Naval Aviation
NEWS

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NAVAL AVIATION NEWS

SIXTIETH YEAR OF PUBLICATION

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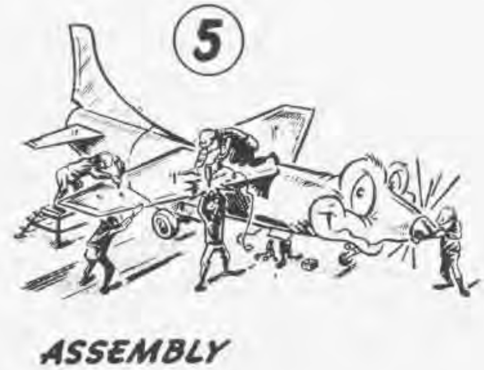
COVERS — This month's cover photos were taken last fall at various air shows. NANews' Bill Bearden filmed Blue Angel action at NAS Patuxent River's Air Expo 77, front. Back cover views, top to bottom, include Bearden's Blue Angel takeoff maneuver at Patuxent; Captain Ted Wilbur's flight line at Golden Wings Over Richmond; PH1 John Sheppard's Blue Angel flight line at NAS Miramar; and PH1 John Borovoy's view of Ben Hall's F-86A at NAS Whidbey Island. Borovoy also caught the gear coming up on this division launch at Whidbey Island.

editor's corner

Serious Sequence. It's not easy to add 96 months to the life span of a *Phantom*. NARF North Island uses an eight-step process in the service life extension program for RF-4Bs and F-4Js. These views, by NARF's Wes Curtis, give an idea of what SLEP is like. (For a serious look at *Phantom* SLEP, see page 3.)



Naval Aviation NEWS did you know?

Longer Life Accustomed to putting new airplanes through the test and evaluation wringer, the Naval Air Test Center has been asked to put some old ones through the same wringer, after they've been dipped into a fountain of youth. The latter is the service life extension program (SLEP), a let's-make-them-last-a-little-longer project designed to add 96 months to the oldies' life span.

Two versions of the *Phantom,* the Marine Corps' aging RF-4B and Navy's fleet-weary F-4J, are slated to be funneled through NARF North Island which, like the other five rework facilities, is an experienced hand at taking oldsters and turning them into youngsters.

In a normal refurbishment, an aircraft is stripped and cleaned, disassembled and repaired, and then put together again with most of the same parts. In SLEP, both *Phantom* versions will receive all new wiring and some structural strengthening. Each will receive separate personal updating. The RF-4Bs will be given some new avionics, including the latest automatic carrier landing system, a new infrared detection system, new side-looking radar and a new navigation system. (For a less than serious view of *Phantom* SLEP see Editor's Corner, page 2.)

The F-4Js' major change will be the addition of leading edge slats on the wings to increase their high-angle-of-attack capabilities. "They will be redesignated F-4Ss after the slats have been added," explains LCdr. Bob Randall, NATC's F-4S program officer. "This isn't going to put the *Phantom* into the same class as the F-14 or F-18, which are designed to stand up on their tails and fight, but it is going to let the pilot push it a little further before the airplane wants to depart controlled flight."

The extensive changes are the reasons NATC will put the *Phantoms* through much of the same test and evaluation given new airplanes. Together, NARF and NATC should be able to provide the fleet with a product it can live with a little bit longer.

Eisenhower Commissioned The Navy's newest nuclear-powered aircraft carrier, *Dwight D. Eisenhower* (CVN-69), was commissioned October 18 at Norfolk, Va. Named for the late president, *Eisenhower* is the Navy's third nuclear carrier, joining *Enterprise* and *Nimitz.*

CVN-69 is 1,092 feet long and 252 feet wide. Her flight deck area covers four and one-half acres. The ship displaces over 94,000 tons, can accommodate more than 6,000 crew and air wing personnel, has four catapults, and is capable of speeds in excess of 30 knots. Because conventional propulsion fuel storage is not required, the newest flattop can carry 70 percent more aviation and escort fuel, 50 percent more aviation ammunition, and has berthing and ship facilities to support 50 percent more air wing personnel.

Ike is protected by extensive use of armor and an improved anti-torpedo hull. She has increased offensive and defensive capabilities, due primarily to the high-speed steaming endurance provided by two nuclear reactors which are expected to supply more than 13 years of normal operation before refueling.

Eisenhower's post-commissioning schedule calls for a brief at-sea period for flight deck certification, damage control training during a cruise to Guantanamo Bay, and post-shakedown activities at the Norfolk Naval Shipyard before deployment in late 1978 as part of the Atlantic Fleet. Her first commanding officer is Captain William E. Ramsey. The ship will be home-ported in Norfolk.

NAVAL AVIATION NEWS did you know?

Autopilot Engineers at NASA's Dryden Flight Research Center have developed an autopilot that will permit future high-speed, high-altitude aircraft to fly much closer to prescribed flight paths. The autopilot was developed during flight tests of the 2,000-mph YF-12 aircraft that NASA is flying to develop technology for the design of future high-speed aircraft.

Experience gained from the YF-12 and other aircraft that cruise at high speeds and altitudes indicates that deviations from planned speeds and altitudes can be quite extreme. Altitude changes of plus or minus 4,000 feet and speed differences of over 30 miles per hour have been reported. Conventional aircraft autopilots use flight control surface movement to maintain speed or altitude; however, this method will not work at the higher altitudes and speeds. Automatic throttle control is generally limited to lower speeds.

The YF-12 system combines both surface and throttle motion for control. The combination, along with newly developed sensors, has enabled the YF-12 to maintain a high degree of flight path control precision over extended periods of time even in high-speed cruise conditions.

Eight-Bladed Propeller Propellers, once thought of as obsolete for fast commercial aircraft, could stage a comeback if research going on at NASA's Lewis Research Center, Cleveland, Ohio, is successful. The study is part of a NASA-wide aircraft energy efficiency program which may achieve a substantial saving in fuel in future U.S. aircraft.

A family of small-diameter, eight-bladed propellers is being tested in wind tunnels to determine propeller operating characteristics at flight speeds up to 530 miles per hour and cruising altitudes above 30,000 feet. Engineers estimate that at this speed and altitude an advanced turboprop engine, with the new short, ultrathin, curved blades, will offer a 20 to 40-percent fuel saving over current turbofan engines and a 10 to 20-percent fuel saving over an advanced turbofan engine.

Lewis Research Center engineer Robert J. Jeracki demonstrates a test model which is suspended from the top of the tunnel on a pylon.

ANA Convention The Association of Naval Aviation convention was held in San Diego last October and brought together many members of the active duty and retired flying community, as well as friends of Naval Air. The Honorable Bob Wilson, Minority Leader of the House Armed Services Committee and a strong supporter of Naval Aviation, spoke at the banquet. Admiral Thomas H. Moorer, USN(Ret.), president of the Association, also addressed the gathering, and announced that the next convention will be held in New Orleans in the fall of 1978.

Wake Vortex Studies

NASA is continuing its inflight tests to reduce the hazards of trailing wake vortices of large aircraft. Wake vortices are the normally invisible flows of turbulent air that stream in a circular or funnel-shaped flow from the wing tips of all aircraft. Strong vortices generated by large transports, especially the current "wide-body" planes, are a potential hazard to smaller aircraft, particularly during takeoff and landing.

NASA's Dryden Flight Research Center, Edwards, Calif., has awarded a contract to Lockheed Aircraft Corporation, to provide an L-1011 wide-body, tri-jet aircraft for approximately 10 one-hour flights. The L-1011 will be equipped with eight smoke generators to mark the vortices in flight.

The tests will determine the effectiveness of different combinations of spoilers in dispersing wake vortices. A specially-instrumented probe aircraft will be flown through the wake at different distances behind the L-1011 to assess the severity of the wake and measure its velocity, size and intensity at various trailing locations. Previous tests conducted by the Center with a four-engine 747 (the same 747 used for the approach and landing tests of the space shuttle) indicated that wake vortices could be dispersed by extending the outboard spoilers on each wing. The L-1011 studies will be used to confirm the fact that this same technique also applies to aircraft having different configuration details.

Logistics

The Naval Aviation Logistics Center was given an official send-off in ceremonies aboard NAS Patuxent River, Md., on October 5. The new command had functioned in a developmental status since March 1. Admiral Frederick H. Michaelis, Chief of Naval Material, in his keynote address, said that the Navy's ability to conduct prompt and sustained combat operations at sea depends largely on the success of logistics support. He described logistics as the offensive line of the Navy's combat football team. Adm. Michaelis said that the center will improve communications among all activities involved in the rework and maintenance of naval aircraft. Vice Admiral Forrest S. Petersen, Commander, Naval Air Systems Command, predicted a time-phased growth of the logistics establishment.

Rear Admiral William H. Hinkle officially assumed command of the center. He had managed the organization from its fledgling state, operating first out of his office as the Naval Air Systems Command Representative, Atlantic at Norfolk, and then at Pax River beginning in August.

The logistics center consolidates the functions of the naval aviation integrated logistic support center at Patuxent River, the depot management division at NavAirSysCom in Washington, D.C., and the two new AirSysComReps, one in San Diego and one in Norfolk.

Circulation Control Wing

The Naval Ship Research and Development Center has awarded a contract to Grumman Aerospace Corporation of Bethpage, N.Y., to modify an A-6A and conduct a flight demonstration of the circulation control wing high lift system. The concept, developed by the David W. Taylor Naval Ship Research and Development Center, Bethesda, Md., employs engine bleed air for tangential blowing over the rounded trailing edge of the wing. The lightweight and structurally simple system provides reduced takeoff and landing speeds and distances, as well as an increased overload capability for high performance aircraft. Over 500 hours of wind tunnel investigation resulted in a configuration which can generate trimmed lift coefficients more than double those of the conventional A-6A. Grumman will modify an existing A-6A into this configuration, ground test it, and conduct a 10-hour flight envelope clearance program, with first flight scheduled for October 1978. The aircraft will then undergo detailed flight testing and Navy pilot evaluation at NATC Patuxent River, Md.

grampaw pettibone

Cleared to Cross?

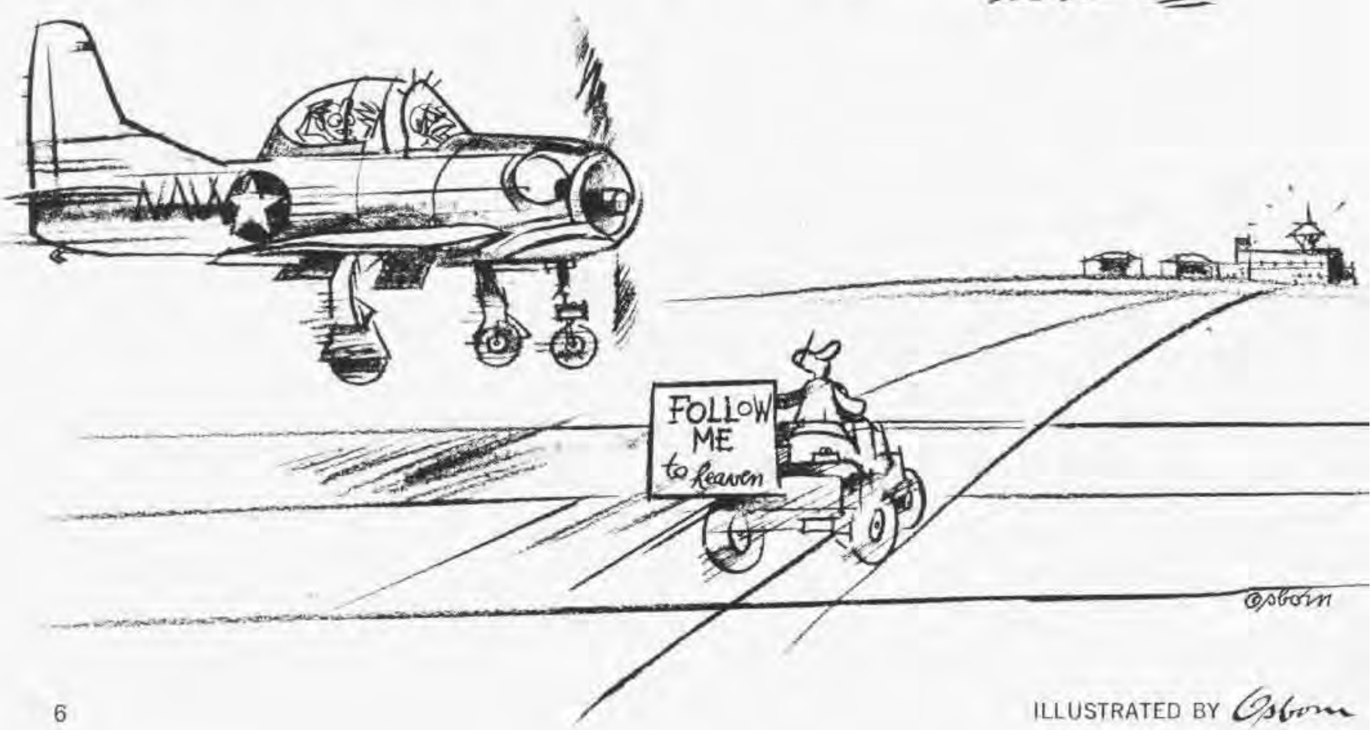
A T-28B was recovering from an incompleted student training flight, cut short due to marginal inflight visibility. The instructor took control of the aircraft after normal traffic pattern entry/break overhead the active runway at NAS Home Plate. He reported the 180-degree position and was issued a proper clearance to land by the control tower.

About the time the instructor initiated the landing transition at 90 knots and 20 feet, he glimpsed a yellow vehicle passing in front from right to left directly underneath the aircraft nose. The alert instructor immediately added full power and waved off, missing the vehicle by approximately 10 feet.

The operator of the vehicle, which was the station Follow Me truck, had called on the FM radio for clearance to cross the active runway. Initial clearance was issued to cross at the approach end. The driver requested a modification of his clearance to cross the duty runway at the intersection of the crossing off-duty runway. The driver was told to stand by for further instructions. This transmission was received garbled in the Follow Me truck. The driver assumed clearance to cross had been issued and proceeded onto the active runway *without visually* checking for traffic or requesting clarification of the garbled transmission.

Grampaw Pettibone says:

Leapin' Lizards! A little more know and a little less assume would have saved us some heartbeats. Certainly it would contribute to a higher state of morale for next of kin. Station and squadron personnel take heed! This could happen to you! This type incident occurs when you least expect it. Look both ways before crossing all runways/taxiways. Always know where you



ILLUSTRATED BY Osborn

are and understand your latest tower clearance. One of the most dangerous evolutions exists when personnel must tow aircraft without tower comm at night across runways to high power turn-up areas, etc. Know your local procedures cold. There is absolutely no margin for error. Your first mistake could be your last. Trite but true! Two on a runway is a crowd!

The Pink Pig

A Royal Air Force helicopter was on a routine training mission following the river Thames at 1,250 feet. The aircraft was in the midst of a right turn when the pilot saw a large pink pig at his one o'clock position at about one-half mile, rising rapidly out of the haze layer. The turn was stopped and the helicopter overtook the pig, passing clear of its port flank. The "pig" was a balloon approximately 40-feet long, which had broken away from its mooring at a local amusement park.

Grampaw Pettibone says:

Jumpin' Jehoshaphat! Flying porkers! What next? This story was passed to Gramps by an old RAF squadron mate, Wing Commander Spry. The incident was classified as an "airmiss" caused by unauthorized penetration of controlled airspace by a pig!

We colonial aeroplane pilots also must watch for unusual flying objects.

Moral – one if by land, two if by bus, thanks to ole Spry, the pig won't get us . . . Blimey!

Hot Start

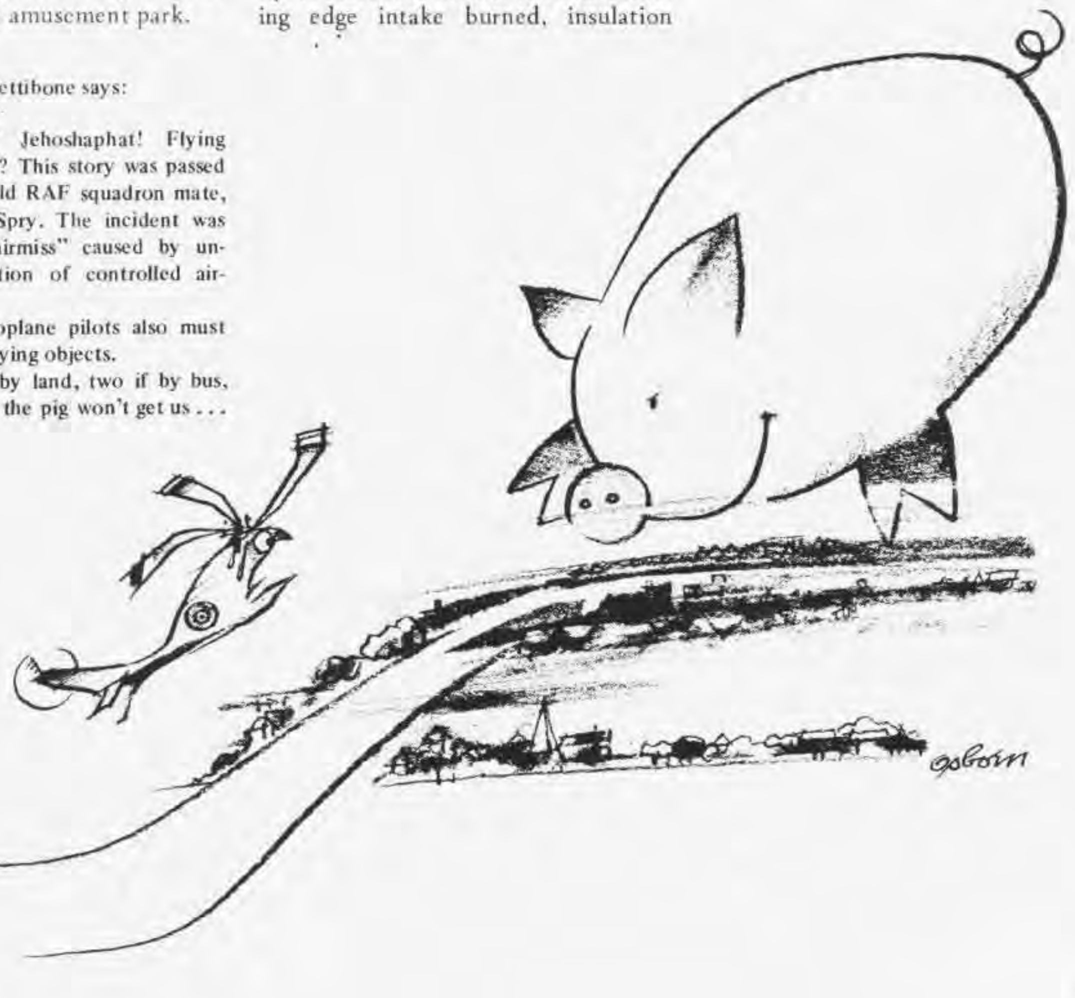
A pilot blasted off on a bright summer day in a T-1A from an East Coast air station for a short x-country to a New England AF Base. He enjoyed the uneventful flight and landed at his destination as planned. Everything seemed to be going along in a routine manner until he discovered he had overlooked the fact that a T-1A starter was not available at this particular AFB.

Not to be outdone, this intrepid airman elected to attempt an air start from another jet aircraft. The starboard intake of the T-1A was positioned in the jet exhaust of an Air Force T-33 and a start was accomplished. The pilot then flew his T-1A back to home base where it was discovered the aircraft had been damaged as follows: paint blisters in vicinity of starboard intake, starboard leading edge intake burned, insulation burned from electrical wiring in plenum chamber. Approximately 20 man-hours were required to repair the aircraft and get it in an up status.

Grampaw Pettibone says:

Now doesn't somethin' like this really gall you! This guy just blasts off on his merry little way without so much as even checkin' the en route supplement for the equipment and services available at his destination.

It's darn hard to believe that grown men will pull tricks like this, but I'll have to admit your ole bearded buddy ain't too surprised at anything that happens in aircraft any more. (September 1964)



AIR SHOWS

Air shows have been popular pastimes on the American scene ever since flying machines first took to the air. The excitement spawned by the roar of an engine powering an aerodynamic shape through the sky remains a strong emotional force. In 1977, millions gathered alongside runways across the nation to enjoy the thrills and drama of aerial exhibitions. On these pages *NANews* presents a sampler from affairs held at Naval Air Stations Whidbey Island, Patuxent River and Miramar and at the Golden Wings Over Richmond Air Show which signaled the 50th anniversary of Byrd Field, Va.

Photographers contributing to this feature were Captain Ted Wilbur, Joel Breger, JOCS Bill Bearden, and PH1s John Sheppard and John Borovoy.

Order gave each thing view.

Shakespeare

'77

"Wow,Dad! What happens if they miss?"
"Son, the Marines don't miss!"

Nimrod the Mighty Hunter

Genesis

"It gets a little old — the traveling and such. Living out of a suitcase. On the go, day in, day out. Meeting people, making appearances. The flying's fine, of course. But it's not easy being a Blue." The pilot's voice was serious, contemplative.

"You mean," asked the reporter, "you'd rather be assigned elsewhere?"

"Are you kidding?" the Blue Angel said quickly and with deliberate force. "I wouldn't trade this life for anything!"

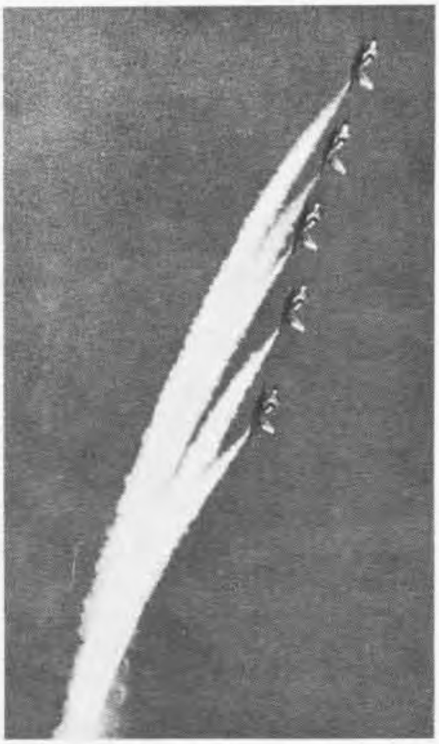
Interview with a Blue Angel, 1964

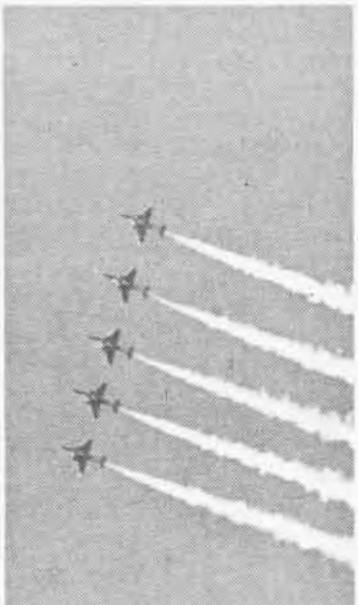
Really, you have seen the old age of an eagle, as the saying is.

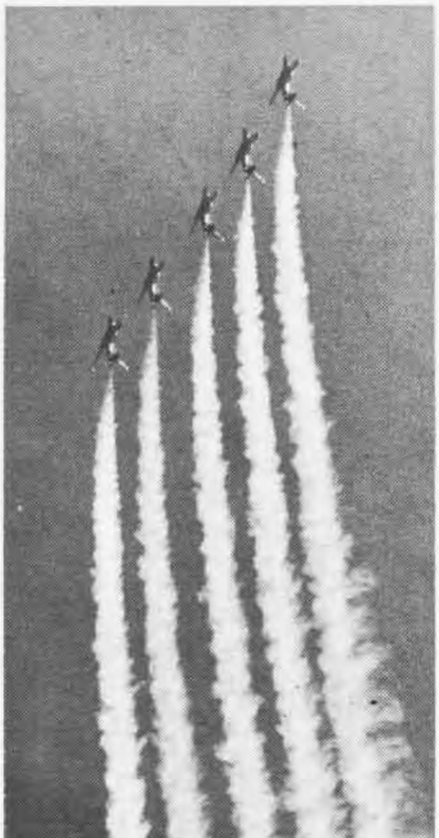
Terence

Once the realization is accepted that
even between the closest human beings
infinite distances continue to exist,
a wonderful living side by side
can grow up, if they succeed in
loving the distance between them
which makes it possible for each
to see the other whole against the sky.

Rainer Maria Rilke

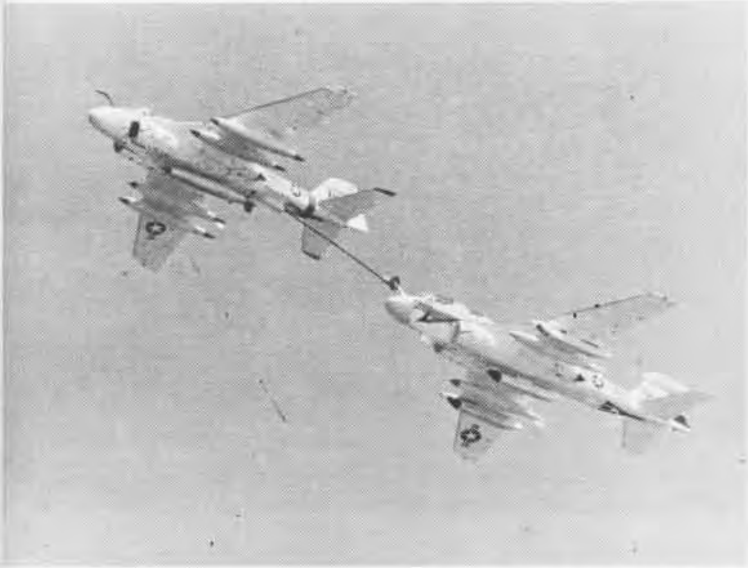





Man, that cat is quick,
I mean she's a really rapid animal.

Overheard at an air show



Fuel to maintain his fires.

Thomas Carew

I am a feather for each wind that blows.

Shakespeare

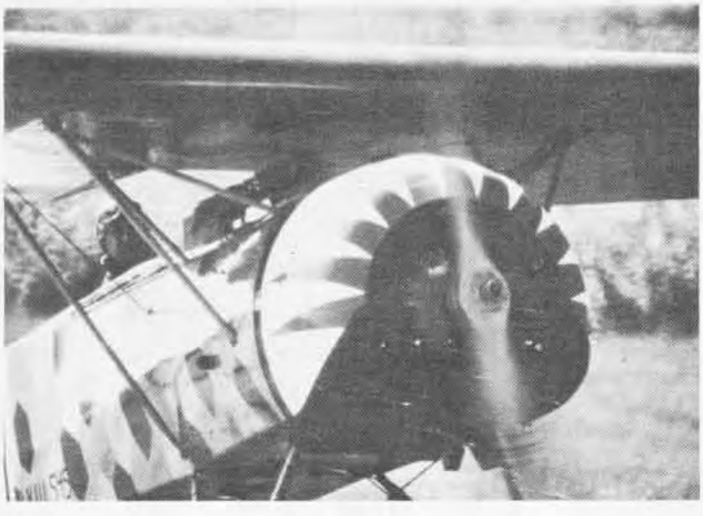
Oh could I fly,
I'd fly with thee!

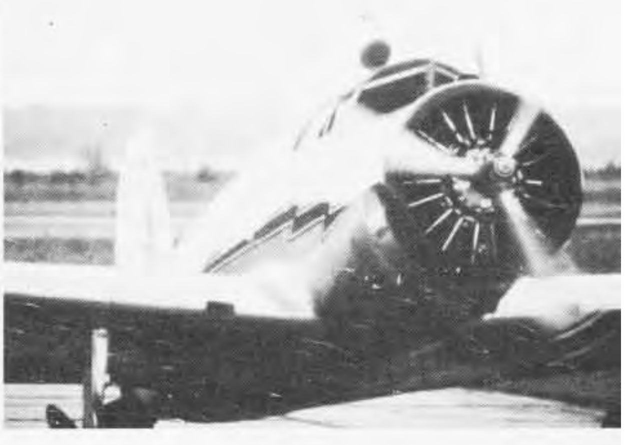
John Logan

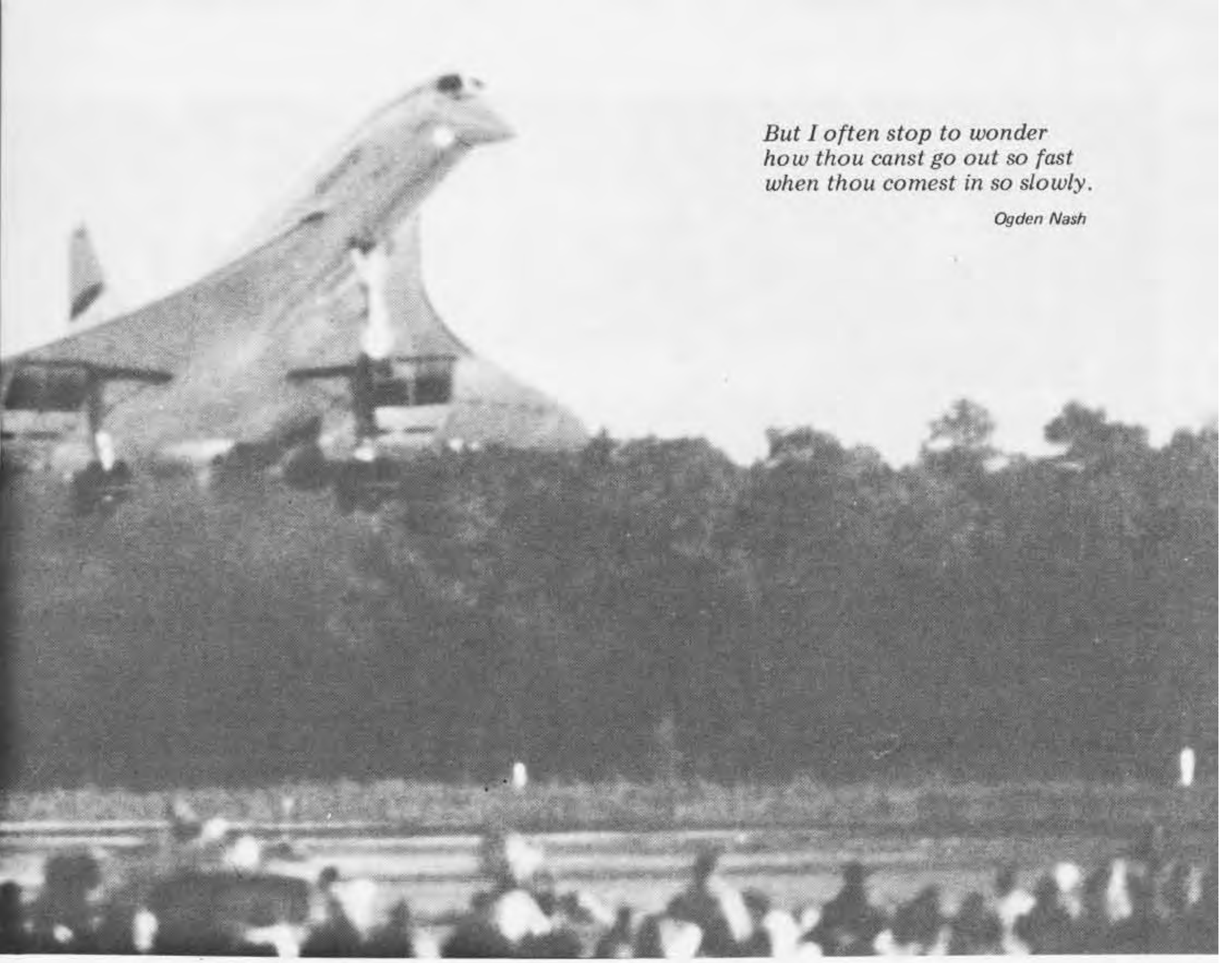
Themistocles replied that a man's discourse was like to a rich Persian carpet, the beautiful figures and patterns of which can be shown only by spreading and extending it out.

Plutarch

Let us, while waiting for new monuments, preserve the ancient monuments.
Victor Hugo





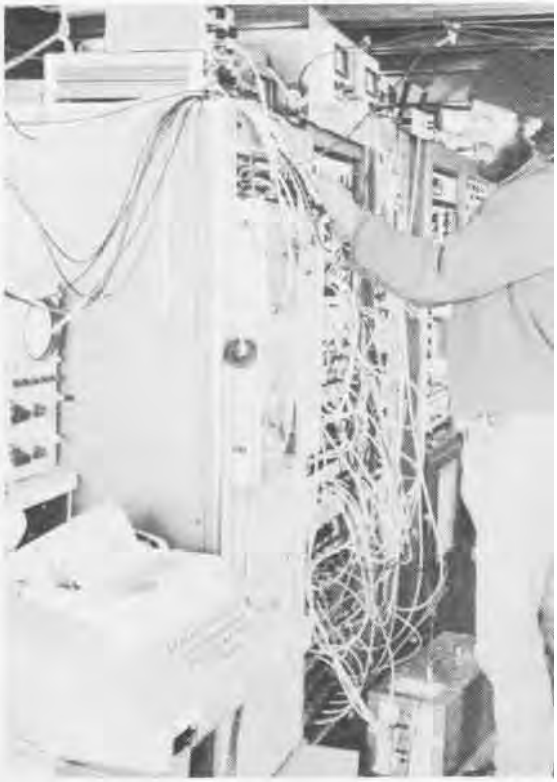


But I often stop to wonder
how thou canst go out so fast
when thou comest in so slowly.

Ogden Nash

No hinge nor loop to hang a doubt on.

Shakespeare



MID

By Tom Houlihan

They say that Navy pilots do it better. At the Naval Postgraduate School, Monterey, Calif., some researchers will tell you that two Navy airmen did it best.

In studying laser transmissions in the marine environment, it became necessary for the electro-optics/laser technology (EO/LT) research group to monitor a set of atmospheric quantities. The measurements, which were to be accomplished at several levels on a forward mast aboard the NPS research vessel *Acania,* included atmospheric temperature, relative humidity and wind velocity. Additionally, measurements of air turbulence and temperature fluctuations that play a primary role in the disruption of laser beams propagating through the atmosphere were needed. Some 20 variables were to be recorded and averaged over periods extending from one minute to one hour.

The recording of such a quantity of data is no easy task. Compounding the problem was the requirement to accurately average this data during extended seaborne operations. A large, multi-channel tape recorder could be used to monitor all the necessary data. However, additional electronic gear would then be required to convert the data to digital records that could be averaged and printed. Extra gear was not welcomed by the researchers, already overburdened with equipment.

At this stage (late 1974) the interdisciplinary nature of the EO/LT project and NPS as a graduate institution came to the fore. Lt. James Sturges was starting his thesis effort in the aeronautics department. His work concerned the application of microcomputer technology to the monitoring of electrical signals. Essentially, Lt. Sturges was beginning the construction of *Midas* – a micro-programmable, integrated data acquisition system. The basic elements of the system were to be a microcomputer control unit, a cassette recorder, an analog-to-digital converter unit and a teletype. Lt. Sturges programmed the microcomputer to control the analog-to-digital unit so that up to 32 signals could be sampled over a specified period of time. Once the digital signals were in the computer's memory banks, average values of the signals were calculated automatically and stored for future use.

After the necessary data for one period had been gathered and averaged, the computer then printed out the values on the teletype and at the same time recorded them in digital form on the cassette recorder. Thus, in one swift moment, an on-site, quick-look, printed log and permanent tape record of the data were made. These cassette tape records were later read

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into the NPS IBM-360 computer so that a complete record of a total experiment (3 to 30 days) could be evaluated for any large scale trends in the signals being examined. All in all, *Midas* was quite effective and several hundred feet of teletype records attested to its initial duty in various studies.

The application of the kingly ways of *Midas* to the EO/LT project was the work of another NPS aeronautics student, LCdr. John Plunkett. He constructed interfacing units between *Midas* and all meteorological readouts for a specified time period. Thus, *Midas* now not only sampled, averaged and logged data but also controlled the actual measuring devices that gathered the data. Free of manual data logging and extended watch-standing, EO/LT researchers could devote their time to on-site computations of laser performance indices and meteorological forecasting. Like the monarch it was named after, *Midas* gilded every data point – this time with an aura of microcomputer technology. It proved to be an invaluable research tool as well as a most cost-effective instructional device. In the latter role, several classes of NPS students were introduced to the intricacies of microcomputer programming and technology by working with *Midas* and the peripheral gear associated with the computer system.

Midas continued its touch with the officers who built it even after they left NPS. Shortly after graduation, LCdr. Plunkett delivered a presentation on *Midas* and its application to meteorological data-recording at a special meeting of the Institute of Electrical and Electronic Engineers devoted to microcomputer applications. This presentation also appeared in a special book devoted to microcomputer systems published by Academic Press.

For a newly-frocked LCdr. Sturges, the *Midas* touch stretched from the confines of the South Pacific to the mountains of Colorado. Upon completion of a tour aboard *Kansas City*, Sturges was informed that his work on the construction and programming of *Midas* was to appear at a special conference on microcomputer technology in Boulder, Colo. The full presentation also appeared in the bound proceedings of the conference. The NPS Foundation Research program provided the means for the officers to tell the story of *Midas*.

It is worth noting that resources, research, faculty expertise and the relationship between faculty and students at NPS encourage such projects. And once implemented, *Midas* programming techniques and construction principles were taught to other students using the same equipment. Hence, the golden circle of teaching-research-teaching was completed.

Navy Sea Cadets

By JO2 Jan Mercurio, USNR

A two-week orientation proved very educational for 27 young men with the Enterprise Unit of the Navy League Cadets and the Essex Unit of the Navy Sea Cadets, when they participated in the annual training program at Naval Air Reserve Unit, NAS Jacksonville, Fla. Tours of various reserve units, NAS Cecil Field and NS Mayport, were the highlights of their training.

The Miami-based junior sailors, accompanied by six Sea Cadet officers, lived Navy style. They had personnel inspections, port and starboard duty sections, classroom instruction, study periods, working parties and even a taste of liberty.

During a four-hour tour of the Marine Air Reserve Training Detachment, the cadets were briefed on its mission and given a breakdown on A-4 operations, including the various bombs and bombing methods used. They viewed flight line operations and ground support and safety procedures and visited the shops run by the reserve Marines.

Following a barracks inspection by their commanding officer, LCdr. Donald D. Brammer, NSCC, the cadets went to Mayport for a tour of USS *Bigelow* (DD-942) and an explanation of LAMPS.

During a classroom day, the cadets heard a lecture by AD1 Larry Bair on aircraft engines and saw films and heard lectures on Naval Aviation history.

A tour of Patrol Squadron 62 was on the top of the agenda for another day. At the squadron, the cadets were shown the interior and exterior of a P-3 *Orion* and VP-62 personnel explained the electronic components of the antisubmarine search and rescue gear, communications equipment, flight deck instruments and turbo-prop engines.

A 30-minute command presentation on the history and operation of the NARU was given the cadets by the unit's public affairs staff.

The cadets also toured Fleet Aviation Specialized Operations Training Group 174 where they were shown the flight training procedures and characteristics of the P-3 and given the opportunity to "fly" the *Orion* trainer-simulator.

Other briefs included a look at weather and air operations facilities and crash crew procedures at NAS Cecil Field.

The cadets also received instruction in small arms marksmanship and gun handling safety. They were able to fire a few rounds on the Smith and Wesson .22 caliber pistol, under the direction of NARU's range master, AD1 Joe Wagner.

The Naval Sea Cadets' program offers young people the opportunity to train in seaman, airman, fireman and construction rates.

The program, which is now open to young women, includes ocean science engineering, medical and naval officer preparatory courses. Cadets who qualify can also study engineering aspects of avionics, nucleonics and conventional shipboard power propulsion. At 18 the cadets are eligible to enter the Navy as E-4s.

Following the two-week tour at NARU, a number of the Miami Sea Cadets were eligible for the E-4 rate of the Sea Cadets.

Dilbert's Big Brother

Navy training devices come in all sizes and shapes, designed for a wide variety of uses. One of the newest resembles an oversized oil drum with holes cut in its sides, but it is a potential lifesaver.

The Universal Helicopter Underwater Escape Trainer (Device 9D5) is also affectionately known as Dilbert's Big Brother. The prototype is now in operation at NAS Pensacola, Fla., under the direction of the Naval Aviation Schools Command.

In the past there was a lack of adequate or realistic escape training for helicopter crews and passengers. Naval Safety Center records show that from July 1963 to February 1975, 34 percent of all helicopter occupants involved in crashes at sea perished. When personnel had received some kind of underwater escape training, the survivor rate jumped to 91.5 percent.

Survivors named the following situations as problems they encountered after crashing at sea: disorientation, panic, inrushing water, confusion, unfamiliarity with exit release mechanisms and entanglement with debris. Dilbert's Big Brother was designed with these factors in mind.

The trainer does not simulate a particular type of helicopter. Rather, its cylindrical design is the result of strength factor requirements.

LCdr. Monty Herron, project director, explains the device's measurements and capabilities, "The 9D5 is suspended from three to six feet above a pool that is 15 feet deep and operates under total hydraulic power.

By Betti Bullock
Photos by PH3 Ron McClellan

The all-fiberglass cockpit is 18 feet long, 7 feet high and 7 feet wide and can be rolled 180 degrees in either direction, before or after water impact. The degree and direction of roll are operator controlled. The device can seat six students, but for safety reasons will operate with four."

To add realism, the students will not have any prior knowledge of the position the trainer will be in when it hits the water, but they will be told which of the six hatches they should exit from. Students will wear blindfolds to simulate all conditions, day or night.

There are three procedures they have to execute before they can make their underwater escape: release seat belt, operate release mechanism properly and clear the exit by operating a slide bar. The release latches can be operated in three directions: pull out, turn up and turn down.

Two divers will be underwater watching for any problems the trainees may have. Both will have surface-supplied air, using Kirby-Morgan band masks. They will have direct communication with the device operator – a vital safety factor.

According to Ray Smith, Schools Command survival swimming coordinator and 9D5 diving system designer, "The system operates with two small compressors; one supplies the divers' air supply while the other is available for emergencies. One high pressure scuba tank is also on hand for backup. The device has an emergency retract system in case there is a power loss."

The $300,000 training tool is designed to last for 20 years. The next six months, however, will be crucial for the device prototype since it will be under evaluation by the Navy, which has budgeted for five additional devices.

The unit's potential was previously recognized by the Royal Navy which has had a similar one in operation since 1962. In the past 15 years, its drowning fatalities during ditching incidents have been reduced to near zero.

Current plans call for all Navy, Marine and Coast Guard crews to train in Dilbert's Big Brother. Additionally, plans are under way for Department of Interior employees who fly in helicopters to practice underwater escape techniques in the 9D5.

F4B

With redesignation of the F4H-1 as the F-4B, comparisons with the F4B series of the late 1920s-early 1930s became frequent. This association is appropriate since these two basic designs have been the two most successful joint U.S. Navy-Army Air Corps/Air Force fighters over the years, and both achieved success as fighters and fighter/bombers.

In 1928, Boeing built two fighter prototypes designed around the P&W Wasp engine and making use of all their fighter design experience gained during the 1920s. Basically the same, the first (Boeing 83) was equipped with a tail hook and went to San Diego for Navy evaluation after its June 1928 first flight, while the second (Boeing 89), equipped as a fighter bomber, went to NAS Anacostia for tests. The Army also evaluated these prototypes before they were purchased by the Navy, and both services ordered production models, starting the Navy F4B and Army P-12 series.

The 27 F4B-1s which went into Navy service had P&W Wasp C 450-hp engines and were of mixed construction: metal fuselage structure and wooden wings with fabric covering while the tail surfaces and ailerons were all metal, using corrugated dural covering. First delivered in August 1929 to VB-1B and VF-2B, the -1s were followed by 45 F4B-2s featuring improvements such as the 500-hp Wasp D enclosed in a ring cowl, and improved ailerons.

Based on other developments, Boeing again turned to a company-built prototype, the Boeing 218 of late 1930, to show the advantages that an all-metal semi-monocoque fuselage and redesigned tail surfaces could offer to the basic design. From its evaluation came Navy orders for 21 F4B-3s of similar configuration and, finally, 92 F4B-4s having a larger fin and other improvements. One extra F4B-4 was assembled from spare parts, a not too uncommon practice at that time. All models could carry a 55-gallon belly fuel tank.

Carrying the colorful markings of the period, the F4Bs were the most popular carrier and Marine Corps fighters of the early Thirties. The early models were updated with some of the features of the later series (Wasp Ds, ring cowls and -4 tails) as they transitioned to advanced trainer roles. The later models transitioned to dive bomber squadrons as they were replaced by Grumman fighters in the mid-Thirties — before leaving the fleet squadrons, the last departing VB-2 in the spring of 1938.

After service as advanced trainers, F4B-4s were modified to serve as target drones, joined by 23 ex-Army airplanes of various P-12 series redesignated F4B-4As. In December 1941, 34 F4Bs were still in service as drones, although they rapidly phased out in the early-war period.

Today, the Boeing F4B is the subject of fond recollections as the last of the open cockpit biplane fighters — and a peerless example of the breed.

Boeing 83

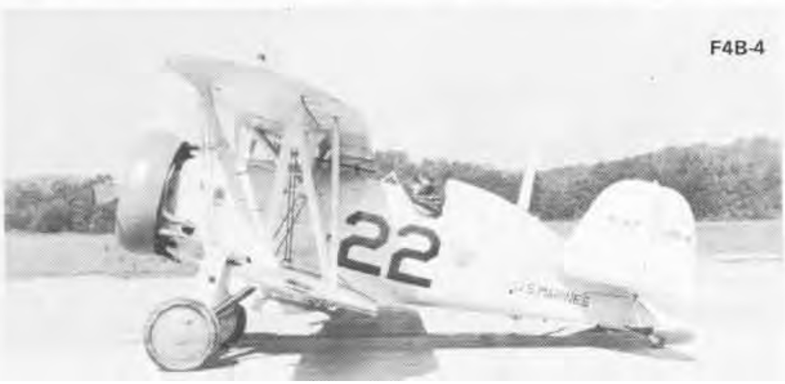
F4B-3

F4B-2

4B-1

F4B-1A

Boeing 218

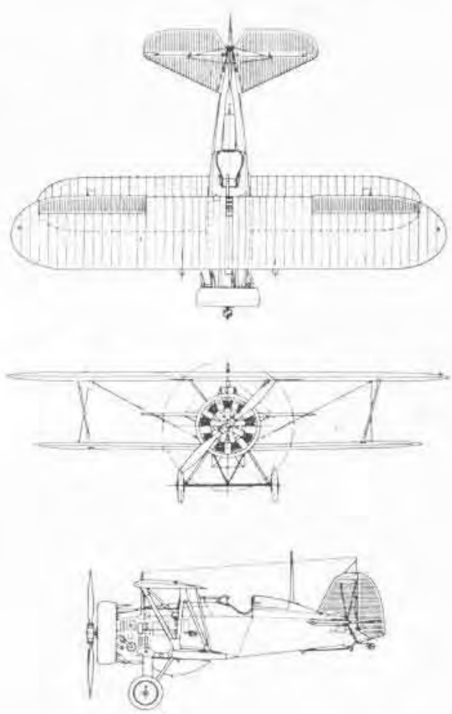


F4B-4

Span		
-1,-2,-3,-4		30'
Length		
-1,-2		20'1"
-3,-4		20'5"
Height		
-1		9'4"
-2		9'1"
-3,-4		9'9"
Engine		
-1	R-1340C	450 hp
-2,-3,-4	R-1340D	500 hp
Max speed		
-1		166 mph
-2		186 mph
-3		187 mph
-4		184 mph
Service ceiling		
-1		26,400'
-2		26,900'
-3		27,500'
-4		24,800'
Maximum range (over land)		
-1		668 miles
-2		738 miles
-3		758 miles
-4		703 miles

Armament

All carried one .30 and one .50 machine guns. The -4, in addition, carried two 116-lb. bombs.



Perspective on NavAir

By Lee Pearson

Lee Pearson's distinguished career as Naval Air Systems Command Historian spanned the eventful years from post-World War II to the present. In this article he describes the evolution of today's Naval Air System Command from its humble beginning in 1910.

Lee retired last September after 32 years of military and civil service.

The Naval Air Systems Command is responsible for the material side of Naval Aviation. Although formed in 1966, it is the successor of earlier organizations that worked patiently, first to devise the means of taking the airplane to sea as an effective part of the Navy and then to enhance its effectiveness through advancing technology. In the broadest of terms these efforts had their beginnings in 1910 and 1911 when the Navy purchased three stick-and-wire airplanes and arranged for four naval officers to be trained as pilots. In a more rigorous sense, the efforts began five years later when the Navy placed its first production order for aircraft.

In July 1916 Assistant Naval Constructor J. C. Hunsaker was assigned to the aircraft desk in the Bureau of Construction and Repair. Three years earlier he had been detailed to the Massachusetts Institute of Technology where he had established the Nation's first course in aeronautical engineering. In his new position, he would be responsible for development and procurement of naval aircraft. The chief source of professional aeronautical guidance in the Navy was Assistant Naval Constructor Holden C. Richardson who had worked with the Navy's aviators and conducted investigations both at Pensacola and at the Washington Navy Yard with its wind tunnel and model basin.

Hunsaker's first major problem was to devise a means of obtaining a new trainer. Naval Aviation faced a serious crisis, and a new training plane was essential. The aviators, reacting to a series of fatal crashes, had condemned their pusher hydro-aeroplanes as unsafe. No suitable seaplane was available for substitution. War was coming closer and there might be a need to train hundreds, or even thousands, of aviators.

Hunsaker's authority was limited. Three years earlier the Secretary of the Navy had determined that administration of aircraft and aircraft material in the Navy Department should parallel that for ships and ship material. Thus, the Bureau of Construction and Repair had been made responsible for aircraft structures, the Bureau of Steam Engineering for aircraft engines, the Bureau of Ordnance for aviation ordnance, and so on. In this way, the Navy's co-equal bureaus, which had played vital roles in the transition of warships from sail to steam, were to bring the expertise of their professional corps to bear on the problems of aviation. Progress required, however, that the airplane and its engine be examined as a unit. On August 8, 1916, the Secretary assigned this responsibility to the Bureau of Construction and Repair by directing that in developing types of aircraft to meet Navy needs, "The Bureau of Construction and Repair will prepare alternative plans and from these certain ones will be selected."

In exercising this newly acquired authority, Hunsaker knew, or learned from Richardson, that the Curtiss Company had worked more closely with the Navy than had any other aircraft manufacturer. It had more understanding of the Navy's needs and was willing to try to meet them. Moreover, while still at MIT, Hunsaker had tested the JN2, a Curtiss landplane trainer, in the wind tunnel. The data thus acquired would be useful in development of a seaplane.

On Thursday, August 10, 1916, Hunsaker acted by sending Glenn Curtiss a telegram: "Can you call at the Bureau Monday with a proposition to supply at earliest date practicable thirty school hydro-aeroplanes, two seats, twin floats light machines with wing loading about four pounds per square foot, two hours fuel, gross weight about twenty pounds per horsepower for use in harbor. Speed climb and details of construction to be as proposed by you. Rate of Delivery is important and must be guaranteed."

No record of Curtiss' response is available. The final result, however, was an order for 30 N-9 seaplanes. Although the Navy had bought its first aircraft five years earlier, 30 aircraft was a contract of an unprecedented size. Moreover, it was only the beginning as the Navy was to eventually buy more than 500 N-9s. Flight tests indicated that modifications were necessary. These included a new float that was designed by Richardson. The aircraft was admirably adapted to Navy needs.

The foregoing marked the first major decision of the Navy's new aircraft design organization. Hunsaker's first assistants were civilian draftsmen, probably detailed from the ship's drafting room in the Bureau of Construction and Repair. As war became imminent, regular and reserve naval officers were added to his office which grew into the Aircraft Division of the Bureau of Construction and Repair. This growth was paralleled in other Navy bureaus. Thus an organization was put together that was able to oversee the production and delivery of 1,500 service aircraft and that many more trainers, experimental types and lighter-than-air craft. Most of these, of course, were ordered and delivered in the 19 months between the U.S. declaration of war and the Armistice.

In addition to facing the task of leading the technical coordination of a number of co-equal Navy bureaus, Hunsaker was also involved in maintaining maximum coordination with the Army. In May 1917, he attended the first meeting of the Joint Army and Navy Board on Designs and Specifications, for Aircraft. The difference in service use precluded a joint Army-Navy specification. Hence, the Navy, in October 1917, issued a 12-page document entitled *General Specifications for Airplane,* which began by stating a basic premise: "No departure from these specifications will be tolerated unless clearly stated in the contract."

Some years later Hunsaker looked back at WW I and the divided responsibility, the multitudinous demands for both internal Navy and joint Army-Navy coordination, and the need for aircraft in quantities that taxed the embryonic aviation industry. He concluded that "the organization was poor." Then he looked at the Navy's record in production and added, "But the results were good."

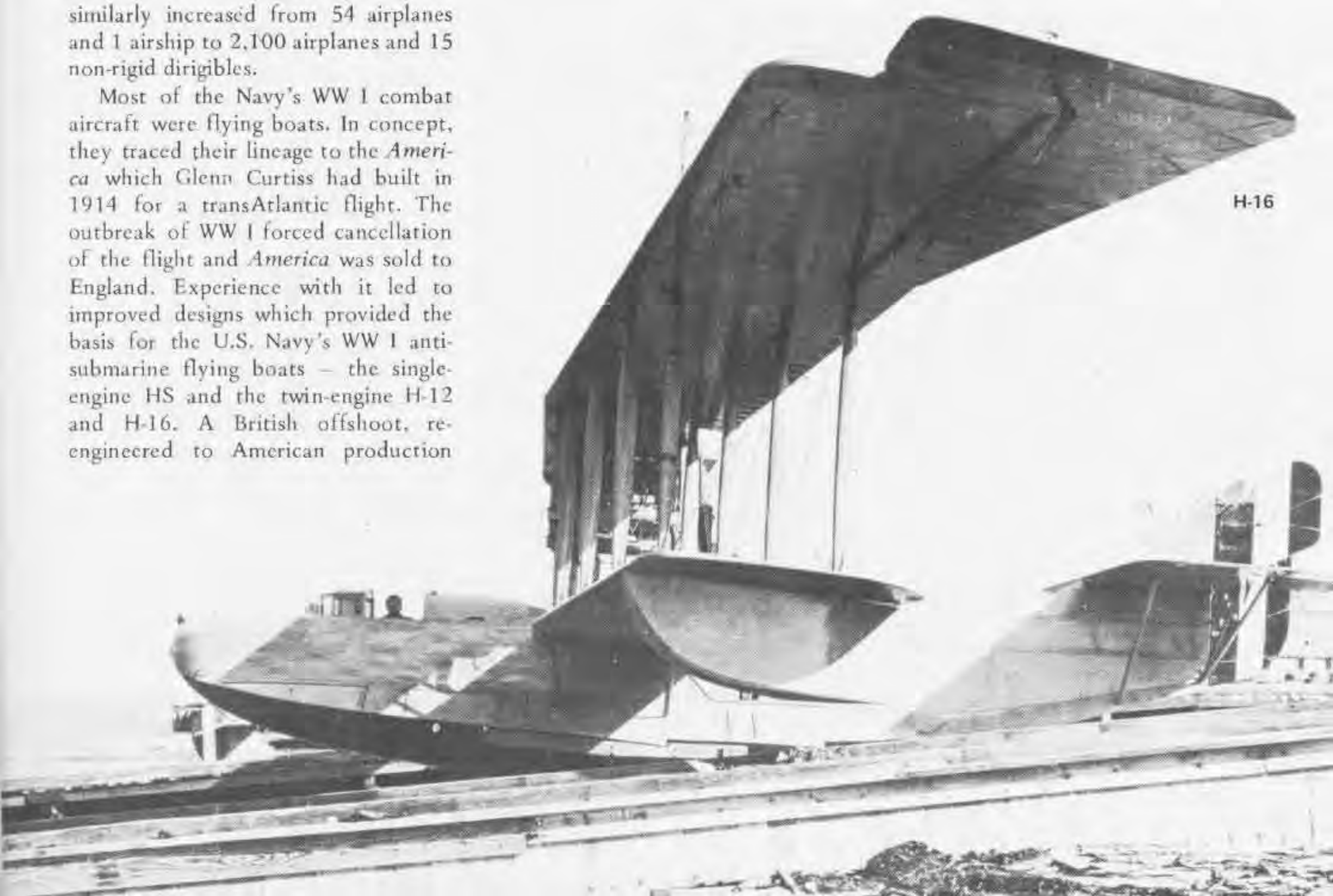
The results deserve mention. Naval Aviation's major mission was antisubmarine patrol. To this end it established 27 air bases in Europe, 14 new bases in North America and one in the Azores. From these, Navy and Marine Corps pilots flew over 3 million miles of war patrols and attacked 25 submarines, sinking a dozen of them. These achievements required the best efforts of many people. The strength of Naval and Marine Corps Aviation increased from 48 officers and 239 men in April 1917 to 8,900 officers and 32,900 men. The aircraft on hand similarly increased from 54 airplanes and 1 airship to 2,100 airplanes and 15 non-rigid dirigibles.

Most of the Navy's WW I combat aircraft were flying boats. In concept, they traced their lineage to the *America* which Glenn Curtiss had built in 1914 for a transAtlantic flight. The outbreak of WW I forced cancellation of the flight and *America* was sold to England. Experience with it led to improved designs which provided the basis for the U.S. Navy's WW I antisubmarine flying boats – the single-engine HS and the twin-engine H-12 and H-16. A British offshoot, re-engineered to American production methods, became the F5L. Rear Admiral David W. Taylor, Chief of the Bureau of Construction and Repair, proposed that valuable shipping space could be used for other munitions if airplanes could fly the Atlantic. This resulted in the NC (for Navy Curtiss) flying boats. Although they were developed too late for combat use, one of these (the NC-4) became the first aircraft to fly across the Atlantic Ocean.

Naval Aviation units in Europe obtained some British, French and Italian aircraft. The bulk of naval aircraft, however, were manufactured in the United States under the supervision of Hunsaker and the Bureau of Construction and Repair. The various models that went into service had a crew of from three to five, a maximum speed of 80 to 90 miles per hour and an endurance of from 6 to 10 hours. While private industry performed valiantly in an attempt to meet Army and Navy aircraft production requirements, the Navy felt that an added source was needed and established the Naval Aircraft Factory on League Island, adjacent to the Philadelphia Navy Yard. It produced nearly one-fifth of the Navy's large flying boats.

The Naval Air Systems Command carries on the tradition established by its predecessors of maintaining the highest technical proficiency, guiding the development and managing the procurement and support of aviation material to enhance its usefulness to the Navy. In maintaining this tradition, it looks back not only to the legacy bequeathed by the Aircraft Division of the Bureau of Construction and Repair but also to that of intervening organizations – the Bureau of Aeronautics from 1921 to 1959 and the Bureau of Naval Weapons from 1959 to 1966.

A brief look at naval aeronautics at the end of WW I, shows that it was apparent to all that aviation would soon become a decisive force in war. Self-appointed spokesmen argued stridently that aerial bombing had already made navies obsolete. Various alternative methods for organizing American aviation were examined, with particular emphasis upon the



H-16

relationship of aviation to the surface forces and the role of aviation spokesmen in strategic and tactical council. Accompanying this were numerous specific proposals for the organization of Naval Aviation.

The three major alternatives were: to merge Navy and Army Aviation in a unified Air Force; to organize Naval Aviation's operating forces in a Naval Flying Corps; and to consolidate Naval Aviation policy and technical direction in a Bureau of Aeronautics. When the first of these alternatives began to gain national support, Hunsaker took the initiative in urging that the third be adopted. His superior, RAdm. Taylor, offered to give his Aircraft Division to a new bureau.

On July 10, 1921, Congress enacted that proposal into law: "There is hereby created and established in the Department of the Navy a Bureau of Aeronautics (BuAer) which shall be charged with matters pertaining to naval aeronautics as may be prescribed by the Secretary of the Navy."

The following month the Secretary issued General Order 65 which assigned functions. These comprised "all that relates to designing, building, fitting out and repairing Naval and Marine Corps aircraft, except as hereinafter provided." In material areas the exceptions included: aircraft radio which was retained by the Bureau of Engineering; aviation ordnance, retained by the Bureau of Ordnance; and navigation instruments, retained by the Bureau of Navigation.

BuAer was to ultimately receive full responsibility for airborne navigation instruments before WW II. After the war, it similarly received responsibility for airborne electronics, the suddenly adult offspring of aviation radio. Aviation ordnance was to prove a more difficult problem.

BuAer was formed by merging into one organization the various aviation offices from the Chief of Naval Operations and the aviation divisions from the Bureaus of Engineering and Construction and Repair. If viewed in terms of the reasons why BuAer was formed, it is easy to understand why it received a policy and operational role to accompany the reassignment of offices from the Chief of Naval Operations. Indeed, it was beneficial to have practically all Naval Aviation responsibilities concentrated in a single organization during the period of development and expansion of the Twenties and the Thirties. It was also beneficial during the mobilization phases of the first two years of WW II. Yet there was a paradox in giving a material bureau policy and planning responsibilities in connection with a program which, under the impact of war, reached into every part of the naval establishment. So long as the emphasis was upon procurement of equipment and personnel, BuAer did a remarkable job. When the material of war became available and when training programs turned out large numbers of pilots and maintenance men, the problems of logistics became paramount and these could only be solved in the Office of the Chief of Naval Operations. Thus, in August 1943, those divisions of BuAer which had responsibility for planning, operations, personnel and training were transferred to a newly formed Deputy Chief of Naval Operations (Air).

To return to 1921, BuAer began functioning as an aeronautical planning, policy and material organization on September 1. The Navy's first aircraft carrier, USS *Langley*, was converted from the collier *Jupiter* and commissioned in 1922. In retrospect, this marked the beginning of the great carrier fleets of WW II and today. At the time, developing aircraft for use from carriers was but one of the bureau's many areas of endeavor. Long-range flying boats, huge rigid airships and small aircraft which could operate from existing capital ships were others.

Technical and tactical advances were made, of course. Tactical development was based upon sound technical underpinnings provided through BuAer. Radial air-cooled engines, improved aircraft structure and more effective streamlining were but a few innovations.

As the operating forces improved dive-bombing techniques, they looked to the bureau for aircraft with the necessary strength factors to handle such missions. In cooperation with the Bureau of Ordnance, BuAer also devised displacing gear that would keep the bomb from colliding with the aircraft when released in a steep dive.

Sound development occurred both in basic areas of technology that were common to all aircraft and in the design of various classes of aircraft. In retrospect, some of these advancements seem to have been agonizingly long in gestation. It is difficult to believe, for example, that the Navy's first production order for a monoplane fighter, the F2A, was placed in June 1938, only months before the Munich treaty that almost certainly made WW II inevitable. The PBY *Catalina* flying boat traced its direct lineage to the Consolidated XPY-1 of 1927 and approximated its final configuration in the PBY-1, which was delivered in 1936. Between these extremes there was steady incremental improvement in the design of torpedo planes, dive bombers and aircraft for battleships and cruisers.

A major problem at the beginning of the 1940s, as it had been 25 years earlier, was to produce aircraft in the quantity that would be needed in case of war. In June 1940 the Navy combat inventory consisted of 1,194 aircraft. During the next five years it increased nearly 25-fold, to 29,125 in 1945. In addition to the quantitative growth indicated by the above numbers, there was a qualitative growth in performance within each class. For example, the F2A never became a Navy favorite and was replaced by the more rugged F4F *Wildcat*. The latter aircraft (manufactured by General Motors as the FM) remained in service throughout the war but was joined by the vastly superior F6F *Hellcat* and F4U *Corsair* in 1943. That same year the SBD *Dauntless* was joined by the SB2C *Helldiver* while the TBF *Avenger* had taken over from the ill-fated TBD almost immediately after the Battle of Midway in June 1942. Flying boats, typified by the PBY *Catalina* and PBM *Mariner*, performed yeoman service throughout the war but they were joined by a number of long-range landplanes which, by virtue of superior performance and ease of operation, added a new dimension to scouting in the Pacific and to antisubmarine warfare in the Atlantic.

Despite the qualitative and quantitative successes of WW II aircraft development and production programs, at the close of the war, BuAer faced unprecedented technical problems in the adaptation of jet planes to carrier operations, in the development of sonic and supersonic aircraft and in exploiting the fullest potential of radar. Guided missiles and push-button warfare became everyday words although the adaptation of hardware to naval warfare was to require the expenditure of much effort over many years. The helicopter required assimilation into Naval Aviation. Visionaries spoke of revolutions in both tactics and management that would stem from the digital computer. The work of BuAer involved planning and directing these efforts.

These highly sophisticated technological problems were faced in a period that was more confused than it would otherwise have been because of the advent of the nuclear bomb. In two test explosions at Bikini Atoll in July 1946, 32 ships, that only a year earlier had been successfully converting the Pacific Ocean into an American lake, were directly or indirectly sunk. These tests emphasized the need for continuing advancement in all fields of naval technology.

BuAer and BuOrd continued their endeavors with various types of guided missiles. Both mounted broad-gauged programs. One of the more successful of these was Ordance's *Bumblebee* that produced the 3-T surface-to-air missiles – *Talos, Terrier* and *Tartar*. The Naval Ordnance Test Station at Inyokern, Calif., began its work in infrared guidance that was to result in the *Sidewinder*. BuAer's *Lark* made tremendous strides towards perfecting the mid-course guidance and radar active homing devices that came to fruition in the *Sparrow*. The *Loon*, an American version of the German V-1, was equipped with radio controls and used to develop and test techniques of surface ship and submarine launched cruise missiles. In 1948, development of the *Regulus* assault missile was

Antietam conducting angled deck experiments.

begun. Efforts to develop an earth satellite vehicle were cancelled because of interservice bickering and because the higher levels of the Department of Defense were not convinced that a satellite would have any military utility.

A first generation of jet fighters acquired some limited carrier exposure in 1948 when VF-5A pilots flew the FJ-1 from *Boxer* and all pilots of VF-17A qualified to operate the FH-1 from *Saipan*.

This technological progress occurred in a time of demobilization and retrenchment. Many of the newer aircraft left over from WW II and many ships were placed in mothballs. The number of carriers in commission decreased from 98 in July 1945 to 15 in 1950 and the number of Navy and Marine pilots on active duty from 59,000 to 10,400.

Then on June 25, 1950, the North Korean People's Army invaded South Korea. On the 27th, President Truman ordered U.S. forces to support the South Koreans. Retrenchment turned into expansion almost overnight. Immediate needs for more aircraft were met by withdrawing aircraft from storage. The F4U *Corsair*, in particular, provided valuable service throughout the war while the new AD *Skyraider* attack plane delivered bombloads comparable to those of WW II heavy bombers. Helicopters came into use both for medical evacuation and for transport and supply of frontline troops.

When Russian MiG-15s were encountered near the Yalu river, America was shocked by the realization that advanced aviation technology was not a western monopoly. Production contracts were quickly placed for advanced design turbo-jet and turbo-prop aircraft. It became clear that developmental problems encountered with complex and expensive high performance aircraft were exacerbated by premature commitment to production. Thus much greater emphasis than before was placed upon systematic development and test.

At the time the need for increased managerial skill in many advanced technological areas was a self-evident problem. In retrospect, it is significant that the A4D (A-4) *Skyhawk*, the F8U (F-8) *Crusader*, the F4H (F-4) *Phantom II* and the HSS-1 (H-34) helicopter all had their beginnings during, or immediately after, the Korean War.

The North Korean's facility at mine warfare led the U.S. Navy to take initial steps towards developing a helicopter minesweeping capability.

Even though F9Fs and F2Hs had demonstrated that they could operate from conventional straight-deck aircraft carriers equipped with hydraulic catapults, the growth in weight of newer aircraft intensified the problems involved in carrier operations. Major parts of the solution were borrowed from the British Navy. In April 1952, U.S. Navy pilots participated in demonstrations of launching aircraft by steam catapult from HMS *Perseus* and, in September 1953, USS *Hancock* became the U.S. Navy's first carrier to be equipped with a steam catapult. Similarly, the British concept of an angled flight deck was tried out on USS *Midway* in May 1952 and actual installation on *Antietam* was completed the following January.

It will be recalled that aviation ordnance was one of three aeronautical material areas that was not assigned to the Bureau of Aeronautics in 1921. For 40 years, BuOrd was responsible for design and production of ordnance materials and BuAer for installation on aircraft. Management problems growing out of this arrangement were resolved or endured. As guided missiles became more important, however, they drew increasing support from both bureaus. Conflicts inevitably developed over basic policy and assignment of particular projects. The magnitude of these differences was a basic factor in the decision reached in 1959 to form a Bureau of Naval Weapons by merging the Bureaus of Aeronautics and Ordnance. The Bureau of Naval Weapons (BuWeps) was formed on September 1, 1959, and became an operating agency on December 1.

Most of us initially looked at BuWeps as a step forward. However, as plans for its organization began to mature all hands realized that it was no simple task to merge two bureaus, each with a long and honorable record of achievement and each with its own home-grown philosophy and method of operation. The organizational problems were compounded with substantive difficulties relating to the incorporation of guided missiles and satellites into the Navy's inventory. At the same time, the *Polaris* ballistic missile program was giving the Navy an object lesson in the efficacy of single-minded project management.

If that were not enough, the change in the Nation's political administration in 1961 brought a new team into the Department of Defense under the leadership of Robert S. McNamara. It stressed the adoption of modern business management techniques as a means of greatly increasing efficiency and effectiveness. In part because of skepticism as to the value of broad reforms and in part because of concern

PB4Y-2

over the burgeoning cost of new weapons and related hardware, Congress simultaneously began to examine very closely proposals for new defense programs.

This turmoil naturally led to several close examinations of organizational relationships and to restructuring of the Navy Department. The first step occurred in 1963 when the Chief of Naval Material and a new Naval Material Support Establishment were interposed between the Navy Material Bureaus and the Secretary of the Navy. To provide more responsiveness and to realign the Navy organization in a manner more closely paralleling that of the Army and the Air Force, the four material bureaus, Ships, Naval Weapons, Supplies and Accounts, and Yards and Docks were abolished on May 1, 1966, and replaced by six Systems Commands, of which the Naval Air Systems Command was one. At that time, the Chief of Naval Material was also placed directly under the Chief of Naval Operations. As Vice Admiral I. J. Galantin, Chief of Naval Material, explained, it involved giving up the Navy's "historic bilinear framework and putting everything under single-line authority," and reconstituting Navy material activities "into a truly corporate body, a unified Naval Material Command."

The disestablishment of BuWeps only six and a half years after its establishment led many people to conclude that it was a failure. I do not think so. Its disestablishment was more a reflection of new theories of organization and management than of its performance.

I spent a year examining its achievements and concluded that they continued to meet the standards of its predecessors, the Bureaus of Aeronautics and Ordnance. To cite a few examples, the Air Force selected the Navy-developed F-4 as a first-line fighter bomber, perhaps the first time that a carrier-based fighter succeeded in a dedicated land-based mission. The multi-service A-7 was developed almost to the point of service assignment under BuWeps management. The OV-10 was developed to meet a newly defined requirement for a counter-insurgency mission craft. The P-3 patrol plane was phased into service and the A-New project was formulated to give the P-3C an order of magnitude increase in ASW data processing. The concept of a universal electronics testing technique gained credence with the formulation of VAST and its effective prosecution. When the Nation's armed forces were committed to the Vietnamese War, aerial defense of both Army and Navy aircraft relied heavily upon the Navy-developed *Sparrow III*, *Sidewinder* and *Shrike*.

In the formation of the Naval Air Systems Command, special thought was given to the problems of aviation ordnance. NavAir received a much broader assignment of ordnance responsibility than had been exercised by BuAer. A major problem area with the new commands was that of electronics responsibilities. When the systems commands were formed, aviation ground electronic concerns were assigned to the Naval Electronics Systems Command. In 1972 the Navy space projects were also assigned to it.

NavAirSysCom is proving a worthy successor to the Bureaus of Aeronautics and Naval Weapons. The F-14 is, perhaps, the most effective aerial defense weapon ever devised and constructed. The F-18, whose first flight is scheduled for the near future, is designed to provide the fleet with maximum air defense for funds expended. The *Harpoon* and *Tomahawk* will give new capabilities in missile warfare while LAMPS is extending the defense capability of so-called "non-aviation" ships against missiles and submarines.

The problems faced today are difficult and challenging, just as were those that J. C. Hunsaker faced in obtaining an aircraft worthy of a production contract sixty-one years ago. At that time the Bureau of Construction and Repair was building up a scientific and engineering foundation for aviation technology. That foundation permitted the Navy's WW I aviation needs to be met and provided precedent for BuAer in developing and procuring aircraft and material for WW II.

When the Navy was adapting turbojet technology to the carrier, it was also procuring aircraft to fight a war in Korea. Similarly, as modern tactical control equipment and automation were beginning to demonstrate their worth, BuWeps and later NavAirSysCom provided aircraft and weapons to support the Nation's policy in Vietnam. Tactics and strategy of war have changed with revolutions in weapons, but the tradition of management based upon sound scientific and engineering foundations remains as the basis whereby NavAirSysCom helps the Navy and the Nation to meet the future.

I first became involved in Naval Aviation history in September 1945. I graduated from the Navy Bomb Disposal School just as the Japanese surrendered, and needed an assignment that would keep me occupied until I qualified for demobilization. Hearing that the Aviation History Unit was looking for an engineer, I applied. The head of the office explained that they had been attempting to get an aeronautical engineer to work on the history of aviation technology. Because of the burgeoning of jet aviation, however, none was available.

As a result, the history office had decided to settle for any kind of an engineer and I (with a chemical engineering background) was the first one to show up. I was hired.

During the next year, I worked on the history of aircraft engine development and Naval Aviation armament. Upon demobilization, I returned to Texas and my engineering profession. In the summer of 1947, Captain Preil of BuAer wrote to me that the Navy wanted someone to write a technical history of BuAer in WW II and offered me the job. I accepted, married and returned to Washington. Here I have stayed for 30 years.

During that time I have had a rare vantage point from which to watch the evolution of Naval Aviation. Change after change has occurred with bewildering rapidity. Through it all there have been a few constants. Most important is the competence and dedication of the many fine people, both officers and civilians, it has been my privilege to know. The picky daily frustrations change but are still a constant irritant. Through the years, however, an atmosphere of dedication, stimulation and accomplishment was achieved by a distinguished group of people, including Vice Admiral P. N. L. Bellinger, Captain Holden C. Richardson and Alfred V. Verville, aviation pioneers; Captain Walter S. Diehl, Admiral A. M. Pride, William Z. Frisbie and Carlyle S. Fliedner, whose careers spanned World Wars I and II; and their successors such as George Spangenberg, William Hoven, Rear Admiral Rupert S. Miller and Vice Admirals Kent Lee and William D. Houser; and, of course, my professional colleagues, H. M. Dater and A. O. Van Wyen of the Aviation History Unit, Al Goldberg and Joe Angell of Air Force History (Al is now DoD Historian), Dean Allard and Rear Admiral E. M. Eller of the Naval History Division. These are just a few of the many. It has been an honor to know such men and in some small way to help record their contributions in a great field.

VA-86 Corsairs

DEPARTMENT OF THE NAVY
AIR SYSTEMS COMMAND

touch and go

On Camera

The 83,000-ton *Saratoga* and two embarked squadrons, HS-7 and VS-22, will be featured in a British televised documentary on antisubmarine warfare. Filmed on location off the coast of Jacksonville in June, the carrier's capability to combat enemy submarines will be part of an hour-long show aired on British National Television's popular "Panorama."

During the two-and-a-half-day filming venture, BBC correspondent Tom Mangold and director John Penycate conducted an in-depth study of *Saratoga*'s newly installed submarine detection equipment and reported on the carrier's submarine-seeking aircraft. The program will also include an interview with *Saratoga's* commanding officer, Captain Charles B. Hunter.

A segment on the shore-based P-3 *Orion* and an interview with Admiral Isaac Kidd, Commander in Chief, Atlantic Fleet, are being filmed at separate locations for inclusion in the show.

HS-7 flies the SH-3, and VS-22, the S-3A.

VP-66 in Naples

I left my job as a high school counselor in Austin, Texas, and joined Naval Reserve Patrol Squadron 66 (VP-66) at its home base, NAS Willow Grove, Pa., for my annual active duty training period at Rota, Spain. I had my public affairs assignment. The squadron was to fly antisubmarine warfare patrols in Atlantic and Mediterranean waters. Just as the jet lag began to wear off, I received instructions to accompany VP-66 Crew One to Naples.

I joined squadron skipper, Cdr. Alan Kyle, and three other officers for an extra-early breakfast. The C.O. rushed through his breakfast and then dashed away to file the flight plan. We soon joined him on plane No. 9.

The crew was briefed. Since I had not flown in a P-3 before, a crew member was designated to fit me with a life vest and parachute. His name tag read AOC Tom Armstrong, VP-66. Chief Armstrong was careful to substitute layman's language for the usual terminology. He was very patient. Condition Five was set, the aircraft made a gradual climb and we were airborne.

Later I was allowed to wander around the aircraft and observe the crew, busy at their complicated-looking pieces of equipment. The cockpit proved even more complicated. There were many switches, dials and gauges, as well as numerous navigational charts.

Each crew member explained what he could about his job and equipment. Each was thoroughly checked out on his gear, understood how it functioned individually and what part it played in the overall mission of the aircraft. Already I felt I'd learned a great deal about the crew, aircraft and equipment.

Upon reaching Naples, I took care of my PAO assignment at the office of Commander, Fleet Air Mediterranean while the air crew took care of its post-flight activities aboard the aircraft.

We all stayed at the same hotel in downtown Naples and later ate together. I felt fully accepted and, in some respects, a part of Crew One. However, this was not an ordinary crew. There was something about them that set them apart – they were special, true professionals. During dinner they talked and laughed in a manner that reflected strong ties and an outstanding rapport.

Following breakfast the next morning, the crew began its preflight duties. Since the return flight was not an operational one, VP-66's officer in charge and tactical coordinator for the hop, LCdr. Norman Beal, conducted a comprehensive, inflight training session. Beginning in the aft section, this included the handling of different types of fires while flying, the use of CO_2 bottles, the hydraulics as well as ordnance systems. In addition, he spent time briefing on the launching of a life raft, its contents and use. There were questions and answers and, two hours later, the training session ended. The men had worked their way to the cockpit. I was impressed with the intelligence, dedication and esprit de corps of the crew.

I learned later that Crew One was representative of the entire squadron. Each crew works with cohesiveness, teamwork and determination to earn a Bravo Zulu. They seemed to collectively express the same idea: "VP-66 provides meaningful, professional training and the opportunity to improve and maintain operational readiness."

Cdr. Alan Kyle, C.O., pilot, LCdr. Rich Orr, copilot, ADC Al Milmant, flight engineer, AOC Tom Armstrong, AW1 Jim Kunsch, AW1 Jim Nicklan, and AW3 Bill Swain: It was a pleasure flying with you. **Lt. Adam Lopez**

PEOPLE PLANES AND PLACES

Six S-3As from VS-21 became the first carrier aircraft to complete a transPacific flight without a lead navigational airplane or inflight refueling. The *Vikings* used their own inertial navigation systems, and their onboard fuel capacities enabled them to make the flight without the aid of a tanker. The planes left Atsugi, Japan, on November 7, stopped at Wake Island and Barbers Point, and completed their 6,000-mile journey at NAS North Island on November 10.

Two-year-old Lisa seems to be saying, "What about me?" while her father, Lt. John P. Peck, embraces his wife Anne upon VFP-63's return to NAS Miramar after an eight-month cruise to WestPac aboard *Coral Sea*.

VMFA-112 has been selected as the recipient of the Robert M. Hanson Award, making it the outstanding Marine fighter squadron of 1977. Squadron C.O., LCol. Michael Hixson, accepted the trophy during the Marine Corps Aviation Association annual convention in Dallas. The Hanson Award, sponsored by the Vought Corporation, is presented annually to a fighter squadron selected by the Commandant of the Marine Corps. It is named for a Marine captain ace and Medal of Honor winner who was killed in WW II after shooting down 25 enemy planes.

Lambert, the Sheepish Lion, a Walt Disney cartoon character, rides the tails of NAS Glenview's VP-90 *Orions.* As the story

goes, Lambert was raised with a flock of sheep and thought he was one. One night the flock was attacked by a wolf. Just about the time the wolf was going to consume his mother, Lambert realized his own strength and successfully attacked the wolf. Happy ending. Even VP-90's insignia depicts a lion's head (*NANews,* February 1975).

Air Vice Marshall Geoffrey C. Cairns, Royal Air Force, presented VP-1 with the Coastal Command Trophy in ceremonies at NAS Barbers Point. This award, for the competitive cycle ending June 30, 1977, commemorates the long-standing good relations between the two services by recognizing the Pacific Fleet squadron attaining the highest level of proficiency in airborne anti-submarine warfare.

Participating in their second annual ORE, *Nimitz* and embarked CVW-8 were involved in more than 66 hours of simulated battle conditions off the Florida coast. "Hostile" forces were provided by several destroyers, a submarine and planes from CVWR-20, NAS Jacksonville. The operations tested new ORE procedures to be employed in exercises.

For the third consecutive year, Whiting Field's aircraft intermediate maintenance department has won the Villard C. Sledge Memorial Maintenance Award in the T-53 category, while H&MS-16's power plants section, MCAS(H) Santa Ana, took the award in the T-65 and T-58 categories. Presented annually by the Chief of Naval Operations to Navy and Marine squadrons with outstanding maintenance records, the award honors a pioneer in Naval Aviation maintenance.

Six VA-303 pilots recently placed second in the annual LAtWingPac Bombing Derby. This normally isn't a stunning achievement, but the fact that the VA-303 pilots flew A-7As makes it noteworthy. The reserve squadron out of NAS Alameda beat five A-7E squadrons, two A-7A squadrons and one A-4 squadron in its effort. Participating pilots were Cdr. Al Talley, C.O., LCdrs. Ken McCluskey and Hal Shorr, and Lts. Steve Josephson, Bob Thomas and Bob Chirone.

LCol. Gerland C. Lindgren, C.O. of VMFA-333 based at MCAS Beaufort, S.C., received the Robert G. Robinson Award for the most outstanding contribution to Marine Aviation during 1977 by a Marine NFO. The award was established in memory of the Marine sergeant who earned the Congressional Medal of Honor in aerial combat during WW I.

NAS Lemoore's VA-153 was decommissioned on September 30, 1977. The *Blue Tail Flies* ended a distinguished history of outstanding achievements by being awarded, for the third consecutive time, the ComNavAirPac Battle E for the period January 1, 1976, to June 30, 1977. It further demonstrated its competitive spirit by excelling on the athletic field and winning the Admiral's Cup Sports Trophy for the 1976-77 season. Squadron C.O. was Cdr. Larry Price.

ABF1 William M. Tucker photographed *Nimitz* recently when she arrived at NB

Guantanamo Bay to pick up and discharge members of the Fleet Training Group.

Lt. Robert "Hoot" Gibson, an F-14 test pilot from NATC Patuxent River, checks out his aircraft prior to a test flight. Hundreds of

tufts have been attached to the aircraft so the chase plane can photograph the airflow around the 17-foot tactical air reconnaissance pod system. The system would not decrease the F-14s capabilities as a fighter.

Changes of command

HSL-32: Cdr. Charles White Oakes relieved Cdr. Stanley John Wass.

MABS-32: LCol. John E. Mead relieved LCol. Gilbert R. Meibaum.

MCAS Yuma: Col. John I. Hudson relieved Col. Robert R. Norton.

MCCRTG-10: LCol. John Gagen relieved Col. John I. Hudson.

NARU Jacksonville: Capt. Edmond M. Feeks relieved Capt. John A. Chalbeck.

VMFA-451: Maj. Ruban N. Patrick relieved LCol. Jack P. Monroe.

VP-1: Cdr. Walter T. Cook relieved Cdr. Richard W. Michaux.

VR-1: Cdr. Wylen R. Holland relieved Capt. Thomas G. Higgins.

VS-24: Cdr. Louis B. Wardlow relieved Cdr. Robert A. Dykes.

VT-23: Cdr. Neil E. Holben relieved Cdr. Leroy Chambers.

VT-86: Cdr. William R. Logue relieved Cdr. Donald W. Seykowski.

Two squadrons have recently celebrated milestones of 30,000 accident-free hours. Cdr. Dick Hamon, C.O. of VA-37, logged the *Bulls'* record hour as he landed aboard *Saratoga* in an A-7 *Corsair II*. The *Pacemakers* of VF-121, NAS Miramar, achieved their milestone while training newly designated pilots and NFOs in *Phantom* operations. In photo (from left) C.O., Cdr. C. R. McGrail; record setting aircrews: Lts. M. S. Boose, T. S. Heath, C. E. Grubaugh and D. C. Hodges; RAdm. F. G. Fellowes, ComFitAEWWingPac; (kneeling) AME1 R. F. McConnell and AQC R. A. Large.

Buffeted by storm winds, the transAtlantic balloon *Double Eagle* drifted low over the sea between Greenland and Iceland. Jacksonville-based VP-24, currently deployed to NS Keflavik, launched its Ready One aircraft after a Mayday report was received by a transiting airliner. The *Orion's* crew communicated with the balloon occupants, kept track of its position and vectored an Air Force H-3 helicopter in for a successful rescue. The P-3C's plane commander was Lt. A.L.V. Ingram. Mission commander was Lt. R. T. Todd. VP-24 is commanded by Cdr. L. H. Grafel. The rescued balloonists treated the Navy and Air Force crews to a large dinner.

The winner of the VAdm. Robert B. Pirie Air Traffic Controller of the Year Award for 1977 is Marine MSgt. Robert A. Marshall of MCAS Yuma. Marshall was cited for ". . . outstanding professionalism, exceptional performance of duty in a demanding environment and sustained individual excellence . . . particularly evident when he averted tragedy on August 27, 1976." He efficiently calmed and directed to the air station the pilot of a light aircraft who stated she was lost and having difficulty flying the plane and coping with her violently ill child, the only passenger.

The award is named for a former Deputy Chief of Naval Operations (Air Warfare), who was also a major contributor to the formation of the present National Airspace System, following enactment of the Federal Aviation Act of 1958.

AC2 Diane L. Barrows was presented a second letter of commendation by the C.O. of NAS North Island for preventing an aircraft accident twice in three months. One day while she was on duty as tower supervisor, an HSL-31 *Seasprite* on a training exercise was given clearance to land. Barrows noticed the wheels of the approaching aircraft were up, not down and locked, and quickly initiated a wave-off, enabling the H-2 to go around and set up for a safe approach. The first incident in which Barrows prevented a mishap involved an H-3 *Sea King*.

Asked about the most difficult part of her job, Barrows said, "It would be learning the different aircraft characteristics, like how long the runway has to be in order for an S-3A *Viking* to be able to land, and the weight limitations on various planes."

Married to AC1 Philip F. Barrows, Jr., who is her section leader, she added, "I enjoy my work because I am close to my husband and not only do we have time off together, but also we have something in common which brings us much closer — our work."

VP-6, NAS Barbers Point, recently accepted delivery of the first of nine P-3B *Super Bees.* The *Blue Sharks,* commanded by Cdr. L. W. Wright, will be the first patrol squadron in the Navy to operationally fly and deploy with this modernized version of the P-3A and P-3B ASW weapons system. The new aircraft features a digital computer processing capability, an Omega navigation system, state-of-the-art tactical display and advanced acoustic sensor equipment.

The Coast Guard has received the first of four advanced model HC-130H *Hercules* patrol aircraft it will use to help enforce the nation's 200-mile fishing zone. The HC-130H is a specially configured SAR version of the Lockheed *Hercules* turboprop, with a range of more than 2,000 miles and a cruise speed of more than 335 knots. The aircraft will operate from the Coast Guard's base at Kodiak, Alaska.

The *Sidewinders* of VA-86 are currently operating their A-7Es with CVW-8 aboard *Nimitz,* conducting refresher training prior to an upcoming Med deployment. Led by Cdr. Herb Taylor, they recently completed four years of accident-free flying, representing over 6,600 carrier arrested landings and 19,000 safe flying hours. During the at-sea period, Ltjg. Paul Rollins became a centurion and Lts. Bob Klosterman, Ted Evans and John Bussey became double centurions. Maintenance officer LCdr. Doug Bradt joined the membership of the *Corsair II* 1,000-hour club.

Not many sailors will be able to visit Patuxent River in 30 years and point to something for which they were personally responsible. VP-68's AD3 Dan Smith will. In the photo, he is making notes on the condition of the XF2Y-1 *Sea Dart* he has

volunteered to restore for the Naval Air Test and Evaluation Museum. The Smithsonian Institution in Washington, D.C., wanted to put the *Sea Dart* on display in their National Air and Space Museum, but they ran out of room. For years now it has been sitting at Pax River almost forgotten. Smith and two volunteers from his squadron, AMS3s Jeff Rose and Fred Coleman, are facing about three months of hard work because the aircraft has suffered massive corrosion. But Smith has assisted in refurbishing at least six planes for the Naval Aviation Museum in Pensacola, and he's confident they will have the *Sea Dart* ready for display early in 1978.

Three of Cubi Point's VC-5 *Skyhawks* accompany VP-65's *Orion* during fleet exercise *Multiplex,* in which the squadrons performed under simulated conditions of war.

A History of Sea-Air Aviation

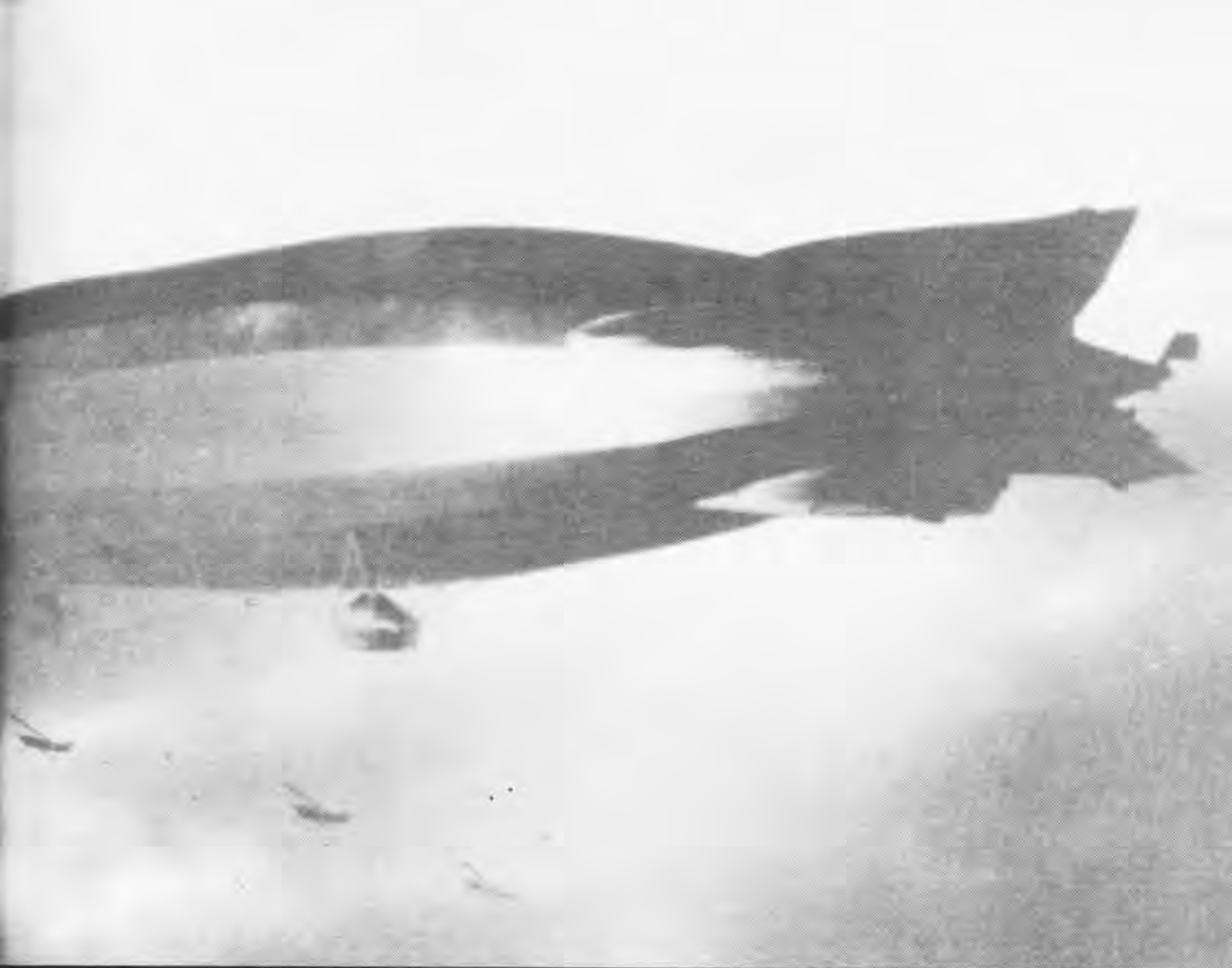
Wings Over The Ocean

part six

By John M. Lindley

By comparison with the North Pole, air conquest of the South Pole was generally less hazardous. The South Pole probably claimed the lives of fewer explorers because it was less accessible and therefore required more careful preparations. Prior to a concerted aerial assault on the South Pole, pilots Wilkins, Eielson, and Joe Crosson flew a *Vega* over Graham Land (also called Palmer Peninsula) in Antarctica, thereby beginning serious aerial exploration of that continent. On their flight they discovered that Palmer Peninsula was in fact an archipelago.

Shortly after that, Cdr. Byrd began aerial exploration in Antarctica. He established a base camp called Little America from which he and a crew of four made their historic flight over the South Pole on November 28-29, 1929.



Their plane, a Ford Tri-Motor called the *Floyd Bennett* in honor of their late fellow pilot, functioned without problems and the weather remained favorable throughout the flight out and back from Little America.

In the 1950s the Antarctic once again became the focus of aerial exploration. The U.S. Navy initiated Operation *Deep Freeze* in 1955 as part of its preparations for the International Geophysical Year of 1957–1958. Since American scientists wanted to set up a scientific observation station at the South Pole, Rear Admiral George J. Dufek, the commander of the naval forces in Antarctica, and six companions landed an R4D *Skytrain* at the Pole on October 31, 1956. They were the first visitors to the South Pole since Capt. Robert F. Scott of the Royal Navy reached it in January 1912. RAdm. Dufek and his party remained at the Pole for 49 minutes setting up navigational aids which would assist future delivery of materials for the scientific station. They then took off and returned to their base camp.

Like polar flights, round-the-world flights comprise a category of sea-air aviation firsts all their own. The first organized attempt at a round-the-world flight took six months, from April 4 to September 28, 1924. Eight top-notch Army Air Service pilots left Seattle in four single-engine biplanes. Since their Douglas *World Cruisers* could fly as either landplanes or seaplanes, these Army pilots would be able to land anywhere regardless of how primitive the ground facilities were. Only two of the four planes completed the 26,345-mile circuit of the globe from Seattle to Seattle via Alaska (where one airplane crashed), Japan, Southeast Asia, Europe, Ireland (where another plane was abandoned due to a faulty fuel pump) and Greenland. One substantial reason why two out of the four planes were able to complete the flight was that the Army had positioned aviation supplies along the route in advance. Even with these supplies, the pilots still had to be their own mechanics and make all necessary repairs.

In 1927 two Americans, Edward Schlee and William Brock, tried to circuit the globe. They departed from Trepassey, Newfoundland, in a Stinson *Detroiter* monoplane named the *Pride of Detroit* and flew to England. From there they headed eastward stopping at Munich, Belgrade, Constantinople, Karachi, Allahabad, Calcutta, Rangoon, Hanoi and Hong Kong before reaching Tokyo on September 30. The next leg of their journey, 2,480 miles to Midway Island, was an extremely long and hazardous flight. Friends and relatives put pressure on them not to try it. Schlee and Brock gave in reluctantly; they and their plane came home by ship to San Francisco. Ten years later, Amelia Earhart and her navigator, Frederick J. Noonan, would also try a long trans-Pacific flight in an attempt to circle the globe. They were never seen again.

After Schlee and Brock, round-the-world flights became faster and faster. Wiley Post circled the globe solo in his *Winnie Mae* in 7 days and 19 hours in 1933, breaking the record Post and Harold Gatty had set earlier in 1931. Howard Hughes bettered Post's mark in July 1938 by circling the earth in 3 days, 19 hours and 14 minutes. By 1949 a U.S. Air Force B-50 went around the world nonstop (it refueled in flight) in just over 94 hours. The first nonstop global flight by jet planes came on January 15-18, 1957, when three AF B-52 *Stratofortresses* made the circuit of the earth in 45 hours and 19 minutes. Now astronauts and cosmonauts traveling in space vehicles at thousands of miles per hour have made even that time for a circuit of the globe seem incredibly slow.

Commercial Aviation and the Mastery of Transoceanic Flight

When Commander John H. Towers and LCdr. Albert C. Read got back to the United States in June 1919 following the flight of the NC-4 to Europe, the New York press asked them what the future was for the airplane in transAtlantic flight. Both responded that in the immediate future the dirigible had all the advantages over the airplane for overseas service. Read also pointed out that crossing the Atlantic by seaplane was not commercially profitable. In contrast, the airship had already proved in flights over land that it could carry profitable passenger loads.

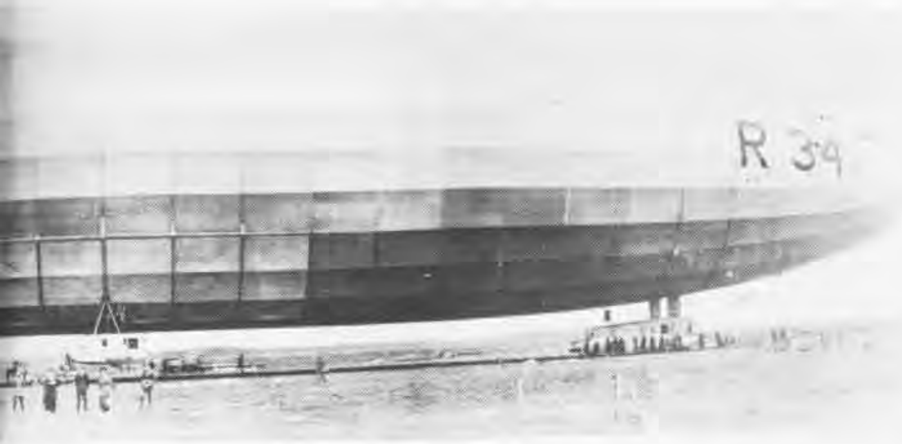
R34

For a time in the 20 years following this interview, the rigid airship did come into its own as the principal passenger carrier for transoceanic flights. Yet this dominance was short lived and by 1939 the dirigible had begun to fade into obscurity as a passenger carrier. The gradual process by which the rigid airship lost out to heavier-than-air craft forms one part of the story of how commercial aviation came to master the problem of transoceanic flight. Thus, this account of the role of commercial flight operations in the history of sea-air aviation must necessarily begin with early transoceanic airship flights.

The first attempt to cross the Atlantic in an airship was a failure. Walter Wellman fitted out a 230-foot dirigible named *America* for a flight to Europe. *America* had two 90-hp engines, a wireless, a lifeboat and a crew of six. It left Atlantic City, N.J., on October 15, 1910. From the outset Wellman and his crew had problems with the lift. Then one of the engines failed. When sparks from the remaining engine threatened to set the hydrogen on fire, Wellman had to shut it down and drift helplessly before the wind. High winds on October 16 prevented a return to the safety of the coast. Wellman hoped they would drift down on Bermuda, but instead they sighted a merchant ship. After making contact with the ship by radio, Wellman brought the airship down close to the water and abandoned it for the safety of the lifeboat and the merchant ship. In five days, *America* had covered only about 1,200 miles; Wellman concluded that a much larger dirigible would be needed for a successful transAtlantic flight.

A big step toward airship conquest of the Atlantic came in 1917 when the German Zeppelin LZ104 (L59) made the first intercontinental flight. The Germans sent LZ104 from their airship base at Jamboli, Bulgaria, to Khartoum in the Sudan to carry relief supplies to German forces trapped in that city. When the Zeppelin left Jamboli on November 21, 1917, it carried 15 tons of cargo and a crew of 22. It had to take an indirect route across the Mediterranean to avoid British aircraft based on the Aegean islands; but once over North Africa, LZ104 navigated across the desert to Khartoum by flying from one oasis to the next. While over the desert the sun superheated the hydrogen forcing the crew to valve considerable gas, which meant that in the cool night air after dark, they had to jettison ballast and supplies to maintain sufficient lift. Once the airship reached Khartoum, it found that the German forces there had already been defeated and the Allied forces were in control of the landing area; thus it could do nothing to help. Since relief was too late, on November 23, LZ104 departed for Jamboli which it reached two days later. The round-trip voyage of 4,200 miles had taken 95 hours.

The intercontinental flight of LZ104 had no significant impact on the course of WW I, but it did prove the capability of the dirigible for transoceanic flight. After the war ended in late 1918, the British Air Ministry, under the leadership of its Director of Airships, Air Commodore Edward M. Maitland, set out to prove the superior capabilities of the airship



for long-range commercial operations. The Air Ministry had two new rigid airships, R33 and R34, which were finished too late for use in the war; thus, when the Aero Club of America invited the British government to send an airship to a meeting of the association in May 1919, Maitland decided to send R34. R34 left East Fortune, Scotland, for New York City on July 2 with a crew of 30 men under the command of Maj. G. H. Scott. Just in case the dirigible needed help en route, the Admiralty had stationed two battle cruisers along the proposed route.

At 634 feet long and 80 feet in diameter, R34 was an average size rigid. It cruised at 45 miles per hour with a top speed of 65 miles per hour. Special passengers were Maitland and LCdr. Zachary Landsdowne, USN. En route to Long Island, the airship suffered a cracked cylinder jacket on one of its five engines, which was repaired with chewing gum. A more serious problem, a storm and high winds, arose on July 5 off northern New England. The airship radioed that it was running low on fuel and might have to land before reaching Mineola, Long Island. The U.S. Navy and civil authorities made preparations to handle an emergency landing, but these precautions proved to be unnecessary when R34 reached Long Island on July 6 without further trouble. R34 stayed in the United States for three days and then returned to Pelham, England, July 9-13. The return trip was made without incident. R34 made the 3,260-mile crossing, east to west, in 108 hours, 12 minutes and the west-to-east transit in 75 hours, 3 minutes.

Surprisingly, the R34 crossings were, as airship historian Douglas Robinson notes, "little remarked at the time and there were no public receptions or decorations for the crew." Robinson believes that the reasons why the flight failed to arouse greater enthusiasm for transoceanic airship travel was the lack of interest by the British government, lack of money, and the lack of support.

Despite the failure of R34 to arouse public support and enthusiasm for airship travel, the German zeppelin program after WW I was able to promote successfully the use of dirigibles in commercial transport. Since the Treaty of Versailles limited the Germans to non-military aviation development, they naturally emphasized the employment of the zeppelin in commercial activities. When the Allied Control Commission rescinded the limit on German airship size in 1925, Dr. Hugo Eckener, Count Zeppelin's successor, was able to exploit the potential market for commercial airship transport.

The commercial air transport division of the Zeppelin Company, DELAG, had already made various passenger flights between German cities as early as 1910-1914; thus, when the Allies removed the limitations on the zeppelins, Eckener had the opportunity to expand DELAG's operations to include intercontinental flights. The first airship DELAG put into service for that purpose was the *Graf Zeppelin* (LZ127). Completed in 1928, *Graf Zeppelin* made a round-trip voyage from Friedrichshafen, Germany, to Lakehurst, N.J., in October 1928. The flight over took 111 hours, 43 minutes; the return trip, 71 hours, 7 minutes. Although this flight aroused great popular enthusiasm for airship travel, Eckener realized that at 757 feet long and 99 feet maximum diameter and with a 71-mph cruising speed, *Graf Zeppelin* was too small for regular transAtlantic service. Thus he began to build an even larger rigid airship, the *Hindenburg* (LZ129), which would be completed in late 1935.

While the Zeppelin Company was building the *Hindenburg*, the *Graf Zeppelin* made several historic flights which greatly increased popular support for airship travel. In March 1929, the *Graf* flew to the eastern Mediterranean, passing over Egypt, Crete, Cyprus, Jerusalem, the Dead Sea and Athens before returning home via Vienna. Eckener then decided to make a round-the-world flight with the *Graf Zeppelin*. Here the problem was not aeronautical or technical but financial. Eckener's airship could not carry enough passengers (20 passengers and a crew of 26) to make the flight pay for itself. Eckener received support, however, from German newspapers, William Randolph Hearst and stamp collectors to make the flight possible. *Graf Zeppelin* thereupon set out on what became two round-the-world flights: Friedrichshafen to Friedrichshafen and Lakehurst to Lakehurst.

First the *Graf* left its shed in Friedrichshafen on August 1, 1929, for Lakehurst where it arrived on August 5. It left Lakehurst three days later and returned to Friedrichshafen on August 10. On the 15th it departed Friedrichshafen for Tokyo via Siberia. After crossing all of Siberia and the Sea of Okhotsk, it arrived in Tokyo on August 19. Four days later it left the Japanese capital for San Francisco. It skirted a typhoon and made the first Pacific crossing by an airship in 67 hours, arriving in San Francisco on August 25. From there it flew to Los Angeles, then across the United States to Lakehurst (August 29) and then back to Friedrichshafen. The round trip from Lakehurst to Lakehurst had taken 21 days and 7½ hours with little more than 7 days spent on the ground at various ports of call.

In the early 1930s Eckener carried out more prestige flights to publicize commercial airship transportation. In 1930 *Graf Zeppelin* flew to Brazil via Spain. In 1931 it participated in Arctic flights as part of the "Aeroarctic" program to explore and map the icy north. Then between August and October, DELAG began to use the *Graf* for regular scheduled passenger flights to South America. It made 9 round-trip transAtlantic flights in 1932 and in 1933; 12 in 1934; 16 in 1935 and, together with the new *Hindenburg*, made a total of 19 trans-Atlantic flights in 1936. The future of transAtlantic airship travel seemed bright and financially feasible until May 6, 1937. On that day a disastrous fire destroyed *Hindenburg* while she was being moored at Lakehurst, N.J., and killed 62 of the 97 persons on board, again calling into question the safety of hydrogen-filled airships and producing much adverse publicity.

Despite the destruction of *Hindenburg*, the record of that airship and the *Graf Zeppelin* in commercial transport is impressive. In nine years of flying, *Graf Zeppelin* made 650 flights (many transoceanic) and carried more than 18,000 passengers for more than one million miles. *Hindenburg* made only 56 flights in 1936 and 1937 but still managed to carry 2,656 passengers a total of 190,000 miles. After the *Hindenburg* disaster, worsening relations between the United States and Nazi Germany, combined with the public image of the airship as unsafe, severely hampered further commercial airship travel. The outbreak of WW II effectively ended any further German commercial passenger transport by dirigible.

Prior to 1940 the flights of German zeppelins operated by DELAG were the only successful commercial airship transport operations. The British had tried in the late 1920s to establish commercial air transport by rigid airship to Canada, Egypt and India, but their efforts had failed. The British Air Ministry had funded the construction of two airships, R100 (built by a civilian company) and R101 (built by the Air Ministry). They made their first test flights in 1929-1930. Then in July 1930, R100 flew to Montreal and back to England, weathering some bad storms en route. After difficulties in its flight tests and subsequent modifications, R101 was provisionally certified as airworthy and prepared for the first of the "Empire flights" to India. Without adequate testing and trials of the later modifications, R101 took off on October 4, 1930. After crossing the English Channel to France, it crashed near Beauvais.

At first the rigid dirigible seemed to be more promising than heavier-than-air craft for long-haul air transport. In the early 1930s the success of the *Graf Zeppelin* tended to reinforce this conclusion; yet even discounting the disasters of R101 and Hindenburg, the rigid dirigible did not become the dominant type of aircraft for long-haul (especially transoceanic) commercial transport. The reasons why heavier-than-air craft were to become dominant are, in retrospect, quite clear, although they were not as apparent in the 1930s.

Even though the rigid airships, especially the zeppelins, demonstrated a high degree of regularity of operation, their record of punctuality was poor. Block time for the transAtlantic flights fluctuated up to twelve hours. Peter Brooks, historian of the modern airliner, argues that, even if helium had been substituted for explosive hydrogen in *Graf Zeppelin* or *Hindenburg*, there still would have been problems with the financial feasibility of com-

mercial airship transport. Helium has less lifting capacity than hydrogen; thus, a helium-filled airship carries a smaller payload than the same airship filled with hydrogen. Brooks estimates that if helium had replaced hydrogen, lighter-than-air costs per seat-mile would have been 50 to 100 percent greater than they were with hydrogen. In addition, he finds that "It is doubtful whether the rigid airship could have achieved acceptable safety standards in worldwide scheduled operation." Thus Brooks concludes that the *Hindenburg* disaster and WW II, coupled with the technical development of heavier-than-air craft by 1946, meant that for practical use on long-haul air routes over both land and sea "the much slower and, by comparison, operationally unproven rigid airship – even filled with helium – had no chance of revival."

Heavier-than-air craft achieved dominance in long-range and transoceanic commercial air transport only very gradually. The dirigible could, of course, compensate for having a slower speed than airplanes with its greater range and bigger payload. In the 1920s and '30s individual airplanes were able to make impressive transoceanic flights. Nevertheless, many of these record flights had no future as regular scheduled air transport. Both landplanes and seaplanes needed to use all their available space for fuel (which weighed six pounds per gallon) on transoceanic flights. An airline has to provide permanent scheduled services to the public, not occasional record flights and dangerous stunts. Thus, the development of transoceanic passenger service depended, in part, upon the gradual improvement of aircraft and the accumulation of flying experience.

The earliest known air transport service began in 1911. During that year, tentative efforts to establish air mail service were made in India, England and the United States. None of these scheduled air mail routes lasted very long. In 1914 Tony Jannus, a pilot, and the St. Petersburg-Tampa Airboat Line provided the first air passenger service. Using a two-seat Benoist Type XIV flying boat, Jannus flew from St. Petersburg across Tampa Bay to Tampa, some 18 miles away. Jannus only made the flight when there were passengers willing to pay the fare which was $5.00 one way. Two round trips per day was the schedule. If there were enough passengers to justify the use of a second flying boat, Tony's brother, Roger, piloted the other aircraft. Both flying boats were biplanes powered by 75-hp Roberts engines.

After the city of St. Petersburg signed a contract for this air transport service, regular scheduled flights began on January 1, 1914. The city fathers wanted the fast air travel over Tampa Bay because the alternatives for getting to Tampa were poor. Travelers could choose a once-a-day two-hour boat ride, a long railroad trip or a difficult automobile ride over dusty roads. The flight with Tony Jannus, in contrast, took 20-23 minutes. To aid the establishment of this new enterprise, the city fathers also provided a subsidy guarantee of $50 per day in January and $25 per day in February and March. In January the airline was able to repay $360 of the subsidy, and it paid its own way in February and March. When the contract with St. Petersburg ran out on March 31, the owners of the airline decided to terminate operations due to the drop in the local tourist business. During its three months or so of operation, the St. Petersburg-Tampa line carried 1,204 passengers without mishap and on only eight days were flights cancelled due to bad weather or mechanical breakdowns.

To be continued

Hindenburg in flames, May 1937.

St.Petersburg-Tampa Airboat Line

NAVAL AVIATION NEWS letters

Shellbacks

This letter is a comment on a letter in the July issue about *Shellbacks.*

I, too, like PO1 Watash have been aboard ship and crossed the equator and am now serving in a patrol squadron.

After reading the letter, many of the *Shellbacks* in our squadron feel a person should cross the equator on a ship to qualify for this honor and, because there is no way of having a proper initiation aboard an aircraft, I feel these people have missed the humbling experience of becoming a true *Shellback.*

With royal displeasure upon these polliwogs. . . .

AMS1 Gerald Springer
VP-6
FPO San Francisco 96601

In regard to your *Shellback* letter (July 1977) please consider the following. Special Assistant to SecNav Adlai Stevenson crossed the equator on January 19, 1943. He was initiated into the Ancient Order of Shellbacks. What makes this different is that SecNav Fred Knox and CinCPac Chester Nimitz were present and the crossing took place in a naval aircraft. They were en route to Espiritu Santo having left Midway. This should set a precedence of some sort.

AT1 John Mackay
CGAS Barbers Point
FPO San Francisco, Calif. 96611

Of course one must cross the "line" in a ship or submarine to qualify for initiation into the Ancient Order of the Deep, and it is imperative that a proper initiation be conducted by genuine *Shellbacks* under the direction of *Neptunus Rex.* Davey Jones would roll over in his locker if he found out that whole planeloads of polliwogs were issuing themselves *Shellback* certificates without the proper protocol. It looks like another attempt by the patrol Navy to identify with the real Navy and its ships without actually serving therein.

Emile J. Paidar
Genuine Shellback

I have been in the Marine Corps for eight years and my father served in the Marine Corps during WW II. Both of us are aviation and we think you don't become a *Shellback* by crossing the line in an aircraft. My father is a *Shellback;* I am merely a *Pollywog.* But I wouldn't feel like I'd been promoted to *Shellback* if I didn't go through the same initiation that 99 percent of the real Navy and Marine Corps *Shellbacks* have gone through for time unremembered. To me there's no merit in receiving an award unless you've truly worked for it. Those young sailors that received the status of *Shellback* by flying over the line should rip up those certificates and try to get the real thing. By the way, that turkey who issued those papers should have to go through the whole ceremony again for issuing fake certificates.

GySgt. Pollywog

Correction

(This letter was received by RAdm. J. M. Tate and forwarded to us.)

I just read with interest your page "Did you know something else?" in *Naval Aviation News* of August 1977, and I want to thank you for including my bit, which is now a matter of history.

However, for your information, there are two errors in the account: (a) we were doing "bounce drill," or touch and go; (b) the gear was *not* rigged. I landed after getting a "high" signal and trying to ease down by giving a touch of throttle. The engine only continued to idle; I hit hard and broke the R.H. landing gear strut (wood). My right wing tip dragged on the deck, finally taking charge and causing me to do a 270-degree ground loop. I was about two feet from the port side of the deck and facing a crash on the dock!

I stopped with five feet of the tail hanging over to starboard side and the engine still idling. The only damage besides the landing gear was a broken inter-plane strut and some fabric rubbed off the wing tip.

Harold Brow

British Collector

I am an assistant air traffic controller in the Royal Air Force, assigned to the *Red Arrows* Aerobatic Team. My hobby is the study of military aircraft color schemes and squadron insignia.

I would appreciate receiving patches or decals from USN/USMC squadrons, also color slides showing aircraft with squadron color schemes.

I would like to thank the squadrons that have already sent patches and slides.

Cpl. Martin W. McClelland
The Red Arrows
CFS (D) Kemble
Royal Air Force Kemble
Cirencester, Gloucestershire
GL7 6BA, England

HSL-32

I am sure that the squadron named in LCdr. Art Schatz's article about LAMPS and DesRon in the August 1977 issue of *NANews* started out as HSL-32 in the original article and merely got typoed into HAL-32. At any rate, Helicopter Antisubmarine Squadron Light 32 is the correct designation for the fine outfit that provided an aviation officer to the DesRon staff.

As for the Helicopter Attack Light (HAL) business, I thought Art got out of it several years ago with his departure from HAL-3. If not, there's always HAL-4 at Norfolk.

M. G. Cox, LCdr.
FASOTraGruLant
NAS Norfolk, Va. 23511

Ed's Note: We erred. HSL-32 is correct.

Reunion

Members of Helicopter Experimental Squadron Three (VX-3) and Helicopter Utility Squadron Two (HU-2) will hold a reunion in Pensacola, Fla., March 31-April 2. All interested former squadron members contact Gene Hecox, 176 Fiore Ct., North Fort Myers, Fla. 33903.

AAHS

The American Aviation Historical Society will hold its annual banquet January 28, 1978, in San Diego. Theme of this year's program is air combat maneuvering with a program provided by the Naval Fighter Weapons School. Anyone interested in attending contact AAHS, Box 99, Garden Grove, Calif. 92642.

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CORRECTION

On page 2 of the December 1977 issue, Lt. Robert W. Bronson was listed as having made 1,000 carrier arrested landings. This was an error. Our apologies.

SQUADRON INSIGNIA

Attack Squadron 86 and its A-7Es are based at NAS Cecil Field. Stationed at NAS Miramar, Fighter Squadron 194 carries out its mission with F-4Js. Fleet Logistic Support Squadron 56 flies C-9Bs out of NAS Norfolk. MCAS(H) Futenma, Okinawa, is home for Marine Helicopter Squadron 462 and its CH-53Ds.

Naval Aviation
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