U. S. Navy Airship Book

2nd Edition

Blimps are majestic and fascinating aircraft. This book is about my experiences flying in Navy blimps from 1954 to 1956. It is my hope that these blimp pictures and stories will stir some of your own memories . . . and dreams.

By Larry Rodrigues

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The purpose of this free book distribution is to preserve and make available some of the relatively brief U.S. Navy Lighter-Than-Air history that I experienced.

This book has stories and pictures I saved from my tour of duty 1954 to 1956 in Airship Squadron 3, (ZP-3) at Lakehurst Navy Air Station, NJ with the crewmen who maintained and flew the ZPG-2N "Nan Ships".

Dedication

I dedicate my collection of pictures and stories to all the ground support personnel and the crewmen who made blimps fly in the past, and hopefully, in the future. The collective efforts of all the support personnel and crewmen forged a unique era in aviation history that proved the value of "the blimp" as a safe and reliable workhorse for many missions in both war and peacetime.

It took the ground-handlers, the pressure-watches, the crewmen, and many other supporting personnel to complete the rich history of LTA. I am proud to have played a small part in that history. I hope this book serves to partially record a narrow slice of the U.S. Navy airship story with the ZPG-2N.

Larry Rodrigues AT1
Combat Aircrew
Airship Squadron 3
1954 - 1956

Table of Contents

Introduction to the "Nan-ship"

Our airship type was the ZPG-2N. We called it a "Nan-ship", for the "N" designation.

AIRSHIP LENGTH: 342 feet long
TOTAL HELIUM: 975,000 cubic feet
CAR LENGTH: Approximately 80 feet
CREW: 18 (9 sleeping bunks)
POWER PLANT: Two 800 horsepower gasoline radial air-cooled engines inside the car. Two 18-foot tri-blade props were mounted on outriggers and were driven by a gearbox and shaft arrangement. Both props could be driven by either single engine. Since the engines were in the car, the engines could be worked on in flight.

Unfortunately, this arrangement with the engines so close made the car a very noisy place to work. From the midpoint of the car back to the stern it was necessary to shout within inches of a person's ear to communicate.

My Assignment

The insignia worn proudly by Aviation Electronics Technicians

I was an Electronics Technician on a blimp combat aircrew of 18 officers and men from 1954 to 1956. We flew often in antisubmarine warfare exercises with the fleet in the Atlantic Ocean. The purpose of these exercises was to develop effective tactics for protecting ships from enemy submarines. Our role was to find and intercept the submarine before it targeted the carrier and other ships in the task force. Of course we practiced with our own U.S. Navy submarines and used rubber-nosed homing torpedoes or harmless depth charges. The newest model airship in 1955 was the ZPG-2N. It was the N model of the letter designated airships. The Z was for lighter than air, the P for patrol, and the G for Goodyear, who made the ZPG-2N. We always called them "Nan ships".

The following pages are pictures and stories from my experiences mostly in and around the Nan-ships. But getting assigned to this blimp squadron took a lot of preparation.

Prior to being assigned to Airship Squadron 3 (ZP- 3) my two buddies, Dave Hatloy and Bob Kelly, and I had two years of training. First there was Boot Camp followed by the Navy Aviation schooling, then electronics "A" school. While assigned to ZP-3 we went periodically to Norfolk NAS and Memphis NTC for more short term courses on special electronics equipment. In between, there were correspondence courses to take constantly. All the study paid off as we all three left as 1st Class Petty Officers at the end of our 4 years in the Navy.

My buddies Dave Hatloy (left), Bob Kelly (right) and I show off our newly earned 3rd class petty officer stripe.

Chapter 1
Lakehurst Navy Air Station

Lakehurst Navy Air Station, at Lakehurst, New Jersey, was the oldest and largest airship base in the U.S. The base is most remembered for the Hindenburg disaster. On May 6, 1937 the German hydrogen–filled giant rigid zeppelin exploded and burned during landing.

The most impressive sight when you arrived at the main gate on the base is Hangar 1 dwarfing the nearby two story buildings.

The giant hangar is 200 feet high, 350 feet wide, and 808 feet long. It is so huge that occasionally it rains inside the hangar. This happens when the huge doors open and the humid air flows into the cool interior and condenses, making small droplets of "rain".

Lakehurst NAS Hangars 5 and 6
Each is 1088 feet long, 297 feet wide, and 183 feet high. Each hangar is made from 2.7 million board-feet of lumber and 143 tons of bolts, washers, ring connectors and miscellaneous structural steel.

When they were built, these hangars were the largest freestanding wooden structures in the world. There are six 30-ton doors on each end of the hangar. They ride on railroad tracks and move out to the sides like sliding 150 foot high sliding closet doors. We went to a class to be a certified door operator. Not only were the doors big and mechanically complex, but also air flow had to be considered much like water flow when operating them.

One of our frequent duties was "Pressure Watch". There are huge air bags (called "ballonets") inside the blimp's main helium bag. Air is pumped into or out of these ballonets to adjust the helium pressure. This pressure is the only thing keeping the tail and nose from drooping. We had to walk miles on the concrete hangar floors, climbing up into every airship to check the pressure throughout every day and night.

When the temperature changed suddenly, like when the hangar doors were opened, every airship would start losing or gaining pressure, depending on which way the temperature changed. If the guy on Pressure Watch was not moving fast to pump up or valve out air, alarms would go off. People from the shops would run to the nearest blimp and take control of the situation, which could be serious if not corrected immediately.

When the hangar doors were open the "Pressure Watch" had to walk a lot because the temperature changes affected the airship helium pressure more than when the doors were closed.

I liked the midnight to 4 A.M. Pressure Watch the best. In the early morning hours the temperature was stable, everything was quiet, and I could do Navy correspondence courses at the Squadron Duty Desk.

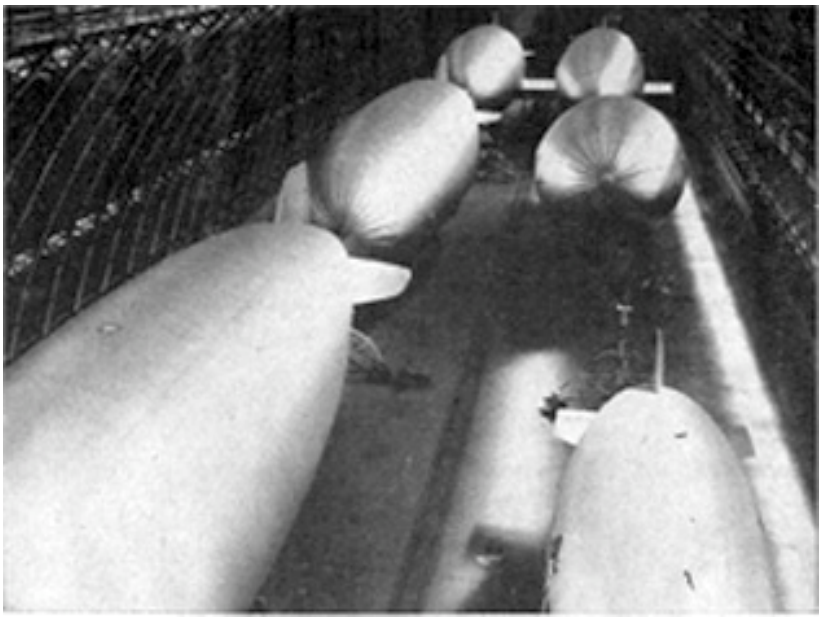
Moving a blimp in and out of the hangar was always done very cautiously. Strong air currents flowed through the hangar when the doors were opened. This was a very dangerous time for the airships in the hangar. When the temperature changed, strong drafts moved the airships and changed the pressure. When the hangar got suddenly cold and all the blimps needed pumped up at once, it was a panic for the Pressure Watch.

Conditions were always different and it seemed to me that it took a scientist to figure out what was going to happen when the doors opened. I always admired (and felt sorry for) the Duty Officer who had to direct moving a blimp in or out of the hangar. It took much planning, foresight, coordination, and a lot of good luck to get the blimp out in one piece with the tail still on.

We had many close calls with disaster while moving the airships. We lost one airship when a strong cross wind pushed the mast over as the airship was half way out of the hangar. The airship completely deflated in seconds. That was a bad day for us all.

When the weather was bad we put all of our airships in the hangar. That was a big job for the duty section. The men guided the tail in with ropes while the mast held the nose and was pulled by a tractor. Everyone had to be really on their toes as it was a tight fit for our five big Nanships to be inside all at the same time.

During one hurricane we even had aircraft and helicopters squeezed in to the hanger with all our Nan-ships, trucks, tractors, squadron vehicles, and assorted machinery. It was amazing how much was in that hangar!



Shown here in the hangar are five K-ships and one smaller experimental airship, lower right.

The Duty Section often had to move one or more airships into or out of the hangar. That was a major task requiring much planning involving the time for minimum winds. That time was usually early morning or evening. Moving tons of delicate metal and fabric close to the hangar walls and among the other ships was really scary to me. For many years after I left the Navy I periodically had dreams about scary things happening in that hangar.

Towing the mast and airship in or out of the hangar was always a tense situation. While I was there I observed one Nan-ship get only part way out. A gust of wind caused it to hit the corner of the door. It deflated immediately.

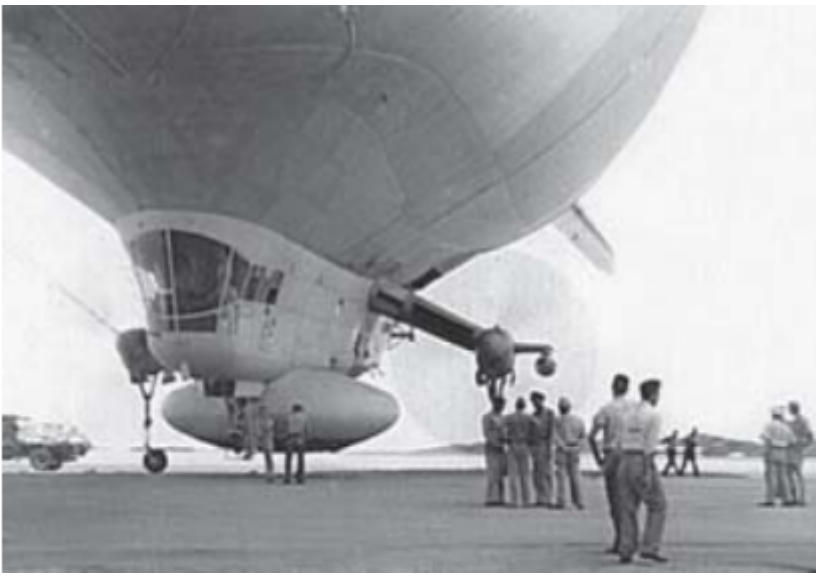
We also had some fun in the huge quiet hangar space. We sometimes made toy airships out of condoms filled with helium. Trouble was, they leaked helium quickly so we experimented with multilayered condoms one-inside the-other. Fortunately, the Navy gave us unlimited condoms to help with our “research and development”.

This also was part of the Lakehurst experience: cold and wet winters. We could not fly in snowy weather so the squadron ceased all operations on some days. The married guys got to go home but we single guys had to hang out in the barracks in case of an emergency. This is our barracks and parking lot at Lakehurst NAS on an all too frequent snowy day.

I liked living in the barracks because there was great camaraderie among us guys who shared working hard on an important mission. We each had our job that was an important part of the whole operation. We had a lot of respect for each other and took pride in our expertise and full efforts to get our jobs done.

Me and my 1948 Pontiac convertible.
Here I am in my winter flight jacket on a clear winter day at Lakehurst NAS. You can not see it in this picture but on our belt we always wore a 6 inch knife in a sheath. The purpose of it was to cut our way out of the blimp envelope should it collapse on us. I got use to using my knife for all kinds of tasks and missed it when I stopped wearing it after I left the blimp squadron.

Chapter 2
Flying On the Mighty Nan-Ship



Takeoff time was never predictable. Many things, including the wind, had to be right.

There always seemed to be long unexplained delays when it was time to go flying. I was always anxious to get up in the air. After takeoff I would turn on all the electronics equipment to see what was going to need to be worked on. Everything could check out O.K. on the ground but after the shaking the vacuum tubes got on takeoff there often were problems. I had a lot of satisfaction and pride in keeping the electronics equipment working. I also operated it, and that was a lot of fun, especially when we were on exercises with ships.

When we weren't flying there was plenty of work to be done on our equipment. That was in the days before solid state electronics. Vacuum tubes only lasted from 200 hours to 2,000 hours, generally. Plus they were constantly getting weaker as they aged. Therefore we spent many hours on the ground before every flight doing preventative maintenance, testing, and aligning our communications, navigation, and search electronic equipment.

Our electronic equipment consisted of these units for hunting submarines:

APS-20 search radar (200 mile range)
ARR-26 Sonobuoy FM receivers (2)
AQS-8 Magnetic Anomaly Detector
APA-69 ECM Direction finder.
APA-74 Frequency spectrum analyzer
APR-9 Receiver, broadband
APX-6 IFF transponder (ID "friend or foe")

For communication and navigation:

ARC-27 UHF transceiver (voice)
ART-13 HF transmitter (90 watts, CW)
ARR-15 HF radio receiver
ARN-6 Radio Direction Finder
ARN-9 Loran receiver

I'll explain later how some of this was used to find submarines.

On the long 20 to 40 hour flying missions we were on duty 4 hours and off 4 hours. Flying as a combat crewman on a blimp was very exciting at times. However, there were more hours of boredom than excitement.

The eating area on the upper deck served as a gathering place for the crew on their off duty hours .

The Nan-ship was built with sufficient space and facilities to be rather comfortable. It had an upper deck with 9 bunks and a galley area equipped with stove, oven, refrigerator, and sink. Shown here is one half of the eating area, which also served as a lounge area. It was a nice place to take a break away from the "war" going on below.

Our galley where we spent much of our off duty time. Crew members Mervosh, rigger (left), and Price, rigger (right), and Hobson, mechanic (rear).

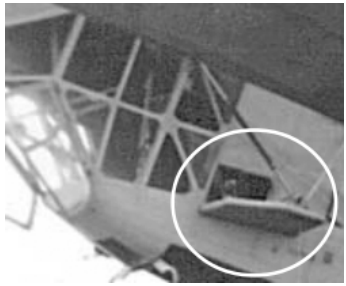
The entrance to the 9 sleeping bunks area is seen in this snapshot at the rear. I can remember how good it felt crawling into one of the bunks when I went off my 4-hours of duty on a long mission. After 20 or 40 hours of flying with 4-hours on duty and 4 hours off duty, my time and space got all mixed up. The bunk was a really special safe place for a few hours to sort things out and rest. Nobody bothered me and the warmth and sound of the engines were more comforting than any place I've ever felt since.

One time our two mechanics decided to bake a cake on the mission during their off-duty time. They said they put helium in it to make it the world's lightest cake. They said it took both of them to hold it down!

Our command pilot, Lt. Lundy Moore cuts the cake as electronics technician Ray Vogt watches.

On our 20 to 40 hour long missions we got a bit dirty and sweaty but we had pretty good facilities for cleaning up.

A memorable place where I loved to be alone and rest for awhile was the armament rack at the stern of the car . I loved to lean out over the edge of the shelf in the wind and look down.



Cruising on automatic pilot and listening to an Atlantic City FM music station.

The pilot's compartment was spacious and well equipped with radios, instruments, and an automatic pilot. That made cruising really a treat up there with the huge windows. We could even open some of the side windows and hang out and take pictures. When we were just cruising and not much was happening, anyone could sit in the right hand copilot seat. It was nice to cruise along looking out the big windows. Here we are just churning our way through the fog about 50 to 70 mph (80 - 112 kph), and listening to the radio as the autopilot flies us to our destination.

One of my duties was radioman maintaining high frequency radio contact with the base and other airships. We used Morse code to send position reports every hour and regular text messages. There was a camaraderie among radiomen that was very important. Many times the weather was bad and radio transmissions were extremely poor. That radio circuit often was the only link we had with someone for weather reports, instructions, and help. Sometimes it took many tries to get the message through. It helped when I had an understanding buddy on the other end of the circuit.

I remember one night when we were returning from several hundred miles out in the Atlantic Ocean. There was a really big storm moving up the coast. The head winds had us slowed to just a few knots per hour towards home. We were even flying VERY close to the

water where the wind was slower. All around us there was lightening and I was ready to give up my $80 a month flight pay. The crew commander told me to stay in touch with the base and keep reporting our position. He didn't say it but I understood that to mean, "so they could come find us if we go in the water."

I stayed constantly on the radio circuit, going nearly deaf from the static crashes in the earphones from the lightening. We kept the engines and huge props churning away all night into the head wind with very little progress each long hour. It was a long night! At dawn the wind let up a little and we started making some headway. We arrived back at the base in the afternoon and I was really grateful and happy to see my buddies who sat up all night with me on the radio circuit.

Our base radio room was small but very important to the safety of our airship crews. CPO Sylvester copying Morse code here.

Sharing some homemade oatmeal cookies from Mom with the officers on the crew.

I remember this cookie incident so well! We were all aboard and ready for takeoff on a long mission but received a radio message to standby for delivery of some important electronics parts before taking off. So there we were with 60 ground-handlers holding the airship bow lines, the engines were running, and the ship was bucking anxiously ready to climb into the sky. In a few minutes my buddy Dave Hatloy came speeding across the mat in a truck. He signaled to open a hatch for the important box. The box was a shoe box with cookies from Mom. He had checked my mail for me, knew what was inside the box, and thought it was important to have on the mission. It was! Thanks Mom. Thanks Dave

Chapter 3
Our Airship Landings Were Always Exciting

One of our ZPG-2 N, “Nan-ships”, approaches the landing mat at Lakehurst Naval Air Station. In the background are hangars 5 and 6.

Landing our 342 foot long airship was a major operation that required a large and strong crew on the ground. They were called "ground-handlers". All the enlisted men (there were no women) in the squadron had to be a ground-handler on their duty day, and any other time when there was an emergency --which was often. All too frequently the call for "ground-handlers to duty" was blasted over the PA system in the hangar, the barracks, and dining hall.

Our airship landings at Lakehurst were always on a huge square asphalt mat, rather than a runway, so we could head exactly into the wind. We flew in on the approach path like most winged aircraft, only much more slowly. The slow approach caused the airship tail control surfaces to react very slowly and poorly.

We generally landed at sunup or sundown because, for about an hour, the wind was the most calm then. This minimized the problem of the wind blowing us around after we came to a stop and waited for the portable mast. Also the temperature wasn't too hot at that time of day, and temperature was a major factor affecting how heavy or light we were.

Unlike a winged aircraft, we never really knew how heavy or light we were after a long mission. We preferred to fly and land at least several thousand pounds heavier than air because it was a smoother ride. We could fly up to 10,000 pounds heavy, as long as we kept the nose up and kept moving .

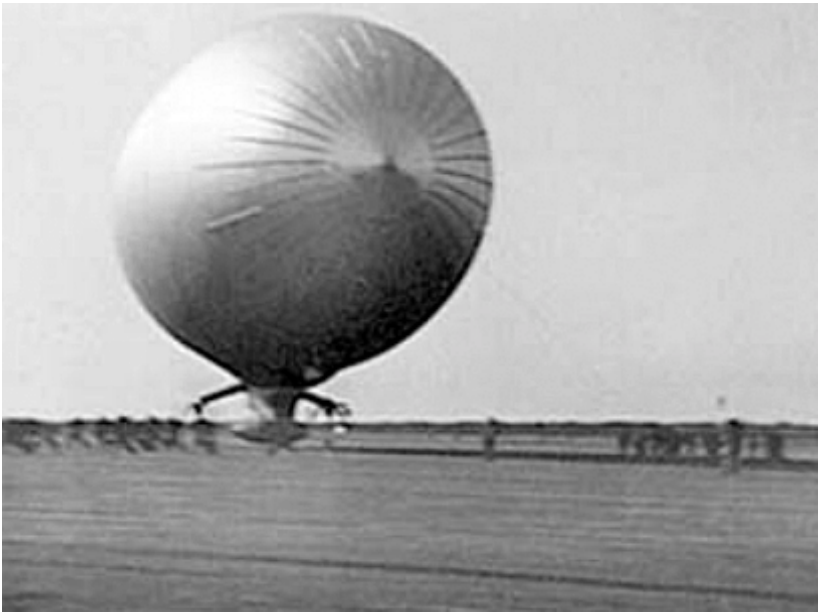
On one hot afternoon landing we were so light that the ground-handlers could not keep us on the hot black asphalt. After we rolled to a stop we just floated straight up! We had to fly back out to sea and pick up about 2,000 pounds of ballast sea water before trying again.

Landing was always hard and dangerous work for the ground-handlers, the pilot, and the mechanic who monitored and nurtured the two 800 hp engines. Many times I saw the back of the pilot's flight suit all wet with sweat after a landing.

The ground-handlers got a heavy workout running, pulling on the lines, and loading or unloading sand bags. Everyone in the squadron had to be a ground-handler when they were assigned to the Duty Section.

Ground-handlers had to move fast to grab the bow lines and run to the sides with them.

After landing we rolled across the mat and headed toward about 60 men lined up in a "V" shaped formation. In front of the point of the "V" were 2 to 4 men whose job was to grab the two hanging bow lines and run like hell with them back to the men in the "V". They were highly motivated to run fast because there were two 18-foot whirling propellers and a monster machine coming right at them!



The ground-handlers struggled with the bow lines as the engines roared with props in reverse pitch to stop the giant airship.

When it looked like the ground-handlers had a good grip on the lines, and we seemed to be in the right spot, the big props were put in reverse pitch and the engines sped up to stop the airship. This was always a little scary to me. The engines were roaring and throwing up dust and the pilot now had no control at all with the tail surfaces.

Also the ground-handlers were often falling all over each other trying to hold the giant airship in place while it bucked around like a wild animal caught in a trap. The slightest wind would push the airship and us around.

The pilot and mechanic adjust the engine speed and prop pitch to bring us to a stop.

Once we stopped, the pilot and the mechanic were very busy gently adjusting the engine speed and prop pitch angle trying to keep the airship steady in one place so the huge mooring mast could approach. The mechanic sat behind and in the center to monitor all the engine gauges to insure one or both engines didn't "die".

We were just dead weight for those critical minutes and we could do nothing but wait. The slightest wind could push us in any direction during this critical time.

The aft ground-handlers help to keep us stationary as the giant props threw dust and sand at them.

The aft ground-handling duty was always difficult and was one of the worst jobs! At times the mat was covered with ice so slick we had to wear strap-on ice cleats on our shoes. Many times we would launch an airship at sundown for a 20 to 40 hour flight, only to have it come back that same night for an emergency landing before dawn. Everyone living in the barracks was called out to ground-handle in those emergencies. What misery it was to leave a warm bunk and go out to ground-handle in the dark and cold! For years after I left the Navy I would periodically wake up in the night thinking I heard someone shouting that we had to go out to ground-handle! I think some squadron guys got married just so they could live off base and avoid that miserable duty we barracks guys got stuck with all too often.

Ground-handlers hold the bow steady as the 23 ton mast is connected to the airship.

As rapidly as possible, a tractor pulled a 23 ton mast on big tires to about 20 feet in front of the airship. A cable then winched the ship and mast together until the blimp nose pin was locked in the mast cup.

The critical moments when the mast and airship nose were facing each other, only yards apart, were the most dangerous. A slight wind could easily force the nose up, forward, and down over the masthead and men.

“Secured!” is yelled down after the nose cone is securely in place on the mast locking cup.

It was always good news to hear "Secured!". Only then was it safe to relax a little. We still had to take care of the tail end of this 342-foot long blimp.

I don’t remember what the title was for the guys who volunteered to wrestle the airship nose into the locking cup. I know I never volunteered for that job. I figured I was way to small and weak to overpower that giant machine if it didn’t want to lock up. And sometimes it appeared to resist very strongly.

A tractor pulled the mast and airship . However, the airship was free to swing 360 degrees around the mast. That made it quite a challenge to move an airship if there was a slight wind in any direction other than head-on.

After the airship was secured to the mast, the duty section ground-handlers hung sandbags on the car to hold the tail down. The sandbags did not completely hold it down but helped. Often when there were gusts of wind, the airship wheels would lift off the ground and then settle back down gently after the gusts subsided.

The mast and airship were towed to a circle where the tail could swing freely around the mast as the wind changed direction. A farm type of tractor pulled the mast and airship. One of our best tractor drivers was my buddy Dave Hatloy. He was a farmer from Drayton, North Dakota, and liked the job of driving the tractor. He volunteered for the job every chance he got when he had his duty days.

When we weren't flying we were doing our duty days every 4th day. The rest of the time we did maintenance work in our shops and on the airships in the hangar. We had 3 out of 4 week ends off.

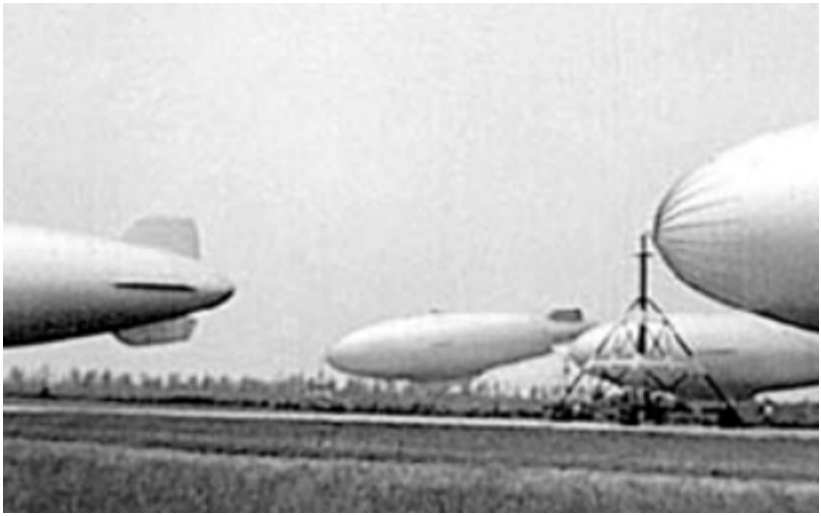
Sand bags were hung on the car to help keep it on the ground once the airship was secured to the mast.

The airship's bow was locked to the mast in the center of a circle where the ship could swing around as the wind changed. A duty section man was assigned to stand "pressure watch" aboard the blimp day and night as long as the ship was outside the hangar.

When I had that duty I usually tuned the navigation radio to a music radio station and did correspondence courses. It could have been boring but I kept busy and the time passed quickly. I spent many hours sitting in the airships out on a circle. Probably that was one of the easiest duty tasks in the Navy!

A Nan ship at mast on a circle with pressure watch assigned. K-ships at mast on circles in the background.

Once the airship is moored at mast on a circle, a pressure-watch will stay onboard and monitor the pressure constantly. If it cools, the pressure will drop and air will be pumped into ballonets inside the helium chamber. If it heats up from the sun, air will be valved out to prevent the pressure from going too high.



The airship in the center of this picture has raised off the ground slightly from a gust of wind.

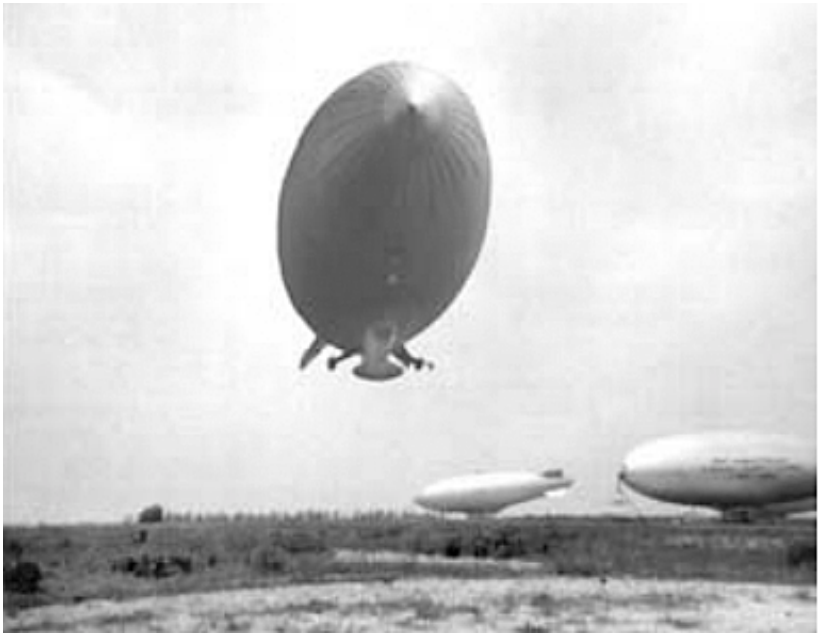
Occasionally an airship would do a nose stand on the mast. One time one of our riggers, Wilbur Lahann, was doing some work in the stern of the car when suddenly he felt the tail rising rapidly.

Unlike the often gentle rise and settle of the tail from a lazy gust of wind, this time the airship tail kept going up! He hung on as it kept going up to near vertical. His tool box and other loose odds and ends, fell down through the blimp car's center aisle and exited out through the huge forward Plexiglas pilot's window. The airship rotated on its nose around 180 degrees gently and settled down to the ground on the opposite side of the mast in less than a minute. The ship was just fine, it appeared, except the pilot's compartment window was knocked out and Wilbur was a bit shaken.

Landing our giant airship was a major operation where few things were in our favor. Often it took us several tries to make a good approach, roll to a stop, and to get enough ground-handlers on the lines to hold us stationary. The slightest wind could push us enough so that the ground-handlers couldn't hold us in place for the mobile mast to approach and lock to the airship bow. When that happened, the Duty Officer on the ground would signal the ground-handlers to drop the lines, run out of the way, and wave us off to get back up flying.

Often by the time the ground-handlers dropped the lines, we were drifting sideways or backwards with absolutely no control. There were hangars, buildings, a water tower, other blimps at masts, and pine trees not far away so we had to do something on our own quickly! The pilot had no control with the tail surfaces until we were moving forward so he and the mechanic were really busy nursing every last bit of power out of the two roaring 800 hp engines. Often we made a lot of noise and dust but not much happened very fast!

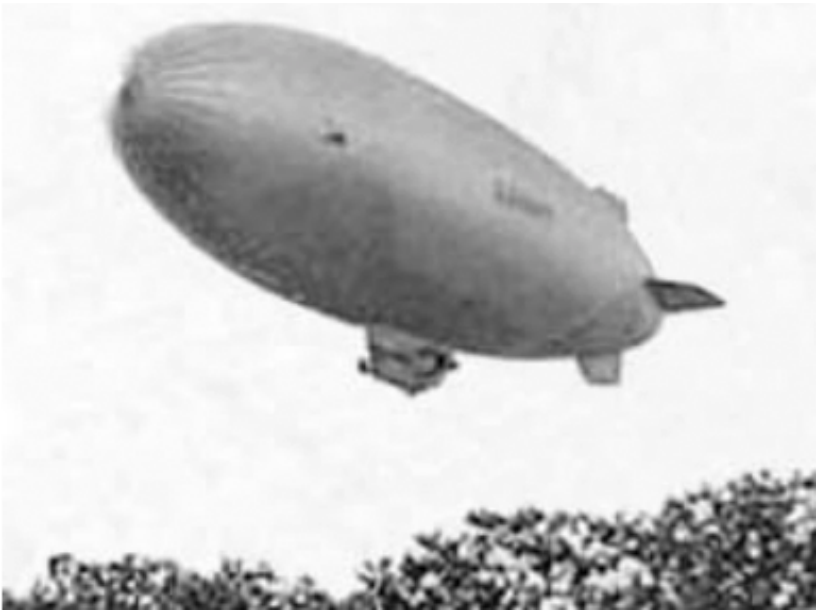
I can still remember the fantastic rush and thrill I felt as the giant 18 foot propellers clawed at the air trying to get our huge heavy mass moving forward again. The combination of the thunderous prop noise, screaming gearbox whine, and the roaring engines was deafening, but thrilling! The engines were inside the car and about 10 feet (2 meters) aft of where I sat at my radar. I left the navy with, and still have, tinnitus (ringing in the ears) and loss of hearing.



One of our ZPG-2N, "Nan-ships", makes a landing approach at Lakehurst Naval Air Station.

Delayed landings were disappointing, especially after a long flight of 20 to 40 hours. When the wind conditions were not right, all we could do was take off and try again to land. Sometimes the Duty Officer would call out all of the squadron members --clerks, supply people and all-- to try to help. Once we had to give up and continue flying overnight until the wind died down the next morning. The Duty Officer had us hover overhead and lower the winch so they could send up extra food in a big basket. They surprised us with lots of ice cream!

Chapter 4
The K-Ships Had a Long and Honorable History



One of our K-ships comes in over the trees and base housing area for a landing.

The “K” class airships were smaller than the Nan-ships, but they have a much more colorful and longer history. The first K-ship were built in 1931. In World War II production increased as did the size and capabilities. During WW II the K-ships conducted search and rescue, patrol, photography, and mine laying. K-ships made 55,900 operational flights of over 550,000 hours. During WW II, 89,000 surface ships were escorted by K-ships. Not a single one of these surface ships was lost to enemy submarines.

Also, only one airship was lost through enemy action. On the night of 18 July 1943, K-74 was on routine patrol off the Florida straits and detected a sub by radar. A gun duel briefly silenced the German deck guns, and the airship made a pass over the submarine but the bombs failed to release. Unfortunately, more gun fire from the sub brought down the K-74. It floated for hours and all the crew but one were picked up the next day.

I only flew a few missions in our squadron K-ships. I remember them as cold, crowded, and uncomfortable. They had a small radar, sonobuoy receivers, magnetic detection equipment (MAD), and radios. Everything was on one deck level.

In the rear of the K-ship car was a small, crowded, and noisy galley for eating and resting. However, the noise level was very high, making it difficult to get any rest.

Shortly after I arrived at the base, the K-ships were phased out of our airship squadron and replaced by the much bigger ZPG-2N that we called the “Nan-ships”.

The K-ships were much smaller than the Nan-ships and required fewer ground-handlers. Also the k-ship missions were usually only day-long flights. The K-ship got its name from the fact that it was the series “K” airship in the list of lettered airships.

This snapshot of a K-ship was taken at Weeksville, North Carolina. Notice the hangar doors are the “clam shell” type. Lakehurst blimp hangars were different.

The proud record that these K-ships had during WWII certainly says a lot about the brave crews that flew them. The WWII K-ships had radar, sonobuoys, MAD, depth charges, contact bombs, a machine gun, and during the latter stages of the war, homing torpedoes. However, the Nan-ship capabilities and endurance for long missions were dramatically improved over the K-ship. The Nan-ship had a more powerful radar, spacious Combat Information Center. and an upper deck with nine bunks and galley

The Navy Reserve's K-ship at mast on a circle at Lakehurst NAS. A Nan-ship is flying in the distance.

I took the above snapshot out of the open side door right in front of the starboard prop of our Nan-ship as we were being towed to the circle. In the background was one of our Nan-ships in-flight. Notice the slight nose up attitude of the Nan-ship flying. It is not actually climbing but rather flying with the nose up because it is flying with a actual weight of several thousand pounds.

The term "lighter-than-air" is not strictly true. We could be up to 10,000 pounds heavy at takeoff. The ride was much smoother when we were flying heavy, but that is not the main reason we flew heavy. We needed hundreds of gallons of gasoline for our long missions. After several days of constant flying the airship would become lighter than air, in which case we would pick up sea water for ballast.

Chapter 5
The Nan-Ship Was a Submarine Hunter and Killer

The submarines in those days were powered by diesel engines and battery driven electric motors. When they attacked a ship, they approached as close as they dared using their diesel engines while submerged. They saved their batteries for the final attack and escape after the attack. However, in order to use diesel engines while submerged, they had to have their snorkel above the water for air intake and exhaust. Our powerful radar could usually track that snorkel as they approached the ships submerged. Our training exercises were only with U.S. Navy submarines and ships.

A U.S. Navy submarine with periscope and snorkel in use.

The snorkel was topped by the head valve that had to be kept out of the water. If it ducked below a wave it would automatically slam shut. The diesel engines would keep running for a short time removing some sixteen thousand cubic feet of air from the boat's internal atmosphere per minute per engine. That was hard on the crew! That was like going from sea level to 6000 feet altitude in seconds.

Our exercises usually went like this, with some variations:
There was a task force consisting of an aircraft carrier with several other ships, such as destroyers and tankers a few hundred miles out in the Atlantic Ocean off the U.S. east coast. At a certain time, the exercise would start with the submarine on the surface approximately 20 miles away from the task force. We flew a few miles aft of the task force so we could see them on the radar in front of us. The goal was to see if the submarine could attack the task force and escape before we "killed" the sub. Each exercise lasted a couple of hours with breaks in between exercises. We flew with the task force continuously for 20 40 hours, then another of our squadron's blimps and crew would replace us and we would go home.

At "Zero-hour" the exercise would begin. We generally observed the submarine disappear off the radar as it dove below the surface. Since it was a diesel powered submarine it needed air for the engines, so a snorkel extended above the surface. The snorkel was considerably smaller than the submarine but our powerful radar could usually see it.

The submarine would zigzag toward the task force attempting to get as close as possible using diesel power. The batteries and electric motors were saved for the attack and escape.

Our mission was to detect the submarine before it could attack any of the ships in the task force. Of course no live weapons were used because we were practicing with our own U.S. Navy ships and submarines.

Submarine periscope

When we detected the submarine snorkel or periscope on the radar, it was reported to our Combat Information Center (CIC) officer and the plotter. In those days our high tech plotting board consisted of a round horizontal Plexiglas covered table with a light underneath, and tracing paper on the Plexiglas. The table was set up like the radar scope with range marks on the Plexiglas that showed through the paper. By marking time and position of submarine and ships on the paper, a record of the exercise was maintained and kept for later review. With this crude setup at least we never had to stop the "war" because the "computer was down".

The Combat Information Center (CIC). From here the battle is observed and directed. All search information is passed to the plotter who records it on the plotting board. The CIC Officer directs the search and kill activities.

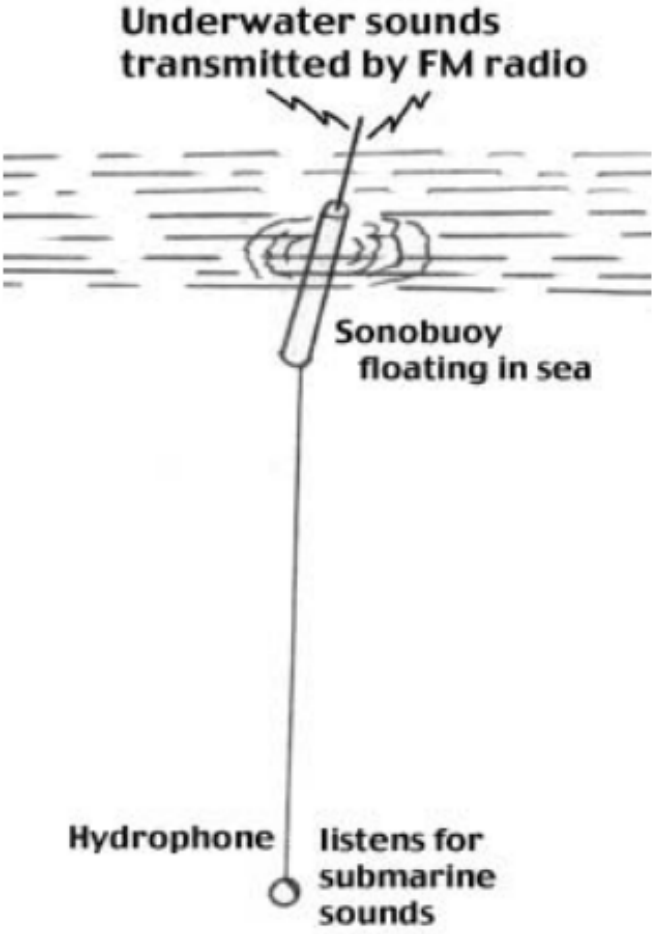
Our first objective in the exercise was to search for the submerged submarine making its way toward the task force ships for a torpedo attack. Our main searching equipment was our powerful APS-20 radar. At the same time we looked for any sign of a radar signal from the submarine, in case it was searching for the ships or aircraft.

When the submarine's snorkel or periscope was identified on the radar scope, we headed for the submarine at top speed. That was about 75 knots, which is about 85 m.p.h. or 140 kmh. When the submarine detected us approaching, the submarine would shut down the diesel engines, dive deep below the surface, and operate on battery motors. Of course the submarine would take evasive maneuvers below the surface and we would not know exactly where it was headed.

After we arrived in the general area of the submarine's last sighting, the second phase of the search exercise began. We dropped a large circle of sonobuoys in the water where we thought the submarine might be located.

The sonobuoys were about 3-foot long by 6 inches in diameter, and floated in the water. When they hit the water, an antenna popped up, a hydrophone (an underwater microphone) dropped down on a cable, and a radio transmitter started sending the underwater sounds. We could tune a special sonobuoy FM receiver to each sonobuoy frequency and hear the underwater sounds from each hydrophone.

Usually one or more of the hydrophones could pick up the sounds of the submarine. Submarines were very noisy in those days, unlike today’s nuclear powered stealth submarines. As we flew above the sonobuoys, the loudest sonobuoy gave a clue to the submarine's approximate location. If needed, we dropped more sonobuoys to get a better "fix" on the submarine.



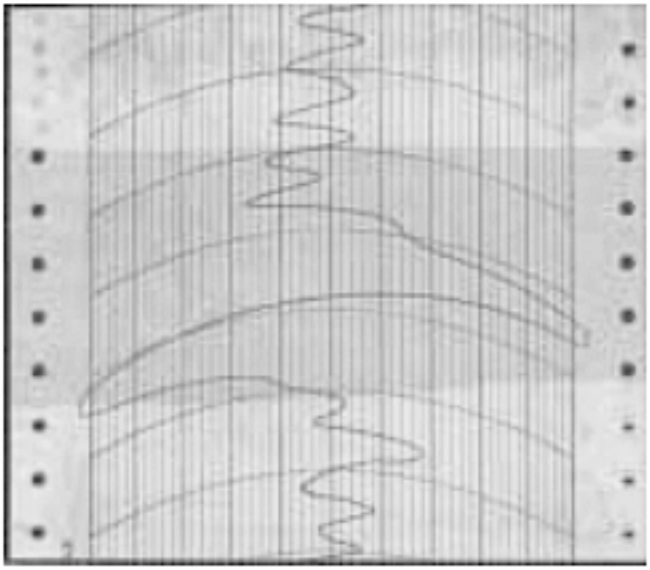
When we were using these sonobuoys, the technology was crude compared to today's similar underwater submarine search equipment. Back then we used our ears to identify and analyze the sounds. Today's equipment is all digitized and analysis is by a computer.

Once the general location of the submarine was revealed by one or more sonobuoys, the third phase of the operation began. We then flew down very close to the water surface and operated our Magnetic Anomaly Detector (MAD) electronic equipment.

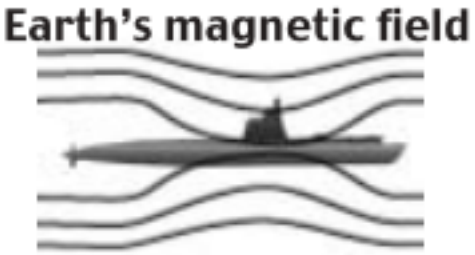
To use the MAD equipment we had to fly fast and close to the water surface making tight turns.

The Magnetic Anomaly Detector (MAD) could detect the presence of the metal submarine, if we were close enough. This was really exciting because we were flying fast, right near the surface, and making very tight turns crisscrossing the area looking for a weak magnetic signal from the submarine. Every second counted. We were constantly aware that the submarine was headed full speed for the aircraft carrier with the intent to sink it. We needed to prevent that from happening.

If all went well for us, we detected the magnetic signal from the submarine on our MAD equipment on the first or second pass over the area. The signal was a change in the Earth's magnetic field that we saw on our paper and ink strip recorder.



The MAD signal for a submarine appears as a large swing on the ink and paper strip recorder.

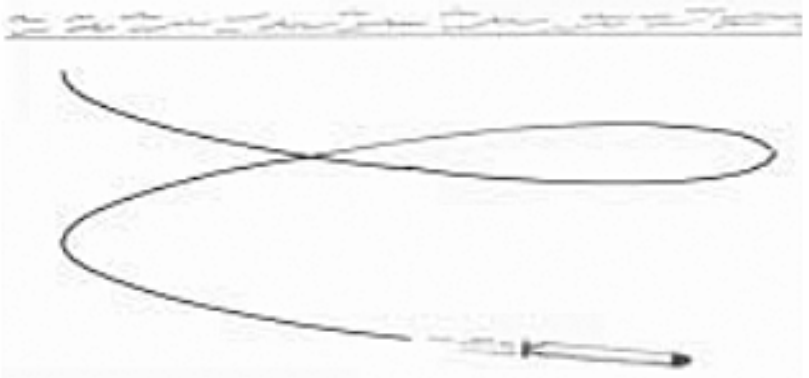


The Magnetic Anomaly Detector (MAD) can detect subtle changes in Earth's magnetic field caused by a submarine.

The magnetic anomaly detection (MAD) equipment was originally designed for geological studies, finding mineral deposits, and locating oil fields. It also worked very well for pinpointing the location of a submarine.

When the MAD signal was received, we dropped a bright yellow dye marker and white smoke bomb that floated on the water to mark the submarine location. We made a few more high speed, low altitude, tight turns and passes over the area. We needed three good MAD contacts as close together as possible to confirm the submarine's location. On the third positive MAD contact we dropped an automatic homing torpedo. Of course they were nondestructive types.

When the torpedo entered the water it started circling and used sonar to look for a target as it went deeper and deeper. If it did not find the submarine it continued to a preset depth then it circled back up to a predetermined depth.



Once we released the homing torpedo it went on its own way to find the target.

The homing torpedo continued searching between those upper and lower depth limits until the batteries went dead. The torpedo then released a float to bring it to the surface, and also emitted a radio signal so it could be retrieved by a ship.

We were nearly always successful in intercepting the GUPPY type of submarines before they targeted a ship in the task force. I was very proud of our team successes and what I contributed to it as an electronics technician.

The "search and kill" operation was directed and coordinated from our Combat Information Center (CIC).

Although the MAD equipment was originally designed for geological studies, it also worked very well for pinpointing the location of a submarine under water. Airships were an excellent platform for carrying the MAD equipment because there was very little metal close to the magnetic detector out on the bow of the airship.

One time I was just messing around with the MAD gear as we were flying low across the New Jersey pines and sand, and I noticed a pretty good size signal. I thought at first that I had found oil in New Jersey! When I looked out the window to see where we were, it turned out that I had picked up railroad tracks and a train!

Other Navy aircraft also carried MAD, but because there was so much metal in the aircraft it was less sensitive. Our "rubber rocket" had very little metal near the actual MAD detectors way out on the bow, so our MAD was much more sensitive. Also we could fly lower and slower than the aircraft and make tighter turns over the target area.

The primary reason our search and kill tactics were so effective was the close coordination and direction from our Combat Information Center (CIC) Officer. We electronics technicians were the main equipment operators and the success of our mission depended on how well we maintained and operated all the equipment. We fed all search results from the radar, ECM, sonobuoys, or visual, to the CIC plotter over the intercom. Minute by minute the plotter wrote down time and target information on the plotting table where it

became a permanent record. It was in real time and showed the overall picture of the "battle" going on so the CIC Officer could make decisions and take actions quickly to change the search tactics or start the attack on the submarine. It was all very exciting!

We practiced variations of this hunt and kill scenario for days at a time. Sometimes our airship crew operated as only a Combat Information Center (CIC) to direct the full search and kill operations of other aircraft. In those operations we would radio the aircraft carrier to launch some aircraft and we would use our radar to guide them to where we thought the submarine was running submerged. The aircraft would drop the sonobuoys and use MAD equipment.

Our blimp was easily blown off course, so the navigator was constantly busy keeping track of where we were. Main tools used were RADAR and LORAN.

I was one of four electronics technicians on the crew. We were both the electronics equipment operators and the maintenance technicians. I got a lot of satisfaction out of making a significant difference in our operations. I worked on that radar so often that I had major parts of the schematic memorized. It had a million watts of peak power and was the best airborne radar available at that time. Because of all that power concentrated in a small area, heat and arcing were a constant problem. Some components had to be changed about every 12 to 24 hours from burnout. Most of the radar equipment was under the deck. I spent a large part of my flying time down in the airship bilges working on --and cursing-- that contrary radar. However, it was a most exciting adventure for a young guy like me then!

Me at the APS-20 radar operator position

Lt. Lundi Moore, our Command Pilot, looks at the navigator position radar scope to get an idea of where we are, as Chief Petty Officer Sylvester makes an adjustment on the scope for him.

Navigation was not easy when flying in blimps back then. The wind could blow us any direction, including backward. The electronic navigation equipment was not very evolved, so old manual methods were still often used. When flying over land, it was not unusual to follow the highways to get where we were going.

Chapter 6
Airship Refueling At Sea

Our blimp burned a lot of gasoline, especially when operating in exercises. We experimented with different tactics for getting fuel from the ships up to our blimp. One of the things we tried was getting fuel pumped up from an aircraft carrier deck to our flying blimp. They had a hose laid out on the deck and all we had to do was lower our winch, hoist the hose up, put it in the tank and say "fill'er up". Right? Wrong!

We approach the carrier to pick up the gasoline hose for refueling. We flew above the deck and lowered our winch cable to hoist up the hose. We never touched the deck. Didn't work easily and safely.

We also tried refueling our blimp from a tanker ship. To me that seemed a little harder because we had to stay off to the side of the tanker and out of the masts.

Two of our squadron airships take a look at the tanker that is there to refuel us.

We approach the tanker cautiously.

It took a lot of team work between the pilot, copilot, and flight engineer (our mechanic) to get positioned properly over the tanker. Problem was that the slower we flew, the less control the pilot had with the controls. Also there were always different variables, such as the wind and our actual weight. We could be actually lighter than air and in that case would rise as we slowed. If we were heavier than air, we would drop in altitude as we slowed. Never really knew what was going to happen until we tried.

About 70 feet to the rear of the pilot's compartment was where our rigger was operating the winch. It was so noisy right behind the engines that the intercom system and earphones were almost useless to hear and talk over. Communications between the carrier deck crew, our pilot's compartment crew, and our winch operator were a major challenge. Also the heavy hose had a nasty habit of pulling our slow flying blimp right over and down toward the masts. The heavy hose also pulled the winch cable sideways and tended to jam the winch.

Although we refueled at sea, we really did not need the gasoline. These exercises were for practice. We carried more gasoline than we needed, and besides airships are very efficient to operate. Unlike all other aircraft, airships do not use fuel to stay up in the air. The helium keeps the airship up and fuel is needed only to move the airship forward. Heavy aircraft expend a lot of fuel overcoming the physical laws that make things yield to gravity and fall to Earth.

The tanker pumps up gasoline to us through the hose.

One of our two riggers on the crew, Paul Price, is in the rear part of the car where he operates the winch for bringing up the gasoline hose.

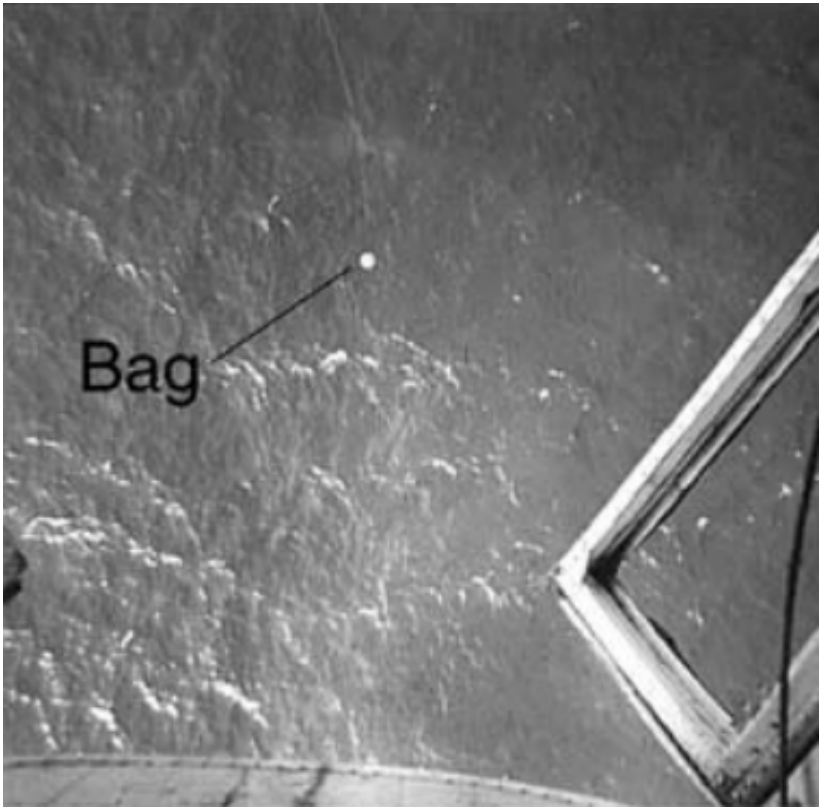
Chapter 7
Picking Up Ballast Water at Sea

When we took off on a mission we had fiberglass tanks in the rear of the car filled with thousands of pounds of aviation gasoline for engine fuel. As we burned the fuel the airship got lighter. We had other tanks to use as ballast tanks to hold sea water that we picked up as needed to maintain our desired weight.

Also at times the sun heated and expanded the helium and made the airship even lighter. This made our blimp uncomfortable to fly in, as it went up and down like a boat in heavy seas.. The airship flew best when it was about 1,000 pounds heavier than air. We just had to keep moving to stay up!

When we became so light that maneuvering became a problem, we had to pick up sea water for ballast to make us heavier. We did this by lowering a weighted bag down on the winch cable. Of course we had to come to a stop in midair so we did not drag the bag through the water. At the stern of the blimp car were two downward opening doors where the winch cable passed.

The picture below shows looking straight down through the aft hatch at rear of the blimp car where the winch cable ran. The ballast water bag is seen just above the water. I always thought how neat it would be to get in the bag and go down for a cool dunk in the ocean.



Looking straight down at the ballast bag with sea water.

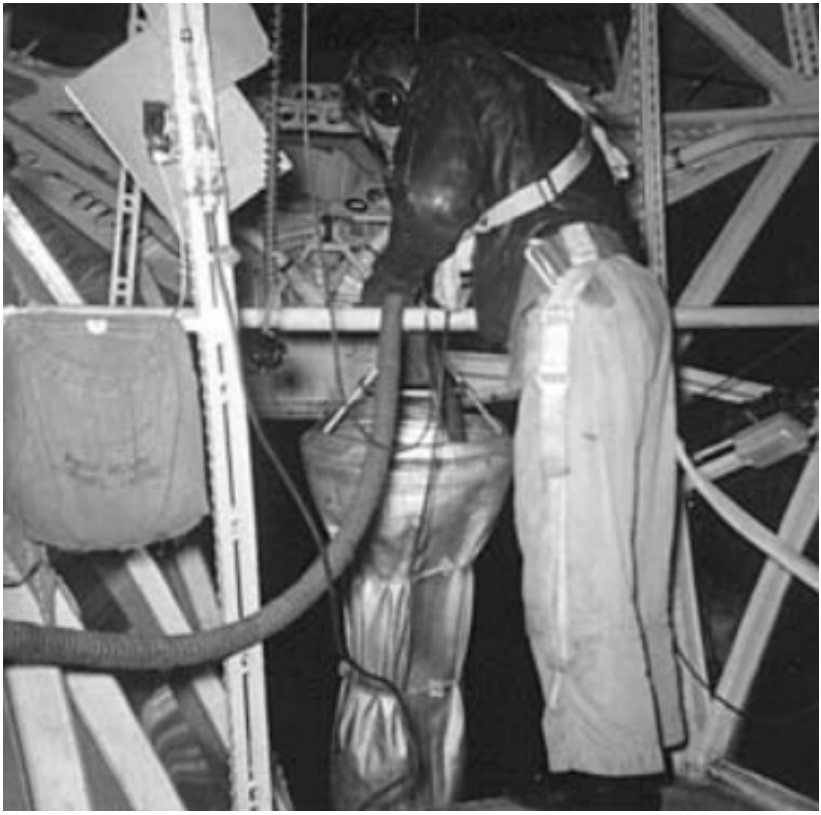
Ballast bag with sea water is winched up.

We usually picked up several of these bags of water each time we needed more ballast to stabilize our blimp. Each bag held approximately 500 pounds of water.

The main problem was that the pilot had to bring the airship to a complete stop so that the bag did not grab in the water, causing a sudden jerk to break something. The pilot had no reference points to judge movement except the sea surface. If there were any waves and wind, it was impossible to know when the airship was stopped. To further complicate the problem, the pilot could not see the bag and had to rely on the rigger operating the winch to talk him through the task.

One time we were so light that, when we stopped to lower the water bag, the airship rose vertically faster than the winch went down. I don't remember how that problem was resolved. Probably we opened up a helium valve and released some helium. Just as a side note, we seldom released helium. But when helium was released, air had to be pumped into inner chambers, called ballonets. The ballonets were inside the main gas envelope to keep the pressure up and maintain proper airship shape.

Here the full bag of sea water was hoisted inside the airship car by petty officer Paul Price, our rigger. This was done at first dawn light after a night of flying and using a lot of gasoline.



The sea water was pumped into a fiberglass storage tank with an electric pump and hose.

Chapter 8
Blimp Mishaps and Tales of Woe

This chapter is about experiences that were especially memorable. Some were funny, now that I look back at them, and some still send a chill through my body when I think about them.

Through the wonders of the Internet, one of the crew members who shared many hours of flight time with me contacted me through my web site. He is Paul Price, who flew as a 2nd class petty officer and rigger on our crew. Paul has supplied some of the details to the gasoline incident in this chapter and he is in several other pictures in other chapters.

I have also included a story from my airship squadron buddy Bob Kelly, who recently contacted me by e-mail and provided the details for his story in his own words.

Bombs Away!

One time we were on an operation with a task force and had been using the AQS-8 Magnetic Anomaly Detector (MAD) gear to hunt a submarine. We had the MAD set to automatically drop a dye marker cartridge on the water when a MAD signal was detected. A dye marker is a cartridge with about a quart of bright yellow powdered dye in it. When it is dropped on the water it bursts open and colors the water a very bright yellow.

After the exercise was over we were taking a break until the next exercise began. We were just flying around the ships killing time and we flew over the carrier to take a look down at her, and see the crew looking up at us.

Unfortunately, the MAD gear was still turned on. When the MAD equipment picked up the carrier's magnetic signal it automatically released a yellow powdered dye marker. The marker made a direct hit right on the flight deck and made a big bright yellow spot of water soluble powder! The flight deck crew got the hoses out immediately and started washing the dye off. As we flew away quickly we could see the yellow spot getting bigger and bigger.

One of our officers apologized and explained what happened was an accident. We received a radio message back from the carrier saying that they were getting ready for gunnery practice and we better not be around!

After accidentally "bombing" the carrier with a dye marker we left the area hastily. We were able to out run the carrier.

Yellow Teeth and Eyes!

On a training mission in a K-ship out over the Atlantic Ocean we were practicing using dye markers for reference points in the water. When the wind is blowing the waves make it extremely difficult to tell which way our blimp is drifting when we try to come to a stop to pick up sea water for ballast. The practice was to drop a yellow dye marker in the water as a reference point.

While the rigger was reloading the dye cartridges into the drop chutes, one cartridge broke open. The yellow powdered dye immediately filled the car because we had the windows open and it was very breezy. Everything was covered with bright yellow dust in seconds. Even our eyes and teeth were yellow! Here is a picture of our rigger cleaning up the yellow powder after the mission.

Our Nan-Ship Brought Us Home Again

We were flying out of the Naval Air Station at Weeksville, North Carolina, on temporary duty from Lakehurst, New Jersey, for about a week in December, 1952. We were operating with a task force of surface ships out of Norfolk, Virginia on operations off the coast. It was a very good week and we were really doing outstanding in our hunter/killer operations with the fleet.

There were no equipment problems on the airship except somehow we tore a 4 to 6 inch rip at a seam in the main airship bag. It was right over the starboard propeller so probably the prop threw a rock up on takeoff or landing.

The hole was too high to reach with any of the equipment at Weeksville so our riggers and the pilots did some calculations to estimate how serious it was. They figured we could stay the remaining two days of the exercises before going back to Lakehurst for repairs. Besides, there were a lot of politics involved and we dared not leave! This was a very important mission because we were proving to the surface fleet how great of an antisubmarine weapon our nan-ship was. So we continued to fly with the hole constantly seeping helium out of the huge helium chamber.

We awoke to a surprise on the morning we were leaving Weeksville to return to Lakehurst: A weather cold front had moved into the area overnight. This caused the helium to contract more than expected.

The ballonets were now filled with air to near capacity trying to keep the overall pressure up to maintain the airship's proper shape. However, we had lost too much helium through the rip and could only hold the pressure near the minimum value. At least the good news was that the lower pressure also reduced the helium loss rate.

Worse weather was closing in fast so we had to leave immediately. We were going to try to make it home with minimum pressure and maximum engine power to the two 18 foot tri-bladed propellers and fly it as a heavier-than-air airship!

We started our takeoff roll at the absolute far edge of the mat, and with nose up high and into the wind, the pilot and mechanic gave it “maximum everything available”, including a lot of unprintable navy words.

The wheel struts were compressed and the tires were squashed as we slowly lumbered across the mat with not much happening in the way of "flying." We crossed the mat with engines roaring wide open but we didn’t lift off the ground. We continued right off the end of the asphalt mat and across some dirt. The solid ground dropped out from under us and we went out over the swamp.

The airship nose was high. The engines were roaring. The gear boxes were screaming. The giant props were ripping at the air trying to claw up a few more feet above the swamp.

After a few agonizing minutes the pilot and mechanic got the laws of physics worked out in our favor and we began climbing slowly.

Very happily we headed back to Lakehurst flying low and slow. We cruised along the coast with our airship nose high and engines working hard to keep us flying as a heavier-than-air giant airfoil.

When we landed at Lakehurst we were so heavy that we literally "dropped in" — and blew a tire. Our normally beautiful streamlined airship was now drooping at the bow and stern. It was a really sad sight. But it got us home safely again.

Pay Attention to Your Flying!

(Story contributed by Bob Kelly, AT-1, ZP-3)

An amusing, and momentarily frightening, story concerns one of our flights from Lakehurst to Key West, Florida. When we reached Miami Beach our copilot, who was flying the airship, wanted to make a "very low" pass directly over the beach. With our command pilot's approval, we proceeded with the plan.

We descended to approximately 100 feet above the beach and we were all jammed into the cockpit, trying to see all the pretty sunbathing girls on the beach below. Our copilot was in control of the blimp. He got excited, stood up and leaned out over the control yoke for a better view. His knee hit a "red" covered emergency switch and flipped this switch to the "up" position, which caused the left engine to shut down and, at the same time, fill the engine compartment with fire extinguishing gas. In a panic, he looked down at the red switch and thought it was in its normal position. Hurrying to correct the situation which had occurred, he reached to the right side of the control yoke and flipped the right hand "red" emergency switch into the "up" position, which immediately shut down the right engine and filled that engine compartment with fire extinguishing gas!

There was an eerie, deathly silence for what seemed like an eternity, although it was only seconds. Then, panic set in as we floated uncontrollably down toward the beach.

Our command pilot yanked the copilot out of his seat and frantically tried to restart one of the engines while the water ballast was being jettisoned in an effort to lessen our descent.

Fortunately, the ship was comparatively light because most of our fuel had been burned on the flight from Lakehurst. We dropped down to about 50 feet before one engine was restarted. You can imagine the verbal lambasting that went on after control was regained.

Ankle-Deep in Gasoline

November 18, 1954

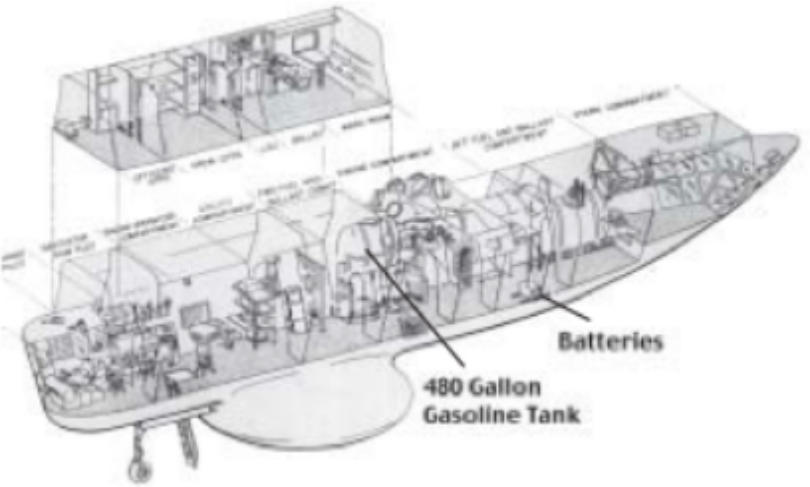
Our flight crew was busy loading everything needed for a routine 24 hour training flight in this cool Fall New Jersey morning. The winds were calm and the sky clear, but everyone had their flight jackets on and zipped up as the sun had not yet crept above the horizon to bring its warming rays.

We were scheduled for 0700 hours takeoff in our ZPG-2N airship 126716. A few extra pilots and riggers were waiting to board so they could get their required monthly flying hours. We had to load more food and supplies than usual for this crew of 23 rather than the usual 18. After the crewmen had finished their loading duties, they signaled everyone to come aboard and get to their assigned stations for takeoff.

As the ladder was pulled up, the tractor towed the mast and our loaded airship from the circle to the mat for takeoff. With efficiency developed over the years, our huge airship was positioned heading into the slight wind, the mast was released from the nose cup and speedily towed back to the hangar while the ground-handlers held the nose steady. The engine throttles opened up to full takeoff speed, and the two huge 18-foot propellers clawed for more air as we started rolling for takeoff. The three wheels rolled less distance than a football field length then lifted off the mat as our flying machine climbed into the morning sky.

After the engines had been throttled back for cruising, our mechanic Hobson came from the pilots' compartment back through the airship checking for fumes. I always waited for him to let me know that it was "all clear" before I turned on the ship's electric alternators for full electrical power to everything. We operated only on batteries during takeoff.

This time, instead of an "all clear", Hobson told me to wait until he tightened a pipe on the overhead auxiliary fuel tank just aft of the radar. There were a couple drops of gasoline under the tank pipe.



This tank contained 400 gallons of gasoline and was suspended inside the car about 2 meters aft of where I sat at the radar position. When Hobson put the wrench on the pipe, the metal flange that was supposed to be bonded to the fiberglass tank dropped off!

A solid stream of gasoline shot out the bottom of the tank on the deck at his feet. He yelled at me to turn off the battery power as he grabbed some rags and tried to plug the hole.

Hobson's efforts were useless to try to stop the gasoline from pouring out on the deck. It didn't take long until the 400 gallons of gasoline was ankle deep all the way into the pilots' compartment. Not that it made this situation any more dangerous for us, there were 1,100 more gallons of gasoline aboard in other tanks.

With no battery power or alternators, everything electrical in the airship was inoperative. That minimized the danger of explosion, but now we had no radios to call for the ground handlers to return for an immediate landing. No way to call emergency fire and crash crews. No way to tell the control tower we had a big problem!

Immediately, the crew started trying to get the gasoline out of the car. One crewman was sweeping it out a side door with a broom. Several officers were using coffee cups to pour gasoline out windows in the pilots' compartment. One crewman was trying his best to scoop gasoline up with a waterproof paper bag that we used in our toilets. In the stern, riggers manually cranked opened the doors where the winch was. The open windows in the pilots' compartment allowed some of the vapor to move the full 80 feet through the car and exit out the stern. That little fresh air coming in the windows probably saved many of us from getting asphyxiated.

Although all efforts were honest attempts, not much helped remove all the gasoline at our feet. Eventually, most of the 400 gallons ran down into the bilge below the floorboards. However, the fumes were still intense and more dangerous than the liquid gasoline under the deck. [Since then I've had very little sense of smell and taste.]

In the meantime, our crew commander and pilot, Lt. Moore, returned us to the base and flew around the control tower so close they recognized something was wrong. The tower operator notified the squadron Duty Officer that they had no radio contact with us, and it appeared we had smoke coming out from our car. Unfortunately after our takeoff, the duty section went to breakfast. It was clear that immediate help and landing were not forthcoming.

Additionally, we had another serious problem. The angle of pitch on the two 18-foot propellers was electrically operated. After takeoff, the prop pitch was set for normal full speed flight. With all power off now, the propellers remained in that position, biting out huge chunks of air and propelling us maximum forward with each revolution. Later this became a major problem in landing, along with our problem of possible explosion from gasoline fumes!

After an agonizing long time for us in the fumes filled car, most of the duty section had been rounded up and was out on the landing mat formed in the traditional "V" to land us.

As we made our normal landing approach, things were beginning to look a little more under control. At least the gasoline had stopped sloshing around in the compartments, and the crew was calmed down back at their stations. Everything seemed to be a lot better, as long as nothing made a spark! Ironically, we were attempting to land exactly where the German giant zeppelin Hindenburg exploded in spectacular hydrogen flames on May 6, 1937.

We made our landing approach toward the ground-handlers as usual. However, with the props set for maximum flying efficiency we were coming in much faster than normally. There was no way to decrease the prop pitch or put the props in reverse pitch to stop our airship! Lt. Moore knew that even when the two 800 horsepower engines were idling with the props set as they were, our speed would be 20 - 25 knots (23 - 28.8 mph). So he shutdown the starboard engine and hoped the ground-handlers would grab the bow and stern lines and somehow drag us to a stop.

We touched down and rolled toward the ground-handlers much faster than usually. As we bore down on the ground-handlers, a few fast runners ran for the dangling bow lines. However, we were rolling so fast they were jerked off their feet. A few ground-handlers were hanging on to the lines and dragging on the asphalt, but they were not slowing us down at all!

They quickly let go of the lines and everyone scattered as fast as they could to avoid being run down and chopped up in the huge propeller. The Duty Officer was not aware of the seriousness of our situation and gave us a wave-off to take off and fly around to try again for more favorable conditions.

How disappointing and maddening that was! Lt. Moore and everyone aboard was more than disappointed that the Duty Officer and ground-handlers hadn't tried harder and succeeded in stopping us. However, as we rolled through the ground-handlers we left a trail of gasoline fumes so strong that everyone recognized the seriousness of our problem: We were a gasoline ticking time bomb and maybe there would not be a second chance to land!

As we left the ground-handlers behind on this failed attempt to land, a new problem suddenly became evident. The port engine and prop set for flight speed had pulled us toward the corner of the mat where Hangar 1 and base buildings met. It became immediately clear to Lt. Moore that he was going to have to take off on one engine while maneuvering around Hangar 1, over the base main street and above base houses across the street!

Our airship was at least 800 pounds heavy, and there was no electrical power to start the starboard engine. These conditions were now the immediate serious problems facing Lt Moore! It was his job now to get all of us, and this wounded flying machine back up and flying.

Using the only thing he had to work with, he pushed the port engine throttle forward all the way to the over-speed stop bar, lifted it up over the stop bar, and shoved it all the way forward possible.

The port engine RPM meter needle rapidly climbed into the RPM over-speed red zone and on to the end of meter dial. The engine still kept increasing in speed and roared like never before! It now was racing way beyond its allowable maximum RPM limit! Those 800+ stampeding horses, all on one side of the car, were pulling us sideways fast past Hangar 1 toward the base main street and base housing!

We were gaining speed rapidly but not climbing enough to clear the houses. Lt Moore yelled back from the pilot's compartment to release the gasoline drop-tank from under the car. Ensign Garner was stationed in the aft fuel and ballast compartment and manually released #3 slip tank with several hundred gallons of gasoline in it. The heavy gas tank dropped from under the car and broke without igniting in front of Hangar 1.

With the airship considerably lighter, Lt. Moore pulled the pilot's yoke all the way back until a tail fin drug on the ground. We crossed low over the base main street and miraculously cleared the chaplain's house with the long bow lines dragging across the roof! Lt. Moore said, "That was a tad close!"

We had been flying over two and a half hours as we circled the landing mat hopefully for the last time. Lt. Moore told our rigger, AM-2 Price, to figure out how to valve helium manually from the 2-foot wide helium valves in the main helium chamber over the car. The valves were designed to be electrically operated. They were never designed to be operated manually.

So Price with his tools, and a couple riggers aboard to get their monthly flight time, climbed above the car among the cables supporting the car to reach the huge helium valves. The riggers also had the problem of how they were going to breathe and not be suffocated by the helium.

And there was still even another problem. Normally when helium is valved out, air must be pumped into the ballonets to keep the pressure up inside the airship envelope to maintain the overall aerodynamic shape. (ballonets: special air chambers inside the helium chamber) Without electrical power, we could not pump air into the ballonets. That meant we would be losing our total airship envelope pressure and the airship would get "limp". That meant there would be no takeoff this time no matter what happened. And we might loose our riggers due to oxygen deprivation.

As we started making our final approach, the riggers started manually valving helium out the huge valves. The trick was not to drop too fast and end up in the pine trees outside the base.

The guess work on how much helium to release was up to Lt. Moore. He shouted instructions periodically to the riggers when to open and close the valves as he flew our giant wounded airship toward the landing mat for the last time, we hoped. The lone engine was idling and laboring under the load of the huge 18 foot propeller in full flight pitch as we approached the mat slowly and dropping fast. We carved an erratic flight path in the sky as Lt. Moore struggled to fly our failing flying machine toward the waiting ground-handlers.

Now nearly all the squadron personnel including clerks and supply personnel were amassed on the landing mat. Along the landing mat were all types of red, yellow, and blue base emergency vehicles. It was unnaturally quiet with all radios off, the port engine idling, and everyone concentrating on Lt. Moore fighting the controls to keep our failing flying machine from dropping into the pines before reaching the mat.

We dropped down hard at the very edge of the mat and rolled toward the ground-handlers fast. I thought how strange it seemed that on the ground we appeared to be going much faster than in the air.

We were now on the ground and charging rapidly toward the ground-handlers hopefully for the last time.

The riggers were told to valve out all the helium possible so our added weight would help slow us down.

Somehow they managed to hold their breath and push their full weight on the huge valves to let helium escape as fast as possible.

As we rolled across the black rough asphalt mat, the wheel struts collapsing completely under the increasing weight of the airship's giant mass. The final trusted engine was shut down and allowed to rest after its magnificent performance.

We continued to roll across the mat toward the many squadron personnel waiting silently to see what was going to happen this time.

As we continued to roll across the mat, the wheels started shimmying like broken casters on a grocery cart as the fully compressed struts pushed the tires into the mat asphalt. The port tire blew from the many tons of airship mass settling down. The entire airship was vibrating noisily protesting the unnatural weight as we continued rolling across the mat, grinding up the port flat tire.

Approximately halfway across the mat our heavy, noisily vibrating airship finally gave up and stopped on its own in a slightly nose down attitude, like a theater bow at the end of a great performance. There was a deadly silence, and everyone breathed a big sigh of relief.

The danger wasn't over yet. We quickly lowered the ladder down the wheel well and hurriedly left the airship filled with explosive aviation gasoline fumes and over 1000 gallons of gasoline. I gratefully breathed in the fresh air. As I trotted away from our "gasoline bomb", I looked back at the wounded airship. I could see the tail and nose were drooping on our once magnificent flying machine, but it had brought us back home safely one more time.

To the best of my recollections here are the names and ranks of those enlisted crew members on this flight and shown above:

#1-AD1 Hobson, Aviation Machinist Mate (mechanic)
#2-AT1 Deitz, Electronics Technician
#3-AM2 Paul Price, Structural Mechanic (rigger)
#4-Structural Mechanic
#5-AM? Wilbur Lahann, Structural Mechanic (rigger)
#6-CPO Sylvester, Electronics Technician
#7-AT2. Dave Hatloy, Electronics Technician
#8-AT2 Larry Rodrigues, Electronics Technician
#9-AT2 Mervosh, Structural Mechanic (rigger)
#10-Aviation Machinist Mate (mechanic)

Chapter 9
The Beginning of the End of the "Killer" Blimps

The ZPG-2N, "Nan-ship" and our airship crews were very effective at locating and intercepting the diesel/electric submarines of that period. Unless we had an equipment failure, we nearly always intercepted the sub before it "sunk" a ship. The signal for sinking a ship was a flare and a big bubble of water within torpedo range of the ship.

A diesel/electric "GUPPY" submarine that trained with the task force and our airships.

I think the beginning of the end for Navy antisubmarine blimps came when the first nuclear powered submarine, the Nautilus SSN 571, came out on training exercises with us.

I began to worry about this new type submarine when we were briefed that the only thing we could expect to see on the radar was the periscope. That is a very small target 15 or so miles away. So I went to the supply room and spent a day testing vacuum tubes to pick out the best they had. I made that radar operate better than it had been designed to do. The sensitivity was twice as good as the design specifications and the magnetron was the most powerful I could find in the supply stock. Each pulse of radar energy was over 1 million watts of power. Every piece of electronic equipment aboard our airship was fine tuned.

We were going out confident of our crew and the Nan-ship. We knew what they could do. But we were concerned about how effective the electronics equipment would be against the new unknown type of "enemy" – the atomic powered Nautilus submarine.

We were scheduled for a flying time of 100 hours in the air. That meant we had to have plenty of everything we might need hundreds of miles out at sea. We loaded extra gasoline, oil, food, water, snacks, coffee, first aid stuff, toilet paper, blankets, tools, and electronic parts.

An 18-foot propeller roars away only a few yards behind these men as they load last-minute food supplies for a long mission.

My close buddies called me "Packrat" because I was always stocking up on things I might need on a mission hundreds of miles out at sea. Our success or failure in finding and intercepting the submarine could depend on a single electronic vacuum tube. I took plenty of spares.

This new type submarine we were going to be working with had everyone concerned. We stocked up on everything we might need. Shown below is a new type Auxiliary Power Unit (APU) being loaded on the external weapons rack. This APU was a new jet turbine type. It was much smaller and lighter than the older units. Unfortunately, it burned about 80 gallons of fuel an hour. We used it on the ground for A.C. and D.C. power to the ship equipment when the engines were not running.

Loading an Auxiliary Power Unit on to the weapons rack of our Nan-ship.

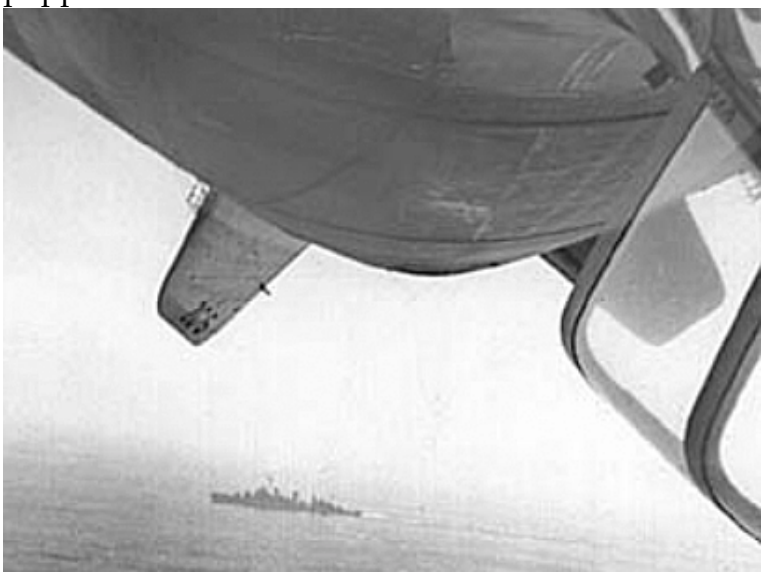
Our Nan-ship takes off much heavier than air and flies as a giant airfoil, nose up but not climbing very fast.

So on this important 100 hour mission our airship took off very, very heavy. Frequently we took off 2 or 3 tons heavier than air with no problems. But this time we were REALLY heavy. I had a lot of anxiety about how all that flimsy mechanical structure was going to hold together under the added weight and the takeoff stresses. The wheel struts were nearly collapsed from the added weight. The wheels were not only on long struts but also they were under long outriggers. The outriggers were additionally stressed by the huge 18-foot, three-blade propellers clawing at the air, trying to drag our massive load into the sky. Although no one said so, I think everyone feared an unexpected bump in the rollout would break off a strut or an outrigger.

On takeoff our pilot kept the tail nearly on the mat and the nose high, while our mechanic nursed every last bit

of horsepower out of the two roaring 800 horsepower engines. We rolled across the mat, slowly gaining speed, all the way to the mat edge and gently rose up over the trees at the edge of the base. Nothing blew up and nothing broke off. As long as we kept the nose high and the big props churning fast, we could stay up it appeared and I hoped.

It took a long time to make our way out to where the task force and Nautilus submarine were operating out in the Atlantic. In such exercises there was always a lot of pre-exercise activity and it seemed like we were never going to get started. I wanted to turn all my electronic gear loose on that new sub and get this over with fast, like we had done so many times before with the snorkel equipped subs.



I was very happy I was on a blimp crew rather than on a ship.

Finally, the zero-hour came for the main event. Everyone on our crew was eager and ready to go to work. We had trained for years to do this job. On the radar I could clearly see the war ships steaming along and the Nautilus many miles off on the surface ready to submerge and make its deadly attack. I hoped this exercise would be much like all the others in the past. I expected that the only difference would be that I would have to find and track the smaller periscope, rather than the much larger snorkel. I was anxious to try my super-hot radar on this new type sub.

This exercise started out pretty much like all the others but suddenly something was different. The Nautilus dove and went in some unknown direction deep and fast without ANYTHING showing above the water! No periscope! No snorkel! Not a sign of anything was evident once it dove below the surface. Uh oh, we were in big trouble! Everyone was leaning over a radar scope searching for some sign of a periscope – or ANYTHING!

As every minute ticked by we had less and less of an idea where that "deadly enemy" might be in that big ocean. We were just taking up airspace now, incapable of doing anything except watch the surface ships churn up the water at high speed. The last line of defense for the carrier was the several destroyers. They were maneuvering around the carrier at high speed like they were in panic. I know I was!

Then the bad news came, much sooner than we expected. There was a bubble of air and a flare signal near the carrier. That was the Nautilus' signal that the carrier had been successfully attacked and sunk (simulated, of course). Then more successful attack signals came, indicating the same fate for other ships in the task force. Over and over. Faster than seemingly possible, the signals were coming for another and then another successful strike on the ships. First here, then there. Again and again, the successful attack signals kept on coming. And there was no sign of where the "enemy"was or where he would strike next.

One of the war ships below us was cruising at high speed searching in vain for the Nautilus headed in for an attack on the carrier.

And we saw nothing on our radar except a big ocean and our helpless ships below. Our sonobuoys were still in their racks and the MAD gear was still on standby. That day made history that changed sea warfare forever. It was the beginning of the end of U.S. Navy antisubmarine warfare with airships.

We "developed engine trouble" at some point after we realized that the game was over for us. We headed back to Lakehurst tired and disappointed. The only thing I can say proudly about that mission is that our crew beat our previous flying time record of 42 hours of nonstop flying. On this mission we logged a flying time of 50.0 hours. However, that was only half of our scheduled 100 hours that we had planned to fly.

The first nuclear powered submarine: Nautilus, SSN 571.

Chapter 10
The Final Years for Navy Blimps

As an enlisted member of the crew I never got in on the "high level" planning or discussions. However, here is what I observed after our poor showing with the Nautilus nuclear powered submarine.

After a few months some new electronics equipment arrived in our electronics shop. Seems the navy put out a call for a new weapon to find the new nuclear type of submarine and one of our U.S. electronics firms made such a device. It was very highly classified. The combat crew my buddy Bob Kelly was on started receiving intense training on the new equipment.

The new weapon was a 450 pound torpedo shaped thing that was to be towed in the water behind the blimp. In it was a sonar transmitter and receiver. Up in the blimp were monitors to see what the sonar picked up. Bob's crew started training on lowering, towing, and raising the device, which they called the "fish". Bob said it was really scary and hard to control. He said it had a mind of its own on where it wanted to go and it nearly ripped the winch out of their airship whenever they tried to turn sharply. There were lots of problems in lowering, raising, and turning with it that the crew had to resolve. Here is one of Bob's stories in his own words sent to me by e-mail in February, 2000:

“On one of our training missions in Key West, we were working with a submarine for some of our testing. The submarine was operating at periscope depth and our job was to track him using our sonar fish that we were towing. As we made our tracking passes at the submarine, normal procedure was to fly the sonar fish out of the water by increasing our altitude when we came close to the submarine.

On one of our passes, we got too close and couldn't gain altitude quickly enough. We ran the winch up at full speed but did not get the sonar out of the water in time to avoid the submarine and we clipped the periscope. Needless to say, they wouldn't operate with us anymore. Our command pilot was in a lot of trouble over that.”

A few months later we were elated to receive orders directing Bob’s crew and airship to Bermuda for exercises with a task force and the Nautilus. A bunch of us in the electronics shop were included as ground support for maintenance of all the other electronics equipment. Dave Hatloy and I were thrilled with the news that we were going with our barracks room mate Bob. We packed everything we thought we needed for both the “war” and a vacation!

We, in the support crew, flew to Bermuda in an airplane and got everything ready to receive the blimp at the Kindley U.S. Air Force base there. By the time Bob’s crew arrived, Dave Hatloy and I had all the beaches identified

and where to get the motor bikes that everyone rode on the island. There were civilian technical representatives present from the manufacturer of the new weapon so Bob didn't have anything to do except fly the missions. Dave and I didn't have much to do either. The civilians did all the maintenance and testing before and after the missions. There were so many problems with the equipment that Bob didn't have to fly often, so we three buddies had a great time on the motor bikes and beaches in Bermuda for 18 days!

The overall result of the exercises seemed to be that it was not practical to use this towed sonar behind a blimp to try to locate a fast submarine. Here are Bob's own words on the subject:

"On the Nautilus shakedown exercise near Bermuda we were able to track the Nautilus longer than anyone else. We would track them for a while with our sonar fish, but when they realized we were tracking them, you could hear their engine props speed up to a high pitched whine and they would start pulling away from us. We would also speed up but when we reached a higher speed, the water turbulence around the sonar nose transducer would be so great we couldn't hear anything and the Nautilus would disappear. By the way, the Nautilus simulated sinking the entire exercise fleet that day."

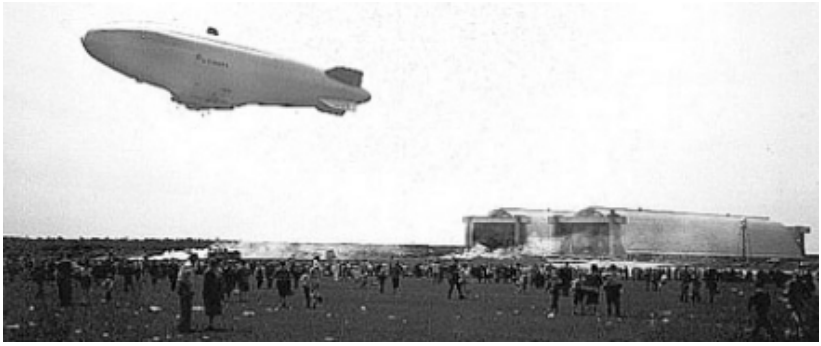
However, it appears that the technology developed for the ineffective "sonar fish" did later evolve to the "dipped sonar" that is used today by helicopters.

The Bermuda exercises were in July, 1955. It appeared that the future for the navy blimp as an antisubmarine weapon was over from that point on. However, the blimp had great potential for providing long endurance flights with a stable platform for early warning airborne radar and command centers. An attempt was made at proving the value of the airship as an airborne early warning platform with the construction of the ZPG-2W. The ZPG-2 was modified to accommodate Airborne Early Warning (AEW) electronics. A large radar dome was located on the top of the envelope for a height finding radar. Another radar antenna was already installed in a dome below the control car for the long range search radar. Five ZPG-2W airships were constructed by Goodyear.

A little later an even larger airship was built. It was the ZPG-3W , a 1,465,000 cubic foot airship, with a primary mission to conduct all-weather AEW patrols of long endurance. It was the largest non-rigid airship ever built. It was 403 feet long and had a crew of 21. The airship had a huge search radar antenna suspended internally from the top of the envelope. The antenna rotated inside the helium chamber. There was also a height finding radar antenna mounted on top of the envelope. One of the ZPG-3W airships deflated and crashed in an accident at sea in July, 1960. Eighteen of the 21 crew members were killed. The last of the four ZPG-3W's built was flown in 1961.

The final flight of a U.S. Navy airship took place at NAS Lakehurst on 31 August 1962. In March, 1977, Lakehurst Naval Air Station was disestablished. This facility is now known as the Naval Air Engineering Station (NAES), Lakehurst, New Jersey.

The ZPG-2W is shown here in 1959. The 2W was designed for Airborne Early Warning duty. On top of the bag is the height-finder radar in a fiberglass radome about 7 feet high. Everything was supported only by the low pressure of the helium spread over the large area of the bag. The pressure was just high enough to force water up 1.5 inches (3.75 cm) in a tube, yet it supported the radome, the radar antenna, and the radar equipment.



Appendix A
Resources

Naval Airship Association, Inc.
http://www.naval-airships.org/

The purposes of the organization are:

1. To gather, perpetuate and disseminate the lighter-than-air expertise and knowledge that has been accumulated during the U.S. Navy's long involvement with the development and employment of lighter-than-air principles in military aviation.

2. To support and assist the Naval Aviation Museum Foundation, Inc. (NAMF) and the National Museum of Naval Aviation (NMNA) in their joint purpose of informing and educating the public on the important role of U.S. Naval Aviation, with specific reference to the lighter-than-air segment.

3. To support and assist U.S. Government agencies in current and future lighter-than-air development and applications.

Navy Lakehurst Historical Society
http://www.nlhs.com/

Navy Lakehurst Historical Society is a non-profit organization dedicated to preserving the distinguished history of Naval Air Station Lakehurst. Established in 1975, with a total of three members, NLHS has grown to over 250 members worldwide.

Here's what you will receive for your yearly membership:

1. Six issues of our bi-monthly newsletter, "The Airship"

2. Bi-monthly meetings located inside historic Hangar One

3. Annual picnic at the Naval Air Engineering Station, Lakehurst, NJ

To join, check the web site:
http://www.naval-airships.org/

I was assigned to Airship Squadron 3 (ZP-3) at Lakehurst, New Jersey from February 1954 to November 1956. The contents of this book are based on my experience during that period. Unfortunately I had no serious interest in photography and verylittle skill in taking pictures. I remember that I bought a small black and white camera for approximately $6 that could be carried easily in my flight jacket. Nearly all of the pictures suffer in quality from my economy. However, I am apparently the only one who bothered to photographically document this period of airship history with the mightyNan-ships. Perhaps these less than perfect photos will re-deem themselves with their rarity and interest.

Over the years I have received many e-mail messages thanking me for posting mypictures and stories. That encouraged me to make this book available and include even more pictures and stories. I hope you enjoy them, too.

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