NAVAL AVIATION NEWS

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NAVAL AVIATION NEWS

Vice Admiral Thomas F. Connolly
Deputy Chief of Naval Operations (Air)

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COVERS

Art Schoeni framed the cover shot of Kitty Hawk in San Diego Bay. The silhouette on FDR, above, comes from the camera of PH2 William R. Curtsinger. On the back cover, PHC William M. Bowers "stopped" the P-3 Orion over fish traps in Manila Bay.

OUR CONTINUING MISSION

'Few of my predecessors have assumed office without first observing that the Navy was facing heavy seas and our country difficult times. Today is no exception. Dynamic political, economic and social changes are at work in our nation and abroad – changes that serve only to emphasize the need for a determined military posture built upon a solid foundation of powerful naval forces.'– Admiral E. R. Zumwalt, Jr.

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1911 1970

Top Prop and Jet Squadrons Are Named

CORPUS CHRISTI, Tex. – VT-23 of NAS Kingsville and VT-28, NAS Corpus Christi, have been selected as the top jet and propeller squadrons respectively, in the Naval Air Advanced Training Command for Fiscal Year 1970. The announcement was made by Rear Admiral F. C. Turner, CNAVanTra.

In close competition for the annual honor, the two squadrons won the fourth annual CNAVanTra top squadron awards by excelling over all other command squadrons in professional performance and degree of dedication in all phases of Naval Aviation training. They were judged in such categories as operational training missions assigned and accomplished, aviation safety, administration and organization, management practices and command inspections.

The top jet and prop awards consist of two large plaques with CNAVanTra insignia and scroll cast in bronze.

In naming the honor squadrons, Adm. Turner said, "The task of selecting these top squadrons was not an easy one because of the fine job done by all squadrons in FY '70. The margin between the winners and the runners-up was very small."

CNAVanTra's six jet training squadrons, based at NAS Kingsville and Chase Field, and the three prop squadrons at NAS Corpus Christi compete throughout the year for the awards.

VT-23 also won the Top Jet title the first time it was given, in 1967. Commanding officer during the period of competition was Commander James V. Walters. He was relieved in July by the former executive officer, Commander Robert E. Ammann.

It was a first win for VT-28 in the top prop category. Current commanding officer of VT-28 is Commander Gilbert M. Lindsay. He relieved Commander Douglas A. Allen in June.

ATTENTION TAILHOOKERS

The dates for the fourteenth annual Tailhook Reunion have been changed from November 13-15 to November 20, 21 and 22. It will be held in Las Vegas, Nev., as previously reported (*NANews*, May 1970, p. 40) but at the Sahara Hotel.

Further information may be obtained by contacting Captain Hugh Tate, VRF-32, NAS North Island, San Diego, Calif. 92135.

ADCNO (Air) Leaves for New Billet

WASHINGTON, D.C. – On August 20, Rear Admiral G. C. Miller was relieved from his duties as Assistant Deputy Chief of Naval Operations (Air), an assignment which he had held since October 1969. On the same day, he pinned on the three stars of a vice admiral.

In ceremonies to be held aboard the Second Fleet flagship, USS *Newport News* (CA-148) on September 14, Vice Admiral Miller will relieve Vice Admiral B. J. Simms as Commander Second Fleet. VAdm. Simms will report for duty as DCNO (Fleet Operations and Readiness).

Wings of Gold for Admiral Rickover

WASHINGTON, D.C. – Vice Admiral Hyman G. Rickover added the Navy's Wings of Gold to his many other honors when he was designated an Honorary Naval Aviator at the July luncheon of Washington area Naval Aviators.

Vice Admiral Thomas F. Connolly, DCNO(Air), introduced VAdm. Rickover to the assembled aviators and presented him with an oversized set of wings and a framed certificate identifying him as an Honorary Naval Aviator. The certificate states that VAdm. Rickover attained the honor through his contributions to advancements in propulsion systems for attack aircraft carriers and his vigorous support of Naval Aviation.

Adm. Rickover is presently Director, Division of Naval Reactors of the Atomic Energy Commission and Deputy Commander, Nuclear Propulsion for the Naval Ships Systems Command.

Blue Angels Receive Marine KC-130

PENSACOLA, Fla. – During recent ceremonies here, a Marine Corps KC-130 *Hercules* and a Marine flight crew began support of the Navy's *Blue Angels*.

Colonel Douglas D. Petty, senior Marine liaison officer at Pensacola, turned the aircraft's log book over to Captain John P. Fox, chief of staff, CNATra, who accepted the aircraft on behalf of the *Blues*. Acting on a request from the Navy for a new support aircraft to replace an aging C-121 cargo plane, the Marine Corps provided the C-130.

The *Hercules* will haul starter units, public address systems, spare parts, miscellaneous equipment and a maintenance crew. It is also capable of wing-tip jet refueling and, if required, can carry a spare jet engine.

Other advantages include easier loading and unloading and less en route time to demonstration sites. The C-130's back-loading capabilities and roller-bed cargo ramp eliminate the need to handle equipment and supplies with fork lifts as was the case in the C-121. The increased speed should allow for a busier schedule for the demonstration team.

Arriving aboard the *Hercules* was a permanent crew, which included Maj. A.E. Therriault, and crew members GySgt. P. B. Bulgat, Sgts. P. C. Myer and A. E. Johnson, and SSgts. W. A. Hawkins and J. L. Shelton.

RECOGNIZED *as the top instructor of the Naval Air Training Command, Major Robert L. Neff, USMC, receives the David S. Ingalls Award from Mr. Martin Ray of the Navy League, at Pensacola. Maj. Neff, now with VT-2, also received the Navy Commendation Medal.*

P-3 Orion Picked for Hurricane Hunting

WASHINGTON, D.C. – The Navy's Replacement Weather Reconnaissance Aircraft Test (RWRAT), conducted last year near Bermuda during the hurricane season under storm conditions, led to the selection of the P-3A *Orion* as the aircraft best suited for hurricane tracking and penetration.

Tested in Bermuda's heavy weather were a C-130 *Hercules*, a WC-121N *Constellation* and a P-3A *Orion*. The *Super Connie*, a 16-year veteran of hurricane hunting, was the trio's control plane.

The RWRAT probe covered aircraft suitability, propulsion system performance, structural integrity and overall capability for heavy weather instrumentation. Physiological tests were simultaneously made on the plane crews, measuring such factors as fatigue, safety consciousness, motion sickness, acoustics, temperature and humidity, and environmental reactions.

The data collected by the test aircraft was evaluated by technicians, engineers, aeromedics and meteorologists at Naval Air Stations Patuxent River, Md., and Jacksonville, Fla. Their findings and recommendations were endorsed by the Naval Air Systems Command and the contract for the prototype of the WP-3A *Orion* was awarded to the Lockheed Aircraft Corporation of Ontario, Calif.

The prototype will be a converted P-3A. Certain ASW equipment in the *Orion* will be removed and replaced with meteorological equipment from the WC-121N. Since the radar system for meteorological operations requires a different frequency, the radome of the P-3A will be reconfigured.

When the conversion is completed, the prototype will become a WP-3A. Expected delivery date is this fall, in time for the second half of the hurricane season (see page 6).

THE FIRST *meteorological rocket to be launched from an EC-121K soars skyward at Point Mugu, Pacific Missile Range, to record weather data and test the new rocket sounding system. The 2.75 rocket launcher, mounted on the right side of the aircraft, is fired to the rear.*

GRAMPAW PETTIBONE

Up and Locked

The Marine second lieutenant departed the training command air station on his P-6 solo flight in a T-28 *Trojan*. After completing acrobatics and slow flight, he entered the landing pattern at an outlying field for touch-and-go practice. The first touchdown was long, and the student applied throttle for takeoff. Just after liftoff, the engine lost power. He quickly applied full throttle, but the airplane continued to settle back to the runway. Maximum braking did not stop the *Trojan* and, as it left the runway, the pilot retracted the landing gear. The craft slid 250 feet to a stop, and the second lieutenant tried unsuccessfully to blow the canopy back; then beat a hole in it with his fists and climbed out through the hole onto the left wing and to the ground.

Another student pilot, an ensign on a solo flight in the same type aircraft, noted the sump plug warning light on while doing wingovers. All other instruments were normal, and the engine continued to run smoothly. Quite professionally, he set 2,000 rpm and 20-inch manifold pressure and prepared for a precautionary emergency landing at an outlying field.

At high key, he set the propeller to low pitch and closed the throttle. The gear warning horn came on, but he silenced it so he wouldn't miss any radio transmissions. He trimmed up for the glide and began the landing checklist. It seemed a bit premature when he reached for the landing gear handle, so he noted to himself, "gear to go." Arriving at the "low key" position somewhat high, he lowered the landing lights. Approaching the 90° position, he lowered one-half flaps, followed soon by full flaps. Since he was still high, he even opened the canopy to increase his rate of descent.

As the *Trojan* arrived on final approach, the crash crew fired a red flare

which the ensign assumed was a warning to other aircraft that an emergency landing was in progress. On touchdown, when the propeller stopped turning, he thought that the engine had seized. As the plane started to skid off the right side of the runway, it finally dawned on him that he had landed wheels up. The craft skidded to a stop and the switches were secured before the pilot climbed out to survey the damage.

Grampaw Pettibone says:

Embarrassin', what! Some days ya can't make a nickel. Seems they couldn't find anything wrong with the engine on the first T-28 or with the canopy. However, the prop was found set at 2,200 rpm and the mixture on normal lean. Even though both these mishaps occurred with student pilots who admittedly had very limited experience, it could happen tomorrow – to anyone. Not one of us, includin' ol' Gramps, is exempt from the broken habit pattern or the diverted attention which can cause a lapse. There is only one prevention, CHECKLISTS. Nuff sed!

Fish or Cut Bait

The A-4E *Skyhawk*, piloted by a combat veteran lieutenant, was launched on a bombing mission from the starboard catapult of the small CVA at dusk one summer evening. The cat was set for the correct gross weight of 23,000 pounds to give the A-4 an end speed of 141 knots.

Witnesses noted a definite decrease in engine rpm as the aircraft proceeded down the catapult. Off the end, with 14 knots excess end speed, they also noted a possible over-rotation, although the lieutenant stated that he rotated normally to ten degrees. The *Skyhawk* encountered immediate buffet and began to settle. Seven to ten seconds later, as the stricken bird reached 20 feet above the water, the pilot initiated ejection on the air boss' radio call. He was forthwith deposited uninjured in the water alongside the remaining debris of his aircraft. He was

ILLUSTRATED BY Oxborn

immediately drenched with fuel but there was no fire. He was picked up by the plane guard helo and deposited on deck within seven minutes.

Grampaw Pettibone says:

What was wrong there? Mighty lucky guy (quite true). What else can a guy do if his engine fails him off the end of the cat. But did he really have engine problems? I'm a mighty suspicious cuss, you say.

Three nights earlier, he had witnessed, from the LSO platform, the catastrophic demise of a friend when his aircraft hit the ramp. By his own statement, he took this cat shot with his left hand on the alternate ejection handle instead of holding the throttle full on. There was sufficient time for several remedial actions by the pilot, such as jettisoning ordnance, cleaning up the aircraft, or above all, advancing the throttle which was probably pulled aft by the G load of the catapult shot.

Why didn't he react? Most probably because he was momentarily over-saturated and unable to respond to the maximal stress situation.

Think ahead – plan and practice your reaction to emergency situations.

Shudda Stood in Bed

During initial carqual landings in the A-7B, the lieutenant was sent out for his first night period. After six passes, resulting in one waveoff, two bolters and three arrestments, the seventh also left something to be desired. A lineup call fairly close in, to which he responded, and an attitude call just prior to touchdown left him in a nose-high, left wing-down attitude. The tailpipe skagged from a point 18 feet forward of the round-down. The nose came through hard, and the *Corsair* hook skipped the first three wires. Engaging the fourth, it continued to roll out in a marked left drift. As the left main mount slipped into the catwalk, the lieutenant reached down and pulled the alternate firing handle with his right hand. Due to the aircraft's approximately 85 degrees of bank, he ejected in a low trajectory and hit the water without chute opening.

The A-7 was still at full power and attached to the number four arresting cable. The flight deck crew flamed out the engine by spraying water down the intake; however, the *Corsair* continued to slip over the side and came to rest, suspended by the wire, with its nose in the water. (Later, the $1.5 million A-7 was intentionally released and fell into the sea.)

The pilot found himself in the water, unable to use his injured left arm. He managed to inflate the right side of his MK-3C, then discovered that his legs were entangled with parachute shroud lines. He turned on his strobe light and was soon approached by the plane guard helicopter. The swimmer was not equipped with fins or knife and, although the pilot had a knife and shroud cutter attached to his vest, quite a bit of time was spent in untangling the shroud lines. Finally, in the horse collar, he was hoisted prematurely and, because of his broken arm, fell approximately 20 feet, back into the water. The swimmer attached his D ring to the hoist, put the pilot back into the horse collar, wrapped his arms and legs about the pilot and signaled the helo to hoist away. Because the lieutenant was hanging too low, it was impossible to get him aboard the helicopter. As he began to slip, a crewman grabbed his broken left arm and, with the swimmer hanging on, too, they proceeded back to the ship.

Although the helo was given a "clear deck," it was unable to land because of the arresting cable still across the deck – holding the suspended *Corsair*. In addition, the helo pilot couldn't lower his landing gear for fear of hitting the rescued pilot. As the lieutenant became aware of the problems he released his grip and fell five to ten feet to the flight deck, receiving minor additional bruises. He was x-rayed in sick bay and evacuated to a naval hospital the following day.

Grampaw Pettibone says:

Holy Hannah! Kind'a shows a weakness in our methods, don't it? Can't second guess the captain, but it sure would'a been nice to save that *Corsair*. I know one ship which went back into port with one hanging over the side so a dockside crane could hoist it back aboard. A million and a half bucks is not small change.

And as fer the uncoordinated rescue crew – man, they need some training, fast. What a contrast between a crew that knows what it's doin' and a fiasco like this. No swimmer should ever be used unless he really knows what he is doing. Who, in the chain of command, allowed this to happen?

Hurricane Hunters

By PH1 Don Grantham

All hurricanes are children of the tropic oceans. Born in the lower latitudes and nursed on the breast of a warm sea by the easterly trade winds, they sometimes grow to full maturity and head north to unleash their awesome power over land masses in the northern hemisphere. No other atmospheric disturbance brings together such destructive energy — in size and duration.

The Environmental Science Services Administration (ESSA) and the Navy have joined forces in an attempt to tame these monsters of the atmosphere. The taming project is relatively new, although, for more than 27 years, the Navy has flown into hurricanes and typhoons to gather important atmospheric data.

Since 1943, the Navy has had an active part in aerial hurricane reconnaissance. The Navy's *Hurricane Hunters* of Weather Reconnaissance Squadron Four began flying into hurricanes in 1953. VW-4 is the seventh Navy squadron to be assigned the mission.

Navy pilots have made thousands of penetrations into the most dangerous part of hurricanes: the eye's wall — where winds reach their highest velocity, sometimes exceeding 200 mph. (In 25 years of hurricane flying, VW-4 and its predecessors have lost only one plane, a P2V *Neptune*, during Hurricane *Janet* in 1955.)

Columbus is believed to be the first man to describe a hurricane. On his return voyage to Spain from the West Indies in 1493, he penned in his diary an account of experiencing a storm with high velocity winds. But hurricanes had plagued Indians in the area for years prior to Columbus' report. They had local names for them. In

Over the next few hurricane seasons, the Navy's *Hurricane Hunters* of VW-4 based at NAS Jacksonville, Fla., will receive new WP-3A *Orions* (see page 3).

Extensive tests over the past year, including actual hurricane penetrations into *Inga* last October, at altitudes of less than 1,000 feet above the sea and in winds up to 140 mph, were conducted to test the aircraft's ability to successfully replace the familiar *Super Constellation*. The tests were coordinated by NATC Patuxent River, Md.

Delivery of the first specially equipped aircraft is anticipated during this year's hurricane season — June 1 to November 30. The *Orion* will shorten the time needed to reach storms far at sea and will also provide greater flexibility in altitude range.

Since 1955, when the Navy began using *Super Connies*, VW-4 has amassed more than 65,000 accident-free flight hours while flying into more than 125 tropical storms.

The aircraft of VW-1, VW-4's sister squadron in the Pacific, are also scheduled to be replaced by the *Orion*. Although the seeding of Pacific typhoons and hurricanes has not been attempted to date — largely because the North Atlantic is the more convenient "laboratory" — the vast reaches of the Pacific and the large number of tropical storms which occur there offer great potential once an operational capability to modify the storms has been achieved.

fact, the word "hurricane" is from the Spanish word "huracan" which is thought to be a derivative of "Hunracan," the Mayan storm god.

The Atlantic area name for high velocity winds (above 75 mph) is hurricane. These high-speed winds are known in the tropical and temperate oceans of the world by various names. They are called typhoons in the Pacific, cyclones in the Indian Ocean, and Willy-Willys by the Australians. Hurricanes form north of the Equator; the South Atlantic is believed to be too cold to sustain them.

During an average year there will be fewer than ten tropical storms in the Atlantic, six of which may develop into hurricanes.

The machinery for this year's hurricane early warning is in high gear. When a tropical storm is detected, scientists of ESSA's weather bureau and research laboratories gather in Miami and Puerto Rico to evaluate the extensive data needed to keep abreast of the storm's force and direction of travel. Weather research is the year-round mission of these men, but when hurricanes are spawned, they have to work harder.

Today, budding hurricanes are spotted by satellites. Their pictures often show the characteristic spiral cloud formation of the storms.

When a suspected storm is identified on satellite photos, the *Hurricane Hunters* are dispatched to take on-the-spot readings of winds, atmospheric pressure, temperature, humidity and the many other factors thought to contribute to the formation of hurricanes.

Sometimes it is days before a hurricane is positively identified. Then, all civilian aircraft and ships in the vicinity are warned to stay clear of the storm and its predicted path.

When the area is cleared, the only way to obtain the necessary data on forces controlling the hurricane is to send *Hurricane Hunters* into the eye for readings.

The Navy's *Hunters* work closely with ESSA and the Air Force. The ESSA planes are flying laboratories; Air Force planes normally work at high altitudes; Navy planes fly from 400 feet over the sea to the top of the storm – 40,000 to 60,000 feet up.

Both exploratory and special reconnaissance missions are flown. One sweep of the powerful, long-range radar in a VW-4 aircraft permits observations of cloud conditions over a 200,000 square-mile area. One flight can obtain information on 1,500,000 square miles of ocean.

No one knows exactly how a hurricane forms. A sudden drop in atmospheric pressure at the surface of the sea and a one to three degree temperature increase at 20,000 to 40,000 feet (about 24 hours before the disturbance develops) are believed to be two factors. However, these factors could be measurable symptoms of another effect which actually triggers the storm's increase to hurricane force. The interaction of low and high

altitude winds is believed to determine the intensity of a hurricane.

"We've learned a lot about hurricanes in recent years," says Dr. Cecil R. Gentry, chief of ESSA's Miami-based Hurricane Research Laboratory. "But there are still more unknowns than knowns.

"Because of these unknowns, it is necessary to view a hurricane as a heat engine, powered by temperature changes and driven by the wind. There are many very delicate conditions that must be satisfied before the atmosphere can produce a hurricane.

"The heat engine seems to be both highly unreliable and inefficient, but the fact that it works cannot be denied. The relative infrequency of hurricanes indicates that many a potentially dangerous one ends as a misfire somewhere at sea."

The heat engine of a hurricane functions like a giant chimney. Winds, hundreds of miles from land, pick up large amounts of moisture from the sea, are warmed by a hot sun and the warm ocean surface, and slowly rise higher into the atmosphere. The moisture condenses as the air rises, releasing additional heat and thereby enhancing the upward motion. If the upward motion is sufficiently localized by suitable wind shears at low levels and aloft, a low pressure center at the surface may result. The winds at low levels blowing into the low pressure area may then generate a vortex about the center, and this circulation, in turn, causes the formation of a "chimney" of rising air near the center. These processes, plus the action of unknown triggering mechanisms, may result in a hurricane.

The circular winds will rotate tighter and higher, until a chimney is formed, 20,000 to 60,000 feet high. These winds reach their greatest speeds at the center's edge, the eye-wall.

The eye or center, averaging about 14 miles in diameter, has relatively calm winds. This is the area of the hurricane that is most deceptive, giving people the erroneous impression the storm has passed. However, the winds will strike again with equal force from the opposite direction as the eye passes.

Winds are not the most damaging force of a hurricane. More lethal are the giant waves and extremely high

tides – the storm surge. Waves generated by the winds reach heights of over 50 feet, and the ocean's surface is drawn upward near the storm center as in a giant straw.

When these waves and the storm surge strike shore, they cause severe flooding in low-lying coastal areas. The massive walls of water are forced up rivers and channels and into low areas. Backed by the high winds, the force of this water, weighing about 1,700 pounds per cubic yard, can beat buildings or towns out of existence.

Atmospheric conditions could be just right for a hurricane to form, but nothing happens; then again the situation may be completely unfavorable and, presto, one of these atmospheric giants appears.

The enormous size of these tempests is almost inconceivable to the average person. It is also one reason man has not yet worked out effective control of them. The problem is compounded by the fact that a hurricane may strongly influence weather conditions for hundreds, even thousands of miles from its center.

The worst winds within a hurricane do not approach the velocity of a tornado but, where the life of a tornado is measured in hours or minutes and covers only a few miles, a hurricane lasts for days and travels thousands of miles. And the tornado circulation's diameter may be only a few hundred yards while a hurricane's diameter may exceed 500 miles.

The power released by an average hurricane – in one day – is equal to the energy released by 400 20-megaton hydrogen bombs.

"If three percent of the heat energy generated in one day by a hurricane were converted to electricity, there would be enough electrical power for the entire United States for more than six months," Dr. Gentry says.

The average hurricane brings six to 12 inches of rain to the areas it passes. It has been estimated that hurricanes account for nearly one-fourth of the annual rainfall of the southeastern United States, whether their centers strike land or not.

In addition to being head of the Hurricane Research Laboratory for ESSA, Dr. Gentry also is director of man's most ambitious attack on hurricanes, Project *Stormfury*, a joint ESSA/Navy operation. Its objectives are to explore the structure and dynamics of hurricanes in order to achieve better understanding, to improve prediction methods and to explore the possibility of changing some of the forces within these tropical storms.

The project also is an experiment in altering cloud conditions around the eye, thereby upsetting the balance of forces and causing a redistribution of energy around the storm center. *Stormfury* is a laboratory experiment with the hurricane serving as the laboratory.

There is no known method for overcoming the storm's force, so *Stormfury* is an attempt at "atmospheric judo," using the giant's own strength and size against itself.

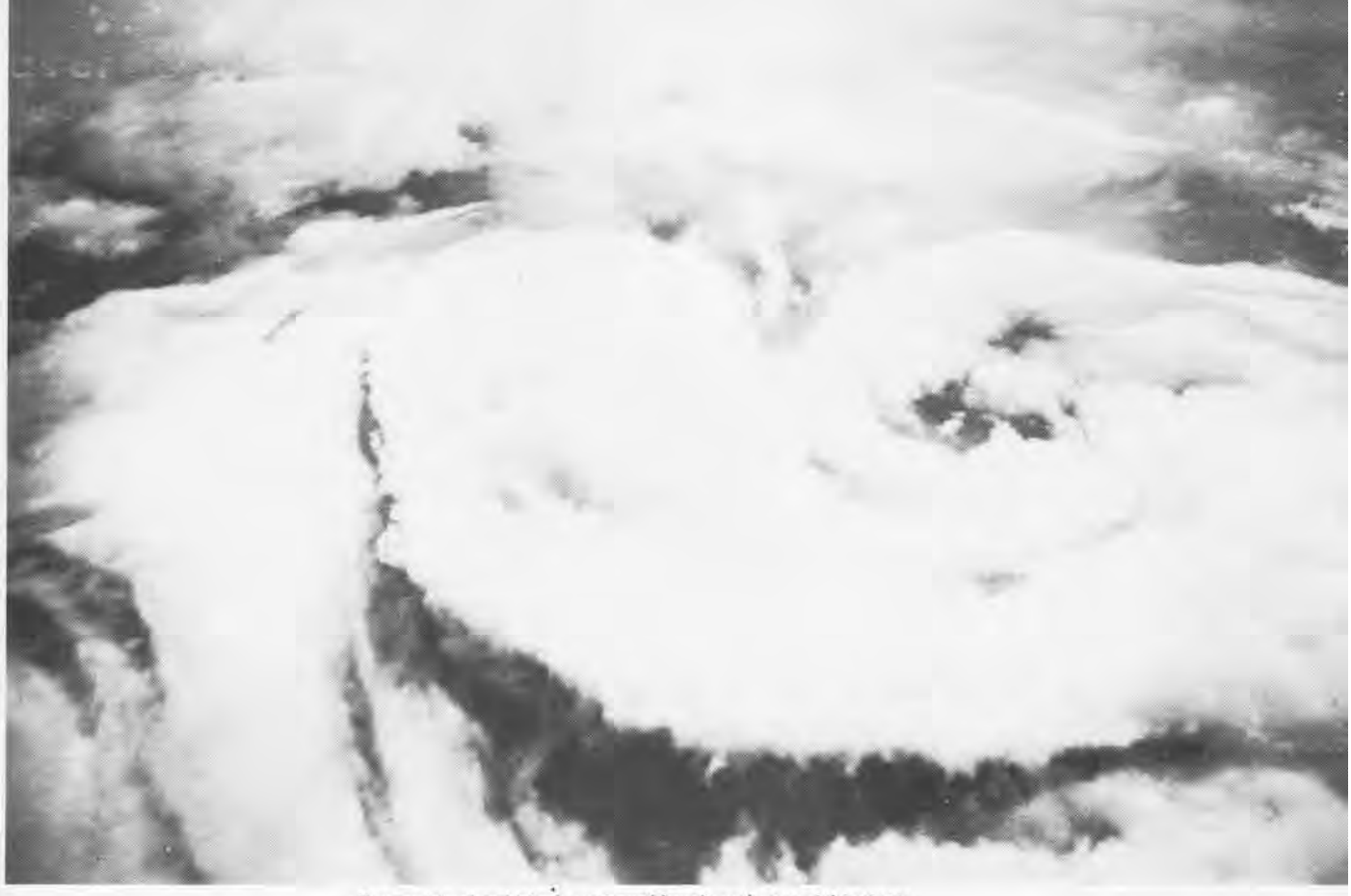
Scientists seed the hurricanes with silver iodide particles. Theoretically, by adding silver iodide to the storm, water droplets should freeze into ice crystals and release heat into the clouds. This additional heat should reduce the atmospheric pressure adjacent to the low-pressure center of the storm, thus lessening the difference in pressure across the eye-wall.

Bringing these pressures down should cause the winds near the center to decrease in speed and, like a spinning ice skater who puts his arms out to slow down, the storm should lose some of its fury.

"The trick," according to Dr. Gentry, "is to pick the right area of the storm to change, so the storm will weaken."

Various types of specially equipped planes fly into the storm, each carrying 208 soup-can-size canisters containing silver iodide to be dropped in the prescribed area. As the canisters fall, a pyrotechnic within burns, releasing the silver iodide crystals which become freezing nuclei. Dr. Gentry says, "The numerical count of these nuclei is about tenth to the 14th power per canister. That is, if they passed a given point at the rate of a million per second, it would take more than three years for all of them to go by. This, however, is small in proportion to the total number of raindrops within the storm."

Hurricane *Debbie*, in 1969, was the first storm to be attacked by seeding on a large scale. Five seedings at two-hour intervals were made on two separate days by five VA-176 *Intruders*. Then highly instrumented Navy, Air Force and ESSA planes flew into the storm at all levels, from sea level to above 40,000 feet. Instrument readings



Concentric cloud bands surround hurricane's eye, right center.

were taken before the seeding, while it was going on, and for 18 hours after it was completed. Dr. Gentry termed the seeding a huge operational success but said it would be months before scientific conclusions would be known.

"Some of the changes which we know occurred were exactly as we had predicted," he said. "But they could have been the result of natural changes of forces within the storm. The only way we will know is to evaluate all the data in a number of seeded hurricanes to see if there were consistent changes after each seeding. If the same changes occur each time, then we will know we caused them."

For the present, storms will continue to plague man. All the ESSA men and the Navy *Hurricane Hunters* are able to do is track the storms, measure them and issue warnings.

These warnings begin as hurricane advisories while the storm is still well at sea. The advisories tell us that a tropical disturbance is reaching, or has reached, hurricane force and its expected path of travel.

As the storm nears land, the term is changed to hurricane "watch." This serves as a first alert for emergency crews and the public in threatened areas. A hurricane watch is not announced until it is reasonably certain the storm is going to strike an inhabited land area. If the hurricane is going to remain at sea but its winds are going to hit the coast, the hurricane watch notice will contain gale-force wind warnings. Local warning information and recommended emergency procedures also are added.

When the winds are expected to reach the coast within 24 hours, the hurricane watch notice is changed to a hurricane "warning" for the area expected to be hit. The watch is maintained for areas in its path and changed to warnings as the storm nears these areas.

Because of the erratic behavior of many hurricanes, the 24-hour notice is subject to a margin of error (average of 120 miles) in predicting the exact coastal point over which the center of the storm will pass. The margin becomes less as the storm nears land.

"There is reason to hope this prediction error can be cut in half soon," according to Dr. Gentry.

When a hurricane warning is issued, it is time for the people in the area to prepare for the worst and hope for the best – and make sure they have a supply of food on hand that requires little cooking.

No matter how effective the warning system, how precise the tracking or how accurate the predicted path of the storm, hurricanes will continue to cause vast damage and loss of life. Unfortunately, this cannot be avoided – yet.

The Navy and Dr. Gentry's hurricane research team are trying to find ways to stop, or at least lessen, the damage. Hopefully, in a few years, these tempests of the warm seas, these children of the tropic oceans, will be moderate winds and rains which man will fear no more.

By AG2(AC) Robert A. Carey

And the Typhoon Trackers: A Fly-By-Night

颱風

The word "typhoon" is partially derived from the Chinese expression *taai fung* or "great wind." To mariners and inhabitants of the Far East, the word means death and destruction. To military commanders, charged with conducting safe and effective operations throughout the Orient, it represents hazard, delay and sometimes loss of men and equipment. To meteorologists, a typhoon is a tropical cyclone that usually develops over the open seas of the Western Pacific, wanders on an erratic course, and then strikes a land mass with devastating force.

To the officers and men of Airborne Early Warning Squadron One (VW-1), typhoons are dark and unfriendly "ladies" who must be approached with caution and treated with respect. At present, the only adequate way to obtain information about these tropical cyclones is to fly specially equipped aircraft through them, and VW-1 is tasked with the low-level, nighttime reconnaissance.

Late in the afternoon, 22 *Typhoon Trackers* take off from NAS Agana, Guam, in their Lockheed WC-121N *Constellation* and set a course for the storm's forecast position. Earlier in the day, the Air Force 54th Weather Reconnaissance Squadron made two daytime penetrations at 10,000 feet or above. Information from these fixes and weather data from other sources, such as satellite pictures, give the Navy crew an idea of the nature of the typhoon.

However, typhoons change rapidly, and *Trackers* must be prepared for a completely "new" storm each time they make a penetration. The crew make their first penetration – normally below 1,000 feet – in the early evening. Six hours later, they return in darkness, either at the same altitude or at the 700 millibar level (10,000 feet). They find that between the two fixes the storm has twisted, turned and blown around in all but predictable directions.

During each penetration, the aircraft commander, copilot and flight engineer have their hands full keeping the aircraft trimmed, level and at optimum altitude. The WC-121N's wings flex, absorbing some of the impact of the turbulence, but it still bounces several hundred feet at a time.

Because the pressure altimeter is misleading inside a typhoon, the pilot depends upon the radio altimeter to keep track of the altitude. As the aircraft nears the center of the storm, the pressure drops rapidly and fluctuates wildly. Because of this, one of the aerographer's mates relays "green worm" readings to the pilot from an SCR-718 radio altimeter.

The combat information center officer (CICO) relays the proper heading and keeps the pilot advised of an emergency abort escape heading. He monitors the aircraft's radar track and is in constant contact with the flight meteorologists (metros) in an effort to select the best route through the storm. He and his men spot the heavy "feeder bands" spiraling into a "wall cloud" – a towering mass of clouds that forms the eye of a typhoon. They also watch for bright "commas" and heavy echoes that may indicate water spouts or thunderstorms inside the eye where scattered low stratus clouds and light winds usually prevail. The crew flies between the feeder bands and through any "holes" in the wall cloud, to minimize turbulence while making a penetration.

Metro peers down through a bubble window to observe the wind's action against the sea. Because the penetrations are made in darkness, he must sight down the aircraft's landing lights to see the ocean's surface which is often obscured by low stratus clouds and torrential rains.

By observing the streaking of the wind on the waves, he can judge the intensity and direction of the wind. As the storm develops to gale force (32 to 63 knots), the ocean is covered with white streaks. As the wind increases to greater than typhoon intensity (65 knots), the sea becomes a blanket of seething foam.

Metro compiles and transmits one

Photos by PH2 Lawrence W. Murphy and PHAN Douglas R. Siefken

Organization

of the most important weather messages immediately after penetrating the eye. This message lists the typhoon's position, maximum winds, minimum pressure, highest and lowest temperatures, the shape of the eye and the extent of feeder bands visible on radar. Metro and his aerographers log this information during penetration.

An accurate "fix" of the typhoon is provided by the navigator. The position of the storm is used by the Fleet Weather Central/Joint Typhoon Warning Center (FWC/JTWC) on Guam to predict the future track of the typhoon and to issue appropriate storm warnings. The navigator's tools include the aircraft's radar, loran, Doppler system, and a great deal of experience.

Sitting across from the navigator in the WC-121N is the radioman. He maintains continuous contact with the appropriate ground radio station, sending out weather messages to FWC/JTWC and handling necessary flight clearances. Through the use of "dedicated" weather circuits and with the assistance of ground radio personnel (many in the Air Force), the time-lapse periods between aircraft transmission and receipt at FWC/JTWC are negligible.

The ride into the eye of a typhoon is a challenge in itself. A typical conversation over the internal communications system (ICS) during a penetration might sound like this:

All hands, Pilot. We are 30 miles from the eye and are commencing penetration at this time. Make a final check for loose gear and man your ditching stations. Mae Wests are required.

Metro, Pilot. I would like your aerographer to give green worm readings every 30 seconds and on every 50-foot change in altitude.

Pilot, Metro. Roger. Green worm every 30 seconds and 50 feet.

Metro, CICO. What are the winds now?

CICO, Metro. I have 50 knots off the port wing at this time.

Roger, 50 knots.

Green worm, one thousand.

Roger, green worm.

CICO, Metro. How far are we from that feeder band on the radar?

Metro, CICO. We're heading through an opening in the feeder band about five miles off and towards a hole in the wall cloud 19 miles off.

Roger, CICO. My contact with the surface is getting worse. I have approximately 60 knots now. The wind is slightly behind the wing. Recommend we come port 20 degrees whenever possible.

Metro, CICO. Roger, I understand, port 20 degrees when possible.

Green worm, nine hundred.

Roger, green worm.

CICO, Pilot. We just had some lightning at two o'clock.

Pilot, CICO. We're cutting through a feeder band now. Come port to two eight zero degrees. Your escape heading is one zero zero degrees. We are 15 miles from the wall cloud.

Roger, CICO. Port two eight zero. Escape one zero zero. Fifteen out.

For a minute the only sound is the occasional green worm reading over the ICS, puncturing the throb of the engines. The aircraft rapidly drops 200 feet as it cuts through the feeder band but continues to bounce in moderate turbulence. Only one crewman is not strapped down – an aerographer who must move from instrument to instrument during the penetration.

The cabin is dark except for the swivel lamps shining on the metro's table, the green glow of the radar repeaters and the bright lights on the navigator's table.

Green worm, seven fifty.

Roger, green worm.

CICO, Metro. I have a hundred knots off the wing. I have contact with the surface ten percent of the time.

Green worm, eight hundred. Green worm, six hundred. Green worm, five hundred. Six hundred. Green worm, five hundred. Green worm, steady at five hundred.

A high pitched squeal whines through the ICS and then cuts off

LCdr. Elmer H. Frokjer, an aircraft commander of VW-4, takes a Constellation into the eye of a typhoon, while below, ATR3 Dennis J. Kron, seated, and ATR2 Rex L. Gray monitor the storm's progress on radar.

shortly after the turbulence ceases. (While bending over to look at an instrument, an aerographer knocked his headset off, causing the squeal.) A few loose pencils and temperature calculators fall to the floor. One of the overhead parachutes drops from its straps.

Roger, green worm.

CICO, Metro. The wind is less than 30 knots. We had 110 knots in the wall cloud and a minimum sea level pressure of 961 millibars.

Nav, Metro. Request a fix.

Metro, Nav. Roger, taking a fix.

All hands, Pilot. Report any damage or injuries.

Pilot, CICO. I believe the 2nd aerographer bruised his pride. No injuries. One parachute fell from the overhead rack. Radar is in good shape.

While the radar watches assure that the aircraft stays within the confines of the wall cloud, the aerographers launch an instrument to measure seawater temperature. After the required data is accumulated, the aircraft flies back out of the eye. Often, the crew selects the same route out that was used to enter.

Approximately 100 miles outside the storm, the aircraft is set on a circular track around the storm. The six-hour interval between penetrations serves as the *Typhoon Trackers'* "underway replenishment" period. Those not involved in monitoring the storm or working at their stations help "fire up" the galley. Relief pilots, navigators, flight engineers, radiomen, radar watches and weather personnel take over while their fellow crewmembers eat and take catnaps.

Six hours later, the aircraft flies into the storm again. This time, at 10,000 feet, the turbulence is usually milder, but the radar "sea return" obscures half of the radarscope. While in the eye at this level, the weather personnel take a dropsonde sounding. The dropsonde is an instrument which measures the temperature, humidity and pressure as it parachutes to the surface.

The weather equipment in the *Typhoon Trackers' Constellation* ranges from mercury thermometers to the data acquisition logging system, a computer that collects, interprets and transmits weather data from other instruments in the aircraft. The WC-121N contains a full complement of temperature, pressure and humidity sensors, a radar camera and even an infrared sensor that measures the sea-surface temperature. In addition, experimental instruments for testing and possible permanent use in the aircraft are frequently added to the regular equipment.

Weather data is relayed to FWC/JTWC Guam. There, appropriate information is used for analysis and research and relayed to other research centers, such as the Fleet Numerical Weather Central in Monterey, Calif. Weather observations, dropsonde soundings and other records are sent regularly to the Naval Weather Records Center in Asheville, N.C. In general, the data gathered by the squadron's weather reconnaissance flights is a valuable source of meteorological information.

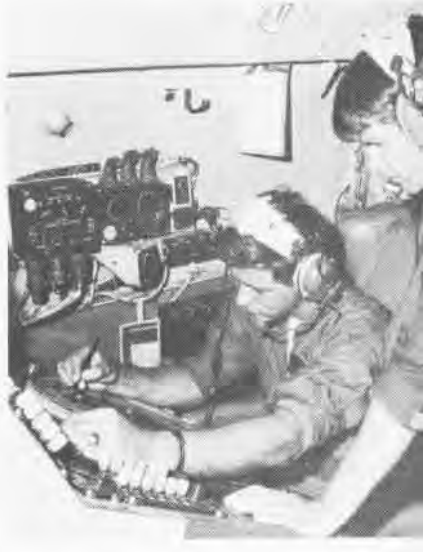
After their night-long flights, crews go back to Guam or an air base near the storm. Very often, a full complement of mechanics will accompany the crews to perform maintenance while the aircraft is away from Guam. In covering their areas of responsibility, from Wake to Vietnam and from the equator to Japan, the *Typhoon Trackers* fly their ten aircraft about 10,000 hours a year.

Indeed, typhoon tracking is a year-round business. In February 1970, Typhoon *Nancy* whipped up a full 130 knots between Guam and the Philippine Islands! For that storm, the squadron's crews flew nine low level, nighttime penetrations (five into winds greater than 100 knots) and several other penetrations at 10,000 feet. An average of about 20 full typhoons develop each year, but the majority occur during the summer and fall.

Since VW-1 crews started flying the C-121 in 1953, they have flown over 155,800 hours (as of December 1969) without a single aircraft accident. The *Typhoon Trackers* were awarded the Chief of Naval Operations Aviation Safety Award for 1969.

In addition, while living up to its "early warning" name, the squadron has accumulated many flight hours performing reconnaissance missions for the Seventh Fleet throughout the Far East – its primary mission before it assumed full-time typhoon reconnaissance responsibilities in 1961.

Providing accurate, timely, relevant data is the job of many reconnaissance squadrons. But to fly into the eye of a typhoon in the middle of the night is an unusual and challenging task for any group. In their profession, the officers and men of the *Typhoon Trackers* are more than an overnight success. They can claim to be one of the best Fly-By-Night organizations.



A detachment of VW-1's *Typhoon Trackers* is also keeping a weather eye on tropical storms off the West Coast. Operating their WC-121N *Constellation* from NAS Point Mugu, they concentrate their search about 1,200 miles south of Los Angeles where small hurricanes and tropical storms often develop. Though these storms seldom strike heavily populated areas and receive little publicity, they do affect fishing and commercial shipping in the Panama Canal area.

The flights radio meteorological data to the Navy Fleet Weather Center at Alameda, Calif., where appropriate warnings are issued. The crew manning the aircraft are all veterans of at least one typhoon season in West Pac.

LCdr. Ralph Hanegan, aircraft commander, and Lt. Raymond Hennessey, flight meteorologist, receive briefing on new tropical storm at PMR Weather Central, top right. Lt. S. Ray Palmer, WC-121N navigator, plots course to eye of storm, above. AG2 Alan Zahnle checks calibration of dropsonde weather probe to be used in gathering meteorological data in the storm, above right. AG2 R. A. Carey and Zahnle, right, prepare to drop bathothermograph which, after plunging into the sea below, will measure water temperatures to predetermined depth and radio information back to the aircraft. AT1 John MacMahon sends radio report of collected weather data to nearest fleet weather center, far right.

Technical Report

Tandem Rotor Helicopters in

By Lt. T. H. Hoivik

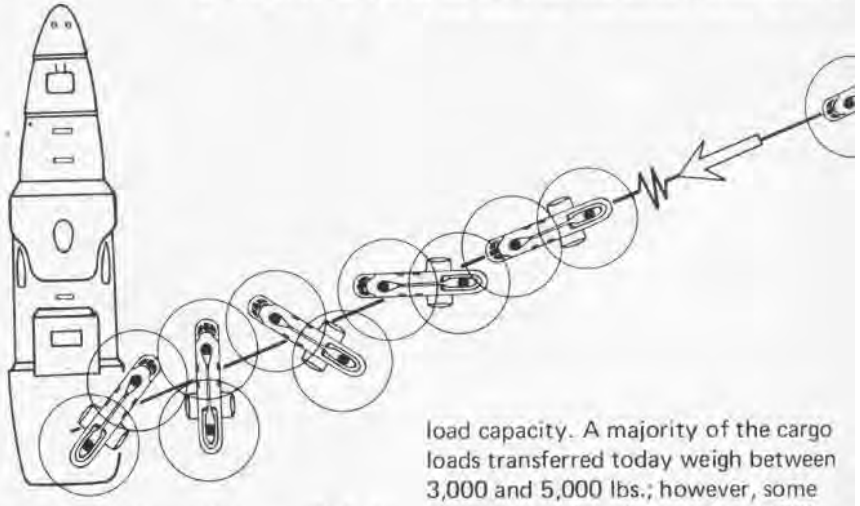
A graduate of the University of Minnesota, Lt. Hoivik earned his commission through the NROTC Regular program. While serving with HC-6 for three and one-half years, he conducted vertical replenishment (vertrep) with nearly every Navy type ship and helicopter. One of the more experienced vertrep pilots in the Navy, he flew several flights demonstrating the unique capabilities of the H-46 during the 1967 Paris Air Show. A graduate of the U.S. Navy Test Pilot School, Hoivik is presently serving with the Rotary Wing Branch of Flight Test at the Naval Air Test Center, Patuxent River.

Ever since the first helicopter was developed, aspiring young men have been trying to improve old designs and create new ones for increasing the load-carrying capabilities of that odd-looking machine with the rotating wings. During the early years of the helicopter, its load-carrying capability was more or less limited to one man and his lunch. However, ingenious craftsmen with the help of modern technology have now developed helicopters with load-carrying capabilities in excess of nine tons.

Not long ago, some astute gentlemen envisioned ship-to-ship cargo transfer without the use of high lines, winches, Petersen rigs and the muscles of the local deck seamen. With the advent of the AFS and AOE-type ships and the UH-46, safe and effective cargo transfer between ships was not only possible but practical and greatly reduced the restrictive fleet maneuvering previously required during underway replenishment periods. This unrestrictive and very successful means of cargo transfer by helicopter is known as vertical replenishment or, more commonly, vertrep.

What makes a vertrep helicopter? Since every present day helicopter has some load-carrying capabilities, whether internal or external, why are some choppers more suited to the vertrep mission than others? These and other similar questions are frequently asked by Navy men, contractors and laymen alike. Before these questions are answered, a basic definition of vertrep should be established.

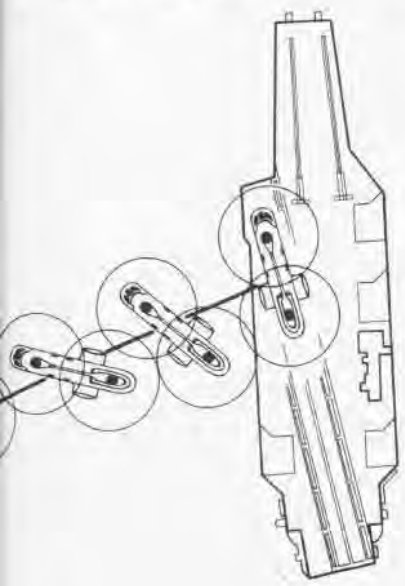
The vertrep mission is the rapid, continuous transfer of external cargo from one ship to another, usually lasting from one to six hours. The effectiveness of the mission is generally measured in tons of cargo transferred per hour. An average, present day rate of transfer between a supply ship and a carrier, separated by 750 to 1,000 yards, using two helicopters, is approximately 120 tons per hour. The vertrep mission should not be confused with the general routine, one or two-load cargo transfers – where time, speed and tons per hour are not paramount considerations.



One of the most important aspects of the vertrep helicopter is its external load capacity. A majority of the cargo loads transferred today weigh between 3,000 and 5,000 lbs.; however, some loads have weighed as much as 8,000 lbs. Fortunately for the vertrep pilot who spends most of his time flying between 75 and 150 feet over the water, most helicopters with this load capacity have dual engines.

Another important consideration is the aircraft's internal capacity. Since many loads are too light or odd shaped, and therefore not compatible with nets or pallets or just too valuable to be carried externally, a large internal capacity is highly desirable. In addition, a large access area, preferably a ramp, is needed for easy loading and unloading.

Vertical Replenishment



Although several helicopters have acceptable external and internal load-carrying capabilities, only one present day helicopter has the aerodynamic characteristics and flying qualities suitable for the vertrep mission. This aircraft is the tandem rotor UH-46. The tandem rotor offers many advantages, particularly applicable to vertrep, over the single main rotor helicopter.

Unlike the single rotor helicopter, the tandem rotor is relatively insensitive to wind direction. The power required to hover varies only slightly between upwind and downwind hovering. Actually, hovering 90 degrees to the wind line requires the least power because the rotors receive the maximum amount of undisturbed air inflow. Therefore, the optimum hovering position over the fantail or bow of a ship is determined primarily by obstacle clearance, pilot visibility and ease of access instead of being severely restricted to a heading within ± 30 degrees relative to the wind line. Since the tandem rotor aircraft is capable of making pickups and drops upwind, downwind, athwartship or from any position required, vertrep is now accomplished without interfering with fleet maneuvers. Many drops and pickups have been made to fantails of destroyers while the ship was executing a 360 degree turn. Since vertrep usually requires a high transfer rate to be effective, the shortest and quickest route between ships is desired.

With the development of optimum approaches for vertrep came the advent of the 90 degree side flare. Again, the tandem rotor proved to be more effective than the single rotor aircraft. Because of the excellent sideward flight characteristics and low speed maneuverability, the approach path now flown is the direct line from the one ship to the other, regardless of the two ships' relative position. This is accomplished easily since the final approach is not governed by the wind direction. A single rotor helicopter is generally limited to a nose flare when reducing airspeed for transition to a hover. However, if a quick stop is needed, a large nose flare is required. This reduces the pilot's forward visibility and he may lose sight of the ship. Therefore, the approach must be much slower than that used by a tandem rotor aircraft. Furthermore, with a large nose flare, a large power reduction is required to keep the aircraft from ballooning during the flare. As a result, precise directional control is more difficult to maintain owing to the large power changes. These problems are eliminated with a tandem rotor by using a side flare.

A typical approach using a side flare is presented in the diagram. The maximum airspeed attained between two ships 1,000 yards apart is about 90 KIAS. Approximately 250 yards from the ship, the nose of the aircraft is slightly raised to dissipate the airspeed to 70 KIAS. A little right rudder pedal is then applied with simultaneous left and forward cyclic to maintain a straight path and prevent the airspeed from dissipating too rapidly. Increasing right pedal and left cyclic is continued until the aircraft is 90 degrees to the flight path and pure sideward flight is attained. Sideward flight at 20-30 knots is maintained until the aircraft passes over the deck edge, at which time a little right lateral cyclic is applied to side flare the aircraft and transition to a hover over the desired spot. The most common flares used with the UH-46 are 45, 60, 90 and 135 degrees. A 180 degree flare, more commonly known as a button hook approach, is also used very effectively. The major advantages of the side flare are: (1) the flare may be accomplished from either direction, (2) the pilot's field of view is not restricted, (3) only small power changes are required, (4) the actual flare is quite small since drag is increased because of the large side area of the aircraft, (5) the most direct flight path is used, and (6) a greater airspeed may be maintained for a longer period of time between ships and during the approach, thereby increasing the transfer rate.

The third aspect of the vertrep helicopter, equally important as the load-carrying capabilities and aerodynamic characteristics, is the low speed and hover flying qualities. If the flying qualities demand excessive pilot effort to control the aircraft with exacting precision in a hover or during low speed maneuvering, the aircraft is not suitable or capable of the vertrep mission. The following flying qualities which happen to be characteristics of the UH-46 are highly desirable.

The aircraft must exhibit strong vertical damping, thereby allowing the pilot to maintain a precision hover attitude without having to constantly readjust the collective setting. The neu tral directional control gradient during sideward flight, which is a characteristic of tandem rotors, enables the pilot to fly at various sideward velocities without requiring directional pedal adjustments. The control system has moderately high sensitivity but is adequately damped to prevent overshooting. To prevent fatigue and overcontrolling, the control forces are very light, yet still provide enough feel. It is interesting to note that most vertrep pilots fly with the stick trim depressed, which removes the stick force gradients and uses only the light friction forces for "feel." The short period gust response characteristics are damped well enough to allow the pilot to easily control the aircraft in heavy turbulence. The large control margins remaining at the edge of the flight envelope build pilot confidence in the aircraft. In contrast, some single rotor aircraft lose directional control at sideward speeds in excess of 25 kts. Another distinct advantage of the tandem rotor is that no directional inputs are required with power changes. Other desirable characteristics for incorporation in a vertrep aircraft are a self starting unit and a cargo hook loadmeter.

During the last five years, vertical replenishment by helicopter has proven to be a safe, effective and efficient method of transferring cargo, with some transfer rates as high as 180 tons per hour. However, vertrep has now reached the point where the aircraft can deliver cargo faster than the receiving ship can take it aboard. In order for vertrep to remain successful, ship designers and planners must develop methods for rapidly recovering cargo, removing it from the deck, and placing it in the proper storeroom.

VRC-40

Codfish Airlines

By PHC B. M. Andersen

"Codfish Airlines" is the nickname given to Fleet Tactical Support Squadron 40 by its officers and men. The name is derived from the designation of the squadron's C-1A *Traders* which are used for carrier on-board delivery (COD). The abbreviation appears on the engine nacelles of the squadron's aircraft, and carrier sailors affectionately call them CODS.

VRC-40's ten *Traders* fly mail, spare parts, supplies, civilian shipyard workers, VIP's and Navy personnel under orders to carriers in the Atlantic Fleet. Small detachments are maintained in the outer reaches of the Atlantic area.

Teamwork is the answer to what makes this NAS Norfolk-based airline run efficiently. This was demonstrated recently when the squadron was called on to evacuate an injured sailor from USS *Roosevelt* (CVA-42). FA R. R.

VRC-40 *crewmen load mail for CVA-42 at NAS Norfolk. Director signals pilot to lower wings. Roosevelt is spotted, right.*

Blizzard, attached to USS *Moale* (DD-693), had crushed his kneecap and had been transferred to the carrier. VRC-40's mission was to transfer him from the carrier to the Portsmouth Naval Hospital for medical treatment.

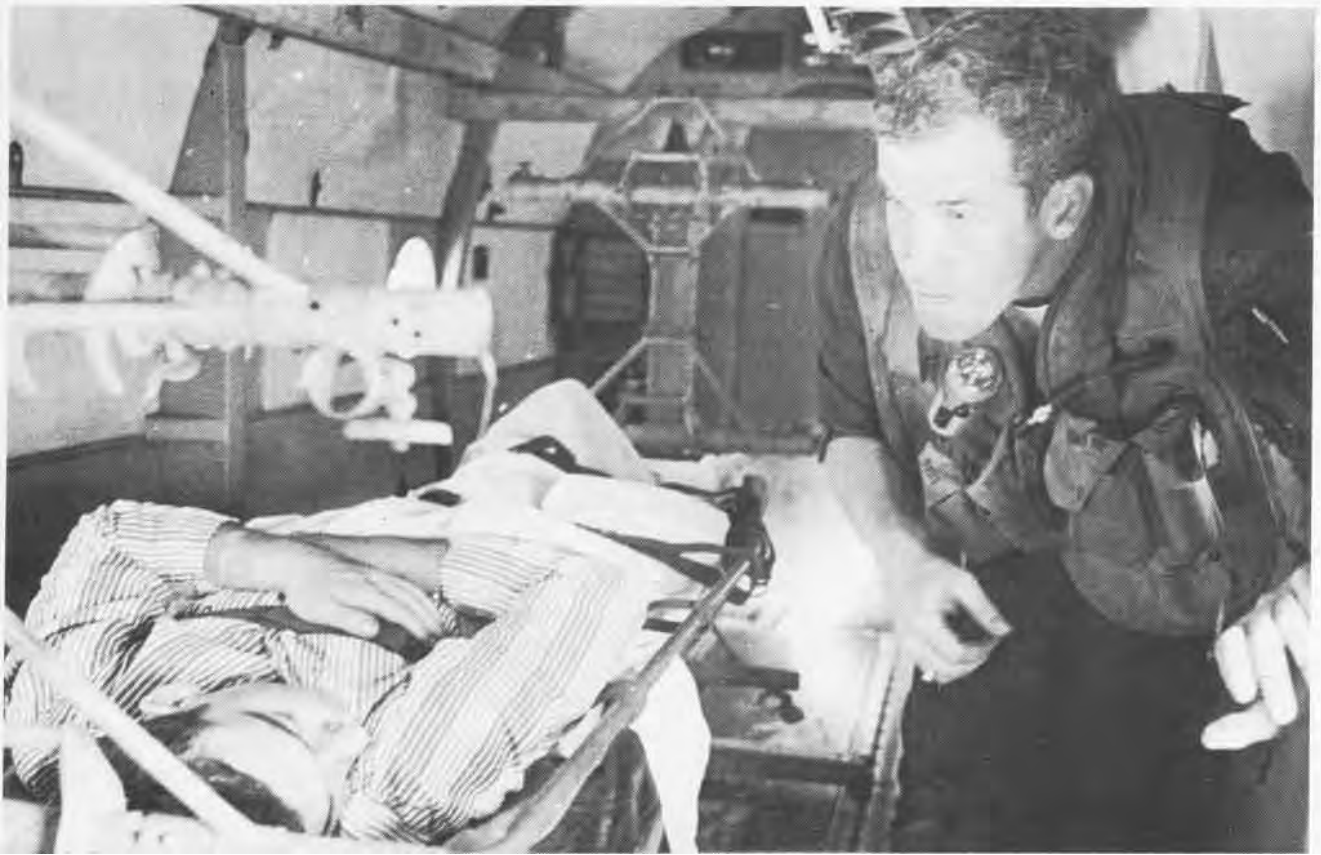
At Norfolk, an aircraft was quickly prepared for the medevac. A special mounting rack for the litter was installed after the seats were removed, wind screens were polished to a sparkle, the tail hook was given a good coat of grease and the aircraft was preflighted by the pilot and copilot. Supplies and mail were loaded for delivery to the carrier.

Then C-1A No. 050 took off and a half hour later spotted *Roosevelt* through the puffy white clouds off the Virginia Capes. The carrier was engaged in launching aircraft and the COD had to wait until the launch was completed to land. The mail and supplies were unloaded, and the cargo door was removed in order to load the Stokes litter carrying Blizzard.

The patient was made comfortable, and the COD was deck-launched to avoid the catapult shock. Forty-five minutes later, No. 050 taxied up to a waiting ambulance at Norfolk. It was one of the more unusual hops for Codfish Airlines.

Commander W. E. Wilder is commanding officer of the squadron.

WHEN NO. 050 *arrived aboard, Roosevelt crewmen unloaded the welcome cargo and mail, and the carrier's corpsmen carried FA Blizzard to the C-1A for the flight back to Norfolk. During the medevac flight, VRC-40 crewman ADR2 R. Jenkins tended the injured man.*



HA

The E-2A *Hawkeye* was designed with one primary mission in mind: patrolling the approaches to the fleet to detect impending attack by hostile aircraft, missiles or sea forces. In addition to this AEW function, the E-2A provides strike and traffic control, area surveillance, search and rescue guidance, navigational assistance and communications relay services.

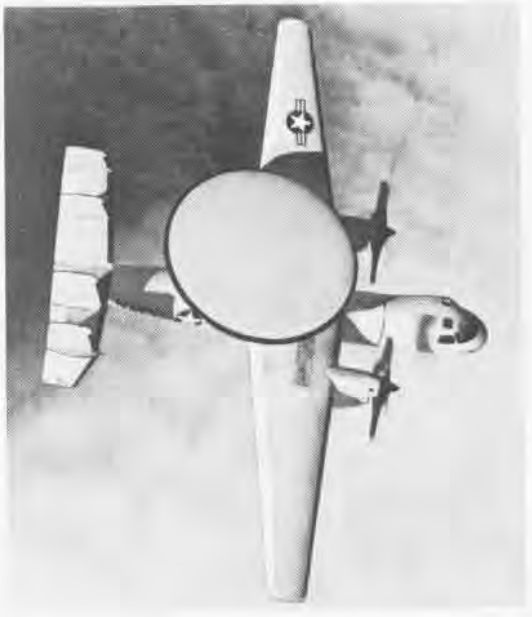
Capable of all-weather carrier operations, the *Hawkeye* has great flexibility in assignments owing to its sophisticated electronics equipment. Its Airborne Tactical Data System (ATDS), consisting of an auto-detection radar, airborne computers, and a memory and data link system, is tied to the Naval Tactical Data System (NTDS), located at fleet headquarters, which gives an overall picture of the tactical situation.

One interesting feature of the E-2A is its 24-foot revolving radar dish. The dish rotates at six rpm and can be retracted two feet to facilitate stowage aboard a carrier. The lift produced by the radar dish when the plane is in flight is sufficient to offset its own weight.

The first *Hawkeyes* went to sea aboard USS *Kitty Hawk* with VAW-11 in 1966. Since that time, they have become a regular part of the fleet's defensive and offensive forces. Presently on station aboard carriers off the shores of Southeast Asia, they monitor and control Navy air strikes in that area.

The five-man crew consists of two pilots and three equipment operators. They can monitor a large number of aircraft at any given time, directing strike aircraft to assigned targets, in fair weather or foul, while maintaining a watch for hostile forces within the long range of their radar. Working as a team, the *Hawkeyes* surround the fleet with an early warning ring capable of directing air defenses against any enemy.

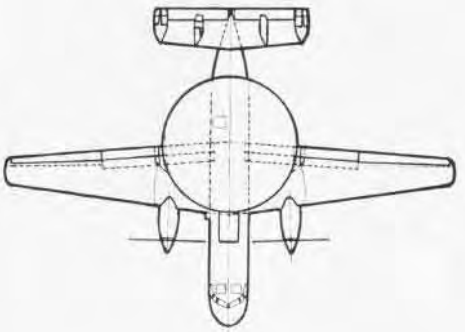
E-2B and E-2C models are now being developed, based on the same airframe but with advanced radar and improved computer systems. These models will have expanded surveillance and command control capability.

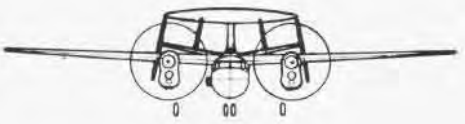


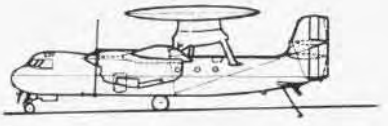
WKEYE

E2-A

Crew	5
Length	56'4"
Height	18'4"
Wing span	80'7"
Radome	24' diameter
Power plant	Allison T56-A-8/8A 4,050 eshp each
Maximum speed	320 kts.+
Cruise speed	274 kts.
Ferry range	1,654 nm
Service ceiling	31,700 ft.
Maximum T.O. wt.	49,638 lbs.







Weapons Training

Spotter checks impact position through his scope before radioing position of hit back to pilots; and, after receiving impact location from spotter, a Marine plots distance from bull's-eye.

A recent deployment of Air Antisubmarine Squadron 37 to the Aerial Weapons Training Range in Yuma, Ariz., turned into a competitive bombing meet. The training involved conventional weapons employment: *Zuni* and 2.75 rockets and the practice bombs normally used by the S-2E.

The rivalry was between two teams: a Blue Team, headed by Commander Jay Ortega, commanding officer, and a Gold Team, led by Commander George Bruce, executive officer.

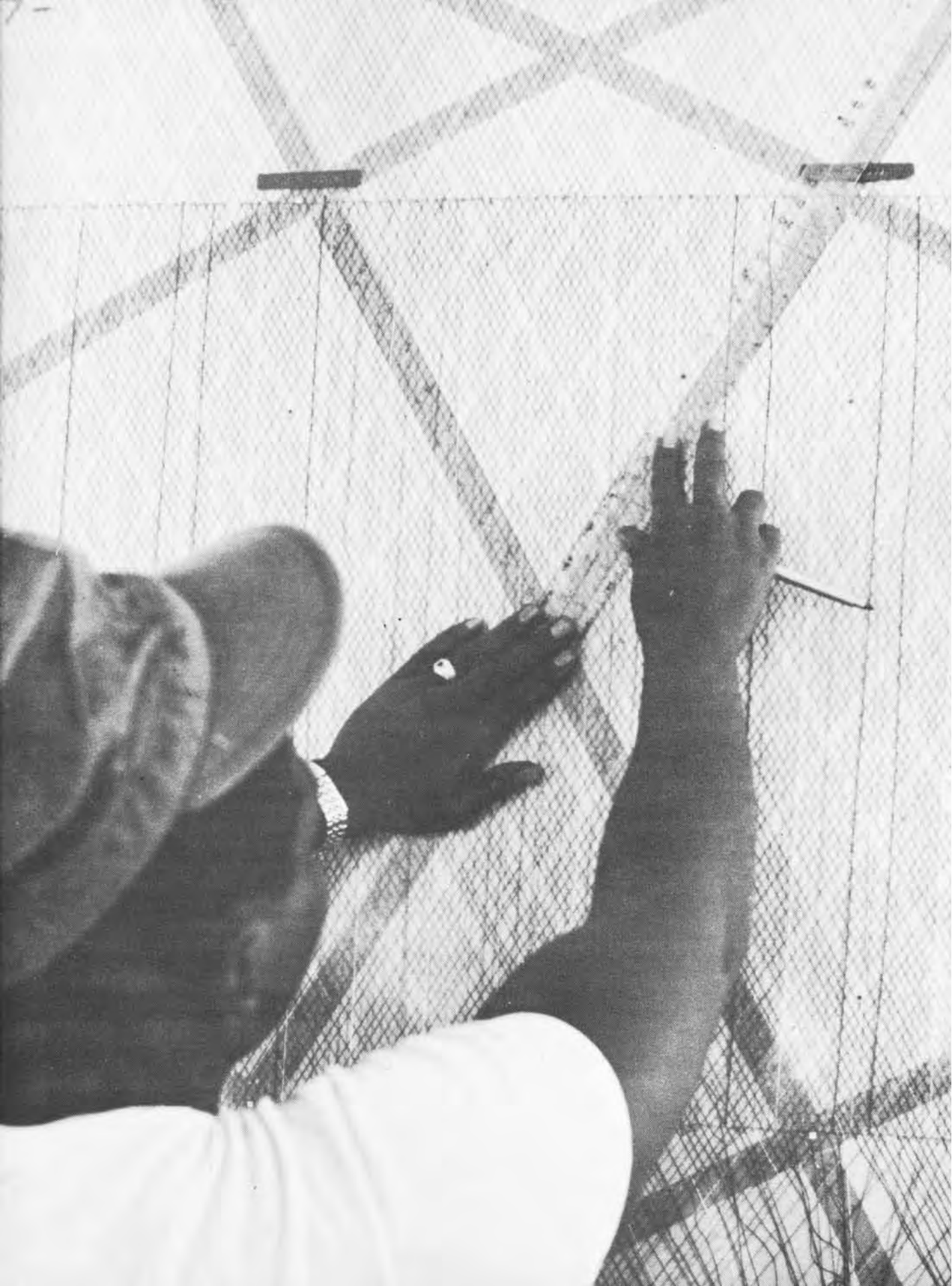
The ground crews, as well as the pilots, benefited from the training. The competition was arranged so that the ordnance crew was required to assemble, load and arm the ordnance for each mission on a time schedule in a manner similar to that used under actual combat conditions. The maintenance crew, on the same time table, was responsible for the condition of the planes and related ground facilities. Each crew's job was made more difficult by sweltering 100° + temperatures but the adverse conditions brought the crews together as a strong working team with one purpose: provide exactly what the pilots required on each mission.

And the competition on each mission was tough – each team doing its utmost to better the other's scores. As a team returned, all eyes were on the scoreboard as results were received from the spotters out on the desert range. Near the end of the week, when only a few points separated the two teams, tension ran high. The best team? Commander Ortega's.

The top VS-gun was LCdr. Jerome Usalis. His point average was eight out of a possible ten per-rocket-fired. He also captured the record for bull's-eyes. But it was LCdr. William Christenson who kicked up the most dust on the desert when he emptied the contents of an entire 2.75 rocket pod within 75 feet of the bull's-eye.

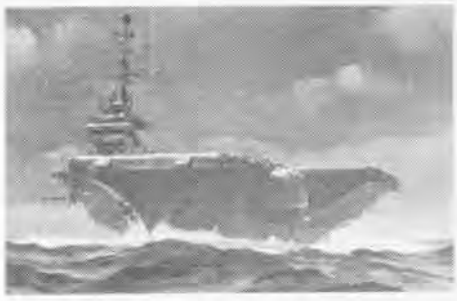
The entire Yuma deployment proved to be a great experience.

By PH2 James A. Fallon
Pacific Fleet Combat
Camera Group



Lts. Orville Cornwall, left, and Harry Thaete check rocket pods during pre-flight inspection. At right, AW1 Paul Jackson connects cable to rocket pod mounts prior to attaching pods.

Zuni streaks toward target on desert floor. AO's Anthony Kurche, left, and Thomas Sukits, working late in the afternoon to avoid the 100° + heat, assemble rocket motor and warhead of a Zuni.



at Sea with the Carriers

ATLANTIC FLEET

Lexington (CVT-16)

While only two hours into its first operational flight, the newly formed *Lexington* plane guard detachment saved the life of a Navy pilot.

A UH-2 *Seasprite* crew pulled Ltjg. Glenn Debard, VA-174, from the Gulf of Mexico after he ejected from his A-7 when it lost power on a catapult launch. The pilot was on a carrier qualification exercise when the accident occurred.

The crew making the rescue included Lts. Richard C. Kearley and Gene Walker, pilots, and crew members AMHAN R. L. Franklin and ADJAN M. S. Bogan.

The CVT plane guard detachment, created to relieve the training squadron from having to supply plane guard units during carrier operations, was formed from men on temporary additional duty status with HT-8, NAS Ellyson Field, Fla.

Franklin D. Roosevelt (CVA-42)

MM3 Peter Russo walked to a cash register at a ships store aboard *Franklin D. Roosevelt* to purchase two record albums and two bars of soap.

The cashier added the purchases and pulled the lever: total — $5.80. Suddenly, CWO J. M. Scott, sales officer, ran to the register and said, "Stop right there!"

Commander E. B. Coleman, the ship's supply officer, and SHC D.L. Howell, assistant sales officer, converged on the scene.

By now the astonished patron was in a state of total confusion. A sign was placed by his side revealing that this was the ships stores' $1 million sale since the carrier deployed.

PO Russo received a tape recorder for his record-breaking purchase. "I thought I had done something wrong," he mumbled.

Wasp (CVS-18)

CVSG-54 welcomed its new commander in a change-of-command ceremony aboard *Wasp* in Copenhagen when Commander Robert E. Combs took the helm of CVSG-54 from Commander Edward N. Stout.

Commander Combs previously served with HS-5 and HS-11; Commander Stout reported to Washington for duty in the office of the Deputy Chief of Naval Operations (Air).

Wasp, currently on a four-month deployment to the North Atlantic, recently docked in Hamburg, Germany, for a five-day visit. She had just completed two weeks of at-sea operations that included crossing the Arctic Circle, while conducting ASW exercises, and operating for a two-week period off the coasts of Norway and Iceland.

Near the end of the deployment, *Wasp* received a message from Vice Admiral R. L. Townsend, Commander Naval Air Forces, Atlantic, praising the carrier and her hunter-killer group for their "superb performance."

After leaving Hamburg, *Wasp* spent two days at sea before docking in Rosyth, near Edinburgh, Scotland.

Forrestal (CVA-59)

Forrestal recorded its 156,000th arrested landing during her recent Mediterranean cruise when Lt. H. W. Kelly landed his A-4C *Skyhawk* on the 1,039-foot flight deck.

Lt. Kelly, VA-36, was presented an inscribed cigarette lighter by Captain Charles F. Demmler, C.O. of *Forrestal*.

ABOARD *Lexington for a day at sea, nonagenerian Maj. Frank Woods enjoys his first trip on a carrier. The early aviator, contemporary of the Wright brothers, is a veteran of three wars and served in the Coast Guard and Army. He told the "youngsters" he hoped to make a catapult launch.*

John F. Kennedy (CVA-67)

Two classmates who graduated from the U.S. Naval Academy together 29 years ago met again recently during a change of command: Rear Admiral William D. Houser relieved Rear Admiral Jack M. James as ComCarDiv-2 in a ceremony on the hangar deck of *John F. Kennedy* moored alongside pier 12 at NAS Norfolk.

When Lt. Joe Hart, VA-72, LSO, remarked that JFK was "looking sharp," he wasn't referring to CVA-67. The man who talks the *Blue Hawks* of VA-72 down to the flight deck of the 83,000-ton carrier was citing the squadron's own JFK – LCdr. Jerry F. Kennedy.

His fellow aviators used to call Jerry Kennedy "Humming Bird" because of the time he spent as a helicopter pilot before transitioning to jets. But now that VA-72 has moved aboard CVA-67, they say, "JFK all the way."

"It's nice to be JFK again," he says. "Actually, people used to call me JFK, and I was always proud of being associated with the President's name. I admired the man."

CVA-67 personnel, and the men and families at Guantanamo Bay, Cuba, recently experienced a turning of the tables – water tables, that is.

When *Kennedy* steamed into the hot and muggy bay to pick up supplies for a training cruise, she found that Guantanamo's water pumps had broken down, and the plant was having a difficult time keeping Gitmo's 10,000 inhabitants cool and quenching their thirst.

So *JFK*, which converts 374,548 gallons of sea water to fresh water each day, spotted the Cuban base 112,000 gallons.

BT1 Lloyd Pruitt was up all night pumping the water into barges for transportation to Gitmo.

When *JFK* sailed from the Norfolk Naval Shipyard after an extensive overhaul, she sent the following message: "It has been a long hard pull but *Kennedy* is underway on schedule with eight burning, twenty-four blowing, four turning quietly, four shooting and ten of eleven elevating. Despite the ever increasing workload and many unforeseen problems, NNSY has done a truly outstanding job under difficult circumstances. *Kennedy's* 1970 RAV has been a conspicuous success. The dedication, perseverance and splendid technical competence that made it all possible are sincerely appreciated. Despite pleasant associations during the past five months all concerned are happy that we are on our way."

SECRETARY *of Defense Melvin Laird, on a ten-day inspection tour of U.S. military installations in Europe, addresses Sixth Fleet crews assembled on the FDR. At right, a CVA-59 sailor relaxes in the Med.*

Guam (LPH-9)

Guam logged her 23,000th accident-free helicopter landing while she steamed off the coast of Puerto Rico.

Capt. Richard L. Barton, USMC, HMM-365, landed a CH-46 *Sea Knight* with the aid of landing signalman AB1 Charles O. Aldridge.

The traditional cake-cutting ceremony was held on the hangar deck that evening with *Guam's* commanding officer, Captain Richard R. Renaldi, and the commanding officer of HMM-365, Lieutenant Colonel Robert H. Nelson, doing the honors.

Saratoga (CVA-60)

Command of four squadrons attached to *Saratoga* changed hands during a recent joint ceremony while the ship anchored off the coast of Barcelona, Spain. Involved were RVAH-9, VF-103 and VA's 37 and 75.

Commander William F. Meyer relieved Commander Courtland D. Ball III as commander of RVAH-9; Commander John R. Winkowski took over VF-103 from Commander Robert C. Davis; the reigns of VA-37 were passed from Commander Kendall E. Moranville to Commander Cecil B. Hawkins, Jr.; and command of VA-75 went to Commander Charles J. Cellar, Jr., from Commander Richard P. Bordone.

Captain Warren H. O'Neil, *Saratoga's* commanding officer, introduced the guest speaker, RAdm. William M. Harnish, Commander Attack Carrier Striking Force, Sixth Fleet.

PACIFIC FLEET

Kitty Hawk (CVA-63)

Kitty Hawk and her 2,500 crewmen returned to their home port, San Diego, after a nine-month overhaul in the Puget Sound Naval Shipyard, Bremerton, Wash.

Two thousand five hundred yardworkers amassed more than 2,206,000 man-hours overhauling the ship's four main engines, eight boilers and catapults, and arresting gear. A 100,000-gallon-per-day distillation plant was added. Projects accomplished by the ship's crew include the installation of a new entertainment system consisting of a color television channel and three FM radio stations.

Because it was a change of home port, 500 dependents and their belongings were taken aboard for the trip to San Diego. More than 800 cars covered the 6.7-acre flight deck.

Kitty Hawk was presented her second NUC by Rear Admiral William R. McClendon, ComCarDiv-9, in ceremonies on the warship's flight deck. The award was accepted by Captain Earl F. Godfrey, commanding officer.

The carrier was cited for operations during her last cruise to the Western Pacific, December 30, 1968, to September 4, 1969.

America (CVA-66)

America and her embarked Air Wing Nine made their 1970 combat zone debut when Commander Fred M. Backman, commanding officer of VA-165, and his bombardier-navigator, LCdr. Jack Hawley, were the first to be launched from the carrier's flight deck. It was also the first combat test for the A-6C, the latest of the *Intruders* to reach the fleet.

America is the flagship for Commander Attack Carrier Striking Force 77, VAdm. Frederick A. Bardshar.

Majors Larry P. Beasley and Doyle E. Balentine, pilot and B/N, respectively, became the first all-Air Force crew to fly the Navy's all-weather A-6 *Intruder* from an operational aircraft carrier. Launched from the 1,069-foot long flight deck, the two flew a 400-nautical mile flight from the South China Sea to NAS Cubi Point.

Majors Beasley and Balentine are assigned, via the Air Force-Navy exchange program, to VA-165 currently deployed to the Western Pacific aboard *America*. They began their training in the A-6 in September 1968 with VA-128 at NAS Whidbey Island and joined the *Boomers* in July 1969.

Constellation (CVA-64)

The hands of thanks reached across the sea when the officers and men of *Constellation* received a resolution from the city council of Olongapo City, R.P., extending their "sincere gratitude and appreciation" for $1,000 donated to the city.

While CVA-64 was operating in the Gulf of Tonkin, a $1 million fire razed a six-block area of Olongapo destroying 63 buildings. Twenty four hours after news of the fire reached the carrier, a ship-wide drive to provide relief to the fire victims was under way.

Constellation returned to San Diego in May after a nine-month deployment to the Western Pacific and now is in the Puget Sound Naval Shipyard for overhaul.

Sitting high and dry she awaits the day when she will once again prowl the seas. She's not resting in the gloom of mothballs, but rather her frame looms proudly over Dry Dock 6.

With millions of cruising miles and five Vietnam combat tours to her credit, CVA-64 entered the shipyard after returning from her last combat mission where she served as the flagship for Task Force 77 in the Gulf of Tonkin.

When *Constellation* moved to Bremerton from San Diego, more than 400 dependents were on board – enjoying a variety of recreational pursuits with movies, tours and hangar-bay games rounding out an enjoyable three-day vacation.

Iwo Jima (LPH-2)

Iwo Jima set a new safety mark last month when she recorded her 51,000th consecutive accident-free helicopter landing. The new safety mark was set during a week of under-

COMMANDER *A. B. Wilson, X.O. of America, takes a break from his many duties to try his shooting touch. The addition to his wastepaper basket was a birthday gift from his wife.*

way exercises off the southern California coast when Capt. James B. Fitch, USMC, guided his UH-1 *Huey* to a perfect flight deck landing. The routine landing came as part of carquals for Marine Light Helicopter Squadron 267. Sharing the controls with Capt. Fitch was copilot Capt. Mark J. Tennes.

Kitty Hawk (CVA-63)

A flight to a western U.S. military base is the re-enlistment incentive introduced by the Command Retention Program of *Kitty Hawk*.

FT3 Normand G. Foucher, FT2 James E. Douglas, DS2 Gregory G. Mills and PH1 D. B. Wood went on the inaugural jaunt – to Reno, Nev.

They left Bremerton, Wash., in the *Kitty Hawk's* C-1A and flew to NAS Fallon, Nev.

A career retention spokesman says that more trips, with destinations to be determined by the men, will be scheduled in the near future.

Shangri-La (CVS-38)

"It's a lot easier landing a plane on a permanent runway than on an aircraft carrier . . . a lot smoother, too."

So said Air Force Capt. Andris Pladars, describing Navy flight operations while he was on a two-day exchange visit to *Shangri-La*. (The Mayport-based carrier is presently deployed to southeast Asia.)

"I'm very impressed with Navy operations," said Pladars. "It sure is different from how we operate!"

Capt. Pladars is the operator of the sophisticated sensing devices aboard the Air Force's AC-130 gunship, a four-engine aircraft based at the Royal Thai Air Base at Ubon, Thailand.

Three Air Force pilots made the exchange visit to *Shangri-La*. Capt. Pladars summed up his visit by saying it was "a change of scenery."

Pilots from *Shangri-La* also visited Ubon to learn more of the Air Force's operations.

Lt. Thomas R. Weinel, a VF-162 *Hunter*, related: "My visit to Ubon gave me a much better appreciation of the particulars of their operations.

IN THE SOUTH CHINA SEA, BON HOMME RICHARD AND AMERICA STEAM TOGETHER

Habitability" – a word that's hard to say, hard to spell and very seldom used – aboard *Kitty Hawk* has become an everyday word. But it has a special meaning to the 2,500 crewmen and an equal number of squadron personnel aboard.

Before *Kitty Hawk* finished her nine-month overhaul at the Puget Sound Naval Shipyard, habitability made many changes in her inner appearance.

Habitability means a living compartment with ultimate utilization of space, a comfortable bunk for every man, room to store clothing, reading lamps that work, bunk curtains, and lounges large enough to accommodate everyone. It means restrooms with commodes, showers and sinks – in working order.

These are basic things that everyone takes for granted but which have a tendency to be unavailable or not working.

The "Habitable Hawk" program commenced with the formation of a 12-member Habitability Committee. Their orders, issued by Captain Earl F. Godfrey, commanding officer, were to organize and administer the rehabilitation of all berthing and sanitary spaces within CVA-63.

A complete survey of all these facilities was made. Spaces where new bunks could go or where bunks should be removed were noted. Of particular interest were the crews' lounge areas.

Kitty Hawk's habitability program is one step in the Navy's attempt to provide its men with better equipment and facilities to carry out their tasks and to make their life at sea as comfortable as possible.

HABITABILITY *is your very own place to stow your dirty pair of size fifteens.*

FASU Da Nang

By JO2 Gene Costello
and PH2 Carey Krause

It isn't much to look at, just a nondescript, barn-like metal building sitting at the end of the runway. The only thing that distinguishes it from the other warehouses and sheds in the area is a small blue and yellow sign on the sliding door. Inside, the facilities are spartan – two picnic-type benches, a luggage rack and a bare concrete floor.

But to thousands of Navy men, the Fleet Air Support Unit (FASU) passenger terminal at Da Nang, RVN, is as welcome a sight as JFK or Los Angeles International Airport.

They come wandering in at all hours of the day and night, wearing blues, dungarees, combat greens or whites. Most of them are tired and weary from traveling. Many of them are bewildered. A few are scared. All of them want transportation.

They may have to wait a day or two but eventually get the flight they want – thanks to the hard-working enlisted men who staff the terminal.

The terminal is operated by FASU, but the men who work there are attached to the Air Terminal Division, NAS Cubi Point, R.P. The Cubi Point Navy men, who volunteer for the job at Da Nang, began working in the terminal on a rotating basis in October 1969 when the Navy halted direct flights between Cubi Point and ships off Vietnam and started moving personnel via Da Nang.

The work in Da Nang can be described as fatiguing. The men are on their feet an average of 18 hours a day trying to keep up with the workload. During April, for example, the five-man terminal crew handled 2,039 passengers – and that doesn't include those traveling on emergency leave orders.

The terminal workers never know how many passengers they will have from one day to the next, or when they will arrive. On a typical day, four Navy men walk into the terminal seeking transportation to Cubi Point. Within four hours, 30 others have showed up with the same request. None of them were expected, but all are accommodated.

"That's the way it always is," says AB2 William C. Miller. "Your passenger backlog can jump from 10 to 100 in an hour."

EO1 John W. Ludlum, who is currently the leading petty officer at the terminal, points out that all of the passengers are in a hurry. "Some of them don't realize the problems involved in getting transportation. They think they can walk up to the counter, put their names on the list and go. Unfortunately it doesn't work that way. We're not TWA."

The bulk of FASU's passengers are traveling to and from Seventh Fleet ships off the coast of Vietnam. This means flying in the C-1A *Trader* or in unscheduled helicopters launched and recovered aboard carriers in the area. When configured for passengers, the

C-1 can carry only eight persons; configured for mail and cargo – which normally takes priority – there is room for only one passenger.

Consequently, if the terminal has 25 or 30 persons waiting for transportation to a particular ship, they have to wait a day or two to get to their destination, depending upon the amount of mail and cargo scheduled for delivery to the fleet.

Most of the shuttle flights between Da Nang and the carriers are flown by VRC-50's detachment in Da Nang, but each carrier on Yankee Station usually sends one plane into Da Nang every day for passengers, mail and cargo. Helicopters are also sent if the backlog of passengers on the ships or in Da Nang is quite heavy.

To get passengers to other destinations such as Saigon, Cubi Point, Japan or the United States, the terminal crew makes use of anything available – scheduled and unscheduled Navy, Air Force and Marine Corps flights.

PO Ludlum and his co-workers try to make the wait for flights as brief and painless as possible. "Guys coming through here have it kind of rough," he says. "They don't know where to go, what to do or how to do it. There's no snack bar, no comfortable seats, and the passengers can't leave the area. So, all that's left is to sit around, play cards or sleep on the floor."

AB2 Miller explains that there are a dining hall, club and transient barracks within the compound. But the club and mess are open only at certain hours, and most passengers are reluctant to go to the transient quarters for fear of missing a plane.

"Quite a few of our passengers will sleep on the floor here in the terminal rather than go to the barracks and risk missing a flight," Miller says.

To make waiting a little more bearable, the terminal crew acquired a coffee pot, a supply of coffee and paper cups. They also installed a refrigerator in their small office and now sell cold and sometimes not-so-cold soda.

The terminal crewmen also have newspapers, books, magazines and a couple of decks of cards on hand.

"Most Navy men going through FASU in Da Nang expect something that at least looks like an air terminal," Miller states. "It doesn't, but one way or another, we get a flight for everyone who walks in here, and that's what counts."

A metal building on the edge of the runway is the Da Nang passenger terminal. Above left, AB2 William C. Miller, FASU, helps passengers into life jackets. In a familiar scene, above, AB2 Ronald A. Quinn announces the passenger list for the next scheduled flight, one of eight daily. And below, Navy men en route to Seventh Fleet ships prepare to board a VRC-50 C-1A.

THE SELECTED AIR RESERVE

SAR

When Maj. A. S. Horton launched a UH-34 *Seahorse* from NAAS Fallon, Nev., he didn't realize that the two-hour local flight would become a search and rescue mission. Maj. Horton, with his copilot, Capt. P. Starn, crew chief, Cpl. W. P. Henkel; and crew members, LCpl. G. J. Alexander and Cpl. T. A. Kolteryahn, all of HMM-767 at NAS Alameda, were at Fallon for the squadron's two-week summer training cruise.

The crewmen were on a flight to Pyramid Lake, Nev., when they heard station KVLV Fallon broadcast a report that a boat had overturned in the lake the previous night and two persons had been reported missing. The helo began a search of the western shoreline and, near the northern end of the lake, spotted a red, fully rigged capsized sailboat. Because there were no other boats in the area, the *Seahorse* landed beside a lone camper and asked its occupant to drive to the nearest town and notify the authorities. Then the UH-34 went back to the capsized boat and flew a search pattern until the crew spotted a male body floating face down. The body couldn't be raised by hoist so Kolteryahn and Alexander dropped off on the beach just as another boat appeared on the scene and recovered the drowned man. Informed that a teen-age girl was still missing, the two crew members proceeded along the shore on foot and located the girl, alive, on the beach. The Nevada State Highway Patrol called an ambulance and took her to the nearest hospital, and Maj. Horton and his crew, with 300 pounds of fuel remaining, flew to Reno to refuel for the trip back to Fallon. It had been an exciting flight.

Pilot Program

A Sunday in mid-June became "boot day" at NARTU Norfolk as 66 recruits from South Weymouth, Mass.; Lakehurst, N.J.; Atlanta, Ga.; Washington, D.C.; and Norfolk arrived at the naval air station.

They were the first of three groups in a pilot program being conducted to determine the feasibility of holding all recruit training for East Coast Reserve units at Norfolk in order to take advantage of the training facilities available in the area.

The other two groups took their boot training in July and August.

NARTU Norfolk, a training center for Weekend Warriors commanded by Captain J. H. Bell, is composed of 1,300 members of the Selected Naval Air Reserve and 250 active duty officers and enlisted men.

Carquals

The Naval Air Reserve Force, following the precepts laid down by its commander, Rear Admiral H. E. Greer, increased carrier qualifications in FY 1970.

More than 100 pilots carqualed in A-4's, E-1B's and S-2E's as they logged more than 870 arrested landings. Nearly 350 helo landings were recorded in the SH-3A.

Qualifications were conducted aboard USS *Dubuque* (LPD-9) and the carriers *Lexington, Intrepid, Guam* and *Kitty Hawk*.

The pilots who recorded 1,200 accident-free landings were from NARTU's Alameda, Jacksonville, Lakehurst and Norfolk, and NAS's New York, Los Alamitos, South Weymouth and New Orleans.

NARTD Moffett Gets P-3's

The Naval Air Reserve Training Detachment at Moffett Field is the first Reserve group in the Navy to take delivery of its own P-3 *Orion* – the same modern, long-range anti-submarine patrol plane used by regular fleet units.

The detachment's three squadrons, VP's 46G6, 47G7 and 28G5, on two-week tours of duty with the Seventh Fleet, flew regular operational missions alongside regular fleet units in the Western Pacific, earning the praise of their regular Navy counterparts.

"It's an indication of the important role played by Reserve units in support of regular fleet units," says Commander B. E. Sutherland, officer in charge. "Up to now the detachment has trained in P-3's borrowed from regular Navy squadrons at Moffett Field."

The *Orion*, which uses modern electronic gear to track submarines hundreds of miles from shore, replaces the earlier-model SP-2 *Neptune* which has been phased out of regular fleet duty but is still being flown by other Reserve training groups.

Record Claimed

NARTU Lakehurst claimed a new NARTU record for total number of flight hours flown by one of the command's aircraft in a single month when pilots kept one of the unit's two remaining Douglas C-54 *Skymasters* airborne for more than 170 hours.

Commander Nicholas Pacalo, transport aircraft program manager, said of the record, "The real tribute should go to NARTU's aircraft maintenance department which put out a supreme effort. Because of these men, we were able to meet our commitments with one aircraft. Usually these commitments are fulfilled by three aircraft."

While accumulating the record hours, the *Skymaster* covered much of the East Coast. Trips included a flight taking midshipmen to NAS Pensacola, the ferrying of enlisted personnel to schools at NAS Memphis and weekend airlifts for two other Reserve units, Memphis and Willow Grove.

National Model Meet

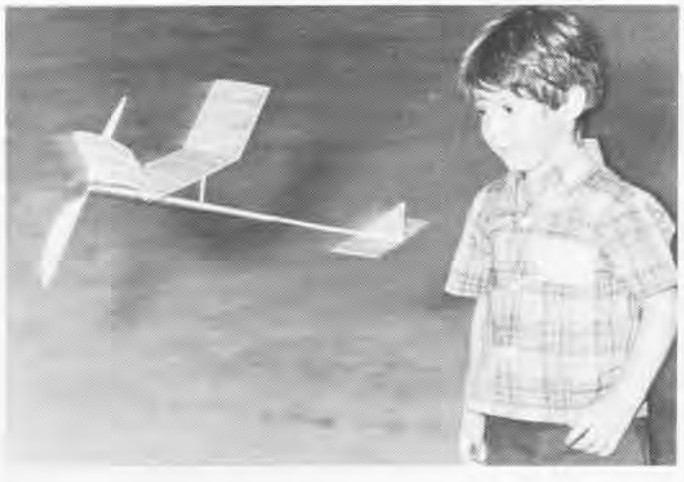
Once a year a kind of controlled insanity strikes an air station in CNAResTra. This year it came to NAS Glenview. Its symptoms include a mass migration of some 2,000 people from all over the country; a complete disregard for heat, rain or fatigue; and a constant buzzing sound experienced by everyone within a five-mile radius. Fully grown men have been known to cry openly before a crowd of spectators or jump up and down like excited children. The strange effects last for exactly one week . . . then suddenly disappear.

The phenomenon is called the National Model Airplane Championships and has been sponsored for the past 23 years by the Naval Air Reserve to encourage public involvement in aviation, especially among the young. The event is conducted in cooperation with the Washington, D.C.-based Academy of Model Aeronautics whose 30,000 members compete in contests throughout the country. Navy men from NAS Glenview act as officials, judges, timers, guides and hosts.

Contest aircraft ranged from flimsy, delicate, slow-moving indoor models to powerful, gas-rocket powered outdoor types. Contending models were judged in an assortment of events, including high speed flight (up to 190 mph), precision aerobatics, combat maneuvering and carrier landing.

An additional attraction providing thrills for some 50,000 spectators was the sight of the sleek, precision flying Tactical Flight Demonstration Team screaming past in tight formation.

By JO2 Gary Brahl



PT2 DAVE SPINDLE, *top right, times a free flight model at the 1970 Nationals while other contestants engage in preparation, flight control or salvage operations.*

CROSS PO

On returning to VP-23 after three months of *Orion* transition training at NATC Patuxent River, Md., I learned I was one of four officers who were going to participate in a program called "Cross Pollination": two weeks aboard the antisubmarine warfare carrier *Intrepid* observing ASW-HUK exercises.

Lts. Robert Wolff and Jack Hastreiter, from VP-11, and Lt. Don Kern and I, from VP-23, joined the program. Two weeks later, four patrol squadron officers from NAS Brunswick had a greater understanding of the ASW team effort and how patrol aviation fits into that effort. Personally, with a new baby daughter at home, the last thing I wanted was to go away for another two weeks; but the trip proved rewarding and I accumulated many firsts: my first sea voyage, first high line, first cat shot and first helicopter ride.

Cross Pollination was originated to acquaint members of the ASW team with the mission and capabilities of each of its other members. VP aviators and tactical coordinators frequently work in combined exercises with destroyers, aircraft carriers and submarines; but, unfortunately, many of these past efforts have not been completely effective. Cross Pollination sends patrol pilots to observe carrier ASW operations and seagoing personnel to participate in patrol flights so that each gains an insight into the problems and capabilities of the other. The result is a good interchange of ideas which may provide a solution to the problem of combined ASW.

With several weeks to prepare for the trip, I looked up *Intrepid's* history.

PH2 B. L. Mack

LINATION

As a CVA, she sank or damaged more than 60 enemy ships during WW II. Her designation was changed from attack carrier to CVS in March 1962, but she served in a "limited attack" status in Vietnam until a short time ago. She is now flagship for Commander Carrier Division 16. Now the exercises we were to observe marked the first time the carrier and her air group had functioned together in the ship's new role as an antisubmarine warfare carrier.

Scheduled to report aboard *Intrepid* at NAS Quonset Point at 0700 on a Monday morning for an 0900 underway time, we first saw *Intrepid* silhouetted against the sky – an impressive sight.

After properly saluting the national ensign and the officer-of-the-deck, we were shown to the junior officers' bunkroom located directly below the number two catapult (which would keep us awake at night in the days to follow). The spaces were small by shore-based standards. The four of us occupied a small cubicle with four bunks and two lockers. There were eight cubicles in one room – less than desirable living conditions. (I gained a real respect for the men who have to live and work in close confinement and wondered how submariners function in even smaller spaces!)

With our gear secured, we went topside to watch the carrier get underway. The ship's whistle blasted, and cranes removed gangways while sailors cast off the lines. *Intrepid* eased away from the pier as tugs took their places and guided the carrier until she was clear of the channel. Out in the open sea, she steamed southward to begin operations.

After lunch, at a flight crew briefing, we learned the first week was scheduled for carrier qualification operations ending on Friday when the ship would go into Mayport, Fla., for the weekend. The second week would consist of ASW exercises with the nuclear submarine, *Seahorse*, acting as the enemy.

The first week we oriented ourselves aboard the carrier and watched the pilots carqual. Although all of us had landed aboard a carrier during flight training, we were anxious to watch from a more comfortable vantage point; so, during one night carqual, Don and I went out on the ship's fantail. As the first aircraft approached, it looked as if it would land on top of us. It didn't take us long to clear the area! (The fantail is closed during recovery operations!)

During the week, I had the opportunity to fly off the carrier in the right seat of the C-1 COD (carrier onboard delivery) aircraft as it made one of its daily mail runs to the mainland. The cat shot was more impressive than I had imagined.

Although the C-1 is similar to the S-2 flown in advanced prop training, I felt completely lost in the cockpit as we positioned on the #1 cat. When ready for launch, I saluted the launch officer as 2,000 pounds of hydraulic pressure accelerated the C-1 down the deck, and I was pushed into the seat, wondering what happened. Then the *Trader* was airborne.

The RON in Norfolk provided a welcome relief from the routine aboard ship. We left Norfolk early in order to meet our overhead time of 1000 (the specified time for recovery aboard *Intrepid*). The arrested landing was my first since the training command, and my adrenaline was pumping when we received the signal for recovery. The aircraft was dirtied up, flaps, gear and hook down, as it slowed to the 85-knot approach speed. With the overhead hatches open, the two engines made a deafening noise.

Instantly we were at 500 feet and turning abeam the ship to intercept the mirror ball. When the pilot saw the yellow ball, he called ball, props, aircraft number and weight over the radio. The LSO acknowledged the call and advised the pilot as the COD descended to the flight deck. Flashing green lights signaled the cut, and the pilot responded by pulling power off. As we caught the #2 wire, I was thrown forward in my straps, one experience as thrilling as remembered.

Later that day, during a refueling operation at sea, we had a chance to visit USS *Taussig* (DE-1030) when she came alongside. We decided to take advantage of the opportunity even though it involved traveling via "high line."

A replenishment at sea is an exercise in precision. *Intrepid*, when established on a steady course and speed, signaled *Taussig* by hoisting the Romeo flag at the dip. *Taussig* responded with a like signal when she was ready to come alongside. The two ships maneuvered until they were about 100 feet apart, cruising at 12 knots.

After watching the rigging and refueling operations begin, Don Kern and I cinched up our life preservers, positioned the uncomfortable safety helmets on our heads and anxiously waited for the men to complete rigging the high line. By this time, a huge crowd had gathered on both ships and our uneasiness was reinforced by the stories the high-line crew related about the ill fate of those who had gone before.

I climbed into the chair uneasily, fastened my seat belt and clutched the iron bars. The chair jerked up with a start and moved unsteadily out over the water. After an eternity, I found myself over *Taussig's* deck and, just as my feeling of safety returned, I dropped to the deck like a sack of potatoes – someone had missed a signal.

Taussig's X.O., Lt. Robert Cepek, took us to the wardroom for lunch. My stomach began to tighten as the destroyer bounced from side to side, keeping pace with *Intrepid* during the concluding minutes of refueling.

By Lt. Dan Titus

nswick Four were aboard as Intrepid med south to begin ASW qualifications.

PHAN G. Davis

Intrepid men prepare to send Lt. Kern to USS Taussig via high line.

After lunch and the usual good-natured exchange of barbs between the black shoe and brown shoe Navy, we had an extensive briefing on the mission and capabilities of the destroyer.

"As with any other ASW platform, the destroyer possesses distinct tactical advantages as well as inherent disadvantages," Lt. Cepek said. "The destroyerman fully realizes the potential of his platform and the necessity for its successful integration in the overall ASW effort. The destroyer is capable of remaining on station for prolonged periods, it has a very powerful echo ranging set, it can deliver a variety of ASW weapons and it utilizes ASW aircraft to assist it in its functions.

"However, other platforms, namely the ASW submarine and aircraft, can deal with tactical environments in which the destroyer is ineffective because of its limited speed, higher noise level, vulnerability to submarine weapons or susceptibility to unfavorable water thermal conditions."

Don and I went to the bridge to watch night carquals, after a delicious rare roast beef dinner (we had to eat in shifts because of the small wardroom which would later double as a movie theater). *Taussig* was plane guard, working with an HS-3 helicopter which hovered off the carrier's starboard. The bridge speaker blared the LSO's commands and we listened intently when we heard "bolter, bolter, power and go." Someone had missed the wire; he had to react instantly if he were to avoid a dunking. The plane disappeared from sight below the carrier deck but reappeared, much to our relief, climbing.

Only one bed was available in the officers' stateroom, and Don exercised his slightly-senior-in-rank prerogative. I was assigned to the rear admiral's quarters directly over the engine room and the hottest sleeping area on the destroyer.

To my surprise, I slept comfortably and long, and arrived late for breakfast. Don and I gave *Taussig's* officers a brief on the mission of patrol squadrons and the capabilities of the P-3 *Orion*. Many patrol pilots feel that surface ships they work with on combined operations do not understand exactly how the P-3 can best be utilized. The briefing allowed us to air our ideas on VP utilization and answer questions raised by our comments.

A helicopter bringing mail from the carrier was to take us back but because of its size could not land on the destroyer's DASH platform, so we were hoisted in the "horsecollar." With the rescue sling securely under my arms, I was pulled slowly off my feet and dragged across the fantail. After narrowly missing an acetylene/oxygen bottle, I was inched up to the hovering helicopter while the crewman turned me so I would slide into the door, back first. The ride back was another addition to my week of firsts.

After two days of relaxing in Mayport, Fla., we were anxious for the ASW exercises to begin.

The overall purpose of this mission was to develop coordination between surface units and aircraft – while searching for and attacking submarines, and in convoy screening and protection. Additionally, opportunities were provided for *Seahorse* to practice convoy detection, screen penetration and attack. The purpose of any exercise is to develop and improve tactics, doctrines and operating procedures in the field of combined airborne and surface anti-submarine warfare.

In one exercise, *Seahorse* attempted to penetrate the screen and attack the carrier. In another, *Intrepid* took evasive action while the helicopters and planes made runs on the sub. In another phase, *Taussig* picked the submarine up on sonar, took charge of the planes and helicopters, and gave them vectors with which to track the submarine.

For each exercise, the pilots and plane crew members reported to the ready room prior to the "rainbow" launch. It was called rainbow because it combined aircraft from each squadron in the air group and each squadron's planes have different colored tail markings. During the briefings, wind, weather, ship's course, radio frequency

and possible contact areas were given to the crews.

The flight deck was a beehive as crews made final checks on equipment before starting the engines. I learned that the green shirted men are catapult and arresting crewmen, photographers and mechanics; plane captains wear brown shirts; plane directors, elevator operators and officers appear in yellow; plane handlers – blue; ordnancemen, fire fighters and repair parties – red; and fuel crews – purple. Postal clerks and corpsmen wear white.

Angel launched as *Taussig* took up position off the carrier's stern. *Intrepid* turned into the wind and picked up speed while the aircraft positioned for launch and turned up their engines.

Coordinating the overall effort on the carrier is the responsibility of the combat information center (CIC) and the antisubmarine classification and analysis center (ASCAC). CIC is the heart of the HUK group effort – radar operators, plotters, status board keepers, evaluators, controllers and coordinators work to collect and assimilate the input of combat information. The room is semi-dark with red, green and yellow lights giving it an eerie look. To a novice, CIC is a noisy, dark area of confusion. Code names and call signs are grease-penciled on neon lighted status boards. Glass buttons on consoles light up when phones are used. Overhead speakers keep personnel in constant touch with other components of the group. A constant flow of information from men pours into this room where it is fed into computers or plotted on the dead reckoning tracer. All this information is passed up to the officer in tactical command, a couple of decks above in flag plot, who gets an overall picture of the task group operation. He is the man who decides the cruising formation, which aircraft will be used, what weapons they will carry and where they will search.

The ASCAC plans the pre-exercise strategy, evaluates contact information and debriefs crews.

Intrepid's ASW weapons include the S-2E *Tracker*, which carries a four-man crew and routinely flies all-weather missions. The twin-engined plane, armed with rockets, depth charges, sonobuoys and torpedoes, can search an area, set up barriers or be vectored into any attack. Submarines can be detected visually or by using radar, ECM, searchlight or MAD gear.

The *Sea King's* crew consists of a pilot, copilot and two sonarmen. Carrying torpedoes and depth charges along with its all-important dipping sonar, the HS-3A is used in "integrated screens" – that is, with surface elements or by itself. One of its primary advantages is the reduction of time late (the lapse of time between discovery of the target and arrival of an attacking unit).

These weapons of the ordinary HUK group can be supplemented by calling for land-based assistance from P-3 *Orions*. And, during one portion of the exercise, a P-3C from VP-56 participated in combined operations with the carrier air group.

In defining the combined efforts of all the weapon carriers in ASW, you could call it the joining of forces by uniting efforts and pooling weapons. But even this can be boiled down to one word – teamwork.

Cross Pollination provides a method for developing teamwork among existing units of the ASW team. The visit gave the Brunswick Four a better picture of surface ASW efforts. By observing, flying on ASW exercises, and talking with the people on the ships, we gained an insight into the HUK group concept of ASW. We came home with new ideas and new friends.

After we returned to Brunswick, the ASCAC officers aboard *Intrepid*, LCdr. Anthony W. Marcantonio and LCdr. Roger E. Carlson, visited our squadron – to fly on patrols. VP-23 plans to experiment with several new tactics developed by LCdr. Carlson.

The future of ASW may well depend on a continuing emphasis on programs such as Cross Pollination. Only with improved cooperation and teamwork will the various ASW groups be able to effectively counteract the increasing Soviet submarine threat.

PH3 E. C. Holm

Lts. Wolff, left, and Titus, in flight jacket, observed a great deal aboard Intrepid.

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EDITOR'S CORNER

WHEN EMPLOYEES at the Air Force Melrose bombing range near Clovis, N. M., expressed a desire for some souvenirs from the company whose A-7 attack bombers used its bull's-eyes as targets, Vought engineers came up with a new substitute for U.S. mail – delivery by bomb!

Several A-7 tie clips were loaded into four unfused 250-pound bombs, and Colonel Noah C. New, assistant head of the Marines' air weapons systems branch in Washington, dropped them in and around the bull's-eyes.

But when range engineers went out to the hot desert to claim their gifts, they ran into problems. After digging eight feet down without finding the imbedded bombs, they gave up.

Vought flight test engineers later sent more tie clips. . .by mail.

United States Navy Aircraft Since 1911 sounds like a rather extensive subject to cover in a 518-page book, but Messrs. Swanborough and Bowers' well planned effort crams a considerable amount of information into its tightly written pages. Illustrated and described, frequently with multiview line drawings, are some 255 Navy and Marine aircraft from the Curtiss A-1 *Triad* to the A-7 *Corsair II*. Separate sections are devoted to airships and gliders used by the Navy.

In addition, the book contains chapters on designation systems, color schemes and a concise guide to aircraft markings since 1916. This encyclopedic volume is well illustrated, often displaying several variations of a particular model, and provides characteristics, performance and serial number data for each aircraft.

The aviation buff will find this book, published by Funk and Wagnalls, a valuable addition to his library.

THE FAA HAS IMPLEMENTED a program to persuade airports to get rid of derelict aircraft. In announcing the program, Secretary of Transportation John A. Volpe said junk aircraft are becoming an eyesore at many airports, just as junk automobiles are cluttering the American landscape.

"The FAA program is aimed at improving the appearance of airports and maintaining public confidence in aviation," FAA Administrator John H. Shaffer says. "These junk aircraft not only degrade the appearance of airports but tend to convey the erroneous impression, to both the flying and non-flying public, that aviation is inherently unsafe."

Agency field offices have been instructed to establish procedures for periodic checks of airports to identify derelict aircraft and bring them to the attention of airport management.

Taking the lead in the drive, FAA's Bureau of National Capital Airports, which operates Washington National and Dulles International, has entered into an agreement with fixed-base operators at both airports to provide for the removal of non-airworthy aircraft. Under the agreement, owners of aircraft exceeding a 60-day parking limitation will be given 30 days' notice to remove the aircraft or return them to airworthy condition. Non-compliance is considered grounds to remove the aircraft at owner expense.

Biplanes to jets was the theme of a recent demonstration by Captains J. B. Morin and W. G. Sizemore, commanders of RCVW-4 and CVW-1, respectively, when they arranged to show their sons the changes which have occurred in naval aircraft over the years. Each flew an N2S type biplane, with his son in the front cockpit, from Herlong Field, Fla., to NAS Cecil Field where they parked alongside the Navy's newest *Corsair*, the A-7B.

Both officers are *Corsair II* qualified and routinely fly the plane with attack squadrons of their respective commands. The Stearman N2S trainers, phased out of Navy use a few years prior to the captains' designation as Naval Aviators, provided a marked contrast to the Navy's latest combat type. Since completing flight training together, the two pilots' paths have frequently crossed. Morin and Sizemore have served at the same duty stations seven times during their careers.

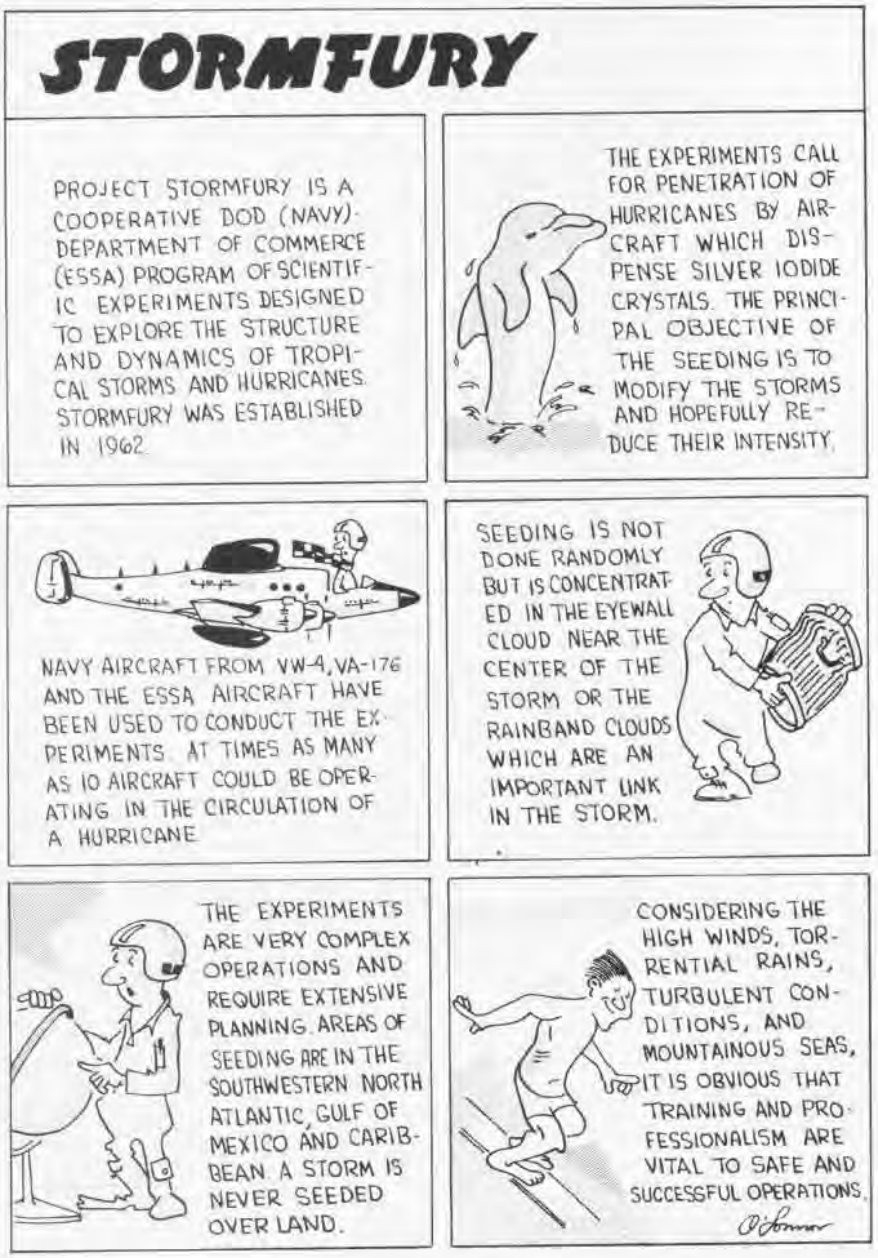
NAVAL AVIATOR LCdr. Wayne Spence likes to keep an airplane handy, so he parks one in his garage. *Sybil's Sacrifice* isn't a supersonic jet fighter, but a home-built machine nearing completion after two years of careful labor.

LCdr. Spence bought the plane from a do-it-yourself magazine and christened it in honor of his wife. He estimates it has cost about $1,000.

The Little Creek-based Tactical Air Control Squadron 22 officer expects the 350-pound, single engine, aluminum plane will do 115 to 120 mph. After about 50 hours of flight testing, LCdr. Spence will either sell the plane or give it to his son, a Coast Guard pilot.

This is his fourth airplane, but the first he built. "The next plane," he speculates, "will be a two or four place one, for retirement, maybe amphibian."

FABRIC, STRUTS AND GUY WIRES FLANK THE NAVY'S NEWEST CORSAIR II



Letters

ASW

There is an omission in your ASW article in the May 1970 issue of *NANews*. While you mention the USS *Santee* (CVE-29) as participating in the African Invasion of November 1942, you do not mention her exploits of 1943. *Santee* was the first U.S. escort carrier doing antisubmarine duty in the Atlantic. Her cruises included three months in the South Atlantic, January to April 1943, during which she captured and sank a German blockade runner. This tour was followed by three escort cruises in the North Atlantic, from Norfolk to Casablanca. During one of these cruises, she was successful enough as a submarine killer to earn the Presidential Unit Citation. She continued to operate in the Atlantic through February 1944 when she transferred to the Pacific Fleet to continue an active existence through the Hollandia, Guam and Philippine campaigns. She was a grand bucket of bolts on which I spent two exciting years. Credit where credit is due, please!

F. C. Wentink, Cdr. USNR (Ret.)
Rt. 1, Box 3510
Ridgecrest, Calif. 93555

A Challenge

On June 7, 1970, Marine Heavy Helicopter Squadron 463 dropped 432 tons of ordnance in a selected area over a period of eight hours. The members of the squadron proudly claim that this is the largest single bombing in Naval Aviation history.

We challenge your publication and all its readers to prove otherwise and anxiously await either a rebuttal or an acknowledgment.

J. A. Tucker, 1st Lt., USMC(R)
HMH-463

P. S. We are now the 463rd Heavy Bombardment Helicopter Squadron.

Aircraft Series

The May 1970 issue of *Naval Aviation News* included a back-page footnote inviting readers' suggestions as to aircraft they would like included on future center spreads.

My suggestion would be *all* U.S. Navy operational aircraft, in some order: perhaps working backward from the most recent types would be appropriate. And if you get all the way back to the Curtiss A-1, that's a "Bingo!"

NANews remains one of our best and most authentic sources of information, as it should be. Keep up the good work.

W.R. Davenport
Assistant Curator
Naval Aviation Museum

Enclosed is a check for another year's subscription to *Naval Aviation News*.

I am an avid reader of your excellent publication. I particularly enjoyed the first of your new series on naval aircraft, the LTV A-7 *Corsair II*. I would very much like to see two other fine naval aircraft covered in the same series — the Grumman F-9 *Cougar* and F-11 *Tiger*.

Barry G. Helgoth, Capt. USAF
3009 Oak Street, S.W.
McChord AFB, Washington 98439

Reunion

Reserve student officers of Pensacola Flight Classes 37 and 38 – 1929-1930 – will hold their 40th annual reunion September 18-20 in San Diego at the Royal Inn. For more information contact Captain Vern Williams, 11 Pine Ct., Coronado, Calif. 92118.

SQUADRON INSIGNIA

Established in March 1969, Tactical Electronic Warfare Squadron 133, NAS Alameda, Calif., is led by Commander J.F. Dillon. The squadron's EKA-3B and KA-3B Skywarriors provide electronic warfare and air refueling support to the fleet.

VAQ-133

NAVAL AVIATION

NEWS

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