

Air and Space this Week

Item of the Week

A BAD DAY AT SUNNYVALE GOLF COURSE

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Convair 990 Galileo Flying Lab

I worked at the NASA Ames Research Center north of San Jose back in the early 1980s. I had a few golfing friends, and we played a number of courses in the area, including one just off US-101 in Sunnyvale. When we got to the twelfth tee, they told me of its history. I never forgot it, and now I'm going to share it with you, since the 50th anniversary of the event in question is on Wednesday, April 12.

NOTE: An airship is any lighter-than-air craft. A zeppelin is an airship comprising gas bags in a rigid airframe. A blimp is an airship without any rigid frame; it's more like a balloon.

ADMIRAL WILLIAM A. MOFFETT

Admiral Moffett had an interesting career, starting with service aboard the *USS Charleston* (C-2) during the capture of Guam and the Battle of Manila in the late 1890s. He captained the Navy's first "scout cruiser," the *USS Chester* (CL-1), during the Tampico Affair, a small dispute that quickly escalated to the point that American forces invaded the port city of Veracruz in 1913. Admiral Moffett won the Medal of Honor for his actions on April 22, 1913, in landing troops and providing covering fire. [This *USS Chester* is not to be confused with the larger and more capable *USS Chester* (CL/CA-27), on which future Admiral and MoH awardee [Richard H. O'Kane](#) served as a junior officer in the early 1930s.]

Admiral Moffett then went to the Great Lakes Naval Training Station and established its first flight training program, opening schools for aviation support personnel that would prove invaluable in WWII. He then served as Director of Aviation under the Chief of Naval Operations, and played an important role in the establishment of the Bureau of Aeronautics. He pioneered the techniques of working closely with aircraft manufacturers for development of aviation-related naval technology. For all of his work, he was broadly known in the service as the "Father of Naval Aviation," even though he himself was not a pilot. He feuded constantly with General Billy Mitchell, who was a passionate advocate for a completely separate air force. He was enamored with the idea of lighter-than-air aviation as an important military capability.

Admiral Moffett was a "hands-on" observer of airship technology, particularly the use of zeppelins like the *Akron* and *Macon* as an aerial aircraft carrier. He also liked to observe the

airship crews in action, and to host guests on airship flights who were proponents of lighter-than-air aviation.

One such trip departed the airship base at NAS Lakehurst on April 3, 1933. Admiral Moffett was aboard, along with his aide, the CO of NAS Lakehurst, and Army Reserve Colonel Henry Cecil, the CEO of Mack Trucks. Airships and storms don't mix well, and when the *Akron* flew into a violent storm later that evening, it was slammed into the sea. Only three aircrewman survived, among the 76 embarked. Many of them had survived the crash, but they had no time to deploy life rafts or don life preservers, so they succumbed to hypothermia and drowned. A smaller airship that was part of the search-and-rescue operation also crashed, killing both aboard.

The *Akron* had suffered several accidents prior to its loss, and with the earlier [loss](#) of the *Shenandoah* in 1925, the crash of the [Macon](#) in 1935, and the death of airship's leading advocate, the zeppelin's days were done in the U.S. military.

Admiral Moffett was buried at Arlington. In addition to the Naval Air Station in Sunnyvale, a destroyer (DD-362) a mountain in Alaska were named for him, and John Phillips Sousa dedicated a march, "The Aviators," to him.

CODA: Admiral Moffett apparently came up in the 1930s with the idea of an angled flight deck independently from the thought processes that led to its eventual development in the 1950s. John Kuehn from the Dole Institute of Politics talked about that (about the 40-minute mark in his lecture, [here](#)). For more on the angled flight deck, see [here](#).

THE SETTING

The area of the orchards, vegetable farms, and hayfields of the Ynigo Ranch of the Rancho Posolmi Mexican Land Grant, in what is now Silicon Valley (*nee* Santa Clara Valley) were chosen as a site for a naval base that would support Pacific coast patrolling by giant zeppelins, such as the *USS Macon*. Commissioned on April 12, 1933, the new airfield/hangar complex was named after William Moffett, who had just died in the 1933 crash related above.

After the airship concept was abandoned in 1935, the Moffett Naval Air Station was repurposed, first as a Naval Air Station, with five squadrons based there, on a trial basis. NAS Moffett Field proved expensive for the Navy to operate. Meanwhile, the Navy and the Army were fighting over San Diego's North Island; both services had an aviation facility there. The Navy needed to expand their carrier pilot training. The Army resisted; they had been on North Island since 1912. Seems to me like the makings of a trade. Seemed that way to some brass, too, aided by FDR. The Navy gave the Army Moffett Field and received the rest of North Island in return. Moffett Field became the Army's Western Training Command's west coast base, home of the 82nd Army Observation Squadron.

In 1939, the Ames Aeronautical Laboratory was established at Moffett Field.

After Pearl Harbor, the War Department decided that Moffett Field, with its large airship hangar, was more important to the War Effort as a Navy base for Pacific reconnaissance patrols, some by airship (smaller than zeppelins, these reconnaissance aircraft were blimps). The Army

decamped to Fort Hamilton, north of San Francisco. The Navy acquired some surplus Army blimps and commissioned the ZP-32 reconnaissance squadron based at Moffett. Two smaller (but still large) hangars were built to accommodate the blimps. The lighter-than-air reconnaissance effort at Moffett would last until 1947, with as many as 20 on active patrol duty at a time, patrolling for shipping, subs, and mines. The blimps were phased out in favor of conventional patrol airplanes. Meanwhile, the scientists and engineers at Ames were working on fixed-wing reconnaissance aircraft, developing the Lockheed P2V Neptune and Lockheed P-3 Orion reconnaissance aircraft that would supplant the blimps.

Moffett's mission morphed into naval aviation transport in the late 1950s, then to training jet fighter pilots. The rapidly-growing population around Moffett Field, and the frequent crashes involving the early jets, made Moffett a poor training base, and that function was transferred to NAS Miramar in the early 1960s. In its place, NAS Moffett Field took on the Air Force Satellite Test Center, and in 1963, Moffett became the West Coast home of the Navy's long-range reconnaissance and anti-submarine patrol effort, flying magnetometer-equipment on the Lockheed P-3 Orion four-engine aircraft. Moffett Field was the HQ of the CO of Patrol Wings, U.S. Pacific Fleet by 1970.

Ames Aeronautical Research Station had always been co-located with Moffett Field NAS, sharing a perimeter but not an internal dividing line. Ames became a NASA center not long after NASA was created, which led to an interesting situation. Naval stations have Marine guards; NASA stations have a civilian security force. Except Ames. When I was there in the early 1980's, we passed a sternly-defended entry point, with heavily-armed, no-nonsense guards. Inside, we could go to the Navy side (relatively) freely, and vice versa (NASA's cafeteria at Ames in those days was a great place for lunch – I took my wife for lunch there on our Honeymoon!) Ames was at the forefront of aeronautical development, home to a dozen or so advanced wind tunnels. It was too crowded for high-speed flight test; NASA had Dryden for that (now named the Armstrong Flight Test Center). [Ames' annual air show was something to see back then. It was too populated an area for the Thunderbirds or the Blue Angels to perform, but the Army's Golden Knights, NASA's experimental planes like the [Oblique-Wing](#) and [Quiet Short Haul Aircraft](#), and stunt pilots like Bob Hoover could do amazing things!] Ames was also the base of NASA's flying observatory, the *Galileo*, precursor to the *Kuiper Airborne Observatory* and *SOFIA*, and NASA's ER-2 high-altitude research effort (the ER-2 was the civilian version of the smaller, but similar, U-2).

By 1973, Moffett Field supported the West Coast P-3 patrol effort (we'd see Orions coming and going all the time), and it supported *Galileo* and other NASA flights. It had grown to the point where its two long, parallel runways 32L and 32R, were pretty busy. We quickly got used to the P-3s, but traffic on US 101 slowed significantly when the ER-2 came in low and slow.

A BAD DAY ON THE GOLF COURSE

The morning of Thursday, April 12, 1973, dawned another typically-beautiful San Jose spring day. A P-3C Orion reconnaissance aircraft assigned to Patrol Squadron 47 took off first thing that morning, on a combination patrol/training flight, looping south off Bug Sur. They were

then conducting planned touch-and-go practice after their six-hour flight. They were cleared to approach runway 32L to do so. Meanwhile, the NASA Convair 990, the *Galileo Flying Lab*, had gone out over Monterey Bay to test new remote sensing equipment designed to survey migrating whales. *Galileo* was a workhorse, it had been used to observe total solar eclipses, comets, and even survey the Bering Sea in collaboration with the USSR. It, too, was approaching Moffett Field, and was cleared to land on runway 32R. Both planes lowered their landing gear successfully, but when the *Galileo* next called the tower, the controller gave them the usual info on wind conditions and then said they were cleared to land on runway 32L, a change that the crew of the P-3 acknowledged without comment.

You see what is coming better than either pilot or the controller did. The *Galileo* was overtaking the P-3 from above and could not see it. The *Galileo* was enough behind the P-3 that the P-3 crew did not see it. The *Galileo's* nose gear hit the tail fin of the P-3. The wrecks, entangled, fell on the 12th tee of the golf course below, only 200 yards from US-101. There were a number of golfers in the immediate vicinity of the piles of flaming debris, but amazingly, nobody on the ground was hurt.

The sky was clear and the weather was good, but the relative position of the aircraft precluded either pilot of seeing the other, a situation eerily similar to the [recent crash](#) of an air show B-17 which was overtaken and hit by a P-63 Kingcobra.

All 11 people aboard the NASA plane were killed in the collision or the following crash/fire. Seven of them were NASA personnel. Five of the six aboard the P-3 were killed, too. One survivor, observer Bruce Mallibert, was so severely injured that first responders thought he was dead. He was lucky to be alive, doubly-so, for a first responding firetruck had driven over his parachute-shrouded body before anyone realized Mallibert was alive; fortunately, the fire truck straddled him and had just enough ground clearance.

The crash made quite an impression locally, and not just with the golfers I knew or those who came rushing from the course and the highway to help the first responders with looking for survivors. Some of the golfers had tried courageously to break the *Galileo's* cockpit glass in a vain attempt to rescue the flight crew, but their clubs weren't up to the task no matter how hard they were swung at it, nor were the fire axes of the arriving firemen. The NAS fire trucks didn't mess around either, they came down 101 and blasted right through the fence separating the course from the highway right-of-way.

THE AFTERMATH

A number of local politicians began pressuring the Navy to close flight operations at Moffett Field, citing the danger to the surrounding built-up population. The P-3 program had an excellent safety record, with only the one crash, and that was due to an air traffic control error, not the pilots or the aircraft involved.

Naval patrol and other flight operations continued in spite of the concerns. I saw many such flights in the early 1980s. But the handwriting was on the wall, and NAS Moffett Field was designated for closure under the DoD Base Realignment and Closure (BRAC) Program in 1992.

Moffett Field was turned over to NASA Ames on July 1, 1994. Much of the West Coast patrolling is now based out of NAS Whidbey Island, Washington or Marine Corps Air Facility at Kaneohe Bay, Hawai'i

Ames is now NASA's center for supercomputing, wind tunnel testing, planetary exploration, and *air traffic management*.

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The Convair 990 *Galileo*

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