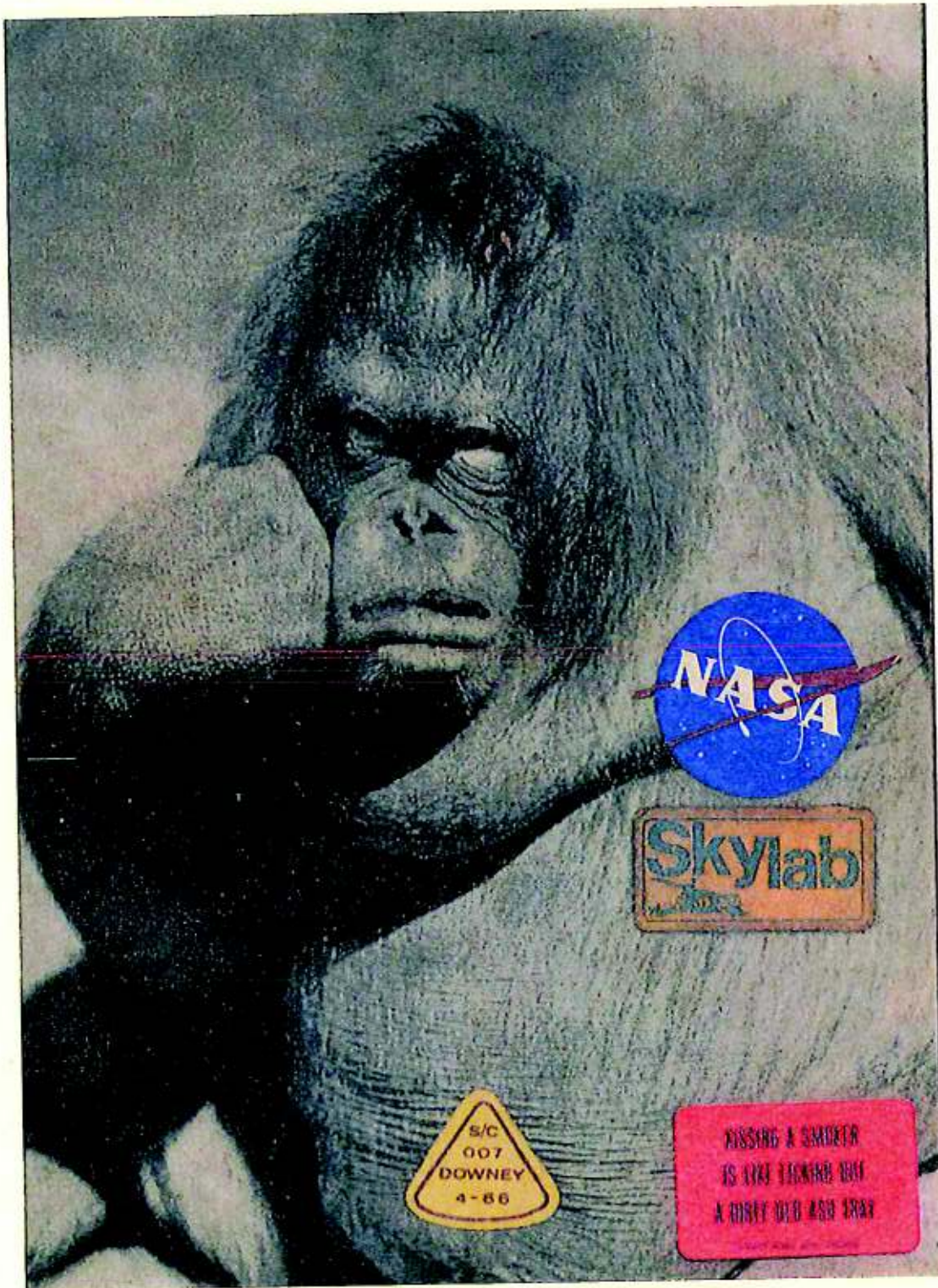


# MY YEARS WITH NASA



Paul T. Chaput, Sr. 2007

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## **Preface**

If you have read the highly acclaimed "The Air Force Years" authored by me you know I finished my active duty tour with the Air Force in January, 1958 and immediately started college at the University of Houston (U of H). I was a 24 year old freshman. Having served in the Air Force during the Korean War era the Korean Bill was paying my tuition. I was back to living in the dump of a house in Cloverleaf with my mother, Janet, and Ray. About the same time I started college I met Linda Parker. Two years later in February, 1960 we were married. We moved into an apartment on South McGregor Drive near the U of H. Linda worked as a secretary and I brought in some money from my participation in the Air Force Reserve unit at Ellington Field. We scraped by. In March of 1961 our first child, Kiki, was born. We moved to Zoe Street near Linda's parents. I plugged on with my studies. I was due to get my Bachelor of Science degree in Electrical Engineering in June 1962. During the spring of 1962 job interviews were held at the U of H. One of my interviews was with a representative of NASA. The Manned Spacecraft Center (MSC) was in its early stage of development in the Clear Lake area and a number of NASA personnel had already been transferred from Langley Field in Virginia to Houston. I received a job offer from NASA. I also received an offer from McDonnell Aircraft in St. Louis for a salary somewhat more than the Civil Service salary I would receive from NASA. Linda and I considered McDonnell's offer but we really did not want to leave Houston. Also by staying in Houston I could continue bringing in extra money with my participation in the Air Force Reserves. I accepted the NASA offer. I would start work at MSC in June after graduation.

MSC had hired me to work with flight simulators. I was uncomfortable about that because of my limited electronics experience but ready to give it a try. But about a month before starting work for NASA a fortunate twist resulted in a change of assignment. The Air Force Reserve squadron I was in at Ellington Field was called upon by NASA to perform some air drop tests of a Gemini test vehicle and I was the navigator on a C-119 aircraft for one of the tests. Milt Windler (later to become a flight director) was the NASA test conductor onboard the aircraft. We talked and he learned of my pending assignment at MSC and asked if I would like to work in the Branch he was in which was responsible for developing the equipment and procedures for recovery of the astronaut crew and spacecraft from the ocean. That sounded great to me. As a result, when I reported to work in June, 1962, I was assigned to the Operational Evaluation and Test Branch which worked the recovery effort. At this point MSC personnel worked at thirteen leased office complexes on the southeast side of Houston. The Operational Evaluation and Test Branch was located at the Houston Petroleum Center, a one story complex along the Gulf Freeway near Wayside Drive. That's where my office would be until the MSC complex in the Clear Lake area was ready for business a couple of years later.

## Mercury

When I started with NASA four of the six Mercury flights had already been flown so from the start my work was aimed towards support of the Gemini flights which would follow the Mercury flights. I did, though, support Mercury in one small but interesting way that first summer. I was the NASA test conductor on board a Navy aircraft for some night test runs off the coast of Long Island to get visibility data on a very bright light that might serve as a navigational aid on the ground for a spacecraft in orbit. (I think that was the reason.) The company which designed and made the light was located in lower Manhattan. So I and the NASA project manager flew to New York City where we met up with the Navy crew who had flown in from a navy base on the coast of New England. On the first day the head of the company insisted on taking all of us to lunch at Delmonicos - a spiffy restaurant on Wall Street. It was so spiffy it had a rule that you must wear a jacket - even for lunch. (And the waiters appeared to be dressed in tuxedos - even for serving lunch.) Well the Navy guys were wearing their summer uniforms which did not include a jacket - just a short sleeved shirt. The maitre d' or whoever tried to have the navy guys wear civilian jackets which the restaurant had on hand for the lowlifes who showed up without jackets. Of course the navy guys wouldn't wear those. Finally, special permission was given for the Navy guys to eat without wearing a jacket.

The head of the company also insisted we two NASA guys stay at his house on the coast of Long Island for the 3 or 4 nights we were there. My first trip for NASA was turning into a pretty good one, but I think some Civil Service travel rules were being broken. I just followed the lead of the other NASA guy whose project this was and who had been around a lot longer with NASA than I had been. Well to sum up this little story we flew two or three nights trying to get intensity readings of this light at various distances. (The light was on a ship off the coast of Long Island.) But we got very little data due to persistent low clouds. Despite that, the powers-that-be at NASA decided to procure a light and test it by having the crew of the next Mercury flight observe it from space. As I recall the light was placed somewhere in Africa. Anyhow, wherever it was located, the astronauts couldn't see it. One guess why not. It was too cloudy.

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Before I go further let me explain my use of the terminology "LRD" which I will be using. When the NASA operations contingent moved to Houston there was an Operations Division headed up by Chris Kraft within which there were several Branches. Two of the Branches - the Recovery Branch and the Operational Evaluation and Test Branch - were responsible for everything concerning the safe recovery of spacecraft and crew and were the interface between NASA and the Department of Defense for military support of the recoveries. As more and more personnel were hired into the two branches it became necessary to expand into a Division with several branches. The Division was named the Landing and Recovery Division which in turn was referred to as "LRD". It became common to refer to anyone who worked within the division as someone who was in LRD. And to this day - at NASA reunions, wakes, etc. - that's how we are referred to.

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## Gemini

In July, 1961, after the safe splashdown of the Mercury 4 spacecraft, astronaut Gus Grissom nearly drowned when the spacecraft filled with water through a prematurely opened hatch. Also the spacecraft was lost into the briny deep of the Atlantic Ocean. As a result, for future recoveries of the Mercury, a flotation collar was designed to be installed around the floating spacecraft by Navy divers or Air Force Air Rescue parajumpers prior to hatch opening and astronaut egress. In 1963 I was assigned to develop a flotation collar for the Gemini spacecraft which would succeed the Mercury. I had to assure that there were an appropriate number of them in the hands of the Navy and Air Force to support the planned first Gemini launch in the latter half of 1964. (Along with this I was assigned with another LRD engineer, Jim Shannon, to develop crew egress procedures.) The first Gemini launch would be a ballistic test flight from Cape Canaveral to a splashdown point about 1800 nautical miles to the SSE in the Atlantic. The flight would last but 18 minutes. It would be unmanned, but would be the first recovery of a Gemini spacecraft. I had to have flotation collars ready for that recovery. Fortunately, Don Stullken, the Navy Commander who had developed the flotation collar for Mercury and who was now a civilian working for NASA as an LRD Branch chief was able to provide me the value of his experience and knowledge along these lines. In fact, he was the one who asked me to take on this assignment.

The Gemini spacecraft, though similar in appearance to the Mercury, was larger, held two astronauts, and had two hatches. Most significant though was that, unlike the Mercury capsule which floated vertically, the Gemini floated horizontally. A completely different collar design was needed. I worked closely with personnel at the Pensacola Naval Air Rework Facility at the Pensacola Naval Air Station in Florida. The Mercury collars had been built there so the way had been paved to have the Gemini collars built there also. The mechanical engineering courses I had taken at the U of H came in very handy in my determining the amount of buoyancy the collar must provide. The collar was designed to include an inner tube with a separate tank of pressurized air to inflate it should the outer tube be punctured. The collar would be larger and heavier and of a different configuration than the Mercury collar yet had to maintain the capability of being installed by the Navy divers or Air Force parajumpers in fairly rough seas.

Many tests were done in a water tank in a NASA hanger at Ellington, in Galveston Bay, and in the Gulf of Mexico to develop the collar and crew egress procedures. LRD had acquired a converted Navy vessel - a Landing Craft Utility, commonly referred to as an LCU. The LCU, which we named the "Retriever", was docked in Clear Lake. I was onboard for most collar and egress procedures tests. On one occasion we were in the Gulf for a 72 hour endurance test of the collar which was installed on a Gemini test vehicle (referred to as a "boilerplate"). Initially, the seas were rough and I vomited every hour on the hour until the seas calmed down. I was miserable. The floating boilerplate/collar was attached to the Retriever with a long line. People were assigned so there was always someone on deck to keep watch over the bobbing boilerplate. I had that duty for a period of time during the evening of the second day. At one point I went below deck for a couple of minutes and when I came back up, to my surprise and consternation, the collar was deflated. No one had seen anything that could have caused

that to happen. That ended the test and to my stomach's relief we sailed back to Clear Lake. Examination of the collar revealed a small slit in the tube as if it had been stabbed with a knife. Made no sense. My conclusion was that a swordfish had done it. (Not really, but during my years with NASA I was to find that things often happened in tests that just could not be reasonably explained. There must be a Murphy's Law that covers this.)

## Gemini/Titan 2 (GT2)

In December, 1964 I found myself on board the aircraft carrier U.S.S Intrepid out in the Atlantic. I was a member of the NASA recovery team on board for the recovery of the GT2 spacecraft. We had been flown from a base along the Florida Atlantic coast (probably Patrick AFB) to the Intrepid by military helicopter. I was there specifically to advise the Navy swimmers and to observe how well the use of the collar went. I was bunked with three gung ho Navy pilots. On our way to the planned splashdown point the Intrepid anchored near the Virgin Islands and the Intrepid's captain was good enough to have the "captain's boat" (a small boat carried on the carrier primarily for use by the captain) take the NASA recovery team to St. Thomas for a night. Nice of him. It allowed us to buy cheap booze to take back home. Of course we broke some Navy rules by clandestinely taking it on board the ship. We resumed sailing. Along the way recovery training was accomplished with a Gemini boilerplate. Navy UDT (underwater demolition team) swimmers practiced deployment from a helicopter and installation of the flotation collar around a Gemini boilerplate. The carrier practiced retrieval of the boilerplate/collar from the sea.

Launch day finally arrived - December 9, 1964. The Intrepid, as well as Navy destroyers positioned uprange and downrange, were in place ready and waiting as the countdown proceeded at Cape Canaveral. The time from launch to splashdown would be only 18 minutes. We'd recover that baby and head home for Christmas. When the launch countdown reached zero the Titan rocket ignited, ran for one second, and then shut down. A few hours later the mission was cancelled and rescheduled for January. We sailed back to port and went home for Christmas.

A month later in January, 1965 we tried again. This time, though, the recovery carrier was the U.S.S Lake Champlain and the NASA recovery team boarded the Champlain in the snow in Providence, Rhode Island. Again there were destroyers involved and each had a NASA recovery adviser onboard. As we sailed south we got the word that the wife of Tom Holt, one of the recovery guys on one of the destroyers, had become ill and that the destroyer was going to make a stop in Bermuda to let Tom off so he could fly back to Houston. Tom would be replaced by Larry Meeker one of our recovery guys on the Intrepid. Meeker was to be flown to Bermuda by one of the Champlain's aircraft and get onboard the destroyer there. And - SURPRISE - I was to do the job that Meeker was onboard the Champlain to do. WOW! Once the spacecraft was safely recovered and tied

down on the carrier his job was to open the hatches of the recovered spacecraft, disarm live pyrotechnics, remove certain equipment and experiments, and take readings of various gauges. He had trained at McDonnell Aircraft in St. Louis to do this. He knew what to look for and what safety precautions to take. I had been privy to none of this. I was given a list of procedures and illustrations – that was it. There was a McDonnell rep onboard but his job was to do things with equipment and experiments after I removed them and write down gauge readings when I read them off. (Maybe his union didn't allow him to do what I had to do. Who knows?) To top things off the NASA recovery team leader gave me some white coveralls with a very small NASA patch on the front to wear for the job. That was OK but he also gave me a blue crayon to print "NASA" in large letters on the back of the coveralls so that the world would know it was a NASA guy doing the work. (The McDonnell guy's jacket had the company name on the back of his jacket.) I obliged. After all, that was nothing compared to the job coming up with the spacecraft.

On launch day, January 19, 1965, GT2 launched successfully. The spacecraft landed 34 miles from the planned splashdown point. No big deal. The Navy UDT swimmers jumped from a helicopter and installed the collar – no problemos – and eventually the carrier retrieved the spacecraft from the ocean. I and the McDonnell guy helped to align the spacecraft for placement in a stand tied down to the ship's deck. Then it was time to do my new job.

The first instruction on the list of things to do was to remove a plug from the spacecraft to equalize inside and outside pressure. There was a note of caution to do this very carefully because if the air pressure inside the spacecraft was high the plug, once unscrewed, could shoot off like a bullet. Oh, boy! I had to crawl under the spacecraft to get to the plug – like working under a car. Using a wrench I slowly – very slowly – unscrewed that plug while trying to protect my face. It seemed to take forever – and all 4000 members of the carrier crew seemed to be watching. The NASA guys and Navy brass were watching too – from a safe distance. Sweat poured from my brow as I continued to slowly - very slowly – unscrew that goddamned plug. Would it ever come off? Finally the plug simply fell to the deck with a "plink".

But wait - don't feel relief yet! (As I attempt to describe the next tasks keep in mind that the spacecraft was in a horizontal position with the hatches on the top side. I would be on a small platform around the spacecraft having to reach over the top to open the hatches, as well as to do the work within the spacecraft. Not an easy task.) The next instruction was to open the hatches. But again there was a statement of caution – I needed to have as little of my body as possible over the hatches when I attempted to open them. Why? Because the Gemini had ejection seats (for emergency ejection of the crew on the launch pad) and though there were no crew members onboard for this launch there still were live pyrotechnics included to test how well the pyrotechnics made it through a launch. The remote possibility existed that when I manually began to open each hatch a live pyrotechnic would try to help me out and in the process send my head on a trajectory back towards Cape Canaveral. Frankly I cannot remember what the procedure was to

open each hatch. Probably turned something and began pulling. Whatever it was – it worked. After opening each hatch my head was still intact. What a relief.

But wait – it's still not time to feel relief. While wiping my brow with a fresh dry towel and while getting used to the feeling of warm pee rolling down my legs I read the next procedure. I now needed to safe not only the ejection seat pyrotechnics but several other live pyrotechnics which were here and there within the spacecraft. To safe each pyrotechnic I had to slip a safety pin through a hole which then disallowed the pyrotechnic from going off. The illustrations that I had been given indicated where the pyrotechnics were located but to actually locate them in the spacecraft and see where to install the safety pins and then maneuver my arms and hands such that I could actually install the pins was something else. But to make a long story short, there was one pyrotechnic I absolutely could not safe. I knew where it was. I could see it with a mirror. But unless I secretly was Plastic Man there was no way in God's creation I could get that safety pin in place. Anyhow, I did everything else okay. Well, nearly okay. After I got back to Houston and the spacecraft got back to McDonnell in St. Louis I got a call about one of the gauge readings. The numbers that I had read off to the McDonnell rep made no sense. I had no explanation until a couple of nights later when lying in bed thinking about it the explanation jumped into my mind. The sequence of numbers as read off by me and recorded by the McDonnell rep was backwards. The only way I could see that particular gauge was with a mirror and I had read off the numbers as I saw them in the mirror which meant I had read the numbers off backwards. Problem solved.

## Gemini 11

After GT2 manned missions were launched every two or three months. My main job was to have collars built and available in the field for the Navy and Air Force rescue teams. After GT2 I do not remember being assigned out in the field in support of a Gemini mission until Gemini 11 which was launched on September 12, 1966 and landed on the 15<sup>th</sup> (my 33<sup>rd</sup> birthday).

I remember the Gemini 11 assignment quite well because I was sent to Dakar, Senegal on the west coast of Africa. I was there from September 5<sup>th</sup> to the 16<sup>th</sup> as a NASA recovery adviser to an Air Force Air Rescue and Recovery Service (ARRS) unit deployed to Dakar from Europe to support the mission. During the launch I was on board their HC-130 rescue aircraft hundreds of miles off the Africa coast operating a NASA provided electronic homing device which would provide spacecraft location data as it passed overhead or if it suffered an abort into the Atlantic or Africa.

Dakar was quite interesting. Senegal had formerly been a protectorate of France so most everyone spoke French. The population was a mix of mostly black Africans, Arabs and Frenchmen. The Catholic and Islamic religions were prominent. Just 150 years earlier Dakar was one of the major ports for the shipment of slaves to the United States and elsewhere. I visited the island of Goree just off the mainland where the slaves were held before shipment. To get there you took a ferry. It was exactly like you see in pictures or

on TV of ferries in that part of the world – overcrowded with passengers, with many literally hanging from the rails. I found myself doing just that – hanging onto a rail for dear life. I safely made it to the island and back.

My hotel was a nice one but without air conditioning. Fresh air and mosquitoes flowed through the windows. Fortunately the bed had a mosquito net around it. From the window I could see a beach with women in bikinis - the first bikinis I had ever seen. Couldn't believe it. The women were probably tourists from France. French women were about the only ones who dared to wear bikinis back then.

As I always did on my trips I took pictures. This time my hobby nearly got me into trouble. There was a Catholic Church in Dakar that I wanted to get a full view picture of and felt like the best place to do it was from the roof of a business building which was several stories high and across the street from the church. I started up the stairs and around the second or third floor came to a sign which, though in French, I could tell said something like "No Trespassing." I have always tended to think that such signs did not apply to me and I continued on up. At some point an irritated black African confronted me. He spoke only French so we could not converse very well. He took me into an office and had me speak to a white French businessman who spoke fairly good English. He asked what I was doing in the building. I told him and hoped the explanation would get me off the hook. He seriously pondered my explanation and finally let me go. I breathed a sigh of relief, wiped my brow, and left. It may not sound like much of a deal but just the thought of trying to explain things to local African police authorities or judge is a sobering one. I vowed to myself to never again ignore signs that say "No Trespassing" or "Restricted Area", but frankly I never could shake that tendency.

Late in my stay in Dakar I received a letter from home telling me my Grandmother Connor in Chicopee, Massachusetts had died in an old folks' home where she had been for a while. She and I had been very close when I was a child. The funeral had already been held. I thought about making a quick side trip there on my way back to Houston but opted to go directly back home. I was very much missing my wife and my three kids, Kiki, Lisa, and Paul.



## Apollo

During the Gemini Program I became more and more involved with recovery preparations for the Apollo Program. (Apollo 1, the first manned Apollo flight, was scheduled to launch in early 1967.) I became a Group Leader and was assigned new graduates fresh out of college. My group consisted of Mack Jones, Harry Clancy, Mike Collins, Milt Heflin, Randy Stone, and an Air Force assignee - Mike Sellers (who, after a couple of years, was replaced by Paul Kruppenbacher). We all became close friends away from work and most of us played together on LRD softball and basketball teams. I named our group the "Whirling Dervishes." When we felt like it we would whirl around. Mike Collins and I especially liked doing this in the hallways at work.

The Apollo command module would carry three astronauts into space and - just as for Mercury and Gemini - would land in the ocean and require a flotation collar. Unlike the Gemini, the Apollo would float upright on its wide bottom and require a collar that went completely around the widest diameter of the vehicle. I assigned the other guys to various recovery tasks such as developing emergency crew egress procedures and I again worked with the Naval Air Rework Facility at the Pensacola Naval Air Station to design and fabricate a collar for Apollo. Again many tests took place in the swimming pool and water tank at Ellington and in Galveston Bay and in the Gulf. I also made occasional trips to North American Aviation in Downey, California. They were designing and building the Apollo spacecrafts. At one point I took models of the spacecraft and collar to the Stevens Institute of Technology in New Jersey (across the Hudson River from Manhattan) for flotation stability tests of the spacecraft (both without and with an attached collar) in various sea conditions. (The spacecraft had two positions it could float in - Stable 1 which was the upright position, and Stable 2 which was upside down with the crew hanging from their straps. An "uprighting system" had to be added to the spacecraft to upright it should it go into the Stable 2 position upon landing in the ocean - which it did on about half the landings. The uprighting system consisted of three large inflatable bags on the upper end of the spacecraft which were inflated by the crew and caused the spacecraft to rotate to the Stable 1 upright position - which it definitely had to be in if a collar were to be attached and for the crew to safely egress).

Because of the larger size of the Apollo the collar was bigger than previous collars and therefore more difficult to handle in the water. (Even out of water it was not easy to handle - its final packed weight was 180 pounds.) We initially tried a design that consisted of two inflated tubes - one above the other - which would provide redundancy should one tube leak and a higher "platform" for the rescue men to stand on and the crew to egress onto. It proved to be much too bulky and unwieldy to handle and install. We reverted back to the tube within a tube concept we had used for Gemini. We also reduced the bulkiness by reducing the amount of padding that came into contact with the spacecraft. Still, in any kind of sea state other than calm, there were difficulties attaching the collar to the spacecraft and we came up with a plug that was pushed into a nozzle of the reactionary control system which kept the collar attached at one point as the swimmers unfolded and positioned the collar around the spacecraft before inflating the

collar. The plug wasn't the best fix and eventually we were able to have an attachment ring added to the spacecraft below the hatch which we could initially attach the collar to (as well as attach a sea anchor to initially slow down movement of the spacecraft). We also developed a cable system which supported the spacecraft within the collar tube

A larger problem to overcome was the fact that the shape and size of the spacecraft floating in the ocean presented a large surface area to the wind causing the spacecraft to be blown downwind. The Navy swimmers could deal with this to some extent by jumping with the collar from their helicopter into the ocean a little downwind from the spacecraft and letting the spacecraft come to them, but even then it was extremely difficult to stay with the moving spacecraft, and install the collar. For recovery operations by the Air Force's Air Rescue and Recovery Service (ARRS), though, it was virtually impossible for the air rescue jumpers to parachute from their HC-130 aircraft from an altitude of 1000 feet into the ocean and position themselves and the flotation collar (which also had to be delivered by parachute) downwind of the spacecraft. This led to development of the air deployed drift reduction system (ADDRS).

The ADDRS consisted of a 600 foot buoyant polyethylene line with a packaged flotation collar and parachute at one end of the line and an MA-1 kit (which consisted of a packaged inflatable raft and other recovery items) and parachute at the other end. If an HC-130 rescue aircraft were used to aid an Apollo spacecraft in the ocean the aircrew would first determine the direction the spacecraft was moving. (The spacecraft contained a dye marker which became activated in the ocean and which would leave a trail of dye behind the spacecraft as it was blown downwind.) The pilot then flew on a course that was perpendicular to the projected path well downwind of the spacecraft. The ADDRS would be deployed from an overhead delivery system in the aircraft so that the flotation collar would land in the ocean short of the spacecraft's projected path and the MA-1 kit beyond the projected path and with the floating line stretched out for about 600 feet between the packages. The spacecraft would then sail into and be snagged by the buoyant line. The parachutes attached to the flotation collar and MA-1 kit would act as giant sea anchors eventually bringing the spacecraft to a halt. The air rescue parajumpers would then parachute in and do their thing. This was a difficult system to develop but it was developed between our recovery guys, particularly Randy Stone, and the Air Force's rescue guys and it worked - though for a while there was concern that the spacecraft could ride over the buoyant line and miss being snagged. (After the Apollo 1 fire, which killed the Apollo 1 crew - Gus Grissom, Ed White, and Roger Chaffee - during a simulated launch countdown performed with the crew in the spacecraft, many changes were made to the Apollo spacecraft. Among them was a complete redesign of the hatch which included the means to deploy a hook and line through the hatch to snag the buoyant line of the ADDRS.) As it turned out no situation ever developed where the ADDRS needed to be used. But the Air Force's Air Rescue and Recovery Service was equipped and trained just in case.

## Apollo 7

The Apollo 1 disaster occurred on January 27, 1967 and set back the program for a year and a half while major design changes were made to the spacecraft. After a couple of unmanned test launches and splashdowns of the redesigned command module (and successful installation of the flotation collar on each recovery), Apollo 7, the first manned Apollo, was launched on October 11, 1968 with Wally Schirra, Donn Eisele and Walt Cunningham on board. The planned splashdown point was in the Atlantic and the primary NASA recovery team was on board the U.S.S. Essex aircraft carrier to cover the landing. I don't recall supporting the recovery of either of the unmanned recoveries but for Apollo 7 I was part of the NASA recovery team positioned in Hawaii to support a contingency splashdown in the Pacific, should there be one. My main task was to interface with the Air Force's Air Rescue and Recovery unit located at Hickam Field next to Pearl Harbor. The NASA team stayed at a hotel in Waikiki. I was usually on a two hour alert except for certain periods when I had to be in place at Hickam on a 30 minute alert ready to fly with the air rescue unit. Needless to say it was pleasant duty.

## Apollo 8, 9, and 10

Apollo 8 took place December 21 to 27, 1968 and was the first flight around the moon – a spectacular and highly historical event. I was not called upon to support the flight so was home for Christmas. After the mission, when the crew (Don Anders, Frank Borman and Jim Lovell) landed at Ellington Field, my family and I were among the large crowd that greeted them. A picture of Linda and Lisa peering through the window of a car at Don Anders was taken by a NASA photographer and was published in the "NASA Roundup" - an MSC publication.

Apollo 9 took place in March, 1969 and Apollo 10 in May, 1969. I believe I was in Hawaii again to support one of those flights. Not positive.

## Apollo 11

Apollo 11 launched on July 16, 1969. Again I was in Hawaii as a NASA recovery rep for the Air Rescue Squadron. Unlike Apollo 7, I was not on any two hour or 30 minute alerts once the Apollo headed for the moon and therefore had more opportunities to roam around the island of Oahu.

The hotel I was in did not have TV sets. So after the lunar excursion module landed on the moon I watched the rather primitive video of Neal Armstrong and Buzz Aldrin taking the first steps on the moon on a TV in the window of a store in Waikiki. Then it was a matter of waiting until the day of splashdown on July 24.

On that day I was onboard an air rescue HC-130 aircraft over the Pacific Ocean about 900 miles southwest of Honolulu. We were in position to provide air rescue recovery

support should the spacecraft land well long or short of the planned target point. The splashdown took place close to its planned target point near the recovery aircraft carrier, the U.S.S. Hornet. We flew over the recovery area at an altitude of a thousand feet or so to take a look as recovery operations with the Hornet and helicopters were taking place. I can see it in my mind. They were recovering the first men to walk on the moon. (Incidentally, because of the uncertainty of there being microbes or bacteria on the moon which may now be onboard the spacecraft, once the flotation collar was attached the crew could not then open the hatch and get out to be picked up by helicopter but had to stay in the spacecraft until it was picked up by the ship. Then onboard the ship a sort of plastic barrier tunnel was placed against the spacecraft and then the crew opened the hatch and walked through the tunnel into a "manned quarantine facility" (MQF). The MQF was a specially designed mobile home in which the crew along with a doctor and a couple of other NASA personnel would live in for the next three weeks or so.)

At some point prior to recovery Linda had flown in from Houston to join me in Hawaii. We planned to greet the Hornet when it docked and then to vacation together in Hawaii. There was a very large crowd at the dock to greet the Hornet and to attend the official military ceremony. The astronaut crew, though, could not really participate. The best they could do was wave through a window of the MQF as it was unloaded from the ship and placed on a vehicle and transported to Hickam Field to be loaded into a cargo aircraft and flown to Ellington Field. After all of that I was able to take Linda aboard the Hornet and onto the flight deck where the Apollo command module was tied down and where we greeted some of the NASA recovery guys which included guys from my group -- Harry Clancy and Milt Heflin. Then, after a day or two in Waikiki, Linda and I flew to the big island of Hawaii where we had reservations at the Volcano House near the Kilauea crater.

In 1969 I took on the task of developing a raft especially designed for use with the Apollo collar. The standard military seven-man raft which was used by both the Air Force and Navy for the first several Apollo earlier recoveries was proving to be less than adequate. For example, in a typical sea state consisting of 3 to 5 foot waves and 15 knots or so of wind, the raft - though attached to the collar - would beat against the collar and ride up on the collar which resulted in a rugged ride for occupants in the raft (rescue team members and astronauts) and wear and tear on the raft and collar. During helicopter retrieval of the astronauts, the shape and configuration of the raft interior hampered movement within the raft. And, worse yet, when subjected to helicopter downwash, the raft tended to be blown out of the water -- sometimes against the spacecraft. This was especially true during the Apollo 9 recovery. Subsequent to Apollo 9 we had Pensacola add ballast buckets to the rafts used by the Navy. At some point, though it was decided to develop a special Apollo recovery raft which I took on as my own project as I had for the Gemini and Apollo flotation collars. Again I worked with the Pensacola guys and again there were various tests in Galveston Bay and in the Gulf -- as well as in the Pacific off of San Diego. For Apollo 13 and subsequent splashdowns we had recovery rafts on the recovery ship.

## Apollo 12, 13, 14, and 15

Apollo 12 launched on November 14, 1969 resulting in the second landing on the moon.

Apollo 13 launched on April 11, 1970 and on the way to the moon experienced a serious explosion in the service module which eliminated any possibility of landing on the moon and resulted in extraordinary measures by both the crew and the ground support team to get the crew and spacecraft safely back to Earth. (See the movie.)

Apollo 14 which launched on January 31, 1971 and Apollo 15 which launched on July 26, 1971 both resulted in landings on the moon.

I supported Apollo 15 as the NASA rep with the air rescue unit at Eglin AFB near Fort Walton Beach, Florida. The mission was uneventful. I stayed at a motel on the beach and when the mission was over I had Linda, Kiki, Lisa, and Paul fly to Florida and we all had a nice beachside vacation. (It was early August and school was out.)

Incidentally, in April, 1971 prior to Apollo 15, I was promoted to Section Head which meant I had a few more guys along with the whirling dervishes under me and more administrative and management duties to perform. My guys continued to work on crew egress procedures and other aspects of recovery as changes were made or new equipment and procedures were developed.

In March, 1972 the Landing and Recovery Division was reorganized into a branch, the Recovery Operations Branch, within the Flight Control Division (FCD). LRD no longer existed. (We were now in a division with a different breed of cats – the flight controllers. Gene Kranz was the division chief.) The Recovery Operations Branch consisted of two or three sections. I became Section Head of the Mission Planning Section with a complete change in recovery personnel under me. The main task of my section was to determine and coordinate NASA's requirements for Department of Defense (DOD) recovery support. The guys in my new section were all experienced in this.

## Apollo 16

On April 16, 1972 Apollo 16 launched with John Young, Ken Mattingly, and Charlie Duke onboard. I remember Apollo 16 rather well. I was the deputy team leader of the NASA recovery team on board the primary recovery carrier - the U.S.S. Ticonderoga. The team leader whose primary job during the Apollo Program was as the NASA recovery team leader on every other recovery. He had mucho experience along these lines. My experience along these lines was zilch. I had not been on a recovery ship since Gemini 2 in 1964, eight years earlier, when my only concern was how well the flotation collar did. Now I was the second in command, so to speak, which implied I had the experience to be second in command. Could I answer the questions from various Navy counterparts adequately? Would I have a feel for why particular questions were being asked rather than their having to educate me to the point of

understanding the questions? Would I know the answers? (I had no concerns about my interface with NASA team members. They had been on recoveries before in their individual specialties and able to accomplish those tasks without any involvement or input by me.)

My main problem, though, would be [redacted] that I did not have the same wealth of primary recovery ship experience he had. He would give me assignments as if I knew what the hell he was talking about. And he'd spring things on me in the last minute. For example, the night before he was to give a briefing to the Navy brass in Hawaii he tells me I'll be giving the briefing the next morning instead of him. So suddenly I had to scramble to review and understand the information well enough to give a knowledgeable briefing and not come across as an ill-prepared dodo. After we sailed from Hawaii he gave me last minute assignments to script and run simulated recovery exercises involving the Ticonderoga operations personnel. I would scramble and do what I thought was a great job, but it was never good enough for him. And his moods would shift from good to very black where nothing satisfied him. Looking back now I think I was the one who put most of the mental strain on myself. I should have been like Gus McCown, another Section Head with little experience on recovery ships who was, like me, assigned as deputy [redacted] on a later recovery mission. He did not worry about any of those things that I did. He basically told [redacted] to do the stuff himself.

Another thing that added to the unpleasantness of this recovery assignment was the length of it. I was away from home for 26 days. It seemed like forever. We were in Hawaii for about a week prior to sailing from Pearl Harbor. Obviously that couldn't be so bad, but the thing I remember most is that Easter was during that week and Easter was always a big day for my family and I wasn't at home for it. And to top it off it rained all day on Easter. Anyhow we did our briefings and got acquainted with our Navy counterparts during that week and then finally departed for splashdown points in the South Pacific - a little south of the equator.

When the Ticonderoga crossed the equator the sailors and the NASA guys - such as me - who had not crossed the equator before had to go through the degrading ceremony the navy puts first timers through. (See the DVD of my home movies of the event.) With that behind us we got into the serious business of conducting recovery exercises with an Apollo boilerplate until the Navy had the recovery procedures down pat. After about five days at sea we were ready for the April 16, 1972 launch. On that day Apollo 16 launched and the U.S.S. Ticonderoga was ready to support an abort into the Pacific, if necessary. The moon mission went off okay and on April 27 the spacecraft splashed down at its planned splashdown point within sight of our recovery ship. The collar was installed and the crew picked up by helicopter and flown to the ship. I took 8mm movies as best I could of the ceremony on the ship. John Young said some sterling things like "being on the moon was really something and we need to keep going back there." Something like that. It wasn't well said but it was right. (The public and government in their infinite wisdom (interpret that as stupidity) didn't agree. We returned to the moon just one more

time. Now, thirty-two years later, we are finally planning to do it again – but don't hold your breath.)

A couple of nights after the recovery at about one in the morning I and a load of moonrocks and experiments were on board a navy plane being catapulted off the deck of the Ticonderoga. A couple of hours later we landed at Hickam Field in Hawaii. Several hours later the astronauts and some of the NASA team (such as the astronauts' doctor) were flown in and a ceremony took place to greet the astronaut crew. The primary speaker for the navy was Admiral McCain the father of the current Senator John McCain who at that time was a prisoner of war and being held in the Hanoi Hilton in North Vietnam. In the meantime the moonrocks and experiments were loaded on board an Air Force C-141 and finally the astronauts and I and some other NASA recovery team members headed back to Houston. As I recall it was dark in the early evening when we landed at Ellington Field. When we got off that plane my kids came running out to greet me. It had been a great adventure - but now I was home.

## Apollo 17

Apollo 17, which launched on December 7, 1972, was the last mission to the moon. (Three more had been scheduled but were cancelled.) I supported Apollo 17 as a NASA Recovery Officer in the Recovery Operations Support Room (ROCR) in the Mission Control Center (MCC). It was the first time I supported a mission in the ROCR. The NASA recovery guys in the ROCR were the NASA interface with the DOD guys who provided the DOD recovery support. Apollo 17 was the first of many recovery support assignments I had in the ROCR – right on through the early Shuttle flights.

## Skylab

Skylab consisted of three space station missions - Skylab 2, Skylab 3, and Skylab 4. The Apollo command modules left over from the three canceled flights to the moon were utilized for the three missions - as was a redesigned Apollo service module as the space station. Skylab 2 launched on May 25, 1973 and the command module splashed down on June 22. Skylab 3 was from July 28 to September 25, 1973. Skylab 4 was from November 16, 1973 to February 8, 1974. I supported the missions in the ROCR or on call.

At some point in 1973 the recovery sections were combined and whittled down into one section - the Mission Planning and Recovery Section. I was section head and had 10 guys under me. In May, 1974 the name of the section was changed to Operations Support Section and I was down to six guys under me. What was once LRD with many sections was now one small section with but one more mission to support - the Apollo/Soyuz Test Program (ASTP).

## ASTP

ASTP (Apollo/Soyuz Test Project) consisted of launching an Apollo spacecraft with a docking module from Cape Kennedy and a Soyuz spacecraft from Russia. The Soyuz would dock with the Apollo and the astronauts and cosmonauts would perform joint activities and visit in each spacecraft. For the remaining recovery guys it was just another Apollo mission with splashdown in the Pacific Ocean south of Hawaii. (The Russians would land in Russia.) I was the lead recovery guy in the ROCR and Doc Stullken was the recovery team leader on the recovery ship. The launch was on July 15, 1975 with Deke Slayton, Tom Stafford, and Vance Brand on board. The Apollo splashed down on July 24. Once the spacecraft and crew were recovered that would basically be it for the Apollo program. In the ROCR we watched TV of the crew arriving by rescue helicopter on the recovery ship and making some brief ceremonial statements. Everything seemed routine. I was about ready to close up shop when Doc Stullken on the ship got on the communications line with me and told me to hang on because there was a problem. The astronaut crew had breathed in toxic fumes that were sucked into the command module from the reactionary control system on the way down to splashdown. (The crew had failed to flip a switch that would have prevented that possibility.) Though the crew appeared to be okay during the brief reception ceremony on the ship it was not certain what their medical condition was. As it turned out the ROCR had to stay in operation for several more days while the conditions of the astronauts were evaluated in a military hospital in Hawaii. It was determined that they were well enough to have their wives flown to Hawaii to spend some time with them while they recuperated before coming back to Houston. That was it for the Apollo Program. It would be nearly six long years before the next launch into space - the first launch of the space shuttle on April 12, 1981.



## SHUTTLE

After ASTP there was suddenly nothing to do. At some point there was a reorganization and I became head of the Flight Data File Section (within the Crew Training and Procedures Division) with just four guys under me. The flight data file (FDF) consisted of all the technical and procedural documents and checklists used by the astronaut crew. Much work goes into formulating the FDF and keeping it up to date. I had no experience in this but the guys I had in the section had worked the FDF. None of this made any difference, though. There was no FDF to work on – not for at least a couple of more years. I and my four guys had nothing meaningful to do except attend some meetings now and then. I thought I would be driven sane. Finally in May, 1977 there was another reorganization and along with it a reduction in force (RIF). Some people ended up losing their jobs. In my case my section was eliminated along with my position as section head – with no other section head position available. I ended up in the Operations Planning Section within the Flight Control Division.

This all may sound like a downer – but for me it was good news. For one thing I did not like being a section head – especially in an area I was not experienced in. Secondly, though I had been a section head for several years, I was never promoted into a section head's pay grade. (This was due to the constant organizational reduction of what was once the Landing and Recovery Division to finally just a section within the Flight Control Division. Within the Flight Control Division the guys who worked recovery were last on the list for promotions.) So the loss of my position as a section head was not a loss in pay. I would continue to get the same pay but with less management responsibilities – and I would not have to worry about how to keep other guys busy.

It turned out that the Operations Planning Section was the best section for me to be in. Within the section an engineer had been trying to develop a plan for support of a contingency landing of the Space Shuttle. Well, that was right up my alley. My recovery experience and Air Force background made me the perfect candidate to not only create a workable plan but to make it happen. The guy who was working the plan had none of this experience and background. I was assigned to work with him. After several months he left JSC to work with a contractor in Denver. The project became totally mine.

The objective of the project was to develop and put into effect a plan for having a number of landing sites available and capable of supporting a Shuttle launch abort or emergency deorbit. This meant determining which airfields around the world best met our needs and coordinating with the DOD for their readiness and real-time operational control. This in turn meant again closely working with my DOD friends at Patrick AFB, Florida just as we did for all previous space flights. It meant working with the FAA to some extent and with the Kennedy Space Center (KSC) for launch aborts and contingency landings when KSC was the contingency landing site. And – when the flights started - it meant supporting each mission side by side with the DOD guys in the ROCR (just as for previous space programs). The flight controller in the ROCR would have the title of

Landing Support Officer (LSO). I held periodic meetings – mostly at KSC – to coordinate support requirements and readiness.

After determining our basic operational support requirements which included identifying the military airfields that could fill our needs as contingency landing sites it became necessary to brief the military commands involved. Thus in the fall of 1977 a group of us - consisting of me, a KSC guy, and several DOD guys from Patrick AFB - headed off to Europe. We briefed various military headquarters and units in London and Woodbridge, England, and Stuttgart and Munich, Germany. While in Munich we took a short side trip to Dachau - one of the death camps the Germans operated during World War II. Tens of thousands of Jews and others died there and their bodies incinerated in ovens. A few of the buildings in which the prisoners were housed or gassed to death and in which prisoners were incinerated remain there as part of a museum as a reminder of the atrocities. Also in Munich, on a crisp early Sunday morning, I jogged to the location of the 1972 summer Olympics which was now a park. While I stood alone on a high point within the Olympic park the sun was rising above the horizon and church bells were ringing for their Sunday morning services. It was a wonderful moment. And it was hard to believe that this was the location where Arab terrorists kidnapped and killed about 15 of the Israeli team members during the 1972 Olympics.

We returned to the States for a month or so and then headed out to Hawaii to brief the Navy and Air Force headquarters there. Linda went with me. It just so happened that the Honolulu Marathon was scheduled to run two days or so after the briefings so several weeks earlier I had sent in an entry form. (Linda had opted to not run in it.) So on December 11, 1977 I ran in the Honolulu marathon. Though the race started very early (6:00 a.m., I think) it was miserably humid and warm throughout the marathon with temperatures in the 70s and 80s. I struggled through it in 3 hours and 50 minutes.

Sometime in 1978 the Shuttle Program Office decided they should be involved in what I was doing. Not a good thing. That was the beginning of a constant butting of heads between me and a guy from the Program Office. I had to live with it. In the meantime I developed the Landing Support Operations Handbook which contained the procedures to be used by the Landing Support Officers (LSOs) during Shuttle missions.

The day finally came when Shuttle simulations began. By then I was the Group Leader over several people who were assigned to become LSOs. One of them was an Air Force Captain assignee with a few brains but little common sense. He was around for awhile but eventually was replaced by a very sharp and easygoing Captain. He and I got along real well. We worked well together in simulations and later in the actual missions. He had his own civilian airplane – a very old two-seater – which he kept at the LaPorte Airport (which no longer exists) and he flew me around the local area a couple of times. Another assignee was a young woman who worked for a NASA contractor. Her background was designing refrigerators. She was assigned to me over my protests. It wasn't long before she got herself transferred out of my group. Not because of me, but because it just wasn't the job for her.

When the head of our section transferred to another position twenty seven candidates who applied for the position. The twenty seven were whittled down to four including me I felt like I was a shoe-in. Then I bowed out of the running. I had been having second thoughts. I had not particularly enjoyed being a section head before. Also I had a major problem going on in my marriage which affected my frame of mind. The decision to bow out was, of course, a career limiting decision.]

At some point management decided that LSOs should be in the same Section as the Flight Dynamic Officers and in August, 1981 we were transferred into the Flight Dynamics Section. Better yet, my new Section Head was Mike Collins from my whirling dervishes group back in the good old LRD days. Mike was always a great guy and a friend and it was great to work under him. With his LRD experience he understood what it was like dealing with the military for operational support, etc. and that I could handle it with virtually no oversight on his part. Besides, he had all he could handle with flight dynamics and the Flight Dynamics Officers (FDOs) - commonly referred to as "Fidos". Mike had become a Fido after leaving LRD several years earlier when LRD was being downsized

On June 12, 1981 the first orbital Shuttle was launched with John Young and Bob Crippen on board. After nearly six years we were back in space. Over the next three years I supported the first 12 or 13 Shuttle missions as an LSO. But I grew tired of it - particularly the constant LSO support of integrated simulations in which we really had little involvement other than to be physically in our positions. In October, 1984 I transferred into a staff position in the Operations Planning Office of the Operations Division of the Mission Operations Directorate.

In my new position my main activity was coordinating and publishing the ever-changing integrated simulations schedule. This was not a particularly difficult task in 1984 when there were only five Shuttle missions. But in 1985 there were nine missions scheduled. Each mission had different payloads, different objectives, and different crews. When you threw in launch delays and other delaying factors there was little maneuvering room for the resulting changes in the simulation schedule. As I recall there were twelve missions scheduled for 1986 and an increasing number after that. Given the existing simulation training requirements for various kinds of missions and the existing simulator/Mission Control Center capabilities it would be virtually impossible to support twelve or more missions a year - and that was with everything going perfectly - no launch slips, no simulator breakdowns, etc. I put together a detailed briefing and briefed Flight Operations management who then had me brief Mission Operations Directorate management. After the second briefing I remember one guy congratulating me for having the guts to give higher management the facts. (At that point in the program it was push, push, push and generally speaking no one wanted to be the bearer of bad news.)

Just a couple of months later the developing simulation scheduling problem was resolved in the worst possible way. On January 28, 1986, after 24 successful Shuttle missions, the

Challenger with its crew of seven was lost in an explosion a little more than a minute after lift-off. The next Shuttle launch would not occur until September, 1988. Many changes would result including a reduced schedule of missions.

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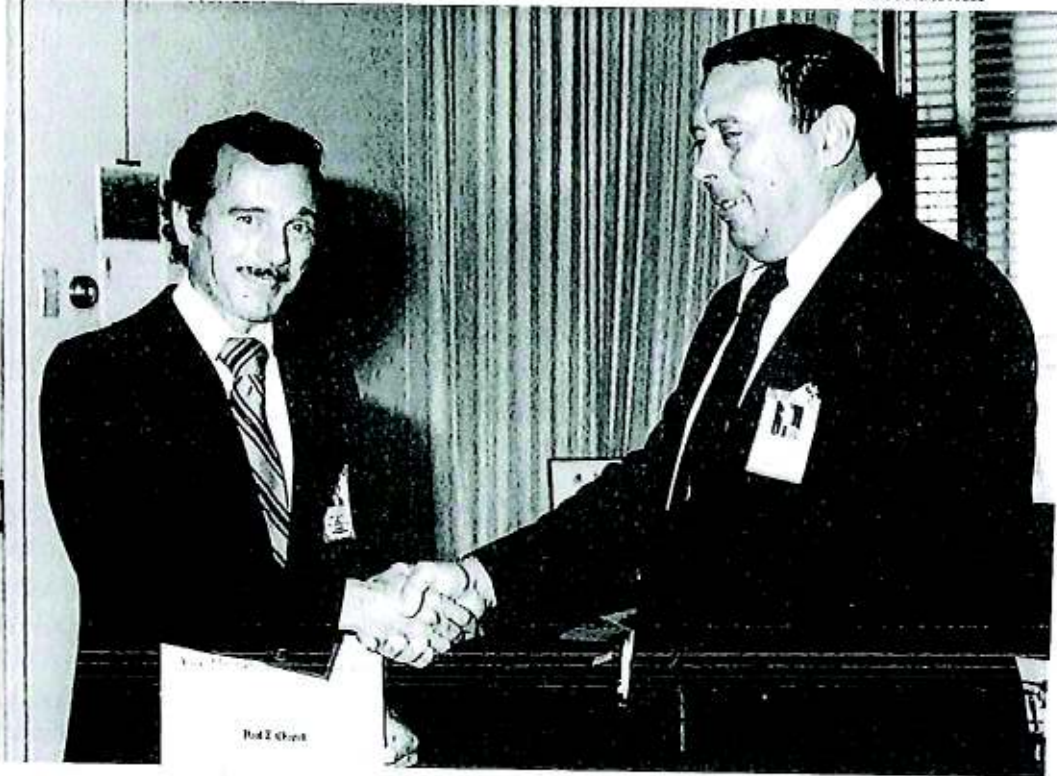
Note: I watched the launch on TV in a room in my office building. When the explosion occurred, many observers weren't sure what they were witnessing, but I almost immediately realized we were witnessing a major tragedy. I knew the commander, Dick Scobee, and the pilot, Mike Smith, rather well. Two great guys. In fact Scobee had given me a couple of large pink fuzzy dice from off his office wall because I kept mentioning how good they would look in my pink 1959 DeSoto. Those dice had originally been hung in the cockpit of the first Shuttle he flew in as a surprise by some of his astronaut buddies.

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Suddenly I and two guys who had been assigned to me months earlier had nothing to do. (After a tragedy such as the Challenger's, depending on what your job was, you either had too much or too little to do for an indefinite period into the future. We were in the "too little" category.) We were in a windowless small office room with virtually nothing to do but show up at 8:00 a.m. and leave at 4:30 p.m. Some people can live happily with that as long as they are getting a paycheck. Some people can go crazy. I fit the "crazy" category. To pass the time I would attend meaningless meetings, take lunch breaks much longer than the thirty minutes allotted, and spend time in the JSC technical library reading whatever was halfway interesting. I started having panic attacks. I guess you could call them that. I'd go out for lunch and then when I got in my car to return to work I would just sit there and feel like I was going to fade out. Finally I would drive back to work. I also started having occasional weird feelings while driving - like I was in a daze and couldn't control my car. This would especially happen on bridges and overpasses. (To this day I have remnants of that.) I had to make a change. I had to leave NASA.

Well it just so happened that I met the requirements for an early retirement from Civil Service. You had to be at least 50 years old and I was 52. You had to have at least 20 years of government service and I had 24 with NASA plus 4 years with the Air Force. And you had to have your work position being deleted. Well, it just so happened that was about to happen. Rockwell Aviation had just won a NASA contract to provide operational support for the Shuttle Program. Most of the scheduling work I was doing was part of that contract. One day I got the guts to call the Directorate Office and pointed this out and said I would like to retire. They wanted me to consider another position but I convinced them I really wanted out. On August 1, 1986 I left my office for the last time.

Postscript: Several months after leaving NASA I received a call from a Rockwell manager offering me a position at a salary higher than what I had been making when I retired. The call came on a Friday. I said I would consider the offer over the weekend. On Monday I declined the offer. I felt that if I accepted the offer it would be like putting myself back in prison in order to build my bank account. I have never regretted that decision.



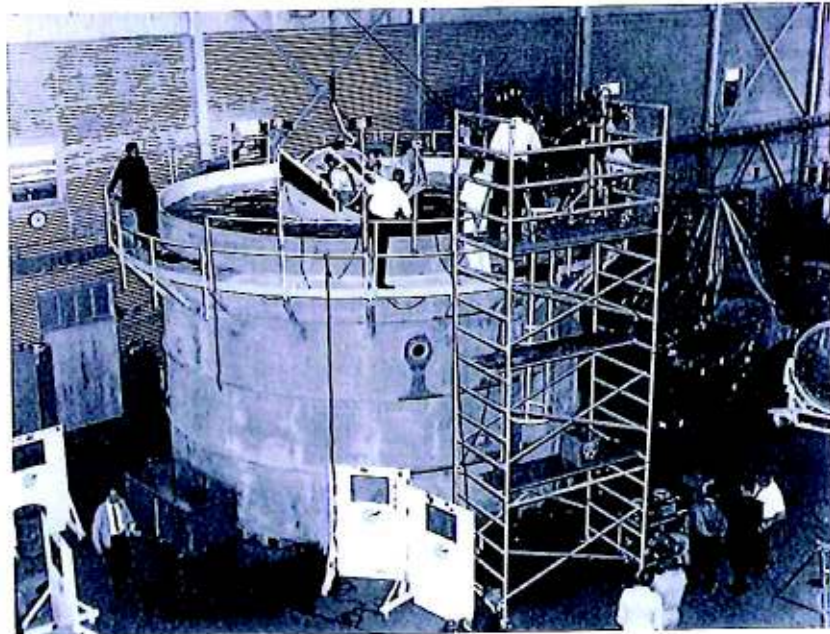
Paul. I wish to congratulate you for a job well done.

Well, thank you, George.

## GEMINI TESTS



In swimming pool and in a water tank at Ellington Field





LRD guys on the water tank



The Retriever



On the Retriever

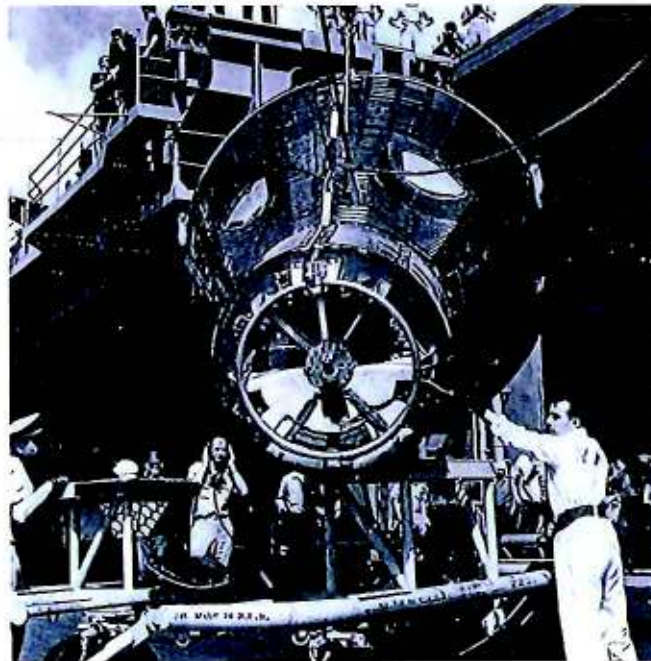
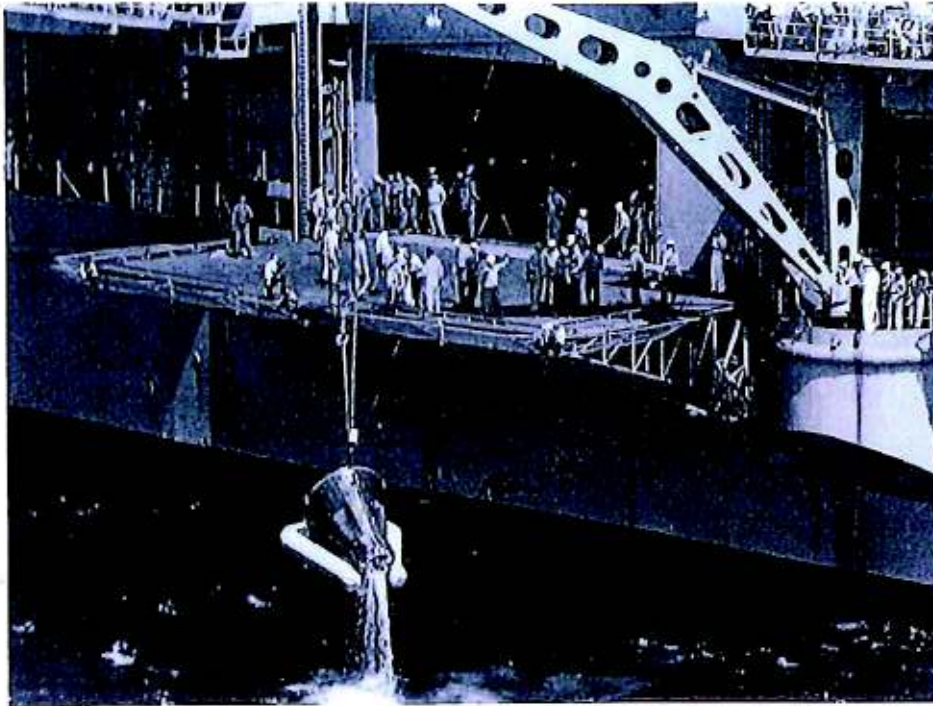


Testing in the Gulf

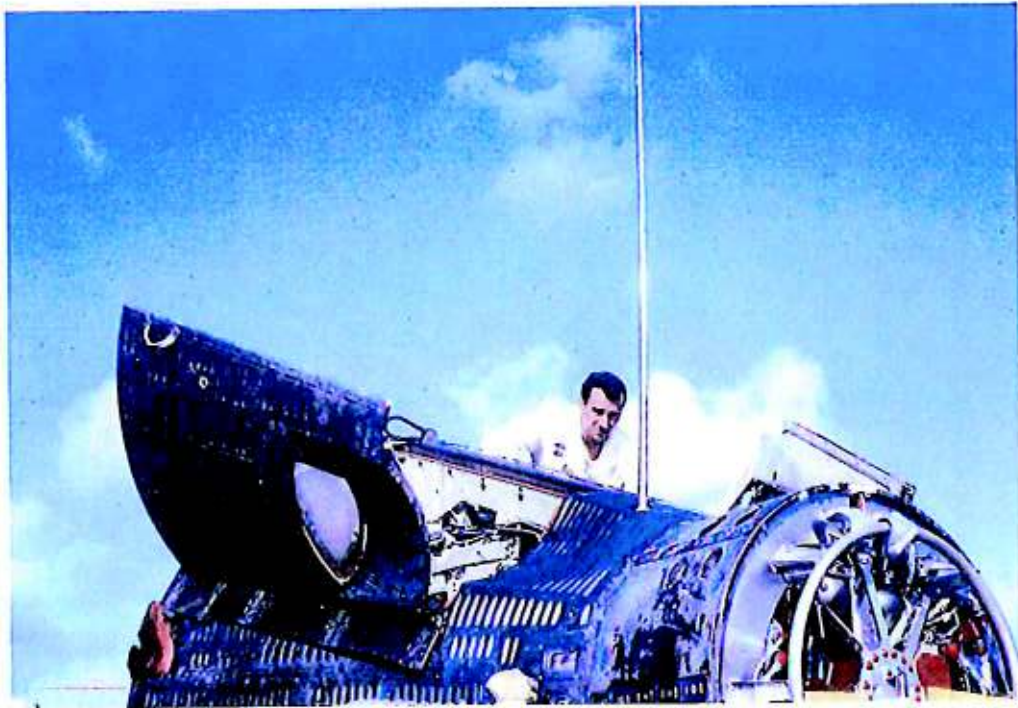


# GEMINI 2 (GT2) RECOVERY

NASA  
8-65-14070



Yes, that's me lower right



Now what?



GEMINI 11 - September, 1966

Dakar, Senegal



Downtown



Hotel - the one with mosquito nets.

## APOLLO TESTS



On the Retriever - in the Gulf



# Apollo Proving Elusive In Sea Recovery Tests

BY LARRY GOLDMAN  
Chronicle Reporter

The Apollo spacecraft with its cork-like heat shield is more of a sailboat than engineers at the Manned Spacecraft Center anticipated.

This could lead to problems when the three-man ship splashes into the Pacific Ocean on the return from a Moon trip, so MSC is testing a small sea anchor that would be attached to the vehicle to keep it from scudding out of the range of recovery personnel.

## Larger Than Gemini

The spacecraft is larger than those used in the Gemini series and it sets higher in the water.

Recovery tests in the Gulf of Mexico revealed the larger area exposed to the wind acts as a sail, sending the spacecraft bobbing across the water. Air Force Aerospace Rescue and Recovery Service personnel would have trouble catching it if they dropped upwind of the spacecraft.

The ideal situation is to drop the men down wind of the craft and let it come to them.

## Try and Try Again

During normal landings, where the spacecraft splashes down in an area within the range of a helicopter, Navy personnel are dropped. If they miss, the helicopter can simply pick them up and drop them a little closer.

Paul T. Chaput, an engineer in the Systems Evaluation Sec-

tion of the Landing and Recovery Division, says MSC decided to slow the spacecraft with a sea anchor so the flotation collar could be put in place.

The division convinced space officials to provide a sea anchor attachment ring below the side crew hatch. During normal landings, Navy personnel will attach a small eight-foot sea an-

chor to the ring, slowing it enough to attach the collar.

When the spacecraft lands out of the prime recovery zone, Air Force personnel will attach reserve parachutes to the ring.

Chaput says it is impractical because of weight for astronauts to carry sea anchors in the spacecraft.

Chaput said that when it is necessary for Air Force personnel to jump from 1000 feet or more, a dye marker shows the path of the spacecraft, but that landing near it is still a problem. After rescue men land, the collar must be dropped. If it lands any distance from the spacecraft recovery again becomes a problem.

## To Hook Line

To solve this problem, the Landing and Recovery Division is testing another concept. Two parachutes attached with a 600-foot line would be dropped downwind from the spacecraft.

Astronauts would drop a multi-prong hook and line out of the spacecraft. When the buoyant 600-foot line passed the hook, it would snag, holding the spacecraft in place.

## YALE GOING JUST 'NEAT'

New Haven, Conn. (AP)—Confronted by sloppily dressed students wearing jackets and ties, Yale's college masters have decided to insist only on a "reasonably neat appearance" in dining halls.

Abandoning the 10-year-jacket and tie requirement may actually make for better-dressed students, according to Georges May, dean of Yale College.

"A reasonably neat appearance could be more stringent than just a coat and tie," said May.

## SWAPS PISTOL FOR A SWORD

Midland (AP)—He turned in his six-shooter and took up the sword. The "sword" being the Holy Writ.

This, in short, is the story of Lt. D. M. (Hoss) Grayson, for 15 years a member of the Midland police department and a lay preacher since 1963.

Grayson resigned from the police department to become a full-time minister. He has accepted the pastorate of the Corinth Baptist Church here.



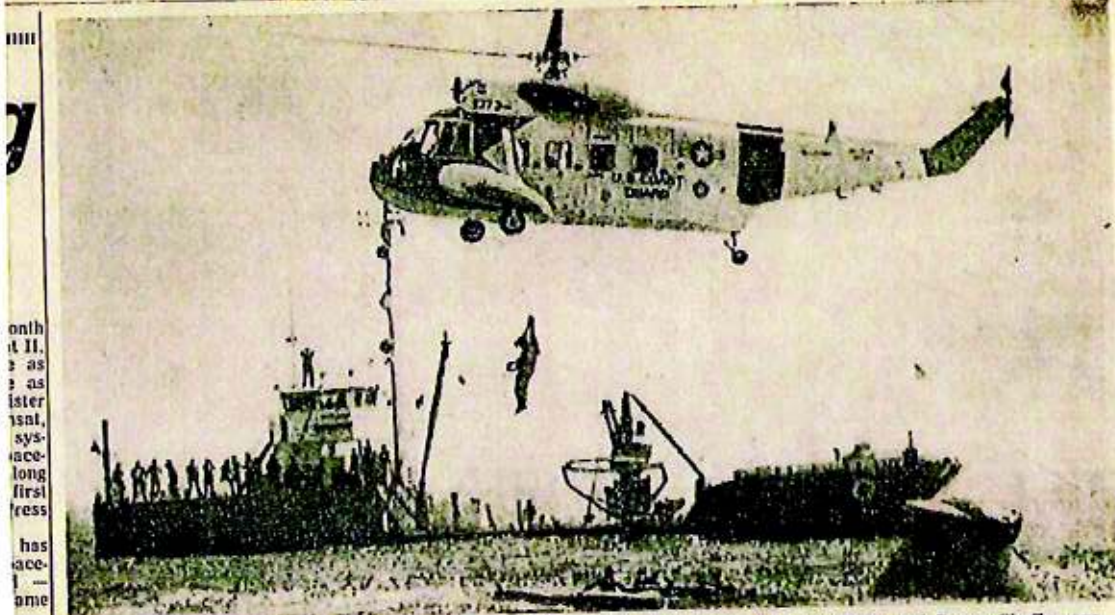
Chronicle Photo

DEVELOP ANCHORS FOR APOLLO SPACECRAFT  
NASA's Randy Stone, Paul T. Chaput Worked on System



Navy training

LEADER — Friday, October 28, 1966



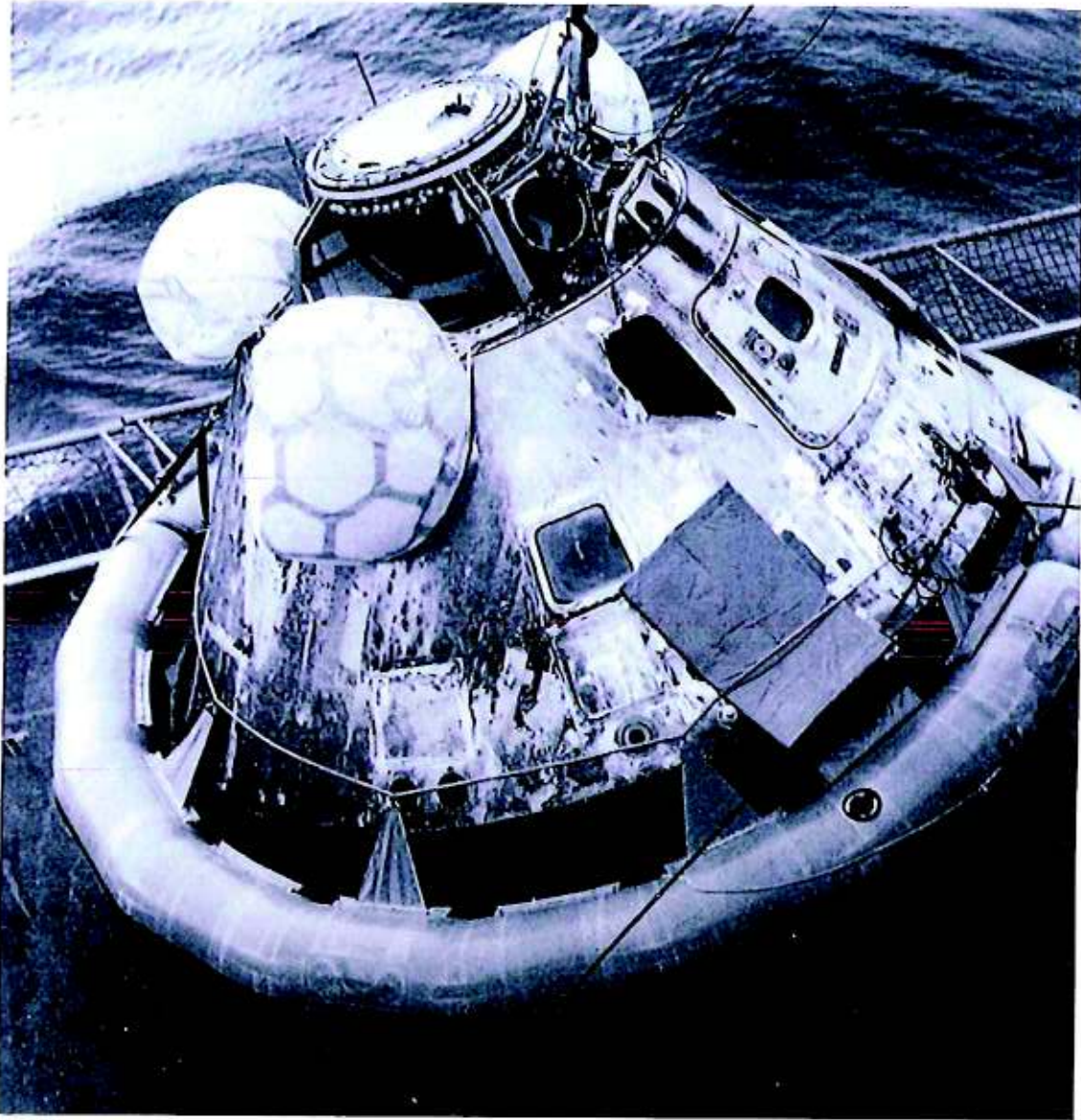
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THE CREW of the first manned Apollo space mission practiced getting out of their spacecraft, lower right, and pickup procedures during egress training yesterday in the Gulf of Mexico. Command pilot Virgil

"Gus" Grissom, Edward White and Roger Chaffee are scheduled to make the first Apollo flight as early as December. The ship in the background is used to place the spacecraft during the training. (UPI Telephoto)

Astronaut training

## APOLLO 8



The Apollo 8 spacecraft, the first spacecraft around the moon, being recovered on board the U.S.S. Yorktown on December 27, 1968.

Linda and Lisa looking through car window at astronaut Don Anders upon return of the Apollo 8 crew to Ellington Field on December 29, 1968.

ROUNDUP

JANUARY 24, 1969

PAGE 4

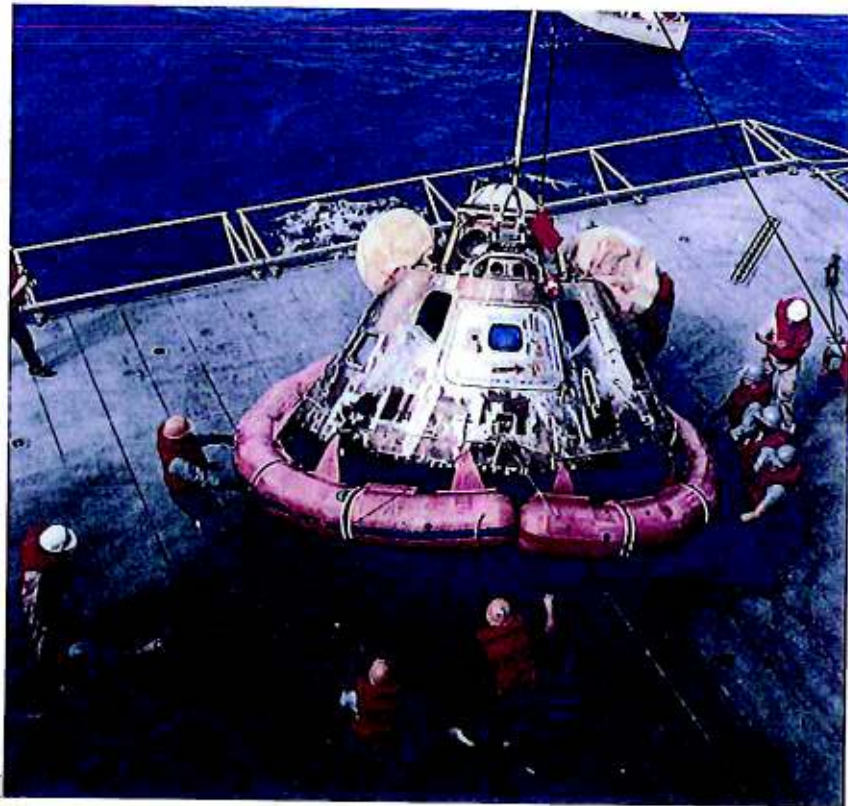
### Home-town Welcome for Apollo VIII



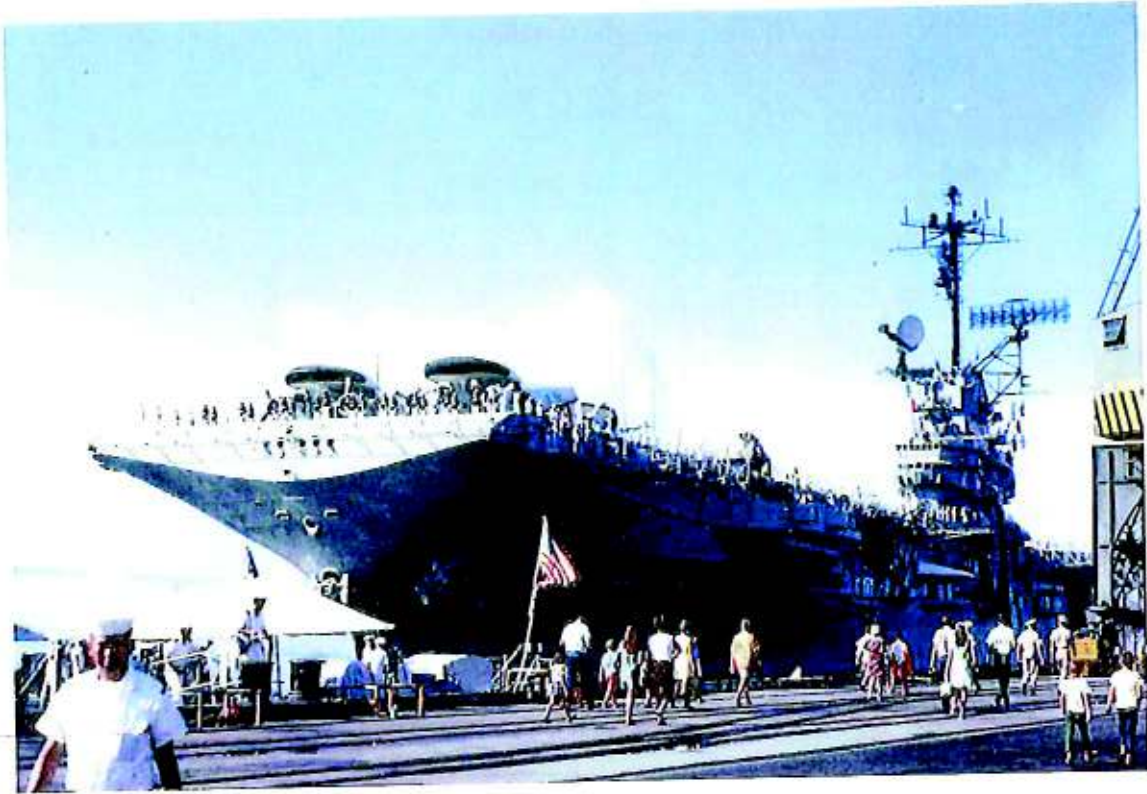
**THOUSANDS ON HAND**—More than 2,000 Houstonians were on hand to welcome the Apollo VIII crew following their historic lunar orbit flight. The crew was given a warm Texas-style welcome when their Airforce jet set down at Ellington Air Force in the wee-hours of December 29. The crew, headed by spacecraft commander Frank Borman (center in left photo), LM pilot William Anders (left) and command module pilot James Lovell (right) accepted the greetings of the throng (center photo) which included top MSC management, scores of fellow astronauts, MSC employees and numerous small fry. Crew autographs were in demand as evidenced by LM pilot Anders shown giving his autograph while a bright-eyed lass peers through car window (extreme right).



# APOLLO 11



On the USS Hornet



The Hornet docking at Pearl Harbor.

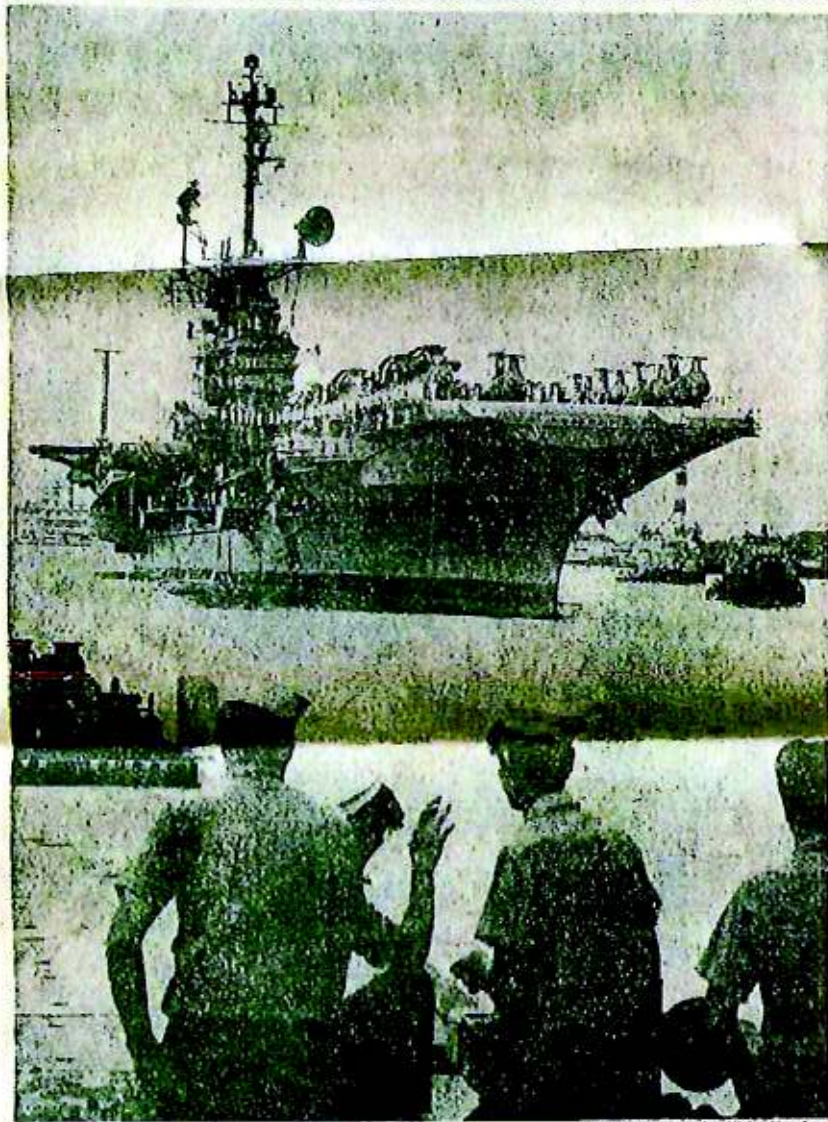
Linda ↑



Linda and me on the deck of the Hornet

# APOLLO 16

A-22 Wed., March 29, 1972 HONOLULU ADVERTISER



U.S. Navy Photo by Kirby Harrison

## *moon mission*

Navy mooring party watches from pier as aircraft carrier Ticonderoga glides toward berth in Pearl Harbor. The vessel arrived yesterday for operations in Island waters before taking station 1,100 miles south of here for recovery of the Apollo 16 astronauts when they splash down on April 28 after spending 12 days in space on their mission to the moon

# Early splash means calmer sea for Apollo

By TOMMY KENNEDY  
Post Reporter

ABOARD THE USS TICONDEROGA — A much calmer sea is now expected for the splashdown of Apollo 16, NASA officials said after learning of the change in the splashdown date.

Splashdown will happen about 2 p.m. Thursday, one day ahead of schedule.

Paul T. Chaput, assistant NASA recovery team leader, said it will take place about 30 miles south of the equator.

"The latitude is roughly 30 minutes south of the equator and at an unknown longitude," Chaput said. This latitude is about 330 miles south of the original splashdown site, he said.

The original landing site was expected to be affected

by the intertropical convergence zone, where the weather is rougher.

"I think it's pretty valid to say the weather will be improved over what it would have been," Chaput said.

Since leaving Pearl Harbor April 8, the recovery crew of the Ticonderoga, primary recovery ship for the Apollo 16 mission, has performed six simulated recovery exercises, with two more scheduled.

"We are ready to perform a recovery at any time," Chaput said.

He said moving the recovery date back one day might pose certain logistics problems.

For instance, dignitaries expected to arrive on the ship via Navy air transport might be out of range.



Apollo 16 command module about to splash down.

## SHUTTLE



In Honolulu in 1977 to brief the military. (Don't ask about the suit.)



1981 Supporting Shuttle in the ROCR. (Don't ask about the hair.)



A Shuttle on a piggyback ride over JSC.

September 1983