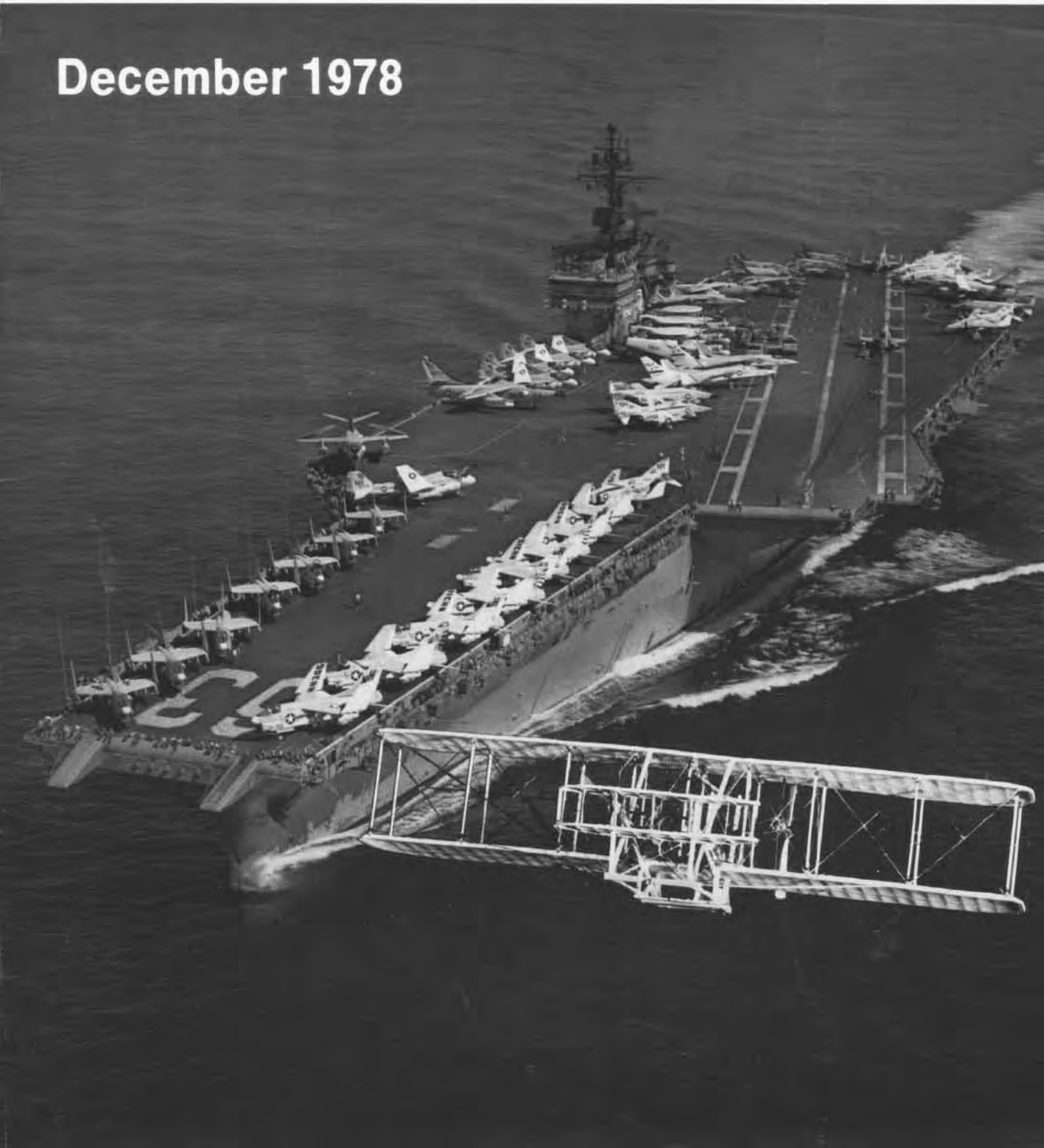
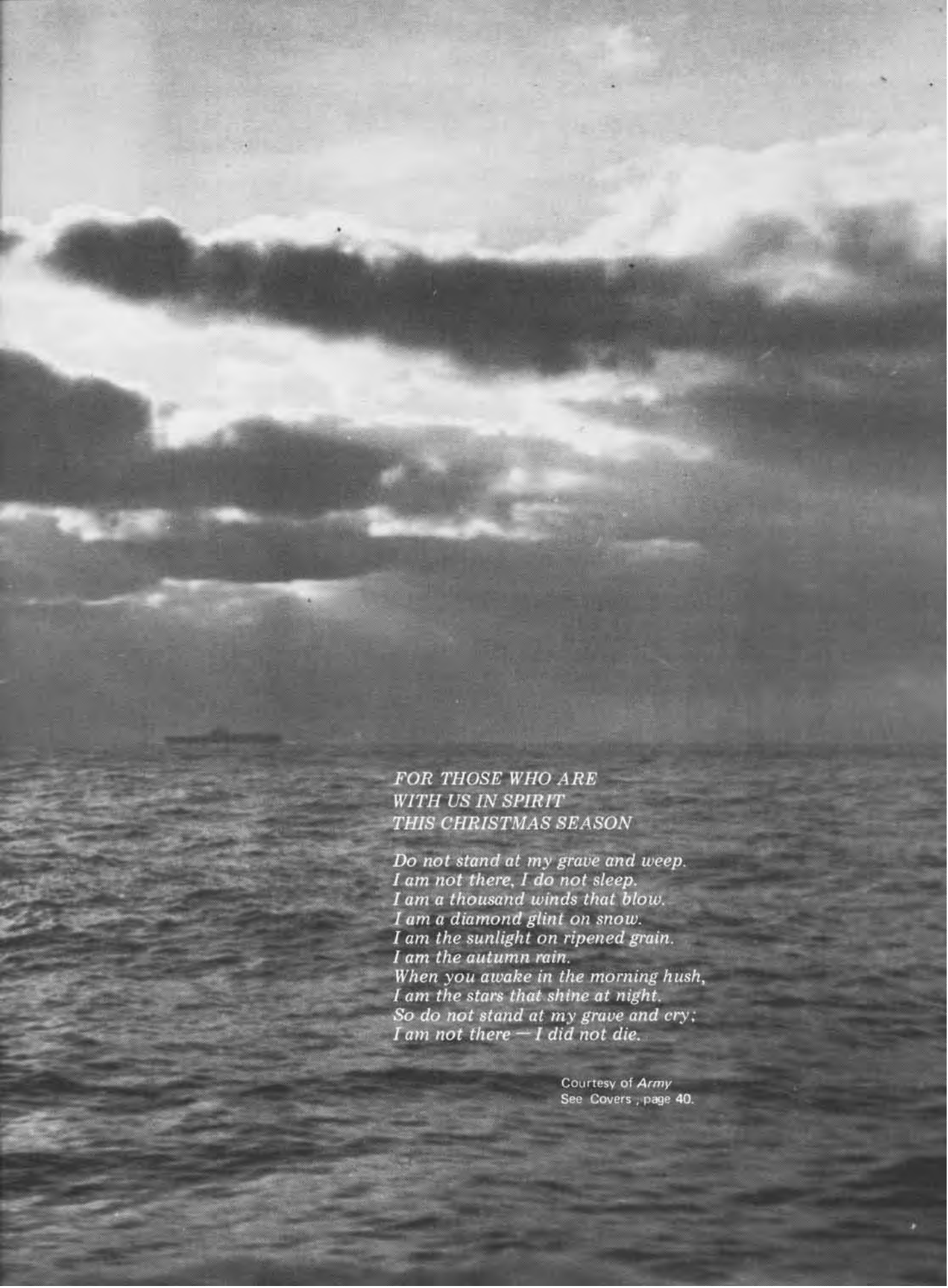
NAVAL AVIATION NEWS

December 1978





FOR THOSE WHO ARE
WITH US IN SPIRIT
THIS CHRISTMAS SEASON

Do not stand at my grave and weep.
I am not there, I do not sleep.
I am a thousand winds that blow.
I am a diamond glint on snow.
I am the sunlight on ripened grain.
I am the autumn rain.
When you awake in the morning hush,
I am the stars that shine at night.
So do not stand at my grave and cry;
I am not there — I did not die.

Courtesy of *Army*
See Covers , page 40.

1000 TRAPS

The following is a list of those flyers who have made 1,000 or more carrier arrested landings. Ranks may have changed. If we have missed listing you or you know someone qualified for membership on this exclusive roster, please let us know.

Cdr. H. D. Alexander
Capt. Robert Arnold
Cdr. Ronald N. Artim
Capt. Stan Arthur
Cdr. Fred Baldwin
Cdr. John S. Brickner
Capt. Edward F. Bronson
Capt. Norman Campbell
Capt. Guy Cane
Capt. W. Lewis Chatham
Capt. Douglas L. Clarke
Capt. Bud Edney
Cdr. L. L. Elmore
Capt. John L. Finley
Capt. James H. Flatley III
Capt. S. C. Flynn
Cdr. George Gedney
Cdr. Jay H. Hall
Cdr. R. W. Hamon
Cdr. Robert W. Hepworth
Cdr. Marshall A. Howard
Capt. Richard L. Kiehl
Capt. H. P. Kober, Jr.
Cdr. P. H. "Bud" Lineberger
Capt. R. E. Loux
Capt. Roger A. Massey
Cdr. James T. Matheny
Cdr. Hugh "Tony" Merrill
Capt. Thomas G. Moore
Capt. Mel Munsinger
Capt. "Moose" Myers
Capt. A. J. Nemoff
Cdr. Richard K. Pottratz
Capt. W. V. Roeser
LCdr. David W. Rucker
Capt. James M. Seely
RAdm. William G. Sizemore
Cdr. Leighton W. "Snuffy" Smith
Cdr. Gary L. Starbird
Cdr. T. R. Swartz
Capt. Jeremy "Bear" Taylor
Capt. Robert Taylor
Cdr Bert D. Terry
Capt. Dwight D. Timm
Capt. Charles L. Tinker
RAdm. Ernest Eugene Tissot
Cdr. R. E. "Gene" Tucker, Jr.
Capt. Jerry O. Tuttle
Cdr. John Waples
Capt. George Watkins
Capt. D. R. Weichman
Capt. W. R. Westerman
Cdr. Gary F. Wheatley
Capt. John R. Wilson, Jr.

NAVAL AVIATION NEWS did you know?

Orville Wright Achievement Award

Ltjg. Donald G. Bringle, VF-124, NAS Miramar, has won the Daedalian Orville Wright Achievement Award as the outstanding Naval Aviator graduate for the period July 1 to December 31, 1977. The award is presented semi-annually. Ltjg. Bringle's selection was based on his record of flight proficiency, academic achievement and officer-like qualities while in the Naval Air Training Command.

The award, established in 1959, recognizes graduates of military pilot training classes for leadership, academic achievement and flying ability. To date, the award has been given to more than 120 outstanding graduates.

Tailhook '78

Nearly 800 Tailhookers met at the Las Vegas Hilton in September to renew old acquaintances and learn what's going on in Naval Aviation today. Bob Lawson, editor of *The Hook*, covered the reunion for *NANews*. His report:

During the symposium, Vice Admiral Frederick C. Turner, DCNO(Air Warfare), spoke on the aircraft carrier situation. Vice Admiral Robert B. Baldwin, Chief of Naval Personnel, commented on Navy personnel matters. The symposium was expanded to include an update on the F/A-18 *Hornet* by Captain Jerry Breast, OpNav program coordinator. An assessment of sea-based air platforms was discussed by Captain Douglas W. Payne, Executive Assistant to the Chief of Naval Material, and a presentation on "Sea-Plan 2000" was made by Professor Bing West of the Naval War College. An address on "Technological Advances in Aircraft Design" was presented by Mr. Wally Deckert, Chief of the V/STOL Technology Division at NASA Ames Research Center.

The panel discussion and forum were highlighted by an open discussion between panel members and the floor. Big-deck carriers, training, leadership and retention problems were just a few of the subjects examined.

This year's selection for Tailhooker of the Year, Admiral Thomas P. Hayward, Chief of Naval Operations, was the speaker at the awards banquet. Trophies were presented to the top 1977 squadrons for outstanding performance in their fields. Max trap awards went to the pilots and NFOs in attendance with the most traps in their respective ranks: Ens. Joseph Heid, pilot, 10; Ltjg. Michael Kane, NFO, 120; Ltjg. Steven Collins, pilot, 120; Lt. Phillip Howarth, Royal Navy, NFO, 349; Lt. David Janiek, pilot, 337; LCdr. Frank Bledsoe, pilot, 750; LCdr. Cecil Clabaugh, NFO, 485; Cdr. John S. Brickner, pilot, 1042; Cdr. Phillip Anselmo, NFO, 680; Capt. Robert Arnold, pilot, 1265; and Vice Admiral George E. R. Kinnear II, pilot, 905.

Belleau Wood Commissioned

USS *Belleau Wood* (LHA-3), third of five amphibious assault ships to join the fleet, was commissioned September 23, 1978, at Ingalls Shipbuilding Division of Litton Industries, Pascagoula, Miss. Vice Admiral James B. Stockdale, President of the Naval War College, Newport, R.I., was the principal speaker.

Belleau Wood is able to embark, deploy and land a fully-equipped Marine assault force by helicopter, landing craft, or a combination of the two. One LHA-class ship can perform many of the functions now requiring four different types of amphibious ships.

Although the LHA will normally travel with other ships, she is capable of providing much of her own defense. Her armament includes three light-weight five-inch guns and air defense missiles, as well as six 20mm machine guns. *Belleau Wood*, 820 feet long at the flight deck and 20 stories high overall, is second in size only to an aircraft carrier. She displaces approximately 39,000 tons fully loaded, and is capable of speeds in excess of 20 knots. The LHA has a

did you know?

complement of 262 officers and more than 2,500 enlisted men, including ships company and embarked Marines.

The ship's name honors the Marines who gave their lives during the WW I battle of Belleau Wood. The action stopped an aggressive German drive to take Paris, and won respect and admiration for the Corps.

Belleau Wood is commanded by Captain T. C. Steele and is home-ported at San Diego.

Santa Ana Blimp Hangars

The huge blimp hangars at MCAS(H) Santa Ana, Calif., have been designated national historic landmarks by the National Register of Historic Places. The normal requirement of being 50 years old was waived in order to ensure their preservation. They were built in 1943 to house the Navy's sub-hunting blimps.

Standing nearly 200 feet high and visible for miles around, the hangars are 1,088 feet long and 300 feet wide. Two identical concrete supporting forms, one on either end, have a brace across the top which serves as a guide for opening and closing the massive doors. The all-wood main body of the hangar is a frame built on the arch principle with 51 vaulted ribs along the length,crossbeams, supports and roof.

The monstrous doors at each end are over 100 feet high and weigh hundreds of tons, sliding back and forth on railroad tracks.

The Santa Ana hangars are two of a series built in 10 different locations throughout the U.S. Each is capable of sheltering six airships. Today, they house the air station's eight helicopter squadrons. The hangars will be open to the public on a periodic basis.

Night Eyes

The Navy has received from Vought Corporation the first production *Corsair II* equipped with a new sensor system which gives a night target scene daylight-like clarity for the attack pilot. It is one of several hundred A-7Es scheduled to receive the forward looking infrared receiver (FLIR) system, most of them through a retrofit program for fleet aircraft. Twenty-six Navy squadrons are flying *Corsair IIs*.

With FLIR, the pilot can "see" surface ships, land vehicles, installations, geographical features and other objects even in total darkness. Heart of the system is a forward-looking infrared heat-measuring sensor in a pod on one of the plane's six wing pylons. It is linked to the already installed precision navigation and weapons delivery system, and the magnified view is projected on the pilot's head-up display. After the mission, a video recorder plays back the infrared imagery obtained during a flight for study by intelligence officers.

FLIR permits the pilot to detect and identify ships at sea at a sufficient distance for a first pass attack. It reveals, in magnified form, details not visible to the pilot's naked eye even during daylight.

Pre-production models have been extensively tested by both company and Navy pilots. More than 250 flights, including bombing and gunnery missions, have been made to prove the system's performance. Approximately 175 pods and 340 FLIR aircraft system installations are planned over the next five years. As a cost-saving measure, pods can be rotated between aircraft by simply attaching the pod to an aircraft's pylon, much like loading ordnance.

Catapult Bridle

Pilots from the Naval Air Development Center, Warminster, Pa., and a Naval Air Engineering Center ground crew recently tested a new catapult bridle at NAEC Lakehurst. Lieutenant Commander John VanDevender and Commander Cole Pierce made 40 catapult shots over a two-day period in a T-2C.

The bridles now used are made of steel wire, expensive, heavy and potentially

damaging to aircraft. The new bridle, of a lightweight inexpensive fiber, is harmless to the airframe. It was able to withstand the strain of a 30-ton aircraft accelerating to a speed of 200 miles per hour.

Silver Falcon Award

Major General Louis Conti, USMCR, is the first recipient of the Silver Falcon Award. The trophy was presented to him at the annual Association of Naval Aviation banquet in New Orleans on September 30. General Louis H. Wilson, Commandant of the Marine Corps, and Lieutenant General T. H. Miller, Deputy Chief of Staff for Aviation, were on hand for the ceremony.

The award is sponsored by the San Diego Squadron of ANA to honor the senior designated reserve Naval Aviator or NFO participating in the reserve program. The trophy, dedicated to the recognition of the importance of Naval and Marine Corps Aviation, will be awarded annually.

MGen. Conti's long and successful career in Marine Corps Aviation spanned both regular and reserve components. Now president of GATX Terminal Corporation, he has remained active in the Marine Corps reserves at NAS Glenview.

grampaw pettibone

C'est La Guerre

Lt. E. Coast launched in his trusty A-4E shortly after lunch (at 1248Z) on the return-home leg of a weekend cross-country flight from NAS Southernmost. After takeoff, the pilot experienced an unsafe indication on the left main gear. Lt. Coast notified the tower of his gear indication and requested a fly-by for a visual check. The tower reported that the nose and right main gear were up but the port gear appeared to be partially down. Lt. Coast recycled the gear but the port main gear continued to indicate unsafe. A second fly-by and recycling of the gear resulted in no improvement in the unsafe condition. At this point, Lt. Coast declared an emergency and proceeded west to NAS Marvelous where better emergency facilities, field arresting gear and A-4 support were available. Once in the pattern, Lt. Coast again recycled the gear, with no improvement.

He requested clearance to a clear area where he performed negative/positive G maneuvers in 25-knot increments from 250 to 350 knots, with no success. Selection of landing gear emergency extension also failed to rectify the situation.

At this point, Lt. E. Coast advised the tower that he had only 1,400 pounds of fuel remaining. He attempted another series of G maneuvers, increasing the loads from one to two negative Gs, followed by four to five positive. On the third execution of this maneuver, Lt. Coast heard a loud thump from the wheel-well area.

A subsequent pass by the tower verified that everything was cool and all three gear appeared to be down and locked. A flared touchdown into a short-field arrested landing was executed. Lt. Coast cleared the gear, secured the engine after the crash crew had hooked the crash crane to the aircraft, and happily closed out his flight plan.

ILLUSTRATED BY Osborn

Grampaw Pettibone says:

Holy jumpin' jingle bells, gents! That was a mighty close call! The cause of this young feller's woes was attributed to an improperly sequencing gear door mechanism. Whether this lad added to his problems initially during the first down cycling of the gear following takeoff was not made clear. In any event, old Santa Bones will yield the benefit of the doubt to this gent during this pending season of merriment, since he handled the rest of the incident like Cool Hand Luke. Like ol' Santa, he seemed to have it all in one bag. Joyeux Noel!

Warped Wing

A patrol squadron recently completed a material readiness condition inspection. One of the P-3 aircraft inspected was under type D preservation. The plane's inspector commented: "Aircraft needs all atmospheric openings covered (i.e., exhaust drain masts, lab seal vents)." The squadron representative who accompanied the inspector interpreted the inspector's comments to mean that *all* atmospheric openings on the aircraft should be covered.

Two days later, the power plant's supervisor directed two shop personnel to tape over all openings on the aircraft. This was accomplished and included taping all fuel tank vents. The vents went unnoticed by anyone for 12 days. No maintenance action form was filled out because the men who did the taping thought the job was part of the previously assigned type D preservation action.

On the thirteenth day, two airframes personnel were tasked with defueling the ill-fated aircraft. The tape on the fuel tank vents went totally undetected. About the time defueling was completed on tank one, a crew member arrived on the scene and noted that the port wing of the P-3 was deformed. He immediately notified his supervisor. Personnel dispatched to the aircraft discovered the tape covering the fuel vents. When the tape was removed and the negative pressure was relieved, the wing slowly returned to its original shape except for minor buckling. It required 1,000 man-hours of labor to repair the wing.

Grampaw Pettibone says:

Oh, my achin' ulcers! This operation needed defooling as well as defueling. Basic qualifications, basic training, basic headwork, basic supervision, basic documentation and basic communication were handled in a basically casual fashion and the outcome was basically predictable. The best maintenance procedures and intentions are worthless when the organization breaks down.

Back to the Barn

The weather was so bad at the advanced training field that safety pilots were assigned to all students on gunnery flights. After checking the yellow sheet and conducting a normal preflight, the safety pilot and his student proceeded in their TF-9J to the gunnery area.

All gunnery runs were normal but on the last inbound run a slight buffet was noted. The buffet was attributed to clear air turbulence, so the TF-9J joined the rest of the flight for return to the field.

At 12,000 feet, just short of the approach fix, the student pilot noted a small explosion and a decrease of rpm, followed by a flameout. He immediately informed the safety pilot who read the relight procedure. They were unsuccessful in getting an air start and, while passing 8,000 feet, broadcast their intention to eject.

At 190 knots and between 7-8,000 feet, the safety pilot ejected, followed shortly by the student. The *Cougar* was in an upright, wings-level position at ejection. Both occupants enjoyed flawless exits and parachute rides back to earth.

Meanwhile, the *Cougar* continued its descent in such a manner that it made a perfect landing in an open field and sustained no more than superficial damage.

Grampaw Pettibone says:

Great heavenly days! I know the *Cougar's* been around for a while, but I didn't know we had any of 'em this well trained.

This particular bird was retrieved intact by an Army CH-54 and by now is back in service. But don't get any ideas that I endorse sticking with it in a case like this. These fellas did absolutely right by executin' the nylon letdown. Investigation showed the engine had an internal failure over which the drivers had no control.

Sure as shootin', if the pilots had ridden it in, things wouldn't have worked out this good. (March 1968)

Navy Astronautics Group

By Jacquelyn J. Blue

The Navy's satellite navigation specialist, the Navy Astronautics Group (NavAstroGru), with its network command post located at Point Mugu, Calif., is now 16 years old and yet is nearly unknown to other than its users.

Commissioned April 10, 1962, to operate and maintain the Navy Navigation Satellite System (NNSS), also known commercially as *Transit*, NavAstroGru has grown from a few trailers to a headquarters complex of approximately 115,200 square feet of space at Point Mugu; tracking and injection stations at Prospect Harbor, Maine, Rosemount, Minn., and Laguna Peak, Point Mugu; and a tracking station at Wahiawa, Hawaii. A satellite prelaunch checkout facility is located at Vandenberg Air Force Base, Calif.

The *American Heritage Dictionary* defines satellite(s) as a noun and, in relation to aerospace, as a "man-made object orbiting or intended to orbit a celestial body" and also defines it as a "subservient follower." We don't know about the follower, but subservient to every wish of NavAstroGru they certainly are. And for every pound of satellite in orbit, there are tons of supporting equipment on earth — receiving, computing, timing, telemetry and transmitting gear — all operated by the 211 men and women (military and civilian) of the Navy Astronautics Group, who manage this utilitarian family of navigation satellites and supply each of them with information destined for military and commercial users around the world.

In the Beginning

In 1963, the destroyer USS *Hazelwood* was the first Navy vessel to test a navigation system that received data from an orbiting satellite. This system had been under study and development since 1958, when scientists at the Applied Physics Laboratory/Johns Hopkins University (APL/JHU) noted that signals received from the Russian sputnik experienced a Doppler frequency shift that depended on the relative velocity between the satellite and receiver. A typical example is the change in pitch perceived by an observer listening to the whistle of a speeding train or the air horn of a fast-moving truck. The same effect is true for transmitted radio frequencies from a passing satellite. APL scientists working for the Navy analyzed the Doppler shift of the beeps from *Sputnik I* and later satellites. They learned that by observing the Doppler shift for about 15 minutes they could reconstruct the complete orbit of the satellite. They correctly reasoned that if a satellite orbit could be predicted from a known, fixed point on Earth, then the reverse procedure could be used to locate a fixed point on Earth from a known satellite orbit.

In 1964, USS *Long Beach*, a unit of the all-nuclear-powered Task Force One, used the navigation system during its cruise around the world. Shortly thereafter the system was made operational with the completion of successful testing of the navigation equipment on *Polaris* submarines and aircraft carriers. It is a truism that the NNSS, at its birth, was solely intended to provide accurate position fixes for the *Polaris* submarine fleet. Enormous energy and creativity went into development of the satellites, deployment of Earth tracking stations, collecting and processing data to establish an accurate model of Earth's gravity field, and developing the AN/BRN-3 navigation set for that one purpose.

The NNSS development was tremendously successful. The first operational satellite was launched just five years after initial funding. The first real-time satellite position fixes were taken the next month, and the system has been continuously operational ever since. The rapid schedule was possible because the system was developed exclusively by and for the Navy's Strategic Systems Project Office (SSP). On July 29, 1967, the late Hubert M. Humphrey, then Vice President, announced that NNSS would be available to commercial users. In his announcement, acting as Chairman of the National Council for Marine Resources and Engineering Development, he cited "an increasing interest in this system by the industrial community, offshore oil exploration companies, and other segments of U.S. industry interested in the commercial application of this system for ships requiring accurate navigation" as influencing the decision to release for nonmilitary use commercially produced versions of satellite navigation sets in the interests of industrial development. Humphrey concluded this announcement of the clearance of NNSS, noting, "The Navy will shortly provide the National Security Industrial Association with the necessary technical information and documentation concerning shipboard user equipment (the navigation sets) which would be available for use on an equal basis by any interested U.S. party." This has been done.

The users now are worldwide. Britain and France have used NNSS for military navigation for years and now other countries are equipping their fleets to use the system. The Soviet Union also uses the system to navigate its oceanographic vessels.

The chart on page 11, using information supplied by 15 to 19 manufacturers of user equipment, shows the total 1977 users to be 3,000 with an expected growth through 1978 to 4,350.

Navigation Satellite — How Does It Work?

Satellite broadcasts are divided into two-minute intervals and at least three of these intervals are required by commercial user equipment to calculate a position fix. Orbital parameters broadcast by the satellite, defining that portion of the orbit which corresponds to the time during which the Doppler counts are received, are used to compute successive hyperboloids of revolution. The point on Earth where these hyperboloids of revolution intersect is the ship's position.

A ship does not sail its charted course down a line drawn with a ruler, but it does do so as closely as possible through dead reckoning. Conventionally, the navigator adds logged speed, compass bearings and educated guesswork about external forces affecting the ship's passage to his most recent celestial observations. Whenever he can, he checks his assumed position by sextant — at sunrise, sunset, or high noon — and the ship's heading is altered

slightly from day to day to return to its charted course. Weather conditions limit chances to "shoot" the noonday sun or the stars at dawn or dusk, and certain knowledge of the ship's true position is often forced to wait until the next clear day. Night or day, anywhere on Earth, in any kind of weather, navigation satellite signals are ready to supply a far more accurate fix than can be obtained from celestial observations, even under the most ideal conditions.

Navigation by satellite does not supplant any of the navigation systems presently in use. It isn't even a navigation system in the full sense of the word. What it does is provide the most accurate, reliable way yet known to fix a position. It is probably more properly defined as a positioning system that is readily available as a navigational aid to provide precise reference points required periodically to zero-out accumulated errors inherent in any dead-reckoning navigation system. It represents a new departure in celestial navigation, using a man-made artificial satellite that takes an active part in the navigation process – a "radio star" which may be observed electronically under any conditions. So far as the user is concerned, this position referencing system is passive, requiring no transmission on his part.

Nuclear-powered fleet ballistic missile submarines that patrol continuously submerged, armed with nuclear-tipped missiles, present, to say the least, somewhat complex navigational problems. Their undersea positions must be determined with ultraprecision for the weapon control system to compute the complex problem of launching a long-range missile from a vessel that has been submerged for weeks or months.

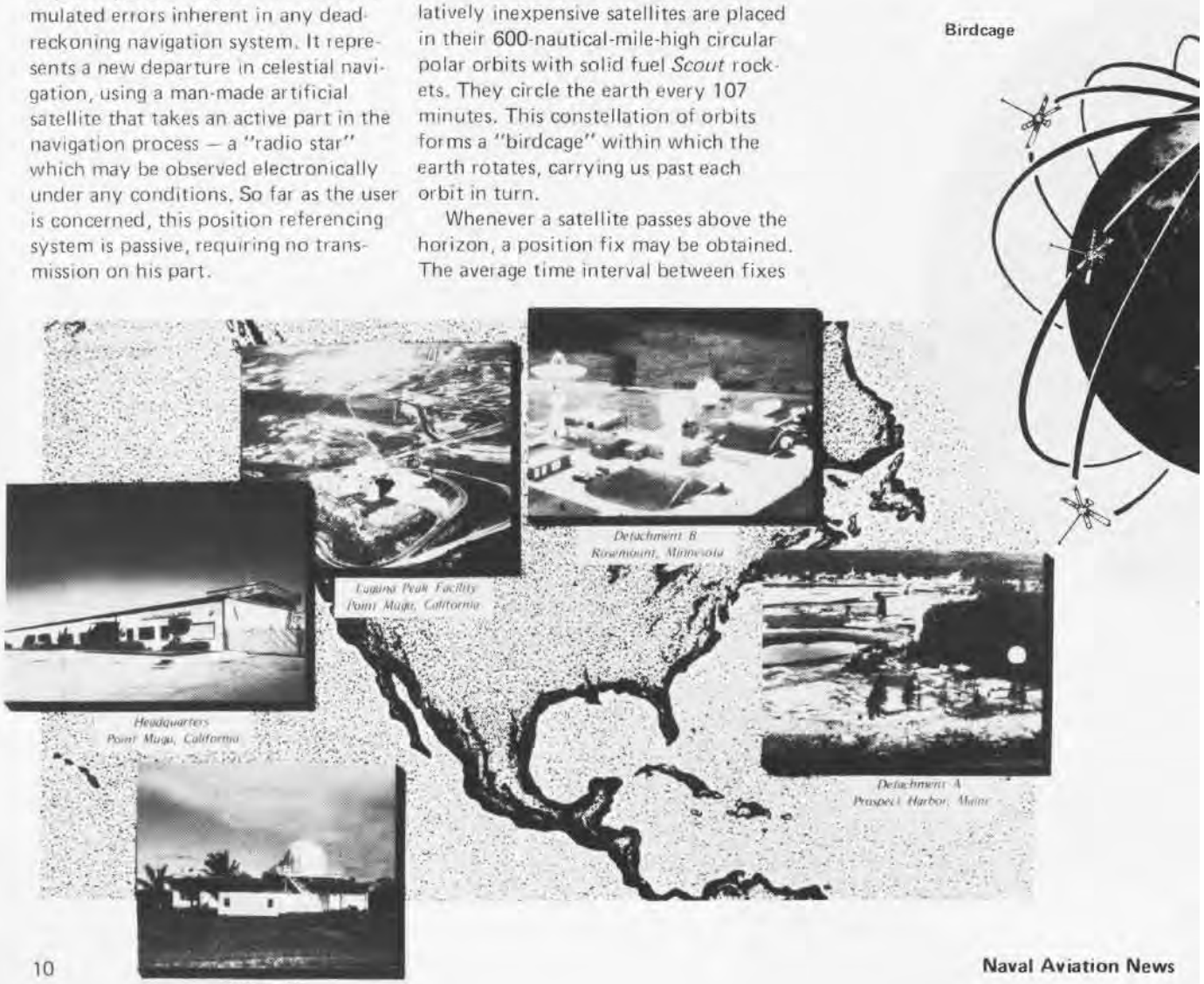
Surface ships, as a rule, track and compute fixes from every available satellite pass and may rely on dead reckoning between fixes with only a speed log and a gyrocompass for their navigation.

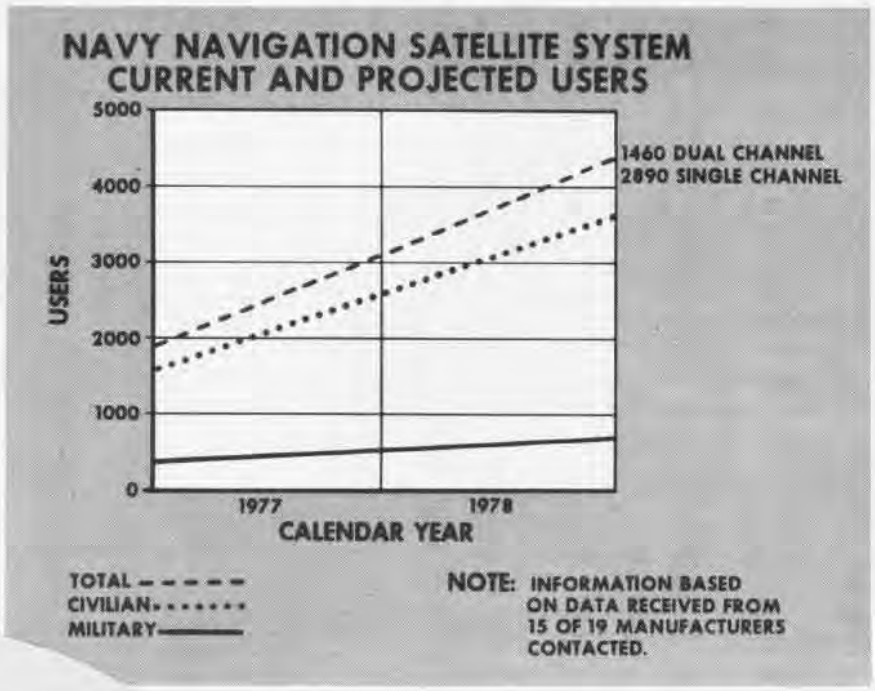
The Navy Astronautics Group supports a constellation of five operational navigation satellites from their headquarters at Point Mugu. Captain J. H. Simpson is commanding officer. These five very light (about 130 pounds), relatively inexpensive satellites are placed in their 600-nautical-mile-high circular polar orbits with solid fuel *Scout* rockets. They circle the earth every 107 minutes. This constellation of orbits forms a "birdcage" within which the earth rotates, carrying us past each orbit in turn.

Whenever a satellite passes above the horizon, a position fix may be obtained. The average time interval between fixes varies from approximately 35 to 100 minutes depending on latitude. Three of these operational satellites are over 11 years old at this writing and, amazingly, the signals are still strong and the satellites continue to function flawlessly – and all this with 37,462 memory injections (as of 0830 August 28, 1978) with an overall success record of 99.94 percent. "Congratulations" is mild praise for such performance.

In addition to the operational satellites, 12 spacecraft are stored and ready for launching, with nine *Scout* rockets in reserve to support the launches.

NavAstroGru's tracking stations receive and process Doppler data on each pass of the orbiting satellites. These data are transmitted to the computer center at headquarters via a high-speed computer-to-computer communica-





tions network. The computers receive this Doppler data and reconstruct the exact orbit of the satellite. On the basis of these reconstructed orbits the computer constructs or predicts the next 16 hours of satellite orbits. These predictions are re-formatted into a satellite injection message and are transmitted to the injection stations. At the proper time, the injection message is transmitted to the satellite and stored in the satellite memory. The transmission of the message to the satellite, which is called an injection, requires precise timing. It takes only 15 seconds to fill the satellite memory with data that are valid for the next 16 hours. It takes the injection station less than two minutes to verify the success of the injection attempt.

As each satellite passes over the tracking stations, its Doppler data are recorded and transmitted to the headquarters computer center. The computer compares the actual recorded Doppler data with theoretical Doppler data derived from the injection message and establishes a navigational fix for the station.

This fix is compared with the known location. If the fix is wrong or out of tolerance, Navy Astronautics Group mathematicians will analyze the problem and the satellite memory will be refilled with valid data.

Improvements

In 1973, an improvement was made in the NNSS accuracy by accounting for the effect of polar motion. In December 1975, another improvement was made when the geodetic basis for computing orbits was changed from the APL 4.5 gravity model to the WGS 72 model. These changes have improved the repeatability of multipass results at fixed sites and reduced the scatter of individual fixes.

The Navy Astronautics Group, even with its proven reputation for reliability and accuracy, has recently completed a reconfiguration of its tracking station electronics at all four sites. The reconfiguration computerizes and automates many of the functions previously handled manually. The result is more reliable performance, if that is possible, and a reduction in staffing requirements.

A New Generation of Satellites

The Applied Physics Laboratory has developed a new generation of navigation satellites called TIP for *Transit* improvement program. One experimental and two prototype satellites already have been launched as part of the development effort. Among the improvements TIP will provide are increased signal levels up to twice the power level now received from the satellites, and TIP will be controlled by an on-board general purpose digital computer which can be programmed from the ground. In conjunction with a larger memory, the computer can provide orbit parameters for eight days without requiring an upload of new information; and very importantly, DisCos (disturbance compensation system) will compensate for the effect of atmospheric drag. As a result, each orbit determination will retain accuracy for up to a week instead of the current 24 hours.

Another newly developed satellite, launched in 1977 and modified to carry a satellite tracking (SaTrack) translator, provides operational support to the SaTrack/range safety program. This TranSat satellite verifies the operational

Reserve satellites are ready when needed. Opposite page, left to right: test program P76-5, a TIP satellite and a Transit.

status of the range safety equipment prior to *Trident* launches. NavAstroGru provides precision ephemerides for the test period and performs all satellite management functions. This satellite can be made available for navigation if required.

Future Applications and Growth of Civilian Use

The breadth of application for the navigation satellites in the future is nearly unlimited. Application of the system in support of amphibious operations is under development. Operational satellites naturally suggest themselves for universal time dissemination; right now they are being used as references with which to synchronize clocks at widely scattered stations around the globe.

There is also the advantage of establishing a pinpoint of latitude and longitude with absolute certainty for minelaying operations and antisubmarine warfare at sea and in the air.

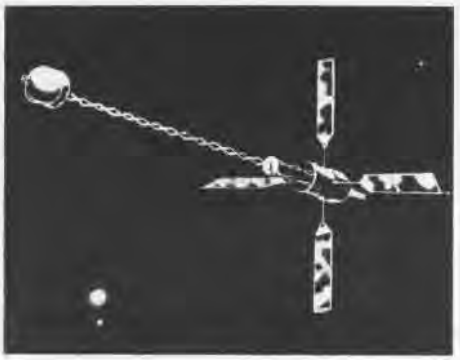
Both U.S. and foreign companies have taken the presidential encouragement for civilian use literally and, since 1968 when the first commercial *Transit* sets were available, there has been a steady and dramatic increase in the types of equipment available and the number of users worldwide. Equipment expertise has grown from the rack-mounted equipment of 1968 to the compact, simple and reliable microcomputer-based navigation systems of today. The range of civilian applications is truly surprising. *Transit* navigators are used on land and at sea aboard fishing boats, private yachts, commercial ships (tankers, freighters, etc.), offshore drill rigs, oil exploration vessels, oceanographic research vessels, hydrographic survey vessels and drifting buoys.

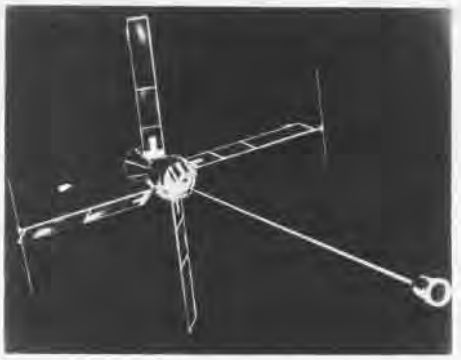
Because less expensive, more reliable equipment is now available, the growth in number of users continues at a very rapid pace. Two surveys conducted by the Group concerning the number of *Transit* users show an actual growth rate from 1974 to 1977 of 47 percent per year, and a predicted growth rate from 1977 to 1979 of 51 percent. If this continues as expected, there will be 10,000 *Transit* system users by 1981.

Civilian investment in *Transit* navigation equipment, exclusive of spares, logistics and installation costs, exceeds $70 million. NavAstroGru's *Transit* has become one of the most important civilian navigation and surveying aids in the world, and most certainly brings international recognition of Navy technology and our willingness to share this technology with the world.

We all know how important successful oil exploration is to mankind. *Transit* is doing its part here as well. Satellite signals are being used very effectively for fixed-site surveys. For instance, after a drill rig has been securely anchored, its final position must be established with the greatest possible accuracy.

Two techniques accomplishing such





surveys by satellite have been used. The first is called point positioning. In this mode, a *Transit* satellite receiver tracks and records every available pass at a given location. These data are fed to a computer program which combines all of the raw data to obtain the single-best-position-fix results in three dimensions, latitude, longitude, altitude.

Using only data gathered from the satellite signals, the horizontal positioning accuracy (repeatability) is about 6 meters rms with 10 satellite passes and about 4 meters rms with 25 passes. To acquire 25 passes typically takes 16 hours at high latitudes and about 40 hours at the equator. Nevertheless, achieving a fix accuracy of 4 meters anywhere on earth without having to extend a land traverse is a great accomplishment.

If a reference station can be situated within several hundred kilometers of the survey site, a technique called translocation can produce even greater accuracy in less time. For example, horizontal position can be established to 76 centimeters rms with only eight satellite passes. More passes would yield even better accuracy. To implement the translocation technique, two satellite receivers are used, one at the reference site and one at the survey site. By tracking the same satellite passes, improved accuracy is achieved because the computer solves for differential position between the two points and is thus insensitive to common error sources.

The Navy Astronautics Group has observed many interesting phenomena during these thousands of orbits by their little birds, especially regarding the geodesy and physical makeup of our planet. Earth's center of gravity is proven to be offset from the geometric center of the globe. For that matter, from the objective viewpoints of our satellites, the Earth is not a globe at all, but viewed from some angles, is slightly oblate, and from others, somewhat pear-shaped, with a "pimple" in the North Atlantic and a "dimple" in the South Pacific. These perturbations are the reason for the updating of the system satellites daily, for NavAstroGru's system is limited to the use of satellites in comparatively near-Earth orbits in order to attain relative velocities required to produce the measurable Doppler effects mentioned earlier. If these satellites were operating in deep space, their fixed orbits would be Keplerian, or perfectly elliptical, in which case it would be unnecessary to constantly update orbital predictions in computing injection data from the ground to be supplied to each system satellite for subsequent broadcast to the fleet and other customers.

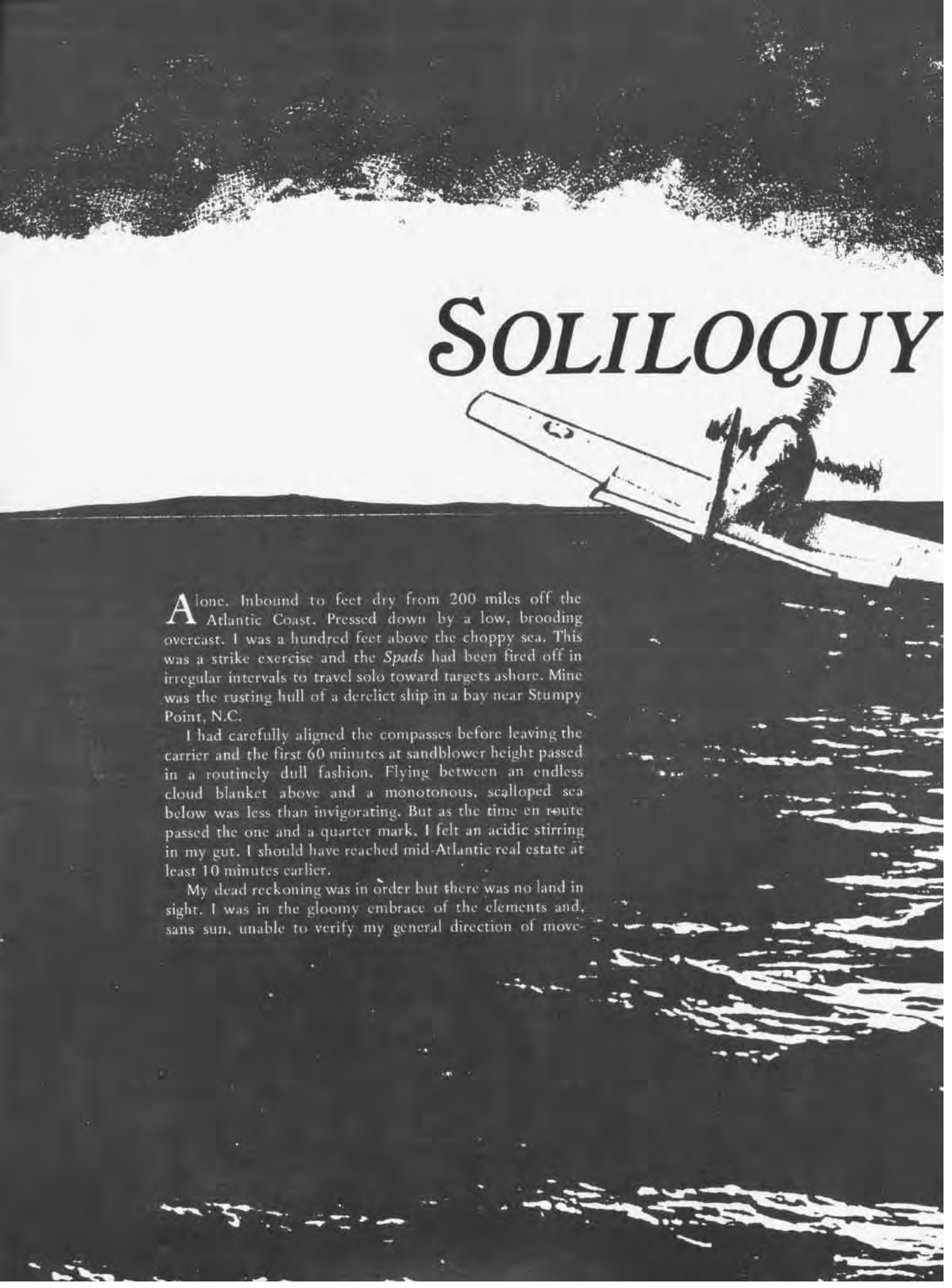
Masters of vessels with satellite navigators have reported never being in doubt of their position by more than 0.5 mile and often, right after getting a fix, of having a position within 200 feet. Others have called it the greatest advance in navigation since the invention of the chronometer for determining longitude.

NavAstroGru's navigation satellites seem to be here to stay. They have demonstrated widespread and unique industrial capability, expanding the economic outlook to other applications. These Earth-orbiting satellites are classic examples of constancy combined with wide coverage. Users have reported significant fuel savings for long-range navigation and claim it can pay for itself in terms of fuel savings alone. In these days of exploding populations and thoughts of where are they all to live and what they shall eat, the Navy Astronautics Group's Earth-orbiting satellites are also taking a peek at the ocean depths in the light of scientific opinion that the time is not far off when this exploding population will perhaps become dependent upon the sea for subsistence. These peeks are telling us more and more about the shape, inner distribution of mass and shifting crust of the Earth, and about the forces that surround it.

NavAstroGru isn't standing pat on its laurels either. A new venture, on a joint basis with the Air Force, is the support of an Air Force satellite experiment titled P76-5, which is an attempt to determine some of the propagation characteristics of the ionosphere. NavAstroGru provided technical advice during the design phase and is responsible for providing Doppler tracking, orbit determination and satellite management of this program.

It is important to remember that since being commissioned in 1962 to operate and maintain the satellites of the navigation system, NavAstroGru and its charge, *Transit,* have, since the beginning of 1964, provided accurate worldwide position fix information without — even once — an interruption of service. An outstanding achievement.

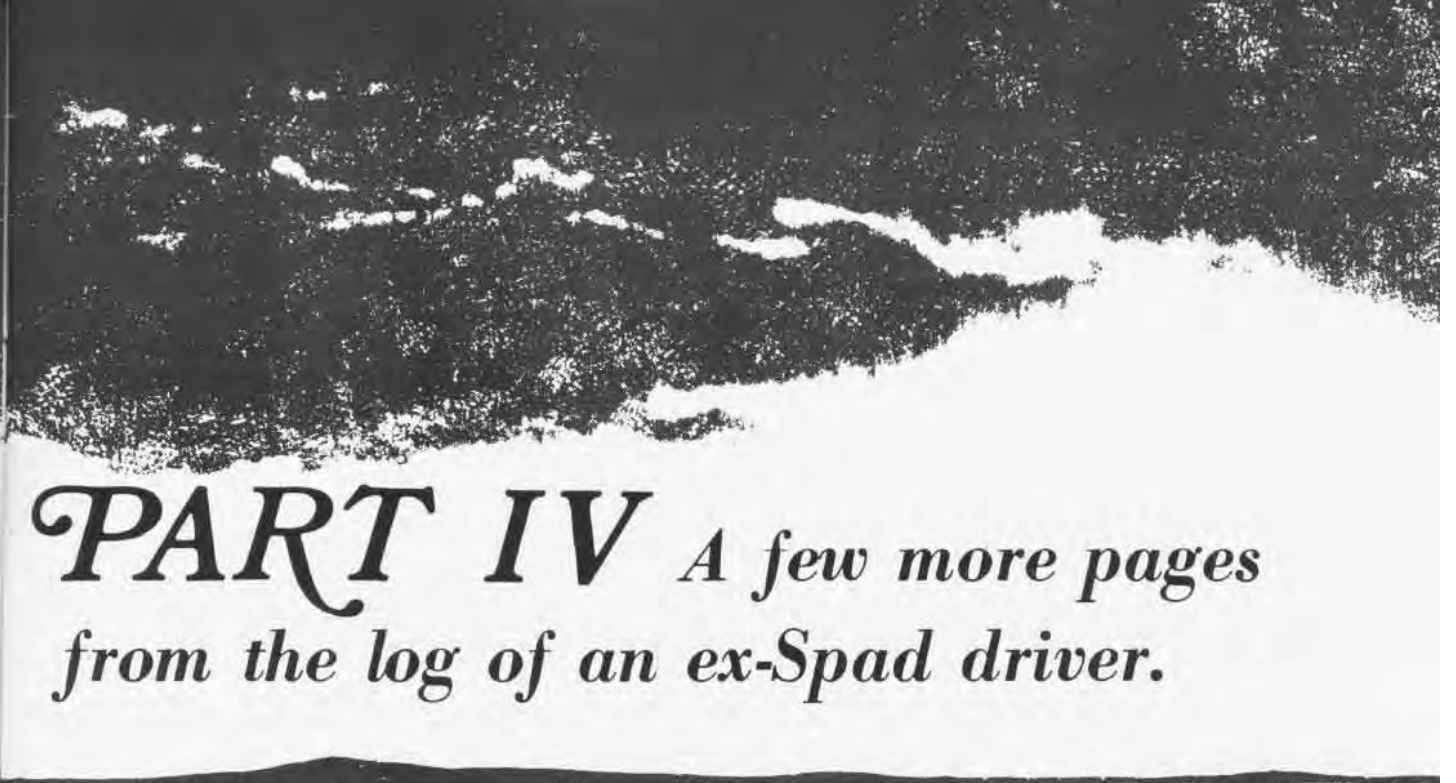
SOLILOQUY



Alone. Inbound to feet dry from 200 miles off the Atlantic Coast. Pressed down by a low, brooding overcast. I was a hundred feet above the choppy sea. This was a strike exercise and the *Spads* had been fired off in irregular intervals to travel solo toward targets ashore. Mine was the rusting hull of a derelict ship in a bay near Stumpy Point, N.C.

I had carefully aligned the compasses before leaving the carrier and the first 60 minutes at sandblower height passed in a routinely dull fashion. Flying between an endless cloud blanket above and a monotonous, scalloped sea below was less than invigorating. But as the time en route passed the one and a quarter mark, I felt an acidic stirring in my gut. I should have reached mid-Atlantic real estate at least 10 minutes earlier.

My dead reckoning was in order but there was no land in sight. I was in the gloomy embrace of the elements and, sans sun, unable to verify my general direction of move-



PART IV A few more pages from the log of an ex-Spad driver.

ment. I began to wonder if North America was on my nose after all. If by catastrophic compass and/or human error I had swung full around to the east, I might be destined for a mysterious disappearance in the Devil's Triangle.

I cursed and railed against my *Skyraider*, its compasses, and Naval Air, in total, for imposing this predicament on me. I squirmed in my seat as if that would appease the twisting barbs of frustration. Finally, I eased the nose up, adding power. It was time to climb and confess. I was lost.

But joy! As I was about to punch through the blanket, I saw a strip of beige stretching across the horizon ahead. It looked like a brush stroke on barren canvas. It was a beach. Land Ho!

I zoomed down to the wave tops and pressed on. With swift and surreptitious switch-ons of the Tacan and ADF (against the rules, but pride was at stake here), I learned I was approaching the northeastern edge of Georgia. Missed my mark by a couple of states.

Some rapid calculations ensued along with realignment of the compasses. (Yes, they were off 40 degrees, including the standby which I doubted the boys in maintenance would believe.) With postman's zeal I went to normal rated power and turned north. I bucketed along on a mad dash over the seaboard feeling a little like the guy who has broken clear on a kickoff return. Fishermen and farmers scattered along the route were my audience.

I made the time-on-target and lofted an Mk76 within respectable distance of the derelict. I rolled out and eased back on the throttle to give the 18 cyclinders a reprieve. With some help from the *Willie Fudds* and steers from the ship, I made it back without fanfare.

After the final recovery that evening I went topside and gazed at the becalmed, moonlit Atlantic as the carrier creaked slowly through the night. "Other ways there may be to spend one's youth," I said to myself, reliving the anxiety and the gratification of the day. "But none better."

Maybe Lorfano expressed it best the time he climbed out of the cockpit after a great hop. He threw open his arms to the flight deck and roared the question that needed no answer. "They pay me to do this?"

They were Irishmen. Ward, a footballer from Marquette. Kelty, a New Yorker, Fordham Fifty-Seven. We were in class Thirty-Nine Echo but parted paths temporarily when they chose the multi-engine pipeline.

They were navigating their way through an instrument-check ride in the Corpus Christi dual-seat trainer. The Irishmen were dedicated to the pursuit of wings and were sharp enough, even with the blinders on, to maintain a slight irreverence toward the curriculum.

The first couple of legs went beautifully and an en route approach was executed with fluid skill. The civilian instructor was lulled into a state of distraction and succumbed to the lure of magnificent legs which belonged to a lady teacher across the way.

Inside their darkened chamber, Ward said something inane which evoked a robust charge of laughter from Kelty. Which prompted a sharp guffaw from Ward. Which sent the pair reeling. The trainer shook momentarily, as if an earth tremor had struck the southwest. Concentration disintegrated and the students were helpless to correct the uncontrolled spin which they had forced on the trainer. The instructor, meanwhile, continued his study of contours.

Kelty: "We're in trouble."

Ward: "You're tellin' me?"

Needles spun, gyros toppled and the yokes swayed like a rudderless ship. At the instructor's station the flight path etched by a tracking pen on the table-sized navigation chart, resembled the blade pattern of an inebriated figure skater.

Kelty: "If this were for real, what would we do?"

Ward: "Hit the silk, of course!"

A knowing smile was exchanged between the young flyers. Whereupon each man opened his door and stepped gingerly from the box. Engrossed with flesh-toned curves, the instructor did not immediately notice the students suddenly poised like marionettes beside him.

"What the . . . ," he began, startled. Were they dressed in toyland red, white and blue with rouge on their cheeks, the marionettes could not have looked more obedient and innocent. They exuded the sure-eyed confidence of someone who has aced an examination and knows it. Superb thespians, this pair.

Gambling that their reputations would carry the day, they explained how the trainer inexplicably went out of control. Whether mechanically or instructor-induced, the malfunction dictated emergency egress. Therefore they bailed out.

Fortunately for them, the instructor had no axe to grind and felt constrained to buy the explanation. He'd examine the device later. He glanced furtively at those soft and gentle lines across the way and eyed the marionettes who remained diplomatically at attention, clear eyes shining.

"Well, ah, yes," said the instructor. "You fellows did the right thing. You can secure now. You have an up."

Luck of the Irish.

Air show for the general aviation folks. Big fly-in. Summer Saturday in Michigan.

"Would one of your A-4s make a fly-by?" they asked.

"Not only will it fly by," we exclaimed, "the pilot will perform an idiot loop for you!"

They were excited. And because it was my turn on the show circuit, I was excited. There's nothing quite like a high-speed run for the civilians, especially when it climaxes in a sensational zoom-arc through the sky. It invigorates the crowd and satisfies the flyer's theatrical urge.

"Oh, certainly," they promised, "the stage will be clear. All aircraft will be shut down and parked, well before your overhead time."

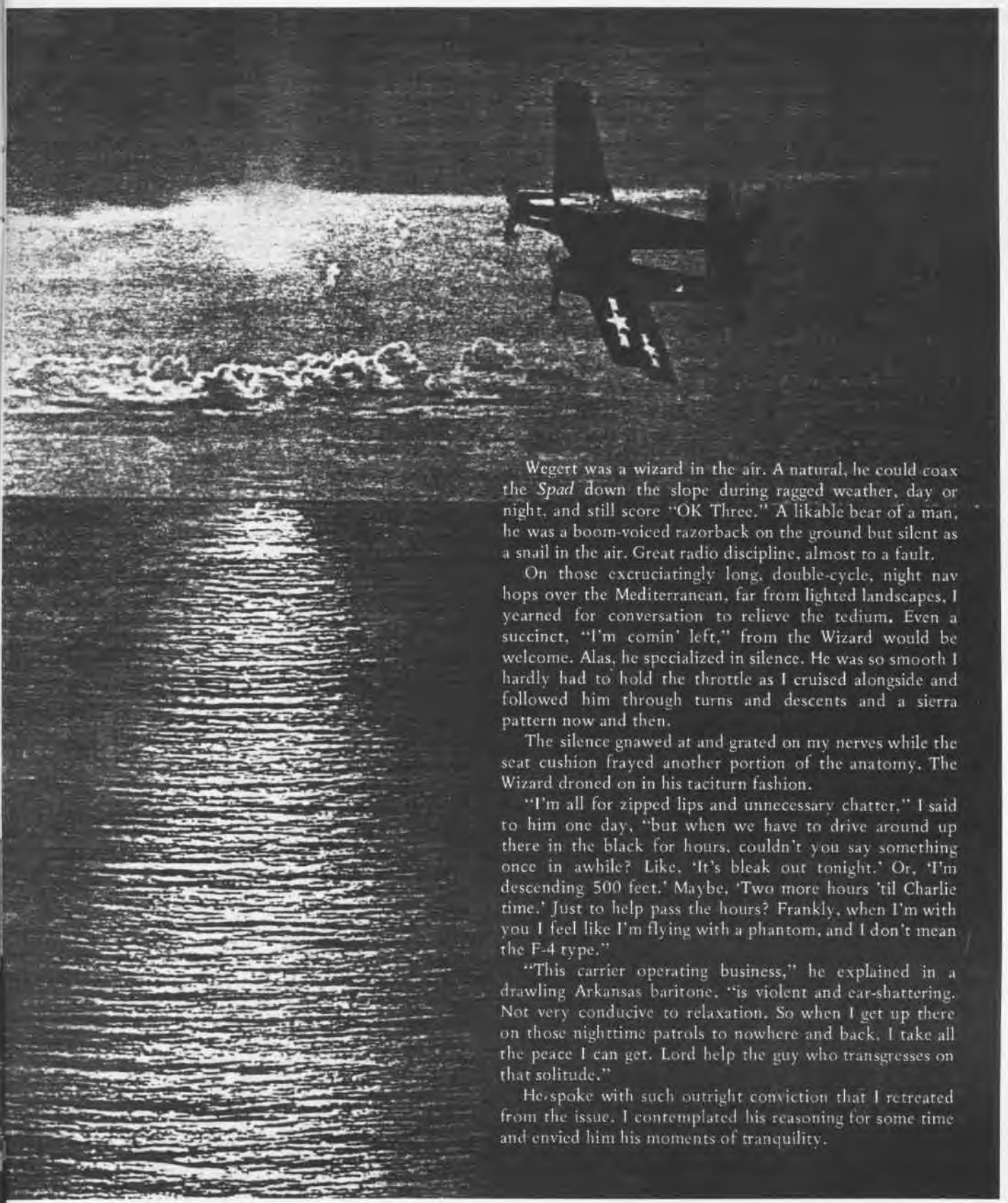
I launched from Selfridge and proceeded toward the strip west of Detroit. As I approached in the bantam bomber, the old nerve ends were in a nice state of stimulation. But I was chagrined to see an aggregation of private aircraft in omni-directional disarray, ascending from and descending to the field. They swooped and rose happily like birds who had discovered a freshly-seeded lawn.

Radar controllers sympathized but could only report "many, many targets in the area." My time overhead arrived. I circled and waited. It passed. I circled and waited some more. The sky did not clear. So, sadly, I said sayonara and swallowed my anticipatory joy. There would be no show business today.

"How did it go?" asked my plane captain afterward.

"I'm dumb," I said with some degree of melancholy, "but not dumb enough to mix it up with happy birds."

I slung my helmet bag over my shoulder. The plane captain gave me a weird look, then shook his head in puzzlement as I wandered away muttering, "I'll get my curtain call some other time."



Wegert was a wizard in the air. A natural, he could coax the *Spad* down the slope during ragged weather, day or night, and still score "OK Three." A likable bear of a man, he was a boom-voiced razorback on the ground but silent as a snail in the air. Great radio discipline, almost to a fault.

On those excruciatingly long, double-cycle, night nav hops over the Mediterranean, far from lighted landscapes, I yearned for conversation to relieve the tedium. Even a succinct, "I'm comin' left," from the Wizard would be welcome. Alas, he specialized in silence. He was so smooth I hardly had to hold the throttle as I cruised alongside and followed him through turns and descents and a sierra pattern now and then.

The silence gnawed at and grated on my nerves while the seat cushion frayed another portion of the anatomy. The Wizard droned on in his taciturn fashion.

"I'm all for zipped lips and unnecessary chatter," I said to him one day, "but when we have to drive around up there in the black for hours, couldn't you say something once in awhile? Like, 'It's bleak out tonight.' Or, 'I'm descending 500 feet.' Maybe, 'Two more hours 'til Charlie time.' Just to help pass the hours? Frankly, when I'm with you I feel like I'm flying with a phantom, and I don't mean the F-4 type."

"This carrier operating business," he explained in a drawling Arkansas baritone, "is violent and ear-shattering. Not very conducive to relaxation. So when I get up there on those nighttime patrols to nowhere and back, I take all the peace I can get. Lord help the guy who transgresses on that solitude."

He spoke with such outright conviction that I retreated from the issue. I contemplated his reasoning for some time and envied him his moments of tranquility.

A Naval Aviator's reputation is like a fingerprint. His (or her) whorl pattern is similar to everyone else's but nuances give it an individual character. Flyers share common qualities of determination, intelligence, dexterity, and a propensity for adventure. These are pretty much mandatory requirements for the winners of wings. But each has his own style, you might say, good, bad or in between.

The ensign was capable at the controls, knowledgeable of his machine, and flew when scheduled to do so. But he dramatized the undramatic and this was his nuance. He demonstrated little reluctance to call Mayday, a distress alarm reserved for occasions similar in amplitude to volcanic eruptions, quaking of the earth, or discovering a scratch on the new car. In his first year he issued three such alrams, well over allowance. Each of them culminated in a safe recovery. Minor malfunctions were faulted.

We were returning to Oceana from a radar-tracking hop with a destroyer. About 70 miles from feet dry he keyed his mike.

"I've got a rough runner," he said.

"Roger," I said. His *Skyraider* looked healthy enough. No lamentable belching of smoke. No abnormal trembling of the R-3350. I gave him the lead so he could concentrate on his dilemma rather than on me.

"Better give the call," he said solemnly. "She's running rough!"

What choice did I have?

"Mayday, Mayday, Mayday," I declared in as resonant a tone as I could contrive. I followed this with an appraisal of the circumstances. Within seconds responses were flowing into our earphones. Had there been a telephone switchboard to handle such matters, it would have lit up like launch time at the Cape. Everyone and his brother, including an SNB proficiency pilot out of Andrews, offered help.

We made it to the beach, despite the UHF noise, where the ensign shot a nice emergency approach into Elizabeth City. A veteran *Spad* driver was sent to collect the plane next day. A first-rate mech was also dispatched. After a thorough examination and a lengthy turn-up, no discrepancy was found. The pilot took off for Oceana.

Short of home base, the sump light came on. Dutifully, he made an emergency landing at Fentress. As he rolled to the end of the runway the engine froze and the propeller came to a quivering halt. There was, indeed, something amiss in that power plant. And the ensign had detected it.

There's a moral here somewhere but I don't know what it is. Maybe we should just say that aircraft can be as unpredictable as the predictable people who fly them.

What's it like when you close the throttle and the engine sighs into silence for the final time? It's delicious pain.

Happily, you have survived. Unhappily, those joyous airborne moments are no more. You won't miss the rain-swept traps on dark and worrisome nights. But you will miss the subdued exhilaration of breaking into the clear blue from a cloud-shrouded climbout.

You won't miss the endless weeks at sea away from home. But will there be a substitute for those marvelous moments when the familar flattop's profile comes into view and you key the mike to report, "See you."

Life is a compromise. And for every beginning there is an ending. But the knowledge of having been a part of Naval Air soothes. The memories must now be shelved in the archives of the mind. Hopefully, they will be retrieved and related to an appreciative listener now and then.

There are no regrets for that delicious pain. You have been there, on the wing of the high and the mighty, and you would not have had it any other way.


NAVAL
AVIATION
NEWS
Wings
Over
The
Ocean ...

Wings Over The Ocean ... Conclusion

A History of Sea-Air Aviation

By John M. Lindley

While the time after WW II was filled with its share of wars, conflicts and crises which involved sea-air aviation, usually in its role as a military vehicle of transportation, those 30 years also saw an intense effort to develop new or improved vehicles of warfare. Since 1945 jets had largely replaced propeller-driven aircraft on carriers; super carriers replaced the carriers of WW II; helicopters joined the fleet; and the vertical or short takeoff and landing aircraft (V/STOL) emerged as a potential future development in Naval Aviation

The first jet-propelled airplane flew in Germany on August 27, 1939. Hans von Ohain designed that first jet engine. At the same time Frank Whittle was at work in England trying to develop a jet engine. Whittle's jet engine made its first flight on May 15, 1941. During WW II the Americans, Japanese and Italians, as well as the Germans and British, tried to develop jet-propelled aircraft. Although a few RAF Gloster *Meteors* and German Messerschmitt ME 262 jets did see action at the end of the war, they had no significant impact on its outcome.

Both the United States and Britain pursued jet development after the war. The jet engine had the important advantage, over the reciprocating internal combustion engine with propeller, of greater thrust for comparable weight. Thus jet engines were poten-

USS Antietam

USS America

tially far more powerful than internal combustion types at high speeds. In addition to greater speed, the elimination of the propeller made possible a more streamlined airframe, which further improved speed. Jet engines are also more efficient than propeller-type engines at speeds above 500 miles per hour. Thus there were several sound reasons for development of jet engines.

The first jet flight by a U.S. Naval Aviator occurred on April 21, 1943, when Captain Frederick M. Trapnell flew a Bell XP-59A *Airacomet* in California. It had a speed of 375 miles per hour. LCdr. Eric M. Brown, Royal Navy, achieved the distinction of being the first pilot to land a jet on a carrier, a *Vampire I* fighter on the light carrier *Ocean* on December 3, 1945. In 1947 the U.S. Navy held carrier acceptance trials for the jets that it had ordered during the war, the McDonnell Aircraft Corporation's FD-1 (later redesignated FH-1) *Phantoms* (maximum speed 579 miles per hour). With subsequent early carrier-based fighters in the fleet by 1950, the U.S. Navy was ready to use them when the Korean War broke out.

Combat operations in Korea demonstrated the military effectiveness of the jet and also revealed a serious drawback. In contrast to propeller-driven aircraft, the new jets consumed fuel at a prodigious rate. As the size, weight and thrust of jets grew in the

1950s, the demand for more and more fuel continued. In addition to increased fuel-carrying capacity (which also increased the weight), high speed at high altitudes meant that the jets had to have more auxiliary gear. New or improved electronic, navigational and communications equipment further increased the weight. These factors combined to make the *Essex*-class carriers of WW II inadequate for jet operations. The *Essex*-class flattops lacked the fuel storage capacity for jet operations; their decks were not sufficiently strong for the weight and they lacked large enough storage areas for these new aircraft.

Faced with the growing obsolescence of part of its carrier fleet, the U.S. Navy initiated two programs to deal with this problem. It systematically began to convert some of its existing carriers so they could handle jets. It also began to build new carriers which would be large enough to handle existing and future jets. The shipyard conversion programs included strengthening the flight decks, installing more powerful steam catapults and doubling fuel storage capacity. The Department of Defense and President Truman were at first reluctant to authorize construction of a new class of carriers, largely because they felt they would duplicate the role of the Air Force's strategic bombers. But the high level of carrier air operations in the Korean War soon won support for the construction of *Forrestal*-class carriers, beginning in the early 1950s. *Forrestal* was the first carrier built specifically to operate jets and, at the time of its completion, it was the largest carrier afloat. It has an overall length of 1,039 feet and displaces 54,600 tons. With a speed of 33 knots, 4 catapults and 4 deck-edge elevators, and an air group that included more than 80 jets, *Forrestal* joined the fleet in 1955. Three more carriers of this class would follow with four more in the new *Kitty Hawk*-class which had *Terrier* surface-to-air guided missiles for close-in defense. The final carrier in this class, *John F. Kennedy*, went to sea in September 1968.

Bigger than the three battle carriers or *Midway*-class flattops of WW II (*Midway, FDR* and *Coral Sea*), *Forrestal* and *Kitty Hawk*-class carriers incorporated three British innovations in carrier design; the angled flight deck, steam catapults and the mirror landing system. The British had begun experimenting with the angled deck (canted to port between five and ten degrees) in 1950 with the new *Ark Royal*. The U.S. Navy first tried this innovation on the carrier *Antietam* in 1962. The advantage of the angled deck is that it provides a landing and takeoff area which is separate from the forward part of the straight deck where other aircraft are parked or taking off. Steam catapults replaced the compressed air or powder catapults because they were able to launch heavier jet aircraft, which could not become airborne in a deck run of 800 to 1,000 feet.

In 1951 a Royal Navy officer designed a new steam catapult which proved successful on HMS *Perseus*. The U.S. Navy subsequently adopted this British breakthrough which gave jets flying speed after a brief deck run. The steam catapults on *Forrestal*-class carriers have a capacity of 42 million foot-pounds of force. Later catapults had an even greater capacity so that they could hurl a jet weighing over 50,000 pounds from 0 to 180 miles per hour in just 310 feet.

The third British contribution to carrier flight operations in the 1950s was the mirror landing system. Prior to the adoption of the mirror landing system, the pilot responded only to the signals of the landing signal officer (LSO) during his approach. Sometimes this system was slow and inaccurate or the LSO was hard to see. With the mirror landing system the pilot has a visual image of the relationship of his jet to the required approach path; thus he can adjust his speed and angle of approach more rapidly and accurately than if only the LSO were signalling these adjustments.

The culmination of the development of the super carrier in the post-WW II era has been, of course, the nuclear carriers *Enterprise* and her successors. Begun in 1957, *Enterprise* was commissioned on November 25, 1961. The new *Big E* has an overall length of 1,123 feet, displaces 85,350 tons fully loaded, has a crew of over 5,000, and a top speed of at least 35 knots. Her four nuclear reactors allow her to steam at maximum speed for years, if necessary, without refueling. Instead of the usual funnels, *Enterprise* has an island which is a box-like shape filled with fixed radar antennas and electronics gear. She cost $445 million, a reasonable figure when compared to the projected costs of the nuclear carriers *Nimitz*, *Eisenhower* and *Carl Vinson*.

The three *Nimitz*-class carriers will be similar to *Enterprise* in design but larger (91,400 tons fully loaded) and will have only two reactors. All four nuclear carriers will carry about 100 aircraft and will have *Sea Sparrow* surface-to-air missiles for close-in defense. The air group on the *Nimitz*-class carriers will probably consist of 24 F-14A *Tomcat* fighters; 24 A-7 *Corsair* attack planes; 12 A-6 *Intruder* attack jets; 4 KA-6 *Intruder* tankers; 3 RA-5 *Vigilante* reconnaissance jets; 4 E-2 *Hawkeye* airborne early warning planes; 10 S-3A *Viking* antisubmarine warfare aircraft and 8 SH-3 *Sea King* helicopters.

Of these latest carrier aircraft, the F-14A *Tomcat* is most noteworthy. Designed as the successor to the F-4B *Phantom II*, the *Tomcat* is an all-weather carrier-based fighter than can counter multiple aircraft or missile attacks. Its variable-sweep wings automatically adjust as the plane maneu-

vers, assuring the most efficient wing angle at all times. The *Tomcat* has Mach 2 speed and carries *Phoenix* air-to-air missiles. Its weapons system can fire up to six missiles at six different targets up to 50 miles away.

The presence of *Sea Kings* on the *Nimitz*-class carriers indicates the changing role of the super carrier in the Navy's plans. Until the mid-1960s, attack carriers had a primary role as nuclear deterrent forces. With the growing availability of *Polaris* missile submarines and the eventual presence in the fleet of the *Trident* submarine with its *Poseidon* ballistic missiles, the carriers in the fleet have had their nuclear deterrent role taken over by the ballistic missile subs. The attack carriers retain a nuclear deterrent role, but it is distinctly secondary to that of being dual purpose forces employed for the projection of sea power overseas and for sea control missions, such as antisubmarine warfare. The presence of *Sea Kings* and *Vikings* on the *Nimitz*-class carrier provides this sea control capability. The *Sea King*, a large, twin-engine antisubmarine helo, carries a crew of four. These helos and the *Viking*, in combination with the *Tomcat* and the other attack aircraft, should be most effective in helping project sea power where and when needed.

Although experiments with helicopters or, at least, rotary-wing aircraft date back to the mid-fifteenth century, the first practical helicopter was the machine built by the German Focke-Achgelis in 1939. In 1939 Igor Sikorsky, an immigrant to the United States from Russia, first flew his VS-300 which had only one main rotor. Two years later, Sikorsky's single-rotor helicopter remained in the air for 92 minutes establishing a world record for time aloft and the true practicality of his design. The U.S. Navy began to buy Sikorsky helicopters during WW II, the first model being the R-4B (later designated HNS-1). Both the Navy and the Coast Guard used these first helos, but the Coast Guard had primary responsibility for the sea-going development of helicopters.

Harrier aboard Royal Navy ship.

The helicopter proved its value for the Coast Guard's rescue work on January 3, 1944, when Commander Frank A. Erickson, USCG, made an emergency flight to deliver 40 units of blood plasma from the Battery, New York City, to a hospital in Sandy Hook, N.J., for the aid of survivors of an explosion on the destroyer USS *Turner*. Erickson's dramatic landing at the hospital, in an area that was too small for a conventional airplane, was even more spectacular than most life-saving missions because he had made the flight through snow squalls and sleet which had grounded all other aircraft.

After WW II, the U.S. Navy began serious evaluation of helicopters for antisubmarine warfare. It found that a sonar transducer could be lowered into the sea (dipped) to detect the presence of a nearby submarine. At the same time that these tests were being conducted, the Marines began their development of the tactics and doctrine of vertical envelopment. By the time of the Korean War, helicopters had joined the fleet air program in antisubmarine warfare, rescue work, plane guard, medical evacuations, and other utility tasks. By 1955 U.S. Navy HSS-1 helos carried dipping sonar, homing torpedoes and a four-man crew for their submarine hunting operations. These helicopters operated from aircraft carriers specifically designated as antisubmarine support carriers (CVSs).

When the U.S. Navy dropped the distinction between attack carriers (CVAs) and antisubmarine carriers (CVSs) in the late 1960s, all fleet carriers were given the capability for handling both attack and antisubmarine operations. Thus helicopters became a permanent part of carrier aviation. Today helicopters go to sea not only on carriers of various types, but also on many Service Force ships for use in vertical replenishment, on hospital ships (as in the Vietnam War), and on some of the new patrol frigates, destroyer escorts and destroyers. The Navy expects to use these patrol ships and destroyers for escorting amphibious forces, merchant ships, and service forces, and in antisubmarine warfare operations as part of the sea control mission. Another Navy project which will put helicopters on some destroyers and escort ships is LAMPS (light airborne multi-purpose system), an indication of the Navy's future surface warfare plans which will integrate air and surface forces more fully than ever before.

In its antisubmarine warfare forces the U.S. Navy has land-based aircraft as well as sea-based helicopters and fixed-wing patrol planes, such as the S-3A *Viking*. For many years the land-based *Neptunes* were the mainstay for long-range air patrols. Today the P-3 *Orion* has succeeded the *Neptune*. The *Orion*, a four-engine turboprop, has a crew of 10 who fly 12 to 15-hour patrols searching for submarines. It is filled with sophisticated radar and electronic gear that can detect submarines in a variety of ways. In contrast to its predecessors, the *Orion* has the advantages of speed, fast response to changing tactical information and the capability for immediate attack against enemy submarines — with torpedoes, depth bombs, mines, rockets, or even nuclear weapons.

Although not specifically used for antisubmarine warfare patrols, another long-range patrol aircraft is the Coast Guard's HC-130B *Hercules*. The Coast Guard uses these four-engine planes to fly six to eight-hour ice patrols in the area of Newfoundland's Grand Banks. Aerial reconnaissance of icebergs provides information concerning ice conditions which is extremely helpful to North Atlantic surface ships.

The helicopter, which has been so useful for rescue work, amphibious operations and antisubmarine patrols, is a form of vertical takeoff and short landing aircraft. Major navies of the world are now experimenting with other types of vertical takeoff and short landing planes. The first jet-propelled V/STOL combat plane design to enter service was the British Hawker Siddeley *Harrier*, based on the P.1127 *Kestrel*, initially tested in 1960. The goal of V/STOL designers is a land-based aircraft also suitable for shipboard operations or for landings and takeoffs from inaccessible places. Early V/STOL trials showed that this type of aircraft was feasible for carrier use, but it lacked the lifting capacity of either conventional jets launched from catapults or heavily armed helicopters. Currently, the navies of the United States, Great Britain and the Soviet Union are all engaged in exploring the use of V/STOL aircraft. The U.S. Marines, for example, are employing the AV-8 *Harrier* V/STOL for support of ground combat troops.

Long-range U.S. Navy planning may put V/STOL jets and conventional helicopters aboard combatant and support ships. As part of its experimentation with possible future ship types, the U.S. Navy has tested USS *Guam*, an amphibious assault ship, in these various roles with V/STOL aircraft. The Navy has another amphibious assault ship (LHA) on the drawing boards. It would also carry helicopters and V/STOL jets for operation with the Marine Corps.

Since 1945 many of the smaller navies around the globe have acquired aircraft carriers and carrier-based aircraft. By 1969 Canada, Australia, The Netherlands, Argentina, Brazil, India and Spain had all joined the carrier navies of WW II – the United States, Japan, Great Britain and France – in operating flattops. All carriers of the newcomers are the light carrier class (11-16 thousand tons), except for France which has two attack carriers, *Foch* and *Clemenceau*, which displace 22,000 tons. Great Britain has supplied all the new carrier navies, except Spain – which the United States provided. France holds the distinction of having built her own attack carriers and a supersonic carrier-based jet. All aircraft flown from these carriers are either British, French or American-built. Although none of the carrier forces of any of these nations can match the 12-14 carriers which the U.S. Navy will be operating in the last quarter of the twentieth century, their presence does provide smaller navies with an antisubmarine warfare and amphibious assault capability.

The Soviet Navy joined the carrier navies with the completion of two helicopter carriers, *Moskva* and *Leningrad*, in 1967 and 1968, respectively. Displacing 18,000 tons fully loaded, these ships are 673 feet long and have a maximum speed of 30 knots. They carry 15-20 helicopters of the Kamov-25K type. Unlike other helicopter carrier designs, the *Moskva*-class ships are missile cruisers forward, helicopter carriers aft. On the forward portion of these ships there are antiaircraft and antisubmarine missile launchers as well as rocket launchers and antiaircraft guns. Although Imperial Russia had been among the pioneering nations in aviation, the Soviets did not try to develop ships capable of handling aircraft until very recently. Instead of taking their naval aviation to sea, as had been the practice in the United States, Japan and Great Britain, the Soviets had concentrated on the development of land-based naval air forces which could fly reconnaissance and attack missions. The Soviet naval air force is presently quite large and has modern jet aircraft.

Prior to the introduction of the *Moskva*-class helicopter carriers, the Soviets had built a substantial submarine force made up of both conventional and nuclear-powered attack and ballistic missile boats. *Moskva* and *Leningrad* are now used in antisubmarine operations and to show the Soviet flag around the world. Their helicopters could also be used for amphibious operations if necessary. The Soviets are presently experimenting with jet V/STOL aircraft which they presumably plan to operate from their carriers. Since the Soviet Navy has no jets suitable for carrier operations and it would take them at least 10-15 years to build and develop an attack carrier and operational carrier-based jets, they hope to leapfrog technologically the U.S. Navy's lead in carriers and jets with the development of their own jet V/STOL.

Recently the Soviets completed building a new and larger carrier, *Kiev*, and are building another ship of this class, *Minsk*. The *Kiev*-class carriers are estimated to have an overall length of 925 feet, displace 40-45 thousand tons and have a maximum speed in excess of 30 knots. Naval analysts conjecture that these ships will carry about 25 helicopters and 25 V/STOL aircraft, and be armed with both missiles and guns. Although *Kiev* has a 550-600-foot angled deck, there is no sign that it will have steam catapults, arresting gear or a mirror landing system, all of which are associated with attack carrier design.

Naval analysts in the West are unsure what the exact mission of the *Kiev*-class carriers will be, but expect that they will have considerable military and political impact. In the past the Soviets have chosen to develop ballistic and cruise missiles as well as missile-carrying submarines, rather than to try to build carrier forces to match those of the U.S. and Great Britain. The construction of the *Kiev*-class and the probable embarkation of helicopters and V/STOL jets on them indicate that the Soviet Navy is moving away from this older naval strategy of coastal defense toward a strategy of naval projection on the high seas, especially for operations against the ballistic missile submarines of the U.S. Navy.

The Soviet Navy is not only challenging the U.S. Navy's superiority in aircraft carriers, it is also probably more advanced in the development of anti-ship or cruise missiles. A cruise missile is essentially a pilotless aircraft propelled by an air-breathing engine and carrying either a conventional or nuclear warhead. First developed by the Germans as the V-1 rocket in WW II, cruise missiles have become a potent threat to all surface naval forces. In the 1967 Arab-Israeli war an Egyptian patrol boat sank an Israeli destroyer, *Elath*, with four Soviet-built cruise missiles, thereby demonstrating convincingly that these weapons will have to be acknowledged in the future.

The Soviets concentrated on the development of the anti-ship missile as a means for rendering U.S. aircraft carriers less potent. The U.S. Navy, in contrast, experimented with cruise missiles, such as *Regulus* in the 1950s, but decided to concentrate on the development of submarine-launched ballistic missiles, such as *Polaris* and *Poseidon*, air-to-air, surface-to-air and air-to-surface missiles. The Navy is now working on adapting its *Harpoon* air-to-surface missile for use as a ship-launched anti-ship missile.

At the present time the United States, Soviet Union, Great Britain, France and the People's Republic of China all have strategic ballistic missiles of one sort or another. These nations have also developed, or are in the process of developing, various kinds of tactical guided missiles for use with their aircraft and naval fleets. These latest advances in missile weaponry seem to mean that the proliferation of aircraft carriers, aircraft and missiles of the past 30 years is very likely to continue at a growing pace.

The second consequence of the post-World War II emphasis on military research and development, especially in aircraft and missiles, has been the space programs of the United States and the Soviet Union. Even before the Soviets launched *Sputnik* in 1957, both nations had seriously undertaken the military development of intercontinental ballistic missiles as part of their strategic arms defense. The space programs were a logical parallel to this military emphasis on rockets and missiles. President John F. Kennedy explicitly gave the United States space program the goal of putting a man on the moon before the end of the 1950s. Unlike the military programs in strategic arms development, the space programs have tended to concentrate on peaceful purposes, scientific exploration and sheer discovery.

As a part of sea-air aviation, the space program in the United States has depended upon the sea for its recovery areas, either the Caribbean or Pacific. Nearly every space capsule in the manned flight programs, the *Mercury*, *Gemini* and *Apollo* projects, has depended upon helicopters for initial recovery at sea and subsequent transportation to a waiting carrier. Many of America's astronauts who made these space flights were either U.S. Navy or Marine Corps test pilots.

Unquestionably the culmination of the American space program came on July 20-21, 1969, when astronauts Neil Armstrong and Edwin F. "Buzz" Aldrin walked on the moon. Although five additional pairs of *Apollo* astronauts landed in various locations on the surface of the moon between November 1969 and December 1972, and the *Skylab* project and the rendezvous between the American *Apollo* space capsule and that of the Soviet *Soyuz* program (July 17, 1975) have made significant contributions to our knowledge of the moon and space operations, they have not surpassed the first moon landing. Indeed, the moon landing by Armstrong and Aldrin fittingly brought sea-air aviation full circle. Just as Daedalus and Icarus struck out from Crete to fly over the sea to Sicily, so also in their own way the trio of *Apollo 11* astronauts set out from launch pad 39A at the John F. Kennedy Space Center at Cape Canaveral to land at the Sea of Tranquility. Unlike their mythic predecessors, these twentieth century explorers heeded the warnings of Daedalus and did not stray too close to the sun. Thus they returned safely to earth, splashing down in the Pacific where they were picked up by an HS-4 helicopter and taken aboard the carrier *Hornet*.

After the *Apollo 11* crew returned to the United States, the three astronauts addressed a joint session of Congress. As a member of this historic first flight to the moon, Michael Collins expressed the feelings which Daedalus may have had after he first discovered that his wings of feathers and wax could help him to fly when he told his listeners: "Man has always gone where he has been able to go. It's that simple. He will continue pushing back his frontier, no matter how far it may carry him from his homeland."

In making this observation, Astronaut Collins had indirectly provided an explanation of why the Wright brothers built their first airplane and, indeed, why there is a space program.

Atlas launches communications satellite.

PEOPLE · PLANES · PLACES

One of the last T-28 roars was heard over Whiting Field recently as VT-2 completed training the final 11 recip drivers in the *Trojan*. The squadron, which has trained flyers in the old "oil hog" since its commissioning in 1960, is now flying the T-34C *Mentor*.

On October 1, 1978, the tasks and functions of NARU Washington, D.C., were combined with NAF Washington, D.C. A personnel inspection and consolidation ceremony were held at Andrews AFB to mark the event. Speakers were Capt. Frank X. Azzarita, outgoing NARU C.O.; Capt. Joseph A. Muka, Jr., present NAF C.O.; and RAdm. Thomas A. Kamm, Deputy Director Naval Reserve, CNO.

Col. Fred Hoenniger, Commander, 51st Composite Wing (Tactical), Osan AFB, South Korea, chats with his son, Ltjg. Phillip Hoen-

niger, an RIO from VF-161. He was recently hosted by the *Chargers* at NAF Atsugi. The squadron is embarked aboard *Midway* which is deployed to Yokosuka.

Intruder pilots Lt. Mike Shon and LCdr. Mike Concannon bid farewell to A-6A BuNo 149485, an asset of Pax River's NATC for the past 11 years. Built by Grumman in January 1963, it was delivered to NATC in May 1967

and was used for ordnance testing. Upon transfer to NARF Norfolk, it will be converted to a KA-6D tanker. Initially known as A-6A No. 19, the aircraft is one of the last of its kind to make the transition.

The VA-72 *Bluehawks*, also from Cecil Field, announced nine new centurions aboard *Kennedy*. They are: LCdrs. Tom Wright and Ken Cech; Lts. Bob Darwin and Dick Costigan; and Ltjgs. Leo O'Brian, Jim Wetherbee, Jim Tucker, Andy Ingram and Brian Leach. VA-72 skipper, Cdr. H. A. Marrill, marked his 200th *JFK* trap.

The first annual LSO Carrier Landing Derby was held on board *Nimitz* operating off the Virginia Capes. Eighteen LSOs participated, logging four arrested landings each. VAdm. G.E.R. Kinnear II, Commander Naval Air Force, Atlantic, personally judged the competition and named Lt. Frank Roberts, CVW-8, the winner. Roberts has over 2,200 flight hours, including 1,000 hours in the F-4 *Phantom*, and has amassed close to 400 carrier landings.

Records

On February 13, 1976, MAG-29 started with zero. Two years, six months and 25 days later, an AH-1T *Cobra* marked the 50,000th accident-free flight hour for the New River unit. MAG-29 C.O., Col. Lloyd W. Smith, and HMA-269's aviation safety officer, Lt. Doyle Beam, were at the controls.

The *Boomers* of VA-165 have achieved more than 35,000 accident-free flight hours and over 9,000 carrier arrested landings flying the A-6. The squadron has been accident-free for more than eight years, four aboard carriers, including 15 months of combat operations in SEAsia.

Another *Intruder* squadron, VA-35 of Oceana, has accumulated over eight years of safe flying. During this period, the *Panthers* tallied an impressive 36,167 flight hours in the all-weather, carrier-based bomber. Under the leadership of Cdr. J. D. Joyner, VA-35 is assigned to CVW-8 aboard *Nimitz*.

VF-84 reached a safety milestone of six accident-free years. Commanded by Cdr. T. S. Treanor, Jr., the *Jolly Rogers* have deployed in the F-4B/JN and F-14A and have surpassed 13,000 safe flight hours.

The *Marlins* of VP-40 Moffett Field, recently topped 85,000 accident-free hours, representing 11½ years of safe air ops. Squadron C. O. is Cdr. M. W. Gavlak.

Et cetera

Over 50,000 people boarded *Saipan* (LHA-2) while it was docked in New York City last summer for the 1978 Harbor Festival. When Navy's newest and largest amphibious assault

ship steamed into New York harbor, motorists on their way to work slowed their cars to get a better look, causing many traffic jams. Mayor Edward Koch was the guest of C.O., Capt. F. W. Johnston, Jr., for lunch and a personal tour. Visitors surveyed the flight deck, displaying four helicopters and a *Harrier*, the hangar deck with fire-fighting exhibits, the cargo-handling equipment, landing craft and a dummy missile. One man was heard to say, "I just don't believe this thing is for real. It's just like a huge city and, wow, look at the basketball nets!"

Two VA-42 officers from Oceana have been selected to join the *Blue Angels*. Lt. Kent Horne will be events coordinator and Lt. Jack Ekl will perform in one of the team's A-4 *Skyhawks*. Another selectee for the *Blues* is Capt. Fred Stankovich, USMC, from VMAT-102, Yuma.

PEOPLE · PLANES · PLACES

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Cdr. George W. White, Jr., CAG-6, recently commended his air wing on the achievement of two significant milestones in aviation safety: 166,500 flight hours and over 44 years of major accident-free flying.

During a recent training period aboard *Saratoga,* three VA-105 pilots from Cecil Field achieved important career landmarks. LCdr. Pete Leum reached 500 traps; LCdr. Obie O'Brien, 400; and C.O., Cdr. Brent Bennitt, 600.

Change of Command

NAF Detroit: Capt. William A. Lawler relieved Capt. Alfred N. Schaaf.

NAS South Weymouth: Capt. Donald L. Boyden relieved Capt. Roderick T. Radcliffe.

NATTC Lakehurst: Capt. "E" James Bock relieved Capt. Frederick A. Rodgers.

VA-42: Cdr. John K. Peiguss relieved Cdr. Jackson E. Cartwright.

VA-195: Cdr. William C. Bowes relieved Cdr. Robert C. Kaup.

VAW-88: Cdr. Roger W. Walsh relieved Cdr. Robert G. Hutton.

VAW-125: Cdr. William J. Mooberry relieved Cdr. James E. Connerton.

VAW-126: Cdr. Vady R. Clark relieved Cdr. Dennis M. Kinney.

VF-151: Cdr. Denny Wisely relieved Cdr. Jay H. Hall.

VP-23: Cdr. Henry H. Davis relieved Cdr. Don W. Medara.

VR-52 Det Washington, D.C.: Cdr. Thomas D. Williamson relieved Capt. William R. Hendricks.

HS-75: Cdr. E. A. Pencek relieved Cdr. D. J. Coolican.

Model Man

"We need a model in a hurry," *NANews* said to Ryser Ericson. "We're working on a cover idea and running short of time." As always, he was ready and willing. "Sure," he said, "be glad to help."

And he did. Within a couple of weeks, laboring nights and weekends, Ericson built the front-cover Wright *Flyer.* JOCS Bill Bearden filmed it and, using a separate view of USS *Kitty Hawk,* a composite was created.

A Navy civilian, Ryser's day-time hours are devoted to the Secretariat, Civilian Personnel Office, Deputy Under Secretary of the Navy. He has built more than 75 models in his avocation and these pictures demonstrate that he is a man for detail. He would have it no other way.

This is not Ericson's first appearance on an *NANews* cover. To help Naval Aviation celebrate its 65th Anniversary he built a model of the A-1 *Triad.* It appeared on the May 1976 cover in formation with an F-14 model. Bearden filmed that one, too.

Thanks, Ryser!

GUANTAN

Guantanamo Bay, Cuba, one of the earliest sites of U.S. naval air operations, today remains a vital part of the aviation scene.

Aviation at Guantanamo began in December 1912 with the establishment of the Aviation Instruction Camp, Lt. John H. Towers in charge. Activity was limited primarily to instruction, but some testing on the usefulness of airplanes in naval warfare was accomplished. During World War I, a small amount of air activity was carried on by six seaplanes and their tenders *Shawmut* and *Sandpiper*. During the winter of 1920 and spring of 1921, the newly formed air group of USS *Langley* operated from the Hicacal Beach salt flats and the bluffs of Leeward Point. During this period some temporary facilities – a pier, shops, living quarters and a concrete ramp for seaplanes – were provided.

Experimentation with dirigibles continued in the 1920s and 1930s, with a mooring mast and track established early in 1931 on what is now McCalla Hill Field. *Shenandoah, Macon, Los Angeles* and *Akron* used this facility for training. When the Navy discontinued the dirigible program in 1934, there was no further lighter-than-air activity until the much smaller type-K non-rigid airships were based there in the spring of 1943. The mooring mast and track were removed and replaced with a landing field for heavier-than-air craft in 1939.

In early 1938, Project *Dog*, the operation of radio-controlled aircraft, was established and ordered to Gitmo. The project's personnel consisted of one officer, one warrant officer, 16 enlisted men, three TG control planes and five N2C drones. Ships participating in this operation included the destroyer *Patterson* and the battleships *Maryland, California* and *Utah*. During

AMO BAY

these operations only one drone was knocked out of the air – by *Maryland*. It is reported that this caused much hilarity and celebration on board. Project *Dog* ultimately became Squadron VJ-3.

In 1939, the Bureau of Aeronautics decided on limited construction at Leeward Point to provide additional operating facilities for carrier aircraft because that area offered better year-round wind conditions for landplane operations.

By the end of 1939, the United States was conscious of the need for increased national defense. The possibility that the U.S. might eventually be drawn into the European war gave rise to the probability that the Caribbean would become an important defense area. Construction of a naval air station and expansion of the naval station to a naval operating base were natural consequences.

Naval Air Station, Guantanamo Bay, Cuba, was officially established on February 1, 1941. It became a command activity of the Naval Operating Base when that base was established on April 2, 1941.

When the NAS was established, the only naval personnel actually attached were the commanding officer, Commander George Leo Compo, and Lt. John T. Workman. On July 1, the station received its first airplane, a JRF-5.

In the spring of 1941, the NAS requested personnel to organize and man the station so it could perform its mission – service to the fleet. On March 24 of the following year, the first seven enlisted personnel reported for duty. By July 1942 a total of 45 officers and 486 enlisted men had been gradually added to the air station complement.

The outbreak of WW II found the

naval air station still in a formative stage and quite unprepared to perform the many duties placed upon it. German submarines soon became very active in the Caribbean and, owing to the almost complete lack of defense against them, the Guantanamo area was, for months, a happy hunting ground for the underwater craft.

Immediately following the U.S. entrance into the war, U-boats were concentrated along the East Coast and in the Caribbean. Throughout the first six months of 1942 they preyed on allied shipping with nearly disastrous results. It was then that the need to establish air bases in the Caribbean became apparent. Guantanamo Bay became an important port in the convoy system which was set up to protect shipping in the Caribbean, the major portion of which sailed through the Windward Passage between Cuba and Haiti, about 60 miles east of Guantanamo Bay. Station aircraft made continuous-sweep flights, patrolled the harbor entrance and approaches, escorted surface vessels and located survivors of torpedoed ships.

For this, the air station had one JRF-5 and one N3N, both unarmed, and two J2Fs, each of which could be fitted with depth bombs and a free machine gun. One Army photographic plane was also based at Gitmo.

Initial construction of the air station was practically completed by the summer of 1942, when activities began to increase rapidly. In October 1942, Naval Air Station, Banana River, Fla., began operating a daily PBM seaplane training flight to Guantanamo. The plane remained overnight and returned the following day. In December of the same year, NAS Jacksonville, Fla., also began sending training flights of from six to eight PBYs to Gitmo biweekly.

Transient, NATS and training

Left, Fisherman's Point, January 1913. Opposite page, bottom, early fixed-wing operations at Gitmo included Loening amphibian. Below, station C-131 is parked in front of hangar.

flights, along with fleet air detachment operations, made the station a busy one. Seaplanes, land-based patrol aircraft and non-rigid airships provided ASW surveillance.

Wartime activities reached their peak during the summer of 1943 and continued at approximately that level until the spring of 1944. That summer, as the war in Europe turned in favor of the Allies, the station underwent drastic reductions and was also involved in the decommissioning of the Naval Auxiliary Air Facility, Little Goat Island, Jamaica.

During wartime operations the station maintained a low aircraft accident rate. It also salvaged a number of fleet air detachment and training aircraft at considerable distances from the base.

The years following WW II were fairly uneventful for NAS Guantanamo Bay. During the Korean Conflict, with jet aircraft introduction into the fleet, an 8,000-foot runway was constructed at Leeward Point in January 1953. Gitmo had entered the jet age. Since that time, the story of the NAS has been one of progress toward meeting increased responsibilities.

McCalla Field, which figured prominently in early Gitmo airplane and blimp operations, now handled prop aircraft and line maintenance, thus freeing Leeward for jet operations and heavy maintenance.

In earlier years the Leeward side of Guantanamo Bay was called Hungry Point because there were no billeting

View of parking ramp shows station's C-131 and UH-1Ns, TA-4Fs of VC-10, and a carrier wing beach detachment. Opposite, Nimitz with NAS in the background.

facilities, and water and personnel had to be barged in. The buildup of Leeward Point necessitated improved sport and recreation facilities. New construction in 1953 included a community center, five enlisted barracks, jet fuel tanks and a jet fuel house and station. By 1957 a movie theater and line maintenance and operations spaces had been added. Later, basketball and tennis courts, and a swimming pool made the area an attractive spot for personnel supporting jet operations. Also built at this time were 44 concrete-block quarters for married personnel.

Since the turn of the century, Cuba has been plagued by social upheaval and internal corruption. General strikes, revolutions, soaring inflation and government suppression harassed the island, and every regime developed political enemies.

In 1959, Fidel Castro led an armed insurrection against the government. On February 16, 1959, Castro proclaimed himself Prime Minister of Cuba. He has held power ever since. Castro's relations with the U.S. have not been friendly. During an unofficial visit to the U.S. in 1959, Castro insisted that he would not request American aid and did, in fact, refuse it when a tentative offer was made.

American relations with Cuba quickly deteriorated and reached a tension point when Cuba nationalized American oil refineries after they refused to process Russian crude oil. Additional nationalization of American sugar-producing concerns further alienated the U.S. In January 1961, President Eisenhower severed diplomatic relations with Cuba. Then, in April of the same year, 1,500 Cuban exiles, trained, organized and equipped by the Central Intelligence Agency, invaded Cuba at the Bay of Pigs. Within 72 hours, they were defeated. The 1,200 prisoners captured were eventually released after the U.S. government and private sources paid a $50 million ransom in food and medical supplies.

For the naval air station, 1962 began, and was almost recorded, as a normal year. During the year, at the request of the Governor General of Jamaica, the American Consul obtained the assistance of the NAS sea-air-rescue team for communication support during the tour of the Duke of Edinburgh to Jamaica, Grand Turk and Belize.

The SAR teams earned additional praise by flying some of the longest

missions on record at Gitmo with one mission logging 15.3 hours. In May, LCdr. J. E. Garlitz, pilot; Lt. C. H. Sawyer, copilot, and two enlisted crewmen of a UF-2 spotted and aided in the rescue of five survivors of the ill-fated merchant vessel *Santa Ana* which had sunk approximately 14 days before.

However, the major event in 1962 was the Cuban Quarantine. October brought the news that Russian long-range missile sites had been discovered on Cuba by U.S. reconnaissance flights. President John F. Kennedy ordered a naval blockade of Cuba.

Approximately 2,800 dependents, civilians, teachers, etc., were evacuated by air, and the air station was on the receiving end of a tremendous airlift bringing troops, supplies and equipment to help defend the base against a possible attack. Within a 70-hour period, 188 four-engine transport planes arrived and departed with an average ground time of less than one hour each. NAS operations increased with the arrival of numerous squadrons and a Marine air group.

During the spring of 1963, the Leeward Point Field runway was closed for repairs and the installation of new lights and safety equipment. To enable McCalla Field to handle jet traffic, mobile arresting gear was installed to provide arrested landings for all jet aircraft. For about three months, McCalla Field resounded to the thundering afterburners of the launching jets.

Today, support of the fleet is still the primary mission of NAS Guantanamo Bay. The station maintains and operates facilities, services and materials to support operations of aviation and operating forces and other units of the Navy.

Tenant activities directly supported are Fleet Composite Squadron 10, the Naval Weather Services Environmental Detachment and the Leeward Base Defense Forces of the Marine Barracks.

NAS provides intermediate maintenance and logistics support as well as berthing, messing and recreation facilities to all tenant and transient aviation activities. Aviation ground support equipment, maintenance spaces, etc., are provided to each carrier air wing's Bingo-detachment crew which comes to the Guantanamo Bay operating area. Support is closely coordinated with the fleet training group which assumes operational control of the nearly 100 ships a year which come to the area for a rugged training and evaluation program conducted in a 14,000-square-mile ocean area south of Guantanamo Bay.

Forrestal, Nimitz and *Eisenhower* are among the aircraft carriers which have visited Gitmo in recent months. In addition, the shakedown cruise of *Saipan* (LHA-2) was completed this summer.

The same type of support is extended to all ships with LAMPS detachments. It is provided in various forms and degrees — from moving all PCS personnel through the terminal to providing aviation supply support.

The NAS has C-131s which fly supply-type missions for several U.S. embassies in the Caribbean and provide logistic support to the naval commands and activities of the Guantanamo Bay complex. The C-131s also participate in long-range search and rescue missions for the Coast Guard. Plane guard and SAR missions are primary functions of the station's UH-1Ns.

The Leeward runway is the touchdown point for regular scheduled Military Airlift Command C-141 passenger flights. Regular cargo flights bring logistic support, supplies and, of course, the mail. All ground support of these operations is carried out by the NAS.

All personnel ordered to the Guantanamo Bay complex on PCS orders pass through the NAS operations passenger terminal. Several times a week many pieces of luggage and pets are checked. Here, too, all incoming air cargo of fresh vegetables and high priority traffic are initially processed before distribution to the supply department, Navy exchange and commissary systems.

Naval Aviation history of Guantanamo Bay has encompassed the development stages of many different types of naval aircraft operating with the fleet. Through war and conflict, progress in technology and increased scope of operations have been experienced at Gitmo — to meet the needs of the naval flight community.

Today, Naval Air Station, Guantanamo Bay, Cuba, a part of the U.S. Naval Air Force, Atlantic, helps maintain peace through power and vigilance.

NANEWS INDEX

1978 JAN. TO DEC. INCLUSIVE

NAVAL AVIATION NEWS

SIXTY-FIRST YEAR OF PUBLICATION

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Deputy Chief of Naval Operations (Air Warfare)
Vice Admiral F. S. Petersen
Commander, Naval Air Systems Command

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Covers

NANews salutes aviation's 75th birthday with this month's cover. JOCS Bill Bearden combined his photograph of a Wright Flyer model (see page 31 for more on the replica) with PH1 J.E. Shriver's picture of USS Kitty Hawk, supplied by the Navy Photographic Center. The milestone journey which took place on December 17, 1903, and launched the age of flight, covered a distance of 120 feet. That's less than the length of the island structure on the carrier named after the site where it all began.

On the back cover, NANews' Charles Cooney arranged the random selection of insignia for the book marks.

The inside front cover came from the files. Author of the poem is believed to have been a member of the U.S. Army's 4th Infantry Division (Mech) which, at the time the verse was composed, was engaged in heavy fighting in the Central Highlands of Vietnam. Shortly after his words appeared in the unit newspaper, the soldier was killed.

letters

Cats, Too?

Reference *Naval Aviation News*, September 1978, p. 39. Note that even with a super aircraft like the SBD, 1942 attack pilots were willing to share their decks with at least a few fighters. (If I'm not mistaken, there are five F4F-3 *Wildcats* up there on the bow.) Also, note the seldom-seen 1,1 quad-barrel pom-pom, replaced shortly afterwards by 20mm and 40mm batteries. Finally, the photo appears to show the now obsolete forward arresting gear installation used on carriers of that period to permit aircraft recovery while backing down. Deck-edge sheaves are visible under VB-6's #5 and #12, parked on starboard side.

Jim Mulquin
NavAirSysCom-03P1B
Washington, D.C. 20361

Tailhookers!

The Tailhook Association is engaged in a concerted effort to expand its membership, especially active duty personnel both officer and enlisted.

We are concentrating on our East Coast membership. The Tailhook Association is *not* a West Coast organization. It is dedicated to carrier aviation and any person directly involved with carriers, carrier aircraft (don't forget, helos are carrier aircraft, too!) or has an interest in supporting carrier aviation.

Our 1979 reunion will be held in Las Vegas. The 1980 reunion will be held on the East Coast at a site to be selected.

The Tailhook Association, in recent years, has endeavored to become a professional organization worthy of its stated goals. It is dedicated to foster, encourage, develop, study and support the aircraft carrier, carrier aircraft and aircrews in their appropriate role in the nation's defense system.

For more information write to: Robert L. Lawson, Box 40, Bonita, Calif. 92002 or call (714) 479-8525 or 8896. We will be happy also to send a complimentary copy of our magazine *The Hook*.

Whoa!

While reading the June 1978 issue of *Naval Aviation News*, personnel of VF-32 ran across an article in your "People, Planes and Places" which we felt required some attention. It states that, on February 8, 1978, VF-142 became the *first* East Coast F-14 squadron to fly a single *Tomcat* 1,000 hours.

Not so fast, VF-142!

It just so happens that the *Swordsmen* of VF-32 had flown 1,007.7 hours on BuNo 159018 Modex 206 by the end of January 1978, a good eight days prior to VF-142's "record breaking event."

T. E. Sherry, Ltjg., USNR
Public Affairs Officer
VF-32
FPO New York, N.Y. 09501

NROTC

The NROTC Unit at the University of Louisville is scheduled for disestablishment June 30, 1979. As a parting tribute to the many hundreds of NROTC midshipmen, NESEPs, instructors and staff who have graduated from or served with the unit, a reunion is being planned for May 12, 1979. All NROTC/NESEP graduates and former staff are asked to write: Reunion 79, NROTC Unit, University of Louisville, Louisville, Ky. 40208.

Kudos

I wish to extend my deepest thanks and gratitude for the assistance offered me during my recent visit to the *Naval Aviation News* office.

Your magazine is, in my opinion, the finest in military aviation. I can only hope that as I approach the realization of my goal to become a Naval Aviator, the other departments and personnel of the Navy will make my future career as pleasant as that visit.

Please feel free to call on me at any time if you should happen to need F7U *Cutlass* references or photos. My files are open to you.

Alfred C. Casby
510 Thorn Tree Road
Grosse Pointe Woods, Mich. 48236

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