NAVAL AVIATION NEWS

DECEMBER 1971

Fifty-Fourth Year of Publication

NAVAL AVIATION NEWS

FIFTY-FOURTH YEAR OF PUBLICATION

FEATURES

THE STAFF

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COVERS

The photograph above is an aerial view of the USS Arizona Memorial at Pearl Harbor. On the back cover, Kitty Hawk's busy flight deck is shown during WestPac operations.

'The world will little note nor long remember what we say here, but it can never forget what they did here.' -- Abraham Lincoln

EDITOR'S CORNER

While we've all heard about the old paradox concerning the chicken and the egg, most of us have never had to worry about it as a practical problem. However, your editorial staff here at NANews *had to face exactly that problem in producing this month's cover. When the idea for celebrating our fifty-fourth year of publication by running a photograph of our earliest ancestor together with this month's cover was first proposed, it seemed like a good idea. The next thought to assail us was, how. "Well . . . ," it was suggested, "why don't we just take one photograph of the two together and then reduce it on an ever-decreasing scale and then paste them one on top of the other."*

But, of course, someone had to raise the question of how to get the copy of the current issue's cover to use in the photo since we couldn't produce the cover without already having the cover. That caused the whole discussion to break down into a rather disconnected search for solutions, characterized by much arm waving, sketch waggling and even a voice or two raised in dissent. At last, however, an answer to our dilemma was discovered.

By the way, the earliest ancestor pictured on this month's cover is dated December 15, 1917, entitled on its subject line Weekly Bulletin, *and is signed on page 2 by Captain N. E. Irwin, then officer in charge of the aviation desk in the Office of the Chief of Naval Operations. His assistant at the time was Lt. John H. Towers, Naval Aviator #3.*

Among the items of interest in this first issue of what one day would become Naval Aviation News *are the following:*

- *A large increase in the flight training facilities at all Naval Air Stations (Training) is being planned.*
- *An R-6 type seaplane and an HS-1 type flying boat, both equipped with 12-cylinder U.S. Standard* (Liberty) *engines, have been assigned for service between Washington, D. C., and Hampton Roads, Va.*
- *Reports from France indicate that the establishment of U.S. Naval Air Stations on the French Coast is progressing satisfactorily.*

In case you have decided that we have problems with our math as well as with cover layout, we'll explain why 1917 subtracted from 1971 equals 53 years, thus the fifty-fourth year of publication. After the Weekly Bulletin *had become the* Daily Aviation News Bulletin *in October 1919, it continued under that title until October the following year. Then, after a one-year delay, publication was resumed as the Bureau of Aeronautics* Operations Report, *which accounts for the seeming discrepancy in our mathematical ability. Under various names from its first appearance in 1917 as a publication serving the Naval Aviation community, it has continued down to the present. Though initially of more limited circulation (the first* Weekly Bulletin *was addressed to: All Air Stations, Aviation Detachments and Ships carrying Aircraft) and typed on onionskin, the function of keeping a flow of information to aviation units has never changed.*

To continue charting our lineage, the next name change came in April 1923 when the BuAer Operations Report *became the* Weekly News Letter, *a title which lasted until January 1927 when* Weekly *was dropped from the masthead and the publication became biweekly. By this time, it was being mimeographed, had expanded to 14 pages and was reporting the news from aircraft squadrons with the Scouting Fleet, the Battle Fleet, the Asiatic Fleet and from the various air stations. Technical information ranging from calibration of radio compasses to details about the Navy entries in the National Balloon Race at Akron, Ohio, were presented for the education of Naval Aviators.*

Finally, in April 1943, the BuAer News Letter *converted from mimeograph to printing press, added photographs and slick paper and became essentially what you see today. In September that year, the name was changed to* Naval Aviation News *and the magazine became a joint publication of the Bureau of Aeronautics and the Office of the Chief of Naval Operations under DCNO(Air). Still a biweekly throughout World War II, it became a monthly magazine in November 1945.*

NAVAL AVIATION NEWS

1911 1971

More LAMPS Ordered

WASHINGTON, D.C. — An authorization to proceed with the conversion of ten additional SH-2D LAMPS helicopters has been issued to the Kaman Aerospace Corporation by the Naval Air Systems Command.

Delivery of the first ten *Seasprites* converted to the light airborne multipurpose system was slated to be completed by the end of last month. Delivery of the second increment is scheduled to begin this month and continue through March.

It is expected that all H-2 *Seasprites* in the Navy inventory eventually will be converted to the LAMPS configuration. The conversion entails airframe modification for the installation of a search radar, sonobuoy rack, magnetic anomaly detector, torpedo mounts, smoke launchers, associated antennas and control systems and displays, including a crewman's console in the aft cabin (*NANews*, June 1971, p. 8).

Training Wing Established

CORPUS CHRISTI, Texas—The Navy moved a step closer to completing its new single base aviation training concept when Training Air Wing Three was officially established at NAS Chase Field in Beeville.

Heading the new staff is Captain Robert P. Smith who will be responsible to Rear Admiral Billy D. Holder, CNAVanTra, for the functions of the wing.

Under the single base system, both basic and advanced flight training will be conducted at each of several air stations. When the reorganization has been completed, Chase Field will have two squadrons of T-2C *Buckeyes*, one squadron of TA-4J *Skyhawks* and a squadron of TF-9 *Cougars*.

The TrAirWg-3 staff will take over a number of management functions now being performed by the air station and individual squadrons, among these the administration of student records, safety programs and general management of the assigned squadron.

CNAVanTra Honors VT-26

BEEVILLE, Texas.—Training Squadron 26 was named Top Jet Training Squadron of the Year during ceremonies at NAS Chase Field.

The top squadron award is presented at the end of each fiscal year to one of the six jet training squadrons in the Naval Air Advanced Training Command. The award is based on the overall performance of each individual squadron in accomplishing its specific training mission.

In presenting the award, Rear Admiral Billy D. Holder, CNAVanTra, said, "It is with great pleasure that I present this distinguished award to VT-26 for its outstanding display of individual performance in all phases of command responsibility and flight training."

Commander John F. Dunn, C.O., accepted the award on behalf of the squadron.

VT-26 operates the TF-9J *Cougar* and conducts all phases of the advanced flight training syllabus.

S-3A Viking Makes its Debut

BURBANK, Calif. — The Navy's new carrier-based ASW aircraft, the S-3A, made its official roll out at the Lockheed-California Company on November 8. Rear Admiral Thomas R. McClellan, Commander, Naval Air Systems Command, was guest speaker at the milestone ceremony where Mrs. McClellan christened the aircraft the *Viking*. First flight of the S-3A, which is designed to replace the aging S-2 *Tracker*, is scheduled for January 14.

Navy's newest antisubmarine warfare aircraft, the S-3A Viking, at rollout on November 8, 1971.

NADC Tests New Emergency Abandonment System

WARMINSTER, Pa.—At the Naval Air Development Center, a manual/automatic system is being developed and tested which will enable pilots and aircrewmen to be released from all cockpit attachments simultaneously during an emergency. The same system automatically gets rid of an ejectee's parachute and energizes his flotation equipment, also instantaneously, when he enters the water. The new hardware is the Manual/Automatic Separation and Flotation Equipment (Man-Safe), developed by LTV.

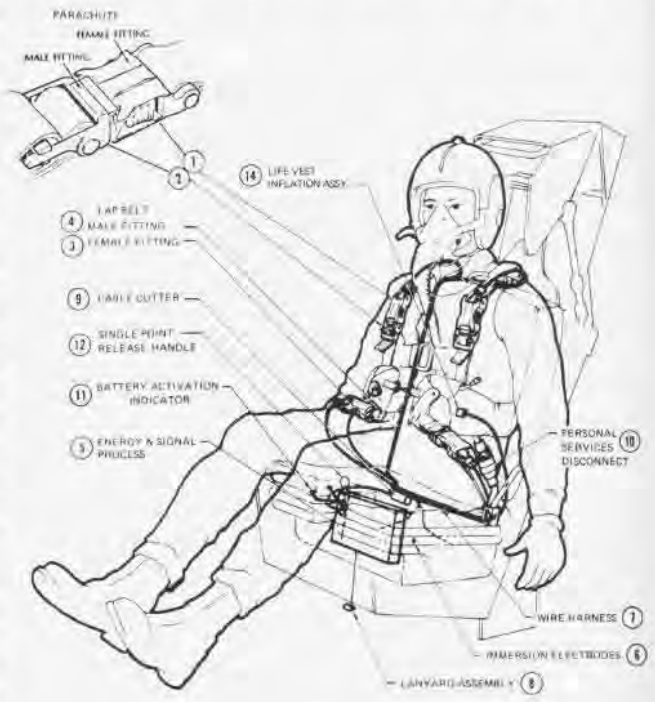
A pilot who ejects over water must precisely recall his past emergency training, performing a number of operations in the right sequence. If he has suffered shock or injury, or if the water is frigid, his capabilities are impaired. Similarly, if he ditches, or if there is a fire on a taxiway or on the flight deck, he must separate himself from a multitude of links in the cockpit before he can leave the aircraft. And there may not be enough time. Moreover, the ejection operations differ greatly from those needed to separate connections in the cockpit, and mistakes can be generated by panic underwater or in the presence of flames.

The Naval Air Development Center is the lead laboratory for the Naval Air Systems Command in the development of the unique manual/automatic system. Man-Safe provides for routine manual connection and separation of parachute and lap-belt connections, personal-services leads, etc., and even includes manual backups for the automatic flotation initiators. Presently, there are two automatic modes for dealing with entirely different types of emergency abandonment: ejection and non-ejection.

In the manual, single-point release mode for non-ejection emergencies, the aircrewman lifts a ring that activates a primary thermal battery having an indefinite shelf life. The battery in the seat kit energizes the tiny pyrotechnic actuators that immediately separate his parachute, lap belts, oxygen/communications lines, leg restraints (if used) and the electrical connection between the thermal battery and his life-preserver actuator.

While the system could inflate the life preserver automatically, as it does during an ejection mode, cockpit exit prior to any increase in body bulk is of overriding importance. If he ditches in water, the pilot can inflate his life preserver manually after he leaves the aircraft.

In the ejectee-flotation mode, when the aircrewman



ejects, the thermal battery is automatically activated by a lanyard and diverted to a large capacitor which, in turn, provides ultra-fast jettison of the parachute and initiation of the flotation operation within one-tenth of a second. The touchdown in water is sensed by a pair of spaced terminals of a circuit designed to discriminate between water immersion and all other forms of precipitation.

The terminals are located on the aircrewman's seat kit; and even before the upper part of his body enters the water, the parachute is detached and set adrift. The circuit also provides instant initiation of life-preserver inflation, seat-kit opening, raft inflation, and slightly delayed parting of the communicating wire harness.

Except for the need to make and break an electrical connection to the life preserver, preflight and post-flight procedures will not be affected.

Wet Runway Tests

WALLOPS ISLAND, Va. — The National Aeronautics and Space Administration, Federal Aviation Administration and U.S. Air Force are conducting a joint runway research program to evaluate methods for measuring runway slipperiness at military and civil airports and improving techniques for estimating aircraft performance on wet slippery runways.

Initial tests at NASA's Wallops Station were followed by similar measurements at Houston Intercontinental, Lubbock (Texas) Regional Airport, Edwards AFB, Seattle-Tacoma International and John F. Kennedy International.

An FAA Boeing 727 was used for the flight portions of the tests. Special instruments for measuring and recording aircraft landing conditions and stopping distances were installed by NASA's Langley Research Center.

Surface measurements of each airport were made under wet and dry conditions by a friction measuring device called a Mu-Meter and a diagonally-braked automobile.

Aircraft stopping distances were measured on each runway under dry conditions and a portion of the runway surface was then flooded for a similar series of tests. Before and after each landing, the Mu-Meter and the diagonally-braked auto made friction measurements of the same runway.

Marines Develop the YOV-10D Bronco

WASHINGTON, D.C. — Acronyms are a large part of the American vocabulary, especially in the military. One of the latest — NOGS — is a new development in Marine Corps aviation. The letters stand for Night Observation Gun System.

Experience gained in Korea in the early 1950's prompted development of weapons systems for the airborne delivery of ordnance during all weather conditions.

These systems proved themselves in Vietnam, but the Marine Corps faced a different enemy and a major problem surfaced, the inability to detect enemy movement at night in the jungle. The problem was complicated by the small size of the enemy groups and the vast geographical areas in which they moved. What was needed was a weapons system that could survey wide areas, detect enemy movement at night and, when appropriate, engage the enemy with fire.

The need for NOGS became apparent, and the Marine Corps first modified and evaluated two OV-10 *Broncos* configured with 20mm guns and infrared (IR) target acquisition systems. Both the IR and 20mm gun are forward looking and turret mounted, with the gun turret slaved to the IR turret.

These aircraft, designated YOV-10D, night observation gunships, can attack enemy units both at night and during the day. They also are capable of night surveillance and reconnaissance.

Additionally, a laser capability is planned for incorporation in the forward turret, providing pinpoint guidance information for other attack aircraft systems.

A-6E Undergoes BIS

PATUXENT RIVER, Md. — The newest of the A-6's, the A-6E, has been undergoing BIS trials at the test center for the past two months. The external configuration of the A-6E is identical to that of the earlier models of the twin-engine attack aircraft. Internally, there is a new avionics system and the first head-up display to appear in a production A-6.

This drawing depicts the Coast Guard's air deliverable anti-pollution transfer system (ADAPTS) at the start of a mission. If a tanker goes aground, ADAPTS will eliminate the need to deliberately pump oil to lighten ship. Instead, the oil will be pumped into the large rubber containers by diesel/hydraulic submersible pumps parachuted from a Coast Guard HC-130B. A specially trained crew will be delivered to the scene by helicopter to operate the equipment.

New Wing Command

NORFOLK, Va. — Medium attack planes of Naval Air Force, Atlantic Fleet, came under one centralized command with the commissioning of Attack Wing One at NAS Oceana, Virginia Beach, Va. The wing has been operating unofficially for several months.

Commander Michael F. Andrassy, who heads VA-42 at Oceana, is the first commander of the new air wing which will primarily operate with A-6 *Intruders*.

Wing commands will centralize all aircraft performing the same mission, provide operationally ready squadrons to operating forces, and supervise training when the squadrons are not deployed.

Funds for Mine System

WASHINGTON, D.C. — An $11 million contract addition has been authorized for the manufacture of additional MK-105 mine countermeasure systems by the EDO Corporation. The MK-105 system is a major part of the Navy's new concept of airborne mine countermeasures (*NANews*, August 1971, page 8).

Study Underway on Helo-Barge Combination

WASHINGTON, D.C. — A study is being conducted to determine the feasibility of using helicopters to tow cargo barges at high speed to the beach during amphibious landings, by Research Associates, Inc., Silver Spring, Md., under an Office of Naval Research contract.

The current study is but one of many undertaken in past years to increase helicopter capabilities.

Preliminary results indicate the CH-53 could tow a high-speed barge with 65 tons of cargo at 60 knots, and that a 20-ton heavy lift helicopter could tow a high speed barge with 100 tons of cargo at 70 knots. Depending on the distances from the amphibious ships to the shore, the use of the helicopter/barge combination could potentially improve the helicopter cargo performance by a factor of 2 to 4.

GRAMPAW PETTIBONE

Rough Ride

At 0802, a U-11A *Aztec* departed NAS Gulf Coast for NAS Inland. The aircraft's crew was a lieutenant commander with over 4,000 hours (400 in fixed wing) as the pilot-in-command and a lieutenant with over 2,000 hours. The passenger was a commander with over 4,000 hours, primarily in helos. The pilot had a total of 66 hours in the U-11A with five hours in the past three months. The flight to NAS Inland was mostly on instruments in smooth air, and the aircraft landed at 0915 after an uneventful flight.

During the next hour and 45 minutes there was shower and thunderstorm activity in the immediate area. At about 1100, when the three aviators returned to operations, a heavy thunderstorm was over the field. But the forecast called for improved weather; the pilots proceeded to the snack bar. At about 1130, the lieutenant commander presented his flight plan to the duty forecaster. During the weather brief, the pilot and the forecaster noted that the weather radarscope indicated prominent returns on the 60-mile scale. At 1145, the pilots submitted their flight plan to the operations duty officer and reported to their aircraft.

At 1204, following instrument clearance, the aircraft departed and received radar vectors to the first checkpoint, approximately 13 miles away. The U-11A entered the overcast at 1,800 feet and continued to climb to the assigned altitude of 3,000 feet. The pilot contacted the center and requested radar vectors around turbulence and thunderstorms. Center informed him that radar contact was lost and passed frequency (132.25) information for the next controlling center. At 1217 our copilot lieutenant requested a lower frequency and the center told them to work on 122.6 or 123.6 en route. The flight continued IFR in relatively smooth air with the copilot attempting to establish communications with en route radio or the center.

During this period, the aircraft entered a thunderstorm of unknown size and subsequently encountered darkness, heavy rain, hail and severe turbulence. Unusual G-forces were encountered as the aircraft's attitude, altitude, heading and airspeed varied abruptly. Control of the aircraft was minimal even with both pilots on the controls. In extreme turbulence, the pilots literally were recovering from one unusual attitude after another.

The pilot had turned on all interior lights, and the copilot abandoned his efforts to establish communications. They descended to 700 feet msl about ten minutes after entering the thunderstorm and established visual contact with the ground. They circled for several minutes looking for a possible path through the weather. Not finding one, the lieutenant commander elected to land in a field. The passenger and copilot agreed.

They were still encountering severe turbulence and intermittent rain as they descended in a right turn. The pilot missed his lineup, executed a waveoff and, seeing that the field was plowed, raised the landing gear and made a left turn to line up for another approach. As the U-11A crossed the trees, the pilot directed the copilot to cut the mixtures, which he did just as the aircraft entered a rainshower. At 1255, with about 100 knots airspeed, flaps up, a left crosswind and forward visibility virtually zero, the pilot landed the aircraft by visual reference to the ground.

It touched down in a relatively flat attitude, and the left propeller made initial contact about ¾ of the way down the field. After the aircraft had traveled approximately 40 feet, the right propeller impacted. The left and right propellers were bent as the aircraft touched down and the U-11A slid 440 feet in a gradual turn to the left. It entered the fence row, passing between two trees which tore both wings off and ruptured the fuel cells. During the final deceleration phase of 40 feet, the empennage and after fuselage were severely damaged as the aircraft tore through the various obstructions. During the rapid deceleration, the right passenger seat failed; the passenger, still strapped to the seat, was thrown forward and out of the aircraft. The pilots, restrained by their seat belts, received head injuries as they were thrown forward. The passenger released his seat belt and left the area. The copilot assisted the pilot from the wreckage.

Post-emergency landing secure procedures were not accomplished because of gasoline fumes. Although the aircraft was destroyed, the pilot, copilot and passenger received only minor injuries.

Investigation revealed that the forecaster on duty was a stand-in; however, he did, apparently, possess the experience necessary with considerable time in this field. During the weather briefing, there was no mention of a significant meteorological report concerning thunderstorm activity a few miles to the southwest. The communications system for passing weather in the area was termed inadequate. And

ILLUSTRATED BY Osborn

the forecaster did not use the available radar summary charts at the briefing, nor did the pilot ask about them. The field was in thunderstorm condition I, but no one told the pilot. The forecaster did advise VFR, but the pilots filed IFR anyhow.

Grampaw Pettibone says:

Egads! Pass me another aspirin! Ol' Gramps is not disputin' the decision to land once the aircraft was rattled around like a Mexican jumpin' bean, but I'm mighty upset at a lotta people who contributed to this mess! First the pilot, although briefed that it would be better to head east, headed southeast—a shortcut home. The "weather guesser" was a big help, giving the pilot a poor brief which did not include thunderstorms in clouds or a forecast of them. Supervisors got their licks in, too, by acknowledging that their communication system for passing significant weather developments was inadequate—after the accident! The operations people allowed the pilot to clear with an improper flight plan—no alternate, even though one was required. Although this latter item did not contribute to the accident, it is indicative of the complacent attitude of many that were involved. Of course the accident board minimized the fact that in accordance with local directives the pilots' NATOPS qualifications had expired! Hey fellows, do you think that if he had his NATOPS check, the check pilot would have detected that his VHF couldn't receive on certain frequencies? Hummm? Sounds like everyone involved had "cornered the poor judgment market."

Does this situation exist elsewhere? How about all you "weather guesser" supervisors reviewing your methods and communications as to how quickly your unit is receiving significant weather developments.

The Cat Got a Bird

An SH-3A returned to the ship after a routine uneventful training flight. It was recovered on the forward part of the angled deck with the right main landing gear on the inboard waist catapult track. About two minutes later, the helo was shut down, chocked, and four tiedown chains had been installed.

The aircraft commander had just left the aircraft and the rest of the crew were preparing to leave when the number three catapult shuttle struck the starboard main landing gear strut chock, collapsing the strut and sponson. The *Sea King* rolled to the right and came to rest on its starboard side. Two flight deck personnel who were standing near the right side, near the cargo hatch, narrowly escaped injury as it rolled toward them.

The copilot and two crew members still inside the helo exited shortly thereafter. They received multiple bruises and were somewhat shaken up. The aircraft sustained a fuel puncture when it hit the deck but, fortunately, there was no fire. There was substantial overall damage to the helo.

Grampaw Pettibone says:

My achin' ulcers! This accident falls into the category of the "most preventable kind." There is no possible excuse that would hold water! Gramps does not agree with the statement made by one supervisor during the investigation that this particular catapult crew was well qualified. A catapult crew that allows the catapult to be repositioned or fired without properly clearing the track is *not* a well qualified crew or a well disciplined crew or a well trained crew or a well supervised crew! This particular accident had catastrophic potential for a flight deck fire. Nuff said!

'I feel that the weather should be a major factor in this accident . . .the warm sun made me sleepy.'

Let GEORGE

Do It...

by COMMANDER TED WILBUR

Survivors say it went right down the stack. Some claim to have seen it. A 500-pounder, they figured. The crew's mess and the bridge disintegrated. Official accounts claim three bombs of at least 550 pounds apiece, released at 1,000 feet of altitude from level-flying Type 97 Mark-3 *Kates*, struck simultaneously. Accurate bombing.

Twenty minutes later on that morning of December 7, 1941, heat and flames from burning fuel oil and wood ignited the forward ammunition magazine of USS *Shaw*, then undergoing repairs in Floating Drydock YFD No. 2. An alert Navy photographer across the channel on Ford Island caught the explosion in one of the most dramatic and famous pictures of the Pearl Harbor holocaust.

As the forward half of the destroyer sank — along with the entire drydock and a nearby tug — a shock wave from the spectacular conflagration swept across the area, its tremendous blast engulfing personnel trying to board launches to take them from the Navy Yard out to the Island or to the ships on Battleship Row. One of the men, Aviation Pilot George Hoover, suddenly found himself relocated 40 feet. His eardrums were injured, a piece of shrapnel had ripped through a fold in his jumper and he was bruised from head to foot from concussion.

Hoover remembers, "It was early, for a Sunday morning, but we were getting ready to go on a picnic. My neighbors next door were playing their radio loud, as usual, and I kept hearing announcements about an enemy air raid. Although they kept repeating, 'This is no drill,' I didn't really believe the broadcast at first. Not until I was on the way over to the naval base.

"My Ford convertible was making good time down the highway — a rarity in the Islands because they were pretty tough on speeders. Traffic was being waved right through and for a while it was kind of fun. There was another car behind me and suddenly I saw it careen off the road and go sailing into the cane field. Then bullets began hitting around me and beyond, and I realized the road I was on was being strafed! Looking up, I saw those big red balls of fire under the wing of a plane as it roared by over my head.

"Well, my first reaction to all that dirt flying was: 'Boy, just like the movies!' But when I saw that airplane and realized it wasn't one of ours, I finally knew we were under actual attack. Up ahead, the amount of smoke and rumbling further convinced me this was really no drill.

"I went through the main gate of the base with the idea of catching a launch out to the air station on Ford Island. I was temporarily assigned there to Patrol Wing 2 utility unit. As I pulled up to park, I saw a sailor trying to crawl up the bank out of the water. He had been hit badly. His shoulder was in awful shape, so I put a blanket around him, got him into the car and drove him over to the hospital.

"It was after I got back, parked again and was running toward the boat that the *Shaw* went off. I wasn't too far from her when she blew. Although my legs were running, my feet weren't touching. After I landed, I realized something had happened to my ears because I couldn't hear anything. But I made it into a motor launch and we headed for the Island."

Ford Island was the focal point for the main Japanese attack. During the final phase, the naval air station and the adjacent line of battleships were subjected to savage dive bombing and low level assaults. Torpedo bombers went for the ships while *Zekes* and Type 99 *Vals* made a shambles of the airfield. Hoover stepped into the middle of the cataclysm.

"Stuff was flying all over the place,"

USS Shaw

INSTRUMENT FLIGHT IN THE FIFTIES

Author's illustration, one of a series, depicts early S-2 aircraft (S2F-1).

LET GEORGE DO IT

he recalls. "We had gone right through all the fire, debris and everything else and had beached at the seaplane ramps — smack into the blast VP-23 was getting. I headed for the hangar, not knowing what to do except that I had to get to my station. Many of the aircraft were already wiped out and we realized it wouldn't have done much good to try to man what was left; we didn't have any guns in them. By the time we got the small arms going, the main attack had subsided. A few stragglers were making final passes and several were hit. There was so much going up and coming down at the same time, we didn't know who was shooting at whom. When it was over and we had a chance to look around, the scene was absolute chaos. And I began to think: 'What am I doing here?' "

Hoover's eyes squint up a little as he leans forward and says, "There's an important point in this. Up until that moment, I had never really understood why the Navy had such strict discipline and regulation. On that morning, I learned why. Because when I stood there and looked around in the midst of that wreckage and tragic disaster and considered the fact that I *could* have stayed at home — remember, in the beginning I assumed it was just a realistic exercise — the thought dawned on me that I had acted *automatically*. It was the same with everyone on the base. Other than the radio report to return to base, I had heard no order given by anyone. No orders were necessary. And for the first time, I understood the real reason for discipline and training. I thought a lot about it that night."

The Pacific Battle Force was decimated at Pearl Harbor. More than 2,400 men lost their lives. Incredibly, USS *Shaw* survived. Repaired, she was in action off Guadalcanal the following October and fought throughout the war. Hoover also survived — to fight a different, unique kind of campaign. He never stopped asking that question: WHY? And he is still looking for answers.

Commander George W. Hoover, USN (Ret.), is difficult to condense. There is too much. A whole volume could be written on just his experiences as one of Halsey's enlisted pilots. Or, we could consider that every time we step into a cockpit that somewhere there is a Hoover brand. When an astronaut walks on the surface of the moon, does he know that this man from the Office of Naval Research (ONR) helped put him there?

At a press conference in 1958 following the successful launch of *Explorer I*, America's first satellite, Dr. Wernher von Braun assigned distinct credit for the achievement to Cdr. Hoover and insisted that he share in the accolades. Hence, there are those who feel this naval officer's progenitive ideas gave the United States' space effort its first real stimulus. At a recent ceremony for the formal presentation of a lunar module to the Smithsonian Institution in Washington, key figures in the Manned Space Program went out of their way to shake Hoover's hand and say, "Maybe you weren't so crazy after all."

How do you define him? Naval Aviator, inventor, engineer, innovator? Study his "Methodology for Defining Man — Environment Relationship Requirements," and you think he is a scientist. Discuss metaphysics with him and you may see him as a philosopher.

The first time I saw George Hoover was back in the Fifties when he made a presentation at the Safety Center in Norfolk. Not long afterwards, he received the Legion of Merit. The next time was in the spring of this year when he was on his way to England where he was awarded the Bronze Medal of the British Interplanetary Society. Both occasions were memorable.

George started off that Safety Center conference like this: "Our objective is to take a kid off Main Street, U.S.A., and within six months have a pilot capable of flying a sophisticated weapons system anywhere in the world under any weather conditions, hitting a target accurately and getting back to his ship safely — without ever having him look out of the cockpit!"

Now, that kind of a statement, made in the days when most Naval Aviators were still flying "needle, ball, airspeed" and relatively few of them were qualified "all weather" types, was pretty astonishing. Even among the minority group — the ones with experience in night and advanced instrument work — there was a bit of disbelief. But Hoover was used to this and he persisted. Unraveled before our eyes were such mysteries as miniature digital computers, integrated microcircuits and a refreshing novelty called a contact analog — essentially a windshield display that was actually a thin, flat, transparent cathode ray tube — TV for the cockpit!

Cdr. Hoover described future operations where you would be able to punch information into an exotic-looking cockpit console which would tell the computer where it was. Then punch in more information telling it where you wanted to go. At low level, no less. The display system would respond; a "highway" would appear before your eyes. Just follow it. Or punch another button and sit back. The plane would do it by itself. Don't worry about such mundane things as wind drift. The little black boxes inside the craft would figure all that out before displaying the highway. Radar would provide your road map. Pick your target, set the cross-hairs, punch the button, and the computer would handle the bombing. You would get back home and land the same way.

It all sounded pretty weird and far out. Of course, we didn't know about the A-6* then. It was this kind of thinking from ONR and the Naval Air Systems Command that went into the *Intruder's* cockpit.

When Hoover got back from England last summer, we asked to see the medal. It had been a singular honor, bestowed only for distinguished achievement. In answer to our question

*Originally designated A2F

Early Link Trainer, a device regarded with mixed emotions by thousands of aviators, is shown in rare 1942 photograph. Instructor is Aviation Pilot Hoover.

about how he felt when he received it, he said, "To tell the truth, a little strange. Most times recognition comes pretty long after the fact. When it happens, you find you are already in the middle of another project and *that* is what occupies your thinking.

"To be honored by one of our own societies is one thing, but to be recognized by a foreign society — that's something else."

We had not seen a press release concerning the award. "I haven't been asked to give interviews," he said, "since *Explorer*. And, besides, many things I say are misunderstood or of little interest to other people."

Reminded that it is a 54-year tradition of the *News* to talk about the men and machines that make up Naval Aviation, he agreed to answer questions for a profile. "But, he stipulated, "with just one objective in mind. The Navy is a rugged outfit in which to innovate. I did. So have many others. We have a new crop of men coming up the line with a lot of good ideas. They will find it is not always easy to get others to listen or to understand at first. But you don't throw in the towel and go home. If you know you are right, you don't quit. You fall back, find another way to go, and try it again. Maybe some of my experiences will make the process a little easier for the next innovator that comes along.

"My concepts and ideas were brought to fruition through the efforts of a great many helpful people. The Navy provided a tremendous education, starting with my initial enlisted training which was based on a 'can do' attitude. I was fortunate, too, in having the opportunity to move up with aviation and space operations during the most exciting and advantageous years."

Hoover's interest in space goes back to 1932 when he associated with the Cleveland Rocket Society. Two years later, after graduating from Shaw High School — a coincidence in view of the Pearl Harbor incident — he was designing rockets in his spare time aboard USS *Lexington* (CV-2). This was not long before Navy rocket pioneer, Captain Robert Truax, was doing similar things at Annapolis and aboard *Enterprise*.

As an aviation machinist's mate striker aboard our second carrier, Hoover discovered the secret of Navy life. He smiles a bit in the telling. "An F4B landed hard, wiping out a wheel and shock strut. My leading chief ordered me to fix it. When I said I didn't know how, he told me to find out how. Which I did, promptly. I got the parts, and *learned* how to put them on. Starting off as a white hat in the Navy way was the best thing that ever happened to me."

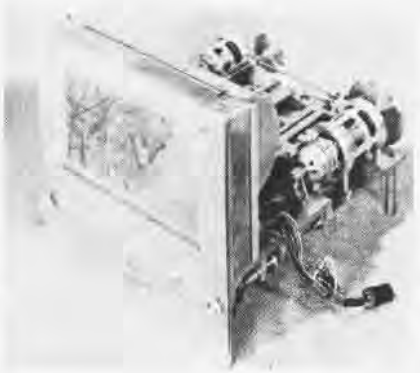
In 1938, Hoover won his wings at Pensacola and became an enlisted pilot (AP) with VT-6. He eventually amassed almost 5,000 hours in fleet type aircraft, but it was during that first tour, aboard *Enterprise*, that he really learned about navigation. "I was on a single sector search one day in a TBD *Devastator* and had gone out about 150 miles. When I came back, *Enterprise* was nowhere in sight. Why? I checked my *Mark III* plotting board again and discovered I'd been using a pencil mark left there by the previous pilot. Believe me, I learned to navigate right then!"

In a day when not a few pilots considered instrument flying the ability to make a 180° turn if they entered a cloud, Hoover became an instrument instructor. "I spent many an hour," he concedes, "sitting at the table, watching the 'crab' crawl around a chart while some poor devil inside the Link Trainer tried to figure where he was. We were doing this one day in 1940 when I suddenly asked myself 'why?' I saw that the whole procedure was wrong. There I was, outside the trainer, getting all the information that the man under the hood wanted to know and had to sweat so hard to visualize. It was backwards; *he* should have been seeing what *I* was watching!"

Hoover put a plotting board inside the trainer to make things easier for the pilot, but he knew what was really needed was a dead reckoning tracker — an *automatic* navigator. "In my spare time I built one in the shop. You could crank in information and it would show you how to get from here to there. It worked, but at that stage it was too big and heavy to put into a cockpit. Then a lucky thing happened.

"I had been making trips back and forth between Pearl and Kaneohe so often I could have plotted it in my sleep. Then one morning, Admiral Bellinger, who was CinCPacFlt, said he wanted to go over to Kaneohe. The weather was poor with a ceiling of about 100 feet. I checked the winds and off we went, the admiral in the back seat. We were in the soup all the way. After letting down right over Kaneohe and landing, the admiral said, 'How did you do that?' I showed him the plotting board and then took

LET GEORGE DO IT



Automatic position plotter was developed by Hoover in 1944. The electro-mechanical computer weighed about 20 pounds, had volume of less than one cubic foot, cost $20,000. Polarized film attitude indicator is shown at right.

the opportunity to explain the feasibility of my navigating machine which could have done the same thing automatically. He listened and seemed to be impressed."

The result of the young aviator's inventiveness was a transfer to Washington in the fall of '42.

Upon reporting aboard the receiving station at Anacostia, Hoover tried to draw his pay but found his name was missing from the chiefs list. Instead, he discovered that he was now an officer. Several months before, he had been commissioned an ensign. Later, paper work on a previous promotion to warrant showed up, too. He had been officially attached to VCS-4, USS *Chicago* which sank, taking his records with her. As he found out later, he was classified as missing in action.

Added to this surprise was a welcome assignment: to the Special Devices Branch of the Bureau of Aeronautics. Hoover was to head up the Flight Section. His boss? Luis de Florez.

Commander (later Rear Admiral) de Florez, USNR,* invented things — the "cracking" process which revolutionized gasoline manufacture, anti-aircraft gunsights, the flame thrower, automatic flight systems; and innumerable other devices and methods to aid a pilot in flying an airplane. Brought on active duty in 1940 by Rear Admiral John H. Towers, then Chief of BuAer, de Florez was soon creating "Project 610," so named because of its headquarters at 610 H Street N.E., in downtown Washington. There, de Florez and 125 men went to work in a remodeled garage. Each man had been handpicked on the basis of skills and talent required to complete whatever job the indefatigable skipper had in mind. Ens. Hoover fitted right in.

"Luis de Florez," says Hoover today, "was an inspiring teacher. A fantastic dynamo. Nothing was 'impossible' — Luis set the pace. We followed."

Money helped. To augment the brains, $1 million was initially appropriated to the Special Devices Division (SDD). By the end of the war, its annual budget was in excess of $57 million and the synthesists at the Navy's "Emporium of Ersatz," under the guidance of their "brilliant, benevolent dictator," de Florez, had turned out more than 450 different types of training aids.

Synthetic trainers was the name of the game and it took Hoover and 400 or so other incredible men of incredible ability into the fields of invention, research, engineering, ballistics, optics, mechanics, electronics, photography, hydraulics and even medicine and psychology.

Simulation training in Naval Aviation was not a new idea. Rudimentary forms were in use at Pensacola in 1918. The Germans practiced with mock-ups too. But it is to the British (once again) that credit must go for the impetus of the modern evolution. Their methods were studied in England by de Florez in 1941 and his recommendation for U.S. Navy adaptation and expansion was quickly endorsed by Adm. Towers.

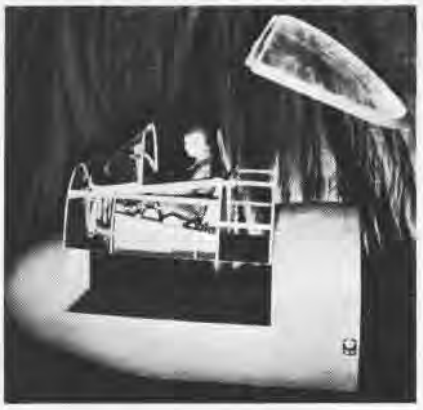
Realism was the keynote. Reportedly, certain parts of a de Florez device were even coated with oil to provide an accurate smell effect. The "610 Synthesists" also did their utmost to instill proper mental attitudes. For example, when it was discovered that students could master gunnery so quickly in the early trainers that their high scores led to boredom, a little spice was added. "The original problem," recalls Hoover, "was that it was too much like a game. Plenty of hits were registered but we weren't really *rewarding* the gunners.

"Device 3A2 was an improvement. If you could hit the little plane in that one, the target would appear to burst into flames before your eyes and you would even hear it explode."

The 610 Project paid off. By the war's end, more than three million pieces of training hardware were manufactured and delivered to ships, stations, training centers and advanced bases. In addition to Navy awards, de Florez received the Collier Trophy for his "contribution to the safe and rapid training of combat pilots and crews." And Lt. George Hoover was commended by Secretary of the Navy James Forrestal, specifically for design and development of the instrument trainer known to thousands of aviators as the standard 45 Link — the "Blue Box."

What Hoover learned from de Florez was, essentially, a way of looking at things — a questioning of the *status quo*. Says Hoover, "You have to go to fundamentals, and not just keep modifying modifications. Over the years, for instance, a tremendous amount of work had gone into aircraft design. Higher performance was the criteria. But I would look at a new

*NANews, September 1968



F8F Bearcat, left, was second in long line of OFT's. Perhaps the most spectacular application of operational simulators was demonstrated during Apollo 13 emergency when problem in space was duplicated on earth.

Mock-up of jettisonable cockpit is early example of concept which raised eyebrows and made magazine covers, but was ahead of its time. The 1945 idea became the Standard Ejectable Cockpit proposal, which is still under consideration.

plane and think, 'There is still one thing wrong: the cockpit.' The WW II pilot was surrounded with stuff not much different from what the Germans had in WW I. There was just more of it. We had not done a great deal to make the job easier or more comfortable.

"The pilot was still using a stick and rudder pedals, and his instruments were spread all over the cockpit. There was little standardization and, in some aircraft, the pilot would have to undo his straps to reach certain controls.

"I remember a problem that arose with jettisonable canopies. As soon as the thing was released, the front end would come down and hit the pilot on the head. One proposed solution was to determine how much of a head blow the pilot could stand, then design the helmet to take it!

"Actually, all it took was a little sliver of metal to catch in the airstream and deflect the canopy up."

The primary concern of the flight section was suitable training commensurate with the rapidly expanding technology. Added to this was a philosophy of equal effort towards elimination of the *need* for such training.

It was, and still is, a battle of aircraft speed versus reaction time. Although velocities were increasing, the pilot's capabilities remained fixed. Obviously, instruments and controls had to be carefully tailored to match man's limitations. Successful accomplishment of the pilot's mission was, of course, the goal. But what added impetus to the work of the flight section was a rising rate of aircraft accidents.

"Crashes," says Hoover, "are usually attributed to mechanical failure or pilot error. It was important to know why the pilot made an error.

"Confusion was the thing we had to beat. Simplification of those complex control arrangements was one method of increasing the pilot's efficiency by decreasing fatigue. We had to clean up the cockpit, make it functional. Controls and instruments had to be mounted in accordance with their function or operational requirement. To bring the flaps *up*, the control handle should look like a flap and be moved *up*. That sort of thing. It seems ridiculous now to remember how illogical some cockpits had been in the past."

During development of the 45 Link, the idea of duplicating specific aircraft characteristics was advanced. The F6F *Hellcat* was selected and SDD constructed the first overall operational flight simulator, complete with windshield fog, rough air, noise and assorted emergencies. The F8F *Bearcat* followed, and the original conception has continued to expand to the present time.

While progress was being made on cockpits and operational flight trainers, Hoover continued his work on the automatic navigator. He designed, built and patented the first cockpit instruments which automatically gave a pilot actual geographic position. His plotting machine, which was an electromechanical analog computer, was successfully flown in an SNB in late 1944 with no error greater than 11 nautical miles.

The following year SDD was relocated under the Office of Research and Inventions to new headquarters at the former Guggenheim Estate, Port Washington, N.Y. "It was about this time," says Hoover, "that I realized our studies on cockpit simplification, which pointed at a complete overhaul of instrumentation, would require much more knowledge than was then available."

Subsequently, a human factors engineer was hired to find out how a pilot thinks and operates. Psychologists were asked what the ideal cockpit should look like. For a year, Hoover worked with scientists trying to find out about such things as how man actually gets information from the real world.

"Meanwhile, the planes were getting faster all the time. In spite of those who said we would never exceed the speed of sound, it was obvious that we would. The technology was moving and man was way behind. And, on one hand, there we were trying to put the pilot into a decent cockpit while, on the other hand, we had to figure how to get him *out*. The high speed bail-out fatality rate was alarming."

The ejection seat was one answer. Germany had conducted research and, in England, Martin-Baker Aircraft had a program going. Hence, on September 12, 1945, the Martin-Baker seat was used by Americans for the first time. Riding the rails that day at the plant in Middlesex were Hoover, Commander N. Richardson and Colonel R. Sheppard of the USAAF.

All three experienced back pain. (Col. Sheppard made the mistake of crossing his arms to pull the face curtain. A year later, resultant nerve damage to his spinal cord became evident and he was forced to end his practice as a surgeon.) What the trio had not known was that there had been only 11 live shots on the 75-foot experimental tower prior to theirs!

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Nevertheless, Hoover had the seat brought to the United States and the first test in flight was made from a JD-1 near Lakehurst on October 30, 1946. Thereafter, the ejection seat became standard equipment on all high speed naval aircraft.

"But," he says, "we still had not solved that fundamental problem of the pilot. What we were seeking was the true relationship between man and machines. Information, of course, is the link. What the pilot wants are answers to three questions: Where am I and what am I doing? What should I do, and when? And, how am I doing? Somehow, we had to give him those answers."

More easily said than done. George Hoover sits in the *NANews* office and gazes at the pictures on the walls. He has given us something to think about and it is quiet. Then, almost contemplatively, he offers, "Sir Francis Bacon was the father of scientific approach. Centuries ago he set down the aphorisms which are still valid. One of these, in *Novum Organum*, published in 1620, states: 'It would be madness and inconsistency to suppose that things which have never yet been performed can be performed without employing some hitherto *untried* means.'

"There are those who disagree. That problem has always been with us. Man hasn't changed much in the last 350,000 years and he isn't going to change much in the next 350,000 years. We have conformists and non-conformists; expertism versus uninhibited thinking; fundamentals versus brute force.

"New ideas, therefore, are not readily accepted. For example, in 1945, supersonic flight was still questionable; experimental projects were needed to validate our calculations. One of these was Project *Helios*. I worked out a plan with Otto Winzen to gather empirical data substantiating supersonic flight calculations by dropping a free-fall missile from 100,000 feet. We figured it would achieve Mach 1.5 or 1.6. To get it up there, we designed a vehicle consisting of a two-man gondola supported by a cluster of 100 thin-skinned, polyethylene balloons. But back then, the idea of using anything but rubberized fabric for balloons was considered sheer folly. The proposal was put up on a bulletin board — as a joke."

The seemingly bizarre project nevertheless was approved and, to the surprise of many, Winzen's initial balloon launchings were a success. Later, the original *Helios* was transformed into other balloon projects such as *Skyhook*, for unmanned cosmic ray research, *Stratolab*, and the Air Force's *Man-High*. Before the *Helios* program ended, instrumented missiles *were* dropped and the telemetered data verified basic supersonic calculations on extreme environmental conditions.

If *Helios* was a joke, how about a two-gimbaled, rotationally free gondola on the end of a 50-foot arm, with speeds up to 45 rpm, which would subject an occupant to a rate of change of acceleration of 10 G per second and attain a maximum of 40 G? Such a machine could produce stresses similar to altitude changes, buffeting, and sound and thermal variations. Again, there were those who said it couldn't be done. (The human centrifuge at NADC Johnsville was placed in operation in early 1950. In addition to numerous aeromedical experiments, it was used in support of such projects as the X-15, *Dyna-Soar*, *Mercury*, *Gemini* and *Apollo*. It is still the world's largest and most sophisticated man-rated centrifuge. LCdr. George Hoover was the original project officer.)

Although much of Hoover's work had gained ready acceptance — such as the functional cockpits with shaped controls and safety features — many of his proposals had thus been greeted with open skepticism. While persistence had proved its value, up to a point, something else might be useful to a non-engineer who wanted to tell engineers how to do new things with unheard-of methods. Therefore, in 1949, Hoover went to the University of Nebraska and, in two years, received his B.S. in physics.

With his extensive practical knowledge and experience now properly bolstered with theory, he became instrument officer at the Naval Air Test Center, Patuxent River, in 1951, and the following year returned to Washington as Manager, Weapons Systems, Air Branch, ONR.

Fortune smiled again for, in that same year, the Honorable John Floberg, Assistant Secretary of the Navy for Air, completed flight training at Pensacola and expressed a desire not only for simplified cockpit instrumentation but for a true, all-weather flight capability. Hoover was given the personal assignment and directorship of what soon became the joint Army-Navy Instrumentation Program (ANIP).

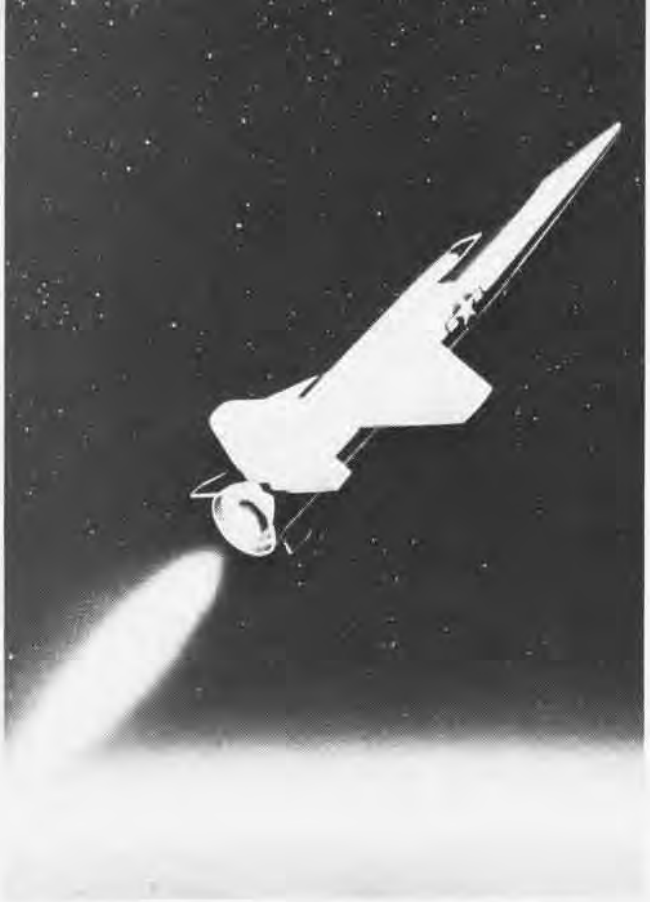
In a sense, ANIP was to serve as a coalescing agent for the solution to several seemingly dissimilar problems. On one hand, there was concern over the increasingly complex aircraft instrument panel. Conversely, the requirement for all-weather flight operation would significantly add to cockpit confusion, especially when viewed in terms of sophisticated weapons delivery systems.

And, too, speeds and altitudes continued their relentless climb. One 1953 ONR-sponsored proposal, which Hoover initiated to determine man's performance outside the atmosphere, called for an aircraft capable of achieving 5,000 knots and an altitude of 700,000 feet. Originated as the rocket-powered Douglas D558-III, the project was subsequently turned over to the Air Force and NACA*, later NASA, where it emerged as the X-15. Technology had suddenly thrust man out upon the threshold of space, a tenuous perch for the poorly prepared.

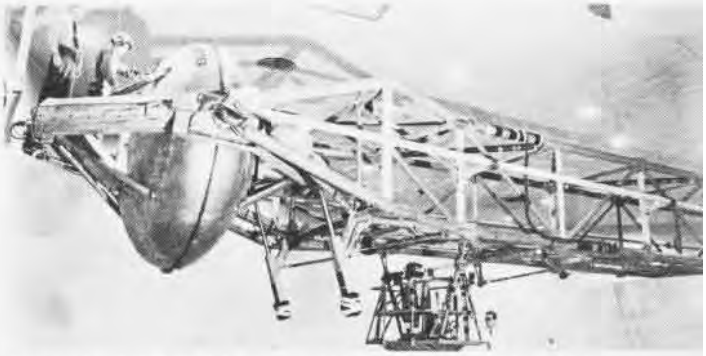
ANIP provided the platform for an integrated approach to aircraft design. The concepts and techniques identified under early ANIP programs generated new and more sophisticated efforts impacting all Navy and Army flight regimes. Under ONR leadership, the Joint Army Navy Aircraft Instrumentation Research Program (JANAIR) resulted from ANIP in 1963. JANAIR continues to conduct applied research using analytical and experimental investigations for identifying, defining and validating advanced concepts which may be applied to future, improved Navy and Army aircraft instrumentation systems.

If we examine the basis of the program in that light, we see that resolution of the instrumentation problem would have much broader application. Since design trends pointed to aircraft that would soon be beyond the physiological limit of man, it became ap-

*National Advisory Committee on Aeronautics



Hoover's work involved operation of more than 100 types and models of aircraft, including choppers. He holds designation of Navy Helicopter Pilot #10.

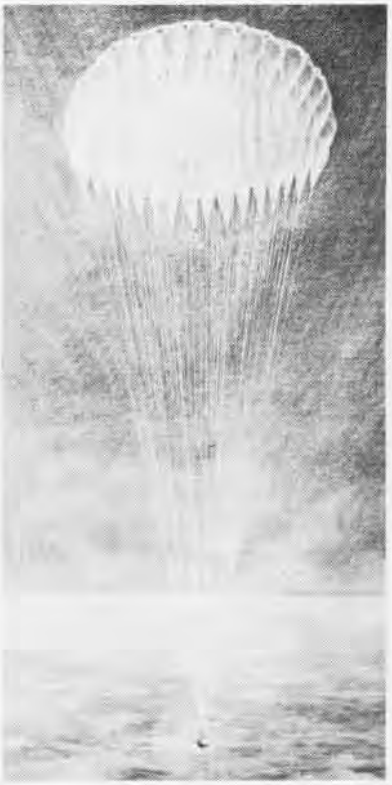


The Douglas D-558-III, left, was ambitious proposal for three high performance test aircraft, costing only $24 million. Project was revised, became the X-15. Above is human centrifuge at Johnsville.

parent that the primary concern must be *that* limitation itself. Instead of placing man in the machine in the traditional manner, the system would have to be built *around* him.

Throughout his career Hoover had devoted his efforts towards the well-being of the man in the cockpit. Already, much had been accomplished by going to fundamentals. Hence, ANIP was directed on the same premise.

"We had to stop looking," he states, "at only one area (instrumentation) as a problem and instead consider a whole family of problems. We had to define our overall objective in its most fundamental terms. We had to recognize the basic requirements and make a clear, concise statement of what the pilot must do with the airplane.



The 1945 Stratosphere Balloon Project (Helios), far right, was to carry man to the edge of space. A later development, Skyhook, came to public attention in 1948 during confusion arising from unidentified flying object (UFO) sightings.

LET GEORGE DO IT

"In order, then, to solve the complete problem, the entire man-machine system had to be treated. Logical organization of the various parts of the system had to be made in order to provide a smooth flow of information and control within a closed loop. Such a system called for a group of sensors, a central computer, a set of displays, controls and the necessary information and power distribution systems to permit smooth operation of the entire loop. Environment, escape and survival had to be integrated with the system. No one part was more important than another. Each was dependent upon the efficiency of the other. Man's requirements were the starting criteria."

By defining the goals of ANIP, the larger, more challenging prospect became obvious. In the abstract, what was really being sought was an integrated approach to the problem of determining under what conditions a man works most efficiently in a high performance vehicle, whether aircraft, submarine, ship, ground or space vehicle. As Hoover saw it, the requirement was for a man-machine system in which the machine or equipment was deliberately designed and adapted to fit the way in which man functions.

There was no precedent for such a system and some of the obstacles seemed insurmountable. Initial research indicated that the most efficient solution to the problem was to provide the pilot with a visual display — a synthetic picture of his outside environment. The logical components were a television-type display and a small computer to generate data for it. Such a concept was new to aircraft designers and some insisted that it would be impossible to achieve a practical system.

However, Hoover's desire and determination to create such a system resulted in steady progress. Into the program were channeled the efforts of more than 60 companies. Both the transparent, flat-plate TV tube and a unique, small, compact, central control computer were developed.

There were still nonbelievers. "One engineer called me a charlatan. I had the TV tube in actual operation on my desk and he looked at it and got angry. He said it couldn't be done. I reminded him that he was *looking* at it! He said it had to be a fake — a trick."

A development of ANIP was the "pathway in the sky" — the display of a ribbon-like path on the screen, along which the pilot literally flies. The integrated panel, a radically simplified and accurate system of flight instrumentation, consisted of a contact analog mounted vertically in front of the pilot, a mechanically operated horizontal navigational map display and standby instruments.

The contact analog is, as the name implies, analogous or similar to contact flight. It reproduces, under all-weather conditions, the same basic visual cues as are seen during flight in clear weather. It was the development of the Kaiser-Aiken flat transparent TV tube which proved the feasibility of the "head-up" display — and led to solid-state cathode ray tubes.

The Litton central control computer laid the groundwork for integration of individual computers and forced ANIP's move toward size and weight reduction of the units — micro-circuitry. Consequently, an entire new American industry was created to provide the electronic components necessary to achieve greater computer capacity, faster processing rates and substantially reduced power requirements.

Above, Lockheed T2V modified by Douglas for flight testing the ANIP cockpit, in 1957. Rear console is standard, front is integrated panel featuring contact analog. The thin, transparent TV tube was developed by Kaiser Aircraft and Electronics Corporation. On opposite page is long-range configuration and early example of "pathway." Modern systems display considerably more information.

Many of the basic concepts developed under ANIP were to be incorporated into the design of modern aircraft and spacecraft. Not only were the Navy's operational capabilities greatly enhanced, but the number of accidents caused by weather and pilot error were materially reduced. Furthermore, the man-machine concept was applied to both the submarine and surface ship programs.

Cdr. Hoover's imagination and foresight took him down varied roads while he was directing ANIP. According to the authoritative Frederick C. Durant of the Smithsonian Institution's National Air and Space Museum, George Hoover secured a place in history with Project *Orbiter*.

Durant is in a position to know, for not only has he written the articles on rockets, guided missiles and space exploration for the *Encyclopaedia Britannica* for the past 15 years, but it was he who arranged the first meeting at ONR in 1954 between Hoover, Dr. Wernher von Braun and other scientists to discuss the possibilities of a satellite project. Further meetings established the feasibility of the program and contracts were let.

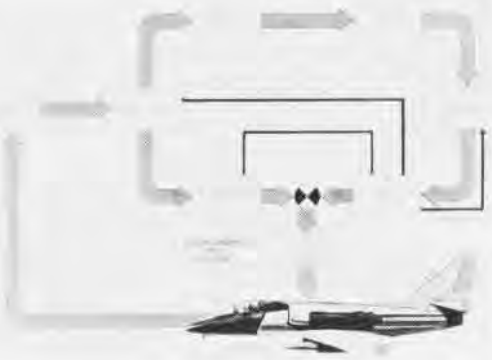
However, when a subsequent proposal by the Naval Research Laboratory (NRL) was given precedence by the Department of Defense, *Orbiter* fell by the sidelines and *Vanguard* took over. What happened after that has been reviewed many times. The sophistication of the *Vanguard* missile precluded a successful launch prior to the Russians' *Sputnik*. In an effort to catch up in the race for space, Dr. von Braun and his team were asked for an urgent assist. On relatively short notice, in January 1958, a face-saving orbit was achieved by *Explorer I*. It was essentially a modification of *Orbiter*. Because of the work previously done by Hoover and the others, it was a fairly simple matter. It could have been accomplished many months earlier. One little publicized feature of *Orbiter* and *Explorer* was that they were both based mainly on existing hardware.

Dr. von Braun relates it this way: "George called me in the summer of 1954 to come to his office. He had called a meeting there, and he opened the meeting with the statement, 'Everybody talks about satellites, then nobody does anything. So, maybe we should put to use the hardware we already have.' And at that time it wasn't very fashionable to even think or talk in the Department of Defense about satellites. George Hoover's contribution to really get the ball rolling should not be forgotten."

Captain Truax makes this observation: "At first I thought he was a crackpot. And when one crackpot thinks another fellow is a crackpot, that is really something! But after he explained what he had in mind and how he planned to do it, it made good sense."

Although Project *Orbiter* in its original configuration had been cancelled, the work that had gone into it triggered the events ultimately leading to the U.S. space program. In 1956, the American Astronautical Society's Space Flight Award was presented to Cdr. Hoover. The presentation, which was made in New York City by the Vice Chief of Naval Operations, Admiral Harry D. Felt, cited the ONR officer's pioneer work in sustained high speed and high altitude research, space medicine and instrumentation — and the "driving spirit, organizing genius, imagination and foresight which set in motion the mighty effort toward the first man-made earth satellite, man's first great step toward space flight."

Above, Dr. von Braun in meeting with Hoover and other engineers to plan Orbiter, depicted in model at far right. Work by group made Explorer possible.



Hoover's man-machine system which integrated essential functions to minimize redundancy.

Explorer I

Orbiter

LET GEORGE DO IT

In 1958, after 25 years of service to Naval Aviation, Hoover retired from active duty. It would be something of an understatement to say he had pursued an interesting career. He would remember with pride flying with Torpedo Six off *Enterprise*. The feelings of accomplishment. The moments of terror. ("When I crashed at Williamsburg, I even worked hard at that!") The fantastic men he worked for, and with. He was Navy Helicopter Pilot #10 – and he had worked in close association with Luis de Florez.

He was also controversial. In his search for truth stemming from fundamentals, he began to use a methodology that was not always understood or accepted. His vision of simplification was often at odds with conventional approach. And, when defending his concepts, he was seldom prone to spread smoothing oil on the waters of chronic skepticism.

He didn't have to. In the battle of ideas, he would enter the lists well armored with facts. He put truth on a spear and attacked without mercy: "Invention inhibits thinking. When you invent something, invariably you freeze. Invention should be a rake-off or by-product of a project, not the goal. If it isn't, you get the invention and end up modifying it for the next 20 years to try to make it work.

"Research and development has been closely associated with the 'ivory tower' concept or with the idea that there is something strange and mysterious about trying to solve a difficult problem. There is also the idea that only a chosen few are capable of solving problems and, that in order to belong to this 'society,' one must have a very extensive, formal education along with enough experience to be classified as an 'expert.' I am not suggesting that formal education is not good, but that we must be aware of the danger that many good ideas are often ignored because experts are certain that these new ideas won't work.

"The trouble was," he states emphatically, "that engineers and doctors speak different languages and relatively few of either discipline make a strong effort to bridge the gap. What was needed was a common denominator—a new language."

One of the lessons learned from the Pearl Harbor disaster was that too much planning had been based upon an enemy's *probable* intentions —it was assumed that an attack might come in the Philippines. In retrospect, the more proper approach would have been to prepare for everything an enemy *could* do. Because such an exploration often seems endless, history is littered with the failures of commanders to take the proper course.

It is in the utilization of a method for avoiding the traditional mistakes and, instead, covering every possibility that Hoover has, perhaps, made his greatest contribution. In his opinion, there were two major weaknesses in previous programs directed toward establishing adequate man-environment relationships:

1. The life-sciences effort was subservient to the physical sciences. (An oxygen system came *after* high altitude aircraft; the anti-G suit was designed *after* high performance capabilities were a reality; and so forth.)

2. The urgency to find solutions to problems created by the advancing technology forced the life-science effort to concentrate on how much man could withstand, rather than to define an optimal man-environment relationship.

The design approach of operational systems had generally been to select a power plant, design the vehicle and equipment—and then accommodate a crew. Hoover proposed a reversal of the process—or, in other words, design of a system to meet *man's* requirements.

The new language employed was called matrix methodology, a system of approach based on uninhibited thinking wherein the problem (or requirement) is clearly defined within a framework of parameters which delineate *all* possible contributing factors. By establishing matrices in which the axes are represented by the sets of parameters, a "checklist" is provided. By using such an analytical approach, Hoover contends that virtually all things are possible. By thoroughly defining the problem, in all its terms, the difficulties can be overcome.

Going back to Francis Bacon again, Hoover quotes, "It is idle to expect any great advancement in science from the superinducing and engrafting of new things upon old. We must begin anew from the very foundation, unless we would revolve forever in a circle of mean and contemptible progress."

Therefore, he tackles a problem with two assumptions: (1) although there may be an infinite number of solutions, there is only one right answer; and (2) *nothing exists* which will solve the problem—yet. The latter assumption prohibits a premature evaluation of the state of the art until after the problem requirements are stated.

The plan of attack is then broken down into five steps:

1. Establish an uninhibited approach. Goals are objectives, not deadlines.

2. State the problem in fundamental terms, not in terms of the present state of the art.

3. Build the program around a complete man-machine system rather than just improve a series of sub-systems.

4. Form a team rather than merely a group of sub-contractors.

5. Finally, utilize a methodology which will permit accurate prediction of success before actually designing hardware.

George Hoover says, "When the fundamental requirements of any problem are established, the solution becomes apparent." And over the years, a growing audience has come to believe him. Since his retirement from active duty, he has applied his

methodology as consultant to a vast array of corporations—Bendix, McDonnell Douglas, Bell, Teledyne, LTV, General Dynamics, Fairchild/Hiller, Curtiss Wright and many others. He was consultant to NASA for the development of human standards for the Apollo program, and he has been actively assisting in the planning and management of ONR research and development programs.

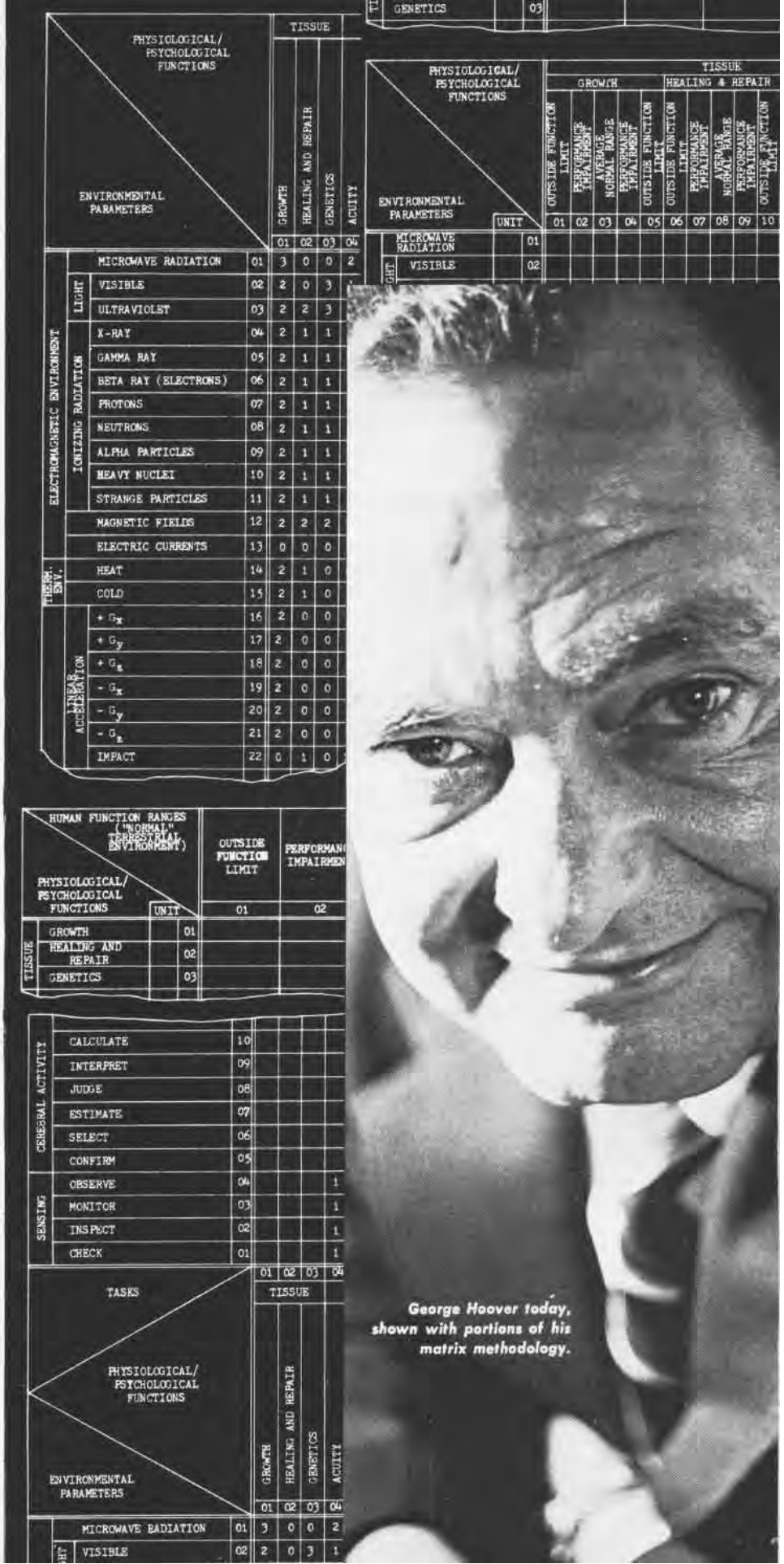
It becomes clear, in looking back over the years, that persistence was the keynote to his progress. Persistence coupled with uninhibited thinking led to his significant accomplishments: design of the standard Link trainer and first operational flight trainer; the integrated cockpit; leadership in human engineering and in the field of high performance flight; the human centrifuge; *Skyhook;* and Project *Orbiter.*

He was fortunate in being in the right place at the right time. It was his involvement with so many varied experiences and his expanding curiosity and interest in diverse fields that led to his personal understanding of the simplicity of the universe. "Man," he maintains, "often complicates life because he *specializes.*"

The work of men like Hoover and his many associates during the last third of a century has provided us with extensions previously only dreamt upon. The once visionary thresholds have become real. "Man's historic concerns have been local. He is now coming to see himself as a product of the universe and is extending his sights from the man-machine concept to the man-environment concept."

Ask him what busies him currently and he is likely to say he is doing independent research on a unified field theory and specific experimentation in unique forms of energy conversion. Twenty years ago: micro-circuitry. Today: amorphic systems. He will also admit to trying to put the universe on a piece of paper—"a *large* piece of paper but still the universe in all its simplicity. . . ."

It has been said that some men light fires; others just fan the flames. George Hoover is still lighting fires.



George Hoover today, shown with portions of his matrix methodology.

NAVAL AIRCRAFT

WI

The Grumman F4F *Wildcat*, the only U.S. Navy fighter to serve throughout all of World War II, was first designed as a biplane in 1935. Designated the XF4F-1, this version soon showed that it could not compete with monoplane fighters and an alternate design was ordered in 1936. This was the XF4F-2, a mid-wing, all-metal monoplane with landing gear which retracted into the fuselage. In flight tests, it proved to be ten mph faster than its competitor, the F2A-1 *Buffalo*, which had earlier shown the F4F biplane design obsolete. Though the F2A won the fly-off tests in 1938, modifications to the *Wildcat* were pushed ahead and a new prototype, the XF4F-3, with increased wingspan, altered tail design and a more powerful engine, showed such promise that initial orders were placed for it in 1939. Other models followed, including F4F-4 and -7, and versions ordered by France and Britain.

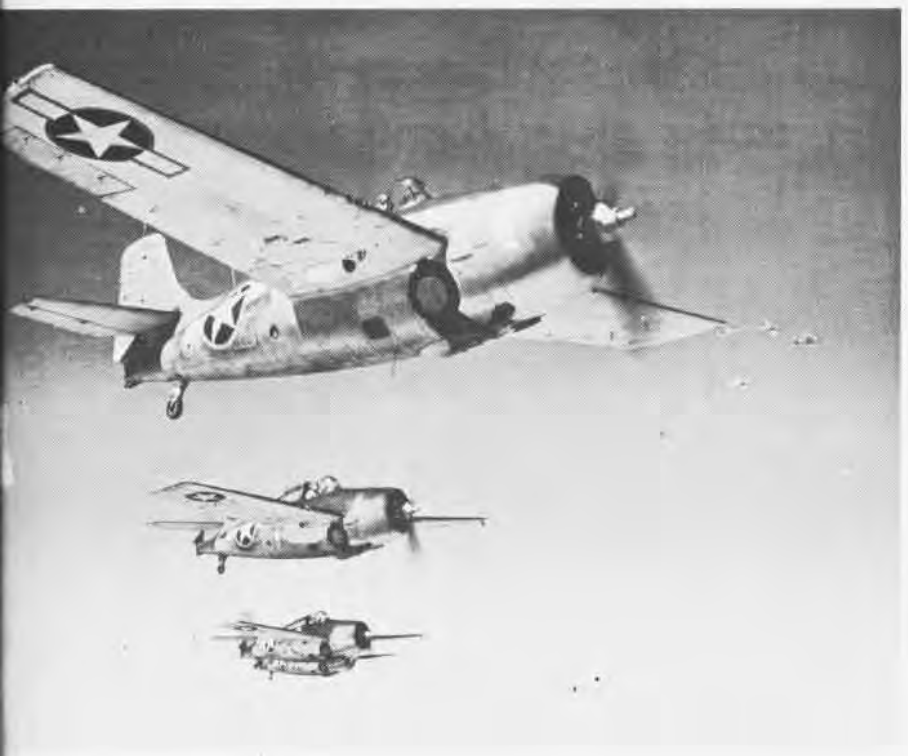
The first *Wildcats* to be delivered to Navy squadrons went to VF-4 and VF-7 at NAS Norfolk, assigned to *Ranger* and *Wasp*, respectively. By the end of 1941, the Navy and Marine Corps had received 248 of the stubby little fighters. These suffered their first combat losses at the Marine air stations at Ewa, Hawaii, and Wake Island on December 7, 1941, during Japanese attacks, but soon revenged themselves against raiding bombers at Wake before being overcome by the vastly superior numbers of the attacking force. This was not the F4F's first taste of combat. In the Royal Navy as *Martlets* they had already seen action against the Luftwaffe off Britain's coast.

The F4F-4 introduced in 1941, added a new feature to the *Wildcat*: folding wings. Though manually operated, this alteration added to the planes' utility, particularly on the small flight decks of escort carriers where they soon appeared as teammates to another Grumman product, the TBF *Avenger*, as part of the ASW effort in the Atlantic. *Wildcats* participated in the important sea battles of Coral Sea and Midway and served with the Marines at Guadalcanal. They also made up the Navy's fighter force during the North African landings in November 1942.

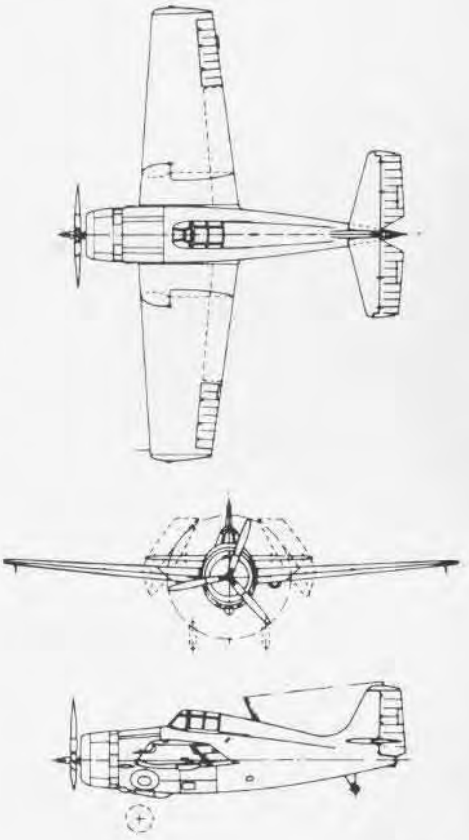
In April 1942, Eastern Aircraft assumed *Wildcat* production to allow Grumman to concentrate on the F6F. Eastern's versions were designated FM-1's and -2's, and, in British service, as *Wildcat V's and VI's*. The FM-2 was recognized by its taller stabilizer.

Though inferior in performance in certain respects to many of the fighters met in combat, *Wildcats*, because of their rugged construction and the well trained men who flew them, maintained a victory-to-loss ratio of nearly seven to one, even though they were the only carrier-based fighters operated by the Navy during the first half of the war in the Pacific.

,DCAT



Length	FMF/FM-1	28' 9"
	FM-2	28'11"
Height		11'4"
Wingspan		38'0"
Engines		
	F4F-3	R-1830-76 1,200 hp
	F4F-4	R-1830-86 1,200 hp
	FM-2	R-1820-56 1,350 hp
Maximum speed		
	F4F-4/FM-1	320 mph
	FM-2	332 mph
Service ceiling		
	F4F-4/FM-1	34,900'
	FM-2	34,700'
Range		
	F4F-4/FM-1	770 st. mi.
	FM-2	900 st. mi.
Armament		
	F4F-4	Six .50 cal. and two 100-lb. bombs
	FM-1	Four .50 cal. and two 100-lb. bombs
	FM-2	Four .50 cal. and six 5" rockets or two 250-lb. bombs



Somebody Does Care

By Captain D. B. Miller

On August 5, 1964, the first plane rolled in on the first target in the northern sector of North Vietnam — Hon Gay. Also on that day, during that strike, LCdr. (then Ltjg.) Everett Alvarez, flying with VA-144 from USS *Constellation*, was shot down and captured. After more than seven years, he is still a prisoner of war.

These events have special significance for members of the Red River Valley Fighter Pilots Association who call themselves *River Rats*.

Their membership is composed of Navy, Army, Marine and Air Force personnel who flew on at least one mission over what came to be known as Route Package VI, centering around Hanoi and the Red River Valley of North Vietnam — by many standards, the most heavily defended area in the history of air warfare. Concern for their close friends and comrades-in-arms who are prisoners or missing is the driving force behind the *River Rats* at the present time.

Centering on the POW/MIA issue as their main purpose was neither difficult nor coincidental. Every member can think back to at least one mission and say, "There, but for the grace of God, go I." All of them have close friends who are prisoners or are missing. With the exception of the wives and families of the POW's and MIA's, no other single group or organization in the country has a deeper interest than the *River Rats* in the welfare of these men and their families from whom they remain so cruelly separated.

River Rat concern for POW/MIA's takes a number of forms.

At least as important as any other activity is keeping people both aware and concerned about the problem — not only in this country, but also around the world. Letter writing to world leaders, bumper stickers, POW bracelets, local speaking engagements and organizing POW/MIA activities with local organizations, billboard displays — these are some of the things the *River Rats* are doing to keep people aware and concerned for their buddies who are prisoners or missing.

Perhaps more tangible and satisfying are the things that can be done to directly assist the wives and families of the POW's and MIA's. A growing scholarship fund is providing educational assistance to sons and daughters of these men. Incorporated as the Red River Valley Scholarship Foundation, it has provided 18 one-thousand-dollar scholarships to POW/MIA juniors in the past two years.

The money has come from industry, private organizations, sponsored fund-raising activities, private individuals and a substantial portion from the membership. The goal of the fund is to provide scholarship assistance to all Southeast Asia POW/MIA sons and daughters who are accepted by an accredited college and who maintain a passing grade level. Applications are accepted between January and June.

In addition to the scholarships, a number of bases and stations around the country have local *River Rat* Forces which have organized personal assistance for POW/MIA wives and their dependents. Twenty Navy installations and two Marine air stations have local forces at the present time. These activities in no way compete or conflict with the Casualty Assistance Calls Program, but merely broaden the base of assistance by providing a large group of military "sponsors" with a deep personal interest in the problem.

Picnics, man-type house repairs and chores, ball games, camping, sports, family outings, Christmas parties and other social events with *River Rats* and their wives and the POW/MIA wives and families are typical of the local activities.

It is the goal of the association to make all of the POW/MIA families aware that the *River Rats* are available and anxious to help them in any way possible; to represent their interests at any time, any place; and to warmly encourage them to keep their

ties with the military family if they so desire.

The idea of starting the association came from Air Force Colonel Howard "Scrappy" Johnson, 388th Tactical Fighter Wing, Korat, Thailand, in 1967. His plan was to hold periodic tactics conferences of pilots who were flying over the northern sector in order to exchange ideas and to discuss problems involved with penetrating and exiting the "valley."

Thus was born the association, and the tactics conferences soon became "practice" reunions, which continued the superb fellowship developed between aircrews who fought in the air war over the north. Regular reunions are to replace practice reunions only after the POW *River Rats* are released and able to attend. At that time, the large bronze *River Rat* bell will be rung for the first time and the names of all returning POW's will be inscribed on its surface.

This bell, which came from Thailand, and whose clapper has been disabled until the return of the POW's, was on display to more than a million visitors at the Air Force Academy Chapel last year. This year it is on display at the Naval Aviation Museum in Pensacola.

Practice reunions have been held in various areas of Thailand, including Korat, Takhli, Ubon and Udorn. Since the association was formally incorporated in 1969, national practice reunions have been held at McConnell AFB, Wichita, Kan.; Randolph AFB, San Antonio, Tex.; and NAS Miramar, San Diego, Calif.

National membership now exceeds 2,200 aircrew members of all four services, with local forces organized at 86 bases and stations in the U.S. and overseas. Army personnel from the Son Tay search and rescue mission became eligible for membership last year, and associate memberships have been extended to senior officers in the chain of command who were in direct command of *River Rats* while missions were being flown into Route Package VI.

Next year's reunion is scheduled to be held in April in Wichita. The members fervently hope and pray that the *River Rat* bell will ring for this next reunion, and that it will not have to be a practice affair as it has been in the past.

Inquiries regarding the River Rat Association or the Scholarship Foundation may be addressed to RRVFPA, Box 2545, Arlington, Va. 22202.

DIARY OF A PRISONER OF WAR

The nights are lonely and the wind is still,
No more that canopy of thrill.
I sit alone, a pilot caught . . . .
Old friend, I implore you, forget me not!

That misty feeling keeps filtering back.
Formation closed — then the attack.
Someone saying, "Give it a try."
Not knowing then that the sign was goodbye.

Each day blends with the long cold night,
And dreams relive the failing sight.
Of seeing friends with whom I've fought . . . .
Now, I implore you, forget me not.

But is it a dream? Perhaps I am dead,
And God is trying me instead.
Just give me a sign . . . lest here I rot,
Please, I implore you, forget me not.

Thinking of times and the hopes I've had,
My wife, my kids, my mom and dad. . . .
Treasuring the days my life had brought,
I beg of you now — please — forget me not!

My son of five, by now, is ten,
Will he recall the moments when
We flew above the kitchen floor,
And parked our plane by the pantry door?

I must know now, before it's too late,
Is this to be my final fate?
If you all could spare just one little thought,
I'm sitting here praying — please, forget me not!

an anonymous River Rat

The United States Government is deeply concerned about American prisoners of war and missing in action in Southeast Asia, and is fully committed to doing everything possible to reach the ultimate goal—the earliest possible release of the prisoners and determination of the fate of the missing.

Most Americans are committed to the ultimate goal but may not be fully aware of the intermediate goal—to insure humane treatment for those men in captivity.

There are more than 1,600 American fighting men listed as missing in action in Southeast Asia since the United States became involved in the Vietnam war. Of that number, it is believed that fewer than 500 are held as prisoners of war by the enemy, but so far no person or agency has been able to obtain the exact number.

Hanoi has consistently refused to give the United States Government an accurate list of prisoners of war . . . a list that is required by the Geneva Convention, of which North Vietnam and the United States are signator parties.

Communist North Vietnam and other communist countries make the specious case that captured Americans legally are not prisoners of war and, thus, are beyond protection of the POW Convention. No humanitarian could morally subscribe to that argument.

The articles of the Convention read: ". . . the present Convention shall apply to all cases of declared war or of any other armed conflict which may arise between two or more of the High Contracting Parties, even if the state of war is not recognized by one of them . . ."

North Vietnam is a party to the Convention, as is the United States and South Vietnam. U.S. prisoners are not "war criminals," and in any case North Vietnam's statements to that effect cannot deprive them of their rights under the Geneva Convention. The International Committee of the Red Cross has repeatedly confirmed that all prisoners of war held by North Vietnam are entitled to the protection of the Geneva Convention.

The convention also specifically prohibits inhumane treatment, physical mutilation, unjustifiable medical or scientific experiments not carried out solely in the interest of the prisoners health, and acts of violence, intimidation and insults from the public.

In North Vietnam, prisoners have been publicly humiliated, mistreated and exploited. Widely publicized photographs have shown American pilots being paraded before jeering mobs in Hanoi and displayed at news conferences. The Communists have refused to release sick and wounded. Many of the men captured or missing in action are pilots with serious injuries incurred when they were shot down. No one knows how many of these men have died or are dying from their injuries and lack of proper medical treatment; perhaps no one ever will know.

Article 17 of the Convention prohibits physical or mental torture, or any other form of coercion to be inflicted on prisoners of war to secure from them information of any kind whatever.

Yet pictures and films released or approved by North Vietnam have shown U.S. Prisoners in what appears to be solitary confinement. Returned prisoners confirm that physical and mental torture are extensive, raising serious questions as to whether the prisoners are receiving proper medical care and diet, since they show them continuing to suffer from injuries apparently incurred at the time they were captured, and in some cases having lost much weight.

The Geneva Convention imposes as absolute obligation to release prisoners of war who are seriously sick or wounded and who wish to return home, as soon as they are fit to travel. In addition they may "conclude agreements with a view to the direct repatriation or internment in a neutral country of able-bodied prisoners of war who have undergone long periods of captivity. Many of those known to be prisoners in North Vietnam have been there over six years.

The refusal of Hanoi to give the United States Government an official list of those Americans held prisoner of war is in direct violation of the

At Oceana, Cdr. M.F. Andrassy, C.O. of VA-42, presents a $1,000 scholarship to the wife of Captain Jeremiah A. Denton, Jr., for their son, Jeremiah III, left , as Commander J. E. McCardell, C.O. of VF-101, presents a scholarship to the wife of Captain James A. Mulligan, Jr., for their son, James III.

eneva Convention. It has resulted in eedless suspense and torture for ap-roximately 10,000 Americans who ve in the shadow of despair wonder-g if their loved one is alive or not.

Not only has Hanoi refused to re-ase an official list, for several years ey refused to allow any mail to or om Americans being held. In fact, nly recently are letters in any quan-ty being allowed to filter through to ependents and loved ones in the nited States. On this subject, the onvention on Prisoners of War is xplicit. There are no legal dodges. ne reads: "Immediately on capture, r not more than one week after ar-val at a camp, even if it is a transit amp, likewise in cases of sickness or ansfer to hospital or to another camp, very prisoner of war shall be enabled write direct to his family . . ."

The only list of prisoners held by lanoi that the U.S. Government has t present has been compiled from the eager number of personal letters that ave been allowed out of North Viet-am and from information provided y Hanoi, through unofficial channels. hese lists, however, are only partial sts of persons in enemy custody and re inhumanely incomplete.

During the first seven months of 971, approximately 350 letters were ceived by the families. Some fam-ies received several of that number om one individual prisoner . . . hich means there were other families ho received nothing.

President Nixon has told the world: "This is not a political or military issue, but a matter of basic humanity. There may be disagreement about other aspects of this conflict, but there can be no disagreement on humane treatment for prisoners of war. I state again our readiness to proceed at once to arrangements for the release of prisoners of war on both sides."

The United States and South Vietnam, in cooperation with the International Committee of the Red Cross, are carrying out the obligation to repatriate sick and wounded prisoners of war. Prior to 1967 about 100 North Vietnamese prisoners were accepted by Hanoi across the Ben Hai bridge in the DMZ, but since that time repatriations have not been possible because the bridge has been destroyed and the area has been the scene of heavy fighting. South Vietnam has repeatedly sought to arrange the return of seriously sick and wounded North Vietnamese by other means, but North Vietnam refuses to acknowledge that these prisoners are members of its armed forces, and have refused such arrangements.

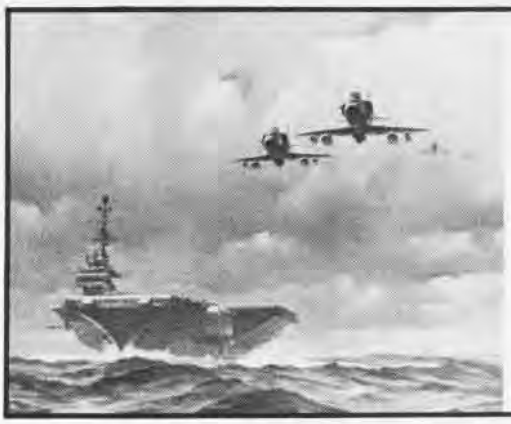
To date, a total of nine U.S. prisoners have been released by North Vietnam and some 25 (including three civilians) by the Viet Cong. But the Communist authorities have shown no interest in negotiations for the release or exchange of prisoners.

The United States and her allies in Southeast Asia will continue to press the Communist forces there to treat prisoners humanely, to provide information about them, to allow all prisoners to correspond with their families, to permit impartial inspection of prisoners-of-war camps, and to release all prisoners of war as soon as possible.

Footnote

There have been many other violations of the Geneva Convention by the Communists. It is unfortunate that many Americans are still confused or have gross misconceptions about facts of the Geneva Convention. The recruiting community has as much contact with the general public as any other organization of the Armed Forces. Through this contact Recruiters in every locale can be of immeasurable value by being prepared to answer questions concerning the humanitarian aspects of the POW/MIA issue when asked. If further information is required, contact Commander Joe H. Ausley, Jr., USN, OPNAV (Op–09-BW1), Washington, D.C. 20350. autovon 22–77371 or 77372, or area code 202 697–7371, or 77372.

Reprinted from *Navy Recruiter*, October 1971



at Sea with the Carriers

PACIFIC FLEET

Hancock (CVA–19)

Captain Albert J. Monger relieved Captain Theodore L. Johnson as commanding officer in October. Key speaker at the change-of-command ceremony was Vice Admiral Thomas J. Walker, ComNavAirPac.

Captain Johnson's next assignment takes him to Washington, D.C., for duty with the Naval Air Systems Command. Capt. Monger served aboard his new command five years ago as CAW-21. Before assuming command of *Hancock*, Monger was skipper of USS *Mauna Kea* (AE-22).

Kitty Hawk (CVA–63)

The heavy, down-home voice of the air boss split the air with "five minutes to launch." On the flight deck, men in colored jerseys seemed not to notice and went about the routine of preparing for the first launch. They moved around the exhaust-burned deck of *Kitty Hawk*, knowing that in 12 hours it would be over.

This was the last day on Yankee Station for CVA-63 after eight and a half months with Task Force 77 in WestPac. She would sail home for a well deserved rest after completing her fifth and longest combat deployment. Her primary mission had been to slow down the heavy enemy supply traffic into South Vietnam. She had been successful.

Perhaps the most remarkable thing about the ship's fifth combat cruise was mentioned by *Kitty Hawk's* C.O. While speaking to the crew over closed-circuit TV, Captain O. H. Oberg noted, "We have set records that people will have trouble equaling, let alone breaking. But, our biggest accomplishment is completing a cruise without a single combat loss."

Kitty Hawk's contribution in the area of missions was also quite an accomplishment. The *Phantoms, Corsairs, Intruders* and support aircraft of CVW-11 were launched nearly 15,000 times during 135 days on the line.

Enterprise (CVAN–65)

VF-143's LCdr. Phil Rupprecht and Lt. Fred Vogt came very close to the 113,000th landing aboard *Enterprise* on Yankee Station recently, but not close enough. Approaching the carrier in an F-4J, they were waved off to allow an E-2 *Hawkeye*, side number

A Kitty Hawk bomb handler gazes at seemingly endless rows of bombs, right. Opposite, CVA-63 comes to port followed by plane guards.

013, piloted by Lt. Tom Hart from VAW-113, to make the 113,000th landing.

Unaware of why they had been waved off, the two had the distinction of completing number 113,001.

The next evening, Rear Admiral selectee Captain F. S. Petersen, then commanding officer of *Enterprise*, since relieved by Captain Ernest C. Pessop, appeared for a small ceremony in VF-143's ready room. He presented the two with a certificate which stated, "Be it known that Lt. Fred Vogt/LCdr. Phil Rupprecht, through adroit stick handling, keen eyes, plus a tight pattern and no small amount of upmanship, having cut out all others, completed the last waveoff before the 113,000th arrested landing aboard *Enterprise* (CVAN-65) on Aug. 19, 1971."

Ticonderoga (CVS–14)

Commander Jerry Williams, executive officer of VS-38, and his copilot, Lt. Austin McMahon, celebrated the opening of this year's Tailhook Convention by bringing in an S-2E *Tracker* for the 142,000th arrested landing aboard CVS-14 since her commissioning. The event took place during a First Fleet exercise off the coast of Southern California.

It may or may not be a first, but Enterprise baked a cake in honor of a wave-off.

Midway (CVA–41)

Lt. David D. Patterson has the distinction of recording *Midway's* 156,000th landing — in a VA-56 A-7 *Corsair*.

Jet aircraft in general and *Crusaders* in particular are known for their infamous idiosyncracies and various aches and pains. They wheeze, creak and moan, each with a personality of its own.

RF-8G, Buno 146856, presently assigned to Light Photographic Squadron Sixty-three, Detachment Three, is certainly no exception to the rule. While deployed to Yankee Station onboard *Midway*, the *Crusader* was the only photographic reconnaissance aircraft on board for a period of 15 days. During this time, it met all of the detachment's commitments on 35 consecutive combat photographic sorties.

The venerable aircraft made it 36 goes in a row when it successfully launched to the beach.

ATLANTIC FLEET

Lexington (CVT–16)

While conducting carrier qualifications 50 miles south of Pensacola, CVT-16 received a call from the Coast Guard concerning the safety of a crewman on board the fishing vessel *Radar*

MIDWAY'S PLAT

Midway Pilot Landing Aid TV (PLAT) is broadcast continuously over the PLAT control system during the daily launch and recovery period. Above, PLAT radar unit measures the speed of an incoming A-6. Information is recorded on PLAT tape and used by the LSO to guide the aircraft in.

Four cameras, strategically located, zero in on an approaching aircraft. Pictures are fed to PLAT tape in control unit, opposite, from maneuverable camera, at side of flight deck, above, and from two center-line cameras equipped with cross hairs on lens. Fourth camera records time, date, speed and wind velocity.

PLAT tape, left, records information from cameras, radar units, voice communications from LSO, primary flight control and carrier air traffic control. Tapes are used during debriefings and act as instant training devices. System helps to avoid/correct human mistakes and provide safer landings aboard all carriers.

Photos by JOSN Mark Wilson

II out of New Orleans, who was reported suffering from exposure. *Lexington*, maneuvering in moderate rain and low visibility, was able to quickly locate the small boat, and dispatched her search and rescue helicopter to confirm the sighting. It was the *Radar II*, and a crewman from the helo was lowered in a sling to pick up the stricken man who was taken directly to the heliport at the Pensacola Baptist Hospital. This was the fourth rescue for the *Lexington* SAR Det since it was formed in May 1970.

Saratoga (CVA–60)

A crewman of a U.S. destroyer underwent an appendectomy on board *Sara* recently after he was flown from his ship, USS *McCard* (DD-822), cruising 200 miles away. GMG3 Robert F. Hornbaker was diagnosed as having appendicitis and a radio message for assistance was beamed to the carrier. As the two ships sped together, an HS-7 helicopter was dispatched to the destroyer. The helo picked up the disabled crewman and shuttled him to the carrier. Five hours after the radio call for help, Hornbaker was recovering from surgery in *Saratoga's* intensive care ward.

Members of the helicopter crew were Lieutenants Steve Aune and Jim Druyors, AWC Edward Hall and AW3 Robert Million.

Saratoga claimed a first recently when an enlisted man took charge on the bridge as officer of the deck while the ship was underway.

RDC Wilfred F. Evans is the first enlisted crewman to step into the post and now stands regular duty as the OOD — a responsibility which puts him in charge of *Sara's* operation directly under the commanding officer, Captain James R. Sanderson.

It was a study in contrast for the chief. He has served as commanding crewman of smaller ships, including minesweepers and 31-foot-long river patrol boats — all far cries from the 1,039-foot-long carrier.

Besides experience with other ships, Chief Evans brings his knowledge as a radarman with him when he assumes the watch. In his primary duty, he makes operating recommendations to the bridge. His expertise has paid off as he advanced from junior officer of the watch through junior officer of the deck to OOD.

NAVAL AVIATION NEWS

Navy's Lady Loadmaster

ROTA, Spain — What's it like being a woman loadmaster in the Navy? Has Women's Lib really hit the Navy? The answer is "fun and different" to the first question, and "sort of" to the second, according to a lady who really enjoys her job — AZ1 Clementine J. McDonald, NARTU Jacksonville, Fla.

The sight of a woman fueling a plane and loading cargo seems to shake up some of the men in the system a little because men "just aren't used to taking orders from and seeing a woman do that sort of work."

PO McDonald tells of the time when her plane landed at an Air Force base and "the man in the office didn't know what to say or do when I walked in and ordered fuel for the plane. But it really shocked them when I helped the crew fuel the plane."

Clementine started her service career during WW II, driving, of all things, an ammo truck (somebody had to), teaching girls to operate switchboards and operating a teletype. She returned to civilian life after two years and became interested in flying while working at the transfer desk of the NARTU's rework facility. It was then that she decided to join the Naval Air Reserve.

"The loadmaster thing really started as a joke and, finally, I decided to take on the challenge," she says. The challenge proved interesting. As loadmaster, she calculates the aircraft's weight and its distribution for use during takeoff and landing, determines how to load the plane so there is a proper distribution of weight, acts as stewardess and generally takes charge of the cabin and the administrative details of preparing the aircraft for flight.

According to the lady loadmaster, "If a woman wants to do a man's job, she should be prepared to do all the job — including the parts which are distasteful." And she believes and practices that theory. It does not bother Mrs. McDonald to put her back up to a big crate and help move it or to get out on a wing to fuel a plane.

The Ever Changing Altimeter

By Commander N. F. O'Connor

It's a known fact that violent natural forces such as earthquakes, tornadoes and hurricanes are continually altering the face of the earth. Perhaps inattention to altimeter settings should be added to the list.

By now the word is out — or should be! On September 1, 1971, the method of computing altimeter settings in the U.S. was changed to conform to worldwide civil aviation procedures. Previously, altimeter settings were computed for ten feet above field elevation. The new procedure is to compute the altimeter setting for the exact elevation of the field. This change also affects shipboard operations as those altimeter settings have routinely been computed for the ten-foot elevation above flight deck level.

Perhaps this change in computing altimeter settings is fortuitous in light of a recent Department of Commerce report which states that all of North America is in a state of settling and upheaval. Don't worry about the difference in altimeter settings between those cities; this change took place over the past 10 million years. So, as the East Coast moves north, the West Coast moves south, rotating in a counter-clockwise manner. As a matter of interest, Europe and Asia are apparently moving clockwise in the opposite direction, but somewhat more slowly.

More applicable to future altimeter settings, though, is the fact that New England's coast is sinking about 2½ feet every 100 years while the continent from Wisconsin-Michigan to the Atlantic Coast is being uplifted about five feet every 100 years.

It should be reassuring to the Naval Aviation community that there are those at the support level that are looking ahead. In the short term, though, just remember that altimeters are constantly changing as migratory pressure systems move through an area. Most important, recall that altimeter settings are now provided for field elevations and deck levels and not for ten feet above, as reported.

THE SELECTED AIR RESERVE

Total Force

Navy men, step back and let the new breed of Reservist show you what he can do; he's eager to prove his ability to serve at your side when the need arises.

This new confidence is due to a concept which is preparing U.S. Naval Air Reservists to move as a squadron and participate in missions of the fleet. The first test of this program was completed on Okinawa when VP-91, a Reserve unit, performed operational missions during its two-week training period last summer.

The new program is labeled the force concept because the Reserve squadron has custody of its own planes and trains as a unit throughout the year. The idea is to complement the strength of the active armed forces through increased emphasis on the mobilization of Ready Reserves in a national emergency.

Because of the new efforts, Reservists in VP-91 and three similar squadrons in the Pacific feel they have an important mission to perform. The program is paying off in better training and increased morale and retention. VP-91 was the recipient of the first application of the force concept. In November 1970, the Moffett Field-based squadron was one of the initial units brought into the revised program — when it began flying its own P-3A *Orions*. In May of this year, VP-91 was the first Naval Air Reserve unit brought up to strength as a full-size P-3 patrol squadron by the merger of three Air Reserve units.

At NAF Naha, Okinawa, VP-91 worked in conjunction with VP-22, an active duty squadron deployed from NAS Barbers Point, Hawaii. The Reserve squadron relied on its host squadron for support equipment only, while its own personnel performed all tasks necessary to keep its planes in operation.

"We've been training for these two weeks all year long," explains LCdr. P. W. Rollinson, one of two active duty officers assigned to VP-91. Two-thirds of the men in the squadron are Reservists; the remaining one-third are active duty personnel assigned to training and administration of the Reserves (TAR's).

In a sense, the operations of VP-91 are a test of the success of the new Reserve force concept. From Naha, VP-91 crews flew three operational and ASW flights each day, augmenting VP-22 flights to cover an ocean area stretching from Japan to the Philippines.

During its two weeks of actual operations, VP-91 maintained air surveillance over shipping lanes and attempted to detect submarines operating in the areas around Okinawa.

The squadron also underwent an extensive operational readiness inspection conducted by Commander Fleet Air Reserve Wing, Pacific, Captain G. A. Surovik, and members of his staff. Observers flew with squadron aircraft and noted the unit's performance during a patrol exercise with the submarine USS *Swordfish* (SSN-579).

"This cruise has shown that the force concept is viable and that Reservists can take on operational missions," states VP-91 commanding officer, Commander Robert J. Husmann. "This has not been training, but rather it has been a deployment; the squadron filled operational commitments of the fleet. The men were dedicated to meeting these commitments."

Ninety-four percent of the squadron personnel were deployed with the squadron. They performed as eight crews, training and flying together. They are all experienced in their duties and to maintain proficiency in their military fields and to keep abreast of new developments, the men of VP-91 train regularly and diligently when they are at Moffett Field. To remain a member of the Selected Air Reserve, as a member of VP-91, each man must attend at least 90 percent of scheduled drills during the year. In addition, under the force concept, VP-91 has been authorized 36 extra drills.

Annual Awards

Due to the reorganization of the Naval Air Reserve which occurred during fiscal year 1971, no trophies will be awarded for readiness and efficiency for that period.

Competition in these two areas has resumed, however, for the current fiscal year.

In the areas of recruiting and retention for fiscal year 1971, Air Reserve officials have announced the following trophies and their winners: Richard K. West Trophy to the station or unit achieving the highest retention percentage of veteran officer and enlisted personnel — NARTU Memphis, Tenn.; Chance Vought Trophy to the station showing outstanding achievement in the Naval Cadet program — NAS Atlanta, Ga.; Beartrap Trophy to the station or unit showing the greatest improvement in officer recruiting — NARTU Washington, D.C.; Lockheed Trophy to the station or unit with the best recruiting and retention record — NARTU Norfolk, Va. (second consecutive award).

Ready

The Naval Air Reserve in San Diego has passed inspection and is ready, willing and able to work side by side with the fleet when needed. This was the conclusion of a 32-man CNAResTra inspection team from Glenview, Ill., which recently concluded a five-day inspection of the 22 Naval Air Reserve units in the San Diego area.

Highlights of the inspection included checks of administrative pro-

cedures and material conditions in tactical and non-tactical squadrons and units located aboard Naval Air Stations North Island, Miramar and Imperial Beach.

Rear Admiral Howard E. Greer, Commander Naval Reserve Forces/ Chief of Naval Air Reserve Training, was on hand for much of the inspection and presided at the critique which officially ended the inspection. He commended the officers and men for the "exceptional progress" made since the establishment of the North Island-based Naval Air Reserve Forces command last year.

The North Island command, headed by Captain John G. Korecki, was established as a training unit in August 1970 and has since been designated the senior Naval Air Reserve facility in the San Diego area. As such, it has coordinated the establishment of Naval Air Reserve activities at Miramar and Imperial Beach.

Cross-Service

The exploits of Navy recruiters are legendary but the following may be remembered as one of the easiest and seemingly bold recruiting exploits of all time: enlisting five Air Force men into the Navy, enlisting them before their contract with the Air Force was even half over and, best of all, having an Air Force general administer the oath of enlistment.

This cross-service enlistment took place recently at Selfridge Air National Guard Base. (Selfridge was an Air Force base until June 30.)

One of the Air Force Reserve units at Selfridge, the 63rd Tactical Air Support Squadron, entered into a reorganization program and several billets within the unit's structure were done away with. The area of aviation ordnance specialist was one of the hardest hit spots and several of these specialists were faced with the prospect of separation.

Enter the Navy with a solution. Selfridge is also the home of NAF Detroit and some 1,500 Naval Air Reservists. One of the Reserve squadrons had openings in aviation ordnance and arranged a cross-service enlistment for the Air Force types.

Back to Willow Grove

Commander Tom Nabors led a happy complement of officers and men from VR-50 back to NAS Willow Grove, Pa., following a highly successful two weeks of active duty at NS Rota, Spain. After establishing operations and maintenance centers, the squadron flew all transport missions assigned by Naval Air Logistics Control Office, Atlantic. The squadron operated under the administrative control of Commander in Chief, U.S. Naval Forces, Europe.

Under the direction of Commander Mort Comer, maintenance crews provided more than 84 percent availability for four C-118's. Aircrews logged 1,990 flight hours; pilots flew 756 hours — over 62 hours each; and all aircrews returned to home station qualified and current.

In meeting 31 transport mission commitments, more than two million passenger-miles and 45,787 ton-miles of cargo were flown. Included in this total were 110 Reservists from Naval Reserve Training Detachment, Wilmington, Del., who were airlifted to Naples, Italy, to participate in two weeks of active duty aboard USS *Gearing* (DD-710). Daily passenger and cargo flights supporting U.S. forces in the Mediterranean were flown to Naples, Athens, Madrid, Wiesbaden and Crete.

During the cruise, Cdr. Nabors gave a command presentation briefing to Dr. Theodore C. Marrs, Assistant Secretary of Defense for Reserve Affairs. The briefing included a report on squadron operations, organization and training since the squadron was commissioned in November 1970.

VP-91 crewmen sharpened their skills during a summer deployment to NAF Naha. The squadron was involved in testing the new force concept.

Typically Untypical

By Michael G. McDonell

Photos by JOC Dick Benjamin

There are no typical plane captains. They are as different from each other as the societies which produce them and as the squadrons in which they serve. They come from Sioux Falls, Bangor, Taos. Their squadrons fly props, rotors, jets. But what they share in common with others of their kind is their youth — they are seldom old, ranging from the late teens to early twenties. They also share an awesome responsibility and a very special dedication to an aircraft and its crew.

What is a plane captain? If you could find the term in a dictionary, it might be defined as "an enlisted man responsible for the aircraft's preflight and overall readiness for flight." But definitions have a way of sounding antiseptic; they seem only to scratch the surface.

To learn more about the plane captain, pick an air station and a squadron, and walk out to the flight line. Chances are that the man you observe packing the drag chute into the tail end of an F-4 *Phantom* is a plane captain. When he finishes checking the cockpit, he will tell you about himself and his job.

David Larimer is his name. He is an aviation fire control technician, an AQAN, and he is with VF-32 at NAS Oceana. For two and one-half years, the Navy has been his home. The 21-year-old plane captain talks about his job in the soft, down-home accent of his native Georgia. "I came to the squadron in November 1969 after completing AQ school at NATTC Memphis and eight weeks of on-the-job training (OJT) with VF-101 at NAS Key West, Fla."

When a new, junior airman is assigned to his first squadron, he normally performs a task that he learned at boot camp — armed with mop and broom, he takes his turn at "compartment cleaning."

Dave Larimer was no exception. "I compartment cleaned for about six months — sweeping and cleaning the barracks. Then, I went to the AQ shop where I trouble-shot the radar on the F-4."

Did he feel that he was prepared when he was assigned to the AQ shop? "I learned aviation electronics at avionics fundamentals school and was familiar with general radar. My eight weeks of OJT with VF-101 taught me about the specific radar that the F-4 uses, the APQ-72. When I was assigned to VF-32's AQ shop, I worked with a crew leader. When a down aircraft came in, they would assign a second class to repair it and I would work with him on the radar. I was with the AQ shop for about five months when I went out to the line."

It was his experience on the flight line that convinced him that he wanted to become a plane captain.

"I went out to the line and worked with a plane captain as his second mech. For about four or five months I assisted him and he taught me his job: fueling, preflighting, packing drag chutes, hooking up the 'huffer' (engine starter), the whole works."

At the end of this period of apprenticeship, Dave was gratified to perform the duties of a plane captain and he volunteered to serve in that capacity.

Why did he choose to become a plane captain? The young Georgian answers: "I like working on the line. You have a feeling of independence — you have your own aircraft and you know what you have to do each day. You go out and do it. There isn't someone constantly supervising you; you have responsibility and you know it."

Does he feel responsibility to the two men who fly his aircraft? The answer is brief and declarative. "Definitely."

When the squadron is not deployed, the plane captain's daily duties take on a somewhat routine pace.

"My day at the squadron begins at 0745," Larimer explains. "The first

thing I do when I report in is check the daily flight schedule to see what launches we have that day. (When the squadron is not deployed, plane captains are assigned to an aircraft on a daily basis.) If I am assigned to an aircraft that day, I preflight it, check to see if it has fuel. If the fuel is low, I send it to the fuel pits.

"The planes are usually manned 30 minutes before launch and I'm out on the line. Two pins in the bottom of the two ejection seats have to be removed. After I do that, I strap in the pilot and the RIO. Then we hook up the huffer and power, and turn up both engines. We go through the signals, the pilot unfolds his wings and I taxi him out."

The plane captain is not alone on the flight line. Personnel from the squadron's various shops — airframes, AQ, etc. — are there to assist if anything goes wrong.

When the squadron deploys on board a carrier, the plane captain's routine changes. He is assigned to one aircraft which is his, generally, for the length of the cruise. He works 14 to 18-hour days and when his aircraft is on the deck, in between flights, he and his second mech are with the aircraft. The aircraft normally makes two or three hops of one and a half hours each. During the period the plane is aloft, the plane captain has time to write a letter home or to prepare for the next launch.

As in all professions, there are good times and bad times. The hurry up and wait, the elevators that whine all night, the long hours next to your plane on the cat during aircraft alert status — all are trying. But the chance to visit foreign ports, to work for a good flight crew, and pride in your own ability are all factors which seem to balance the scales.

Quite a lot of responsibility for a 21-year-old? "It takes a while to learn," Dave Larimer says, "but you get in the groove." With that he heads for the line to preflight another *Phantom.*

NAS Point Mugu

HEADQUARTERS

By Linda Thompson

Is Point Mugu the secret base on the West Coast? It may seem that way because of the many classified projects undertaken there, but the site of Headquarters, Pacific Missile Range is no secret.

The name Mugu, from the Chumash Indian word, means "place of landing." The Navy, however, has made it famous during the past 25 years as a "place of launching."

Since the Naval Air Missile Test Center was commissioned on October 1, 1946, the 4,600-acre facility located about 65 miles northwest of Los Angeles along the Pacific Coast Highway has grown into the headquarters of the Pacific Missile Range.

Today, the PMR command consists of the Pacific Missile Range staff and directorate, the Naval Missile Center, the Marine Aviation Detachment, the Naval Air Station and the PMR Facility in Hawaii, each with its own commanding officer.

Tenant activities include the Navy Astronautics Group, Air Test and Evaluation Squadron Four and the Naval Air Reserve Training Unit.

The Navy's mission at Point Mugu is the operation of a national range for the Defense Department in support of missile and satellite programs, and the test and evaluation of naval weapons systems.

Many other phases of missilry are conducted at PMR; as the Navy determines the need for various weapons, many are developed, tested and approved at Point Mugu.

PMR includes 27,000 acres spread among facilities at Point Mugu, Kaneohe Bay, and Johnston, Midway and Wake Islands. These acres provide unpopulated areas where the missiles of the military services, NASA and other government agencies can be launched and impacted safely.

PMR launches and tracks missiles and satellites, collecting and analyzing performance data. More than 15,000 support and launch operations are scheduled each year at Point Mugu.

Once a missile leaves its launcher, information concerning its behavior and that of its inner parts is telemetered to receiving stations on the ground, on ships and aboard aircraft. Precision tracking radar and optical instruments scrutinize the missile's path and cameras record the critical seconds of flight. Data is sent from the receiving station to Point Mugu's computers, where it is processed and sorted for analysis by program engineers.

Point Mugu is ideally located: the Pacific Ocean offers a safe area for evaluating and testing missiles and remote controlled aircraft; neighboring Laguna Peak provides a convenient site for communication and instrumentation equipment; the adjacent Santa Barbara Channel islands provide locations for sea test range instrumentation equipment; and it is close to West Coast industrial aircraft and missile centers.

Another major factor in the choice of Point Mugu was San Nicolas Island. Heavily equipped with radar, telemetry and communication facilities

Local landmark, the 60-foot antenna at Laguna Peak, top. NAS Point Mugu, at right

PACIFIC MISSILE RANGE: AN OPEN SECRET

The BQM-34A Firebee provides a remotely controlled subsonic target for training and evaluation, above. An air controller gives landing instructions atop station tower, right.

and located 60 miles offshore, the island is an ideal site for instrumentation. Point Mugu, San Nicolas Island and the surrounding sea areas make up the test range.

Much of PMR's field work is conducted in the area between Point Mugu and San Nicolas Island. Within this tightly controlled space, small tactical missiles are tested almost daily — hitting targets or scoring simulated kills on target aircraft.

PMR also operates USNS *Wheeling*, a highly sophisticated tracking and recovery ship designed to extend range capabilities into any area of the Pacific. She is fitted with the most modern precision radar, telemetry, timing, navigation and communication equipment.

Instrumentation coverage is extended to ocean areas that land-based instruments cannot reach, by PMR's EC-121K *Super Connies*.

The Pacific Missile Range has a unique underwater antisubmarine training range in the waters off Kauai, Hawaii. Using the facility's ability to track and record the positions of several surface ships, submarines, weapons and aircraft simultaneously, antisubmarine warfare forces can develop submarine detection and destruction methods, check the performance of weapons and torpedoes, and test the operational readiness of fleet units.

The Kauai facility also monitors missile tests for the Pacific Fleet and has obtained upper air data for *Apollo* flights.

The Naval Missile Center is the principal user of PMR's services, monitoring and verifying every phase of guided missile development, from component parts to completed systems. In extensive environmental test facilities, the weapons parts and systems are subjected to extremes of altitude, temperature, speed, pressure, vibration and shock.

NMC also conducts exhaustive testing and evaluation of manufacturers' production line missiles before certifying them for fleet use. Airborne weapons systems may be flight tested on any of 25 types of aircraft. Test data is recorded on tape and film.

Another function of NMC is the training of men in the use and maintenance of air launched weapons.

An essential component of the PMR complex is NAS Point Mugu. The station maintains and operates the support facilities located at Point Mugu, San Nicolas Island and Santa Cruz Island.

NAS provides support in the air, water and on the ground. Its helicopters and boats conduct search and rescue missions and retrieve targets in the sea target range. Housing and food services are also the responsibility of the air station, along with maintenance of buildings, upkeep of grounds, operation of the air field and security.

Major units of the fleet use the navigation satellites operated by the Navy Astronautics Group. From its headquarters at Point Mugu, the Group operates the Navy navigation satellite system which enables ships of our fleet as well as commercial liners to determine their positions at sea with great accuracy and speed in all weather conditions.

Guided Missile Unit 41 supports VX-4 in testing air-to-air guided mis-

An F-4B Phantom II launches a Sparrow III over PMR, above. Virtually all of that series of missiles were evaluated at Point Mugu. Diver, at right, works on a hydroplane cable at PMR's ASW training range at Kauai, Hawaii. The instrumentation ship, USNS Wheeling, below, extends PMR's range coverage. An F-8 Crusader undergoes cold weather simulation, bottom.

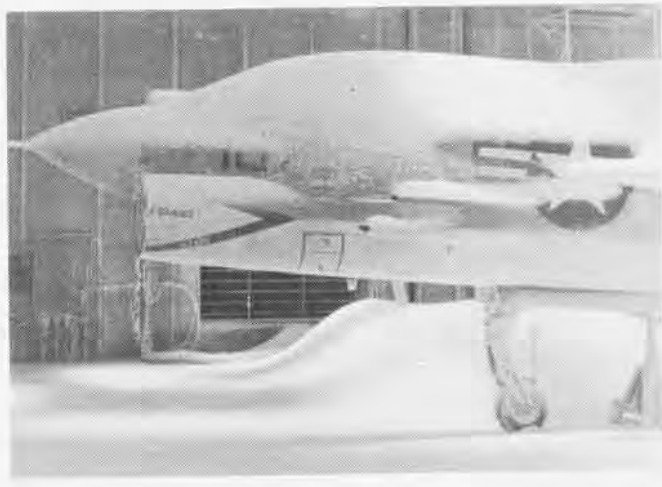
siles and conventional ordnance. The unit operates telemetry vans and maintains complete shops for the evaluation and assembly of *Sparrow* and *Sidewinder* missiles.

Last January, the Naval Air Reserve Training Unit joined the PMR complex as a tenant activity. The unit, formerly stationed at NAS Los Alamitos, Calif., includes 14 *Skyhawks* belonging to VA-305 and 12 *Neptunes* assigned to VP-65, plus four support planes.

Since its inception 25 years ago, Point Mugu has operated with a combined force of military men, civilian scientists and technicians. Today, the overall population is about 5,000 civilian employees and 2,200 military personnel.

Among the missiles tested and evaluated at Point Mugu are *Bullpup, Shrike, Walleye* and virtually the entire *Sparrow* family. The latest addition to the list is *Phoenix*, the F-14 *Tomcat* weapon.

After 25 years of developing, testing and evaluating naval weapons systems, Point Mugu's location is no secret.



NANEWS INDEX JAN. TO DEC. INCLUSIVE 1971

Letters

A Little Late

I am sure you are well aware that every effort is being made by Naval Aviators throughout the Navy to publicize the plight of our POW's/MIA's in Southeast Asia.

In view of this, I was dismayed to see what was obviously a "missing man" formation on the back cover of the October 1971 issue of *NANews* not reported as such. Although the POW issue may not be within the scope or the purpose of your magazine. I feel that at least a single page should be devoted to this important cause.

D.J. Harrington, Lt.
VXE-5
NAF China Lake, Calif. 93555

See the feature beginning on page 22.

Old Issues

I am seeking old issues of *NANews* or *BuAer News Letter*, 1954 or earlier.

R. L. Lawson, PHCS
Fleet Air Photographic Laboratory
NAS North Island, Calif. 92135

Jamming

I would like to correct a factual error that appeared in "Cramming for Jamming" (August 1971). You stated: "Grumman is also in the process of constructing the team tactics trainer which will be used to train the ECMO's. The trainer will consist of a simulated cockpit which will enable the three ECMO's being trained simultaneously to learn to work together under realistic conditions."

The true facts are that the EA-6B Team Tactics Trainer, Device 15E22, is being built by AAI Corporation, Cockeysville, Md., under contract with the Naval Training Device Center, Orlando, Fla. The trainer will be a two-place, part task trainer used to train the forward and aft ECMO's. Device 15E22 is scheduled to be ready for training on-site at NAS Whidbey Island, Wash., sometime after mid-1972.

Allen Q. Collier
Public Affairs Officer, NTDC
Orlando, Fla. 32812

Again, we are only as good as our source.

Nuff Said

People who claim to be "the first" or "the only" should do their homework! The September 1971 issue of *Naval Aviation News* contains an article entitled "Rare Jobs for Sergeants" (page 5) which states that GySgt. Richard H. Heubner is ". . . the only enlisted man to eject from a *Phantom*." For the record, he is NOT!

On April 14, 1967, an enlisted man attached to Service Test Division ejected from an F-4 *Phantom* on his maiden flight. The details are documented in an aircraft accident report. The date of the ejection is given in case someone, including GySgt. Heubner, wishes to try for a claim as "the *first* enlisted man to eject from a *Phantom*" or "the *first* enlisted man to eject from any aircraft on his maiden flight."

George A. Mullen, Ltjg.
Service Test Division
Naval Air Test Center
Patuxent River, Md. 20670

Equal Time

We demand equal time. I enjoyed the *Zeppelin* article, September *NANews*, but on page 12 you neglected to say the first plane to hook onto a dirigible in flight was a Vought UO-1 flown by Lt. Jake Gorton in August 1929.

Art Schoeni
LTV
P.O. Box 5907
Dallas, Texas 75222

Scheduled

The caption under the photograph on page 4 of the August issue of *NANews* indicates that the last A-1E is scheduled for storage at Davis-Monthan AFB. I believe if you check this out, you will find that the Confederate Air Force is the proud owner of the last A-1E. Number 132443 was flown from Patuxent River, Md., to Rebel Field, Harlingen, Texas, on July 27, 1971.

Bob Hensz, Manager
Rebel Field, Harlingen, Texas 78550

Apparently schedules change!

Reunion

USS Essex (CV-9)
August 3-5, 1972
Oklahoma City, Okla.
For information write: USS Essex, C-V-9, Inc., P.O. Box 10123, Louisville, Ken. 40210.

These new insignia, which received official approval in 1971, are representative of the fine designs submitted by more than 50 Naval Aviation units this year and are indicative of the current widespread appreciation of the value of insignia.

Governed by a CNO instruction, squadron insignia must be depicted within a circle, while higher level commands are required to employ a triangle. The Naval Aviation insignia program seeks to encourage units to express individuality and tradition, promote team effort, and produce a visible, continuing representation for their activities and achievements. Typically, the design idea and art work are originated by the unit. Pride in an organization's insignia is evidenced by its use, on flight clothing, on aircraft and in squadron areas.

Symbolism, originality, clarity of design, and contrasting colors produce the most favorable results. Symbolically, NARTU North Island combined the historic with the contemporary in superimposing the first Naval Aviation event in that area upon the Coronado Bay Bridge at sunset. VAL–4 produced a symbolic and durable design, while VP–94 stressed local symbolism. VP–65 demonstrates imaginative originality and VA–304 displays a modern rendition of a popular theme.

Other units, including VF–201, NARTD Moffett Field, VAQ–129, Commander Naval Air Reserve Force, NAS Bermuda, HM–12 and HS–74, achieved particularly pleasing designs. The number of new Reserve insignia reflects the 1970 reorganization of the Naval Air Reserve.

All in all, 1971 was a very good year for Naval Aviation insignia.

SQUADRON INSIGNIA


NAVY
NH
307
Naval Aviation
NEWS