

Jog 80 counts; walk 20 counts; continue 20 minutes.

#### Friday

Jog 90 counts; walk 20 counts; continue 20 minutes.

#### Tuesday, Thursday, Saturday

Five-minute brisk walk; five-minute jog—comfortable

pace; five-minute brisk walk; five-minute jog—comfortable pace.

### Week Seven

#### Monday

Jog 90 counts; walk 20 counts; continue 20 minutes.

#### Tuesday

Five-minute walk; five-minute jog; five-minute walk; five-minute jog.

#### Wednesday

Jog 100 counts; walk 20 counts; continue 20 minutes.

#### Thursday

Three-minute walk; seven-minute jog; three-minute walk; seven-minute jog.

#### Friday

Jog 110 counts; walk 20 counts; continue 20 minutes.

#### Saturday

Five-minute walk; 10-minute jog; five-minute walk.

### Week Eight

#### Monday

Jog 110 counts; walk 20 counts; continue 20 minutes.

#### Tuesday

Three-minute walk; seven-minute jog; three-minute walk; seven-minute jog.

#### Wednesday

Jog 120 counts; walk 20 counts; continue 20 minutes.

#### Thursday

Five-minute walk; 10-minute jog; five-minute walk.

#### Friday

Jog 130 counts; walk 20 counts; continue 20 minutes.

#### Saturday

Three-minute walk; 14-minute jog; three-minute walk.

### Week Nine

#### Monday

Jog 130 counts; walk 20 counts; continue 20 minutes.

#### Tuesday

Five-minute walk; 10-minute jog; five-minute walk.

#### Wednesday

Jog 140 counts; walk 20 counts; continue 20 minutes.

#### Thursday

Three-minute walk; 14-minute easy jog; three-minute walk.

#### Friday

Jog 150 counts; walk 20 counts; continue 20 minutes.

#### Saturday

20-minute easy jog.

### Week Ten

#### Monday

20-minute easy jog at a pace that feels comfortable.

#### Tuesday

Jog 150 counts fairly hard; jog 50 counts very easy; continue 20 minutes.

#### Wednesday

20-minute easy jog at a pace that feels comfortable.

#### Thursday

10x50 counts at good pace with a rest interval of 50 counts at a very easy pace; finish the 20 minutes with easy jogging.

#### Friday

20-minute easy jog at a pace that feels comfortable.

#### Saturday

Using count system—12-15 150 counts with a 50-count rest; 20 minutes light jogging.



## Inside this issue

- Command Change
- Shoot Out
- Safer
- Changes

## Captain Anderson Talks About His New Job

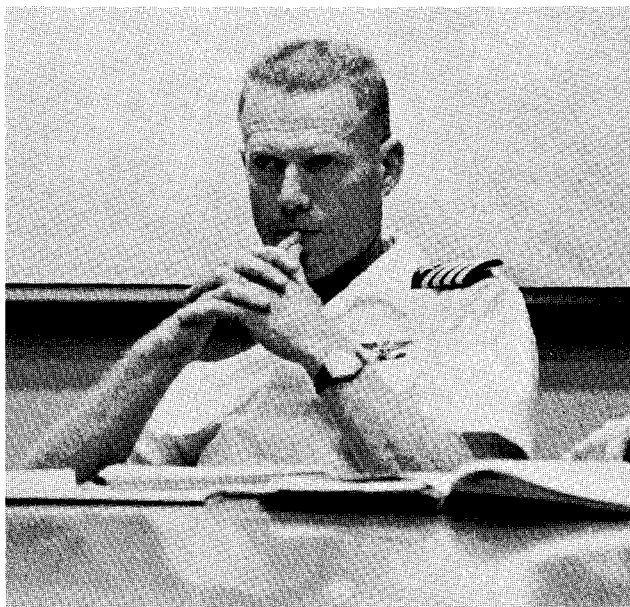
The new Center Commander, Captain James B. Anderson, sees NADC's role in Naval aviation as one of providing a strong influence on the kind of systems the Navy purchases for its aircraft. "I think it's an absolute necessity that we concentrate on the proper functioning of those systems from the standpoint of doing the job that has to be done in meeting the threat and secondly to be reliable. We have systems in the fleet today that, when they work, are very capable but we have trouble keeping them operating and some of that trouble is inherent in the design of the system. To some extent we have mended our ways and we are now addressing reliability performance in the procurement stage. An example is the FA-18 contract."

### First

"My first challenge here at the Center is to fully understand the intricacies of the operation so that I can help the Technical Director and other high level managers focus the technical effort on Navy needs and to create an environment for the very competent people here to do their best work."

### Philosophy

Captain Anderson expressed his management philosophy very simply. He believes that problems should be solved at the lowest level possible. "I am a firm believer in the chain of command. Each individual should understand how their supervisor wants things done and endeavor to do them that way. In solving problems and getting on with the job at hand I think you should do what you know is right and if you're in doubt ask for guidance."



New Center Commander, Captain James B. Anderson talks about chain of command. Photo by David Polish.

"An organization like NADC," Captain Anderson said, "can be effective only if people work together. Most of the things we do involve more than one Directorate. It is important that we communicate with each other and set up a plan of action that is consistent with other programs. A prudent manager looks to see if the proper people have been made aware of a proposed action and concurs with what he said. If they don't agree find out what the issues are and then make the decision. Although not everyone agrees with the decision, everyone has 'their day in court'."



A part of doing business here at the Center involves dealing with constraints. Captain Anderson stated that such things as personnel ceilings, money, personnel management requirements such as merit pay, the basic performance appraisal system, and other things that take time must be done quickly in order to get on with the job at hand.

To close, Captain Anderson said that both he and his wife Nelma are delighted to be at NADC, and they are looking forward to getting to know the people better.

## Technical Director to Retire

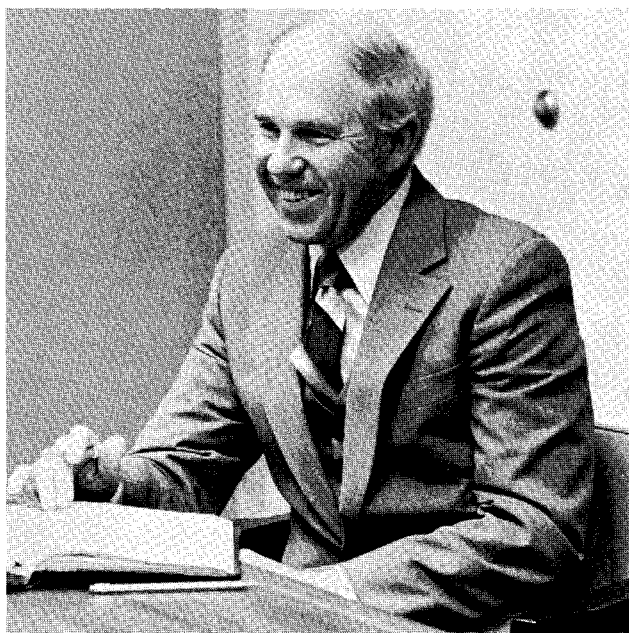
On 31 July Dr. R. Kenneth Lobb announced that he would be leaving NADC after six years and nine months of distinguished service to the Center. Dr. Lobb has been responsible for the almost total renewal of NADC, having been the main force behind the remodeling, not only of the physical plant but of NADC's image.

His expertise has been sought by the Navy to help evaluate various high visibility programs. Dr. Lobb has cochaired the critical design reviews of the Tomahawk cruise missile and the MK-48 Torpedo. He has served on numerous engineering review teams including the Forward Swept Wing Aircraft Demonstrator and the SSPO Re-entry Body Steering Group.

Such changes as the hallway and restroom renovation and the solarium have all been a direct result of Dr. Lobb's concern for a better work environment.

During his stay at the Center, Dr. Lobb, the Commanding Officers, and all Center employees have built NADC's image up to a point where we are considered a leader in the Navy Laboratory system. "When I came here in 1974, we had good managers and an excellent technical staff, but we were not that well known in the Washington arena," Dr. Lobb said. "It is the Technical Director's job to use whatever means he has at his command to sell the Center to the various sponsors. I believe now," Dr. Lobb added, "that we have the best managers in the NAVMAT community." He also said, "all this is great, but we in management/staff areas are only supporting the technical people. It is these people who make the Center what it is today."

"At this point NADC is flying high. We have the reputation as the yardstick against which others are measured. For these reasons I feel comfortable leaving the Center," Dr. Lobb said. "I have been thinking about this for a long time; in fact, I told Captain Dudley, Admiral Whittle, and Mr. Colvard about my plans this



Dr. R. Kenneth Lobb will retire Oct. 2, 1981.

Photo by David Polish.

past spring. It was decided not to announce my intentions until after the SES and MPS programs were completed for the year and the brief to Admiral Williams was presented."

In closing Dr. Lobb stated that he would like to "thank everyone for their strong support. It made my job easier, and I can assure you that the Center will continue to have my strong support even after I leave."

Dr. Lobb plans to move back to Washington where he had lived for 27 years before coming to NADC. Although he is retiring from the government, Dr. Lobb will not be retiring completely. He is currently considering opportunities in several areas.

## Dr. Von Beckh Honored

On 10 August 1981 Professor Dr. Harald J. von Beckh, Director of Medical Research at the Naval Air Development Center, was awarded the Austrian Cross of Honor for Science and Art, First Class. Dr. von Beckh received this award for his assistance over the years to the Medical Corps of the Austrian Air Force regarding problems in aviation medicine.

The decoration is Austria's most distinguished award and was presented to Dr. von Beckh by the President of Austria through Harry C. Schaub, Austrian Honorary Consul for Pennsylvania, at a reception held at the Austrian Consulate in Philadelphia. Present at the reception were senior officials of the Naval Air Development Center, leaders of the Austrian-American communities in Philadelphia, and other friends of Dr. von Beckh.

As a graduate of the University of Vienna Faculty of Medicine, Dr. von Beckh specialized in aviation medicine and later in space medicine. He has served at the Naval Air Development Center for the past 12 years and for the previous 13 years served as Chief Scientist of the USAF Aeromedical Laboratory in Holloman Air Force Base, New Mexico.



Dr. Von Beckh receives award from Austrian consul.

# Change of Command Speeches; Words to Ponder

## Captain Dudley

Rear Admiral Chambers, Captain Parrish, Captain Anderson, distinguished guests, ladies and gentlemen, it is a pleasure to welcome you to this ceremony, the change of command of the Naval Air Development Center. I would like to particularly recognize Captain C. M. Rigsbee in the audience. I was privileged to accept command of this Center two years ago from Captain Rigsbee's capable hands. In that two years, I have learned more and more to respect the superior quality of the products of this Center, aircraft technology investigations, structures, materials, biomedical research, sensors and their associated systems derived from several disciplines, software for new systems and life cycle support of existing systems. These products are a direct result of the dedication and inventive nature of the engineering and scientific staff, the can do attitude of the support personnel from the shops, public works, computer center, firefighters, security personnel and many others. The products of this Center also bear the professional excellence of the naval personnel, flight crews, maintenance crews and the many project and support personnel. As an aside, one superb product of this Center is the Phoenix missile and fire control radar, the major portion of the weapon suite of the F-14.

The F-14 is the Navy's and, probably the nation's, finest fighter weapons system. Though the Phoenix system was not needed in the Libyan incident several days ago, its employment would have produced the same result, sooner and at longer range. When the systems of this Center and weapons of our sister center, China Lake are airborne in naval aircraft, perhaps Colonel Qadhafi and others of his ilk would do well to keep their fighters on the ground, pitching nickels on the lawn or some other time-honored fighter pilot pursuit.

From my observations, the personnel of this Center work well as a team. That spirit of teamwork must be continued, indeed reinforced as we face the next few years—years in which cuts in ceiling, civilian as well as military, will no doubt continue, perhaps abated, but cut nevertheless. It is clear that the work levels have not nor will not diminish however. For that reason, innovative, productive thinking and execution are essential. As I have noted, the talent and spirit of team work here are equal to the challenge. I am very proud to say I have been a member of that team, only a short period to be sure, but a very significant one to me.

Another product of this Center, this Navy activity, must be an understanding, indeed, an acceptance of our existence by our neighbors the homeowners, renters, business people in our area and that oppressed crowd who must traverse Jacksonville Road each morning, blaming Penndot's answer to the Grand Canyon, on this Center.

## This Center Had a Part in the Recent Shoot Out

The United States vs Libya: U.S. 2, Libya 0. One of the interesting questions about this incident is how did our pilots know where to maneuver and when to fire their missiles from an essentially untried aircraft. You see, the F-14 had never been used in real combat before. The answer is that the F-14, its pilots, and every other aircraft/pilot combination have been combat tested on a simulation system that NADC has had a major role in developing. This system, called Tactical Aircrew Combat Training System (TACTS), is used by the Navy and Air Force to train its pilots on the proper air combat tactics and the capabilities of the weapons the aircraft carries. According to Roland Hall, of the Systems Directorate, the TACTS grew out of a need seen in the mid 60's to provide better combat training.

Originally called the Air Combat Maneuvering Range (AMCR) system, TACTS is a computer based simulation of actual air combat. Software developed at NADC is used to simulate weapons parameters from the envelope of effectiveness to actual weapon performance.

Pilots are sent to one of six Air Combat Maneuvering Ranges to first get classroom instruction and then fly actual mission profiles. Computer generated graphics give a three dimensional display of practice missions. These are analyzed by the students and the instructors. When the classroom sessions are over, it's into the cockpit for actual flight training.

Each aircraft is fitted with a telemetry gathering package that is shaped like a missile and hangs on a



Captain Anderson addresses the Chain of Command audience. Photo by Al Shanks.

I believe it vitally important that each employee of the Center articulate our capabilities, programs, aspirations as well as frustrations, to the populous around us. Communication must not be restricted to events such as Armed Forces Day. It must be an every day event. Security apparently gets in our way some times, but an understanding of a product line and its use is important and need not violate any real security guidelines. We need to articulate to these neighbors why as well as what we do, why we operate aircraft, why our development activities require them. By the very nature of operating aircraft we are a noisy facility. We shall continue to operate as quietly as possible and importantly, to attempt to give notice when special operations are required. On the other hand, I would hope that our neighbors and friends understand, we are not in the business to make noise, but we are a noisy business. To quote a recently detached officer, now serving in the Western Pacific, as he watched a jet take off one day, "What they hear is the roar of freedom." You may find that roar an aggravation, but please, carefully consider the alternative.

To the personnel, the team, of this Center, my pride in your accomplishments is without bound. I shall cherish the past two years, knowing I was privileged to serve with men and women of stature and dedication—working for a common goal—the protection of our great nation.

## Captain Anderson

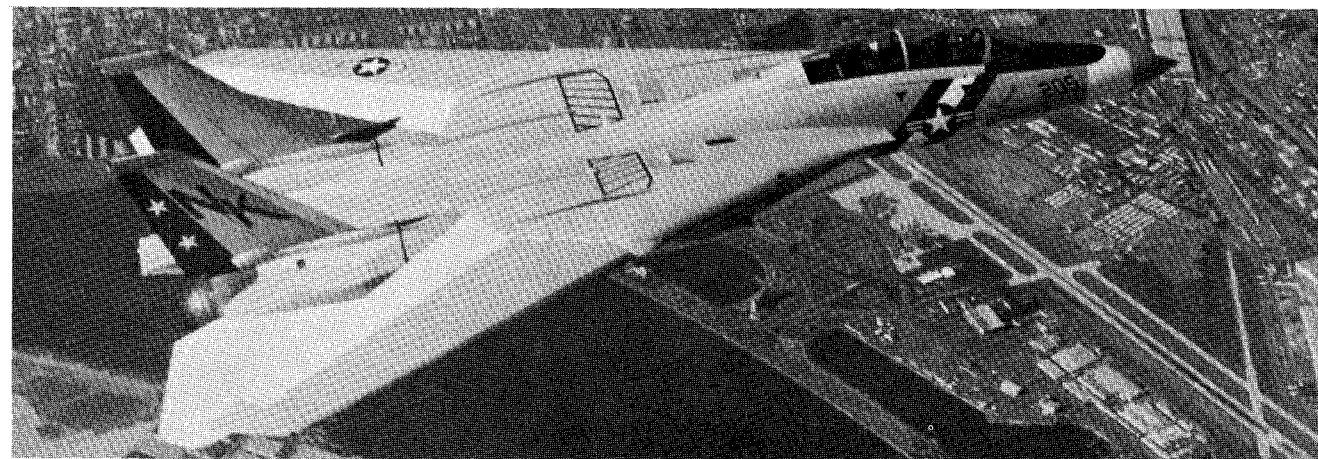
Admiral Chambers, Captain Parrish, Captain Dudley, distinguished guests and friends of the Naval Air Development Center, and members of the Military and Civilian NADC team.

It is a rare privilege and high honor to be the commander of this fine RDT&E center. I have become acquainted with some of you during the past ten days, and without exception I have been impressed by your obvious competence, enthusiasm, and highly professional approach to the task at hand. Captain Paul Dudley's very fine leadership of the Center during the past two years has also been apparent, and I shall endeavor to carry on in that tradition. As we here at the Center look into the future let us not lose sight of what we are about and the potential far-reaching implications of our work.

Although we in the United States have been blessed with an abundance of natural resources, we are far from self-sufficient in that regard. Our modern industrial society requires many materials which must be imported from other parts of the world: titanium, manganese, cobalt, chromium, and of course oil from the Middle East to name a few. Our industry needs these materials to function, and we must have a strong Navy to ensure that the sealanes of communication to their sources remain open for unimpeded use by the free world.

As the U.S. Navy's principal development laboratory for aircraft systems under the Chief of Naval Material, we play a key role in determining not only the kind of systems that ultimately equip the fleet, but their capability and reliability as well. For all of us here whether we be military or civilian, blue collar or white collar, in direct fleet support, systems development, basic research, or maintenance of our own facilities, the bottom line is: patrol and reconnaissance aircraft on track, ASW aircraft on datum, fighters on patrol and strike aircraft on target, all with systems that work. These are necessary, in sufficient numbers, for maritime air superiority which we must have if we are to insure that those sealanes of communication remain open.

I for one am optimistic as the Navy moves forward with its program to rebuild our strength on the high seas to an active force of 600 ships and 15 battle groups. But the task will not be easy and our best efforts will be required in the months ahead. I look forward to working with each of you toward our common objective of a Navy that can go into harms way, now and in the future, anywhere in the world if need be, and *win*.



F. 14 in flight

weapons pylon. All of the aircraft's motions including altitude, airspeed, and simulated weapons releases are relayed back to the computer center where they are recorded. The missions can involve one plane against another or multiples such as 2 on 1, or 3 on 2, and so forth. After the mission is concluded, the aircrews are debriefed. At this time the mission is played back on the computer where it can be viewed in real or fast time. The instructor can stop the replay at any time to analyze mistakes or change the viewpoint to show the pilots eye view or an overall scene.

TACTS is now being used not only for air-to-air combat, but also for no-drop (simulated) bomb runs and

air-to-ground missile firings. Energy management is another phase where TACTS helps out. By reviewing mission profiles, areas of possible energy savings can be pointed out.

One by-product of the system is some of the flight information relayed back to the computer. Such things as how many G's an aircraft pulls in a certain turn and what position it is in are recorded. These numbers are used by NADC's structures people to program their equipment which is used to test actual airframe components. It's systems like TACTS that give the United States an edge and makes our pilots the best in the world.



## Helicopters Will be Safer Thanks to NADC by Carolyn Riemer

Engineers and technicians in the Seating and Escape Branch (6032) of the Aircraft and Crew Systems Technology Directorate are currently testing a device that, once installed in helicopter seats, "will improve a pilot's and copilot's chances of survival and decrease the likelihood of serious injury in the event of a crash," Leon Domzalski, project manager for the Variable Load Energy Absorber program, said.

The variable load energy absorber, which was developed under contract by Simula, Inc. of Arizona, attenuates, or weakens, the force of the impact for the pilot and copilot during the helicopter crash. Cylindrical in shape, the energy absorber reduces the impact of a crash by using the force to crush an aluminum tube during the downward deceleration of a crash.

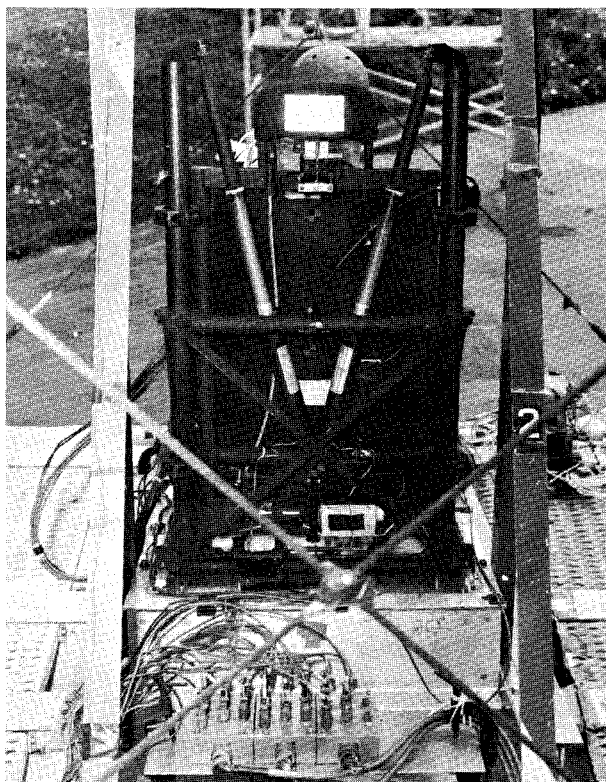
Testing of the device at the Drop Test Facility, which was moved to NADC from the Philadelphia Navy Yard in 1975, was conducted last month. Results from the test reflected the ability of the energy absorber to reduce the force of a crash. The device helps prevent serious injury by spreading the energy of the impact over a greater period of time, thereby increasing the human body's ability to tolerate the force of a crash.

In addition, this device will provide greater protection to pilots and copilots because, unlike current energy absorbers, the variable load energy absorber can be adjusted to correspond to the individual weight of each seat occupant.

Current load limiters, or energy absorbers, have only one setting, which is for the 50th percentile occupant. Thus, half of the seat occupants are heavier than the weight setting and half the occupants are lighter than the weight setting.

As a seat is moving downward during a crash and the load limiter is absorbing the impact and lessening the forces on the occupant, a pilot or copilot who is heavier than the weight setting may bottom out during the downward stroke. Conversely, an occupant who is lighter cannot take advantage of the full absorption during the downward stroke and is subjected to greater downward deceleration.

"The basic concern is to prevent spinal injuries that would occur in situations such as these. Although humans can withstand high forces during horizontal impacts, human tolerance for absorbing vertical impact is much lower," Domzalski said. Testing has set the tolerance level



**New energy absorbers are seen on the back of this seat.**  
Photo by NADC Photo Lab.

at 23g's, which is approximately 4,000 pounds of impact, although that is still a controversial figure.

Because the impact tolerance is set for 23g's and because the variable load energy absorber can be adjusted to individual pilot and copilot weights, it provides optimum crash protection.

Settings for the absorber range from 141 to 215 pounds effective vertical weight. Vertical weight is the weight of an individual in a sitting position and about 80% of an individual's total body weight.

One possible drawback to the system, however, is that it is an "active" system, Domzalski said. The pilot and copilot must enter and set their weights in the system during preflight checks.

Ideally, Domzalski explained, the system would be a "passive" one, where the system would automatically adjust for each occupant's weight and not require any conscious effort from the occupants. Such a system is the

next step of improvement in the area of energy attenuating devices for crashworthy seats.

Testing of the variable load energy absorbers has taken place as part of a LAMPS (Light Airborne Multipurpose System) aircraft seat and is part of an overall effort to make an entire craft crashworthy.

For example, LAMPS has been designed with floor wells beneath the seats, which is ideal for load limiters. Since there is little vertical space in a helicopter in case of a crash, the extra depth of the floor well provides more room for the downward stroke of the seat and more time for the energy absorber to attenuate the impact forces during that downward stroke.

In addition to the variable load energy absorbers, the Seating and Escape Branch, under the direction of project manager James McElhenney, is in the process of developing, in-house, an inflatable restraint system.

Called the Inflatable Body and Head Restraint System (IBAHRS) it is designed to restrain pilots' and copilots' forward motion during a crash, in the process reducing whiplash and related injuries.

The inflatable restraint for aircraft occupants, a concept similar to the air bag in the automotive industry, also reduces the seriousness of injuries because the forces of the forward motion are spread over a larger region of the upper body, rather than being concentrated over the webbing of the traditional restraint system.

Inflation of the restraint is activated by a crash sensor, which recent full crash testing has shown to react quickly enough to the impulse of a crash deceleration to inflate the system within .02 seconds, or before the occupant's forward motion begins.

Once the crash sensor is activated, the inflatable restraint, located on the back of the traditional restraint that crosses the pilots chest, is filled by gas generators with a non-toxic nitrogen gas.

Besides the increased protection for the pilot and copilot, the system is also advantageous because even if it fails, it still affords the seat occupant the same protection as does the traditional restraint system.

Installation of IBAHRS, which was developed by the Army along with NADC, in Army aircraft could be as early as 1983. Likewise, installation of the variable load energy absorber could come about as early as 1984, with both providing pilots and copilots greater protection during a helicopter crash.

## Changes Made to Merit Promotion Program

Captain Dudley signed a new Naval Air Development Center Merit Promotion Policy and Program Instruction on 11 August 1981. This new instruction NAVAIRDEV-CENINST 12335.1A incorporates numerous changes enacted into law by the Civil Service Reform Act (CSRA).

The instruction, which has been provided to all employees, sets forth the policy and procedures to be used when staffing positions under the competitive Merit Promotion Program. It covers all GS/Gm/WG/WL/WS and WD positions. If there is a conflict between the instruction and the Negotiated Agreement between NAVAIRDEV-CEN and the American Federation of Government Employees (AFGE), Local 1928, the negotiated agreement will take precedence for bargaining unit employees. The instruction includes provisions for the announcement of vacancies, the acceptance of applications, the evaluation and referral of candidates, and the selection and release of the successful candidate.

Several key areas have been changed. Under the previous NADC Instruction, employees who were changed to lower grade through no fault of their own were entitled to receive prior consideration for vacancies for which they were qualified up to and including the previous grade level. Under the new instruction, such prior consideration will be limited to those employees who are under CSRA grade and pay retention, CSRA pay retention only, or under salary retention accorded prior to 14 January 1979; to those who failed to receive proper consideration in a prior action due to procedural regulatory or program violation; and to those registrants in the Department of Defense Priority Placement Program (Stopper List). It is important to note that any employee who previously held a higher grade on a permanent basis may, if management officials desire, be non-competitively promoted to that grade level if qualified for the position; however, this is not an automatic referral.

Temporary promotions will continue to be used to the extent necessary in meeting workload and staffing considerations; however, the Center, in accordance with Navy policy, will not temporarily promote an employee to a supervisory position for less than 31 days.

The Center has established two continuous registers—one for Clerk Typist, GS-4 level positions and one for Secretary, GS-5 level positions. If other continuing registers are established, they will be announced under the Merit Promotion Program. Any individual interested in being considered under any current continuous registers should contact the appropriate CPO area as set forth in the announcement in the Log.

A new provision has been included which expedites the filling of vacancies and allows for the use of a promotion certificate for up to 90 days after the closing of an announcement. If this provision is to be applied, the Vacancy Announcement will include a statement to this effect so all employees will be notified.

Voluntary applications from Navy and Marine Corps employees outside the minimum area for promotion will no longer be considered unless specified in the Vacancy Announcement.

Employees will continue to submit the information requested by the specific Vacancy Announcement and will be evaluated based upon such information. In addition, one supervisory appraisal will be obtained from the immediate supervisor which will address the specific requirements of the position to be filled. In the past, two appraisals were required, one from the immediate supervisor and one from the second level supervisor. As in the past, employees are entitled to review the supervisory appraisal at any time. Gerry Keenan, Employment and staffing specialist in Civilian Personnel, recommends that supervisors discuss appraisals with employees prior to submission to CPO. "This serves as an excellent time to review performance and as a supplement to the performance appraisal programs," she said. "It is

important to note," she adds, "that the most current appraisal will be used in the evaluation process when related to the requirements of the position being staffed."

The use of evaluation panels is optional and will depend upon the number of candidates for the position, the grade level of the position, and the judgement of the operating official and the personnel specialist staffing the position. When used, panels will be composed of at least two subject matter specialists appointed by the selecting official and an Equal Employment Opportunity representative appointed by the Commander or the Deputy Equal Employment Officer. If the position is a unit position, a fourth panel member may be appointed by the President, AFGE, Local 1928. A CPO representative will serve as advisor to the panel and will be available throughout the deliberations.

Center Merit Promotion Policy states that up to ten candidates, in alphabetical order, may be certified to the selecting official who is free to select any candidate certified or to non-select all candidates. The selecting official is not required to interview candidates unless the position is an Upward Mobility position being filled under the Department of the Navy-wide Training Agreement which allows for the waiver of qualifications.

"It is important that the employee keep informed of promotion opportunities by reading the Log for Vacancy Announcements of positions they may be interested in," says Gerry Keenan. "If a desirable position is advertised," she adds "employees should secure a copy of the Announcement as it will contain all pertinent information in reference to the Merit Promotion action." Mrs. Keenan added that, as with previous policy, "the Center will make promotional opportunities available for all employees; however, it is incumbent upon the employee, to apply for the positions and to supply all pertinent information."

## Commander Salutes

Franz Bohn, John Lamperez both of DCP, James Davis, Edward M. Koszarek, Robert F. Minder and William R. Wentz all of SD, Michael C. Messe, Joseph Armento, Richard Goelz and A. Thomas Weaver, all of SCD, also AW2 Dennis DePriest, AW1 R. Browne, AT1 Peter Remington and LCDR David Seckinger all USN, all for their efforts on the P-3C UPDATE III Program.

Clarence M. Chen, ACSTD, for his work in the area of structural analysis on the SH-60B helicopter.

Scott M. Cote, ACSTD, for his presentation on aircraft and engine mission developments given to the Naval Air Propulsion Center.

LCDR Michael J. White, USN, for his participation in the Arizona State University Class 81-3 of the Crash Survival Investigations School.

CAPT Richard A. Fidler, Acting Chief Staff, for his support to the Naval and Marine Corps Reserve Center, Indianapolis, while serving as Executive Officer at the Naval Avionics Center, Indianapolis.

John Fuller and Vincent Crusco of NADC's Fire Department also AK1 Robert Keck and LT Daniel J. Paterson, USN, all for their assistance to the Environmental Protection Agency (EPA) in preventing a potentially hazardous "midnight dumping" incident.

All Center employees who assisted in the preparation of the Voice-Interactive Avionics Conference.

George P. Gillespie, ACSTD, for his presentation on Life-Support Systems to the Lenape Junior High School.

Edwin S. Tankins, ACSTD, for his presentation at the Bensalem High School Career Day.

Stephen G. Fisher, John Fuller and Richard Deuble, all of NADC's Fire Department, all for their cooperation to the Northern Division Fire Marshal.

LCDR Chad Norton, USN, William Mulley, ACSTD, Franz Bohn and John Wrigley, DCP, all for their assistance during the meeting of the Navy's Golden Eagles.

Calvin Harvey and Michael W. Bronson both of NADC's Fire Department for their efforts on behalf of the Bethanna Bonanza.

James A. Dunn, PAR, Craig R. Volker, Nelson J. Hall, Theodore R. Trilling, Gerald D. Ferguson, Michael Rankin and Lloyd Bob, all of SATD, Alan M. Kaniss and Robert Finkelman, both of the Computer Department, all for their contributions to the Bucks County High School Science Seminars.

Patricia K. McMahon, PAO, for her assistance to William Tennent Senior High School.

Joseph Perrine, Gina Luce, Carl Anderson, and Jeff Bass, all of CNTD, and LT Steve Barnes, CDR John Calande, LCDR Jeff Harrison, ADC John Barbagallo, ADC Peter Remington, AD1 Rich Troy, AW2 Mark McQuilling, AE3 Charles Gibson, AMS2 John Marci, ADAN Dennis Dykes, all USN, and MAJ James Keane, USMC, for their effort in conducting successful high latitude flight tests at Keflavik, Iceland and the North Pole on the Litton LN90A inertial navigation system which took place during the month of July 1981.

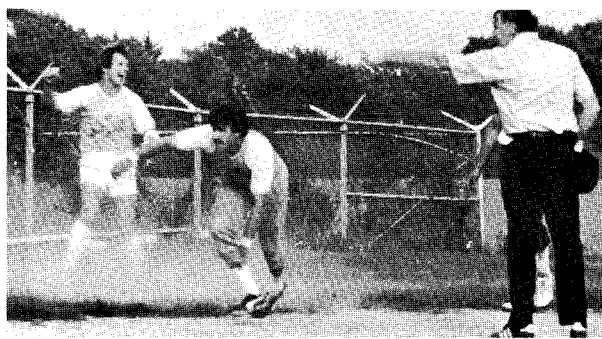
Emil Bazow, DCP, and Theodore Trilling, SATD, for their assistance to Hill Air Force Base in resolving TARPS negotiations.

## NCAA Schedule

The first joint civilian/military breakfast meeting of the Naval Civilian Administrators Association will take place on 24 September. Guest speaker will be Captain James B. Anderson NADC's new Commander. Coming up on October 19th 8th District Congressman James Coyne will meet with the NCAA. Contact Don Morway for details X3100.

## Energy Awareness Week

October means Energy Awareness in the Navy and this year NADC will hold an Open House 30, 31 October to inform both Center employees and the Public about the latest in energy conservation measures. Look for details next month in the Reflector.



## Softball Champs

by Bob Larr

The backlash of the baseball strike was felt on-Center as fans stayed away in droves from the NADC Softball Championship series. But the die-hards who came out to watch agreed that they saw the best series in recent years. When it was all over, the Granfalloon had won their third consecutive championship, defeating the Swingers two games to one.

The Swingers, who finished second behind the Falloon in division A, beat the resurgent 8th Inning in the first round of playoffs. After a humbling 15 run loss in the first game the Swingers took the next two games and moved into the semi-finals against division B champs, the Bearcats.

The Bearcats had won eleven straight games during the regular season. But without starting pitcher Skip Reed the Bearcats couldn't counter the Swingers hitting, and lost the series in two games.

Meanwhile, the Granfalloon were methodically throttling the always vocal Guzzlers in two straight games to avenge their only regular season loss.

In the first game of the finals the tone was set for the entire series. Hits were few and far between. Pitchers Steve Torok of the Falloon and Swingers' Greg Heydet were both masterful. The Swingers scored four runs in the last inning rallying to win 4-3 with two outs on a towering 3-run homer by pinch hitter Tom Murray. It would be the only home run of the series.

Pitching again dominated the second game. Heydet pitched a two hitter, but this time it was the Granfalloon's turn to rally from behind. In the fifth inning Falloon centerfielder Ed Swiski went to the fence to rob Dean Stoerrle of a home run. The key Falloon hit was a two RBI infield smash by Tom Weiss in the top of the final inning. The Falloon pitching and defense held to win the second game 5-4.

In the final game the Swingers scored in the second inning, as Heydet's first of three doubles scored Stoerrle. The Falloon kept pace as Steve Fleischut walked with bases loaded.

In the fourth inning the Falloon again scored. Torok walked and John Tralies doubled. Bob Bauder then provided the big blow—a two-run double. The Falloon added an insurance run in the sixth inning. Tony Viola tripled and scored on a sacrifice fly from Torok.

The Swingers would make it exciting in the seventh. Ron Lang walked and Heydet doubled. Lang then scored on an infield out, sliding around the tag at home. But that would be the last run to score—the Granfalloon winning 4-2.

Falloon coach Tom Weiss and Swingers coach Bruce Heath accepted trophies for their teams at the All-Star game.

Naval Air Development Center

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Views and opinions expressed in this publication are not necessarily those of the Department of Defense.

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CAPT James B. Anderson — Commander, NADC  
Dr. R. Kenneth Lobb — Technical Director  
Joseph P. Cody — Public Affairs Officer  
David Polish — Editor

## Flight Ops to Increase

Lasting to approximately the end of October, flight operations at the Naval Air Development Center in Warminster will increase significantly.

The increase in flight activity is due to the temporary relocation of nine aircraft which are permanently assigned to Navy, Marine Corps and Air Force units stationed at the Naval Air Station in Willow Grove. The temporary relocation is necessitated by runway repairs at Willow Grove which began on 9 August.

During this time, the hours of operation at the NADC airfield will be expanded to accommodate the training requirements of Willow Grove's reserve squadrons. The hours for flight operations at NADC will be:

Monday, Tuesday, and Thursday 8:00 a.m. to 5:00 p.m.  
Wednesday, Friday, and Saturday 8:00 a.m. to 11:00 p.m.  
Sunday 12:00 noon to 11:00 p.m.

NAS Willow Grove aircraft which will be operating out of NADC Warminster include a C-12, C-130, C-118, P-3, and five A-4's.

## 805 Years



Captain Anderson presents service pin.

Photo by David Polish.

This month marked a very meaningful point in 25 Center Employees careers. Pins were given out marking over 805 years of combined service to the Federal Government. Noteworthy to this ceremony was that there were five people receiving 40 year pins, one 35 year pin and the rest were all 30 year pins. The following should be congratulated for outstanding support to this country.

### 40 Years

Charles S. Powell, SD, Arthur Brand, SATD, Frank R. Previti, CNTD, William Ward and Paul J. Cedan, both of ACSTD.

### 35 Years

Shirley B. Shaffer, Comptroller.

### 30 Years

Robert L. Belz, William H. Graff, John Mankewicz, all of SATD, Jerome Yutkowitz, Robert A. Leonards, Charles W. Olson, all of CNTD, also Thomas J. Massey, SCD, Robert B. Spotts, Harry Brown and Richard F. Refsnyder, ACSTD, Leonard E. Needles, Richard C. Lewis, Thomas E. Willey, all of PAR, Virginia M. Johnson and Roy R. Radzai, TSD, Edward C. Scott, John F. Salviola and Benjamin Drexler, all of PW, and Clare K. Ashley of Supply.

## New Titles

Following is a partial list of books recently added to the Technical Information Branch. Visit or call your library at x2541 to inquire about these books.

### AVIATION

Aircraft of the U.S.A.F.: Sixty Years in Pictures Paul Ellis UG 1243.E44

Jane's Aerospace Dictionary Bill Gunston TL 788.A1G8

Jane's World Aircraft Recognition Handbook Derek Wood TL 501.J32

### COMPUTER SCIENCE

APL Version 2 Reference Manual Control Data Corporation QA 76.73.A27C53

Data Conversion Integrated Circuits [edited by] Daniel J. Dooley TL 7887.6.D36

Measuring, Modeling, and Evaluating Computer Systems: Proceedings of the Third International Symposium sponsored by IRIA-LABORIA QA 76.9E94M4

Structured Requirements Definition Ken Orr QA 76.6.078x

6800 Programming for Logic Design Adam Osborne QA 268.5.083



# NADC Can Save Millions for Navy

Total fuel savings to be achieved are on the order of 5% of the Navy's current aviation fuel allotment which translates to an estimated yearly dollar saving of over 50 million dollars per year at current fuel prices. That's what NADC can do to help the Navy save fuel.

Energy-saving technologies/subsystems being investigated at NADC include environmental control systems, electric power supplies, and aircraft stores carriage drag reduction concepts.

Progress during the past six months includes the following:

VP-49 has agreed to conduct the "P-3 Fuel Conservation Experiment" working closely with NAVAIRDEV-CEN personnel. This experiment will test, evaluate, and document fuel-saving procedures which could possibly be used by the entire VP community. VS-28 has agreed to perform a similar experiment in the S-3 community.

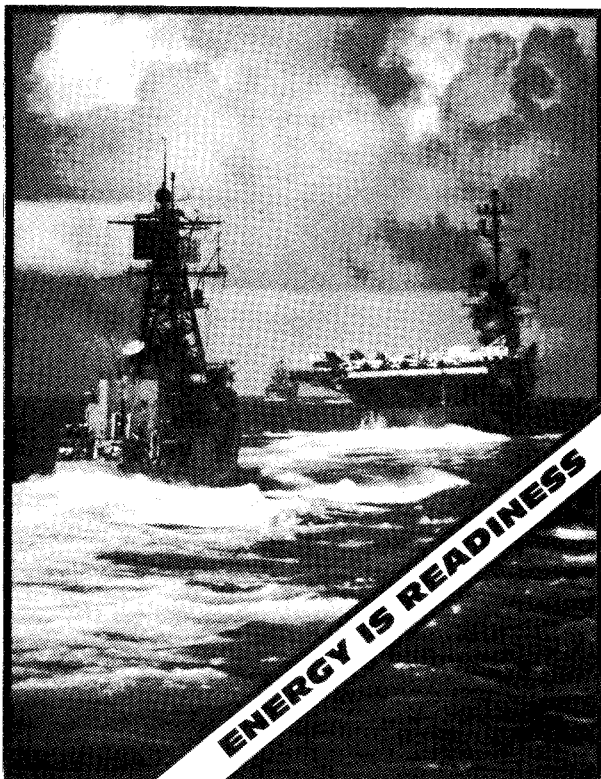
VA-27 has conducted preliminary testing and evaluation of the NAVAIRDEV-CEN developed A-7E/HP-41C pocket-size aircraft performance advisory computer. This small but powerful computer advises the pilot of his

optimum or minimum fuel flight parameters (e.g., airspeed, altitude, etc.) for a given set of inputs. Test results were very favorable. The computer is also used by Space Shuttle astronauts.

The VA/VF Ground Refueling Procedures Investigation was completed with the general conclusion that truck refueling should replace hot refueling as the primary method of refueling aircraft at Naval Air Stations. This method brings the fuel to the plane instead of moving the plane to the refueling station.

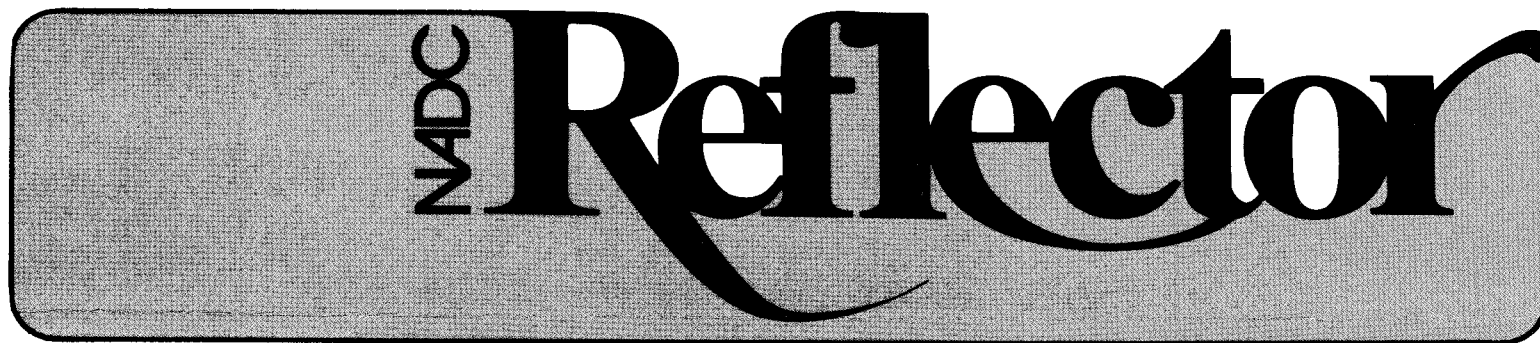
TRAWING SIX testing of NAVAIRDEV-CEN recommended concept of changing TA-4 configuration from two external wing fuel tanks to one centerline tank resulted in fuel savings even greater than anticipated.

Within the next two years computerized flight performance advisory systems will be developed and tested on several Navy aircraft including the P-3 and A-7. Flight testing and evaluation should result in fuel savings similar to those achieved by the airlines and Air Force. Also, unused equipment will be removed from the Navy's TA-4J fleet resulting in fuel savings up to 5%.



Department of the Navy  
ENERGY AWARENESS WEEK  
October 25-31, 1981

## Energy Expo Set for 30-31 Oct.



Volume 25, Number 10

Naval Air Development Center, Warminster, PA

October 1981

### Inside this issue

- Super Dr.
- Nav System
- Food School
- Energy News
- Policy
- Health
- CU Merger

## Brennan Impressed With PAR

by Patricia McMahon

Since becoming the Director of Planning Assessment Resources (PAR) in April 1981, Tom Brennan has firmed up several impressions of his staff and the future of the Center. From what he has observed in his first few months in the position, Brennan has been impressed with the organization and the high level of professionalism of the staff. Outlining his responsibilities, he defines PAR as "a staff directorate which assists the Center Commander and the Technical Director directly in defining Center goals and objectives for technical business. PAR's efforts are many times disguised from the view of most people on Center. They are presented at a level where there is little visibility when looking at the end product."

In defining the functions of PAR, Brennan explained that "in addition to short-term, mid-term, and long-range planning, PAR is also involved in the assessment and implementation of new opportunities for the Center along with the assessment of the quality of our products. In terms of resources PAR provides guidance for control of resources, facilities, manpower/skill mixes, and space allocations. The Air Warfare Office is a resident within PAR and provides an operational liaison throughout the Navy for various projects on Center."

PAR's responsibilities not only include those previously mentioned, but also expand into the areas of the Intelligence Liaison Office (STILO), Test and Evaluation (T&E), the Key West Detachment, Navy Scientific Advisory Program (NSAP), the scheduling of aircraft, and off-Center personnel on temporary world-wide assignment.

PAR is also involved in developing a 5 year plan for the Center, of which Brennan said, "We see a need for continued development and excellence in our major

product areas of air/combat systems, airborne command and control, and mission support including software and hardware for Fleet avionics systems." According to Brennan the major thrusts in the next 5 to 10 years will continue to be in acoustic radar sensors and electro-optic tactical navigation for the entire three-dimensional Navy (air, surface, and submarine), all spurred to greater levels of performance by the incorporation of VHSIC circuitry and weaponry in aircraft systems of the future. The thrusts in aircraft technologies include survivable structures, materials, aircraft demonstrators, and crew systems achievements." Brennan commented that "Major developments in new systems as well as maintaining the primary development mission for the Navy in modifying current aircraft will continue through the 1990's."

Tom Brennan also talked about the funding outlook for the Center and its future trends. "I foresee the Center growing in dollar volume from the current \$260 million per year to a level of \$300 million per year in constant dollars throughout the next five years. In doing so we'll have to be extremely selective because I do foresee an increase in involvement by the Center in major systems developments due to a draw-down within the Navy Headquarters system." Brennan also said, "personnel ceilings can be forecasted to remain fairly level over the next couple of years with a decrease expected in outer years due in part to possible CITA reductions."

In regards to CITA (now known as Commercial Activities or CA), which is under the direction of PAR, Tom Brennan had this to say. "At the present time the CA program has been given much attention at all levels. Potential candidate jobs up for evaluation have been identified and appropriately scheduled for study throughout the next few years. Undoubtedly there will be some impact on the workforce in CA affected areas. That level of impact has yet to be seen."

As part of the career development of professional and scientific people on Center, a rotational assignment, usually of 1 year duration, has been initiated whereby

(Continued on page 5)



Tom Brennan sees levels of work and funding increasing in the next few years.

# Meet Dr. Gloria Chisum, Scientist Plus

by Gwen Dixon

Meet NADC's Award Winning Research Psychologist, Dr. Gloria Chisum. It is easy to understand why Dr. Chisum was recently named as one of the Distinguished Daughters of Pennsylvania. She is poised, gracious, intellectually stimulating, and her inspired scientific endeavors have led to patents in the field of visual perception.

A research psychologist at NADC for 21 years and presently acting manager for Scientists Research Group, she is working on such projects as laser eye protection, advanced display development, and the basic research efforts on the effects of various transparencies on pilots' visual performance.

Dr. Chisum, a graduate of Howard University with a Ph.D. from University of Pennsylvania, became interested in NADC after completing her Ph.D. and learning that NADC was looking for someone to do work in the area of visual science.

Dr. Chisum became interested in psychology after taking scientific survey courses at Howard. She taught psychology at the University of Pennsylvania and the Tuskegee Institute in Alabama. While in graduate school she was a teaching and research assistant.

Besides being selected as one of the Distinguished Daughters of Pennsylvania, she has published a number



Dr. Chisum is one of NADC's outstanding scientists.

of papers and received the Longacre Award from the Aerospace Medical Association as well as an award for outstanding accomplishments in the area of psychology.

Dr. Chisum is a member of such professional organizations as: The American Psychological Association, Optical Society of America, New York Academy of Sciences, Chairman of the Board of Overseers at University of Pennsylvania, Board of Directors for Philadelphia Saving Fund Society, Trustee for Free Library of Philadelphia, Life Member of NAACP and a member of the World Affairs Council, to name a few.

Dr. Chisum is a resident of Philadelphia. Her husband Dr. Melvin Jackson Chisum, is the Associate Medical Director for Bell of Pennsylvania.

On Center, Dr. Chisum is felt to be the type of person who is always willing to extend a helping hand. She immediately makes you feel at ease and no matter how small or trivial the problem might seem, she handles it as if it were a major concern.

When asked what gives her personal gratification, she replied, "When I am able to provide some insight or shed some light on a problem that is difficult to solve, or when I am recognized by my peers, I find that personally rewarding." This appears to be a very modest response for such a dynamic personality.

## Navigation System Checks Out

As the P-3's take-off and land at NADC they are supporting many different projects. One of these projects is known as the LN90A—ring laser gyro navigation system which represents a new generation of inertial navigation systems. The LN90A was built by Litton Industries and since April of this year has been under evaluation by the Air Navigation Systems Branch (Code 4011) which is under the direction of Ed Dinter.

The idea behind the development of the LN90A was to devise a navigational system which would be completely electronic, not dependent on the mechanical devices presently used. An extremely simplistic explanation of the LN90A begins with the alignment process. The alignment procedure is the point where the heading and level are determined. This initialization is very important because the accuracy of the LN90A and its calculations of direction depend upon this. After the alignment is completed, the system senses accelerations by use of accelerometers. An equation using acceleration, velocity, and position is integrated by the computer to calculate longitude and latitude.

The LN90A was tested in the lab for 4 weeks before being installed in the P-3C for the purpose of conducting flight tests and evaluation. Flight tests are performed to ascertain how an instrument performs in different flight conditions. On an East to West flight to Pittsburgh the P-3 was positioned in a true West direction while being aligned. After the alignment, the aircraft turned east for the take-off and once in the air made a 180 degree turn to get on course. The purpose of the flight to Pittsburgh was to check the accuracy of the LN90A's longitude and latitude with the known longitude and latitude of certain chosen TACAN stations along the way. Once back on the runway at NADC, the P-3 was turned in a true East direction for collecting the data and then running the system for a set period of time.

Another project run for the LN90A took Joseph Perrine and his team: Gina Luce, Carl Anderson, and Jeff Bass, all of the Air Navigation Systems Branch of CNTD to Keflavik, Iceland and from there to the North Pole. This flight test was successful in determining that the LN90A showed expected sensitivity to the problems of performing under high latitude conditions. The LN90A flight was the first Ring Laser Gyro System to be flown over the North Pole. As can be seen with the LN90A project, the P-3 played an important role in the testing and evaluation of a new technology. This type of role will help make all the Navy's aircraft, the best in the world.

## Going to School in the Galley



Bucks County class meets in NADC's Galley.

The galley at the Naval Air Development Center has just recently become involved in conducting classes in Hotel/Motel/Restaurant/Institutional Management in conjunction with Bucks County Community College (BCCC). The first class, conducted by Mr. Bill Rech of BCCC, is a class in theory called Safety and Sanitation for the Hospitality Industry which started on 8 September 1981. Class is held for 16 weeks every Tuesday from 7-10 p.m. It is open to all military and civilians who are interested in the course, not just those stationed at the Center. Currently there are 5 military personnel from NADC, 7 from NAS Willow Grove along with 1 civilian from NADC and 2 from Willow Grove participating in this course. The next course offered will be one in hands-on production of food.

The idea for conducting these courses came from MSC T. Hamacher who had experienced this type of program when he was stationed at NAS Norfolk, Virginia. Courses in Food Service were offered at NAS Norfolk in cooperation with Tidewater Community College to bring the skills of Mess Management Specialists to a level equal to that of civilians in the same occupation.

As a participant in these courses in Norfolk, MSC Hamacher realized the benefits in terms of upgraded skills that this type of program offered. With this in mind when he came to NADC in January of this year, MSC Hamacher set about trying to introduce such a program at the Center. He looked into the different colleges in the area to find out what kind of programs they had in the Food Services field. Bucks County Community College had the most to offer.

A meeting was set up with representatives from the Community College and the Center for the purpose of determining if this project was feasible. CDR Iaquina, LCDR Hadrosky, and MSC Hamacher of NADC along with Mr. Bill Rech and Mr. Carver of BCCC decided that if enough people signed up—15 students are needed in order to implement an off-campus course—the classes would be held at the galley in the Ship to Shore dining facility. Also aiding in the coordination of this program were MSC D. Deuell of NAS Willow Grove who was involved in the program in Norfolk with MSC Hamacher and MSC Gibson, Food Services Officer of the enlisted dining facility.



## Expo

If you're interested in saving money and energy then you should come to the Open House to be held during Energy Awareness Week. On Friday 30 October the Center will have displays from area businesses and utilities set up for employees to see. The latest in energy saving devices and information will be available. This exhibit will be open to the public on Saturday 31 October from 10 a.m. to 3 p.m.

Also during Energy Awareness Week which is between the 25th and the 31st guest speakers and films will be shown at lunch time so come out to look, listen and save.

# Calendar of Events

DATE	TIME	EVENT	LOCATION
Monday, 26 October	1200	Film "A Play Half-Written: The Energy Adventure" (1979)	Center Auditorium
Tuesday, 27 October	1200	Film "The Energy Experience" (1980) from Chevron, USA, Inc.	Center Auditorium
Wednesday, 28 October	1200	EAW Luncheon with CDR Frank Gregory, Assistant Director Energy R&D Office, NAVSEA	Executive Dining Room
Thursday, 29 October	1200	Film "Cap in the Gap" Department of Energy	Center Auditorium
Friday, 30 October	0830-1600	Energy Expo 1981	Building 4, Hangar Bay 1
Saturday, 31 October	1000-1500	Energy Expo 1981	Building 4, Hangar Bay 1

## Fuel Conservation by Designing for Future

NAVAIRDEVCCEN has been designated by the Navy Energy R&D Office as lead Navy Laboratory for aircraft energy conservation. As such NADC reports directly to cognizant NAVAIR codes and AIR-104, the NAVAIR Energy point-of-contact. The effort is part of the Navy Energy Program directed by the Navy Energy Office (OP-413).

The objective of the Navy Aircraft Fuel Conservation Program is to investigate, identify, and develop ways and means of conserving natural petroleum based fuels (e.g., JP-4, JP-5) during the operation of Naval aircraft, without decreasing operational readiness, system effectiveness, or system safety. The project will follow four major paths:

- RDT&E of cost-effective fuel management concepts.
- RDT&E of cost-effective fuel-saving aircraft modifications.
- RDT&E of energy efficient designs and operations concepts applicable to planned Navy aircraft.
- RDT&E of energy-efficient technologies/subsystems which promise significant reductions in use of natural petroleum fuels for aircraft operations.

Fuel management concepts currently under investigation include:

- Use by Navy pilots of computerized flight performance advisory/management systems which display optimum or minimum fuel flight parameters such as airspeed and altitude or actually fly the aircraft in the most fuel efficient manner. Use of these systems is becoming commonplace in commercial aircraft and is being implemented by the Air Force. Fuel savings estimates range from one to six percent depending on aircraft type and system sophistication.
- Implementation of fuel-efficient flight and ground



A-4 aircraft similar to ones being modified for fuel savings.

procedures such as fueling aircraft to mission requirements only; use of shore-based truck refueling instead of "hot" refueling; temporary removal of unused equipment such as pylons, bomb racks, or external fuel tanks.

Aircraft modification concepts being pursued include:

- Aerodynamic modifications such as drooping aircraft flaps or ailerons several degrees during cruise to improve the lift-to-drag ratio of the wing (a concept employed on the Lockheed L1011-500) thus reducing fuel consumption.

- Weight reductions such as permanent removal from the TA-4J trainer aircraft of guns, refueling boom armor, and unused wiring and brackets.

- Incorporation of flight performance advisory/management systems (previously described).

- Engine modifications aimed at reducing fuel consumption.

Planned Navy aircraft such as VTX, ECX, VCX and others will be scrutinized during the proposal stages to insure that energy-saving features are incorporated.

## New System Helps Center Use Less Energy

In the past year NADC has undergone major revisions to two large central air conditioning systems, one new central air conditioning system has been installed and numerous areas have been rehabilitated. All of these projects have one thing in common: air conditioning utilizing the variable-air-volume (VAV) technique.

The variable air volume (VAV) concept or system of air conditioning supplies a varying quantity of air at a constant temperature to a space to balance heat gain or loss and thereby achieve and maintain desired space conditions. The old systems supplied a constant volume of air at variable temperatures to balance the space conditions.

VAV systems respond directly to loading conditions. If a space is under a heavy load from people, lights and solar gain, the cooling requirement is at a high level. When the space is vacated and lights are turned off, the cooling load is reduced. A VAV system will throttle off air volume to a level required to maintain space temperature. Unoccupied areas receive only the quantity of air necessary to balance solar heat, infiltration and conduction areas, while at the same time the occupied areas receive an increased volume of air to balance the additional lighting and occupancy heat gains as well.

During the heating season, the VAV system only requires a one-hour warmup period to operate effectively.

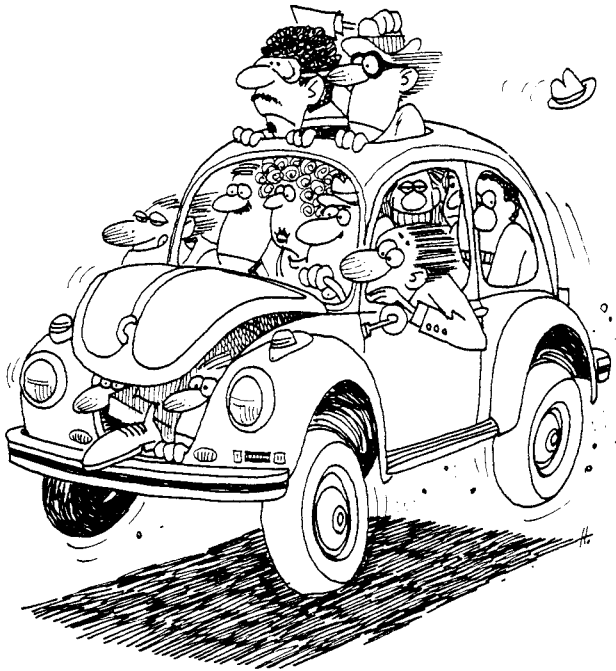


Public Works Officer LCDR Ray Tyler, rt, shows Center Commander, Captain James Anderson new windows that are part of NADC's energy conservation program.

Once the warmup cycle is over, heat generated from the lighting, equipment and personnel within each space will be balanced by the VAV system. The balancing is accomplished by varying the amount of air supplied to the space by dampers or bellows located in each terminal unit.

With the VAV systems responding to individual space conditions, temperatures within a space may vary if the loading conditions, number of personnel present and amount of equipment turned on vary. Therefore, temperatures within a space may not always be 78°F. in the summer and 65°F. in the winter.

## Swimming in Oil— for How Long?



## Pool It!

Japan, which must import every drop of oil it uses, recently declined an offer from Mexico to sell it 200,000 more barrels a day on a long-term basis. Japan lately has been able to buy all the oil it needs, and at lower prices than Mexico was asking. Besides, oil consumption in Japan has dropped by about 15% in the last year.

Mexico got another shock when a French oil company announced that it was cutting its purchases in half, to 50,000 barrels a day, and for the same reasons. With less publicity, U.S. oil imports from Mexico have declined from 700,000 barrels a day earlier this year to about 400,000 barrels now. That decline is part of a pattern. A year ago the United States was buying a little over 7 million barrels a day of crude oil and refined products overseas; last week the figure was down to slightly over 5 million barrels a day.

Some oil analysts now figure that the world oil surplus—the excess of production over consumption—has reached 3 million barrels a day, despite the production cutbacks by some major exporters. Nigeria, for example, has slashed its output nearly in half, to about 1 million barrels a day. Libya's production has dropped by more than 500,000 barrels a day. Still, the glut grows, because Saudi Arabia, which accounts for more than 40% of total OPEC production, is flooding the market in an effort to force a unified and lower price for oil on its cartel partners. When the Saudis get their unified price, they will rein in their excessive production to try to dry up the surplus.

One OPEC official has predicted that this contest of wills could

last through 1982. Libya and Nigeria, which charge more for their oil than other countries, so far seem to fear the precedent of price cuts more than the loss of markets. Britain, a non-OPEC exporter, would rather try to hold onto its markets, and has cut its price more than \$4 a barrel. Mexico's oil minister thought it would be wise to do the same; his action gave his political enemies the chance to force him from office. Mexico now talks of partly restoring \$2 of its \$4 June 1 price cut while simultaneously slashing production. The effectiveness of that approach remains to be tested.

At some point, equilibrium in the oil market will be restored, probably on the terms that Saudi Arabia wants. The question then will be whether the consuming nations can exercise the restraint required to prevent a demand surge that will again send prices soaring.

The answer will depend to some extent on the pace of economic recovery in the recession-hit industrial countries. It will depend to a probably greater extent on how well conservation practices are followed. Here the record looks promising.

Price-induced conservation may be working better than anyone anticipated. In the United States alone, according to a recent study by Lee Schipper of the Lawrence Berkeley Laboratory, conservation measures taken since 1973 are saving up to 6 million barrels of oil a day, with some of the most notable gains being in the residential sector. The full fruits of conservation—through building insulation, improved auto mileage, cogeneration and the like—are yet to be realized. That is the hope for the future.

Balanced against this hope is the danger that stable or even declining prices might encourage a relaxation of efforts to hold down the growth rate in oil demand, paving the way for a restoration of a disruptive sellers' market.

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Naval Air Development Center

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Joseph P. Cody — Public Affairs Officer  
David Polish — Editor



DEPARTMENT OF THE NAVY  
OFFICE OF THE SECRETARY  
WASHINGTON, D. C. 20350

### ENERGY AWARENESS WEEK

1981

For Navy and Marine Corps commands, improvements in operational flexibility and force readiness should be sought at every opportunity. Given the energy costs and fuel consumption rates of our ships, aircraft and facilities, we are faced with a direct connection between energy use efficiency and naval preparedness... "Energy is Readiness." This theme will herald our observance of the Department of the Navy's fourth annual Energy Awareness Week, 25 - 31 October 1981. During this time, each command is to draw special attention to energy saving principles and practices at all levels.

Energy Awareness Week is a time for promoting within and around the naval community the importance of eliminating the wasteful use of energy. Command sponsored activities should be both instructional and motivational, recognizing energy savings to date and securing pledges of continued support from all hands. I urge you to demonstrate your deep concern and make Energy Awareness Week 1981 a successful event for all.

*John Lehman*  
JOHN LEHMAN  
Secretary of the Navy

Chief of Naval Operations  
Washington, D.C. 20350

Commandant of the Marine Corps  
Washington, D.C. 20380

### ENERGY IS READINESS

From 25 - 31 October 1981, the Department of the Navy will conduct its fourth annual Energy Awareness Week. This event is to be observed by the Navy and Marine Corps throughout the world under the common theme "Energy Is Readiness." For Naval personnel, an awareness that the DON mission is deeply affected by energy use is vital.

Conserving energy makes a great deal of sense both strategically and financially. Every barrel of fuel we save by improving the fuel efficiency of our operations represents a potential increase in the number of hours for steaming, flying, and ground training. Every dollar saved on energy is a dollar that can be applied to recruiting, training, and equipping our operating forces, improving maintenance, and upgrading readiness.

Your command has a responsibility to enlist the greatest support and participation possible to make this year's Energy Awareness Week a success. Energy conservation programs currently instituted within your activity and new energy saving programs requiring command and community support should be made highly visible during Energy Awareness Week. In today's global climate, the key to a secure future is in many ways dependent upon the energy efficiency of Navy and Marine Corps forces.

*Robert H. Barrow*  
ROBERT H. BARROW  
General, U.S. Marine Corps

*T.B. Hayward*  
T.B. HAYWARD  
Admiral, U.S. Navy



## Policy Statement

From: Commander, Naval Air Development Center  
 Subj: Department of Defense (DoD) Program for Stability of Civilian Employment; affirmation of support  
 Ref: (a) DoD Directive 1400.20-1-M dtd Apr 1980

1. The DoD Program for Stability of Civilian Employment has been established to minimize the adverse impact on employees affected by base closures, consolidations, transfers of function, and employment reductions. The Department of Navy strives to offer continuing employment to DoD employees who are adversely affected while continuing to assure that positions are staffed by fully qualified individuals.

2. Reference (a) requires that DoD employees who have been displaced through Reduction-in-Force or Transfer of Function or who have been downgraded through no fault of their own be given priority placement rights for vacant DoD positions for which they qualify. The mechanism for achieving this is the Priority Placement Program Referral Listing, commonly known as the "Stopper List", which will continue to be applied against vacant positions at this Center. All of the Naval Air Development Center's staffing actions will be in compliance with the requirements, goals, and objectives of the DoD Program for Stability of Civilian Employment.

3. This program has my wholehearted support. I expect all levels of Center management to carry out both the spirit and intent of the program.

JAMES B. ANDERSON

## General Pay Scale

	1	2	3	4	5	6	7	8	9	10
GS 1	\$8,342	\$8,620	\$8,898	\$9,175	\$9,453	\$9,615	\$9,890	\$10,165	\$10,178	\$10,439
2	9,381	9,603	9,913	10,178	10,292	10,595	10,898	11,201	11,504	11,807
3	10,235	10,576	10,917	11,258	11,599	11,940	12,281	12,622	12,963	13,304
4	11,490	11,873	12,256	12,639	13,022	13,405	13,788	14,171	14,554	14,937
5	12,854	13,282	13,710	14,138	14,566	14,994	15,422	15,850	16,278	16,706
6	14,328	14,806	15,284	15,762	16,240	16,718	17,196	17,674	18,152	18,630
7	15,922	16,453	16,984	17,515	18,046	18,577	19,108	19,639	20,170	20,701
8	17,634	18,222	18,810	19,398	19,986	20,574	21,162	21,750	22,338	22,926
9	19,477	20,126	20,775	21,424	22,073	22,722	23,371	24,020	24,669	25,318
10	21,449	22,164	22,879	23,594	24,309	25,024	25,739	26,454	27,169	27,884
11	23,566	24,352	25,138	25,924	26,710	27,496	28,282	29,068	29,854	30,640
12	28,245	29,187	30,129	31,071	32,013	32,955	33,897	34,839	35,781	36,723
13	33,586	34,706	35,826	36,946	38,066	39,186	40,306	41,426	42,546	43,666
14	39,689	41,012	42,335	43,658	44,981	46,304	47,627	48,950	50,273	51,596
15	46,685	48,241	49,797	51,353	52,909	54,465	56,021	57,577	59,133	60,689

**NOTE: Notwithstanding the salary rates shown, the maximum rate of basic pay legally payable to employees under this schedule may not exceed the rate payable for level V of the Executive Schedule, currently \$50,112.50.**

## New Health Care Plan Enacted

A new Health Care Delivery Plan for Naval Regional Medical Center, Philadelphia has been announced by Captain Raymond E. Tobey, Medical Corps, USN, Commanding Officer.

The Health Care Delivery Plan in general will be aimed at providing maximum service to active duty personnel and their families. Under the new plan, emphasis will be placed on providing primary patient care with some limited secondary care. A major component of achieving this goal was the establishment of a Family Practice Service on 1 August 1981. This service will enroll families with a Family Practice physician and provide comprehensive continuing inpatient and outpatient care for family units. Other specialists will provide consultative support to the Family Practice Service when required. It is expected that the final operation of this Plan will take up to three years to implement completely.

Additional changes in health care will be expansion of the Medical Acute Care Clinic hours (same day appointments for urgent care) from its current five-days a week regular hours to week days from 0800-2100 and 0900-1700 on weekends and holidays. This clinic is designed to care for patients with acute, non-life threatening medical problems. Appointments can be obtained the same or one day earlier by calling 755-8263/8264 after 0700. The expanded hours of this clinic began on 1 August 1981 also.

In line with the mission of primary care and limited

secondary care, the capability for tertiary care given in the Intensive Care Unit and Coronary Care Unit closed on 1 October 1981. Patients requiring this particular care will be referred to local civilian institutions or other federal health care facilities.

Additionally, the Obstetrical Service was disestablished on 1 October 1981 with referral of all patients for delivery to nearby civilian institutions. Discussions have been held with several local hospitals concerning the increased number of referrals through CHAMPUS for care that will be necessary and regular channels of communication have been established.

Emergency Room services will be modified to a more appropriate level of care because of the inability for us to provide tertiary care through the Coronary Care Unit and Intensive Care Unit. The Emergency Room Services will be staffed by an Emergency Room Nurse and coprsman who will provide triage and first aid with referral to the appropriate specialty clinic or civilian institution as necessary. A physician will no longer be assigned to the Emergency Room to provide care although one will be aboard NRMC in order to cover inpatient requirements and those military services that are necessary.

It is expected that these changes will result in an overall improvement in health care provided to the active duty member and his family with a concomitant improvement in the capability of the staff at NRMC to better meet the needs of the operating forces of the Navy and Marine Corps.



### (PAR Continued)

employees from all directorates are assigned to various functions within the PAR organization. Brennan says, "these rotationals receive a much broader picture of the Center and a better view of how their specific products effect the Center. And it's a two-way street. Rotational assignments give PAR the opportunity to make a better quality of assessment since it allows us to make our assessments representative of the entire community, thereby increasing our efficiency."

Tom Brennan has definitely been impressed by PAR and its staff in his first few months there. When asked if he is enjoying his position as Director he said, "I really am. It has been an exciting, challenging job, and I'm impressed by the level and intensity of the work done and continuing

to be done. It's a level of quality work done by highly professional people. The people here do a staff service that can be done nowhere else on Center." He continued, "I have noticed a good balanced relationship between civilians and military counterparts. PAR is composed of a combination of civilian and military officers working together as a team. In doing so it provides a good mix of the operational community in direct support of better R&D products produced by the long-term civilian force."

Being Director of PAR is different from his last two positions as Associate Director for Aircraft, Technology and V/STOL Programs Director. Said Brennan, "I've gone from the technical end to the business end, and the learning curve is still very steep. With this background,

I'm trying to bring in new ideas to improve on my predecessors."

Tom Brennan has been with the Center for 15 years. His early years were spent in propulsion. From there he spent 6 years working in the Navy V/STOL program as Deputy Director and then Director. Before he became Director of PAR, Brennan was the Associate Director for Aircraft Technology. He was the first incumbent in that newly created position within ACSTD.

Tom Brennan graduated from Penn State University with a BA in Aerospace Engineering. Under the NADC Graduate Study Award Program, he received his MA in Aerospace Engineering from Princeton University.

## Commander Salutes

Joseph W. Zaroff, SATD, Robert J. Orr and Charles K. McGill both of PAR all for their support to the Naval Coastal Systems Center during a recent series of explosive tests.

Janet Koch, Staff, and Jerome Bortman, PAR, for their participation in a Business Opportunity Fair at the Tobyhanna Army Depot.

LCDR Michael D. Abrams, for his assistance to VS-21 during inflight validation tests of the S-3A F.I. 4.0.2 operational computer.

Lt. Norman Edwards, for his support during the Navy's Recruiting Area One and Recruiting District Boston's Combined Aviation and Nuclear Fleet Assistance Recruiting effort.

Command Projects for their presentations at the ASP/VP/NAVAIR Orientation Seminar.

Thomas W. Castaldi, DCP, for his service to the Anti Submarine Warfare Systems Project office.

Paul Terpeluk, John J. Lamperez, Theodore Kopp, Franz Bohn, John B. Wrigley, LCDR David N. Seckinger, LCDR Jeffrey A. Harrison and CDR Arthur H. Collier all of DCP also Ralph Collins, A. Thomas Weaver and John M. Kichula all of SCD and Rudolph R. Virga, ACSTD, William R. Wentz and John R. Rawley of SD all for their efforts on the P-3C Program during the tenure of Captain Petri as Project Manager.

Richard E. DeFrancesco, Borys I. Umy, Alphonso Pittman and Jack Hirsh all of SCD, also Leonard H. Cantor of SD, all for their assistance in working on the CNO/ASW Tape Recorder Steering Group.

Albert J. Shanks, TSD, for his photographic coverage of a recent Institute of Navigation (ION) Meeting.

All those who supported the overhaul and conversion of the USNS Vanguard.

The dedicated effort of the Center for a record Navy Relief Drive.

All the employees who helped make the Warminster Rotary Day a success.

Edward Peterson, Comptroller, for his contribution to the Navy Accounting and Finance Center's "How to Conduct an Internal Review Audit" course.

## Travel Service Improved

The Passenger Transportation Office will shortly inaugurate an automated travel service. This new service, made possible by the installation of computers providing direct access to the airlines, is geared toward booking a flight on any airline more easily and efficiently.

LCDR Bill Dean, Officer-in-Charge of Willow Grove's PASS office and coordinator of this new service says, "This new system is aimed at streamlining civilian travel and minimizing airline travel costs." Madelyn Horner, Travel section supervisor, added, "Once we become familiar with the computer, and the traveler is aware of our capabilities it will be fantastic." She estimates a time savings of 50%, and more importantly, an estimated 20% savings in overall airline costs for NADC. The travel section presently books 50,000 trips a year for NADC personnel. The system's two terminals have direct access to the airlines which provide real time information. With this information, Travel can book and confirm reservations on the most convenient and cost effective flights. Seating arrangements and rental car requirements can also be reserved through the computer. Once arrangements are complete and confirmed the ticket printer will automatically process the airline boarding pass.

"Booking flights is the hardest part of my job, especially since the air traffic controllers strike," says Marie Avery of Travel. With many flights being rescheduled or cancelled, the airline guide that Marie currently uses for booking flights is essentially ineffective. She has to phone the airlines for the most recent changes. Much time is wasted by calling the airlines and then contacting the traveler to ensure the new arrangements are satisfactory. Presently, there is a ticket printer in Travel, but it is far from automatic. Receiving the ticket in Warminster is totally dependent on an airline clerk.

NADC is the first DOD installation on the East coast to obtain this system.

## Summer Aides Honored



Captain Paul Dudley Jr. receives plaque from Michelle Gibson on behalf of the summer aides.

Awards were given out in August at the Summer Aid, Supervisor Recognition Program to outstanding summer aids and supervisors. The group in the CMG conference room was welcomed by Captain Dudley at which time he received a plaque as a gift of appreciation.

Also given at the gathering were certificates of appreciation to each summer aid supervisor and a special recognition to Jean Dowds, Cathy Gendur, Madelyn Horner, and Nancy Ballew, who were considered outstanding by the summer aids. College certificates were given to all summer aids who attended a two week session at Bucks County Community College. According to the supervisors, there were four summer aids who deserved special recognition and a \$20.00 award, Ron Garrison, Matt Reynolds, Tracy Coaxum, and Patty Wood. An Outstanding Suggestion Award of \$25.00 was presented to summer aid Fred Brown with Loretta Alston and Lorie Pollard as first and second runner-ups. One more special presentation was awarded, and that was to Zinnie King. A planter was given by the summer aids as a token of their appreciation for all her support and help during the course of the summer.

## CFC Drive Starts

The CFC is an annual fund-raising drive supporting the work of the United Way agencies, national health agencies, and national and international service agencies. Some of the member institutions help meet the particular needs of the local community while others continue charitable work abroad.

To ensure success, the 1982 drive offers the easy way to give—through payroll deduction. Whatever you designate will be withheld from pay checks starting in January. Since millions of people in our community and throughout the world are counting on you for their physical, mental, and emotional well-being, it is urgent that your gift be generous. Think about it. Then sign your pledge card and let that good feeling in.

## Credit Union Merges

NADC's Credit Union is now part of the Fort Monmouth Credit Union. What happened? And what changes can we, as shareholders, expect to see?

According to Patrick Quigley, from the Fort Monmouth Credit Union, the reason NADC's credit union was absorbed was because the economy was moving away from the credit union. Many members were looking for higher returns on their money, such as money market certificates. This caused a cash flow problem because as money was taken out for investment elsewhere this in turn left little money for loans. Because of the low cash reserve waiting periods for loans were as much as 3 months said Ken Clegg, Liaison for the NADC branch.

Another tight spot occurred with the Credit Unions investment portfolio. At the time the investments were made the interest return was good. But with inflation today the interest wasn't enough to warrant keeping monies tied up in this type of investment.

It was decided then by the NADC Credit Union Board of Directors that help was needed. The National Credit Union Administration, which is a federal agency, was contacted. They in turn looked at 8 different credit unions which were able to help NADC. Because of its probability for growth and its proximity our union was made a branch of the Fort Monmouth organization.

What changes can we expect. For one thing an immediate increase in interest rates on savings accounts, from 6 to 6½ percent. Also because a larger base of monies is available there will be a lower interest rate on loans. Future plans call for credit cards, automated teller machines and individual retirement accounts.



## Beni Suggs

Harry Davis, PW, \$550 for suggestion titled "Recovery-heat Units Be Installed in High Hangar Bay Areas".

George W. Scheid and Guy L. Nissley, PW, \$455 to be shared equally for suggestions titled "Saving Well Water" and "Conservation of drinking water".

Robert C. Birrane, PW, \$35 for suggestion titled "Color Coding of Boiler Room Lines".

Bernard L. Coxhead, TSD, \$50 for suggestion titled "Use of Robot Interface Device".

Franklin E. Wescott, PW, \$125 for suggestion titled "Install Heat Recovery Exchanger".

David Varner, PW, \$25 for suggestion titled "Safety Release Valve".

William Stumpp, PW, \$40 for suggestion titled "Disconnect and Facilitate Supply Fan Removal".

Samuel J. Giordano, PW, \$50 for suggestion titled "Schrader Valve Access Actuator".

Elwood J. Leibrandt, PW, \$200 for suggestion titled "Development of Security Strong Rooms".

Charles E. Mayers, TSD, \$25 for suggestion titled "Use of Water Additive in Fire Apparatus Water Tanks".

Richard A. Kaufmann, CNTD, \$100 for suggestion titled "Infrared Hearing Device for Training Course".

Emanuel F. Pine, CNTD, \$25 for suggestion titled "Accessibility of Facilities for the Handicapped".

Richard H. Rowland, PW, \$65 for suggestion titled "Water Conservation".

George W. Scheid, PW, \$100 for suggestion titled "Tower Safety".

Beverly P. Pettis, TSD, \$25 for suggestion "Locating Under Floor Smoke Detector".

William G. Knebel, PW, \$25 for suggestion "Correcting Hazardous Entrance to the D. System Generator Room for the 6600 Computer".

Jacqueline M. Pine and Lynn B. Mohl, PW, \$30 to be shared equally for suggestion titled "Identification of Jogging Path/Access Road on Airfield".



# NADC Reflector

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- Subs
- Careers

Volume 25, Number 11

Naval Air Development Center, Warminster, PA

November 1981

## Dr. Lobb Receives Award From President Reagan



Dr. R. Kenneth Lobb, NADC's Technical Director from 1975 to October 1981 is congratulated by President Ronald Reagan for being selected as one of the Outstanding Senior Executive Service employees for 1981. Dr. Lobb received a check for \$20,000, the highest award possible for federal workers.

## New TD Selected

Mr. Robert S. Buffum of the Naval Surface Weapons Center has been selected to fill the position of Technical Director at the Naval Air Development Center, replacing Dr. R. Kenneth Lobb who retired in October 1981. Mr. Buffum is currently assigned to the Staff of the 97th Congress of the United States as an Office of Personnel Management LEGIS Fellow, providing counsel on defense programs to Congressman J. Kenneth Robinson (R-VA) a member of the Defense Subcommittee. As part of this Executive Development assignment Mr. Buffum was also recently assigned to the Office of the Assistant Secretary of the Navy (Research, Engineering and Systems). Buffum brings to the Center a long list of experience and accomplishments.

While at the Naval Air Test Center in Patuxent River, Buffum was the Chief Engineer of the Rotary Wing Directorate. Prior to that position he was an Automatic Flight Controls Specialist also at Pax River. From 1963 to 1969 Buffum was an Aerospace and Principal Engineer at Sperry Flight Systems in Phoenix, Arizona. There he researched helicopter handling qualities, simulation of aircraft and new automatic control systems. While at General Dynamics from 1961 to 1963, Buffum worked on stability and control analysis, simulation and automatic flight controls. From 1958 to 1959 he was a Wind Tunnel Test Engineer at North American Aviation.

Buffum holds a B.S. in Aeronautical Engineering from Wichita State University, a B.S. in Electrical Engineering from Oklahoma State University, and a M.S. in Management Science from the Naval Postgraduate School.

## The Check is in the Mail

This much used phrase takes on a more truthful meaning when you start to understand the new Financial Information Processing System (FIPS) at NADC. The check or more precisely the "checks" will amount to somewhere in the neighborhood of 45 million dollars this year, according to Joe Dugan, Head of the Cost Accounting Branch. "We now have the authority to pay bills directly. Prior to the introduction of the FIPS, paperwork was done here at NADC and then forwarded to another activity where more paperwork was done and then the bill was paid," Dugan said.

The old system lead to processing times of anywhere from 3 to 6 weeks. This new system cuts that time in half. If an urgent payment is needed it can be processed in one day. "We anticipate improved relations with the contracting community as a result of quicker check issuance," added Dugan. It's all made possible by computers. The machines integrate the disbursing and accounting functions associated with the bill paying procedure.

Several things are eliminated by using this system. For one thing thousands of vouchers that previously passed among various agencies will be eliminated. Another feature is built in that prevents the duplication of payments. Also, the system will hold on to money until the bill comes due, thus maximizing the Treasury's use of its money. Payroll, currently done by the PASS office, will be taken over by the FIPS in 1982.

The FIPS was devised to achieve a standard, highly responsive and timely financial management system through the cost effective use of automatic data processing (computer) capabilities. It establishes a single



Peg Tomlinson keys in purchase information on a new system that will simplify paying bills.

**(Continued on page 4)**

# Three cited for Research/Development Work

Three people have been singled out to receive awards for their work under the Independent Research/Independent Exploratory Development (IR/IED) program.

Dr. R. Kenneth Lobb presented plaques and letters to Yau Foon Lui, CNTD, Vinod A. Agarwala, ACSTD, and Otto Kessler, SATD. Each is working on a unique project with potential to benefit the Navy/Marine Corps community.

The basis for Yau Foon Lui's award is his excellent work on Independent Exploratory Development Project, "Investigation of Multifunction Spread Spectrum Techniques." Lui recognized that the Navy cannot afford a multiplicity of modulators/demodulators to operate with each of the spread spectrum signals presently planned for implementation. Under his project, he investigated the techniques for developing multifunction modulators/demodulators for spread spectrum signals to determine the best technical configuration for a multifunction device from the analysis of analog and digital techniques employing convolution and correlation methods. The identification of all of the user subsystems and the basics of their requirements, the potential approaches, the thoroughness with which design factors were identified, and the pure objectivity of the results are to be highly commended. His report of his effort will be extremely valuable to the Navy in many ways beyond this project.

Otto Kessler's award was based on Independent Research Project GC193 "Coherent Radar Sea Clutter Measurements." He produced a comprehensive body of statistical data on sea return to support the design of future airborne radars. Under his Independent Research Project, he organized a program to collect X-band and L-band sea echo phase and amplitude data from a cliff site overlooking the ocean. Also, Kessler prepared the test site, collected clutter and target data over a six week period, and analyzed it. It is expected that the fundamental information acquired through this project will be of far-reaching utility in the design of radars used in a sea clutter environment.

The Independent Research "Research on Multipurpose Corrosion Inhibitors for Aerospace" was Vinod A. Agarwala's work. The Navy incurs a very high annual cost and suffers a large loss in availability of aircraft because of corrosion fatigue, stress corrosion cracking, wear, and general corrosion. He explained the mechanisms involved in corrosion processes and analyzed the specific electrochemical effects that various inorganic compounds could have on these processes. Since more than one mechanism was involved, Agarwala's approach was to determine the combination of inhibitors that would prove most effective in reducing the corrosion component in corrosion assisted cracking. His work, based on an understanding of the science underlying the phenomena, has resulted in new multipurpose compounds that reduce dramatically the rate of stress corrosion cracking and corrosion fatigue in aircraft structural alloys. Steps are now underway to develop means for incorporating these compounds into corrosion protective coatings for various aluminum alloys and steels used in naval aircraft.

Naval Air Development Center

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CAPT James B., Anderson — Commander, NADC  
Mr. Carmine DeCresente — Acting Technical Director  
Joseph P. Cody — Public Affairs Officer  
David Polish — Editor



From left to right: Yau Foon Lui, Dr. R. Kenneth Lobb; retired TD, Otto Kessler and Vinod A. Agarwala pose for the camera after receiving IR/IED awards.

## What is IR/IED?

One of the biggest driving forces behind the advancement of technology is the independent work of scientists. This type of endeavor allows for the freedom to research and explore new ideas without the constraints put on by sponsors or project deadlines. Such things as LASERS, and transistors were developments of independent programs.

NADC has two programs which promote this independent type of work. They are the Independent Research (IR)—Independent Exploratory Development (IED) programs. At present about 3 million dollars each year is set aside to fund the IR-IED effort.

As proposed by the Chief of Naval Material the program is delegated to the Technical Director at NADC, to stimulate independent and original work and to

enhance competence in science and technology. Also, the projects have to be of value to the Navy.

Subjects for research and exploratory development can run the gamut of scientific study. From physical, engineering, environmental and biological—medical to behavioral—social science, the spectrum of study is broad and varied. Some of the specific disciplines for exploratory development encompass the defense related technologies of communications, detections, tracking, surveillance, propulsion, mobility, guidance, energy conversion, materials and personnel support. Each year proposals are reviewed by a panel of technical representatives on Center. After an evaluation is made, projects are selected for funding.

## Editorial: Thanks for Giving

We give thanks for many things during the year. We're thankful for our health, our happiness, our families and our friends. We do, as Americans, choose to set aside the fourth Thursday in November as our day to celebrate the bountiful life we have. Yes, there are many things not to be happy about, like high interest rates, the cost of food and clothing, etc., but we are lucky, lucky to be free to choose, free to speak, free to enjoy and free to live the way we want. These "freedoms" manifest themselves in different ways with one of them being the freedom to give. This giving takes many forms during the year including Navy Relief, the W&R Christmas Party for Orphans and the Combined Federal Campaign. Our giving, particularly to the CFC, helps more people collectively than we could ever hope to help as individuals. The money we pledge is distributed to a number of human service organizations which in turn use that money to assist and care for countless thousands all over the world. Giving gives most of us a good feeling. We usually get that feeling when we can see the reaction of the person who gets the gift. With CFC we usually don't see the people who need our help but we get that good feeling anyway and that makes it worthwhile.





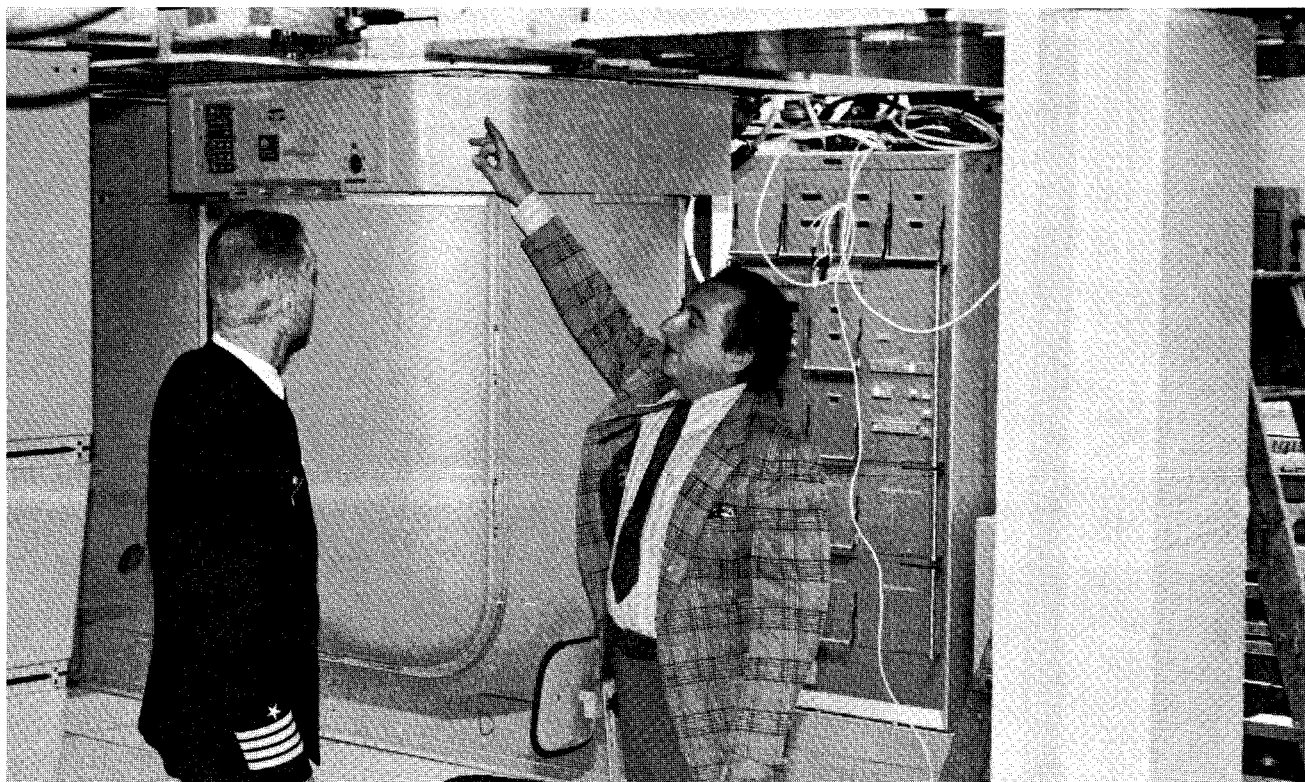
# Subs Get Help from NADC's Nav People

The USNS Vanguard with personnel from SATD sails about 200 days a year testing inertial navigation instruments that are used in Fleet Ballistic Missile submarines. Jerome Yutkowitz explained that the Vanguard duplicates the navigation systems aboard the Posiden, Trident I and Trident 2 submarines. These types of subs require the most precise navigation information available. Equipment that is on the leading edge of technology is installed on the Vanguard which was once a NASA tracking vessel.

Since 1956 the Navy has used a surface ship to evaluate and test navigation systems. Then, the Navy's Navigation Laboratory was located at the New York Shipyard. A group from the lab was selected by the Strategic Systems Project Office to oversee the FBM navigation development. Designated as SSPO-C, the "C" standing for civilian detachment, they were moved to NADC after a base realignment in 1973. At that time the USS Compass Island was used as the test-bed for navigation systems. It was decided in 1977 that a new platform was needed and the search started. Selected was the USNS Vanguard which was used by NASA to track space shots and



Captain James B. Anderson gets a Captain's eye view of the control onboard the USNS Vanguard.



Jerome Yutkowitz explains equipment spaces to Center Commander, Captain James B. Anderson.

satellites in orbit. The 600 foot ship offered the perfect platform for the type of equipment needed for navigation testing, and the size made it ideal for the number of engineers and scientists who accompany the tests.

NADC oversaw the overhaul of the Vanguard, which is a ship from the Military Sealist Command. As such, it has a civil service crew including its Captain. This Center also acts as the on-board sponsor representative for all tests and evaluations of new equipment. Sperry Gyro in Great Neck, New York is the technical manager for the Vanguard and works closely with the Navy during all trials.

An important advantage to handling all the latest FBM navigation gear on board the Vanguard is that it can go to areas where the Fleet is and evaluate any problems and help implement solutions. Recently the ship went to Holy Lock Scotland to check inertial alignment procedures and help solve some operational problems. Planned deployments include a cruise in the Pacific as well as many other trips all over the world. This floating surface lab keeps the underwater community on course and on target.

## NADCers Give Students Career Choices

As the second largest employer in Bucks County, the Naval Air Development Center is frequently requested by area school districts to support programs designed to acquaint young high school students with careers available to them following graduation. These "career nights" bring together a representative sampling of both professional and non-professional workers in numerous fields to counsel students on the educational and experience prerequisites for entering different careers. Representatives from each career area also try to provide students with predictions of future job availability and realistic salary expectations.

Dozens of NADC employees participate annually in such programs, either to assist their own school district or at the request of the Public Affairs Office to assist another area schools. Mr. Al Hellman, Head of the Aircraft and Crew Systems Technology Directorate's Protective Clothing and Devices Branch, and Dr. Bruce Steinberg from SATD's Acoustics Processing Division recently represented NADC at a career night held for students of the Council Rock High School in Newtown. In addition to providing a community service, participation in "Career Nights" by NADC employees can highlight the importance of the work done at this Center for future experts in engineering, computer science, etc. and serve to enhance the Center's long-range recruiting efforts. "I have been attending these functions at Council Rock for about six years," said Hellman. "We have just recently made arrangements at the Center to bring on board an



Al Hellman demonstrates life support gear to Council Rock High School students.

engineering co-op student from Drexel University who, as a sophomore, received his first introduction to NADC from one of my Council Rock visits."

The Naval Air Development Center recognizes its position of leadership in this community and encourages

its employees to participate in civic activities of this type. If you possess the time and inclination to help provide the foundation which will enable students to make important career decisions, contact the Public Affairs Office.

## Commander Salutes

Anthony Madera and LT Daniel J. Paterson, SATD, both for their briefings to representatives from Patrol Wing Eleven.

Thomas Milhous, ACSTD, for his assistance to the Advanced Aircraft Armament System Technical Program Office.

Scott Cote, ACSTD, for his participation in the 17th Joint Propulsion Conference.

John J. Keane, Paul S. Haas, Peter N. Van Schuyler, David W. Harrison, Gabriel J. Potocsky, William A. LaBarge, Alfred M. Karalus, also Robert M. Balonis, Robert Gindhart, Lester B. Hanson, Thomas B. Gabrielson, Leland W. Sprunger, Joseph M. McCandless, John S. Sniscak, John D. Taylor and Stephen Lanchak, all of SATD, for their support and assistance during the at-sea testing of the Long-Life Commandable Vertical Line Array DIFAR sonobuoys.

LCDR Raymond M. Umbarger and Richard A. James both of DCP for their seminar conducted on NADC's role in the LAMPS MKIII program given to the Naval Post Graduate School.

LCDR Richard E. Koehler, DCP, for hosting the Canadian CF-18 staff visit.

Marvin Schulman, ACSTD, for his briefings on ejection seat technology given to Captains Bekeris and Roos from the Aerospace Engineering Test Establishment Alberta Canada.

Dr. Malcom Cohen, Mary Lou Cohen and Diane F. Kurz all of ACSTD for their support to the Tri-Service Working Group for Biodynamics.

All those who participated in Operation Danny Boy.

Barbara Kempf, Command Administration, for her organization of the Second Annual Secretarial Workshop.

## Letter to Center Helpers

On the 26th of October after a very difficult day with on-the-job, people, and mechanical problems, I felt that I reached the ultimate when I walked out with someone I promised to drive home to find that I had a flat tire!

Considering the weather, I decided not to call Keystone but my husband who I hoped would be home. First to find a way home for Claire Bayer who I offered to drive home. Luck was with us when we found Al Spector in the lobby. He was kind enough to take her home.

After a few trying calls on the phone—a local call for which I was asked 25¢, even getting the operator and asking that my call be charged to my home phone did not work. I finally used the next phone booth, deposited my dime, got through to my husband and felt a little less frustrated. The end of my problem was not reached yet; the tightened lug nuts were almost impossible to get loose. Trying to keep the umbrella over my irate mate and getting out of his way when he tried a number of ways besides brute strength to loosen the nuts was adding to my woes . . . when along came Don Meadows in a Navy Van to our rescue. The tire was changed and three very damp people left the scene.

So, we SALUTE!

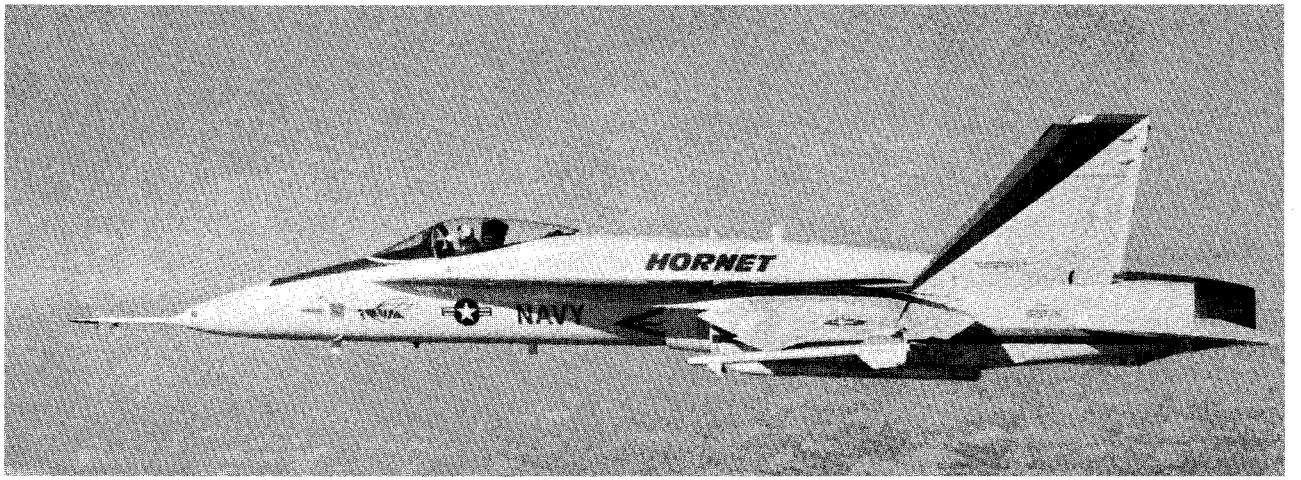
Joe & Freda Larkin

P.S. I just felt I wanted someone to know about how really great people can be.

## Workshop Success

NADC's second annual Secretarial Workshop was held in the Center Auditorium as part of Federally Employed Women's (FEW) Week. The purpose of the workshop was to give women the opportunity to polish up their skills and explain career development options. Barbara Kempf organizer of the workshop explained that since the response was so great last year an enlarged program would be offered this time. About one hundred employees heard presentations on time management, extension correspondence courses and sexual harassment.

## The Roar of Freedom



When you hear the roar of our aircraft  
Soaring into the sky,  
You are hearing the Roar of Freedom—  
Freedom for you and I.  
Freedom to choose what you want to say.  
Freedom to choose where you work and where  
you play.  
Freedom to choose the way that you pray.  
So rejoice in your roar of freedom each day.

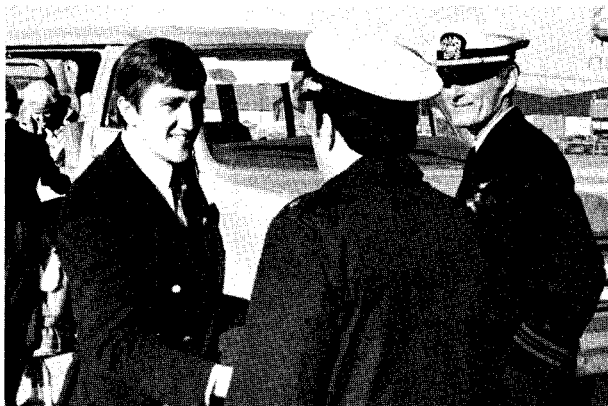
by Paul Devlin

In appreciation to the personnel of the Naval Air Development Center who have dedicated themselves to the continual refinement of naval aircraft.

## Public Affairs Information

Recently there have been several conflicts in the scheduling of the Center Conference Room and the Center Auditorium. When reserving either of these two rooms please clearly identify the room you are requesting. Every effort to keep conflicts at a minimum will be made by the Public Affairs Office, x3067.

Maps, hotel listings, restaurant listings and other general information are available in the Public Affairs Office. This material can be obtained by calling Public Affairs on x3067.



## SecNav Visits

Navy Secretary John Lehman stopped at NADC to board a plane headed for Washington. Shown greeting the secretary are CDR Bart Corgrati and LCDR David Rainsberger.

## Craft Fair

The NADC Officers Wives Club is having their 2nd Annual Craft Fair 19 and 20 Nov. 1981 from 1000 to 1400. Christmas decorations, ceramics, jewelry, leather goods, macrame and other handmade items will be on sale in Hangar Bay One as well as baked goods and a raffle for an Atari Video Game. Start your holiday shopping early and support the Wives Club charities.

## (Check continued)

document file for accounting and disbursing transactions, eliminating the storing of duplicate documents. The system currently handles Navy Industrial Fund (NIF) monies and the accounting work for the Patent Office here at NADC. Dugan said it took 6 months of hard work by his people, Supply and Public Works, to set up the FIPS and make it work. A lot of extra effort will now pay off in the future, giving NADC a smooth and fast accounting/dispersing system.

## New Titles

Following is a partial list of books recently added to the Technical Information Branch. Visit or call your library at x2541 to inquire about these books.

### AVIATION & SPACE TECHNOLOGY

"Aircraft dynamic stability and response" A. W. Babister TL574.S7B19 1980

"Voyage to Jupiter" D. Morrison TL799.J9 M6 1980

### COMPUTER SCIENCE

"Problem solving and structured programming in PASCAL" E. Koffman QA76.73.P2K63

"Program design and construction" D. A. Higgins QA76.6.H528 1979

### ENGINEERING

"Concepts in thermal comfort" D. Egan TH6021.E4

"Handbook of air conditioning, heating, and ventilating" E. Stamper TH7687.S76 1979

"Handbook of controls and instrumentation" J. D. Lenk TS156.8.L45 1980

"Modern communication principles, with application to digital signaling" S. Stein TK5101.S695

"Modern control systems" R. C. Dorf TJ216.D67 1980

### MANAGEMENT

"Organizational behavior" F. Luthans HD58.7.L88 1981

### MATERIAL SCIENCE

"Electrochemical corrosion testing" TA462.E53

"Molecular basis of transitions and relaxations" QD380.M64

"Symposium on Fatigue Crack Growth Measurement and Data Analysis" TA409.S89 1979

### PHYSIOLOGY

"Textbook of work physiology" QP301.A23 1977

### TYPING

"College typewriting" S. J. Wanous Z49.L6233 1980



# NADC Reflector

Volume 25, Number 12

Naval Air Development Center, Warminster, PA

December 1981

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- Best
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## Party Tips From Super Safety

by Mike Masington

Arnold Funguy, self styled jet-set swinger and connoisseur of vintage Ripple, T-Bird and other fine wines, was throwing his annual Christmas party. Anyone who was anyone in scenic, downtown Warminster was there including the scion of safe celebrations, Super Safety.

The Christmas cheer was flowing like a ruptured distilling vat as Arnie kept "forcing" drinks on his guests to lift their spirits (which if lifted any farther would require TACAN and radar).

Super watched the proceedings, knowing that problems would be developing shortly. Although he too was drinking, he quietly limited himself to one drink per hour. This he had learned was the amount of alcohol the average person could safely consume without impairing their ability to drive.

About 2:00 a.m. the party began to break up and the real fun began. Leroy Lush lurched toward the large, red door knob and gave it a hearty twist and yank. It was then he noticed that the doorknob had a pair of nostrils, and was in fact the nose of one Stanley Stoned. Stan, taking the incident in normal good humor, swung a lamp at Leroy's head and accidentally knocked Mrs. Van Trashed into the nearby punchbowl. (Her entry was superb however, and she was awarded a 9.7, 9.8, 9.8, 9.6 by an impressed panel of judges).

At this point Super could stand no more and he quickly collared Funguy.

"Arnie, you can't let these people drive home this way," he shouted.

"Oh, they're fine, Supe," answered the barely ambulant Arnie, "you just worry too much."

Bobby Bombed was now attempting to crawl out the door since the altitude at standing level was more than he could take. Pointing him out, Super continued.

"You call that fine? Not only can't he drive, he can't even stand. In fact I'm surprised he can still breathe! Arnie, when you have a party you have a responsibility to your guests not only to provide a good time, but also to insure they get home safely."

"Pushing drinks on people may make them happy, but it also endangers their lives. If they do become drunk, you should do everything possible to make sure they don't attempt to drive. Have a sober friend give them a ride home, and they can pick up their cars the next day. Or call a cab for anyone unfit to drive."

"If they're really bad have them sleep over if necessary. Finally, about an hour before the party ends cut off the booze and start serving coffee. It won't sober your guests any faster, but at least they'll stop drinking, and it may help them to stay alert."

Seeing the error of his ways, Arnie started the coffee, got everyone back in the house and made preparations to have them taken home. Leroy and Stan mutually apologized. Bobby Bombed eventually regained the use of his legs, and Mrs. Van Trashed was awarded the Warminster Gold Medal for Free Style Punchbowl Diving.

## Holiday Message

Everyone's family is in their thoughts and hearts at this time of year. Some families are far away and others live around the corner. NADC in a sense is a family, a rather large one, but still a family. Our people, their dedication to the Center, the Navy and our country, make NADC an organization we can all be proud of. Your efforts in making NADC a recognized "Center of Excellence" are much appreciated. We thank you all for your service during the past year and wish you and your loved ones a safe and happy holiday.

*James B. Anderson*  
*R. A. Strange*

## NADC Adds Its Expertise to New Trainer



This Hawk aircraft is similar to what the U.S. Navy's new trainer will look like.

The Navy is about to embark on a new phase in its pilots training program. A new training system which includes simulation, classroom material and a new aircraft has been selected by the Navy. NADC played an important role in leading and supporting the process that led to the adoption of the McDonnell Douglas/British Aerospace Hawk. Al Spector, SD, heads the Center's effort on the Advanced Jet Training System or VTXTS.

For NADC, Spector explained, it started in 1975 when the Navy recognized the need for a new trainer to replace the T-2C and TA-4J aircraft. Since it was known that the

lead time from idea to reality is about 8 to 10 years and the aircraft at that time had about 11 years left of useful service life, an effort to combine the two aircraft was started. The T-2C at that time was used as the intermediate jet trainer. After mastery of the T-2C's characteristics a student would move up to the higher performance TA-4J. By trading off some traits from each aircraft a single trainer could satisfy the Navy's needs. This approach would save maintenance time, cut down on parts inventory, conserve fuel and allow the incorporation of new ideas for training.

Workshops were held at the Center to gather information from a number of commands. Mr. Spector stated that the Chief of the Training and Education Command, the Naval Air Training Command, the Naval Training Device Center and the Air Force all participated in design reviews. Using the information generated from the reviews, a preliminary design study was issued in 1976. "As a result of this study it was recognized that the problem was not so much the replacement of two aircraft, but the entire methodology of training had to be revised," Spector said.

At this point the program began to get large. The Naval Air Systems Command saw the need for complete training and restructuring and thus established an AIR Project Coordination Office (APC). More studies were done, resulting in a competitive contract for a preliminary system design. Six contractors were chosen to compete: McDonnell Douglas, General Dynamics, Northrop, LTV, British Aerospace and Dussalt/Dornier. At that time the APC was transferred to a Program Office at NAVAIR (PMA 273).

Next a conceptual design contract was let. A demonstration/validation proposal was submitted to initiate the pre-full scale development phase which included alternatives to produce the new training system by the 1987/88 time frame. At this point the competitors were narrowed down to just one McDonnell Douglas/British Aerospace.

NADC now is supporting NAVAIR in several areas related to the VTXTS. The Center helped evaluate energy saving aspects, costing of engines, software for the aircraft simulation and training, human factors and structural analysis. We also maintain a management information tracking system for all Navy activities involved in the training of pilots.

The airplane with all of its supporting software and equipment will become a common sight within the Navy community. NADC was there from the start and will be there the next time the Navy needs a new trainer.

# Remembering Pearl Harbor



Center Commander, Captain James B. Anderson addresses Pearl Harbor survivors group on the deck of the USS Olympia.

Address by  
 Captain James B. Anderson, USN  
 Commander, Naval Air Development Center  
 Pearl Harbor Survivors Association, Inc.  
 Liberty Bell Philadelphia, Chapter No. 1  
 On Board USS Olympia

In the months preceding World War II, there were sweeping and violent changes taking place in the world: Nazi Germany was at war and well on its way toward conquering the entire European continent; Japan had developed a formidable war machine and was extending her influence in the Western Pacific. All the while, there were influential Americans vociferously advocating an isolationist policy for the United States. Although our industry had mobilized to a limited extent to support Lend Lease, the national sentiment was to stay out of it.

You may recall that in 1941 a congressional bill to continue the draft passed by only one vote. That one issue typified our mood at the time. Stay on the sidelines; don't get involved. In short, we were a house divided; we lacked resolve.

But forty years ago today, to this hour, we suddenly became involved. War came to us, like it or not.

News of the Japanese attack on Pearl Harbor travelled fast. Americans across the continent were shocked into reality. It was a day they would never forget. Nearly every American alive at the time can describe how he or she first heard the news. We marked the moment carefully, carving out a sort of mental souvenir, for instinctively, we each knew how much lives would be changed by what was happening in Hawaii.

The next days and weeks after the attack on Pearl saw a tremendous growth in the National Will . . . an overwhelming patriotic spirit and national resolve. President Roosevelt's famous "Day of Infamy" speech was over in six minutes and war was voted in less than an hour. "Remember Pearl Harbor" were the words that welded the country together and focused us on the single objective of unconditional surrender by the enemy. Young men volunteered for military service, factories mobilized for production of ships, tanks, planes, guns, and ammunition. Rosie the housewife became Rosie the Riveter in order to keep production lines open 24 hours per day and our combat troops supplied. Those days, months, and years were difficult for all of us, but we were sustained time and time again by the words, "Remember Pearl Harbor." And we won.

Even today, the belief in the ability of the American Will, that indomitable American Spirit, to overcome any difficulty has its foundation in the example provided by men and women like you forty years ago—at Pearl.

As a Nation we have relied on that Will to see us

through countless troubled times. It also provided the impetus to excel as exemplified in our space program.

Today, this country and its Navy face another challenge, requiring the same staunch display of National Will. We must rebuild our strength on the high seas.

In the words of the Secretary of the Navy, the Honorable John F. Lehman, our United States is an "island nation" in every sense but the geographic. We import and consume more raw materials than any other country on earth. On some of these materials, such as fossil products and certain metals, we are dangerously dependent. Fully a third of U.S. business profits are derived internationally. Of more than 40 allies all but two lie overseas. And over 90 percent of all of our trade must travel by sea. In other words, this means that the free use of the seas is absolutely vital to our existence: for resources, for commerce, for the resupply and reinforcement of our allies and our own forward-deployed forces, we must have access throughout the world's oceans. In spite of this, America has slowly allowed its Naval strength to deteriorate. Forty years ago the U.S. Navy had 819 ships. Fifteen years ago, we had over 900 ships with 24 aircraft carriers. Today we have a total of only 536 ships with only 12 deployable carriers. The Soviet Navy, on the other hand, has evolved during the same period of time from a small coastal defense force to a modern, bluewater, globally deployed Navy of 1700 ships. And for what purpose? They have no need for such a Navy to protect the livelihood of their relatively self-sufficient empire. The logical answer to that question is: the denial of access to the sea by others.

This condition seriously detracts from our ability to manage crises; it weakens confidence in the United States abroad; it endangers our friends and allies and it poses a danger to our own security as great as any we have faced since World War II.

But there is hope, for there seems now to be a new spirit—a resurgence of that National Will—demanding that our maritime posture again be appropriate to our status as a world power and leader. The Secretary of the Navy is planning a Fleet of 600 ships with 15 Battle Groups by 1989. The goal he has set is not parity, but control of the seas sufficient to maintain vital U.S. interests in the world.

Not long ago it seemed that we had forgotten the lessons of that terrible world war; that strength and readiness are the only real deterrents; that a strong Navy is as important today as it was in the past. Today, it is obvious that America has now recalled these important lessons. We are revitalizing. We are renewing our traditional American character. And we are again becoming strong and filled with resolve. We are remembering Pearl Harbor.

## Letter to Editor

While reading the November issue of the Reflector, I realized that there is some confusion in terms of the Federal Women's Program and Federally Employed Women. The article stated that the second annual Secretarial Workshop was a part of FEW week. In fact the week which included the workshop, films, a play and the Awareness Luncheon, was sponsored by the Federal Women's Program, a special emphasis program, located in the EEO Office (Equal Employment Opportunity), here at the Naval Air Development Center.

The women employed here are fortunate to have the FWP (Federal Women's Program) and FEW (Federally Employed Women) whose main interest is the advancement of women. I'd like to take this opportunity to salute both and to give you a little history of the relationship between the two groups.

The Federal Women's Program (FWP) seeks to enhance opportunities for the hiring, training, and promotion of women in every area of the Federal service. As an integral part of the overall Equal Employment Opportunity Program, it is administered by the Office of Personnel Management. Each Federal agency has an FWP manager, full time or collateral. In addition, many agencies have an FWP Committee. The Naval Air Development Center has a committee. The manager acts as the agency's contact point, source of information and advisor to the head of the agency on matters involving the employment of women. The FWP covers all civilian Federal employees, but there is no formal membership among Federal employees.

Federally Employed Women (FEW) is a private organization similar to the League of Women Voters, National Organization of Women (NOW) or the NAACP and is concerned with goals similar to those of the FWP. The organization has a specifically defined membership, a national governing board, and local chapters around the world. One joins FEW by paying dues. There is no conflict between FWP and FEW goals and objectives. Rather through team effort, achievement of mutual purposes will be facilitated. The FWP supports the general purposes of FEW aimed at actions to eliminate sex discrimination in employment in the Federal Sector.

Zinzinita L. King  
 Federal Women's Program Manager

## Corrections

The December Reflector article "Subs get help from NADC's Nav People" incorrectly identified the Directorate responsible for Navigation Research at NADC. That Directorate is CNTD. The work highlighted in the story is sponsored by the Strategic Systems Project Office, detachment C. And Captain Sinski, seen in the photo with Capt. Anderson is Master of the USNS Vanguard. Many apologies for these errors. Ed.

Naval Air Development Center

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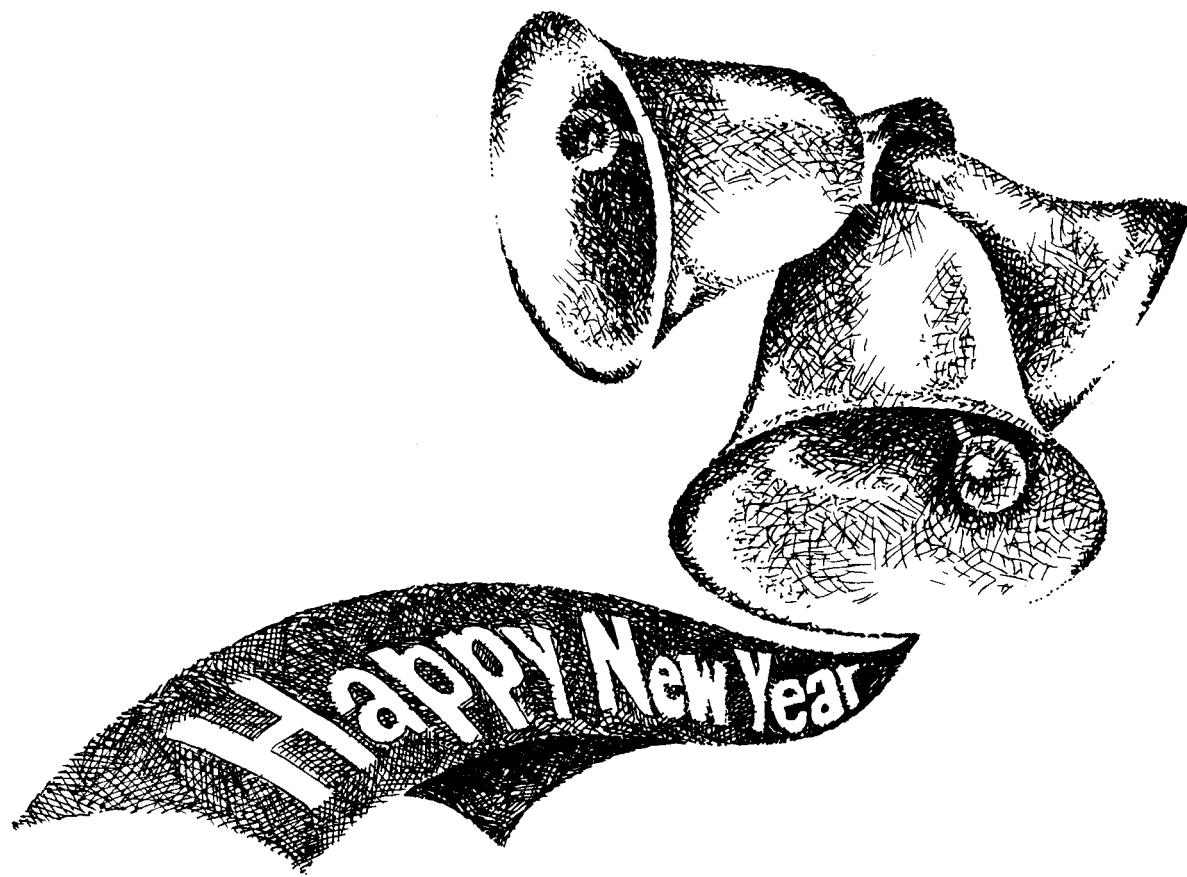
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CAPT James B. Anderson — Commander, NADC  
 Dr. Rudolf A. Stampfl — Acting Technical Director  
 Joseph P. Cody — Public Affairs Officer  
 David Polish — Editor





## Best Paper Awards

NADC people garnered two Best Paper awards recently. At a symposium for New Aircraft Technology held at Wright-Patterson Air Force Base in Ohio, over 400 attendees from the Navy and the Air Force heard 112 presentations on a variety of subjects. Topics that were covered included: Flight vehicles, weapons propulsion and life sciences. In the electronics category Greg Catrambone SATD received the Best Paper Award. For the Best Paper in the Materials area Len Buckley, T. Donnellan and R. Trabocco all of ACSTD won with their presentation on epoxy resin for composite repair.

# It's Cold Outside But You Can Still Run

by Sylvia Wasyluk

In case you haven't noticed, winter is here. With it comes cold and snow, and people tend to remain inside and eat big holiday meals rather than get out and exercise. I am hoping to remind some people who usually pursue the aforementioned activities that it is even more important to get out and exercise during the winter months. People in good physical condition can handle the cold better and are less susceptible to colds and flu. So please don't let the weather slow you down. You might want to consider some seasonal activities like skating and skiing, or increase your indoor activities by joining the "Y" or participating in a local parks and recreation or high school indoor open gym program. I'm sure that there are other indoor athletic endeavors that you would be interested in trying. But for those who plan to continue running, the remainder of this article is for you, compliments of Dannon Yogurt and LCDR White of Crew Systems. Have fun!

The onset of winter needn't bring a seasonal halt to a runners' enthusiasm or routines. Actually, it's easier for runners to protect themselves in cold weather than in hot, when heat and humidity reach certain levels that make running difficult or impossible. With some adjustments, running is possible even in the extremes of cold, wind, ice and snow.

Of course, when wearing 5-10 pounds of clothing and

running on icy or snowy surfaces, one's pace may have to be adjusted (the added resistance more than compensates for the slower pace). You may have to adjust to running less frequently for a while. However, if you keep the following suggestions in mind, you shouldn't have any trouble.

1. Wear clothing in layers—you can always remove a layer if you get too warm. Also, experiment with different materials—wool works best because it "breathes" (the sweat is taken away from your body, but the material still keeps you warm).
2. If you plan a long run on a cold day when you would be wearing multi-layered clothing, it is advisable to lubricate yourself with petroleum jelly in those areas likely to rub.
3. The fingers and toes are areas with the smallest blood supply, so they must be protected. Gloves or old wool socks (or mittens in extreme conditions) work over the hands. In wet, snowy or extremely cold conditions, it may be advisable to wear two pairs of socks on your feet (if you can do so without causing blisters).
4. A significant (up to 40%) amount of body heat is lost through the head, so wear a stocking cap. In extremes of cold and/or wind, a ski mask may be used to keep the face and nose warm. Coating your

face with petroleum jelly will also help keep this area warm and keep the skin from getting chapped and windburned.

5. How much to wear on the legs is a matter of preference, but never more than a pair of long underwear and a pair of sweat-pants (in addition to your regular running shorts) are needed.
6. Wear *dark* clothes to contrast against snow, unless you are running at night when you would wear *light* colored clothing.
7. Plan your runs so that you run into the wind during the beginning portions and with the wind behind you in the later portions. Otherwise, built-up sweat may cause you to become too cold when you turn into the wind.
8. Be extremely cautious of traffic on icy and snowy roads. Also, when running on snow try to pick areas which will not hide uneven terrain.
9. Let someone know where you are going and when you expect to return.
10. Keep in mind the wind chill chart which follows.

If you dress properly and are cautious in various weather conditions, running in winter can be as productive and enjoyable as during any other time of year.

### EQUIVALENT CHILL TEMPERATURES

Wind (MPH)	Temperature (Fahrenheit)																				
	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-60
5	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-65	-70
10	30	20	15	10	5	0	-10	-15	-20	-25	-35	-40	-45	-50	-60	-65	-70	-75	-80	-90	-95
15	25	15	10	0	-5	-10	-20	-25	-30	-40	-45	-50	-60	-65	-70	-80	-85	-90	-100	-105	-110
20	20	10	5	0	-10	-15	-25	-30	-35	-45	-50	-60	-65	-75	-80	-85	-90	-100	-110	-115	-120
25	15	10	0	-5	-15	-20	-30	-35	-45	-50	-60	-65	-75	-80	-90	-95	-105	-110	-120	-125	-135
30	10	5	0	-10	-20	-25	-30	-40	-50	-55	-65	-70	-80	-85	-95	-100	-105	-115	-120	-130	-140
35	10	5	-5	-10	-20	-25	-35	-40	-50	-60	-65	-75	-80	-90	-100	-105	-115	-120	-130	-135	-145
40*	10	0	-5	-15	-20	-30	-35	-45	-55	-60	-70	-75	-85	-95	-100	-110	-115	-125	-130	-140	-150

Little Danger

Increased Danger  
(Flesh may freeze within one minute)

Great Danger  
(Flesh may freeze within 30 seconds)

\*Winds above 40 MPH have little additional effect.

## Commander Salutes

Michael Herskovitz, ACSTD, Jackie R. Benner, and Ida Briggs, TSD, Tom Ames, PW, Tom Massey, SCD, Chris Taylor and Jim Nycum, ESG, all for their support during Energy Awareness Week.

Gerard Goulet, SCD, for his participation as Chairman of the EEO Committee.

Roland A. Bender, Edwin S. Gernant, Malcom I. Dickinson, Charles D. Pizzichello, Emil Garkav, Lawrence Coar, Gerald D. Toland, Terry A. Shepherd, and Michael V. Mele, all of SATD, for their outstanding performance in the development of Active Multiple Ping Sonobuoys.

Craig S. Jencks, PAR, for his briefing given at the Naval Postgraduate School.

Eugene R. Locuniak, TSD, Frank Drummond and Sidney J. Barber, Supply, all for their support given to the 1981 Technology and Business Opportunities Conference.

Arthur A. Krol, SATD, for his participation on the technical team that evaluated the ASPJ/CPMS.

Anthony Manno, ACSTD, for his presentation on Structures Repair given to the Joint Technical Coordinating Group on Aircraft Survivability.

Peter Santi, SATD, for his coordination of briefings given to the ASW Weapons and Fire Control Subcommittee.

William G. Seeman, ACSTD, for his participation in the Firebolt Critical Design Review.

All Center employees who assisted with the implementation of the Basic Performance Appraisal Program.

## Beni Suggs Total \$2175

Robert P. Bollard, SATD, for suggestion titled "A Custom IC for the AN/SSQ-75 Sonobuoy". \$1725 Award.

Rosemary H. Watts, Comp., for suggestion titled "Improved Sorting of Command Projects DWUPS Report". \$425 Award.

Karen O. Byrd, Command Safety Office, titled "Fire Extinguisher Protector". \$25 Award.

## CFC Over the Top



Mack Cox presents a check from employees of Lockheed's office, for \$350 to Captain Anderson on behalf of the CFC. This years total was \$74,986.55. Ann Witt and CFC Chairman John Lane look on.

## Patent Infringement Makes News

In an unprecedented action, the United States Government is suing Telectronics Ltd. of Wisconsin for infringement of Navy-owned U.S. Patent which discloses a system for expediting the healing of bone fractures and bone defects. The patent has been exclusively licensed to Zimmer, U.S.A. Inc.

The patent in question covers an invention made in the early 1970's under a Navy contract with the Medical School of the University of Pennsylvania. It was licensed under a new program designed to give additional incentives to the private sector to develop commercial markets for inventions made primarily for governmental purposes. In consideration of the license, Zimmer



Haig Here! Secretary of State Alexander Haig stopped at the Center while he was on his way to receive the Freedoms Foundation award. Acting Chief Staff Officer CDR Corgnati greets him.

## LDO Program Action

The LDO aviator program was established in 1980 to assist with the pilot shortage, enhance pilot production in the training command, and provide upward mobility for navy enlisted personnel. The success rate for the first group of flying LDO's has been excellent and the first graduates of the program are expected to be commissioned as LDO ensigns and receive their pilot wings in February/March 1982.

Candidates for this program must meet the following eligibility criteria:

- A. Be a citizen of the United States.
- B. Have completed at least four years of active duty as of 1 July 1981.
- C. Be serving as a petty officer second class, petty officer first class, or chief petty officer (pay grades E-5 through E-7) on 1 July 1981. There is no time-in-grade requirement.
- D. Be under 30 years of age as of 1 July 1981.
- E. Have successfully completed at least 60 semester hours, or 90 quarter hours, at an accredited college or university or possess a service-accepted equivalent.
- F. Have a minimum academic qualification test/flight aptitude rating (AQT/FAR) score of 3/5.
- G. Meet the physical standards for candidates for flight training (student naval aviator). Academic qualification test/flight aptitude rating (AQT/FAR) examinations should be ordered by phone or message from commanding officer, naval aerospace medical institute, Code 111, Naval Air Station, Pensacola, Fl. Phone results should be directed to commercial (904) 452-2516/2187 or Autovon 922-2516/2187, when ordering exam, specify for LDO (aviator) program. Exams should be ordered, administered, and returned at the earliest practicable date to ensure the availability of the test scores prior to submission of individual applications.

Application deadline for this year's program has been extended to 24 December 1981. Eligible candidates will be considered by a selection board which will convene on 18 January 1982. The names of those selected will be promulgated by message.

incurred considerable expense in market development and in obtaining Food and Drug Administration approval.

The complaint filed in the suit alleges that Telectronics' willful infringement of the patent is undermining the Navy's commercial licensing program, and seeks an injunction and treble damages.

According to Henry Hansen, NADC Patent Counsel, the Navy owns about 10,000 unexpired patents of which 75 have been licensed. Seven of the licenses are on inventions made by NADC employees and relate to anti-corrosive coatings and decal removers originally developed for use on naval aircraft.

## Data Exchanged

by John DeMatteo

The Fifteenth Joint Services Data Exchange for Inertial Systems was held at the Marriott Hotel in Philadelphia, PA on 17-19 November 1981. This location was selected with the express purpose of having the conference attendees tour the Navigation and associated facilities at the Naval Air Development Center. The conference attracts an international audience and as the name implies, is a forum for cooperative technology and information exchange amongst various government services, manufacturers, developers, consultants, airline and international agencies who compose the inertial equipment community. Inertial Navigation Systems (INS) are used to provide vehicles with position (latitude and longitude) velocity and attitude (heading, roll and pitch) information.

Each year the conference is sponsored by one of the participating DOD activities; Army, Navy or Air Force. This year it was the Navy's turn and the selected sponsor was NAVSEA 61Y3. As is the custom, industry acts as the co-sponsor and this function was provided by the Sperry Division, Sperry Corporation. The Naval Air Development Center served as the coordinating activity. In this role, the Public Affairs Office attended to the many administrative details and arrangements, related to the conference as well as the tours of this Center. The Communication Navigation Technology Directorate (Code 40) setup a Navigation display outside the conference room which included a video tape of Center's Navigation Programs and facilities.

This year's conference theme, "INS Challenges and Opportunities", was intended to stimulate the inertial equipment community to resolve present problems, meet future requirements and to share available opportunities as a result of technological improvements and breakthroughs being made. The conference was opened by the Chairman M. Novak of NAVSEA 61Y3. Consistent with the theme, the keynote speaker, CAPT William Nelson, HQ NAVSEA, who was introduced by CAPT R. A. Fidler of NAVAIRDEVCON, reviewed current fleet requirements and his projections into the future and challenged the navigation community to develop cheaper, accurate, rugged and easier to maintain inertial systems.

The format of the conference included four sessions consisting of formal technical presentations on new technology, general interest items, international subjects, and Navy, Army and Air Force requirements; and a formal workshop made up of mini-presentations and audience participation on specific problems. The major topics included: unconventional sensors, marine strap-down systems, land navigation, hybrid systems, life cycle costs and high accuracy systems. The INS requirements session was conducted by having an interchange between a representative speaker from the participating DOD speakers and a panel consisting of prominent contractors from the navigation community. Many interesting ideas were discussed such as renting versus buying inertial navigators and reliability improvement warranties (fixed price repair and support based on an agreed to Mean Time Between Failure of the inertial navigator equipment).

NADC provided a chairman to one of the four sessions and presented three technical papers. Tom Sanders, Deputy Director of CNTD, acted as chairman of the session on Marine and Missile Navigation Technology and papers presented by Code 402 personnel included: "Strapdown INS—Surface Ships and RLG Submarines" by Robert Hibbard, "Nuclear Magnetic Resonance Gyro Development" by Francis Karwacki and "Strapdown Accelerometers, INS Aircraft" by David Morris.

As noted above, the subjects were many and varied, however, it was generally agreed that major emphasis is being placed on the Ring Laser Gyro (RLG) Strapdown System on which NAVAIRDEVCON has conducted pioneering research and development efforts for the last eight years.

The conference was concluded with a tour of the NAVAIRDEVCON facilities including the Inertial Test Facility, Ships Motion Simulator Facility and the Human Centrifuge.

The conference was attended by approximately 180 people including representatives from France, Germany, Japan, Australia and England. It was generally agreed that the conference had been very successful and rewarding.