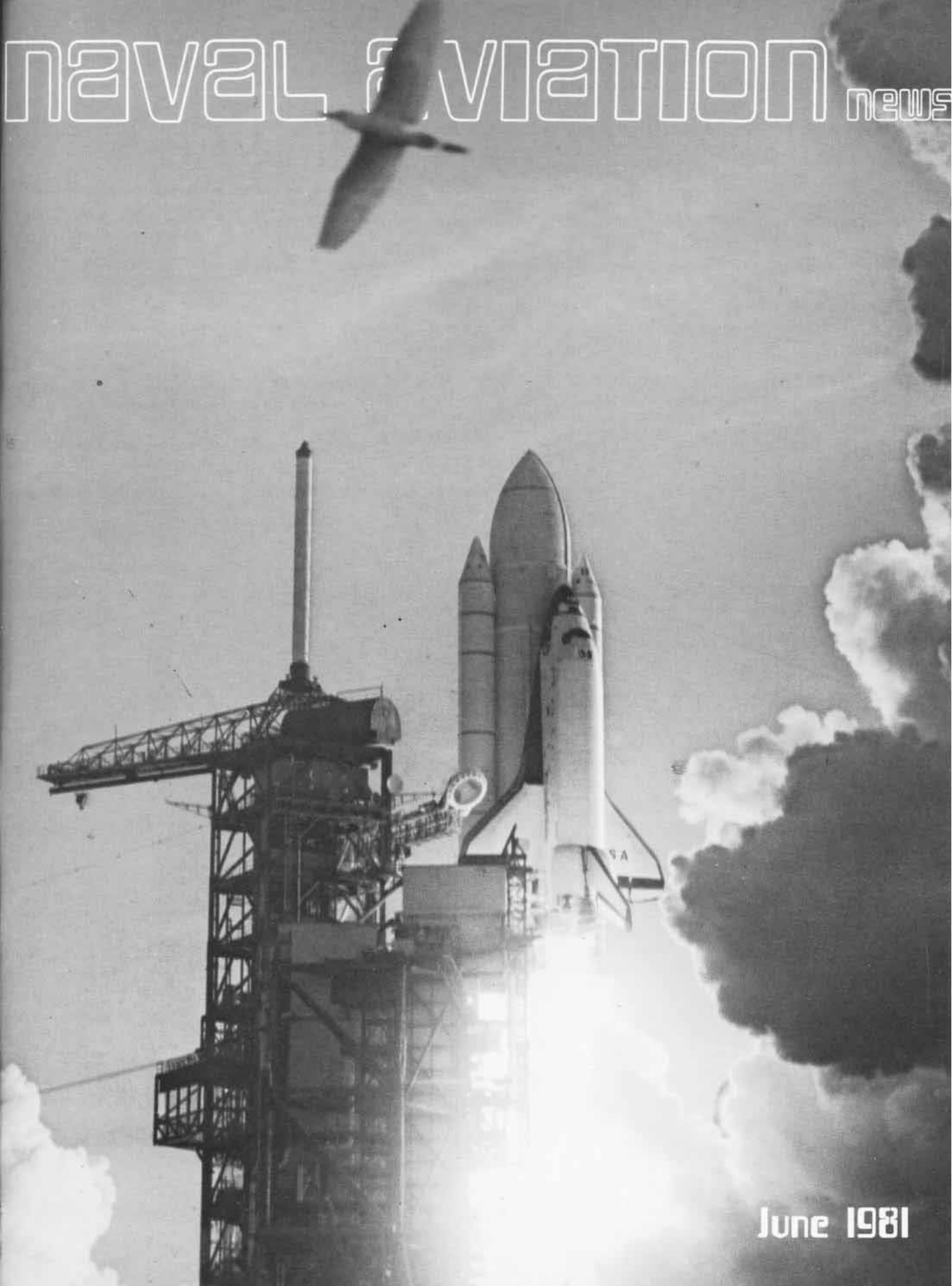
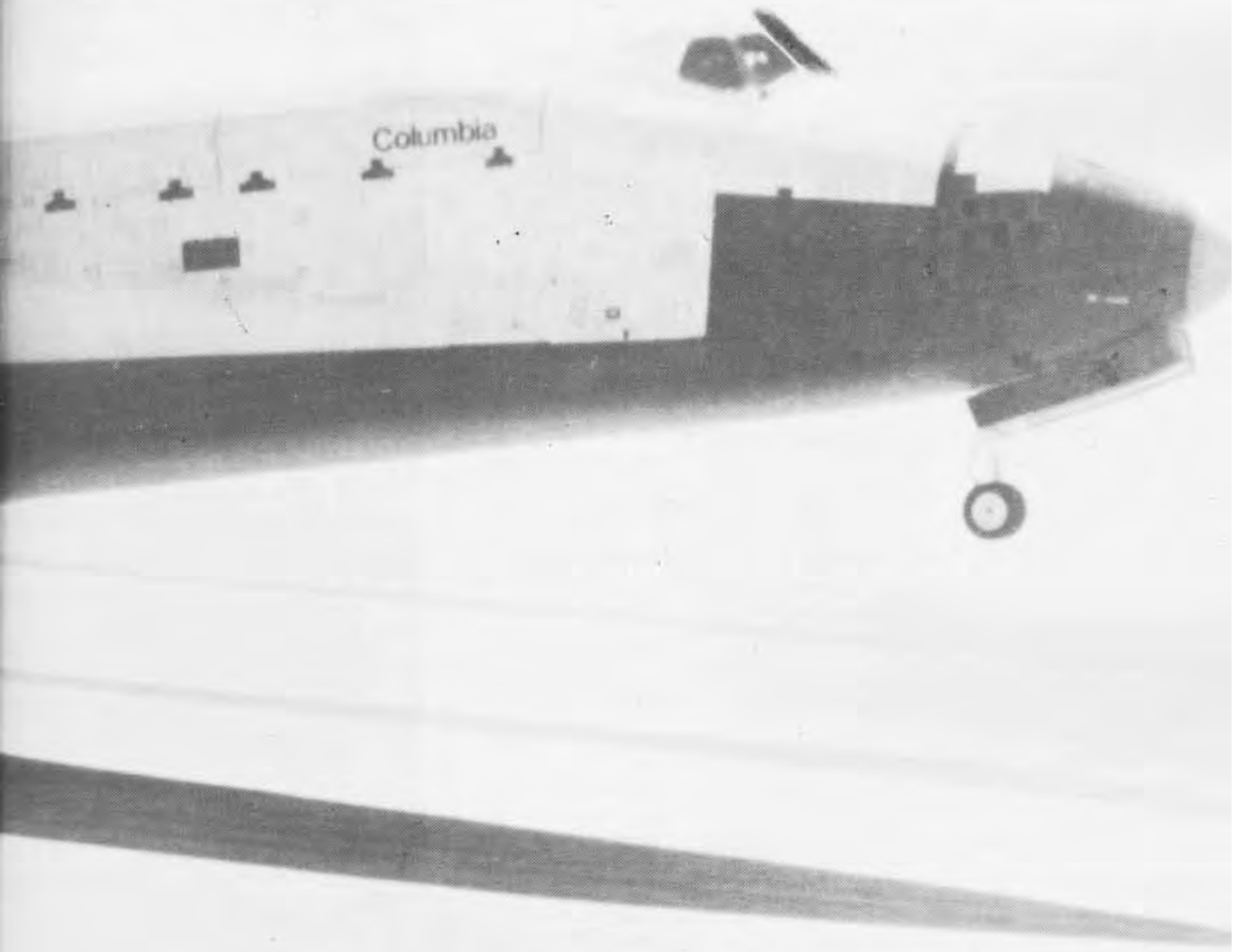
NAVAL AVIATION NEWS



June 1981


NASA
United States

The moment of touchdown marks the end of a successful world premiere.



(Photo courtesy of NASA.)

naval aviation news

Sixty-Third Year of Publication

Vice Admiral W. L. McDonald, Deputy Chief of Naval Operations (Air Warfare)

Vice Admiral E. R. Seymour, Commander, Naval Air Systems Command

STAFF

Captain Ted Wilbur	Head, Aviation Periodicals and History
Captain Dick Knott	Editor
Helen F. Collins	Managing Editor
Charles C. Cooney	Art Director
JOC Kirby Harrison	Associate Editors
Sandy Russell	
Jeanne Gray	Assistant Editor
Harold Andrews	Technical Advisor
Cdr. Chuck Sammons	Contributing Editor

COVERS — Front, the Space Shuttle takes to the sky as a feathered predecessor wheels in the foreground. Back, a super-wide angle lens view of astronauts John Young (left) and Robert Crippen in Columbia's cockpit during training.

(Photos courtesy of NASA.)

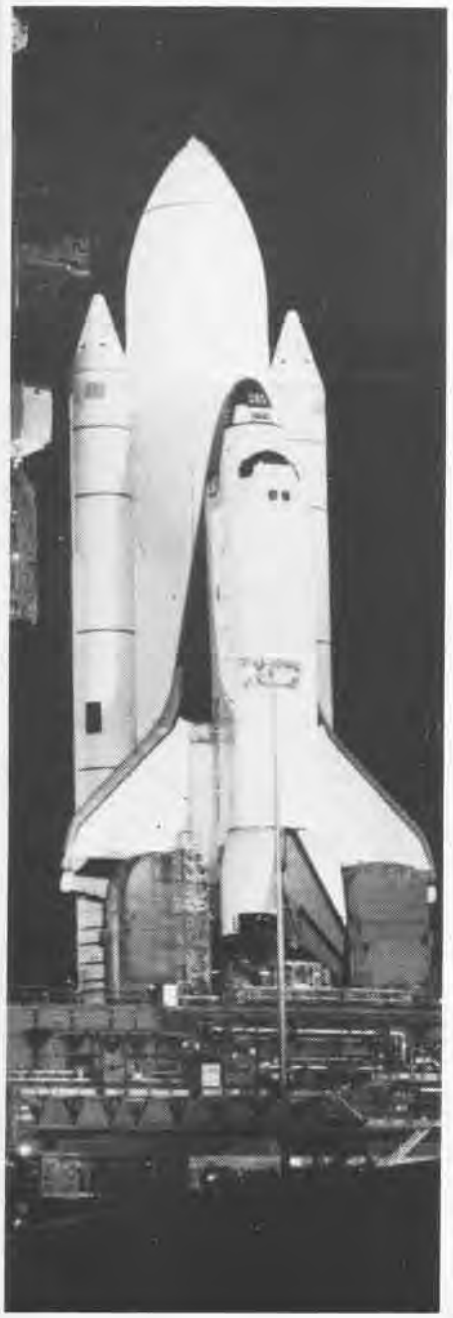
Features

Departments

Published monthly by the Chief of Naval Operations and Naval Air Systems Command in accordance with NavExos P-35. Offices are located in Bldg. 146, Washington Navy Yard, Washington, D.C. 20374. Phone 202-433-4407; Autovon 288-4407. Annual subscription: $18.00, check or money order ($4.50 additional for foreign mailing) direct to Superintendant of Documents, Government Printing Office, Washington, D.C. 20402. Single copy $1.50.

From the

EDITOR'S NOTEBOOK



Hail Columbia

It made a mighty rumble in the air and the earth trembled 50 miles away. The breathtaking pyrotechnic display was a sight that will long be remembered by the thousands of spectators gathered at Cape Canaveral for the launch and by the millions more who watched the event on TV as the Space Shuttle left the ground.

But this was much more than a television spectacular. It was the culmination of years of painstaking effort, of a succession of failures and disappointments and of ultimate triumph for the engineers, technicians and a host of others who had made it all possible. It had been their lot not only to resolve the many technical problems involved in putting this complex system into space but to suffer the criticism and the inevitable bad jokes that dogged each delay in the painfully slow march to the launch pad.

To veteran astronaut and Naval Aviator Captain John Young, the successful flight was another logical step toward the exploration and exploitation of space. For Captain Bob Crippen, also a Naval Aviator, it was the payoff for 12 long years of patience and faith. He was later to remark that he would be willing to wait 12 more years, if necessary, to do it again.

As Crippen observed, however, it is highly unlikely that either he or the other astronauts who are anxious to take up the challenge will have to wait that long. Another flight using the same orbiter is scheduled for September. *Columbia* will be followed into space by *Challenger* and later by *Discovery* and *Atlantis*, and these will be only the first in a whole new generation of space vehicles.

The historic launch and recovery was a triumph of U.S. technology, a capability which some had begun to question in recent years. And, if it was a shot in the arm for NASA, it was no less of a morale booster for the American public. An upwelling of national pride was clearly registered on the faces of those fortunate enough to be present at the takeoff in Florida or the landing in California. It may also have been an expression of relief and a feeling that here was hard evidence that America was still in the game.

U.S. astronauts have been conspicuous by their absence in space in recent years. Meanwhile, the Soviets have forged ahead with a steady stream of manned flights. The sheer size of their program is impressive and is indicative of the importance they place on space exploitation. From a practical standpoint, their activities have provided Soviet scientists with opportunities to study and refine operating techniques, and have given their cosmonauts many hours of hands-on experience under actual conditions. Soviet hardware, however, does not seem to be as sophisticated as that of the U.S. and they have not been able to duplicate the spectacular U.S. moon landings. Nevertheless, the Soviets may be close to completing their own version of the Space Shuttle and they are widely expected to establish a permanent manned presence in space during the next few years.

The practical significance of the Space Shuttle program is mind-boggling. It will open new vistas for the study of the universe on one hand and greatly increase our knowledge of the earth and its environment on the other. It means tremendous advances in all sorts of communications capabilities. It will affect things like mining, manufacturing, medical research, fishing, agriculture and perhaps even the eventual emigration of man into space. It will allow us to build great space stations piece by piece and inevitably it has positive implications for national security.

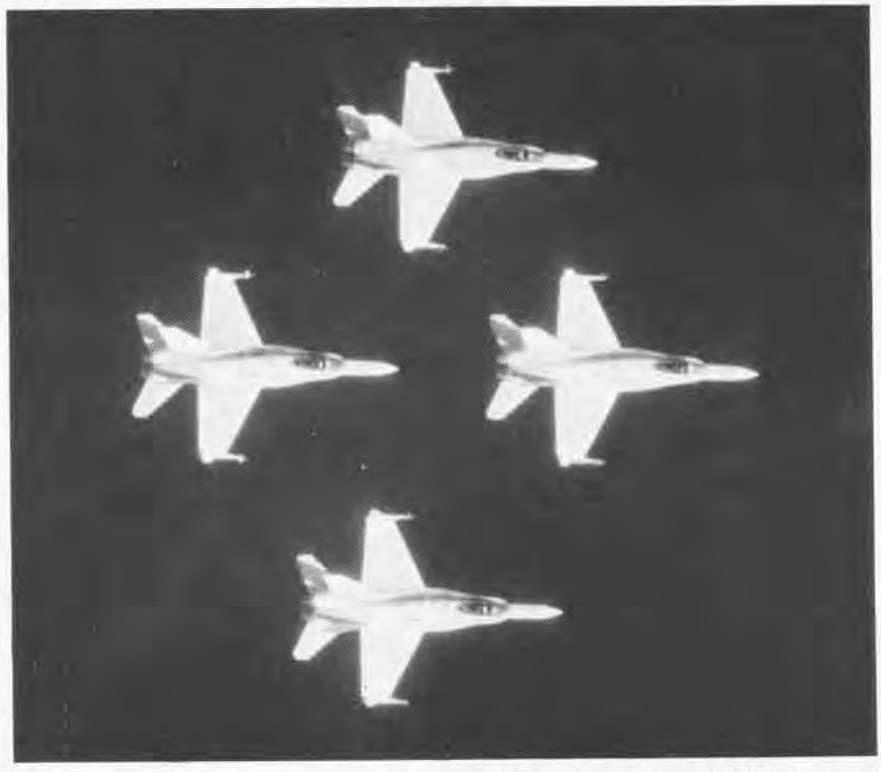
The success of the Space Shuttle is at least as significant as the discovery of the New World or the beginning of the Industrial Revolution. It is man's first real step toward the stars with a potential that is limitless. Superlatives fail to describe adequately the meaning of the event.

Hail *Columbia*!

DID YOU KNOW?

F/A-18 Hornet Update

Four McDonnell Douglas F/A-18 *Hornets* fly formation over Chesapeake Bay near NATC Patuxent River, Md. The multi-role, twin-engine strike fighter is undergoing final development testing, recently surpassing 3,000 flight hours. The aircraft shown are participating in an initial operational test and evaluation program, flown and supported by Navy and Marine Corps personnel from a Patuxent River detachment of VX-4. The det is evaluating both fighter and attack capabilities. More in-depth studies will be done on the fighter mission later this year at Pacific Missile Test Center, Point Mugu, Calif., and next year at Naval Weapons Center, China Lake, to examine the aircraft's attack mission.



The *Hornet* has demonstrated more than three times the reliability rates of the F-4 *Phantom II* and A-7 *Corsair II*, the two combat aircraft it will replace. A two-week performance test at Pax River involved 50 flights and 100 flight hours. Test results, reviewed and validated by the Navy, show that the F/A-18 required other than routine maintenance only 12 times. Before trials, the Navy established 29 times as a "passing grade" and set 16 times as the best possible performance.

"Coupled with the *Hornet's* superb multimission performance and ease of maintenance, its extraordinary reliability allows the services to do more with a given number of aircraft than has ever been possible before," officials said. "This kind of versatility and flexibility is what cost-effectiveness is all about."

AV-8B Fuel Tanks

Four 300-gallon external fuel tanks increase the range of a prototype McDonnell Douglas AV-8B advanced short or vertical takeoff light-attack aircraft nearly 550 nautical miles. The AV-8B carries 7,500 pounds of internal fuel, and an external load up to 9,200 pounds can be carried on its seven weapon stations. With external fuel tanks removed, armament includes up to sixteen 500-pound bombs, six 1,000-pound bombs, four *Maverick* air-to-ground missiles, four *Sidewinder* air-to-air missiles, 10 rocket pods, or combinations thereof. For the maximum ordnance load, the AV-8B needs an airstrip only 1,100 feet long.

Contract Awarded for UC-12B

Beech Aerospace Services, Inc. (BASI), a subsidiary of Beech Aircraft Corporation, has been awarded a $6 million Navy contract for continued support of a worldwide fleet of Beechcraft UC-12Bs. The twin-engine, jetprop utility aircraft is flown by both the Navy and Marine Corps.

BASI has provided total contractor support for the aircraft since September 1979, including maintenance, service, parts and on-site technicians. The UC-12B has maintained an average operational readiness rate exceeding 90 percent.

Fifth Anniversary

A new jet aviation exhibit gallery, free concerts and workshops, and extended hours will be part of the fifth anniversary celebration scheduled for July 1-5 at the Smithsonian's National Air and Space Museum.

The museum opened to the public on July 1, 1976, as part of the nation's Bicentennial celebration. Since that time, nearly 45 million people have visited it to view some of the world's most significant vehicles of flight. The 23 exhibit galleries feature history makers from the 1903 Wright Flyer and Lindbergh's *Spirit of St. Louis* to John Glenn's *Friendship 7* and the *Apollo 11* command module. Every period of flight is covered with the display of racing planes, a presidential helicopter, balloons, satellites and astronaut suits. The interior of a U.S. Navy aircraft carrier, complete with aircraft, is a feature attraction.

Coast Guard To Receive Jets

Until recently, the Coast Guard has relied on its C-130s, venerable HU-16 *Albatrosses* and a handful of ex-Air Force C-131s for air patrols. Soon, a jet with a Grumman touch will take over the job. The Coast Guard purchased 41 Falcon 20 executive jets. These medium-range surveillance jets will have new engines, sophisticated avionics and many structural modifications.

Last February, Grumman reached an agreement with Falcon Jet to build 41 shipsets of parts for the structural modifications and install them in 41 aircraft. Grumman will modify eight fuselages at Falcon Jet's facility in Little Rock, Ark.; the rest will be modified at Calverton, Long Island, N.Y. Grumman program manager Tom Gillen explained that "Essentially, we cut the plane in half. We add structural modifications to the fuselage, add observation windows on both sides, a camera door on the left side and a spoiler underneath, which diverts air away from the hatch we put on the bottom." Installations include a 200-gallon fuel tank. It takes about two and a half months to modify a fuselage.

Flatley Awards

The Admiral Flatley Memorial Awards for 1980 went to *Dwight D. Eisenhower*, for the second consecutive time, and *Saipan* (LHA-2). Both ships are homeported at Norfolk, Va. Runners-up were the West Coast's *Ranger* and *New Orleans* (LPH-11).

Presented each year by Rockwell International, in honor of the late Vice Admiral James L. Flatley, the awards recognize superior operational readiness, an outstanding safety record and significant contributions in the field of aviation safety during the previous calendar year.

Grampaw Pettibone

Pistol Packin' Pilot

Soon after a night catapult launch and just under a 2,000-foot broken cloud layer, an A-4 pilot was forced to eject when his aircraft went into what appeared to be uncontrollable left rolls. Because of the low altitude there had been little time to try much in the way of recovery measures and no Mayday call had been made.

The seat and chute worked perfectly but, as he swung in the harness while descending, he began to worry about no one knowing of his ejection. Deciding to signal before the ships in the formation went by, he pulled his unloaded .38-caliber pistol from his shoulder holster, removed his gloves and put them in his G-suit pocket. He was attempting to load the pistol in the darkness when he suddenly realized the water was getting pretty close. Shoving the pistol back in the holster, he stuck the cartridge in his mouth, grabbed the rocket jet fasteners on each parachute riser and hit the water almost immediately.

He was able to release the right fastener, but not the left and, since there was a 30-knot wind, he found himself being dragged through seven-foot waves on his back. He swallowed some salt water and was beginning to panic when he finally got the left riser fastener to release. After taking a few quick gulps of air and inflating his MK3C life vest, he followed his life raft lanyard down to the inflation bottle. There was no toggle on the bottle, so he raised the aluminum lever, and the raft, to his immense relief, started to inflate. Although it only partially inflated, he decided to climb in anyway.

Something was wrapped around his legs, and he was forced to cut himself

free with his survival knife. He then climbed into the raft and inflated it with the oral inflation tube!

Still working hard at survival, he loaded five rounds in his pistol and fired them off at about two-minute intervals.

Seeing a destroyer heading his way, he started to reload, but was unable to eject the expended cartridges from the cylinder. Looking up, he noted that the rescue vessel was closing at a startlingly high rate of speed. Fortunately, he put the pistol back in the holster and decided to await a more opportune time to reload, for the destroyer went roaring by at about two feet and flipped pilot, raft, and all end over end!

After struggling back into the raft, the pilot loaded the remaining empty chamber and fired his pistol once again. Alert lookouts on the destroyer spotted the tracer. As the ship heeled over in a fast turn, the now weary pilot decided not to take any more chances, put away his pistol and fired a flare from his life vest. The destroyer came alongside, one of the ship's officers dove into the heavy seas with a line and he was helped aboard, safe at last.

Grampaw Pettibone says:

Sufferin' catfish! This feller really had a pistol fixation, but it *did* save his bacon! Dozens of people saw the tracers, but he was firing them at such an angle that no one really pinpointed him.

The survival equipment officer in this squadron better get with it! The .38 cartridges were corroded, hence wouldn't eject; the raft had no toggle; and the pilot obviously hadn't had enough dry runs on use of his survival gear. There are some procedures you MUST follow prior to water entry if you're gonna have a chance at survival. You've got to KNOW your survival gear to use it properly!

Ever try blowing up a life raft by the oral inflation tube, while you're sitting in it? It's a killer, believe me! (Reprint from *NANews*, September 1960.)

Upright Uptight End of Flight

An instructor pilot (IP) and two student Naval Aviators (SNAs) briefed for a morning round-robin radio instrument flight in the T-44A *King Air*. The flight was to include an instrument departure, multi-approaches and landings at a strange airfield where the students would exchange positions and return to base. The flight was uneventful until approach for final landing back at home plate.

GCA reported the aircraft crossing the landing threshold to be 20 feet

ILLUSTRATED BY Osborn

above glide path. The SNA reduced power almost to idle. An excessive sink rate developed and the IP commanded "Waveoff!" The SNA rapidly advanced the power levers but the slow engine response failed to arrest the sink rate. The aircraft slammed onto the runway and bounced back into the air. Asymmetric power response caused the aircraft's nose to yaw left and up. It then rolled left with the left wing dragging the runway for about 20 feet. The aircraft continued a modified barrel roll to the left and impacted the runway inverted. The port engine was driven into the right wing, rupturing the fuel tanks. Instantly, the right side of the aircraft became engulfed in flames. The aircraft skidded on its nose, flipped over, and came to a smouldering stop in an upright position on its main mounts.

The SNA pilot and IP were knocked unconscious. The SNA observer unstrapped and opened the main cockpit door, assisting the now conscious but dazed student pilot and IP from the flaming aircraft.

Grampaw Pettibone says:

Great balls of fire! This is enough to singe more than just your whiskers, gang. This could have been a trip to crispy critter city for this trio.

On the surface, this may appear to be simply a pilot error mishap. The SNA established such an excessive sink rate with the large power reduction (near idle) in a 17-knot crosswind that a waveoff could not be effected. A flight instructor who values his hide must not allow a student to place the aircraft in a position from which he cannot recover. This was the IP's first flight following 17 days of TAD and old Gramps wonders if he was mentally prepared to get back in the instructor's saddle.

Post-accident investigation revealed that this SNA had a history of reducing power early and had difficulties with crosswind landings. After all, an accident is not the most appropriate time for an instructor to review his student's areas of difficulty.

The fact that *King Air* engines accelerate unevenly is well known in the T-44 community and, in fact, Natops advises pilots to advance power levers to 70-80 percent to allow props to stabilize for normal takeoff and touch-and-go procedures. This smash and crash was far from a normal touch-and-go.

Old Singed Whiskers smells a morsel of maintenance meat-loafing in this menu, and views with concern the fact that this particular aircraft had eight previous engine discrepancies involving slow port engine acceleration. Two of the discrepancies were within six days of the accident (third and second flights prior to this flight). The last two discrepancies noted 2.0 to 2.5-second lag in port engine acceleration from low power setting. The maintenance actions performed in each case were to adjust the fuel control dome, the last adjustment being the fourth. Maintenance directives required fuel control replacement, should a fourth adjustment be necessary. The manufacturer of the fuel control has revised the adjustment procedure to allow for more than three adjustments. It might well be that this procedure is acceptable but Gramps has difficulty swallowing this logic. When the machine doesn't perform within specifications, is it wise to change the specification to fit the machine? These gents needed power within the hour to avoid receiving flowers (i.e., pushing up daisies). The business of slow and/or asymmetrical engine spool-up leaves a lump in my throat and may have been the contributing culprit in other T-44 incidents. I feel it could do with a little more looking into. Over to you, Mr. Goodwrench.

SPACE SHUTTLE

One More Giant Step

Obviously still elated after their return to earth, Young (left) and Crippen share the spotlight with their wives, Susy (left) and Virginia

We're back in the space business to stay

Rising from a massive cloud of steam and roaring defiance to gravity on a tail of orange flame, humanity took another giant step into space on April 12. Lifting off launching pad 39A, with Naval Aviators John Young and Robert Crippen at the controls aboard orbiter *Columbia,* the Space Shuttle marked a spectacular beginning to the U.S. Space Transportation System.

Inside the launch control facility, cheers were accompanied by a collective sigh of relief and satisfaction. The launch, already delayed three years, had been delayed an additional 48 hours when a backup computer caught a human error minutes before scheduled liftoff Friday, April 10.

According to Richard Parten, deputy director of NASA's data analysis section in Houston, the error occurred the previous Wednesday. When the four computers aboard *Columbia* were turned on, a programmer had failed to allow sufficient time for a warm-up. That failure caused a timing error of 40 thousandths of a second among the computers. It had gone unnoticed until 20 minutes before launch Friday, when a fifth backup computer signaled the error.

Photographs and artwork courtesy of the National Aeronautics and Space Administration.

But on Sunday, the countdown went smoothly and even the weather cooperated. A predicted overcast failed ed to materalize and the shuttle, made up of the orbiter *Columbia,* its main fuel tank and two solid-fuel rocket boosters, sat stark and white against a clear, blue sky.

And most of the audience from Friday was back, VIPs from movie stars to members of Congress, and thousands who had begun arriving as much as a week before. All through the night before the launch, they had struggled in traffic jams that stretched for miles. Many had spent the night before in tents and sleeping bags to claim a good vantage point for the spectacle. By morning, an estimated million spectators lined some 50 miles of Florida beaches around the Kennedy Space Center. President Reagan, watching from the White House, sent his message from the nation. "Through you today, we all feel as giants once again," he told the two astronauts.

Young and Crippen had awakened at 3:50 a.m. and eaten the traditional steak and eggs breakfast. At 7 a.m., minutes before ignition, NASA instruments registered Young's heartbeat at 85 per minute, only slightly above normal for the man who had already made four trips into space and who had walked on the moon. Crippen, awaiting his first adventure into space, was apparently more excited. His heartbeat had leaped to 130.

The main engines ignited and, within moments, clouds of smoke and steam from the evaporating water sound supression cushion enveloped the Space Shuttle. Unlike the old *Saturn* rockets that had carried U.S. astronauts into space on previous missions, the Space Shuttle did not rise ponderously, but seemed to fairly leap off the pad. With a deafening roar and a trail of flame and white vapor, the craft rose, quickly, tilted and turned gracefully to a position with the orbiter on the lower side, and gained speed. Delivered to the launch site on a flatbed truck at less than 3 mph, *Columbia* left the world at nearly 2,000 mph, burning nearly 45,000 gallons of liquid hydrogen and more than 100,000 pounds of solid fuel a minute, reaching orbit at 17,500 mph.

Told by Mission Control in Houston that everything was "go for orbit," Young replied, "What a ride!"

The reusable solid-fuel boosters separated as scheduled and a short time later, *Columbia* blasted away from the main fuel tank as planned. Twelve minutes after liftoff, the spacecraft was in orbit 170 miles above the earth, and the astronauts were preparing for a 54½-hour flight.

As Young and Crippen neared the end of their first day in space, the two made their first television transmission back to earth, noting the only problem being loss of about a dozen of the heat-absorbing tiles near the aft end of the craft. Otherwise, Young reported the first hours of the mission had gone " . . . as smooth as it could possibly go . . . the vehicle is just performing like a champ."

Young and Crippen spent the second day in space evaluating *Columbia's* systems and practicing maneuvering the stubby, delta-wing spacecraft, using batteries of 32 small reaction control thruster rocket engines in the orbiter's nose and tail.

There was also time for humor, one instance resulting in a long pause from Houston Mission Control when the voice from *Columbia* was recognized as that of backup commander Joe Engle. Young and Crippen had smuggled aboard a prerecorded tape of Engle's voice and played it in response to a Houston query. Houston got even later, referring to Crippen, who was obviously enjoying the television transmissions back to earth, as "Cecil B. deCrippen."

Tuesday morning prior to *Columbia's* return brought a renewal of the tension that had accompanied the liftoff. NASA officials said the lost tiles would not be a critical factor in the orbiter's reentry, but repeated attempts to photograph other tiles on the bottom side of the spacecraft by specialized earth telescopic cameras had been unsuccessful. Most of the more than 30,000 glass-coated, silica fiber tiles covering 70 percent of the orbiter's surface are on *Columbia's* underside and are necessary to disperse and absorb the tremendous heat build-up during reentry.

The worries were unfounded. At approximately 9:50 a.m., *Columbia* reentered the atmosphere at 18 times the speed of sound, 400,000 feet above the Earth's surface. A chase plane pulled up underneath the gliding orbiter after reentry and the pilot reported, "Looks real good underneath."

On the ground at Edwards Air Force Base, a crowd estimated at almost 150,000 waited. As *Columbia* passed over the U.S. coastline, still traveling at well past the speed of sound and accompanied by a double sonic boom, Young announced, "What a way to come to California!"

Young banked *Columbia* exactly as practiced in previous flights in jet aircraft modified to simulate the orbiter's flying characteristics. He pointed the nose of the spacecraft straight down the center of the dry lake bed runway and brought *Columbia* to a gentle two-point landing. At 200 mph, he eased the nosewheel to the ground and, rolling down the runway trailing a cloud of dust, he asked jokingly, "Do I have to take it to the hangar?"

"No," came the reply from Mission Control's Joe Allen, "we're gonna have to dust it off first."

Forty-five minutes later, Young exited *Columbia,* kissed the ground and exhibited the characteristics of an exhilarated new father. He walked off the extra adrenaline inspecting the spacecraft, occasionally gesturing excitedly with his hands and talking to the ground crew.

Crippen came out of *Columbia* with a smile equally as wide as Young's, and both men were driven to meet their

families at a nearby dispensary.

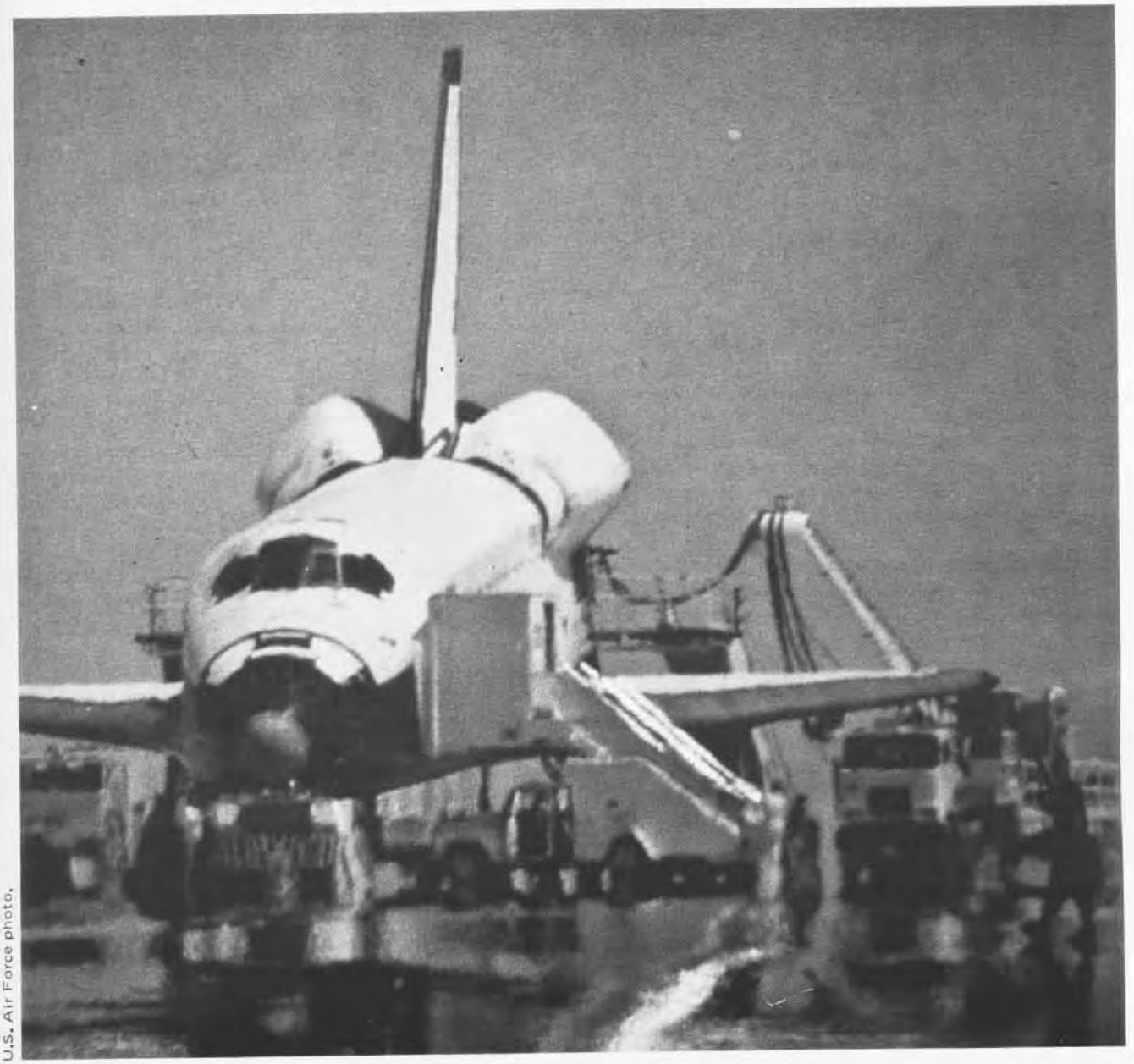
Greeting the crowd about an hour later, Young described the mission as " . . . the best thing that ever happened to me."

Crippen was even more ebullient. "Waiting 12 years for this flight was worth it," he said. "I'd wait in line another 12 years but I know I won't have to wait that long anymore."

The U.S. Space Transportation System will open for business in 1982 and already has seven flights scheduled for 1983. There are as many as 17 flights set for 1984, 24 in 1985 and 30 in 1986. The Space Shuttle will haul civilian and military satellites and equipment into orbit for the next 20 years. RCA, Satellite Business Systems, Bell Telephone, the countries of Saudi Arabia, Canada, Indonesia and the People's Republic of China are only a few of the estimated 50 customers already booked to use space in the orbiter cargo bay.

In terms of space technology, the maiden flight of the Space Shuttle has placed the U.S. at least 10 years ahead of the nearest competition, according to unofficial reports.

As Crippen put it, "We're back in the space business to stay."



U.S. Air Force photo.

SPACE SHUTTLE

Airline to Space

"With the first orbital flight of the Space Shuttle, the curtain rises on an era that will shape U.S. space exploration for the next decade, and perhaps for the remainder of the century. Columbia and her sister ships will be far more than odd-looking heavy-lift launch vehicles, though they will be that. Each Space Shuttle will be an element in a total transportation system linking Earth with space: vehicles, ground facilities, a communications net, trained crews, established freight rates and flight schedules — and the prospect of numerous important and exciting tasks to be done. Although the Space Shuttle has been a long time in development and won't be workaday for several years, it will transform space travel. We will go into space not just to meet the challenge of exploration but to do many useful and productive jobs, at reduced cost, returning again and again. We are initiating an era of routine utilization of space and it signifies a new epoch in the history of the planet."

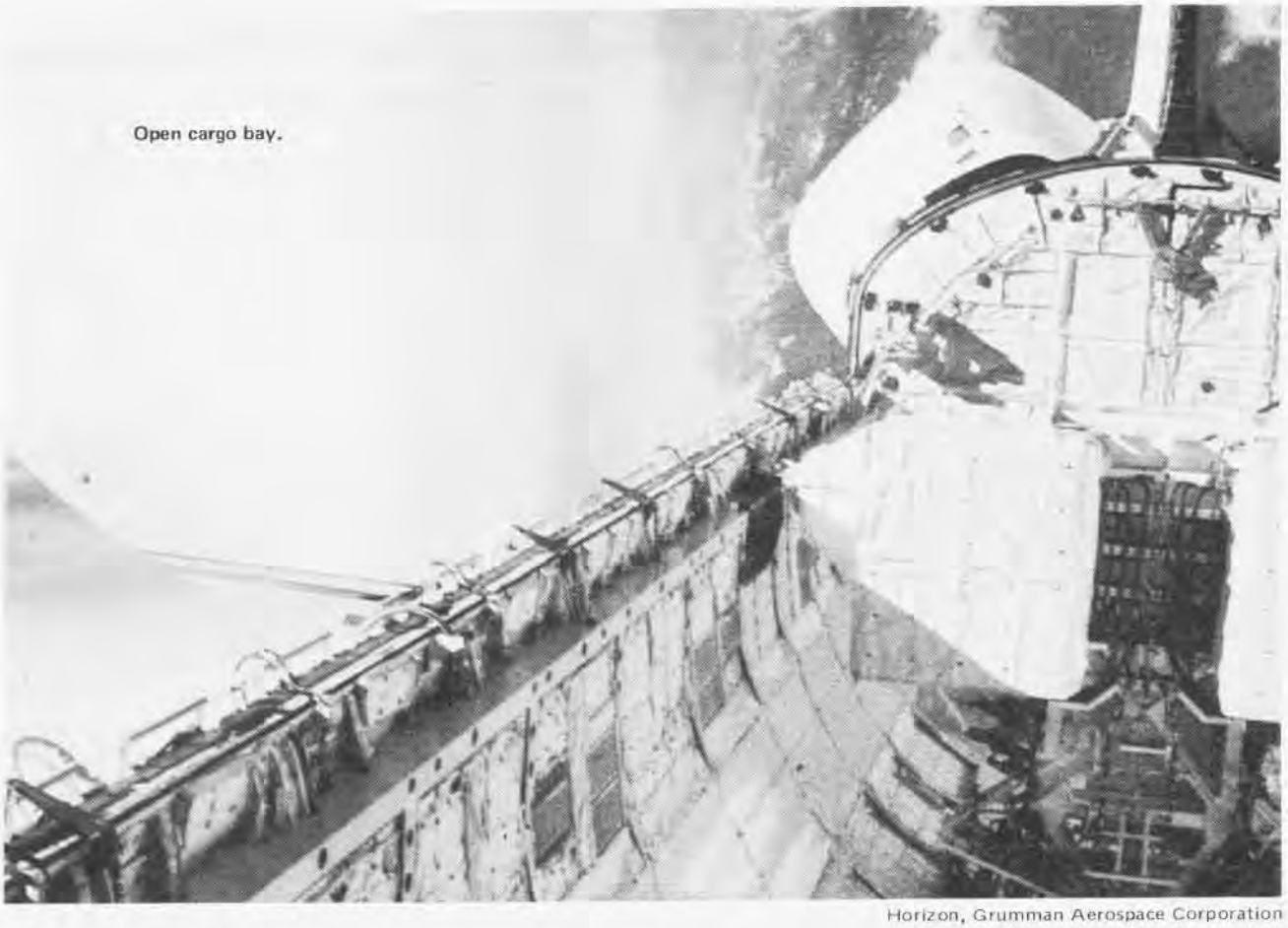
Adlai E. Stevenson
Chairman, Subcommittee on
Science, Technology and Space

The Second Space Age has begun. Whereas the first was an age of exploration, the second will be one of space exploitation. It will open the doors to new uses of space in astronomy, communications, scientific research and biomedicine, defense, manufacturing – and perhaps even some emigration from Earth to establish colonies in space.

The Space Shuttle's first flight inaugurates the Space Transportation System (STS). Its first trip to low earth orbit was only a little over two days in duration and took the Space Shuttle around the world 36 times to test its wings before its descent into the Mojave Desert.

STS-1 is the first manned flight using solid rocket boosters, and the first U.S. space vehicle to be manned on its maiden flight. All of the first four STS flights will be engineering tests to prove and evaluate the shuttle system in launch, orbital and landing operations. On its fifth flight the shuttle becomes operational. Its first regular mission is scheduled for late 1982, when it will deploy a giant tracking and data relay satellite. Additional space flights of a week or more will follow until, by the end of the 1980s, a fleet of orbiters could be in operation.

Astronauts John W. Young and Robert L. Crippen, both Naval Aviators, rode *Columbia* on its first launch into space. Young, a retired Navy captain and veteran of four trips into outer space, was in command, with Crippen, an active duty Navy captain, as copilot.



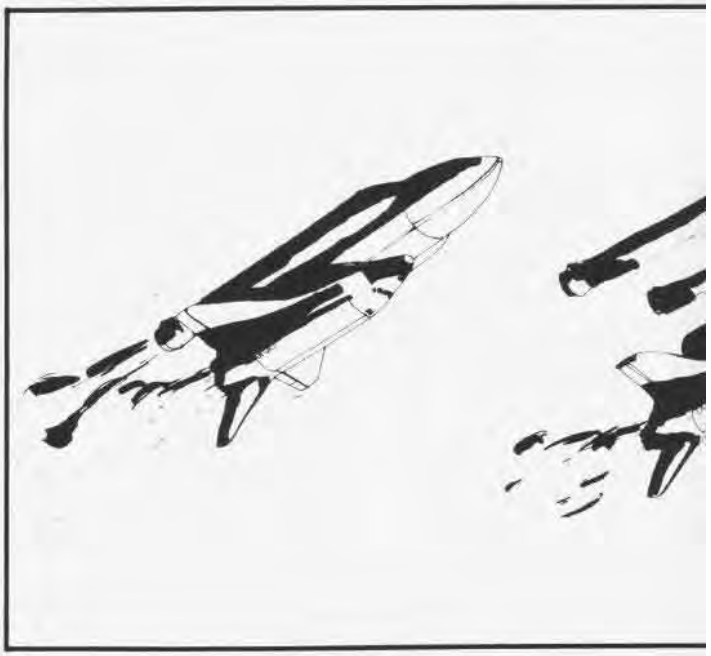
Open cargo bay.

Horizon, Grumman Aerospace Corporation

The Space Shuttle is a true aerospace vehicle. It takes off like a rocket, maneuvers in Earth orbit like a spacecraft, and lands like an airplane. Its wings function from reentry into the atmosphere until landing about one-half hour later.

It is basically a space-going workhorse and cargo ship that can be used over and over again. Not only will it take people, satellites, military hardware and other payloads to space, but it will bring them back again. If, once in orbit, a satellite fails, it can be retrieved for servicing and repair. The spacecraft will transport telescopes, laboratories and eventually construction equipment into orbit.

When sophisticated switching stations for telephones and television begin operating in space before the end of the century, people may be able to make an inexpensive telephone call from a wristwatch telephone via satellite anywhere in the world. Floating factories are envisioned that would take advantage of the absence of gravity in space. In its military application, a new surveillance system could be deployed, and it is within the realm of imagination that wars could be fought between satellites that would hunt and destroy each other, with lasers or high energy beams.



The Space Shuttle has three main components: the orbiter, external tank and two solid rocket boosters, all of which are bolted together. It stands 184 feet tall.

The orbiter, a delta-winged spacecraft-aircraft, which looks like a small, fat airliner, is the core of the system. It is what will go back and forth between earth and space. It features work and living quarters for as many as seven people, and a 60-foot-long payload bay for storing cargo. The orbiter is built to last for at least 100 flights.

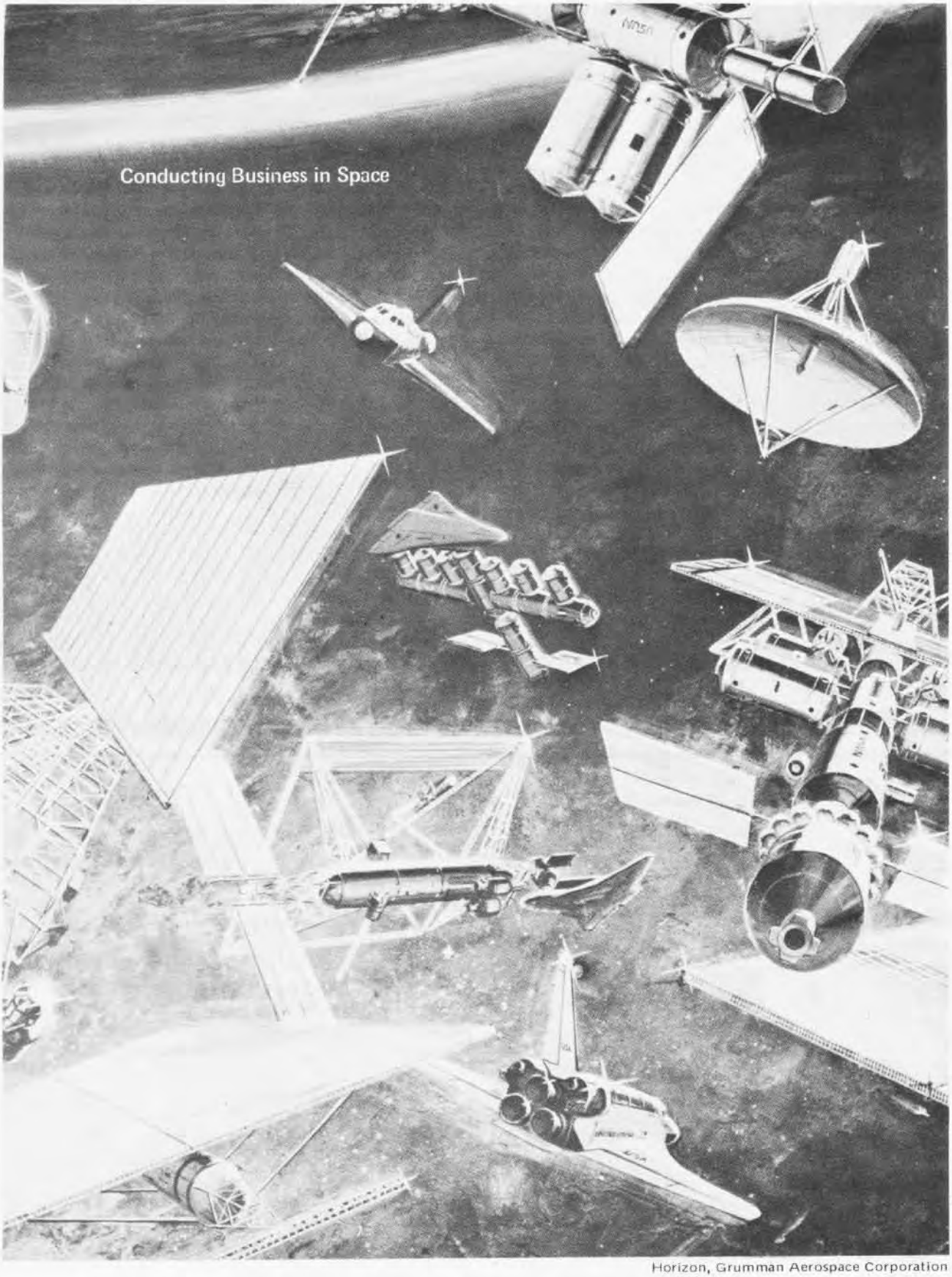
The huge, white, bullet-shaped, expendable external tank carries the enormous volume of liquid hydrogen and oxygen propellant burned by the orbiter's main engines. If the orbiter itself had to carry all that liquid, it would have to be far too large a vehicle. So, instead, the orbiter rides on its external fuel tank and then, just before reaching orbit, it jettisons the empty tank into the Indian Ocean. The external tank is the only part of the shuttle system that is not reusable.

A pair of reusable solid rocket boosters, which make up the third component and which are attached to the sides of the tank, have tremendous "get-up-and-go." They are needed because, on the ground, the fuel in the external tank weighs a million and a half pounds. The orbiter's main engines could not budge a load like that. The rocket boosters provide 5.3 million pounds of thrust for two minutes, which gets the shuttle airborne. Once the solid fuel is exhausted, explosives fire the boosters away, and these are then recovered by a ship in the Atlantic off Florida, for reuse. Each booster returns to earth borne by three enormous chutes. After splashdown in the Atlantic, the rockets float like buoys until they are picked up.

That is the system: The rocket-fueled launch sends the Space Shuttle up – one orbiter, one external tank and two solid rocket boosters – into space. Two minutes after liftoff there is a bank and a lurch when explosive bolts blow the spent solid rocket boosters away. Speed builds as fuel in the external tank is consumed and the spacecraft lightens. The astronauts are flying upside down now, riding the underside of the external tank. This will help the orbiter to separate from the more massive tank with a minimum of thrust and G-force discomfort. The main engines shut off and seconds later an explosive signal indicates that the external tank has been separated and is spiraling away. The orbiter then fires up two secondary engines called the orbital maneuvering subsystem (OMS). One OMS burn takes the vehicle up to orbital height and a second burn 35 minutes later puts the spacecraft in revolution around the Earth. Then the vehicle's cargo bay doors swing open and space tasks begin.

During the orbital flight and later descent, the OMS engines and 44 smaller thrusters placed strategically along the spacecraft enable it to turn over or straighten up, to change orbits or to rendezvous and dock. They also make the precise adjustments needed at the end of the mission to take the spacecraft out of orbit and head it safely through the intense heat of reentry to earth.

The shuttle flight is almost totally automated from just before liftoff until just before touchdown. During critical phases of flight, the orbiter's computers – four computers, with a fifth as a backup – brief the pilots on three TV screens in the cockpit. Aside from the TV screens and some 1,400 switches and circuit breakers,the orbiter cockpit



Horizon, Grumman Aerospace Corporation

looks much like that of any transport plane. Directly behind the cockpit is a small area where the mission specialists will work. They are the people who will run the experiments and actually carry out the mission of a flight. They will operate a complex mechanical arm — remote manipulator arm — which deploys and retrieves such payloads as satellites and telescopes.

Insulation is crucial. Without heat-dissipating tiles, the orbiter would burn up on reentering the earth's atmosphere. In addition to radiating heat, the tiles establish the aerodynamic shape of the orbiter. More than 30,000 cover about 70 percent of the orbiter's surface. A black glazed ceramic coating enables the tiles to withstand temperatures up to 2,300 degrees F. Computer-controlled machines cut the tiles, tailoring them in varying shapes and thicknesses to fit the location where they are attached by hand. No two are exactly alike, which makes them look like the pieces of a giant jigsaw puzzle.

The main purpose of the first Space Shuttle flight was to test the spacecraft. There was no payload in its cargo bay on its first orbital flight. The craft carried instrumentation for measuring orbiter systems performance in space and during its glide through the atmosphere to a landing back on earth. The big doors of the cargo bay were opened to let out into space the heat that built up from the onboard electronics. The doors were then closed again for safe reentry.

On the second day of its first flight, the orbiter was turned around in preparation for de-orbit. As *Columbia* traveled backward and upside down at 15,200 knots, the pilots fired the OMS engines to slow the vehicle slightly from its orbital speed (about 25 times the speed of sound) and nudged it down from its 150-mile-high orbit. *Columbia* began to drop and thrusters jockeyed the vehicle to a nose-high attitude so that its tile-coated belly could absorb the reentry heat generated when it hit the atmosphere some 35 minutes later. Drag took effect after reentry and the rudder split open to serve as a speed brake. The orbiter then banked and flew wide traverses to control its speed.

Flight computers controlled *Columbia* from reentry to the approach, when the crew took over for a manual landing. On this first flight, Young lifted the nose and gently pulled the orbiter out of the dive. At 270 knots, he lowered the landing gear and touched down at 190. Applying the brakes he brought *Columbia* to a stop on the wide-open dry lake bed at Edwards Air Force Base. Though automatic landings may later become routine, the crew will still have to lower the landing gear and man the brakes.

Ground operations to prepare *Columbia* for ferry flight back to Kennedy Space Center began immediately upon the landing. Kennedy Space Center is responsible for ground operations, and a recovery convoy from Kennedy moved in to begin preliminary securing and "safing" operations as soon as the orbiter came to a stop. The flight crew left the vehicle about 45 minutes later. The ground crew first checked the spacecraft for any toxic leaks and then set up an air conditioning system to remove the tremendous heat that had built up.

Solar pumped laser.

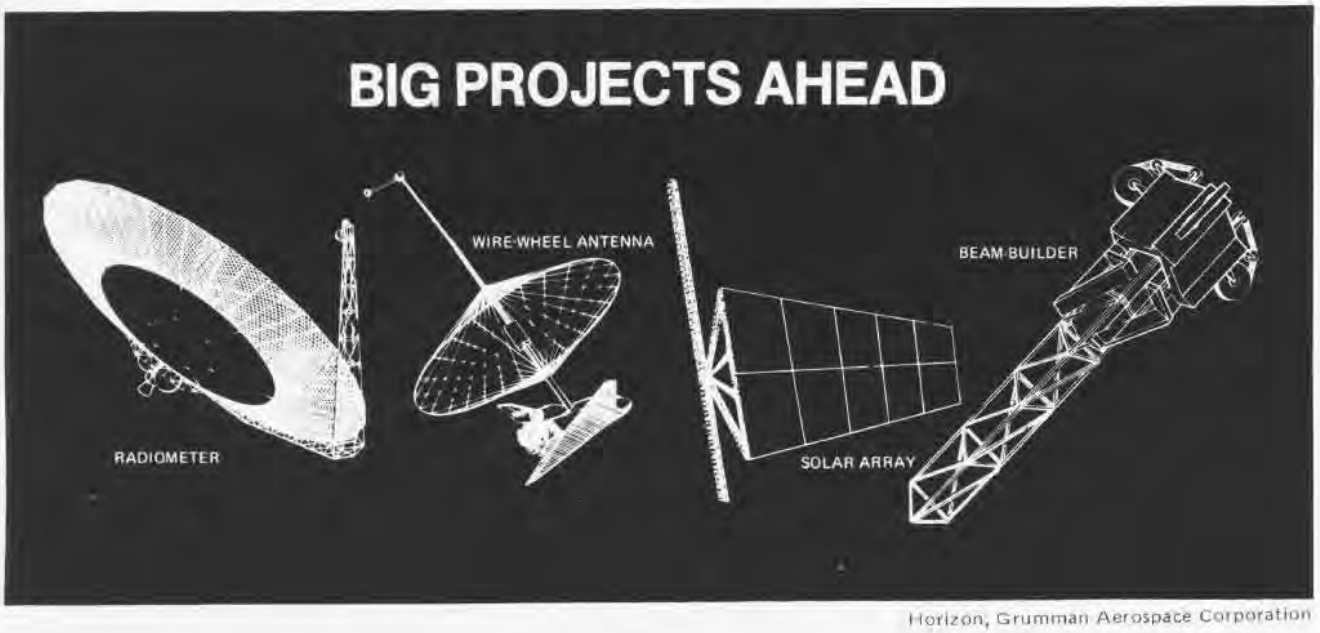
The orbiter was then towed to the NASA area at the Dryden Flight Research Center, where it remained for about a week, undergoing further system deservicing and preparations for its piggyback ferry flight back to the Kennedy Space Center.

Columbia is scheduled to fly again about four months after its first flight. Five flights are planned. The first four are test flights. On the fifth, the Space Shuttle will be declared operational and its landing at the completion of that mission will take place on the much narrower runway at Cape Canaveral.

STS-2 will have as its payload a series of environmental and earth-resources experiments. It will also test the remote manipulator system, the skinny 50-foot-long arm with a claw. In 1984, the RMS will deploy the long duration exposure facility, a free-flying space ark with a menagerie

The U.S. Space Transportation System made its debut with the first flight of the Space Shuttle. The system consists not only of the orbiter, fuel tank and solid-rocket boosters, which make up the Shuttle, but also other associated equipment such as:

- Spacelab, in which scientists and technicians of many nations can conduct experiments beyond Earth's gravity and atmosphere.
- Optional flight kits of special equipment and extra supplies, such as additional tanks of fuel for maneuvering, to enhance the shuttle orbiter's performance and extend its stay in space.
- The payload manipulating arm.
- A modular spacecraft that can be outfitted with different sets of instruments for a variety of missions.
- Rockets to propel shuttle payloads to higher orbits or on their way to other planets.
- A complex communications network.
- Launch sites and service facilities.
- Ingenious cargo handling equipment to speed ground operations.
- Ground control centers.
- The management structure to put them all together into a working system.



Horizon, Grumman Aerospace Corporation

of experiments and materials which scientists want to expose to space for long periods. The following year, a 45-foot-long telescope will be deployed which will increase man's view of the universe 350-fold.

Probably the most important of the shuttle's scientific payloads will be the Spacelab, a portable scientific laboratory developed by the European Space Agency for performing experiments in orbit. Part of its equipment will consist of incubators for biological experiments and furnaces for processing materials to determine whether, in the near-zero gravity of space, materials can be manufactured which cannot be made on earth, such as purer crystals for electronics components, better drugs and alloys of metals. Spacelab experiments could help us understand how the sun's cycles affect our long-term climate.

Spacelab remains attached to the shuttle orbiter throughout its mission. Upon its return to earth, Spacelab is removed from the orbiter and outfitted for its next assignment. It can be reused about 50 times. Spacelab personnel will be men and women of many nations who are experts in their fields.

Further along the road would be huge telecommunications platforms constructed in space that could carry 250,000 simultaneous telephone calls, make video phone calls commonplace, and enable viewers with special receivers to tune in almost any TV station in the world. The shuttle could carry into orbit materials for constructing large solar power stations that would convert the unlimited solar heat and sunlight of space into electricity. It could also transport modular units for self-sustaining settlements. Space could be the logical site of a war front at some time in the future. No matter how you look at it, space represents new frontiers.

The Space Shuttle is the U.S. launching pad for the Space Transportation System – into a new era of space research and manufacturing. The future rides with *Columbia*. It was not a one-time shot but represents the long haul. It will offer something for everyone and the prospects are perhaps beyond our imagination. The Space Transportation System could make space an extension of life on the Earth's surface.

If Things Had Not Gone Right

STS-1 flight planners tried to prepare for any contingency that might occur during the first flight, from premature main engine shutdown to a sudden desert cloudburst that might have made a mud hole out of the dry lake at Edwards Air Force Base. Northrup Strip on the U.S. Army's White Sands Missile Range in New Mexico was the backup landing site in an abort-once-around situation or if Rogers Dry Lake was wet.

A still earlier shutdown of a single main engine would have brought about a more critical return-to-launch-site abort. In that case the spacecraft would have been turned around while thrusting and then would have glided back toward the shuttle landing facility at Kennedy Space Center. Orbiter systems failure during ascent could also have forced a return-to-launch-site abort.

In an emergency requiring the crew to leave the craft prior to liftoff, the crew would have slid down a cable to a parked military personnel carrier.

Loss of control or impending catastrophic failure during ascent, after clearing the launch pad service structure up to an altitude of 100,000 feet, would have called for crew ejection. Loss of two main engines prior to seven minutes of flight would also have required crew ejection. Therefore, the flight deck carried ejection seats.

In addition to the White Sands Missile Range, there were other contingency landing sites at Hickam Air Force Base in Hawaii; Rota, Spain; and Kadena Air Base in Okinawa.

Acknowledgements: Reference material from the March issue of National Geographic and from NASA publications.

The STS-1 Pilots

John W. Young was commander of the first Space Shuttle flight. As a Navy pilot, he was assigned to VF-104 for four years, flying *Cougars* and *Crusaders*. He took test pilot training at the U.S. Navy Test Pilot School, and was then assigned to the Naval Air Test Center at Patuxent River, Md., for three years as a test pilot. Prior to reporting to NASA, Young was maintenance officer of VF-143. He retired as a captain in 1975 after almost 25 years of active service in Naval Aviation.

Young was selected as an astronaut by NASA in September 1962. He served as pilot, with command pilot Gus Grissom, on the first manned *Gemini* flight in 1965. In 1966, he was the command pilot on the *Gemini 10* mission, with Michael Collins as pilot. On the *Apollo 10* mission in 1969, Young was the command module pilot. This was the lunar orbital qualification test of the *Apollo* lunar module with Thomas P. Stafford as spacecraft commander and Eugene Cernan, lunar module pilot. Young's fourth space flight was as spacecraft commander of *Apollo 16* in 1972, with Thomas K. Mattingly II, command module pilot, and Charles M. Duke, Jr., lunar module pilot. Young was also backup pilot of *Gemini 6*, backup command module pilot of *Apollo 7*, and backup spacecraft commander for *Apollo 13 and 17*. In 1973, he became responsible for the Space Shuttle Branch of the Astronaut Office which provides operational and engineering astronaut support for the Space Shuttle program.

Young was named chief of the

Astronaut Office in 1975 and in 1978 was designated spacecraft commander of the Space Shuttle's first orbital flight test, with Robert L. Crippen as pilot.

Robert L. Crippen, Captain, USN, is an active duty Naval Aviator, and served as the shuttle pilot on its first orbital flight. His flying career in the Navy has been varied. From June 1962 to November 1964, he was an attack pilot with VA-72 flying off USS *Independence*. Crippen was then sent to the U.S. Air Force Aerospace Research Pilot School at Edwards Air Force Base and after graduating

from the school remained there as an instructor until October 1966. At that time he was selected for the U.S. Air Force Manned Orbiting Laboratory Program.

Crippen became a NASA astronaut in September 1969. He was a crew member on the Skylab Medical Experiments Altitude Test. Later he was part of the Astronaut Support Group for the Skylab 2, 3 and 4 missions, and also for the *Apollo Soyuz* Test Project mission in 1975. He was then selected for the Space Shuttle program and began training in 1978.

Their Training

Young and Crippen began full-time training for shuttle flights in 1978. Twenty-five hours of each week were given to instruction in navigation, astronomy and in launch, orbit and descent procedures. They spent more than 1,200 hours in mock-ups of *Columbia's* flight decks, familiarizing themselves with the labyrinth of switches and the five computers that run the spacecraft. Wearing pressurized suits, they entered a water tank where they performed flight operations in an orbiter model. One of their most important preparations involved the crucial moments of takeoff and landing. To get the feel of flying the shuttle, Young and Crippen spent hours flying a Boeing 707 to acquire the perception of flying a massive aircraft. To practice the critical touchdowns, they flew a *Gulfstream II* outfitted with thrust reversers and side-force generators. In preparing for possible contingencies, Young and Crippen were confronted with scenarios in which everything that could go wrong — did. Thus, they got ready for the real thing.

Diego Garcia detachment crewmen load the Navy's newest weapon, Harpoon, aboard a P-3.

(Photo by Ltjg. Chris Kostyack)

Strangers in Paradise

If you're scheduled to
go to Iceland,
and you end up
on a tropical island
in the Indian Ocean,
you'd better be able to adapt.

If you are in the Indian Ocean, on a westerly heading some 12 flying hours from the Philippines, you may come upon the small coral atoll of Diego Garcia. By agreement with Great Britain, it is the U.S. Navy's front line in the Indian Ocean and, between February and August last year, it was home-away-from-home during 30-day deployment rotations for a Patrol Squadron 26 detachment.

Diego Garcia was a major departure from the original schedule. The VP-26 *Tridents,* home-ported at NAS Brunswick, Maine, had been slated for a tour of duty at Keflavik, Iceland, shoveling snow and wearing parkas. Instead, they found themselves at Kadena Air Force Base on Okinawa and the Diego Garcia detachment was shoveling sand and wearing as little as legally possible in the near-equatorial heat.

Where the near-equatorial sun brings temperatures up to over 100 degrees on the flight line, (l-r) Lts. John Christman, Ed Wreski and Terry Brisette beat the heat with khaki shorts.

The rotation flights from Okinawa, to maintain a two or three-plane detachment of 50 men on the island, included a stop at NAS Cubi Point in the Philippines for briefings, a one-day stop in either Bangkok or Singapore, and finally Diego Garcia. In a short time, the detachment had begun referring to the island as "Dodge, the final frontier."

"In a sense, it was frontier living," recalls Lieutenant Commander Robin Larson. "It is at the end of the supply line." LCdr. Larson, of VP-1, commanded the combined patrol squadron dets on Diego Garcia.

Lieutenant John Christman agrees, adding, "Flying out of Diego Garcia was the most demanding and challenging flying I've ever experienced. Let's face it, the support we're used to just wasn't available at such an isolated station, and there was a lot of pressure on both aircrews and support personnel. It required initiative and everyone did a terrific job, keeping us flying."

In addition to the logistics problems, Diego Garcia offers its own unique challenge to flight. Everything seems to acquire a coating of fine coral dust if left sitting for more than a few minutes, and pilots taking off or landing have to be alert for any of the island's stray donkey population wandering across the runway.

During off-duty hours, life on Diego Garcia was described by one comic as "adult Boy Scout."

Officers from the detachment were berthed in C-huts made of plywood and screen wire and raised off the ground to allow air circulation. Enlisted personnel were housed in open bay type berthing reminiscent of boot camp days.

"Diego Garcia reminded me of the television show *Gilligan's Island,*" says flight engineer Petty Officer Cecil

LK-1, the 500th P-3 produced by Lockheed, patrols south of Okinawa.

Simmons. "You have a feeling of being shipwrecked in the South Seas."

Aircrews and support personnel took advantage of the island's recreation programs, and Lieutenant Bruce Appleton describes the snorkeling and fishing as "better than Jacques Cousteau could have imagined."

Appleton and other squadron swimmers and divers took advantage of the water but also kept a sharp watch for Hector, a large hammerhead shark of dubious amicability which rumor had it the Seabees were keeping as a pet. Hector's size, according to one VP-26 member, varied from 15 to 25 feet, "depending on the person relating the tale."

A thousand miles from the nearest significant landmass, those in the detachment, along with the rest of the island population of approximately 2,000 persons, relied upon their own ingenuity for much of what is taken for granted elsewhere. On the Fourth of July, the parade floats were made up of everything from cement mixers and cranes to pickup trucks and bicycles. Beach parties invariably include hermit crab races and tobacco-spitting contests, and rarely is any athletic event short of participants or spectators.

The squadron is home now, and spring has turned to summer's warmth and a reminder of Diego Garcia. And there are other reminders, mostly sailors going on liberty wearing a prized souvenir of that last deployment – the Diego Garcia T-shirt.

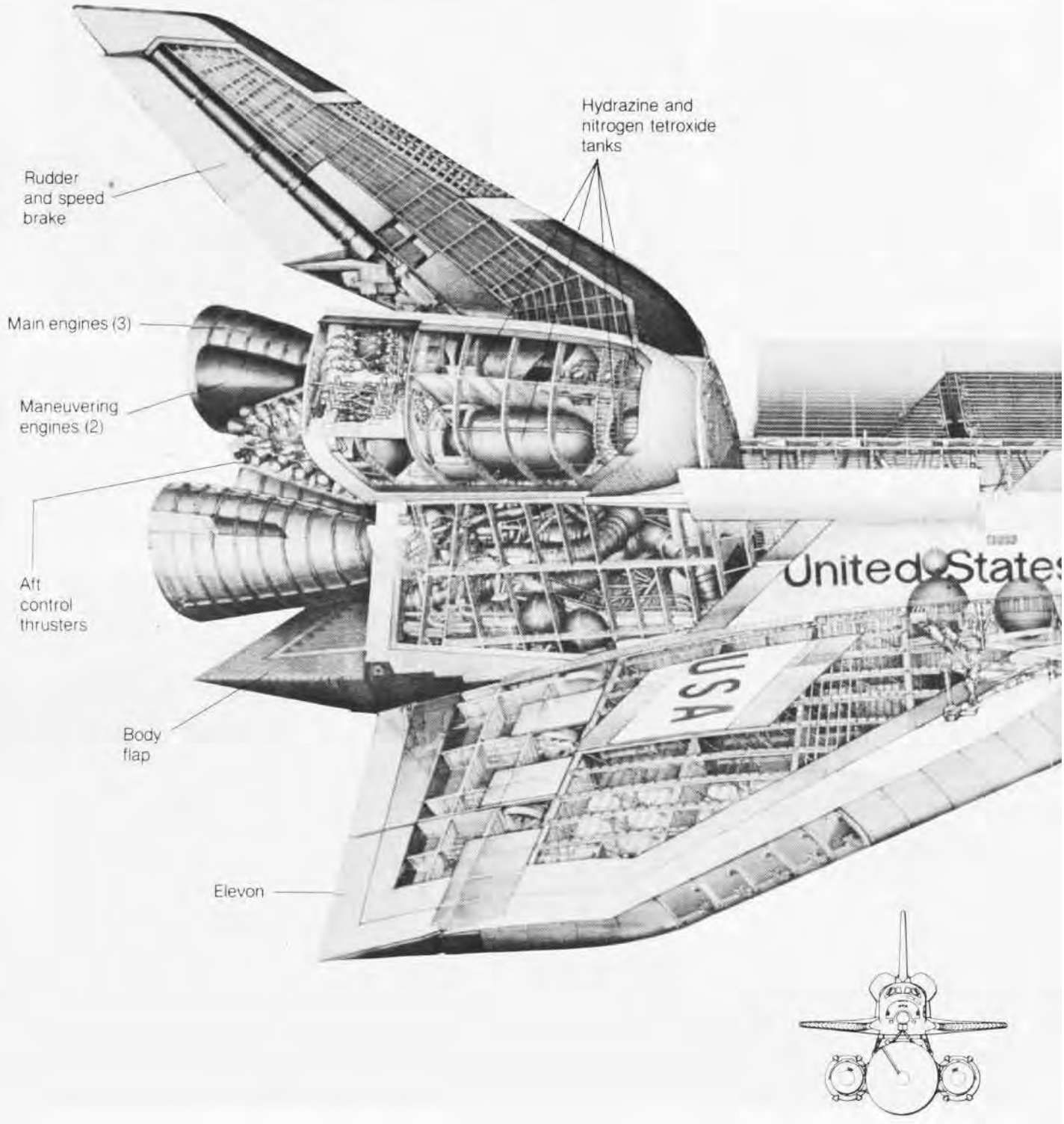
(Photo by Ltjg. Jim Birkemose)

Petty Officers (l-r) Joe Nikolaus, Jeff Ross and Paul Mainville of VP-26 take a break and hope for a breeze. The P-3 maintenance shop on Diego Garcia could never be mistaken for the Waldorf.

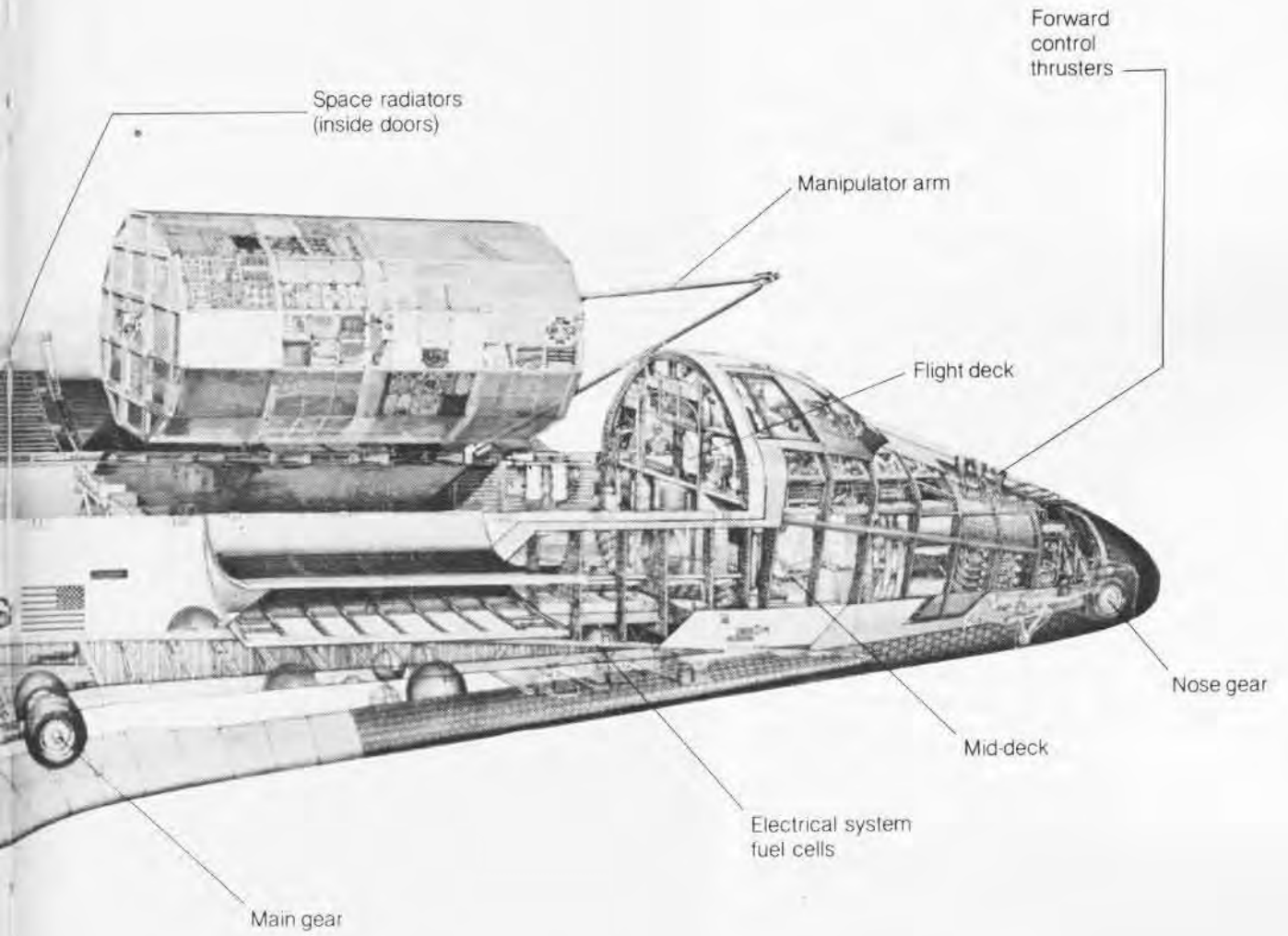
Examining antisubmarine efforts of the past, Ltjg. Chris Keswick takes a look at the wreckage of a PBY Catalina on the beach at Diego Garcia.

(Photo by Lt. John Christman)

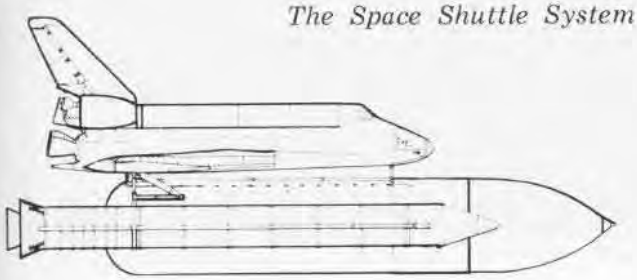
The Orbiter -

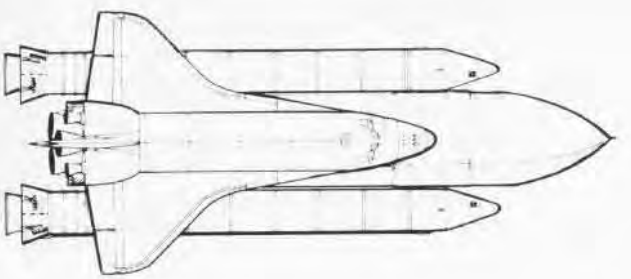

Hydrazine and nitrogen tetroxide tanks
Rudder and speed brake
Main engines (3)
Maneuvering engines (2)
Aft control thrusters
Body flap
Elevon
United States
USA

The Core of the System



The Space Shuttle System





Death of a

The Sinking of USS Langley, February 27, 1942

By the time Cdr. Divoll returned to the main deck, *Langley's* list had reached 10 degrees. He had already ordered counterflooding and was going to the bridge to report the situation to the captain. What he had seen below had not been encouraging. Water was entering the motor pits.

On the flight deck there was little activity. The last of the Japanese planes were leaving and without targets the two remaining three-inch guns had stopped firing. Through the wooden deck poured smoke from the fires below, that mixed with the smoke and flames of the burning P-40s. Exploding .50-caliber ammunition in the P-40s added to the danger and kept many men down and flat on the deck. In a hurried conference, Cdr. Divoll and Cdr. McConnell decided to push as many of the P-40s over the side as possible to reduce top weight and help slow the list.

In the crypto room below the bridge, Ensign Jay Thurman and Warrant Officer Radio Electrician Charles Snay were preparing code books and documents for destruction. As the list increased, Drs. Blackwell and Handley sent the less seriously wounded men topside.

Among the wounded sent topside was Fireman First Class Earl Snyder (no relation to Marvin Snyder) who had been with Carpenter Curtis when the first bomb hit. Snyder had been hit in the arm and chest and was now wearing a cast that encased his upper body and arm. Though he was punchy from morphine, Snyder recognized *Langley* might not survive much longer. If the ship went down, he did not want to be trapped in the heavy cast, and with the help of a shipmate he broke away the still damp plaster and freed himself.

Langley was still listing 10 degrees when Cdr. Divoll reached the flight deck. Gathering several men, including Army pilots and ground crewmen, he told them to start pushing aircraft over the side. Many of the planes were burning or were so badly damaged that they could not be moved, and Divoll's scratch crew succeeded in pushing just five P-40s off the flight deck. The

Pioneer

By Dwight R. Messimer

PART II (conclusion)

Army P-40 fighters line the deck of a WW II carrier much like those carried by Langley on the day of her demise.

effort was ineffectual – the list was now approaching 15 degrees.

Langley's problem was not caused by top weight but by the steadily rising water in her hull. Chief Engineer Lieutenant Nat B. Frey, down in the engine room, did not like what he saw. The fireroom bilges were awash and there was already four feet of water in the port motor pit. While Lt. Frey moved around below searching for a way to stem the flow of in-rushing water, a messenger hurried to the bridge with his report.

1300 to 1325 – The captain received Lt. Frey's message shortly after 1300. Fires still burned down two-thirds of the ship's length, though most were either under control or soon would be. The rudder was still jammed, all efforts to free it having failed, and the ship's speed had fallen to five knots.

Cdr. McConnell ordered the word passed to prepare to abandon ship. He was not ready to leave yet, but he wanted things ready if that increasingly likely situation became necessary. The captain was actually thinking beyond the immediate future. He knew that in her present condition *Langley* could not negotiate the channel at Tjilatjap, just 74 miles away, and there was no hope of reaching Australia. If the rudder could be freed and the flooding controlled, he was determined to make for Java and, if necessary, beach the ship.

The "prepare to abandon ship" order spread through the ship with surprising speed. In the process, it was oftentimes misinterpreted or improperly delivered. Many weary and frightened sailors began going over the side, particularly from the after portion of the ship where the fires were still burning hotly.

When the word to prepare to abandon ship reached Machinist's Mate Second Class Millard McKinney, he was on the poop deck fighting fire, having left the after steering engine room when it had become apparent that the rudder could not be freed. Though shocked by the destruction he had witnessed below decks, he had not been prepared for the disaster on the poop deck.

Men had been jumping from the stern ever since he had arrived and more were going now. Most were leaping to escape the flames which now spread across the entire after portion of the stern, consuming the wooden structures that stood on the poop deck and the boat deck. Despite the apparent ferocity of the fire, however, it was in fact almost under control.

McKinney, along with most of the ship's crew, responded to the order immediately. A further inducement was a widely circulated rumor that *Langley* had been hit twice by torpedoes, and the authenticity of this information appeared to be confirmed by the steadily increasing list. Descending to the second deck, McKinney went to his locker and grabbed his watch, camera and rations. Back on the main deck, he saw a pile of pistols and rifles, and took a .45-caliber automatic pistol that he stuffed into his belt. An old salt, who many insisted had been in the Navy when Dewey was an ensign, was telling the younger men to put their valuables in empty five-inch powder cans. McKinney quickly found two powder cans and put his watch and camera in one and his rations in the other. He then put on a life jacket and walked to the starboard rail carrying his two powder cans.

Seaman First Class James Meally had been part of an ammuniton party when the attack started, and had taken cover under a boat on the well deck to escape the bomb blasts. When he looked up, the ammunition party had vanished. Since then, Meally had been fighting fires under the direction of the Chief Master-at-arms in an area about amidship. When the word came to prepare to abandon ship, he started forward intending to retrieve his valuables from his locker. But he was told that the Japanese were strafing and, hearing what he thought was cannon fire, he turned back. The Japanese were by that time long gone and what Meally thought was cannon fire was really exploding ammunition in the P-40s on the main deck.

Baker Third Class Wetherby had spent his time, after leaving the forward magazine, helping the wounded he found lying around the deck. When the order to prepare to abandon ship reached him, he was in the bake shop with two other bakers binding up a nasty head wound suffered by Chief Commissary Steward George Vano. The three bakers then helped the injured man to the starboard rail.

Radioman Second Class David Jones emerged from the base of the bridge structure onto the open main deck and saw for the first time the results of *Langley's* ordeal. *Langley* had lost nearly all way and was bow to wind so that the black, acrid smoke boiling upward was blown astern. Jones could see fires burning in several places, and the boats stored on this part of the main deck were smashed and burned. The forward main hatch, over what had formerly been a huge coal bunker, was bent and twisted. At the base of the foremast, a boat's horseshoe-shaped taffrail made a perfect "ringer."

By now *Langley's* engines had stopped and the old Covered Wagon was dead in the water. A messenger from Lt. Frey told Cdr. McConnell that water had risen so high in both motor pits that there was an immediate danger of explosion. Reports reaching the captain from his other department heads were not encouraging and at 1325 he reluctantly ordered abandon ship.

1325 to 1446 – The number one motor whaleboat hung in davits on the starboard side, forward. The boat, used as a lifeboat aboard *Langley*, was firmly secured to a strongback. Miraculously, this boat had survived the blast and fire of the first three hits, and into this boat were put several seriously wounded men including Lt. Bailey. Accompanied by Dr. Blackwell and four seamen, the wounded were to be transferred to *Whipple*.

How the boat was to be lowered down the side of a ship listing 15 degrees is not described in any of the official documents, nor is it explained by the survivors who were near the boat at the time. Both the documents and survivors agree, however, that when the hooks were released, allowing the boat to swing away from the strongback, the after fall parted, dropping the stern and spilling the occupants into the ocean.

Radioman Second Class Bernard Jasper had just left the radio room and had come out on the main deck when the boat full of wounded was dropped into the water. Jasper ran to the rail and saw several men splashing in the water 20 feet below, while others floated motionless supported by their large kapok life jackets. Jasper jumped into the water and began to help the injured men back into the boat which had been hurriedly lowered the rest of the way.

Most of the crew went over the starboard side and were picked up by *Whipple*. Those who took the plunge to port went aboard *Edsall*. The starboard choice seems to have been based on the possibility that *Langley* might roll clear over on her port beam. Additionally, the wreckage from boats and aircraft, as well as loose equipment, was starting to tumble into the water on the low side. To most of the crew a 30 or 40-foot drop looked like a better deal than the possibility of being zonked by a chunk of falling debris.

Not everybody went right away. For some, there were still final duties to be performed. Documents and

coding machines had to be destroyed along with charts and other publications. All were thrown over the side in weighted bags, their destruction verified by Cdr. McConnell.

On the well deck, Machinist's Mate First Class James Harvey and two other seamen were hesitant to leave the ship. *Langley* was nearly deserted by now but Harvey did not believe that she would really go down. He was discussing the situation with his mates when Cdr. McConnell came along and ordered them off the ship.

Except for a few officers and petty officers who were checking the lower decks for stragglers, the captain was alone on the ship. As soon as the lower decks were reported clear he sent the last man over the side and then followed.

While anxious lookouts watched the sky, *Whipple* and *Edsall* moved in close to *Langley* and began scooping men out of the water. Lines and cargo nets were alive with men as they swarmed aboard, and boats from the destroyers cruised among the survivors picking up the injured and the feeble. In less than an hour, the last man had been fished out of the water.

There now developed a rather awkward situation – *Langley* did not seem to be sinking. At 1428 *Whipple* pumped nine four-inch rounds into the hull without any noticeable effect. Four minutes later she launched a torpedo that hit just aft of the starboard jib crane. *Langley* seem to right a bit but she still was not going down. *Whipple* moved around to the port side and fired another torpedo that hit her below the stack sponson. By now there was a real concern that the Japanese would return any minute. The destroyer skippers, Lieutenant Commander Eugene S. Karpe on *Whipple* and Lieutenant J. J. Nix on *Edsall*, were reluctant to hang around any longer, and for very good reasons. Both ships were inadequately equipped with antiaircraft defense, both suffered from prior battle damage, and both were filled to over-capacity with *Langley* survivors. Their anxiety was shared by Commander E. M Crouch, commanding officer of Destroyer Division 57, who was aboard *Whipple*. At 1446 both destroyers cleared the area.

As the destroyers disappeared over the horizon, *Langley*, still burning, slowly settled. No one saw the old Covered Wagon go down, a fact that caused a short-lived controversy. But despite the small controversy surrounding her unobserved sinking, her end was in a way fitting. *Langley* had been a pioneer and like so many pioneers she died alone. □

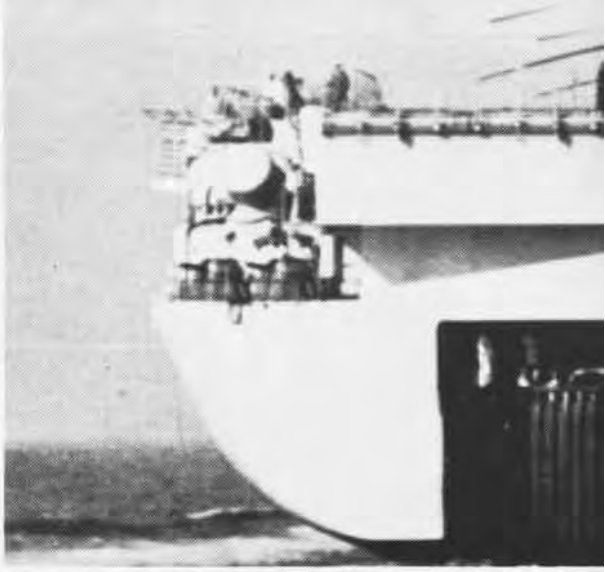
Photo by Capt. L. E. Divoll, courtesy of Shipmate, Alumni House, Annapolis, Md.

Above, Whipple administers the coup de gras to the grand old lady.
Left, Langley as a seaplane tender.

Meeting the Challenge

This article has been adapted from a speech delivered by Vice Admiral Ernest R. Seymour, Commander, Naval Air Systems Command, as part of a briefing for industry.

For years we have acknowledged that the Soviet Union held a quantitative lead in military equipment, but believed that our qualitative lead would more than compensate for this. It is time to reexamine that belief and to reject the complacency that went with it.



During the decade of the 1970s, the Soviets made a major advance in the development and production of defense material and, as a consequence, will enter the 1980s in a dramatically different defense posture than they had as they entered the 1970s. Their objective was to challenge the U.S. lead in defense technology while maintaining their numerical advantage. They have had a remarkable degree of success in achieving that objective by making an enormous investment, and by maintaining an unwavering emphasis on technology.

The Soviet Union started the 1970s with an annual defense investment — research, development, test and evaluation (RDT&E), procurement and military construction — approximately equal to that of the U.S. but they have increased at a steady rate of four percent per year since then, while the U.S. investment decreased in real terms every year until 1975. As a result,the Soviet Union invested, over the decade, about $240 billion more

A stern view of the Soviet aircraft carrier Kiev underway.

Soviet Union's aircraft carrier, Kiev.

than the U.S. in FY 1981 dollars. This differential exceeds the estimated acquisition cost in 1981 dollars of 1,000 F-16s; 1,000 F-18s; 10,000 XM-1 tanks; 20 CG-47 class guided missile cruisers; 50 nuclear attack submarines; 20 *Trident* submarines with missiles; the entire MX program; and an additional $70 billion in research and development (R&D). Generally speaking, they have used this investment increment to produce large quantities of equipment, thus maintaining their numerical advantage. But, as they try to match the sophistication of U.S. equipment, the unit cost of Soviet equipment has substantially increased. For example, we estimate that the cost of their MiG-23 approaches that of the Air Force's F-16.

Construction facilities represent a second component of Soviet investment. During the last five years of the 1970s, Soviet military production facilities have been constructed at the highest sustained level of the last two decades, portending high production rates and increased productivity during the 1980s.

The third investment component, which can be used as an indicator of future plans, is the Soviet R&D program. While our estimates of Soviet investment in R&D have significant uncertainties, the evidence is compelling that their program is about twice the size of ours. We can make a fair evaluation of this by observing their test programs, where we can identify about 50 major systems — ships, submarines, aircraft, and missiles — in various stages of test and evaluation. Some of these systems are quite significant: a new attack submarine, a new interceptor, a new look-down/shoot-down missile, and a new sea-launched ballistic missile. Also, we can assess some portions of their technology programs by observing laser test activity; for example, we estimate that their high energy laser program is about four times the size of ours.

Overall, during the decade of the 1970s, the Soviets invested about $70 billion more than we did in defense R&D. It is quite clear that their R&D program has had the highest priority access to funds, to trained personnel and to scarce materials, to the extent that they have imposed serious hardships on their non-defense industry. As a result, their non-defense industry is not competitive in world markets.

In sum, we see the Soviets entering the decade of the 1980s with a commitment to compete in quality with U.S. weapons systems. A major start has already been made in that direction, with the acceptance of the much higher unit cost implied by this commitment. They are accepting this increased unit cost, without decreasing their traditional emphasis on quantity, simply by increasing their total investment in weapons production to where it is now 85 percent greater than ours.

That they plan to continue this emphasis throughout the 1980s is clear by the major increases made in the previous decade in production plants and in defense RDT&E. This challenge is formidable. We are behind quantitatively in deployed equipment and are falling further behind because of disparities in equipment production rates. While we are still ahead in defense technology, we are in danger of losing that advantage because of massive Soviet spending in defense R&D. But, we also have some distinctive advantages: a superior technology base, a competitive industry with greater productivity, and allies with a substantial industrial capability.

In order to meet the formidable challenge we face, our investment strategy must fully exploit these substantial advantages. Our overriding near-term need is to get on with the modernization of our forces. Our technology is of little use to our armed forces when it is not embodied in reliable and maintainable operational equipment. As superb as they were in their day, systems like the A-4 and F-4 were developed during the fifties and entered production in the sixties. As a consequence, they simply do not incorporate current technology. They provide maintenance and support problems created by their age.

Fortunately, a new generation of weapons systems was developed during the seventies and is now ready for

production — like the multi-role F/A-18 *Hornet*. Unfortunately, the preponderance of these new systems coming into producton at the same time will cause a "procurement bulge" during the first half of the eighties. There is no way of avoiding this. We have examined all of these new systems in great depth; they are needed and they are not "gold-plated." Our industrial base has the capacity to produce these new systems. The challenge now is to provide stable and effective program management in the face of this rapidly expanding workload, and to provide adequate procurement funds so that new systems can be produced at efficient rates. As a result, the Department of Defense has requested a five-percent real growth in procurement funds in FY 1981 and has programmed a seven-percent average annual real growth in our five-year program to accommodate this "bow wave" of new programs.

The second component of our investment strategy is to meet the Soviet challenge in technology. In spite of the Soviet two-to-one advantage in R&D spending, we have been able to maintain technological leadership in most critical areas for three quite different reasons. First, we had enormous momentum in defense technology derived from the lead we built up in the 1960s and, in effect, could "live off the fat" for a few years — but not indefinitely. Second, the Soviet systems respond well to increased funds and priority in evolutionary programs, but do not rise to innovative challenges. For example, they have been quite successful in increasing production on the *Flogger* aircraft (MiG-23), which embodies significant but principally evolutionary improvement in technology over previous aircraft; but they are still copying the U.S. with a lag of five years or more in the revolutionary development we have made in computers and micro-electronics.

Third, we have a tremendous asset in our commercially oriented, high technology industry, for which there is no real equivalent in the Soviet Union. A comparison of defense RDT&E budgets does not reflect the considerable effort expended by U.S. companies with their own funds or independent R&D funds — efforts which have led to technological advances of fundamental importance of precision guided weapons, were basically a commercial development.

For this combination of reasons, the U.S. still maintains leadership in the underlying technology critical to defense. But our technological advantage in deployed equipment is eroding. Therefore, our investment strategy involves increasing our R&D in the 1980s, with emphasis on those technologies which can produce a distinct military advantage. During that time, we will be requesting a substantial increase in RDT&E with a major increase in the application of technologies such as microelectronics, computers and microprocessors applied to a new generation of precision guided weapon systems, and advanced materials which will improve the performance of aircraft, missiles and jet engines.

In the field of naval tactical aircraft, which is my prime concern, we are looking forward to a brighter future, but right now our force level picture doesn't look very good. We are simply stretched too thin. How can this be? In today's Navy we have essentially the same worldwide commitments we did shortly after World War II, but we don't have nearly the same number of ships, especially carriers.

Consider this fact. In 1953, the last

Soviet Golf II-class ballistic missile submarine.

year of the Korean Conflict, we had 34 aircraft carriers on active service. Today we have only 12, not counting the training carrier USS *Lexington*. When we total up our commitments to national defense and NATO, simultaneous deployment of our carrier task groups to the Mediterranean and the Indian Ocean only goes to illustrate my point.

This stretching I'm talking about requires our existing forces to operate at a near wartime pace. Partially because of this, we are losing tactical aircraft faster than we are replacing them. In the meantime, the fleet awaits the introduction and build-up of new machines to replace the ones we are losing to normal attrition. We have had to maintain our aircraft numbers by assiduously managing our resources, by extending their service life, and by converting in lieu of procuring aircraft. But these efforts cannot be continued indefinitely before we become asset-poor and future procurements are unable to meet the bow wave built from past procurement.

Because of these problems, I sometimes think of us as being like Atlas, obliged by the gods to slump under the weight of the heavens. But the task is not impossible, and it's one in which we must succeed. It is America's aerospace industry that will help us make up the difference. If we are Atlas' arms, it is the aerospace industry that provides the muscle. Only by working together can we support the weight of the task at hand.

Naval Aviation weapons systems acquisition in the 1980s will continue to be a process of making tough trade-off decisions between conflicting requirements in order to live within constrained defense budgets. The situation is exacerbated by the inflationary pressures we all have to live with. We will be making these decisions in the face of the greatest military might ever assembled by a potential adversary. Nevertheless, I believe we can produce a formidable defense capability under such adverse conditions by capitalizing on our strongest assets — our innovative ability, our technology, and our superior aerospace industry.

MiG-23 Flogger.

The first Soviet Kirov-class nuclear-powered guided missile cruiser, in the Baltic Sea.

Kamov KA-25 Hormone helicopter.

Glenn H. Curtiss

By Captain Dick Knott

He was something of an enigma. Hailed as "the fastest man on earth" and "king of the air," Glenn Hammond Curtiss was at the same time a quiet and somewhat retiring person who seemed ill at ease in the spotlight of fame that followed his spectacular accomplishments. He had grown up in the little town of Hammondsport, N.Y., in the heart of the wine country, imbued with a belief in the work ethic and an unshakable faith in the great American dream.

Left fatherless at an early age, he dropped out of high school when he was 15 and was employed for a time by the Eastman Company and Western Union in nearby Rochester. After a few years, however, he returned to Hammondsport and began a rise to success which would eventually make him a wealthy man and a giant of the American aircraft industry.

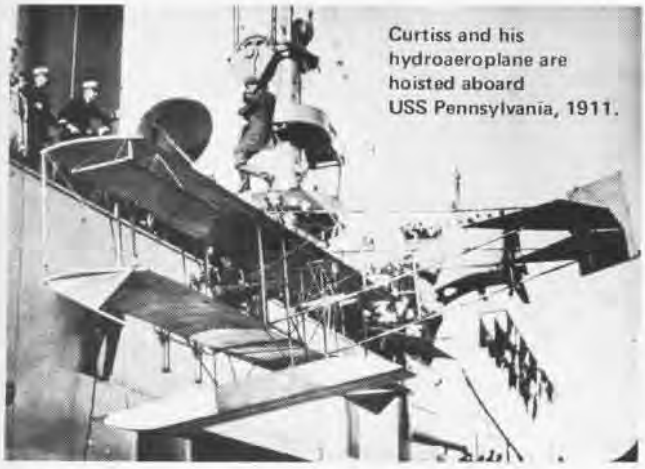
At first he went into business selling harness, his father's old trade, and bicycles in which he had always been interested. Soon he was manufacturing his own brand of the popular two-wheeled conveyances and before long he had married his product to the gasoline engine to produce motorcycles which were then gaining acceptance in America.

Things mechanical had always attracted and fascinated the young entrepreneur but his innovative bent was toward practical rather than theoretical concepts. He pursued those ideas which seemed to have immediate application and was not much interested in resolving purely academic problems.

Curtiss considered himself a businessman first and to be successful in business one was expected to promote his product. In January 1907, at the Speed Carnival at Ormond Beach, Fla., he clocked 136.3 miles per hour on one of his cycles. It was a record which was not broken for several years and the young man from Hammondsport took on new national status as "the fastest man on earth."

The idea of powered flight did not appeal to Curtiss in the beginning, probably because he did not think it had any practical application or commercial value. Although his small company had taken on the manufacture of engines for early lighter-than-aircraft, Curtiss like most other people of his day seemed to consider manned flight more of a scientific oddity than a serious pursuit. Nevertheless, in the

Sheet music commemorates Albany to N.Y. flight.



Curtiss and his hydroaeroplane are hoisted aboard USS Pennsylvania, 1911.

Curtiss H-16 used in World War I.

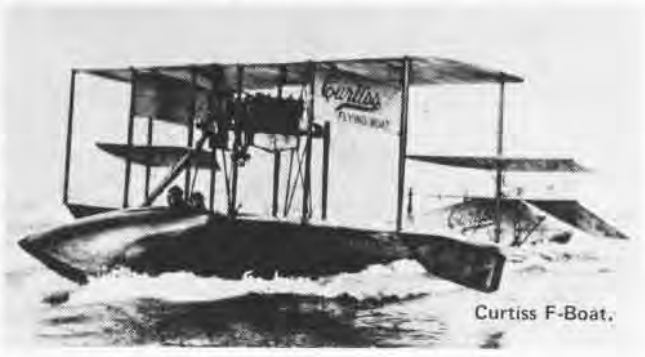
fall of 1907, he decided to join with Dr. Alexander Graham Bell and three other enthusiasts to delve into the mysteries of flight. The five men, Bell, Curtiss, Baldwin, McCurdy and Selfridge, formed the Aerial Experiment Association. After painstaking experiments with tetrahedral kites and gliders, they were successful in building two powered aircraft which were able to leave the ground and fly for short distances.

On the fourth of July, 1908, Curtiss flew a third aircraft known as the *June Bug*, which he had designed, for a distance of more than a kilometer. His feat was witnessed by a number of spectators and the flight won him the *Scientific American* award. Although the Wright brothers had already made their historic flight in 1903, they had not given a public demonstration of their machine, which made skeptics doubt their claim. Curtiss and the Aerial Experiment Association, on the other hand, had welcomed spectators and were happy to have their work publicized.

Representatives of the Aero Club of America attended the flight of *June Bug*. Theirs was the only widely recognized aviation organization with national status. Later they would set standards for and issue the first pilots' licenses in the United States. Curtiss, who had made the first public flight in this country, was accordingly issued pilot's license No. 1, an act which infuriated the Wrights and did much to exacerbate a rift between the two camps – which developed into open legal warfare in the courts. It is ironic that in 1929 his company merged with the successor to that of his antagonists to become the Curtiss-Wright Corporation

NAVAL AVIATION HALL OF HONOR

This is the sixth in a series of articles on each of the first twelve men to be enshrined in the Naval Aviation Hall of Honor.



Curtiss F-Boat.

which still exists today.

Having demonstrated the feasibility of powered flight, the Aerial Experiment Association dissolved itself and Curtiss formed a new company to produce aircraft, engines and other products. Thereafter, he devoted himself largely to making the airplane a commercial success. His company produced the *Golden Flyer* which won him the *Scientific American* trophy for a second time in July 1909 for a flight of 25 kilometers. He flew the *Rheims Flyer*, another of his aircraft, in the first international air meet which was held in France. There he won the Gordon Bennet International Aviation trophy in a speed contest with the world's finest aviators. The French awarded him their country's pilot's license No. 2, the first having gone to Louis Bleriot whom Curtiss had bested in the contest. In 1910, he flew the *Albany Flyer* from the city of the same name down the Hudson River to New York City to win a $10,000 prize and the *Scientific American* trophy for a third time, retiring it in his name.

The Navy accepted aviation somewhat reluctantly. On November 4, 1910, Curtiss Exhibition Pilot Eugene Ely flew his Curtiss pusher aircraft from a platform erected on *Birmingham* and, on January 18, 1911, Ely landed on and took off from a similar structure aboard *Pennsylvania*. Despite this spectacular demonstration, the Secretary of the Navy was not convinced of the utility of aircraft taking off from and alighting on warships. The wooden platforms, after all, interfered with effective operation of a ship's guns. What was needed, he thought, was an aircraft which could be lowered over the side of a warship, take off from the water to pursue scouting duties and return to make a landing on the water and be hoisted back aboard.

Glenn Curtiss took up the challenge. In the meantime, however, he had offered to train a naval officer "in the operation and construction of the Curtiss aeroplane." Lieutenant T. G. "Spuds" Ellyson was subsequently assigned to the Curtiss Aviation Camp at North Island, San Diego, for this purpose. Between training flights Ellyson assisted Curtiss in his experiments with the hydroaeroplane that Curtiss was working on to fulfill Navy requirements and, on January 26, 1911, this machine made its first flight from the water. The following month Curtiss taxied his

hydroaeroplane up to *Pennsylvania*, which was then anchored in San Diego Bay, where it was hoisted aboard by the ship's boat crane. After Curtiss exchanged pleasantries with the commanding officer, Captain Charles F. Pond, the hydroaeroplane was lowered over the side and Curtiss returned to his camp at North Island.

The Navy ordered its first two aeroplanes from Curtiss on May 8, 1911, and this has come to be celebrated as the official birthdate of Naval Aviation. The first of these aircraft, called the *Triad* because it could operate on land, sea or in the air, was test flown by Curtiss on July 1 of that year and turned over to the Navy. The second aircraft, originally built as a land plane trainer, was delivered a short time later.

Curtiss now directed his attention to a new kind of aircraft. It differed in concept from the hydroaeroplane in that the fuselage of the aircraft would also be a boat hull. It came to be called a flying boat — literally a boat with wings as opposed to an aeroplane with float appendages. His experiments with early versions of the F-Boat produced the "step" on the underside of the hull, which broke the suction created by the water's surface and enabled the aircraft to lift off. Curtiss was granted a patent for this invention in 1915 and is properly credited with invention of the flying boat.

The Navy bought five of these new-type aircraft, which were redesignated AB-1 through AB-5. Curtiss continued to make improvements on each of these aircraft and lessons learned were later incorporated in larger, more sophisticated flying boats.

Curtiss understood that the ability to launch aircraft directly from a ship at sea would greatly enhance their utility to the Navy. He and Ellyson worked on the problem and devised a wire launching device which the latter demonstrated in September 1911. It was not a practical solution to the problem of shipboard launching but in November 1912 another Curtiss aircraft was successfully launched from a barge in the Anacostia River, using a catapult designed by Naval Constructor Holden C. Richardson. The catapult also proved capable of launching the heavier flying boat and, in November 1915, the concept was successfully demonstrated from *North Carolina*.

The Navy established its first formal flying school at Pensacola, Fla., in January 1914, with Lieutenant John H. Towers as officer in charge. Towers (Naval Aviator #3) had been trained by Ellyson under the watchful eye of Glenn Curtiss and would later become one of the most distinguished figures in Naval Aviation. The Navy purchased a number of Curtiss flying boats which, along with other aircraft, were used extensively in the training of early Naval Aviators.

During World War I, Curtiss built large flying boats, mostly H-4 (Small Americas) and H-12 (Large Americas), for the British, who used them for antisubmarine patrol duties which occasionally saw combat with German float plane fighters. When the U.S. entered the war, Curtiss provided improved H-16 and HS-type flying boats for the U.S. Navy. For all practical purposes, Curtiss flying boats were the only U.S.-built combat aircraft to be used in Europe by the Allies during World War I.

Eugene Ely flies Curtiss aeroplane from USS Pennsylvania, 1911.

Curtiss is honored by the U.S. Post Office.

Toward the end of the war, Curtiss was called upon to develop, in partnership with Navy engineers, a large flying boat which could deliver itself across the Atlantic. The result was the Navy-Curtiss NC-type aircraft. Although hostilities ended before these planes could be employed in a wartime capacity, the NC-4 in May 1919 became the first aircraft ever to fly the Atlantic.

Glenn Curtiss was only 52 years old when he died in 1930. He was one of the most prolific of the early aviation pioneers and did much to further the development of aviation in the United States. He was the first American to achieve powered flight from the water and is the undisputed inventor of the flying boat. These achievements won him the Langley Gold Medal of the Smithsonian Institution and the prestigious Collier Trophy, as well as many other aviation awards. Curtiss was one of the foremost of Naval Aviation pioneers, having brought the concept to fruition by producing a hydroaeroplane to meet the difficult requirements set forth by the Secretary of the Navy. One of his aircraft flown by a Curtiss pilot, made the world's first takeoff from and landing aboard a warship. He designed and built the Navy's first aircraft, trained the Navy's first pilot, produced the only U.S.-built combat aircraft to be employed by anyone during World War I and helped design and build the NC-4 which made the first flight across the Atlantic. In those early days, the name Curtiss and Naval Aviation were inseparable. □

PEOPLE·PLANES·PLACES

Awards

Seven officers of VAW-125 recently became *Forrestal* centurions. Receiving centurion patches and certificates were Cdr. Chip Chiprany, Lts. J. J. George, Tim Leighton, Jim Kriewaldt, Mike Borza and Jim Badini, and Ltjg. John Yurchak. The squadron operates out of Norfolk aboard *Forrestal* as a part of CVW-17. Flying the E-2C *Hawkeye*, the *Tigertails* recently completed three years of accident-free flight operations.

HSL-36 was recently awarded the Atlantic Fleet Battle E. This award was the culmination of a highly successful year for the squadron, which flew a total of 6,201.9 flight hours, establishing a LAMPS squadron record. In addition, the squadron logged 2,643 deck landings, 1,158 of these at night. Squadron aircraft and crews participated in numerous exercises during the year.

The Sixth Fleet presented six VA-205 sailors with Navy Achievement Medals for heroic action. A Marine AH-1J helicopter was air-taxiing back to the flight line when the tail rotor of the aircraft contacted the main rotor blade of another helicopter. The pilot immediately lost directional control. From a height of approximately 25 feet, the aircraft came down hard and crashed, ending up on its side with the pilots trapped inside. Pieces of rotor blades and other debris were hurled high into the air; a fire erupted in the engine creating the possibility of fuel tanks exploding. AQ3 Alley, ADANs Fitzpatrick and Fetterolf, AD2 Hall, and AD1s Hedden and Caroon used available firefighting equipment to extinquish the fire and prevent it from spreading. Alley and Fitzpatrick went to the cockpit area and helped remove the injured pilots from the wreckage, carrying them to safety. The courageous actions of these men prevented further injuries and damage to other personnel and property.

Records

Several squadrons marked accident-free flight-hour milestones: VP-26, 150,000 hours; VMGR-152 and VQ-4, 100,000; VXN-8, 60,000; VT-6, VT-27, VT-31 and VT-86, 50,000; VAW-126, 20,000; HC-9 and VMFA-212, 10,000.

Some squadrons recorded safe flying hours in years: VP-48, 13 years; VP-46, 17; VP-19, 12; VF-51, 7; and VF-24, 5.

HC-9's ADAN Elizabeth A. Smith is the first woman in the squadron to qualify as a plane captain, responsible for aircraft servicing and preparation for flight.

LCdr. Will Forness, VAQ-137, received his 2,000-hour plaque from Grumman Aerospace Corporation. The ceremony took place aboard *Ranger* deployed in the Indian Ocean. LCdr. Forness is believed to be the first NFO to attain 2,000 hours in the EA-6B.

VS-33's commanding officer, Cdr. Fred H. Vogt, logged his 900th carrier arrested landing and his 200th aboard *Independence* in the Indian Ocean.

Lt. Stan Hlavka logged his 1,000th hour in an A-7E attached to VA-113, currently part of CVW-2 on *Ranger*.

Et cetera

Midway is home to some 65 aircraft, most of which are flown daily. Her high state of readiness can be partially attributed to the ship's rigidly enforced tool control and maintenance procedures, in addition to a well organized foreign object damage (FOD) prevention program. FOD is expensive in its cost to the fighting capabilities of the carrier. Any discarded trash on the flight deck could mean thousands of dollars in damage and many man-hours of repair if it

PEOPLE·PLANES·PLACES

is ingested into a jet's engine. When the call "FOD walkdown" is announced, twice a day, all hands proceed down the flight deck to ensure it is FOD-free. All FOD collected is turned over to the FOD collection team

which categorizes the items found in order to locate and eliminate the source. Cdr. Ken Rauch, *Midway's* flight deck officer, says the most common offender is safety wire.

Most people have heard of the "One Navy – Total Force" concept. Some might consider it a family. Capt. John H. Semcken, Jr., does. He is a reservist assigned to VTU-7272 at Glenview and recently attended ceremonies at Beeville in which his son, Ltjg. J. H. Semcken III, received his Wings of Gold. Capt. Semcken received his wings in 1952 and, in both cases, the same pair of wings was pinned on by the recipients' wives, who are both named Elizabeth Ann. Ltjg. Semcken, a 1978 Annapolis graduate, flies F-14s out of Miramar. His wife, Ens. Semcken, was the first female graduate and Trident Scholar at the Naval

Academy. (A Trident Scholar is a midshipman chosen to do independent study in the senior year.) She is assigned to *Samuel Gompers* (AD-37).

DT2 Marc Langer of *Ranger's* dental prosthetics lab, repairs a plastic computer panel for an F-14 electronics system. A little-known talent of dental prosthetics specialists is their expertise in the plastics field, which has led to their employment aboard ship to repair such items as typewriter elements, hearing aids and machine parts.

Rescues

VP-47's LCdr. Woodfill and crew sat in their early morning briefing, unaware that the day would be anything more than routine. The Navy's patrol planes had sighted refugee vessels occasionally in the past but that contingency seemed remote. Flying on their routine mission in the South China Sea, they located a vessel in distress crowded with Vietnamese.

Just a short while ago, the story of the refugees fleeing their new government was a common one. As occasional escapes became an exodus, sightings of "boat people" by ships and patrol planes increased dramatically. Now, almost nine years later, they continue to trickle out of their country in search of a better life.

The VP-47 crew dropped supplies to the people in the boat below. They tried to communicate with the refugees but were unsuccessful. The pilot tried to signal the nearest ships in the area for assistance but two freighters within view of the refugee boat steamed ahead with no apparent interest. Finally, a Danish freighter was located on a course that would take it within a few miles of the refugees, and this ship responded by altering its course towards the refugees. With fuel running low, the VP-47 crew turned homeward.

Change of Command

HMA-28: Maj. Gregory K. Manary relieved Maj. David C. LeCount.

HMA-269: Lt. Col G. W. Lee relieved Lt. Col. R. J. Hooton.

HS-12: Cdr. Thomas J. Clothier relieved Cdr. Olin C. Cannon.

NAS 194: Capt. James M. Strickland relieved Capt. Richard W. Hendel.

VA-42: Cdr. John A. Pieno relieved Capt. William R. Galbraith.

VAW-88: Cdr. Paul T. Schubarth relieved Cdr. James D. Ream.

VAW-116: Cdr. Robert P. McClendon, Jr., relieved Cdr. Marty P. Morgen.

VAQ-135: Cdr. W. D. Bird relieved Cdr. R. A. Zardeskas.

VC-10: Cdr. Francis P. Riordan relieved Cdr. James J. Drew.

VP-9: Cdr. James L. Mattson relieved Cdr. Charles C. Nute.

VR-52: Cdr. Robert P. Gick relieved Capt. D. P. Loucks.

professional reading

Messimer, Dwight R. *No Margin for Error*. Annapolis: Naval Institute Press, 1981. 176 pp. $15.95.

This is the story of Commander John Rodgers' attempt to fly the seaplane PN-9 #1 from San Francisco to Hawaii in 1925. On its way across, the aircraft disappeared at sea and after an exhaustive search was presumed lost. Ironically, the plane went down at the same time the airship *Shenandoah* was lost with 14 lives, resulting in severe criticism of Naval Aviation. Rodgers and his crew turned defeat into victory when they stripped the fabric from the wings and sailed the aircraft tail first to Hawaii. Dwight Messimer has produced a well researched, true adventure story. It is a little known but important episode in the history of Naval Aviation. Illustrated.

Rausa, Rosario. *Gold Wings, Blue Sea*. Annapolis: Naval Institute Press, 1981. 216 pp. $15.95.

The significance of Navy wings to those who wear them is the underlying theme of this book. The narrative takes the reader from the author's first realization that he wanted to be a Naval Aviator through flight training to a fleet squadron and beyond. It is replete with colorful episodes that will bring instant recollections of one's own experiences in Naval Aviation. Refreshing, exciting and humorous, this book is a good insight into the special world of Naval Aviation. Illustrated.

Brown, Eric. *Wings of the Navy*. New York: Janes Publishing, Inc., 1980. 176 pp. $19.95.

Good detailed coverage of Allied carrier aircraft of WW II. One chapter is devoted to each of 16 aircraft, 9 British and 6 U.S. from the Fairey *Swordfish* biplane to the Grumman *Hellcat*. Captain Brown describes the development history of each aircraft and comments on its wartime exploits. Of special interest is his evaluation of these warbirds in terms of flying characteristics and idiosyncrasies. There are plenty of excellent black and white photographs as well as a number of good line and cut-away drawings.

Henderson, Mary. *Famous Personalities of Flight Cookbook*. Washington, D.C.: Smithsonian Institution Press, 1981. 132 pp. $4.95.

A very unusual cookbook based on the recipes of well-known figures in aviation. The culinary secrets of early pioneers, astronauts, engineers, industrialists, all kinds of aviators and other unlikely persons are revealed here. The book includes recipes associated with names like Wright, Doolittle, Earhart, Lindbergh, Chenault, Northrop and many others. It provides a new and different insight into the personalities of some of the great men and women of aviation.

LCdr. Bob Shields, officer in charge of Ranger's Greyhound detachment, signals his plane captain during an aircraft preflight check. Ranger crewmen (far right) unload a cargo pod from VS-37's Viking aircraft.

Photo by JOC Gary L. Martin

Delivering the goods

By LCdr. S. R. Arends
and JOC Gary L. Martin

Neither rain, nor snow, nor dark of night, nor 28 million square miles of Indian Ocean shall stay these messengers from their appointed rounds," to paraphrase, and with apologies to, the U.S. Postal Service.

Whether it's mail, critical parts, enthusiastic arrivals or even more enthusiastic departing passengers, the maximum for the aircraft and crews whose aerial supply line feeds U.S. sailors and ships 10,000 miles from home is simply "We deliver the goods."

When the C-2 *Greyhound* carrier onboard delivery (COD) aircraft delivers, there are no vertical climbs or aerial acrobatics – just delivery of the goods.

"We're not the fastest or the most glamorous aircraft aboard *Ranger*," says Lieutenant Commander Bob Shields, who flies one of these planes and is officer in charge of a VRC-50 12-man detachment that is a major supply link for critical and oversized parts, people and mail. "But when we bring in the mail or some important cargo," he adds, "we're the most popular."

Photo by PH3 J. A. Ray

Airman Darryl Holly (left) ensures the readiness of VRC-50's C-2 Greyhound carrier on board delivery aircraft. Holly is part of an eight-man crew assigned to the detachment during the Indian Ocean deployment.

During the first month of a deployment aboard *Ranger*, the detachment transported 141 passengers for the task force, brought aboard 9,000 pounds of mail and nearly 16,000 pounds of cargo. Including surveillance flights, the plane and crew average 50 to 60 hours of flight time a month.

The US-3A *Viking* antisubmarine aircraft is another plane which provides this important logistics service for ships operating in the Indian

Photo by JOC Gary L. Martin

PC3 Thomas Tristan (left) goes through mail delivered by the VRC-50 detachment. While other Ranger aircraft are in stand-down (below) for a day of rest, the COD is launched for another mission.

Ocean. This twin fan-jet aircraft in a COD configuration carries parts, mail and personnel, making frequent trips between Diego Garcia and carriers operating in the area.

On delivery to the carrier, cargo, mail and people are sorted and anything and/or anyone en route to one of the support ships is readied for another trip. On this one, the SH-3 *Sea King* helicopters and crews take to the air. There are few sailors aboard a fast frigate or destroyer escort who do

Photo by JOC Gary L. Martin


Photo by JOC Gary L. Martin

VRC-50's COD aircraft makes another trap aboard Ranger (top), delivering personnel, cargo and mail (right) for the carrier and other ships on deployment in the Indian Ocean.

not associate the familiar beating of a helicopter feeling its way onto a tiny fantail flight deck with the announcement of "Mail Call!"

The men assigned to the aircraft which deliver the goods are an important part of the supply system that supports carriers like *Ranger* and *Independence*, their 180-plus aircraft, some 27 accompanying ships, and approximately 20,000 men.

"It's really a great feeling to have a skipper come and thank us for delivering a badly needed part for one of the aircraft," explains one C-2 pilot. "But even more rewarding is to have a sailor come up with a smile and say, 'Thanks for the letter from home.' "

The C-2 *Greyhound* det pictured here is part of VRC-50, home-ported at NAS Cubi Point in the Philippines. The *Viking* and *Sea King* aircraft and personnel from *Ranger* are part of VS-37 and HS-2, respectively, both home-ported at NAS North Island in San Diego.


Photo by PH3 J. A. Ra

Picking up another load (left), HS-2's helicopter crew lowers a hoist hook to the flight deck crew aboard the guided missile destroyer Goldsborough.

Making sure the mail goes through, top from left, AW2 Rocky Saring, Lt. Don Pence and AW3 Steve Wright get ready for another "express" mail delivery to ships in the Indian Ocean. Right, an HS-2 crew makes a delivery aboard the fast frigate Badger in the Arabian Sea.

Letters

Billingsley

Reference "From the Editor's Notebook," March 1981, on the death of Ensign Billinglsey. My father was with his unit during this time and later at Pensacola and Veracruz in 1914 as an electrician. If I remember correctly, he recalled that in this accident they had put a different kind of engine on the aircraft, and it probably changed the center of gravity – another of the unknowns of early aviation.

James H. Coakley, Maj., USAF (Ret.)
St. Mary's High School – Central
15 North Sierra Madre
Colorado Springs, CO 80903

VSA

We'd like to introduce you to the Vintage Sailplane Association and our journal, *Bungee Cord*. VSA tries to cover an area of aviation history overlooked by most museums and journals, but one that touches on all aspects of aircraft development. For information, write to Vintage Sailplane Association, Inc., 3103 Tudor Road, Waldorf, MD 20601, or call (301) 843-8818.

Len McClain, President

Flight Engineer

No offense to Ms. Fentress and her article in "Touch and Go," *NANews*, February 1981, but the enlisted crew member riding the jump seat on a C-9 is *not* a flight engineer. They are called crew chiefs, and there's a big difference. I don't want to imply that their job is not important; in their aircraft the job is just as essential as ours. But, with the loss of the C-121, there are only three aircraft remaining in the Navy that have flight engineers: P-3s, C-118s and C-130s.

AMS1 Gene Oisten
VP-56
NAS Point Mugu, CA 93042

Help Needed

I am working on a photo history of the B-24 *Liberator* and PB4Y-2 *Privateer* for Squadron/Signal Publications in Texas. The book will cover the history of the aircraft. It will contain about 200 photos and numerous color schemes, along with a written history. I would like to contact any Navy or Marine Corps personnel with photos or material on the use of this aircraft. All material will be handled with care and returned as soon as possible. Full credit will be given and, wherever possible, copies of the book will be given to contributors. Please contact me at the address below.

Jim Mesko, IS 1, USNR
4019 LeCona Rd.
Akron, OH 44319

WW II Museum

The Board of Directors of the U.S. Navy Memorial Archives Foundation is comprised of veterans, historians and Navy organization members dedicated to illuminating the role the Navy played in the 1940s. After years of selective dismantling of WW II warships scheduled for the scrapheap, and surveying historical artifacts wasting away in depots, 40 tons of relics have been accumulated, enough to reconstruct seven typical interior compartments of a cruiser of that period.

A combination museum, library and reunion center complex is being developed to house the personal mementos of officers and personnel of the WW II U.S. Navy. Veterans and the families of deceased Navy members are encouraged to dig out those long-forgotten memorabilia to donate to this unique memorial collection.

Donations may include WW II shipboard hardware, photographs, official and unofficial publications, books, charts, letters, insignias, enemy souvenirs, complete uniforms, etc. Monetary contributions are welcomed and, since this is a nonprofit function, all cash donations and objects having provable monetary value are tax deductible. Contributors are encouraged to accompany donations of money with a note about the service background of the person in whose honor it should be credited. Donated objects are of more historical value if accompanied by some historical information, i.e., ship involved, location, dates, etc.

Donations should be directed to the U.S. Navy Memorial Archives Foundation, Los Angeles Maritime Museum, Berth 84 (Foot of 6th Street), San Pedro, CA 90731. For further information, contact Mr. Robert W. Rogers at (213) 625-7175.

NJROTC Unit Fire

Our NJROTC unit had photographs of aircraft and approximately 45 squadron patches on our walls before a classroom fire destroyed everything. We would very much appreciate any donations of aircraft photos and/or squadron patches, and anything else which might be appropriate for an NJROTC classroom. Please mail to LCdr. Mark A. Devenney, USNR, P.O. Box 711, Menard, IL 62259.

Reunions, Conferences, etc.

Ed's note: We regret that in the future, because of space restrictions, it will be necessary to curtail publication of those announcements which are not directly related to Naval Aviation.

Flying Midshipmen Association ninth annual West Coast reunion June 19-21, 1981, Monterey, Calif. Contact Clyde Tuomela, 3530 Oak Place, Carmel, CA 93923, (408) 625-3180.

VA-125 ex-Rough Raider officer reunion on June 27, 1981, coinciding with NAS Lemoore's Air Fair, June 27-28, in celebration of the air station's 20th anniversary. For reunion details, contact Cdr. Russ York, ComLAtWingPac Flag Secretary, NAS Lemoore, CA 93245, autovon 949-3642.

Seabee 10th Battalion first reunion will be held in Orlando, Fla., July 30-August 2, 1981. For further information, contact William Carey, 3847 Breezemont Drive, Sarasota, FL 33582.

Seabee Veterans of America will hold their reunion at the Marriott Inn, Orlando, Fla., July 30-August 2, 1981. Please contact 35th Convention Chairman, William Carroll, 3145 Siesta Drive, Venice, FL 33582.

USS Medusa (AR-1) 35th reunion will be held on August 16, 1981, at Admiral Baker Navy Recreation Center, San Diego, Calif. Contact ENC C. W. Mantz, USN(Ret.), 486 Welton Street, Chula Vista, CA 92011, (714) 420-9299.

Professional Aviation Maintenance Association, Inc., will hold its 10th annual convention on August 20-22, 1981, in Ft. Lauderdale, Fla. The business meeting and banquet will be held at the Marriott Hotel, 1881 S.E. 17th St. Causeway. For further information: Ms. Linda Kiernan, P.O. Box 700, Hialeah, FL 33011, (305) 887-7314.

VP-33 Black Cats reunion will be held September 22-23, 1981, in San Diego, Calif. For information, contact Larry Bunce, 300 7th Street, Coronado, CA 92118, (714) 435-8089; or John Zubler, RD 2, Spring Mills, PA 16875, (814) 422-8296.

The Blue Angels celebrate their 35th anniversary this month. Organized in 1946 as the Navy Flight Demonstration Team, the Blues flew Grumman F6F Hellcats until later that year, when the team transitioned to F8F Bearcats. Over the years, several different aircraft were flown by the team, including the F9F Panther, F9F-8 Cougar, F11F-1 Tiger and F-4J Phantom II. On December 10, 1973, in an organization change, the team became the Navy Flight Demonstration Squadron, and the Blue Angels switched to the McDonnell Douglas Skyhawk II.

Since the beginning, the Blues have had a total of 18 leaders. The present skipper, Commander Denny Wisely, recently achieved a milestone of 5,000 accident-free career flight hours. He is a seasoned combat veteran with 800 carrier landings, and has flown practically every Navy jet fighter from the F-6 Skyray to the F-14 Tomcat.


naval aviation news