# Fist of the Fleet Association

a non profit 501 (c) (19) military organization

# NEWSLETTER

October 2015

Preserving the Past Providing for Today
Promoting the Future

## AUTUMN EDITION

By: Jerry "Ricochet" Fritze

Back in ‘84 in another of my post-Navy adventures I worked in a body shop: One Way Auto Body in South Gate, CA. Our motto was “You bend ‘em, we mend ‘em.” Four of us worked Monday through Friday and Friday evening we would load up our ‘70 Chevy Impala street-stock car and head out to Jim Irwin’s race shop in San Fernando. Jim sponsored our car and also ran super-stock and modified cars. Saturday morning we would hit Saugus Speedway in Valencia at 9 am for hot laps, and the long day began ending at 11 pm when the track closed. In today’s race world that small team would barely register as a going concern, but back then we were pretty big for the local tracks. All of us knew at least one other team members job, so if I wasn’t pounding sheet metal I was tearing down small blocks or standing by in the pits to change tires. On the short track circuit there wasn’t much need for that unless a tire blew out. We raced for things like free gas, free tires and minor sponsorships to help pay for our shop bills and spare parts. Eventually two of my partners split from Irwin to form G&G Racing to run two cars, but without Jim’s help they never even made it to the track for practice. The team fell apart before the start of the ‘85 season and by then I had moved on to other work.

The value of disciplined teamwork is apparent in almost any endeavor. Even a solitary surfer has someone watching his back. Organized sports, corporate America, even marriage; teamwork is the key to success. And no where is teamwork more necessary than in the endeavors of the US military. There is no room for the rogue pilot or the Lone Wolf. In Naval Aviation the links between the maintenance divisions, the aircraft and pilots who fly are unbreakable as are the tactical rules that govern flight integrity when going into combat. To break those links or violate those rules almost always results in damage, injury and even death.

Back in the day we pulled MAF forms and worked out gripes generally swearing along the way, especially if it was a fuel quantity issue. I’m sure the days of sitting on a wing and pounding on a fuel probe with a rubber mallet are long gone but as we were so fond of saying all we ever needed was a hammer or a rubber: “ If you can’t fix it, ….” well, you know the rest. And just as often someone was bound to look at a pilot prior to launch and say “ I just fixed this damn thing so don’t break it.”

TEAMWORK! Sailors of VFA-25 re-install the repaired horizontal stabilator in FIST 400 following a crunch on the flight deck.

I have carried that sense of disciplined teamwork with me wherever I have gone, be it the race track, the baseball and softball diamonds or working in various corporations along the way. I have never done it for recognition or reward, or for pay or perks. I’ve done it because back in the Navy I was *trained* to do it. It takes a team to win, but losing can almost always be traced back to the actions of one person. On opening night of the ‘84 race season at Saugus, our driver, who’s name I forget but who’s nickname was “Pollack”, spun out in the first couple of laps and was t-boned. We never made it back on to the track that night. See you in Dallas.

**Mission Statement**

**Perpetuate the history of Naval Aviation Squadrons VT-17, VA-6B, VA-65, VA-25 and VFA-25,**
**Remember deceased veterans and comfort their survivors,**
**Conduct charitable and educational programs,**
**Foster and participate in activities of patriotic nature,**
**Assist current active squadron members, and**
**Provide assistance to family members in times of emergency.**

## PRESIDENT'S MESSAGE

I am pleased to report to the membership that the IRS has ruled favorably on our application requesting reinstatement of our tax-exempt status under section 501 (c) (19) of the Internal Revenue Code. The effective date of the exemption goes back to May 15, 2010 when our tax-exempt status was revoked unbeknownst to us at the time. In turn this means that our tax-exempt status has been in place since our original application in May 2004 continuously and now into the future. Since at least 90 percent of our dues paying members have served during the wartime periods noted by the IRS, members are allowed to deduct any donations to the Association on their individual federal income tax returns.

I appreciate your patience as we worked through this long process of compiling the necessary information back to 2006, which was eventually submitted with our application. A special thank you goes to Chuck Webster, FOFA Treasurer, for the many phone calls and emails between us as we sifted through the Association financial records and then composed tax returns from 2006 through 2014 and the support letters and forms required for the application. I assure the membership that moving forward we will file the required forms and reports in order to retain our tax-exempt status.

I had previously asked the membership to hold off on future donations until we had a determination from IRS. Now that we know you can deduct any donations to FOFA, I am soliciting future donations from you to keep our organization and it's charitable programs in strong order. Specifically we need support for the Ltjg Harry D. Jones Memorial Award for Excellence, which was recently awarded to LT Mark A. "Seacrest" Lovrencevic. Our Educational Grant account balance is more than ample for the foreseeable future, but certainly feel free to donate there also. If you donate to the General Fund it helps offset the printing, mailing, general supplies and any miscellaneous expenses of running the Association as well as the hosting of any active duty members of the squadron attending our reunions. Remember not a dime goes to any of the officers who serve FOFA. You can make a donation on our new FOFA website via PayPal on the Grants page or send a check to Chuck Webster with a note directing which area you desire your donation to be deposited in. Thanks in advance for your generosity.

Fist 15 in Dallas is quickly approaching and as of this writing we have 96 people attending. Our Lockheed/Martin tour on Friday October 30th is currently full at 75 which, as I noted in earlier emails and newsletters, is the maximum number they could accept. There may be cancellations or adjustments so if you have not signed up just let me know via email if you wish to get on a waiting list for the tour. We can take care of the details at the reunion. We have 67 people signed up for the AT&T Stadium VIP Tour on Saturday October 31st. There is no limitation on the total number for this tour. As a reminder the stadium has scheduled an alumnus event that same day on the field with former players and cheerleaders. My contact for the tour stated we couldn't have scheduled a better day to attend.

I will be firming the scheduled times for the various events and dinners in the next week so check the website for updates. I will email the final schedule to everyone who is attending once it is finalized. Looking forward to seeing you all in Dallas.

Gary Kerans

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## Blue Angels Tour Dates

Oct 03/04 MCAS Miramar
17/18 MCB Hawaii HI
31 Peachtree City GA

Nov 1 Peachtree City GA

10/11 San Francisco CA
24/25 Jacksonville Beach FL

06/07 Pensacola Beach FL

## SKIPPER'S CORNER

Fist of the Fleet:

I am happy to report that FOFA's legacy of discipline, excellence, and teamwork resulted in the squadron's preparedness for the 2015-2016 Commander, FIFTH Fleet deployment. The move into Super Hornets and realignment to Carrier Air Wing SEVEN is a distant memory with over 2500 sorties and 3300 flight hours flown in just 2015 alone preparing for deployment. Additionally, the hull swap to USS Harry S. Truman (CVN 75) was a very positive and enriching experience for all involved. Today, as I write from Ready Room 7 (03-225-0-L), I couldn't be more proud of the men and women that make up Strike Fighter Squadron TWO FIVE - the most lethal, capable, and professional group I've ever had the privilege of serving. We stand ready for any and all tasking by our warfare commanders.

Since the last edition of the Newsletter, the squadron successfully completed Air Wing Fallon and Composite Training Unit Exercise (COMPTUEX). As I am sure the readership is well aware, these two detachments demand much of our maintenance professionals and pilots. If our record-setting Material Condition Inspection (MCI), Maintenance Program Assist (MPA), and Aviation Maintenance Inspection (AMI) are any indication, our squadron's programs and policies are innate in how we operate and perpetuate the Fist Standard that we have grown to expect.

With work-ups and the maintenance inspection cycle behind us, we now shift our attention to making final aircraft preparations for deployment. Our average monthly flight-hours prior to starting work-ups in January 2015 was a mere 225 hours. This past month alone we safely executed 625 flight hours - a 275% increase! Sustaining this high level of excellence has been an All Hands effort. With the dramatic increase in flight hours comes the delicate sidelining of aircraft for much needed scheduled maintenance. The administrators have also done a fantastic job ensuring we had the funding to move 10 airplanes and 195 of our Finest from the boat to Fallon, back to the boat, and finally to our homes near Lemoore for POM.

Work-ups were about learning, growth, internal process development, and standardization across the ship and air wing team. At this point, however, I am shifting my priorities to those appropriate for deployment: 1) tactical efficiency; 2) professional execution; and 3) team building at every opportunity. There are a lot of firsts here on this historic deployment: first deployment in Super Hornets; first Mediterranean deployment in so many years; first deployment ever for 76% of the command; and ranked first among peers in operational and maintenance performance, afloat and ashore. There is always a lot going on in this way of life we have chosen. A special shout out to the entire FOFA leadership team and the hundreds of past and present Fisties. My mission and command is more successful because of you.

Proud to be a Fist,

Skipper

## FROM THE COCKPIT By: LT Stephen "Scooby" Yoo

Strike Fighter Squadron TWO FIVE (VFA-25) completed work-ups with their new air wing, Carrier Air Wing Seven (CVW-7), and are now ready for their first deployment with HARRY S. TRUMAN (HST) Strike Group. Amid aircraft carrier readiness challenges, VFA-25 successfully wrapped up a compressed work up cycle culminating in the final evaluation by Carrier Strike Group FOUR. The FIST OF THE FLEET, FREEDOM FIGHTERS of CVW-7, and the entire carrier strike group are ready for any and all national tasking.

Upon completion of Air Wing Fallon in early August, Team Fist returned to Lemoore, California to make final preparations for the capstone training evolution, Composite Training Unit Exercise (COMPTUEX). As is the case with COMPTUEX, the ship and air wing team, as well as Strike Group Staff (CCSG-8), came together as one through exhaustive planning, effective communication, and near flawless execution. This training exercise provided the entire carrier strike group with ample opportunities to showcase various mission sets and capabilities expected to be performed in traditional major combat operations in a variety of theaters. In the end, the exercise was an overwhelming success.

VFA-25 exercised the full spectrum of warfighting skills that only a modern Naval strike fighter can provide including close air support (CAS), large force strike (LFS), surface combat air patrol (SUCAP), defensive counter air (DCA), and rescue mission commander (RMC) missions. During COMPTUEX alone, the squadron safely executed 625 flight hours and 385 traps with a 95% boarding rate. For a squadron having not deployed in over three years, the Fisties showed they are ready to join our coalition forces on the horizon ahead. Hats off to our exceptional Maintenance Department for grooming our aircraft throughout work-ups; the end result was an unprecedented level of support to CAG "Lucky" Luchtman and the rest of Team Freedom.

VFA-25 has come a long way from where it began at the start of the work-up cycle. Furthermore, our slate to CVW-7 has been a very positive experience for all involved. Despite being a Pacific squadron in an Atlantic air wing, our performance while embarked in TRUMAN was rich in efficiency, standardization, and mission accomplishment. The next stop is a much needed reset back in Lemoore before heading out for our 2015-2016 Mediterranean deployment. Team 25's planes, people, and combat pilots are ready to go!


Left: LSO helps ensure that everyone gets aboard safely after the mission.

Right: Work Center 230 conducts final checks of a 2,000 lb JDAM GBU-31.

## FROM THE HANGAR DECK

Greeting FOFA faithful's,

We come to you from the deck-plates with lots of accomplishments and plenty of great news for this edition. Last we talked; we were finishing up a successful Air Wing Fallon detachment, so we packed up all our gear and made our way back to Lemoore to start prepping for our next series of events. Before letting the dust settle from Fallon, the crew got heavily involved in preparing for our Aviation Maintenance Inspection (AMI). I can't begin to tell you how many hours our Sailors spent ensuring their programs were in order prior to commencing the inspection. I once heard that luck is when preparation meets opportunity; well the hard work and preparation of our Sailors in the shops met the opportunity of AMI and completely blew it out of the water. Phrases like "the best program I have ever seen" and "the best on the flight line" were common themes used by the inspectors during this week long event. It all culminated with VFA-25 receiving one of the best grades on the flight line this year for an Aviation Maintenance Inspection. It just goes to show that the Sailors don't just care about fixing jets; they understand the importance of keeping their tools, training, and programs on track as well.

After a short break spent with family and friends, it was time for the Fist of the Fleet to head across the country once again to embark the warship USS. Harry S. Truman for the month of September while participating in Composite Training Unit Exercise (COMPTUEX). This would be an opportunity for the ship and air wing to work together for a second time, but more importantly an opportunity to allow our Sailors to gain valuable experience performing their jobs in a simulated combat scenario. There is no environment that can compare to working on the flight deck or in the hanger bay during flight operations. This is truly what we will do once we go on deployment, so it was critical that these young Sailors charged with maintaining FA-18 Super Hornets got to do their jobs in a chaotic, but controlled, atmosphere. The flight deck is not just a dangerous place for personnel but it is hazardous for our jets also, as witnessed by us when one of our aircraft was damaged in a minor mishap on the flight deck. The rear left horizontal stab was crunched by a piece of flight deck support equipment. After evaluating the damage and trying to figure out the best solution for repair, it was our own air framers who were able to acquire the proper materials to fix the jet. It took the support of the Mechs from power plants to get it done. I am proud to say the jet was back up and flying two days after the incident occurred.

As if that wasn't enough, our Sailors had to also take the Navy-wide Advancement Exam while we were at sea during this time period. Most of them had been studying for the exams since TSTA, our first boat detachment in June and we look forward to advancing many of those Sailors in November shortly after departing for deployment. Speaking of advancement, the Fistie Chiefs welcomed two new Chief Petty Officers into the Chief's Mess during this underway period. Congratulations to ADC Terrance Washington and PSC Rita Rocha on their promotions. Great job to every single Sailor in VFA-25 in completing another successful arduous underway!

We are now in a well-deserved POM stand-down period. As the readership likely recalls, this is a time when Sailors get to spend a couple of weeks with their family and friends prior to heading out on deployment and it is richly deserved as we have been going full speed ahead since the beginning of the year. While half the squadron is home with their family, the other half is maintaining the upkeep on the jets. VFA-25 has accomplished a lot and the performance of all, from the ordies to the line shack, from the AZ, AT, and AE shop to supply has been nothing short of remarkable. At the beginning of November we will get the entire squadron back and it will be time to start our final preps for deployment. From the performance shown on the deck plates the last few months, I couldn't think of a better group of professional Sailors to go on deployment. For many, it will be there first deployment and they are excited to do the jobs they came in the Navy for and even more excited about our first port visit.

As always, we will continue to make you all proud and always uphold our reputation here at VFA-25 as one of the best squadrons in the Navy - and definitely the best on the West Coast.

With the utmost respect,
CMDCM Claude "Hendu" Henderson

Right: AMC Mount, AE2 Fitzsimmons, AD3 Loyd and AZ3 Kone man the Alert 5 aft of cats 3 and 4 during COMPUTEX.

Left : Chief Personnel Specialist received her anchors 9/16/15.

**Have you paid your 2015 Dues?**

**Annual Dues: $25/YR**
**Life Time Dues $200**
**Mail dues to Financial Officer:**
**Chuck Webster 39224 132nd St. Bath SD 57427**

**Only Voting Members receive a copy of the Directory**

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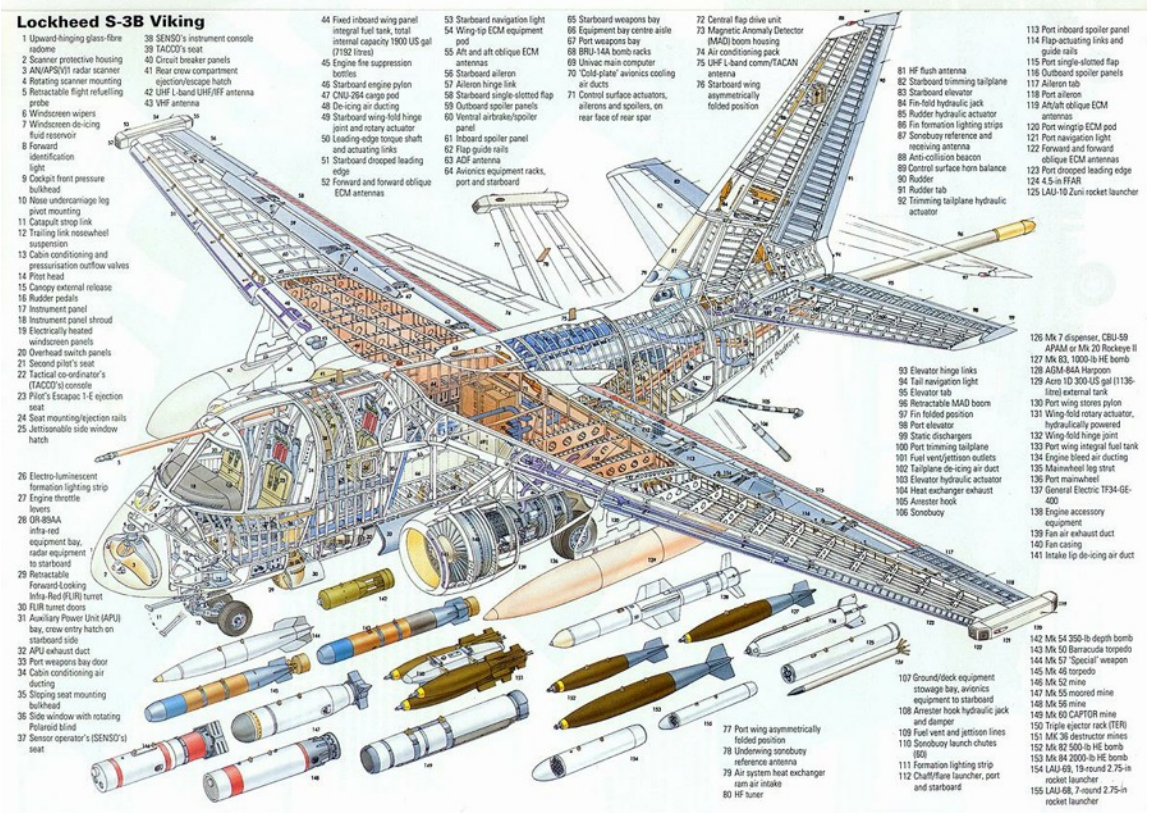
**www.fistofthefleet.org**

## South Korea Moves Forward With Plan to Revive the S-3 Viking: Tyler Rogoway 9/09/15


There are just four S-3 Vikings plying the skies these days and none of them are executing the mission they were designed for. This may be about to change as South Korea is reportedly moving forward with a plan to return a dozen of the maritime patrol jets to service. The timing of this announcement is especially relevant as the most recent confrontation with North Korea showcased just how relevant and ready North Korea's submarine capability remains, regardless of its old age. S-3B's, which were designed to patrol thousands of square miles surrounding American Carrier Battle Groups, will be well suited for reconnoitering the seas around the Korean Peninsula, and if it comes to it, attacking surface and subsurface threats.

If South Korea gets its S-3 Vikings, they will fill the space left by the retired S-2 tracker, fielding a medium-range capability falling in between the country's Lynx and Super Lynx anti-submarine warfare helicopters and the country's fleet of 16 aging P-3C Orion long-range maritime patrol aircraft. It is not clear at this time what new systems are envisioned for these refurbished jets or what defense contractor would do the work of reanimating and upgrading them. Lockheed, the manufacturer of the Viking, and Korean Aerospace Industries (KAI) have a notoriously tight working relationship and seeing how the S-3 would have to integrate with existing South Korean anti-submarine and anti-surface warfare assets, the Lockheed KAI team seems like the most likely candidate.

Even though the S-3 was controversially retired a half decade ago, the type has been eyed for decades to fulfill many other tasks aside from its original carrier-borne anti-submarine and anti-surface warfare missions, along with the ELINT, carrier onboard delivery and tanker missions it executed during its career. As of yet, none of these new missions have panned out nor have other potential users snapped up the surplus Vikings as some thought they would have. As such, Korea's push to move their S-3 acquisition forward is exciting. Regardless of all the potential uses for the Viking, the jet was pulled from its original mission seemingly prematurely, during the "peace dividend" years following the end of the Cold War. Today, with the proliferation of advanced submarine technology, and the rise of multiple potential peer-state rivals, an upgraded S-3's presence in America's Carrier Air Wings seems to make more sense than ever.







Although they won't be flying off of aircraft carriers while wearing South Korean colors, the potential reintroduction of an upgraded Viking into anti-submarine and surface warfare service may just prove how invaluable the aircraft's capabilities could be. This is especially true for smaller countries who are now facing maritime threats like they have never encountered before. Simply put, there is no other platform in the world available with the unique capability set of the S-3. Who knows, with new mission systems maybe this sub-hunters glory days lay in its future instead of in its past.

# DEPARTURE NOTIFICATION

Commander Rex Reed Berglund VA-6B/VA-65 Life Member

6/28/26-2/19/15

Rex became a Naval Aviator after entering the V-5 Program upon graduating high school in 1944. After completion of the Skyraider familiarization training Rex was posted as a Midshipman to VA-6B then operating off the USS Coral Sea (CVA- 43). On Mar 17 '48 after a normal takeoff Midshipman Berglund noticed the gear handle would not go all the way up. He then discovered the gear would not come down. All efforts to get the gear down failed. He made a commendable landing that resulted in Class C damage. Investigation revealed a deteriorated O-ring in the port actuator cylinder, blocking hydraulic fluid flow to lower the gear.

During the Korean War Rex would experience the durability of the Skyraider again. Now with VA-65 Lt (jg)* Berglund's AD-4Q was hit by anti- aircraft fire near Munsan, causing the 20mm ammunition in his wings to catch fire and explode. Despite a complete radio failure and several hundred holes in his wings, he executed a wheels-up landing at Seoul airfield without injuries to pilot or passenger. The airfield had been in enemy hands a few days earlier.

Rex on the deck 3/17/48

(* Another website which lists all aircraft lost during the Korean Conflict shows the following: 3/21/51 VA-65 Douglas AD-4Q BuNo 124066 Seoul Airfield ***Ens.*** Rex R. Berglund, USN PFC Robert W. Pierce USMC Hit by AA, wheels up crash landing due to battle damage. USN pilot and USMC crewmember uninjured. Carrier Valley Forge CVA-45 ).

Pvt. Pierce had been waiting orders to flight training and was the passenger in Berglund's aircraft. Pierce had never flown before, and RADM Ewen requested the flight. On this one flight, Pierce experienced a catapult shot, AAA fire, a wheels -up landing , and the smell of Korea close up. After returning to "Happy Valley," Pierce expressed an even greater desire to fly.

Rex Berglund would eventually leave the Skyraider behind as he rose through the ranks, taking command of VF-11 "Red Rippers". He is survived by his wife, Amy; his children, John Berglund, Eric Berglund, and their mother, Marie Vallely; his sister, Thelma Williams; grandchildren, John and Michael Berglund; great-grandchildren, Michael and McKenna Berglund; and many nieces and nephews. A $50.00 donation has been made in his memory to the Fist of the Fleet Education Fund.

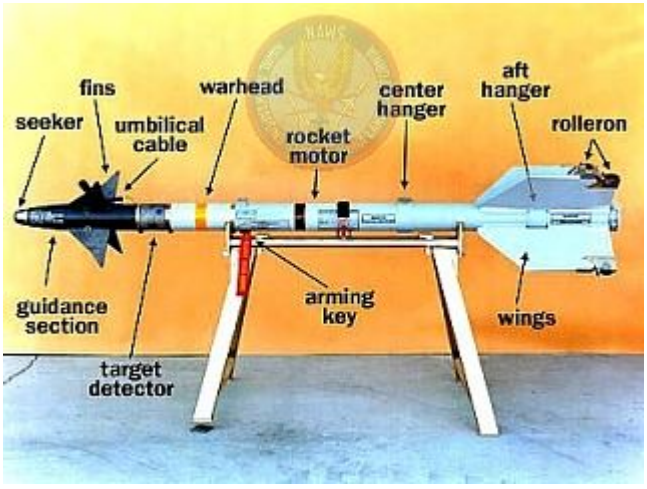
***Last Issue Correction:*** Page 7 Paragraph 4 should read "The ASM-N-7 was a roll-stabilized missile, powered by an Aerojet MK 8 solid-fuel rocket motor, and with a simple derivative of a standard 113 kg (250 lb) bomb as warhead".

## THE EVOLUTION OF WARFARE: AIR TO AIR MISSILES OF VIETNAM

Raytheon AIM-9 *Sidewinder*

The AIM-9 *Sidewinder* is the world's most successful short-range air-to-air missile, and will remain the U.S. military's main "dogfight" AAM for the foreseeable future.

Development of *Sidewinder* began in 1950 at the NOTS (Naval Ordnance Test Station) at China Lake. The idea was to create a very simple heat-seeking air-to-air missile by equipping a 12.7 cm (5 in) air-to-air rocket with a lead sulphide photo cell in a hemispherical glass nose to detect IR radiation. Another simple, yet effective, idea was the use of "Rollerons" (slipstream-driven wheels at the fin trailing edges acting as stabilizing gyros) as roll-stabilizing devices. The first test missiles were fired in 1951, and on 11 September 1953, the first air-to-air hit on a drone was scored.




General Electric began low-rate production in 1955, and in May 1956, the *Sidewinder I* entered U.S. Navy service. Only 240 *Sidewinder I* missiles were built.

The AIM-9A/B used a 4.5 kg (10 lb) blast-fragmentation warhead. This was triggered by an IR proximity or contact fuse, and had an effective kill radius of about 9 m (30 ft). The un-cooled seeker of these early missiles had a 4° angle of view and a tracking rate of 11°/s, and the missile itself could turn at 12G. Propulsion was provided by a Thiokol MK 17 solid-fuel rocket motor (17.8 kN (4000 lb) thrust for 2.2 s), which could propel the missile to a speed of Mach 1.7 above launch speed. Because of the limitations of the seeker, the AIM-9A/B could only be used for tail-on engagements of non-maneuvering(!) targets at ranges between 900 m (3000 ft) and 4.8 km (2.6 nm). The missile was also very susceptible to other heat sources (sun, ground reflections). More than 80000 AIM-9B missiles were produced until 1962.

On 24 September 1958, the *Sidewinder* achieved the world's first successful use of air-to-air guided missiles, when Taiwanese F-86F's shot down Communist Chinese MiG-15s using AIM-9Bs supplied by the U.S. Navy.

The limited performance of the AIM-9B prompted the Navy to look for improvements. The *Sidewinder IC* was developed in two version: a semi-active radar homing version designated AIM-9C in 1963, and an IR guided version, later designated as AIM-9D. Improvements common to both IC versions include a new Hercules MK 36 solid-fuel rocket motor for significantly increased speed and 18 km (9.7 nm) range, a larger MK 48 continuous-rod warhead, and slightly larger fins.

The SARH AIM-9C was only used with the Navy'S F8U *Crusader* fighters to provide these with an all-weather capability without having to fit a *Sparrow*-compatible radar. However, the AIM-9C was not very successful, and only 1000 were built by Motorola between 1965 and 1967. Many were later converted into AGM-122A *Sidearm* anti-radiation missiles.

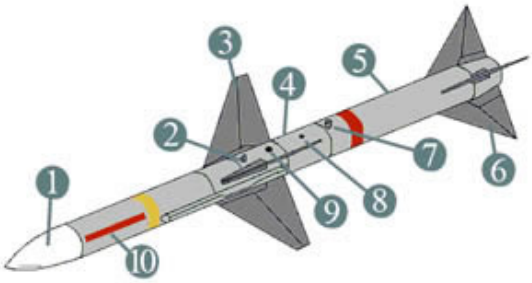
The IR seeker of the AIM-9D (in a more pointed nose) featured a new nitrogen-cooled seeker, which had field of view of only 2.5° (reduced background noise) and a higher tracking rate of 12°/s. However, only about 1,000 AIM-9D missiles were built (by Philco-Ford and Raytheon) between 1965 and 1969.

Raytheon AIM-7 *Sparrow*

The AIM-7 *Sparrow* had been the major medium range air-to-air missile of U.S. fighters until the advent of the AIM-120 *AMRAAM* (Advanced Medium Range Air-to-Air Missile).

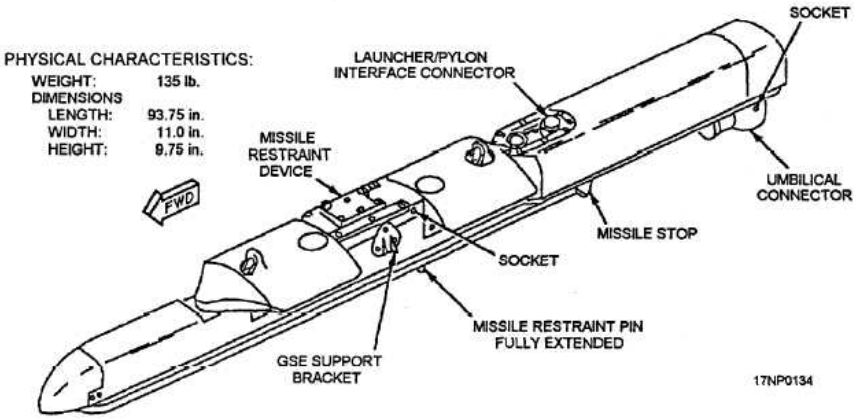
The history of the *Sparrow* missile dates back to 1947, when the U.S. Navy contracted Sperry to develop a beam-riding guidance system for a standard 12.7 cm (5 in) HVAR (High Velocity Aerial Rocket). The 5" diameter soon proved to be too small, so Douglas developed a new airframe of 20.3 cm (8 in) diameter. The first un-powered flight tests of the prototypes occurred in 1948. Development was difficult, however, and the first successful air-to-air interception was only done in December 1952. The *Sparrow I* entered service in 1956 with F3H-2M *Demon* and F7U-3M *Cutlass* fighters. Because of the inherent disadvantages of beam-riding guidance, like poor low-level performance, only 2000 *Sparrow I* missiles were produced, and it was withdrawn from service after only a few years. Another drawback of the AAM-N-2 was that the guidance beam was slaved to an optical sight in the aircraft, which necessitated visual identification of the target, making the *Sparrow I* a short-range VFR missile only.

Because of the principal problems new guidance methods were searched almost from the beginning. As early as 1950, Douglas studied the possibility of equipping the *Sparrow* with a radar-homing seeker. The *Sparrow II* was born. By 1955, Douglas had reached the point of proposing active radar homing for the *Sparrow II*, using an AN/APQ-64 radar. The missile was originally intended as armament for the Douglas F5D *Skylancer* interceptor and the forthcoming Canadian CF-105 *Arrow* interceptor, but in September 1958 the missile was canceled.




**Key to drawing:**

1. Radome
2. Forward suspension lug
3. Wings
4. Control section
5. Rocket motor
6. Fins
7. Aft suspension lug
8. Connector
9. 1760 interface
10. Guidance section




Sparrow Launch Rail

Development of the modern *Sparrow* began in 1955 by Raytheon, the new missile being designated *Sparrow III*. All subsequent versions of *Sparrow* used semi-active radar homing. After production of the *Sparrow I* had been completed in 1956, Raytheon took over the missile production facilities, and has since been prime contractor for the whole *Sparrow* program. After tests with R&D missiles, production of the tactical version began in January 1958, and it entered service in August 1958. The missile had an Aerojet solid-fueled rocket motor, and a 30 kg (65 lb) MK 38 continuous-rod warhead. About 2000 missiles were built..

In 1963, all *Sparrow* missiles were re-designated in the AIM-7 series. In 1963, production switched to the AIM-7E version. It used a new propulsion system, a solid-fueled rocket by Rocketdyne (either a MK 38 or later a MK 52). The new motor again significantly increased range and performance of the missile. Effective range of course depended greatly on firing parameters like launch speed and relative velocity of the target. In head-on attacks under optimal conditions, it could be as high as 35 km (20 nm), while in stern attacks, maximum effective range was more around 5.5 km (3 nm).

About 7500 AIM-7D and 25000 AIM-7E missiles were built, and the *Sparrow* was used heavily in Vietnam by the USAF and the U.S. Navy. The first combat kill was scored on 7 June 1965, when USN F-4B *Phantoms* shot down 2 MiG-17s. However, the initial combat results were very disappointing. The potentially long range of the AIM-7 could not be used, because unreliable IFF capabilities of the time effectively required visual identification of all targets. Coupled with the high minimum range of the missile of 1500 m (5000 ft) and poor performance against maneuvering and/or low-flying targets, this led to a kill probability of less than 10%. Therefore, the improved AIM-7E-2 was introduced in 1969 as a "dogfight missile". It had a shorter minimum range, clipped wings for higher maneuverability, and improved autopilot and fusing. The AIM-7E-3 had further improved fusing and higher reliability, and the AIM-7E-4 was specially adapted for use with high-power fighter radars (like the F-14's AN/AWG-9). Despite all problems, more than 50 aircraft were shot down by *Sparrow* missiles during the Vietnam air war.

In January 1972, Raytheon began development of the vastly improved AIM-7F. It featured a new dual-thrust (boost/sustain) rocket motor (usually a Hercules MK 58, but sometimes an Aerojet MK 65), which greatly increased the missile's range. The AIM-7F also had a completely new solid-state electronic guidance and control system (GCS), designated AN/DSQ-35, which was also compatible with modern pulse-Doppler radars. Continued improvement of the GCS resulted in versions from AN/DSQ-35A through -35H (used in the AIM-7F-11). The smaller GCS permitted the use of a larger 39 kg (86 lb) MK 71 warhead in the new WAU-10/B warhead section. Production began in 1975, and continued through 1981. With the AIM-7F, the official name of the missile was changed from *Sparrow III* to plain *Sparrow*.

U.S. Navy AIM-7 Sparrow and AIM-9 Sidewinder Aerial Combat Victories in the Vietnam War 1965–1973

| Aircraft | Missile | Kills | Comments |
|---|---|---|---|
| F-4B | AIM-7D | 4 MiG-17 (2 probable) | From *Ranger* CV-61, *Midway* CV-41, *Coral Sea* CV-43 |
| F-4B | AIM-7E | 2 An-2, 2 MiG-21, 1 MiG-17 | From *Constellation* CV-64, *Enterprise* CVN-65 |
| F-4J | AIM-7E | 1 MiG-21 | From *Saratoga* CV-60 |
| Total 10 | | | |
| F-8E | AIM-9D | 1 MiG-21/9 MiG-17s | From *Hancock* CV-19, *Oriskany* CV-34, *Bon Homme Richard* CV-31 *Ticonderoga* CV-14 |
| F-8C | AIM-9D | 3 MiG-17/1 MiG-21 | From *Bon Homme Richard* CV-31, *Intrepid* CV-11 |
| F-8H | AIM-9D | 2 MiG-21 | From *Bon Homme Richard* CV-31 |
| F-4B | AIM-9D | 2 MiG-17/2 MiG-21 | From *Constellation* CV-64, *Kitty Hawk* CV-63 |
| F-4J | AIM-9D | 2 MiG-21 | From *America* CV-66, *Constellation* CV-64 |
| F-4B | AIM-9B | 1 MiG-17 | From *Kitty Hawk* CV-63 |
| F-4B | AIM-9D | 7 MiG-17/2 MiG-19 | From *Coral Sea* CV-43, *Midway* CV-41 |
| F-4J | AIM-9G | 7 MiG-17/7 MiG-21 | From *Enterprise* CVN-65, *America* CV-66, *Saratoga* CV-60, *Constellation* CV-64, *Kitty Hawk* CV-63 |
| Total 46 | | | |

**NEXT TIME IN THE EVOLUTION OF WARFARE: RAPID ADVANCES AND THE GULF WAR**