

Air Force Missileers

The Quarterly Newsletter of the Association of Air Force Missileers

Volume 23, Number 3

“Advocates for Missileers”

September 2015

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The Mission of the Association of Air Force Missileers -

- Preserving the Heritage of Air Force Missiles and the people involved with them
- Recognizing Outstanding Missileers
- Encouraging Meetings and Reunions
- Keeping Missileers Informed
- Providing a Central Point of Contact for Missileers

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Association of Air Force Missileers

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Name				Home Phone	
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City	State	Zip Code	Rank/Grade	Active Duty <input type="checkbox"/>	Retired <input type="checkbox"/>
Can AAFM release this information-only to members and missile organizations? Yes _____ No _____				Reserve or <input type="checkbox"/>	Nat Guard <input type="checkbox"/>
Signature				Discharged/ Separated <input type="checkbox"/>	Civilian <input type="checkbox"/>

Summary of your missile experience - used in the AAFM database - attach bio if you have one

Missile Systems and Units		Matador _____ Units _____	Blue Scout _____ Unit _____	Titan I _____ 568 _____ 569 _____ 850 _____ 851 _____ 703/451SMW _____	Titan II _____ 308 _____ 381 _____ 390 _____	GLCM _____ JCMPO _____ 38 _____ 303 _____ 485 _____ 486 _____ 487 _____ 501 _____ Dug- way _____ 868TMTS/G _____
Navaho _____	Thor _____ Units _____	Mace _____ Units _____	Atlas D _____ E _____ F _____ 548 _____ 549 _____ 550 _____ 551 _____ 556 _____ 567 _____ 576 _____ 577 _____ 578 _____ 579 _____ 706/389SMW _____		Minuteman I _____ II/Mod _____ III _____ Peacekeeper _____ 44 _____ 90 _____ 91/455 _____ 321 _____ 341 _____ 351 _____ 4062 (MM Train) _____ Small ICBM _____	
Snark _____ 702SMW _____	Bomarc _____ Units _____	ALCS _____ 2ACCS _____ 4ACCS _____				
Jupiter _____ Italy _____ Tur- key _____						
Space Systems _____ Thor _____ Atlas _____ Titan II _____ Titan III _____ Titan IV _____ Delta _____ Nike _____ Vanguard _____ Scout _____ EELV _____ Apollo _____ Mercury _____ Gemini _____ MOL _____ Agena _____ ABRES _____ Ranger _____ Shuttle _____ Skylab _____ Sat Control _____ SpaceSurv _____ BMEWS _____ DSP _____ DMSP _____ DSCS _____ GPS _____ PavePaws _____ Other Space System _____ 21SW _____ 30SW _____ 45SW _____ 50SW _____ Other Space Units _____			Airlaunch _____ AIM _____ AIR _____ AGM _____ SRAM _____ ALCM _____ ACM _____ AAMRAM _____ RPV/Drone _____ Hounddog _____ Quail _____ Skybolt _____ Other Airlaunch Systems _____ Airlaunch Units _____			

Headquarters/Numbered Air Force/Specialized Units (Check only if assigned to the headquarters level)

JCS/DOD/SECAF _____ Air Staff _____ AFIG _____ AFOTEC _____ SAC or JSTPS _____ AFSPC _____ AFGSC _____ TAC _____ ACC _____ STRATCOM _____ PACAF _____ USAFE _____ EUCOM _____ NATO _____ or AAFCE _____ AFSOUTH _____ AU _____ AFMPC/AFPC _____ DTRA/OSIA _____ Other MAJCOM _____	HqARDC/AFSC _____ WDD/BMD/BSD _____ BMO _____ SAMSO _____ SMC _____ WTR _____ ETR _____ 6555 _____ 6595 _____ SACSO _____ SATAF _____	HqAFLC _____ AMC _____ Ogden _____ SBALC _____ SAALC _____ SMALC _____ AGMC _____ SACLO _____
HqATC?AETC _____ CTTC _____ LTTC _____ STTC _____ VAFB ATC _____ 381TRG _____ 392TRS _____ 532TRS _____ 533TRS _____	NAF 2 _____ 3 _____ 5 _____ 8 _____ 14 _____ 15 _____ 16 _____ 17 _____ 20 _____	Division Hq _____ 4 _____ 12 _____ Other _____ Vandenberg Units 1MslDiv _____ 1STRAD _____ 392 _____ 394 _____ 395 _____ 576 _____ 4315 _____ 3901 _____ 51MMS _____ Other VAFB Units _____
Other Units _____		

Specialties **Operations** **Maintenance** **Munitions** **Comm** **Facility Mgr** **Safety** **Civil Eng** **Support**
 Research/Devel/Test **Instrumentation** **Security** **Contractor** _____ (_____) **Other** _____

Missile/Space Competition Participant _____ **Years** _____ **Commander -Sqdn** _____ **Group** _____ **Wing** _____ **Other** _____

Other Information _____

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Joe Andrew's Painting, "The Guardians"

**Prints of
"The Guardian"
are available in the AAFM
Donations/Store on the
internet or by mail on
page 20 of the newsletter.
Print is \$10, is 14 by 18
inches and includes the
painting and the plaque
that was presented with it.**

Minuteman Missile National Historic Site and AAFM - by Col (Ret) Charlie Simpson, Executive Director

On Saturday, 26 September, over 100 AAFM members and guests took part in a special preview opening of the new Visitors Center at the Minuteman Missile National Historic Site (NHS) in South Dakota. The event was originally scheduled to be the official grand opening for the new center, but delays in delivery of the contractor-developed displays have put that event off until sometime in 2016. AAFM and the Superintendent, Eric Leonard, decided to go ahead with this special preview by AAFM members.

Members gathered at the Comfort Suites between Rapid City and the base, and many of the attendees took part in the 44th Strategic Missile Wing/Missile Wing Reunion scheduled at the same time. On Friday, a number of us toured the South Dakota Air and Space Museum at Ellsworth, which included a driving tour of the base and a visit to the Minuteman Training Launch Facility (TLF) on base. Some members took part in a clean-up day at the TLF that morning. Friday evening, some joined the 44 SMW Reunion Santa Maria BBQ at Canyon Lake Park.

Saturday morning, two busloads of AAFM members and guests traveled east to the Visitors Center for a brief ceremony, reception and tours. The Ellsworth Honor Guard joined us for the ceremony, with about 300 people there, including a number from the 44 SMW Reunion. AAFM presented board member Joe Andrew's painting, *The Guardians*, to the National Park Service (NPS), and the painting will hang in the new facility. After the reception, buses took the AAFM attendees to the launch facility for above ground tours and the launch control facility for both above and below ground tours. One advantage of conducting our own AAFM preview was that members and guests got much better access for tours than would have been possible at an official opening ceremony.

That evening, 125 of us gathered at the hotel for dinner and a great talk by AAFM Member and former Secretary of the Air Force Tom Reed. Many of you remember that Tom spoke at our National Meeting in Washington, DC in 2008. For this event, Tom's subject was "Cold Warriors I have known, from Schriever to Reagan." It was an absolutely superb review of the involvement of Gen Schriever, Col Charles Terhune, Col Ed Hall, Harold Agnew, Edward Teller and Ronald Reagan during the many significant events revolving around missile development during the Cold War. For those who missed our event, we strongly recommend you find a copy of Tom Reed's book, "At the Abyss." This book and others by Reed are described in our "Books for Missileers" part of the Warble Tone, and all are available on Amazon.com.

AAFM will keep members advised of the NPS's plans for the official grand opening next year. With 2016 being the centennial year for the NPS, there is a possibility that the opening will be combined with other special centennial events, which was another reason AAFM decided to go ahead with our preview gathering this year.

Superintendent Leonard tells us that just the presence of the new building, easily visible on Interstate 90, has significantly increased the number of visitors to the facility this summer. It is great that we have such a fine facility to help tell the story of nuclear deterrence and Minuteman's role.



Joe Andrew Describing his Painting

Artist's Comments - by CMSgt (Ret) Joe Andrew, AAFM Board Member, AAFM Mbr No A0476, Marlborough, MA

The painting "The Guardians," done in acrylic on wood, depicts the 44th Strategic Missile Wing's (SMW) Minuteman missile launch facility Delta-09 protecting the United States during the Cold War in the latter half of the 20th century. The artist's comments on the various elements in the painting are presented below:

The missile launch facility in the center of the painting speaks for itself. Here is the "silent sentinel," the lonely warrior, going about its duties night and day, day after day, for over 40 years. It stands ready, under the command of the Launch Control Officers at Delta 01, and attended to when needed by the maintenance and support personnel of the 44th SMW at Ellsworth AFB, SD, to carry out its ultimate duty, the launch of the Minuteman Intercontinental Ballistic Missile that is safely secured in its silo inside the launch facility.

The thunderstorm in the upper right quadrant of the painting represents the Soviet threat during the Cold War, rumbling and flashing in the distance. The threat of Attack by the Soviets was the principal reason for the existence of the Minuteman fleet. By maintaining these missiles on alert, ready to launch on a moment's notice, the Soviet Union was made aware that any hostile actions on its part toward the United States would be met with the most severe retaliatory response imaginable. Thus, an uneasy "peace" was maintained until the Soviet Union collapsed in 1991.

The three ghosts on horseback in the lower right quadrant of the painting represent the original guardians of the land, the Native American Indians. Here represented by a Chief of the Lakota Sioux tribe and two of his braves, the trio of warriors watch over their modern-day counterpart standing guard below. The Native American spirits are joined by a ghost of one of the original rapid response soldiers of the United States, a Minuteman from Concord, Massachusetts. Here we see the Minuteman gesturing to other members of his troop beyond the boundaries of the painting, urging them to hurry and join him at the edge of the bluff overlooking

Delta-09.

In the lower left quadrant of the painting we see a maintenance convoy from Ellsworth AFB approaching Delta-09. The convoy consists of a group of security forces personnel in the lead vehicle followed by a transporter-erector, and a maintenance van bringing up the rear (this was the standard configuration for a missile convoy in the 1960s). We may imagine that the convoy is headed for Delta-09 to remove the missile for shipment to Vandenberg AFB in California where (equipped with a dummy warhead in place of its live nuclear round), it would be test-launched as a part of the Strategic Air Command's Follow-On Test and Evaluation (FOT&E, or "foot") program. Under the provisions of this program, missiles were selected at random from time to time (legend has it that the missiles were selected by drawing their site numbers from a hard hat) and shipped to the Air Force's Western Test Range at Vandenberg. Once there and in place, they were launched just as if they had received a valid launch order from SAC at their operational base. In this way the Air Force not only gained valuable data about the missiles' performance, but the missile launch crews and teams of maintenance and support personnel received valuable training in an actual launch environment.



AAFM Members at Launch Facility D-09

Global Strike Challenge 2015

The 2015 Air Force Global Strike Command bomb and missile competition is being conducted this year with no symposium or scoreposting activities at Barksdale AFB, LA. Bomber and missile operators, maintainers, security forces and other teams are competing as they have at their home bases, but this year, teams will not gather for a formal event at the command headquarters, as has been done in the past.

The 2015 Symposium was announced early this year, organized by the Cyber Innovation Center in Bossier City, and AAFM had signed up as a sponsor for the event. Your executive director was scheduled to give an presentation during the symposium, but that part of Global Strike Challenge was cancelled.

Trophies to the winning teams and wings will be presented to bomb and missile wing commanders at an upcoming AFGSC commanders conference later this year.

Training to be a Missileer – by Col (Ret)

Charlie Simpson, AAFM Executive Director

When each of us decided to become part of the Air Force, it all started with training. If you were enlisted, you probably started with Basic Training. For most, it was at Lackland AFB, TX, but we did have basic training some other places in the early years, like Sampson AFB, NY. If you were an officer, you could have started one of several ways. Some of you attended one of the military academies, others took the Air Force Reserve Officer Training Corps route in college, and others became second lieutenants through the Officer Training School, earlier called the Officer Candidate School. A significant number of missileers started as enlisted members, then became officers, through programs like Bootstraps or Airman Education and Commissioning Program. Whatever route you took, it all started with training.

We all know that once we became members of the Air Force, that training continued throughout our time in service. It never ended. Once we learned how to be an Air Force Airman (using the old use of the term before Airman became a catchall for everybody in our service) or Officer, we then had to learn how to do whatever job we had chosen, or that was chosen for us. Most of this training was called Technical Training. Those of us who call ourselves missileers had some of the most demanding, most detailed and most informative technical training of any specialty in the Air Force.

We have trained missileers at many places during the more than 70 years Air Force people have been involved with these weapons systems. We trained at Patrick AFB (Cape Canaveral), Orlando AFB and Eglin AFB in Florida, at Holloman AFB, NM, Lowry AFB, CO, Redstone Arsenal at Huntsville, AL, Sheppard AFB, TX and Chanute AFB, IL. Many of us also spent time learning more about our business at Vandenberg AFB, CA, where all the current missile training takes place. There were probably some other places some of you trained – like on the test launches of Mace in Libya. I suspect this issue will only be part one of many parts on missileer training. Send us your story of how and where you learned to be a missileer.

ICBM Training in the early 1960s –

by Col (Ret) Charlie Simpson, AAFM Executive Director

When the Air Force began the deployment of the Atlas D, E and F and the Titan I and II, missiles, the initial training programs for all these new systems was established at Sheppard AFB, Wichita Falls, TX. Some of the early Minuteman officers began their training there, before most of that training was established at Chanute AFB, IL. Sheppard was a busy place in the early 1960s, with some classes conducted 24 hours a day, in four separate shifts. Air Training Command, now called Air Education and Training Command, always liked to start things early, so if we were lucky enough to get the first shift, we were in class from 0600 to 1200. The second block started at 1200, the third, when used, at 1800 and a lucky few got to go to class from Midnight to 0600. I got to experience that schedule later in my missile training, when I was at Vandenberg for Minuteman – more about that later.

I volunteered for missile duty at the end of 1960, and in September, 1961, I reported to Sheppard AFB to begin my first missile class. Officers attended a three month long class titled “Missile Launch/Missile Officer (Ballistic Missile),” course number OBR 1821B/3121-3. The class started on 8 September 1961 and ended on 19 December. We were assigned to the 3750th Technical School at Sheppard on temporary duty (TDY). In my case, I was PCS en route (en route to my Permanent Change of Station at Mountain Home AFB, ID, with a TDY along the way for missile training). Some of my classmates, 23 other officers, had already reported to their new bases, but many were in the same status that I was.

Our class was five days a week, from 0600 to 1200 each day. Most of my classmates were very senior to me, since most had come from the Strategic Air Command bomber or tanker force. They ranged in rank from lieutenant colonel to second lieutenant, but there were few of the latter. Most of the others were heading for Atlas E or F, with a couple of the brown bars on the way to Vandenberg as part of the initial Minuteman cadre. I was the only Titan I officer in my class.

The class consisted of three blocks totaling 306 hours of training. After a basic introduction to Air Force organization, regulations, budgeting and other basics, we studied what was called “Weapon System Introduction.” The block gave us a good look at the basics of all the planned new missile systems, along with the basics of how rockets and missile work. We also had a few hours of mathematics as it related to missile flight. The first block lasted five weeks.

The second block was called “Electronics for Missiles” and included a lot of time in the laboratory. We built simple circuits and even studied how a new idea, magnetic core storage of data, worked in the brand new computers we would be dealing with. Remember that in 1961, computers



Neel Kearby Hall Missile Training Facility

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Sheppard Missile Training Launch Facilities

were very large, very basic and only capable of a series of simple tasks. This block was four weeks long.

The final four week block, called “Missile Systems and Equipment,” concentrated on an existing ballistic missile system, the Thor. We learned everything they could teach us about the airframe, propulsion, the launch complex and all the procedures involved with operating, maintaining and launching this new, medium range, single stage missile. We spent hours with colored pencils, marking fluid and electron flow on charts and wiring diagrams. We learned about guidance systems, gyroscopes and accelerometers. We even used the colored pencils to trace the flow of the sewage system for the Thor site. When we graduated, we knew the Thor pretty well.

There were a lot fewer Titan I classes than there were for the Atlas folks. Most of them got a week break over Christmas, but I had to wait to start Titan I training until early January. We weren’t allowed to take leave during the almost three weeks I had between classes, so we stayed in the area, but I had no duties during that time.

Class number OZR 1821B/3121-3, “Missile Launch/ Missile Officer (Titan I)” started on Monday of the second week in January, and we graduated on 6 February 1962. The class was smaller, 15 of us, and again, I was junior compared to my classmates. I was the only maintenance officer in the class, with all the others, captains, majors and lieutenant colonels from SAC bombers, going to crew duty or staff positions in operations. A couple were going to Mountain Home with me, the rest to the other Titan bases. Note that this course only trained launch officers. The other officer position for Titan I, the guidance control officer, had a different training program focused on the Titan I’s complex radio guidance system.

The course was 174 hours long, and again, we had class from 0600 to 1200. Our initial class had been in one of the older Sheppard classroom buildings. Now we were in the new missile training facility, Neel Kearby Hall. Colonel Kearby, a Wichita Falls native, was a P-39 and P-47 pilot in

the Pacific, a multiple ace with 22 kills, and was awarded the Medal of Honor for a combat mission on 11 October 1943, where he downed six enemy aircraft and then led his heavily outnumbered flight to safety. He died in combat in March 1944.

The first block was titled “Familiarization and Facilities” and taught us the basics about the Titan I system and complex. Block two was “Missile Systems Maintenance and Inspections” and looked at every aspect of how the Titan I worked. Once again, we used lots of colored pencils to trace wiring and fluid flow diagrams. Block three was “Launch Procedures and Console Operation” and in today’s world, would have been conducted in a missile procedures trainer. We didn’t have those in Titan I, so we practiced checklists and procedures using big cardboard pictures of the consoles. When we graduated on 6 February, Carol and I headed north to Mountain Home, with a short stop in Las Vegas on the way.

Launch crews went to Vandenberg for Operational Readiness Training, but those of us who were maintenance officers had no formal program to prepare us on the SAC way of doing things. My TDY orders make it sound like a formal program, “Cadre Training Course SM-68-11” to be conducted by the 4315th Student Squadron (before it was called the Combat Crew Training Squadron), but when I arrived on 29 April 1962, I was sent to the 395th Strategic Missile Squadron. When I got to the Titan unit and told them I was reporting for training, they said “what training?” I ended up spending the rest of the week just watching 395 SMS maintainers at the Titan I site. On Wednesday, I was told I had to leave a day early, since President Kennedy was coming to watch an Atlas launch and they didn’t want any TDY folks hanging around while he was there. So Carol and I took off north for a side trip to the just opened 1962 World’s Fair in Seattle.

From that point on, all my Titan I training was “on the job,” either on site during the acceptance phase or in Job Control learning from the very experienced and qualified noncommissioned officers that I would work with for the next three years.

After Titan, Minuteman – by Col (Ret) Charlie Simpson, AAFM Executive Director

After almost four years in Titan I, from the start of training at Sheppard in 1961 to the complete closedown of the 569th Strategic Missile Squadron at Mountain Home AFB, ID, I found myself transitioning from Titan I to Minuteman II, and from maintenance to operations. When SAC announced the closing of the Atlas and Titan I units in late 1964, the command sent a personnel team to each base to ask each of us what our preference was for the next assignment. My first choice was to remain in missile maintenance and go to Titan II, preferably Davis Monthan AFB, AZ. My second choice was Minuteman maintenance.

During the last few months at Mountain Home, we had no missiles and no real job. Many of my counterparts,

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Titan I Tunnel to the Silos

both officer and enlisted, ended up in temporary jobs around the base in the 9th Bomb Wing or the support units. A few of us were left in the squadron to complete the closedown of the unit. I was a junior captain - less than one year in grade - but I ended up being the senior maintenance officer still in the missile squadron. I came back from Squadron Officers School in early January 1965, so I had about four months of "casual" duty. Those of us still in the squadron got a few special projects, inventories and investigations from the bomb wing, but we spent most of our time at the office, at the gym, the base indoor pool or the bowling alley. It's too bad there weren't computer games in those days, since it might have filled some of that dead time.

In March, I was notified of my new assignment – operations in the new Minuteman II wing, the 321st Strategic Missile Wing (SMW), at Grand Forks AFB, ND. The wing was the last of six to become operational and would not get its first flight of missiles until late in 1965. In April, I drove my new Jaguar E-Type roadster from Idaho to North Dakota, and got my name on the housing list. It was spectacular weather at Grand Forks – everything was green, the sky was blue and the sun was warm and bright. I flew back to Idaho on the old SAC courier, a C-97 that made a circuit around many of the SAC bases twice a week.

My plan was to wait until I was high enough on the housing list to be frozen to the top five, which meant a house was guaranteed, then pack up and move out of our house on base at Mountain Home. A few days after I got back to Idaho, I called the housing office at Grand Forks to check my status. I was in the top ten, but when I asked a question about the top five slots, the housing clerk told me, "Captain, you can't advance to the frozen slots unless you are out of your house at Mountain Home." Oops – that meant a quick change of plans, so Carol and I packed up the household goods, moved out of the Capehart house and started a two week leave. We loaded the car with the two young kids and headed to California to visit Pat and Patty Henry. Pat had ended up back in the cockpit after his tour at Mountain Home, had just gotten married and was starting

B-52 training at Castle AFB, CA.

I called every day to see where we stood for housing, and found I was bouncing up and down from the top ten but not frozen to as low as 25 on the list. It didn't look good for base housing, and housing downtown was scarce due to the large number of contractors working on the new missile sites. We stopped in Colorado Springs for a few days with my mother, and after a week of calls with the same results, we decided to send Carol and the kids to Miami with her family until we got a house. I made one more call late Friday afternoon, and was told, "Captain, we just assigned you a house. You need to be here Monday to select the one you want." We headed north the next morning.

The first three months at Grand Forks were a lot like the last four at Mountain Home. We had many missileers coming in, both in operations and maintenance, but no missiles and no real jobs yet. Several senior noncommissioned officers and a few officers that I worked with in Titan I, joined me in the 321 SMW. Shortly after I got to the wing, SAC decided to implement the three man crew concept, with a commander, deputy and Alternate Missile Combat Crew Commander (AMCCC). Most of us who were captains were assigned in this new position. For the summer, my job was squadron commander's call officer for the 447 SMS, responsible to the commander for setting up each monthly meeting. Late that summer, we were assembled into crews and scheduled for training. I was assigned to Crew N-069, with crew commander Joe Lear, a senior captain who would soon pin on major's leaves, and Lieutenant Gary Grim, our deputy. On paper, we were still assigned to the 446 SMS, but would be one of the first crews in the 447 SMS, the first squadron to go on alert once we were trained.

We reported to Chanute AFB, IL, to the 3345th Technical School, on 17 August, along with four other 321 SMW crews. We began training the next day, in the class titled "Missile Launch Officer, WS133B," course number OZR 1821G-1. The orders read that the class lasts four and 3/7th weeks. The crewmembers who had preceded us had been trained by both the Air Force and the contractor. We were the first set of crews to go through the "real" Chanute course for the Sylvania ground system for Minuteman II. We learned everything about our new missile system, and, just like at Sheppard, spent a lot of time with colored pencils and diagrams, tracing fluid flows and electrons. Also just like Sheppard, class was from 0600 to 1200 five days a week.

We had few real mockups yet, so many of the explanations about the consoles and racks of equipment including cardboard versions – drawings covered in plastic so we could make notes with grease pencils. During our training on the hardened cable system that connected all of the launch facilities and launch control facilities, one of our classmates brought up the issue of an enemy injecting poison gas into the pressurized cable system. He didn't say poison gas, he said Phosgene, one of the gases used on World War I. He earned the nickname "Phosgene Bob" and it stuck with

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him throughout his tour at Grand Forks. The instructors were “pretty sure” that the system would protect us, and that we wouldn’t all die from the gas since filters would prevent it from entering the control center.

We had a couple of weeks at home before heading out to the next phase of training, Operational Readiness Training (ORT) at Vandenberg. We would be trained in the 4315th Combat Crew Training Squadron, although my orders called it “School” instead of “Squadron.” Three of the crews from our Chanute class made up Minuteman II ORT class M2-8, to start on 4 October 1965 and to be five and 5/7th weeks long, except one crew was only the commander and AMCCC, since class size was eight for each class. Because we would return and quickly become combat ready, most of us were required to travel to Vandenberg by air, since there wasn’t enough time to drive both ways and meet our schedule. In those days, any officer who was on flying status still had to fly four hours a month for his flight pay, so three of the members of our class were assigned to the 4392nd Aerospace Support Group for “flying duties.”

The first part of ORT was classroom study, primarily on technical order checklists and Emergency War Order (EWO) procedures. We were finally learning how to do our job and how to go to war. No more colored pencils and wiring diagrams – now we were learning how to use the tech data and do every task step-by-step in the demand-response format. We were finally exposed to EWO fast reaction messages and classified launch procedures. The last half of the class was all in the missile procedures trainers (MPT).

We were divided into four teams, and rank was the big factor in who got what schedule. The three crew commanders took the 0600, 1200 and 1800 MPT. That left me and another junior captain the midnight shift – we started training at 0001 and ended at 0600 six days out of seven for two and a half weeks. I never did figure out when to sleep – too much noise and light during the day and then television noise and other roommates studying in the evenings. At least, nobody bothered us during our MPT sessions – they were all home in bed.

We got back to Grand Forks in late November, but we still weren’t quite ready for alert duty. Since we had been taught the “Vandenberg Way” by the 4315 CCTS, now we had to learn the “321 SMW Way” and polish our EWO skills before we would be declared Combat Ready. We spent the next three weeks in a combination of classroom and MPT sessions, with one of the ten crews that preceded us doing the training – we were the eleventh to upgrade – before ending with our upgrade standardization evaluation and EWO Certification to the Wing Commander. Our crew became Crew R-069 on 17 December, after presenting a two hour EWO briefing to Colonel Friederichs, the 321 SMW Commander, and on 18 December, we headed to Golf-Zero

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for our first alert. We only had two launch control centers turned over to the wing, and only two crews on alert – but we only had a few crews to fill all those alert requirements. We were now fully combat ready and up to our ears operating the new Minuteman II weapon system. We also got a bonus that month – we got to pull our second alert tour a week later, on Christmas Day, 1965. With a two year old and a six month old, we had a very early Santa Claus visit that morning, and the good news was that the family got to come out to Golf-0 for a Christmas dinner cooked by our Launch Control Facility cook (they weren’t called “Chefs” then).

When we returned from our second alert the day after Christmas, our crew became an Instructor Crew, so, while we had a few alerts the next several months, we spent most of our time training a flood of newly arriving crews as they were cranked out of the 4315 CCTS. By mid-summer, we had an entire squadron of missiles and five launch control centers up and running, with more coming over the next year.



Oscar One at Whiteman

Whiteman Museum- *by David Grisdale, 509 BW, Whiteman AFB, MO*

Whiteman AFB, MO, is the home of Oscar-01, the only inter-continental ballistic missile launch control facility located on a base anywhere in the world. From 1963 to 1995, Whiteman was home to the 351st Strategic Missile Wing, which operated the Minuteman I and II intercontinental ballistic missile (ICBM) weapon systems. The wing consisted of the 508th, 509th and 510th Strategic Missile Squadrons. Each squadron operated five flights, with a flight consisting of a control center like Oscar-01 and 10 missiles (designated Oscar-02 through Oscar-11). In total, the wing operated 15 flights, controlling 150 Minuteman I/II ICBMs.

Step back in time and receive an informative briefing of the history, design, construction, crew life and the missile itself. Then travel 45 feet below the facility and tour the Launch Control Equipment Building and the Launch Control Center. Tours are free and individuals with base access can call (660)-687-6560 to schedule a tour Monday - Friday, 8am to 4 pm.

AAFM has provided these grants to Whiteman: 1995, \$1,500, Photo display, 2002, \$1000, Replace LCC/LCEB Dehumidifiers, 2005, \$2,000, Display Cases, 2011, \$2,500, Renovation of the Flight Security Control Center.

More Missileers Stories

We started “How I Got into Missiles” several months ago, and we still get a story or two for each or the newsletter. We will continue to publish these personal tales as long as members send them in. Sorry for the mistake last issue, when we published one story in consecutive issues.

A View from the R&D Side - By Col (Ret) Joseph P. Martino, AAFM Mbr No A1012, Sidney, OH.

I was awarded a Missile Badge, but never served in a missile wing, or stood watch in a silo. My entire career was research and development (R&D), with several years of work on missile guidance. It may be of interest to the missileers to learn how it looked from the R&D side.

I graduated from Miami University (Ohio) in 1953 with a degree in physics, and an Air Force Reserve Officer Training Corps (AFROTC) commission. Immediately I was sent to Purdue for graduate studies, and I graduated from Purdue in 1955 with a Masters in Electrical Engineering.

My first “real” assignment was the Armament Laboratory at Wright Field, OH. Because of my physics background, plus the control theory I studied at Purdue, I was put in the Inertial Guidance Section of the Lab. Our job was to award and manage contracts for inertial guidance systems (INS) for a variety of missiles. It was there that I was awarded the Missile Badge for my work on missile guidance. Immediately on arriving, I was put in charge of a program for INS for what would now be called an air-launched cruise missile. The officer who had been running the program had recently been transferred, and I had to step in and keep the program running. For me, it was an education in disaster management. The program was a real stretch, and the state of the art wasn't up to meeting the goals of the program. Despite my best efforts, and those of the contractor, the program was a failure. However, a lot of what we learned during the program appeared later in other missiles when the state of the art caught up.

Other engineers in the section were running programs for INS for missiles such as Snark, Navaho, and Matador. This gave me an opportunity to learn about different approaches to inertial navigation, and about the missiles themselves. Incidentally, that was during the period of the “Snark infested waters” off Patrick AFB, FL. The Snark often failed, and sometimes went well off the desired course.

At the time I arrived at the Lab, the typical INS was a “stable platform.” Gyros and accelerometers were used in a closed loop control system to keep the INS in a particular orientation. Typically this meant keeping the platform “level,” that is, at right angles to the local vertical, so the earth's gravity would not appear in the accelerometer output. Any errors in either the gyros or the accelerometers would show up as position errors in the system's output.

Gyros were a particular problem. The spinning wheel rotated on bearings that inevitably rattled, with the result that “noise” was injected into the gyro output signal. One assignment was to look for “nonmechanical” means of rotation, to avoid the problems of bearings. I looked at a lot of alternatives, including vibrating wires and tuning forks. At the time, none of these were anywhere near as good as gyros, so nothing came of those efforts.

One alternative that I came across was the “Sagnac gyro,” invented by a French scientist. It used an interferometer, which had an optical path consisting of a square with mirrors at three corners and a prism at the fourth. Light was injected into the prism and split into two beams, which went around the square in opposite directions. They were recombined back at the fourth corner. Interference between the beams resulted in dark and light “fringes” where the beams were combined. If the apparatus were rotated about an axis normal to the square, the fringes would shift their position, by an amount related to the speed of rotation, and in a direction determined by the direction of rotation.

The sensitivity of the Sagnac gyro depended on the path length of the light beams, and the wavelength of the light. Longer path length, or shorter wavelength, for greater sensitivity. I ran the calculations. To get the sensitivity we needed, competitive with mechanical gyros, and do it in a size that would fit into a missile or aircraft, would require that the device use, not light, but gamma rays. That was impossible. There are no mirrors for gamma rays to get a closed path around the device. I gave up on that.

Another innovation that was assigned to me was the “strapdown” INS. Instead of maintaining the accelerometers in some specific orientation, the INS was allowed to take any orientation. The gyros were used to keep track of the orientation, and the accelerometer measurements were run through a computer to get acceleration in each of three axes. The big problem was that it was necessary to subtract out the earth's gravity measured by the accelerometers. Any error in computing the correction for gravity would propagate into a position error. The idea was basically sound, but the technology of the day wasn't up to the job. However, “strapdown” systems eventually became feasible with advances in the state of the art.

My last task at the Armament Lab was to manage a project to improve the gyros used in the Thor missile. The project was almost completed when I had to leave it. I was transferred to Ohio State to get a PhD in mathematics. Although I never worked with INS again, two of my projects turned up again later in my life.

Several years after leaving Wright Field, I was reading Aviation Week, and came to an article about a laser gyro. That intrigued me. How do you make a gyro out of a laser? The article gave me a head-slapping moment. Of course! You make a Sagnac gyro and use a long optical fiber to get the needed path length. Obvious, when you see it.

After I retired from the Air Force, one day I went to

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the AF Museum in Dayton, OH. In the Missiles and Space Gallery, I came to a stand holding what was labeled as a Thor guidance system. I couldn't help but shout, "Hey! Those are my gyros!" After nearly forty years, I finally saw the things. I was never again involved in missiles the rest of my AF career. For the most part, though, I stayed in R&D. From Ohio State I went to Air Force Office of Scientific Research (AFOSR). This was during the Kennedy presidency, with his emphasis on fighting Communist insurgency. I had written an article on using technology to combat insurgents. This resulted in my being assigned to the then Advanced Projects Research Agency (ARPA, now DARPA), and sent to the ARPA R&D Field Unit in Bangkok, where I spent nearly two years testing various electronic devices for use against insurgents. From there it was back to AFOSR, then to Armed Forces Staff College. From there I went to the Office of Research Analyses at Holloman AFB, NM. Air War College followed, then back to Wright Field and the Avionics Laboratory, successor to the Armament Laboratory.

On being promoted to Colonel, I went to Defense Electronics Supply Center as Director of Engineering Standardization, where I commanded a staff of over a hundred electronics engineers and technicians.

After twenty two years on active duty, I retired and took a job as a research scientist at University of Dayton, where I stayed for eighteen years, before retiring again.

How I began in ICBMs - by Maj (Ret) R. David Harrison, AAFM Mbr No L507, Brigham Vity, UT.

I was raised in a suburb of Los Angeles adjacent to Los Angeles International Airport (LAX), although initially it was not known by that name. During my early youth, World War II raged elsewhere in the world and the aircraft manufacturing industry nearby flourished. Giants like Lockheed, Douglas, North American, and Hughes were all nearby. I became enthralled with airplanes, Air Force, and anything to do with them. So, when I began college at Brigham Young University, I enrolled in the AFROTC. Before graduating and receiving my commission, I underwent three or four physical examinations, alternately passing and failing them to be qualified as a pilot - my lifelong dream.

Fortunately, as result of the last physical exam before graduation, I qualified. Thrilled, in June, 1960, I entered USAF pilot training in Florida. Dreams do come true! Soon, I was reminded that dreams can turn into nightmares. Sure enough, one of the initial activities in pilot training was my nemesis - a physical exam. It was my turn to fail - 20/20 vision in my right eye, but 20/25 in the left. In addition to the physical requirements for becoming a pilot, there were several allied emotional and security requisites. These latter elements were also required for the new and ever-expanding career field of intercontinental ballistic missiles (ICBM).

Thus it was that my young bride and I, who had just

crossed the United States from west to east, returned halfway to a new life in Lincoln, NE. My focus on airplanes in the Air Force - one shared by everybody who was anybody in that organization - had precluded my appreciation for this new element of growing importance. During those days, I remember ignorantly confusing the acronyms IBM and ICBM, both fledgling entities of great significance to the United States and the world. Atlas, the ICBM, had gone through the A, D, and E phases while the F model, the last for that weapon system, was just beginning to unfold. When I arrived at Lincoln AFB, the new home to the 551st Strategic Missile Squadron, there was one officer wearing a missile badge, Lt Col Marsh, working for SATAF - the Site Activation Task Force. There was no missile organization for me to be assigned to, there were no missiles and there were no missile silos. Soon, however, the ever-increasing number of us who would ultimately man and maintain the Atlas F watched over-the-shoulder, as the Corps of Engineers and Convair built and installed this new weapon system, under the concept euphemistically called "concurrency".

Finally, after nearly two years of familiarization from watching the missile system being constructed and formal training at Shepard AFB, TX, and Vandenberg AFB, CA, the 551 SMS was declared operational on 4 July 1962, and our crew performed our first alert tour the following day. Because we had not completed a Standboard evaluation after the final phase of Operational Readiness Training (ORT) at Vandenberg AFB, we served on a waiver in lieu of being a combat ready crew until those elements were completed.

Our familiarity with virtually every nut, bolt, valve, and gauge on the site paid off. Theoretically, a crew was eligible for 4 hours of rest during each so-called 24-hour alert tour. Not one of the five of us got a moment of sleep that tour. Proving the wisdom of our carrying a dual Air Force Specialty Code (AFSC) of operations (182X) and maintenance (312x), we spent our time figuratively plugging holes to keep our site on alert. Each time an alarm would sound or a gauge would creep out of tolerance or a fitting would threaten to rupture or some other unimaginable malfunction, we pored over pages of tech data from the complete library of books in the Launch Control Center (LCC) to keep the lid from blowing off. As the Deputy, my role was primarily to keep in touch with Job Control and the army of maintenance personnel coming and going. Of course, I also stared a hole in those 3 critical gauges in front of me on the console - Oxidizer Tank pressure, Fuel Tank pressure, and the differential between them.

The crew commander, Maj Frederick Langille, and the 3 crew technicians did the technical work. Maj Langille was a former B-17 pilot who was difficult to work for because of his demanding quest for excellence. He was a credit to the Strategic Air Command (SAC) and the perfect commander for the tour we suffered through. I am ever grateful for the difficult, effective tutorage I received under his watchful eye. By the early morning hours of 6 July, he had declared

our site off-alert and we had the missile in stretch. (See the Note at the end of this article)

The pipeline for the final phase of Operational Readiness Training (ORT), a requisite for the coveted "R" (Ready) rating for each crew, was so full that we continued to operate on a waiver, even into the fall of 1962. By then, our sites were nearing completion as developments in that small island to the south of the United States defied existing war plans. Lincoln AFB had two B-47 bomb wings and an air refueling squadron, in addition to the Atlas F squadron, assigned directly to the 818th Air Division.

Overnight, after all the noisy airplanes departed for staging stations to the south, it became a very quiet base. Quiet is what we were about in ICBMs. So, as the rest of the armed forces focused on Cuba and its surrounds, we continued our diligence. The civilians working to finish the few remaining sites were told to accelerate their work and leave sooner than originally planned. Because our crew was not yet certified combat-ready, we were sent home as only combat-ready crews were allowed to man the sites. That was a technicality many of us did not understand. Several days later, those beleaguered Ready-crews were augmented by the rest of us. In several of the patched sites Convair (General Dynamics) resumed the final stages of their construction.

I completed my tour in the 551 SMS as a crew commander, as the end of B-47s, KC-97s, Atlas F, and Lincoln AFB all culminated in the summer of 1965. I lived with the Weapon System, as they say, "from womb to tomb".

In subsequent years my assignments changed from operations to maintenance. When I arrived at the 341st Strategic Missile Wing at Malmstrom AFB, MT, I was amazed at the difference in one leap between early ICBMs with their maze of plumbing and wiring, liquid propellants and close attention by an adjacent crew and an army of maintenance people to the quiet, remote existence that was Minuteman.

I was also amazed that SAC, so insistent on rigorous training to become qualified for any critical task, provided me with no established training to become a Target and Alignment Team Chief. Rather, two young experienced airmen were dispatched with me on regular maintenance assignments as I began training on-the-job. Over the next few months at Malmstrom, and a few weeks of formal training at Chanute AFB, IL, when I felt ready I requested a formal QC check which I passed.

Eventually SAC formalized the training program for which I became responsible at Malmstrom. There, I was privileged to work for another great soldier, our squadron commander, whom I characterize as the "John Wayne" of SAC ICBMs, Col George V. Leffler. He was reassigned before I was and it was my privilege to work for him again at 15th Air Force headquarters, March AFB, CA. Following

a four-year "sabbatical" on the faculty of the Air University, I finished my Air Force career at Vandenberg.

Note - The missile in stretch: Some referred to the Atlas missile as a large balloon. General Dynamics preferred comparing it to a football - tough and durable. It was of pure monocoque construction-stainless steel skin with no internal bracing. Normally it depended on internal pressurization to maintain its tough and durable character. On the launch control console were three gauges: one for each tank (oxidizer and fuel) and another monitoring the differential between these tanks. Just above the engines was the fuel tank, at ambient pressure. RP-1, similar to jet fuel, was stored in the missile. Above the fuel tank, separating it from the oxidizer tank, above, was an intermediate bulkhead. While in standby, the oxidizer tank was maintained at low pressure (about 3.5 psi) by gaseous nitrogen, and by liquid oxygen and helium while in flight. The differential between these tanks was critical and maintained automatically. It was the deputy's job to monitor this differential and manually override the system if it dropped below a safe level. In an emergency, a work platform in the silo could be lowered, a hydraulic jack raised, a pin inserted into a receptacle on the side of the missile, and, with hydraulic pressure on the pin, the missile could literally be stretched and thereby maintain its shape. Of course, in this configuration the missile could not be launched and was therefore called off alert. At a site east of Lincoln, an intermediate bulkhead reversed and the missile collapsed. Later it was stored at the Missile Assembly Building and looked as if Paul Bunyan had wrinkled up a chewing gum wrapper and discarded it.

A Round-about Way to Missiles - Former 1st Lt Allan R Martens, AAFM Mbr No A2776, Tucson, AZ.

Getting into missiles was a little round-about for me. I joined the Air Force in July 1961 as part of the Officer Training School (OTS) program at Medina-Lackland AFB, TX, then to Keesler AFB, MS, for Communications Electronics. Our class, all newbie second lieutenants with degrees in engineering and science washed ahead and took the yearlong course in half the time, and then we were all sent to instructors school. The last thing I wanted to do was teach, so when a request for launch control officers came to the base with the last sentence indicating that volunteers could not be sidetracked for any reason, of course, I volunteered. The program included access to a masters degree, another reason to get into the program. The Malmstrom AFB, MT program required an engineering degree, so I was not qualified because my degree was in math and physics. The second base, Ellsworth AFB, SD, required that I take an entrance exam for the Master of Science in Business program, which I did at Loyola in New Orleans.

In a few weeks I was assigned to Ellsworth in time for the bitter cold, then Chanute and Vandenberg for crew training with Capt Monahan, my crew commander. By May of 1963, we were qualified and were part of the AF acceptance crews as Boeing finished up their work in

South Dakota. In September, the 44 SMW assigned crews to specific squadrons and ours was the 68 SMS. We were on alert in N-01 when President Kennedy was assassinated. Squadron command posts were not in place yet, so orders were a little flexible for the “modified Defcon 2” we were in for about 8 hours.

I do not remember getting lunch that day but late in the afternoon we were authorized to open one blast door for a few minutes in rotation. Another notable thing happened to us in March of 1965, where Capt. Monahan and I launched the missile “Long Life” out of N-04 with assist from O-01. Capt. Monahan was killed shortly after that in an aircraft accident. Years later I read in “Time” magazine that the AF had tried a few other times to launch from an operational site, and it had only worked once, “Long Life”. I realize that the launch crew really had very little to do with the success of the launch. The real heroes were the maintenance teams that made sure it was successful, as they have continued to do many times at Vandenberg. You might remember that the missile only had enough fuel for a 7 second burn, for about a 1.5 mile range. The systems other than the missile were the real purposes of the test and to see how much damage WAS inflicted on the silo. I would guess that later tests failed because, for safety sake, too many wires were disconnected. The net results of all this is that I am the only person alive who has launched a Minute Man Missile from an Operational Site. Aren’t we all lucky that real operational launches have never taken place. I left the AF in August 1965 to complete an advanced degree in Physics at the South Dakota School of Mines and Technology. Guess what, I was an Instructor of Physics for two years.

What goes around comes around. Ten years ago traveling through South Dakota, I read in a recreational vehicle magazine that the new Minuteman National Historic Site was giving tours. During our D-01 tour the ranger asked if I knew something about the Minuteman and I said, “A little bit”. Well, I volunteered again and have given tours at the Minuteman National Historic Site in Wall SD at D-01 where 50+ years ago in the late spring of 1963 I had pulled crew duty. I can still wear my white uniform even though it is a little tight at the waist.

Being part of SAC during the startup of the Minuteman program was a very interesting and satisfying part of my life. I am very thankful for the many Missileers who have provided, and that continue to provide for, our national security. They are a dedicated group, we are in your debt.

A Note About Long Life - there were two more programs to launch a modified missile from an operational silo, both in the 321 SMW at Grand Forks AFB, ND. They were called “Lont Life II” and “Giant Boost.” We asked fir opermission from the Ronald Reagon Minuteman Missile State Historic

Site near Cooperstown, ND to include the story below in this issue. The original, with other information about the launch attempts, is on their site at <https://oscarzero.wordpress.com>. AAFM thanks them for letting us share the article.

Long Life II - *An Article from The Oscar-Zero Web Site*

19 October 1966, was another beautiful day on the northern prairie. The day had started with temperatures in the low 20s but by noon the temp was climbing into the 40s. The approximately 150 people that were gathered about 6 miles south of Michigan, ND, were excited to witness the launch of a Minuteman II from the H-24 (“Hotel-24”) launch facility (one of 150 such facilities that had been recently constructed in eastern North Dakota). The launch, part of the Air Force’s “Project Long Life” promised to be quite the spectacle for the high-ranking Air Force Generals, local VIPs, countless reporters, and numerous local citizens. This was to be the second launch in “Long Life” – the first had occurred over 1 year ago near Newell, SD, when the 44th Strategic Missile Wing (SMW) launched one of their missiles. Granted, the specially modified test missile was altered to ensure the missile was powered for no longer than 7 seconds and would impact within a mile of its launch point, it still promised to be an incredibly exciting sight for those gathered on the prairie. This was the Air Force’s second attempt at this launch – the original attempt was scheduled for 12 October but was postponed several days when the Air Force had discovered a malfunction in the special test equipment on the missile. However, since the malfunction was found days in advance, there was little excitement or concern over the postponement.

The gathered crowd on the 19th also included five farm families that the Air Force had forced to evacuate their homes. Although the Air Force was very confident that it “knew” where the missile would come down, it nonetheless wanted to ensure nobody was harmed. The Hamre, Yoney, Danda, Senger, and Anderson families all waited patiently along with the others for the eventual launch. Donald Hamre and his family not only evacuated themselves but also their herd of cattle that was in a pasture that overlapped the expected impact area.

As the time to launch grew closer the anticipation mounted. Then the Launch Director, Lt Col James Simmons and the Task Force Commander, Col Joe Schonka announced that the launch would be delayed. The crowd was disappointed and confused. The Air Force went into action and a helicopter hurried a replacement for a failed component from Grand Forks AFB to the launch site. However, the leaders felt that hurrying the repair was just too risky and the launch was indefinitely postponed.

Suddenly the gathered folks probably felt a bit more of a chill in the 40 degree afternoon. Of course, everybody wanted to know one thing, “What went wrong?” The Air Force explained that an electronic part that isolated the test missile from armed missiles in the same area had malfunctioned and they tried to reassure everybody that if it

had been a wartime scenario, they could have gone through with the launch but it just wasn't worth the risk in this test environment.

So, the Federal Aviation Administration lifted the 10 mile, 10,000 foot no-fly-zone surrounding the launch site, the road blocks around the two mile perimeter were removed, and the farm families were allowed to return to their homes.

A few days later, on 26 October, the Grand Forks Herald reported that the next attempt would take place on 28 October. The anticipation began to build once again.

On the morning of the 28th, the no-fly-zone went into place, the road blocks cordoned off a two mile area, and the farm families were forced to evacuate their homes. The nearby people of Michigan and Petersburg, ND, waited in what must have been dubious anticipation.

The crowds of dignitaries, locals, and journalists came again to the remote missile silo on the prairie. This time, they were joined by protestors who had just received word of the launch the night before. The protestors were led by Reverend Robert L. Branconnier, one of two Roman Catholic priests from the University of North Dakota. This man of the cloth felt it was his "responsibility as a priest to be a prophetic voice and warn of danger." He and his fellow protestors were there to raise questions about the morality of these nuclear weapons that indiscriminately targeted large population centers.

As the protestors picketed and the on-lookers waited, the launch progressed. Finally the time came when the below ground launch crews, one crew led by Maj John J. Phelan and the other led by Maj Carl E. Stone, began their launch procedures. Simultaneously, the crews turned their launch keys, but the missile just sat quietly in its silo and refused to launch.

Disillusionment rapidly spread throughout the gathered crowd. This was the third scheduled attempt to launch, and the third failure. The Air Force confirmed that the crews followed through with their launch procedures, but that the first stage of the rocket simply failed to ignite.

As cynicism spread throughout the crowd, someone asked, "When will they try it again?" One person answered, "How about April 1!" Another answered, "How about October 31 – tricks and treats!" While another chimed in, "Maybe they should have called it Project Long Wait"

After just witnessing a massive two-year construction project that emplaced 150 nuclear missiles in North Dakota soil – missiles that despite other successes, now appeared extremely unreliable - the local confidence in the wisdom of the Air Force must have reached an all-time low.

As for Rev Branconnier and his protesters, they were relieved to witness the failure. Branconnier hoped that this "would spark a discussion on the campus," where he

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felt there was "an increasing apathy toward the use of these weapons." He went on to wonder "...how much this cost. How many University students could have been given loans with this money?"

Over a month later, on 7 December, during ceremonies when the Strategic Air Command accepted the fully operational 321 SMW, the Air Force announced that they had not given up on "Project Long Life" and that the test would occur sometime in 1967. The Air Force proclaimed that despite the previous failures, they had complete confidence in the Minuteman II.

Then, in February, the Secretary of the Air Force sent a letter to North Dakota Senator Milton Young to ensure him of his confidence in the Minuteman. Brown wrote, "an analysis of the facts involved in these attempts does not reduce our confidence in Minuteman II reliability."

In the summer of 1967 the Air Force moved forward with their plans to launch a test missile from the Grand Forks missile field but they had renamed the project. Project Long Life was now referred to as Project Giant Boost. Perhaps the Air Force was hoping for a "Giant Boost" to the reputation of the Minuteman II missile.

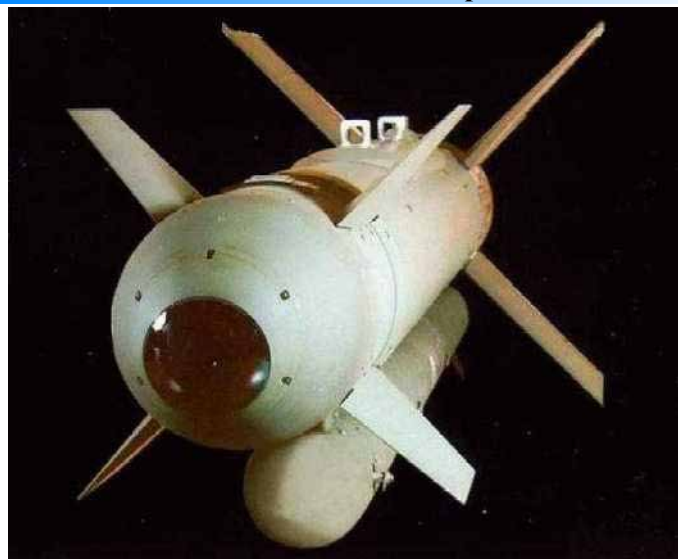
The Air Force scheduled the test launch for 14 August – anticipation and hopes were high. When the day arrived, and everything was in place, the test failed...again.

According to the Office of Air Force History, "When the launch aborted, the Air Force rushed a 7-second missile to Vandenberg AFB, CA, where it was successfully launched." Secretary Brown believed that that successful test must have restored public confidence in the Minuteman; he certainly had confidence in the missile.

Brown may have been satisfied, but the confidence of many of the stoic, practical farmers of the Northern Plains, who tend to follow a "show me and then I'll believe you" philosophy probably never returned after the 4 scheduled, and 4 failed attempts to launch the Minuteman from their backyard.

As it turned out, after that first successful launch from an operational silo in South Dakota in March of 1965, that first test of Project Long Life, the Air Force never again launched an intercontinental ballistic missile from an operational site.

The failure of Project Long Life and Giant Boost scarred the reputation of the Minuteman. However, if all you knew of Minuteman test launches was those failures, your knowledge would be very incomplete. Test launches of Minuteman missiles have occurred over 100 times in its 50 year history. Today, the Air Force still conducts numerous annual test launches. These tests are typically very successful. A very significant difference between Long Life and the test launches that have occurred since then (and still occur today) is that the Long Life tests were to take place at operational missile silos and all other tests occur from Vandenberg.



AGM-130

Air-launched Missiles, Part II

This is the second part for air-launched missiles currently in the Air Force inventory. Information came from Air Force Fact Sheets on each missile.

AGM-130 - A powered, air-to-surface missile designed for high- and low-altitude strikes at standoff ranges against a variety of targets.

Features

Carrying forward the modular concept of the GBU-15 guided weapon system, the AGM-130 employs a rocket motor for extended range and an altimeter for altitude control. The AGM-130 provides a significantly increased standoff range than the GBU-15. Two variants, based on the warhead: the AGM-130A with a MK-84 blast/fragmentation warhead and the AGM-130C with a BLU-109 penetrator.

Equipped with either a television or an imaging infrared seeker and data link. The seeker provides the launch aircraft a visual presentation of the target as seen from the weapon. During free flight this presentation is transmitted by the AXQ-14 data-link system to the aircraft cockpit monitor.

The seeker can be either locked onto the target before or after launch for automatic weapon guidance, or it can be manually steered by a weapon systems officer. Manual steering is performed through the two-way data link.

Designed for use in the F-15E, the development of the AGM-130 was initiated in 1984 as a product improvement to the GBU-15 guided glide bomb system. In the mid-1990s, the AGM-130 weapon system received a significant modification upgrade when Global Positioning System and inertial navigation systems guidance capabilities were added. This combined enhancement provided the AGM-130 weapon system with an adverse weather capability.

Background

For the primary mode of operation, the aircraft flies to a pre-briefed launch position. The survivability of aircraft and crew is enhanced by launching the weapon at low altitude and from a significant standoff range, thus avoiding detection by enemy air defenses. After launch, the weapon flies through glide-powered-glide phases toward the target area with midcourse guidance updates provided by global positioning system navigational information or by the weapon systems officer through the data link.

Upon termination of the powered flight phase the rocket motor is ejected. As the target comes into view, the weapon systems officer has dual flexibility in guiding the weapon via the data link. For automatic terminal homing, the guidance tracker is locked on target but can be manually updated for precision bombing. When total manual guidance is used, the operator manually steers the weapon to the target. For those aircraft not equipped with a data-link pod, the weapon may be launched in a direct attack mode.

The first unit was operational in 1994.

General Characteristics

Primary Function: Air-to-surface guided and powered bomb
Contractor: Boeing Co.

Thrust: Classified

Length: 12 feet, 10.5 inches (3.90 meters)

Launch Weight: 2,917 pounds (1,312.65 kilograms)

Diameter: 18 inches (45.72 centimeters)

Wingspan: 59 inches (149.86 centimeters)

Range: Classified, Speed: Classified

Ceiling: 30,000-plus feet (9,091 meters)

Guidance System: television/imaging infrared seeker man-in-the-loop; autonomous GPS/INS

Date Deployed: 1994,

Unit Cost: Approximately \$450,000 per weapon,

Inventory: Classified.

AIM-7 Sparrow

Mission

A radar-guided, air-to-air missile with a high-explosive warhead. The versatile Sparrow has all-weather, all-altitude operational capability and can attack high-performance aircraft and missiles from any direction. It is a widely deployed missile used by U.S. and North Atlantic Treaty Organization forces.

Features

The missile has four major sections: guidance section, warhead, control and rocket motor. It has a cylindrical body with four wings at mid-body and four tail fins. Although external dimensions of the Sparrow remained relatively unchanged from model to model, the internal components of newer missiles represent major improvements with vastly increased capabilities.

Background

The AIM-7F joined the Air Force inventory in 1976

The New Members Page

For those who have joined recently, here is a recap of the benefits and activities for AAFM. One important facet of AAFM is that the dues have not changed since we began in 1993. Annual dues are still \$20 per year (\$5 for active duty and students), \$50 for three years (\$14 for active duty and students) and \$300 for a lifetime membership. Life membership donations can be made in up to 12 monthly installments. All dues can be paid by mail using a check or on our web page using Paypal. No other credit card options are offered. Our benefits and programs:

- A quarterly, 24 page newsletter featuring articles and stories by members, official news releases and other information. The newsletter is available in full color for those who select the electronic edition, at the end of March, June, September and December. The print, mailed copy, follows the release of the electronic version by about three weeks, and doesn't have color illustrations.

- Email updates monthly or as needed, to every missileer on our contact list.

- AAFM's web page, at afmissileers.org, featuring information about AAFM's programs, a frequently updated "Warble Tone" with the latest news about missileers, meetings, books and much more, including our "Taps for Missileers" list of missileers who have passed away, and more. Access to Greg Ogletree's collection of missile patches and our entire newsletter library are included.

- A Member Directory, updated fully every three years, and with changes as they occur, available free electronically and for a small fee for a print copy.

- National Meetings every two years, always near a base with a missile-related mission.

- Occasional local area meetings at locations around the country and participation in Air Force events, including the Bomb and Missile Competition and others.

- Missile Heritage Grants to museums, donated in memory of members who have passed away, to museums for missile and missile-related displays. AAFM has donated almost \$200,000 to date to museums for displays.

- A large library of publications, videos and CDs about missile history and missile programs.

- A Donations/Store area with a wide variety of logo items, lapel pins and badges, CDs and DVDs, models, books and much more. A link is on our web page.

New Members since 1 July 2015 - Xavier Gagnon, Matthew Langer, James Milliron, Ron Morita, Larry Ostby, Angelica Phillips, David Redding, Artie Riddle, Ricky Schroeder, Rytheon Scott, John Shepherd, Robert Straw, Peter Tencza, Mathew Youngmans.

New Life Members - some converted from annual membership, some are new members - Lee-Volker Cox, Doug Keller, John Lowry, Charles Pegley, Allen Roberts, Peter Pandolfi, Dale Stone, Lawrence Thompkins, Denis Yarosh.



AIM-7

as the primary medium-range, air-to-air missile for the F-15 Eagle.

The AIM-7M, the only current operational version, entered service in 1982. It has improved reliability and performance over earlier models at low altitudes and in electronic countermeasures environments. It also has a significantly more lethal warhead. The latest software version of the AIM-7M is the H-Build that has been produced since 1987 and incorporates additional improvements in guidance. The F-15 Eagle and F-16 Fighting Falcon fighters carry the AIM-7M Sparrow. U.S. and NATO navies operate a surface-to-air/surface version of this missile called the RIM-7F/M Sea Sparrow.

In the Persian Gulf War, the radar-guided AIM-7 Sparrow proved to be a potent air-to-air weapon used by Air Force fighter pilots. Twenty-two Iraqi fixed-wing aircraft and three Iraqi helicopters were downed by radar-guided AIM-7 Sparrow missiles.

General Characteristics

Primary Function: Air-to-air guided missile

Contractor: Raytheon Co.

Power Plant: Hercules MK-58 solid-propellant rocket motor

Thrust: Classified

Speed: Classified

Range: Classified

Length: 12 feet (3.64 meters)

Diameter: 8 inches (0.20 meters)

Wingspan: 3 feet, 4 inches (1 meter)

Warhead: Annular blast fragmentation warhead

Launch Weight: Approximately 500 pounds (225 kilograms)

Guidance System: Raytheon semiactive on either continuous wave or pulsed Doppler radar energy

Date Deployed: AIM-7F, 1976; AIM-7M, 1982

Unit Cost: Approximately \$125,000

Inventory: Classified



“Cobb’s Jinx” Being Readied for Launch

A Matador Story

This article was printed in a newspaper about 1955 and came from AAFM Member Ron Plante, along with the photos, which were found on E-Bay. We had a reprinted article from the *Missileers* magazine, published by the 38th Tactical Missile Wing in Germany, in December 1998. That article was about the Annual Missile Launch Operation (AMLO) conducted at Wheelus AB, Libya.

US Launch “Flying Cigars” Guided Missile Tests on Desert Range

Special - USAF crews last week fired an \$85,000 cigar-shaped Martin-Matador missiles from a rubber-tired launching platform 15 miles from Wheelus Air Base.

This was one of many guided missiles that have been tested on Libya's 200 miles desert range during recent months by rotating teams of about 600 men from USAF bases in Germany.

Motorists passing the test area as well as invited newspaper correspondents saw the 39-foot missile with swept-back wings as, with a shattering roar and a burst of flame, it hurtled from the platform.

It rose swiftly at an acute angle leaving behind a trail of smoke.



A Matador Lifting Off

JATO Take-Off

The Matador gets a rocket-assisted take-off from a “JATO bottle” an expendable apparatus that delivers a 50,000 pounds thrust.

Major General Robert M. Lee, Commander of the US 12th Air Force, recently announced at Wheelus he was very satisfied with the performance and accuracy of the Matador and with the training of missilemen. USAF crews at Cape Canaveral, FL, have been electronically firing Matadors into the sea. These models, like those fired into Libya's remote desert targets, are supersonic missiles powered by Allison turbo-jet engines.

End of Season

The Tripolitania tests, which are now completed for the season, have been the Province's biggest outdoor show since the Flying Saucer season, writes the Sunday Ghibli Aeronautical Correspondent.

They were witnessed by hundreds of people from bleachers erected at the launching site at kilometre 29 on the international coast road east of Tripoli.

New Books for Missileers

Blue Gemini is a novel by Mike Jenne about a secret space mission in the late 1980s. Scott Ourecky has always had a dream to fly, and then finds himself in a highly classified military space program designed to destroy Soviet satellites, Available at Amazon.com.

Random Factor is a novel by AAFM Member Jeffrey Bair and Dawn Henry. The book is a story based primarily at Ellsworth AFB, SD, about a missile crew, and a special single Minuteman launch mission at Ellsworth to counter a new Russian threat. The book also includes a number of other characters in South Dakota, Washington and Russia as part of the plot and the story. A good story by Jeff, who spent time as a missile crew member at Ellsworth, that includes not only a story about missileers, but a look at native American history in the area as part of the story. Available at Amazon.com, listed as *Random Factor: Courage in the Cold War*.

Intercept 1961, The Birth of Soviet Missile Defense, by Mike Gruntman, is a detailed history of the Soviet development and testing of missile defense systems. Available at astronauticsnow.com/intercept1961.

Not for Ourselves Alone by AAFM Member Gary Conine, is subtitled “The Evolution of the Titan II Missile in the Cold War.” The book is much more than a history of Titan, with chapters on the history of the Cold War, early strategic thinking and the development of intercontinental ballistic missiles. Available at Amazon.com.

NORAD and Cheyenne Mountain AFS by J. Brian “Bear” Lihani, is a history of the command and the underground command center., Available at Amazon.com.

AAFM maintains a list of books that are of interest to missileers on our web page in the Books for Missileers section of the Warble Tone.



Marines Raising the Flag

Colors - by Brig Gen (Ret) Allen Rachel, AAFM Mbr No L636, San Diego, CA.

It was early on the Miramar Memorial Golf Course at Marine Corps Air Station Miramar, CA. I have played golf there for over 30 years. I often play early in the morning. At 8 AM we pause for Colors. For military men and women, Colors means you stop what you are doing and pay respect to our flag. A crisp bugle alerts us 5 minutes before sounding Colors. In my peripheral vision, I see my fellow golfers, come to attention and either salute in the direction of the flag or place their hands over their heart. It is soon over, and we are again focusing on our major task...hitting the next shot.

Most of my golfing "buddies" are retired from 25 or more years in the military. We are senior in age and our respective scores validate that observation. We share the camaraderie formed from like experiences in war time. Our "war stories" are embellished as we grow older. We daily remind each other of how far we "used" to hit the ball, a reflection of the effects of father time. But we still talk par golf. We have all of the jargon you hear on the Golf Channel and can explain, in detail, why our errant tee shots behave the way they do. Fat and thin are often heard, as are the terms chunked it, sliced it, duck hooked it, came up on it, over swing or eased up, pulled it, pushed it, and missed it completely. We compete for big bucks and often have as much as three to four dollars at risk in addition to the seven dollar fee required to play in our weekly match.

I sometimes wonder what the world sees as they drive by. From that distant observation they see a bunch of old men, swinging at little balls, with little resemblance to the swings seen on Sunday afternoon at the Masters or the US Open. Perhaps they don't notice at all or they are preoccupied with professional or personal concerns. But, being one of them at age 81, I see much more. I see a friend with over 900 carrier landings and another with artillery experience. The long hitter in our group has recently recovered from a seriously injured shoulder in a parachute mishap. One of our group left us a few months ago but his

15
spirit is with us on hole 17 where he "used" to reach the mound on his drive but no longer could due to the loss of one lung from too many hours in the engine room. One of these folks ran a major medical center and another served as corpsman. Most are retired Navy and Marine folks, but a few are Army and Air Force. Our active duty rank ranged from 0-8 to E-1, but has given away, on the course, to deference recognizing the level of golfing skill. If the passerby could see up close he would see old men competing, playing to win, and auditing each other's handicap index with the fervor that qualifies one to be an IRS auditor. Brought together by the love of golf but forged in friendship through common sacrifices during our active duty service, we assemble each Thursday morning for golf. We gripe, complain, cuss, and whine about world politics, national issues, and the state of readiness of the armed forces. All of it has gone to hell since we left and most of us feel like we can still contribute even at our advance age. When in combat, we knew the risks and experienced the loss of those serving beside us. At the sunset of our lives, we acknowledge the risks, and experience the loss of friends.

In recent years, it has become customary for the public we served to express their appreciation for our service. We seldom express our appreciation to each other, yet we know far more about the risks and heartaches each experienced during our time of service. So how do we show it? We describe each other as sandbaggers when we have to "give" strokes or as a "slow player" when we are waiting to hit our next shot. But our best way of showing our respect for each other is when we stand at attention during the playing of "To the Colors." We tell our wives we are going golfing. We are really going to be with our friends.

Omaha in 2016

We begin registration in this issue for our next National Meeting, to be conducted in Omaha, NE, 12-16 October 2016. The 2016 gathering returns to our normal format of starting on Wednesday afternoon and ending Sunday morning. AAFM Board members will gather on Tuesday, 11 October, for a day long board meeting.

We will begin with registration and the welcome reception on Wednesday, and Thursday will be spent at Offutt AFB for tours and briefings. We will have lunch on base and have invited the Commander, US Strategic Command, to speak at lunch. That evening, we will have dinner and time to tour the Strategic Air Command and Aerospace Museum.

Friday offers a choice of golf or tours of local attractions, including Lauritzen Gardens, the The Spirit of Nebraska's Wilderness and Pioneer Courage Park, the Hot Shoppes and the Old Market. Lunch will be on your own at the Old Market.

Saturday morning starts with our General Membership Meeting followed by the AAFM Board Meeting. That afternoon, an optional tour to the Omaha Zoo will be offered, and our AAFM Banquet is that evening.

AAFM's Executive Director

A couple of times in the past, we have published an article about the future of AAFM and the need for continuity in the "Staff." You all know that there is really only one staff member, a non-paid volunteer, although throughout the years some functions involved with running the organization have been shared by others.

We have asked in the past if any of our members are interested into stepping into the Executive Director position at some point in the future. Your current "staff" isn't ready to leave the position yet, but we always talk about planning ahead. Once again, we are asking if there is anyone out there in our membership who would like, at some future date, to assume the duties of the day-to-day leader of our organization. This move could be gradual, piece by piece, or as much activity as a new director wants to assume.

These are the tasks that the executive director is involved in:

1. Member database and recordkeeping. Includes entering new member data, changes to current members, tracking dues, mailing dues notices and posting dues payments. Once each month we mail 70-150 notices, and at least once per year, a mailing of up to 1,000 followup notices. Our Alpha Five Database program makes these tasks straightforward. Dues receipts are mostly by email, with only about 5 percent by regular mail.
2. Maintaining financial data, including posting dues notices and donation, payments for models and other orders and other income or expense. Requires a trip to the bank once or twice a week to deposit checks. About a third of the payments come from Paypal so no checks are involved.
3. Annual state and federal tax-exempt nonprofit reports. Filed each year with only a postcard for the federal and two online reports for the state.
4. Maintain the web page. Page is in three basic parts, the main page sections, the Store/Donations and the Warble Tone sections. The Warble Tone is updated once or twice a week, the main page once every month or two. Programs are easy to use and quick. The Patch Gallery takes additional time about once every three months as Greg Ogletree adds or changes patches.
5. Newsletter. Put together a 24 page issue once per quarter using Adobe InDesign. Send files to printer, who mails about 1500 copies. Printer sends 200 to AAFM for packages to 12 squadrons. Those with electronic newsletter preference get an email with access instructions and the newsletter is posted on the web page.
6. Email Updates. Send a short update to about 2,300 addresses once a month, more often if necessary. Program sends the majority but some require a separate email from AAFM.

7. Respond to emails, phone calls and letters requesting information about AAFM. Respond to calls from researchers, producers and writers for information about specific systems or issues.

8. Mail orders for items purchased through the AAFM store. Most can be prepared for mailing without using the post office and dropped at the out box.

9. Check AAFM mail three to six times per week and respond to mail.

10. Coordinate AAFM involvement with current Air Force activities at 20th Air Force, AF Global Strike Command, Strategic Command and bases, along with other events. Some are by invitation and some are AAFM initiated. Participate in events as the AAFM Executive Director. This may include speaking at large gatherings during special events.

11. Schedule, organize and manage National Meetings once each two years. Normally includes visit to one or two cities to tour with Convention Staff during the selection process. Communities provide lodging, food and sometimes travel for these trips. Once a city is selected, return and establish contracts for a hotel, tour buses, tour location and meals and arrange military tours. May require one to three more visits between the selection date and the meeting. Accomplish the registration process for the meeting, organize all the meeting events and oversee the meeting.

12. Review new books about missiles and respond to authors, publish reviews in the newsletter and provide information to members on obtaining books.

13. Keep store inventory up to date, ordering replacement items and new items as necessary.

14. Respond to notices of deaths of missileers by posting information on our web page and sending letters of condolence.

15. Request, receive and arrange for board review of annual Missile Heritage Grants for museums. Visit museums to see what AAFM has provided. Complete the grant process by sending checks each year.

AAFM pays all expenses, travel and lodging for all events attended and local expenses like telephone, local travel, etc. AAFM provides a computer system, printers, scanner, and other hardware and related software.

The AAFM budget runs about \$45,000 per year, with the majority going for the grants and postage, printing and mailing for the newsletter, as well as other mailing and printing.

If you are interested in assuming some of these duties at some point in the future, and taking over the entire operation at some later point, contact your Executive Director by email at aafm@q.com or at 970-453-0500. While an immediate transition isn't planned, there will have to be a new "staff" at some point in the next few years.

AAFM is still growing, with 100 to 200 new members each year, replacing those we lose for various reasons. You can ensure the future of a great organization.

A Word from the Association

Board Elections - we will elect/reelect four of our board members in early spring. If you are interested in serving on the board, send us a short resume by email to aafm@q.com. Board members are expected to be available for a day long meeting every two years, the day before our National Meetings.

AAFM Missile Heritage Grants - application forms for museums have gone out, so if you are involved with a museum in your area, ensure they complete a request for funding for the end of this year. We will provide at least \$10,000 again this year in memory of members we have lost since the last grant cycle.

Newsletter Articles - we start a series this issue about missile training - we know there are some great stories out there. Put your story together about your experiences as a student or an instructor and get it to us for a future issue. We trained lots of missileers in lots of different places.

AAFM On-Line - we list a number of on-line sites that are of interest to missileers. One, the Missile Forums, has not been available lately. If you have information about this site, let us know. There are a number of Facebook pages about missiles, some specialized for specific units and others more general by system, specialty or, in some cases, for all missileers. While AAFM maintains a Facebook page, we decided some time ago to let all the others take care of postings for Facebook - we still do it the "old" way with email and our web page, which includes the Warble Tone, which we update often.

Member Directory - AAFM completed an updated Member Directory earlier this year, with listings of every current, past and deceased member. As in the past, we also included sections for each system that includes unit information. The directory is available any time electronically at no cost, in response to an email request from you. We can provide a printed copy for a fee of \$10 to cover the cost of printing and mailing the 70 page document. We add an appendix each year to add new members, but do not provide the detailed system information for these updates. You can also request a list from AAFM at any time by state, unit or system, by mail or email.

Missileer Health Issues - we occasionally get requests from members about health problems that may have been caused or contributed to by missile duty. We provide any technical information we have about any system to those requesting it, and keep a file of all health-related information we receive and provide that file when requested. AAFM doesn't get involved in the processing or filing of health claims but is glad to act as point of contact for those seeking further information about health issues and the possibility that missile duty could have contributed to those problems.

Letters to AAFM

Address letters to AAFM, Box 5693, Breckenridge, CO 80424, or send by e-mail to aafm@afmissileers.org. Letters may be edited to fit - content/meaning will not be changed.

General LeMay - Outstanding newsletter issue. The articles about LeMay were very interesting. He was a great general. His early foray in 1942-43 into the European air war took guts, of which he had plenty. As to SAC's interest and participation in the missile programs, LeMay had to be dragged kicking and screaming. There was no love lost between LeMay and Schriever. LeMay was just one of several senior generals (I don't know the number, only two for sure but was told of others) that strongly resented the management channels established for the missile program and the power given to a newly-minted brigadier general. I experienced some of LeMay's invective manner when a small group of us were to brief LeMay on the program progress at LeMay's headquarters. It was a disaster. Like so many strong leaders, many had big egos, or perhaps it is better to say, a high degree of self-confidence. One outstanding leader I knew who did not have an uber-ego, but had strong self-confidence, was General Doolittle. He was a perfect gentleman. Another general officer who was also a fine gentleman and good leader was Maj Gen Ben Funk. LeMay's accomplishments far outweigh his idiosyncrasies. He was the Air Force's Patton. *Lt Col (Ret) C. W. "Bill Getz, AAFM Mbr No A2254, Fairfield, CA, one of the original members of Gen Schriever's team*

Missiles and Bombers - Great June Newsletter, especially your article on "Our Bomber Heritage". Brought back a lot of memories and some things I had totally forgotten. *Col (Ret) Randy Blanks, AAFM Mbr L412, Woodbridge, VA.*

Mace Vets - I am looking for two people I was in the Mace missile program with at Sembach, Germany, from 1960 to 1962. They are William Abney, who lived in Indianapolis, IN, and William Malone. Malone rotated back to the states late 1961 or early 1962 and was reassigned to Vandenberg AFB. He was a missile mechanic. He was originally from Lebanon, TN. *If you know either of these two, contact Gene Bielinski, bielin@charter.net*

**Is your Personal Data Current?
Mailing Address, Email Address,
Military Record? Dues?**

Ensure you Keep AAFM Advised of Changes

Answers to Quiz on Page 18

1-D; 2-G; 3-F; 4-A; 5-I; 6-C; 7-J; 8-E; 9-B; 10-H.

Send questions to Bill Huey at sacguy@onlineus.com

A Minuteman Quiz - by Lt Col (Ret) Bill Huey, AAFM Mbr No A0376, Newman, GA.

Here is a matching quiz of terms that were familiar to every combat crew member in Minuteman B or Minuteman Mod at Whiteman in 1964-1968. I think they were common to all Minuteman crews at the time. See what you remember. Just match up the items in the numbered list with those in the alphabetical list. **Answers are on page 17.**

- | | |
|---------------|------------------------|
| 1. NAF | 2. 5 BX |
| 3. FSC | 4. Six Four Seven |
| 5. SIN | 6. Fifty-Five Eighteen |
| 7. Bent Spear | 8. K Oh Two |
| 9. FLFIS | 10. KLI 9 or 12 |
- A. Receipt for Positive Control Documents
B. Launch schedule for delayed missiles
C. SAC Missile EWO Procedures Regulation
D. Eighth or Fifteenth for example
E. Active ingredient in Oxygen Regeneration Canisters
F. Last gun before elevator shaft
G. 1960s Air Force Physical Fitness Program
H. Mechanical device used to authenticate Fast Reaction messages
I. Soft communications lines in Minuteman
J. Safety incident involving a nuclear weapon



*The Restored
Lewiston
Minuteman*

Lewistown Minuteman - by Zane Fulbright, Bureau of Land Management

In 1966 the City of Lewistown, MT, partnered with the 490th Strategic Missile Squadron at Malmstrom

AFB to obtain a missile to display in Symmes Park in Lewistown. The project came to fruition on 17 May 1969, with the dedication of the missile as a memorial for military personnel. Col William P. Reed of the Pentagon spoke at the event, and the Ellsworth AFB, SD, band added music for the affair. Ownership of the missile was transferred from the Department of Defense to the City of Lewistown. This site was reported as the nation's first Minuteman missile monument.

The missile had received sporadic maintenance since it was installed, and showed a deteriorated condition. In 2012 the Lewistown Historic Resources Commission conducted a structural assessment of the missile, and in 2013 acquired the appropriate decals, including the SAC stripe. In 2013, AAFM granted the city \$2,500 to help fund structural aligning, body work, repainting, application of the SAC stripe, and new lighting. Other funding for this project came from the Central Montana Foundation (\$1,500). In 2015, the Sons of the American Legion and American Legion Post 16 coordinated the efforts to complete the project. One of the volunteers is the son of one of the coordinators who tirelessly worked to get the missile in 1969.

Taps for Missileers

Lt Col (Ret) Orville L. Doughty, an AAFM Member, served in Atlas in the 579 SMS, in Thor in the UK, in Titan II in the 390 SMW, lived in Tucson, AZ, and was active with the Titan Missile Museum.

Col (Ret) Richard Farkas, an AAFM Life Member, served in Titan II in the 381 SMW and was commander of the 90 SMW with Minuteman and Peacekeeper, in Space Systems and at SAC, and lived in Akron, OH.

Col (Ret) Nick Gaynos, an AAFM Member, served in AFSC, the Western Development Division, and was involved in the conversion of Camp Cooke to Vandenberg AFB, and lived in Post Falls, ID.

Lt Col (Ret) Loyd E. Jensen, an AAFM Member, served in Titan I in the 569 SMS and Minuteman in the 351 SMW, and lived in Houston, TX. Jensen was your AAFM Executive Director's boss in the 569 SMS.

Chaplain (Col, Ret) William L. Rhoads, an AAFM Member, served in the 341 SMW and lived in Tallahassee, FL.

John (Jack) B. Starwas served in Titan II in the 390 SMW. **Col (Ret) Raymond Urbanski**, an AAFM Life Member, served in Minuteman in the 44 SMW, 351 SMW and 90 SMW and in the 3901 SMES, and lived in Warrensburg, MO. **MSgt (Ret) Russel L. Watson** served in Minuteman in the 321 SMW and 341 SMW and lived in Great Falls, MT.

Membership Program for Active Duty Enlisted Missileers

If you are an active duty enlisted member and don't belong to AAFM, complete the form on the facing page and return it to us, or go online to afmissileers.org and complete a registration. Just tell us by e-mail or on the form that you are a new member taking advantage of this special offer.

Donate to AAFM Missile Heritage and Enlisted Recognition Funds

Select logo and collector's items from below for your donation

Missile Badge and Space Badge lapel pins - silver, inch and quarter

Circle Choices - \$5 each or any 6 for \$25

Total Amount for Missile Badge and Space Pins \$ _____



Indicate Quantity of each

Indicate Quantity of each

AAFM Golf Cap \$15 EACH
Quantity _____ Total \$ _____



AAFM Dress Shirts
Call or email for style, colors, sizes and prices or visit our web page for details and to order. Price and availability vary.



AAFM Golf Shirt
Blue _____ White _____
S-\$25 M-\$30 L-\$35 XL-\$35
Limited sizes available
Call or email first for availability



AAFM Brief Case
\$15 each Total \$ _____



AAFM Patch
\$5 each or 6 for \$25
Quantity _____ Total \$ _____



Subterranean Sentinels Patch
\$10 each or 6 for \$50
Quantity _____ Total \$ _____



Reproduction Patches
Made for reunions and donated to AAFM
\$10 each Total - \$ _____ (indicate choices)



341 MIMS _____ 321 OSS _____ 6555 ATW _____ SAC with Stripe _____

AAFM Lapel Pin
\$5 each or 6 for \$25
Quantity _____ Total \$ _____



SAC Lapel Pin
\$5 each or 6 for \$25
Total \$ _____



Minuteman II
100 and 200 Alert Pins
\$5 each 100 _____ 200 _____
Total \$ _____



Guardian Challenge Coins
2006 _____ 2008 _____
\$5 each Total \$ _____



AFSGC
Challenge Coins
\$5 each
2010 _____
2011 _____
2012 _____
2014 _____
Total \$ _____



AAFM Coin - \$10 each
Quantity _____
Total \$ _____

2012 National Meeting
Cuban Missile Crisis and
First Minuteman Alert
Commemoration
Lapel Pins

\$5 each _____ or 3 for \$10 _____
Total \$ _____

Commemorative Patch
\$10 each _____
Total \$ _____

Print - A06 Alert

\$15 each _____ Total \$ _____
Missileers and the Cuban Crisis
Book - Stories by Members
\$15 each _____ Total _____
DVD - Briefings and Talks
\$10 each _____ Total _____

Donate to AAFM Missile Heritage and Enlisted Recognition Funds

Select logo and collector's items from below for your donation

AAFM CD Collections - for research and historical use only - Photos, Tech Orders, articles, publications, other data - For example, Atlas is 8 CDs of data - CIRCLE CHOICES

AAFM and Historical Data CD set - \$10	Early and Airlaunched CD set - \$10	Minuteman CD set - \$10
Atlas CD set - \$10	GLCM CD set - \$10	Titan CD set - \$10
Competition and Peacekeeper CD set - \$10	Matador and Mace CD set - \$10	All Eight CD sets - \$50

AAFM DVD Collections - for research and historical use only - Collections of films and videos from various sources, including documentaries that AAFM advised on - CIRCLE CHOICES

AAFM Historical DVD set - \$10	Competition DVD set - \$10	Minuteman DVD set - \$10
Air Force Space DVD set - \$10	Early/Airlaunched DVD set - \$10	SAC DVD set - \$10
Atlas and Titan DVD set - \$10	GLCM DVD set - \$10	All eight DVD sets - \$50

- Bill McKee's Cartoon Book, "Missile Business" - \$5 Greg Ogletree's "History of the Missile Badge" - \$5
- 1998 AAFM Book, "Air Force Missileers" - \$30 SAC Memorial DVD - Dedication at Dayton - \$10
- Randy Mayse signed print for Malmstrom 25th Anniversary - TE on site - \$25
- Signed/numbered Art Project Print "Countdown - 5,4,3,2,1" - \$20 The Groobers Missile Music CD - \$10
- Print of Joe Andrew's painting, "The Guardians" - \$10

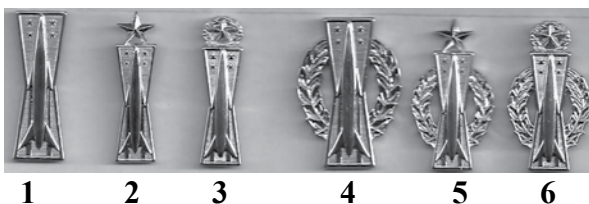
Bob Wyckoff's Collection of Poems - printed on photo paper for framing with background graphics - \$10
 Olympiad, The Unsung, Elegy to a Silo Queen, Birthright, Excellence, Liftoff, Cold War, Victors in the Cold War, Missile Maintainers plus AAFM's "We are Missileers" For the poem Missileer - choose graphics preference - one, more or all
 Original Missile Badge - Basic Senior Master Missile Badge with Ops designator Basic Senior Master
 Space Badge Basic Senior Master

Missile Models - Minuteman I, II and III models - available in white or real colors. Delivery time about two months \$200 each - call AAFM for details and to order or go to our web page to order.

New Manufacture Original Missile Badges or Combat Crew Badge

Note finish and sizes available below - NS is Non-shiny, CF is chrome finish.

FS - full size SS- smaller size for shirt outer wear \$10 Each Total \$ _____



1 2 3 4 5 6



Combat Crew Badge
 NS FS
 \$10 Total \$ _____

Indicate Quantity of each

- 1 - Basic, No Ops Design - NS FS ____ SS ____
- 2 - Senior, No Ops Design - NS FS ____ SS ____
- 3 - Master, No Ops Design - NS FS ____ SS ____
- 4 - Basic, Ops Design - NS FS ____ CF SS ____
- 5 - Senior, Ops Design, not available
- 6 - Master, Ops Design - CF SS ____

Official Chrome Finish badges, any of the six in either full size or shirt size available by special order, \$15 each.

Order and Pay on-line at the Donations/Store area on our web page
 Books and Special Collectibles (pins, prints, etc.) also shown there

Complete the form below and send your check to AAFM to the address below - shipping included

Name:
Address:
City, State, Zip code:
Total Donation

Association of Air Force Missileers, PO Box 5693, Breckenridge, CO 80424

AAFM Twelfth National Meeting, Omaha, NE, 12-16 October 2016

Meeting at the Home of United States Strategic Command

Register On-Line, and use a Credit Card, at <http://afmissileers.org> on the Reunions and Meetings Page

Registration - You must register using this form or on-line no later than 10 September 2016. SORRY - NO WALK-INS

Reservations - Make your hotel reservations directly with the Sheraton Omaha Hotel, and ensure you say you are with Air Force Missileers. Rate is \$89, including breakfast for two each morning. You must make reservations before 12 September 2016. Call 402-496-0850. Hotel is newly renovated and is near Westroads Shopping Center.

Not Staying at the Hotel? - If you are staying in a motor home, other hotel or with friends, or live in the area, you can attend any or all of the events. Complete the reservation form for the events you would like to attend.

Hospitality Suite - Open every day when no other activities are scheduled, with snacks and refreshments. Registration fee covers suite operation and mementos.

Attire - Casual dress for all events. Banquet business casual (open collar shirts, coats optional, no jeans)

Refunds - Registration fees can only be refunded if you cancel by 1 September 2016.

Special Needs - Let us know of any special diet needs, handicapped access, etc.

AAFM Board Meeting - The Board of Directors will meet at the hotel on Tuesday, 11 October.

Schedule of Events -

Wednesday, 12 October - 1300 - Registration, Hospitality Suite open

1800 - Welcome Reception - Stand up buffet and pay as you go bar, \$28 per person.

Thursday, 13 October 0700 - Breakfast (included in room rate)

0815 - Depart hotel for tour of Offutt AFB - lunch on base - \$40 for bus and lunch.

1800 - Dinner at the Strategic Air Command Museum - \$40 per person including bus, dinner, museum

Friday, 14 October 0700 - Breakfast (included in room rate)

Golf Tourney - depart from hotel at 0800 - \$75 per player for golf, cart, range balls at Quarry Oaks Golf Course.

0830 - Depart hotel for Tour of Omaha attractions, including Hot Shoppes, Old Market, Lauritzen Gardens and Spirit of America Sculpture Garden, with lunch on your own in the Old Market. \$30 per person.

1830 - Dinner at the hotel - Italian Buffet - \$30 per person

Saturday, 15 October 0700 - Breakfast (included in room rate)

0900 - General Membership Meeting 1100 - Board of Directors meeting - open to all. Lunch on your own.

1200 - Optional Tour - \$30 per person for bus and tour - Omaha Zoo

1800 - AAFM Banquet with featured speaker and special program. - \$37 per person, choice of beef or chicken.

Sunday, 16 October 0700 - Breakfast (included in room rate), Depart hotel

Registration Form - 2016 National Meeting

Mail with check to AAFM, PO Box 5693, Breckenridge, CO 80424

Name _____		Number	Amount
Address _____	Registration Fee - \$15 each	_____	_____
City, State, Zip _____	Reception Buffet - \$28 each	_____	_____
Phone _____	Base Tour - \$40 each	_____	_____
Number Attending _____	Thursday Dinner - \$40 each	_____	_____
Spouse/Guest Name _____	Omaha Town Tour - \$30 each	_____	_____
Arrive _____	Golf Tourney - \$75	_____	_____
Depart _____	Friday Dinner, \$30	_____	_____
Special Requirements _____	Optional Saturday Tour - \$30	_____	_____
(Enter names as preferred on name tags)	Banquet - \$37 each	_____	_____
Saturday Banquet choices - Beef _____	Chicken _____	Total Amount	_____

For Base Tour

For Active/Retired Military or spouse with ID card - Full name and SSN for each

Member _____ SSN _____

Guest _____ SSN _____

For those without active/retired ID cards, Full Name, State Driver's License No and last four digits of SSN

Member _____ DLNo _____ State _____ SSNLastFour _____

Guest _____ DLNo _____ State _____ SSNLastFour _____

Association of Air Force Missileers
PO Box 5693
Breckenridge, CO 80424

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Reunions and Meetings

390 SMW, all Titan II Vets Invited - 28 September - 2 October 2016, Desert Diamond Hotel Casino, Tucson, AZ
Contact John or Susan Lasher at 520-886-3430 or email slasher@390smw.org or visit the our web site at 390SMW.org.

Strategic Air Command 70th Anniversary Commemoration - Shreveport/Barksdale AFB, LA, 21-24 April 2016.
More details as they become available.

TAC Missileers - 28-30 October 2015, Orlando, FL, contact Max Butler, maxandlois05@gmail.com or 812-307-0187, or go to tacmissileers.org.

Association of Air Force Missileers - Twelfth National Meeting, 12-16 October 2016 in Omaha, NE. Registration on in side back cover and online at afmissileers.org. **Hold your unit reunion with us in Omaha - we do all the work, you have a great reunion.**

Get your reunion and meeting notices to AAFM as early as you can - we will post them on our website and include them in the newsletter. Consider holding your next unit reunion with us as part of our next National Meeting. We do all the work, and you have a good unit reunion combined with a meeting with many other missileers.

AAFM is a non-profit, tax-exempt organization under section 501c(3) of the IRS Code. The Newsletter is published quarterly, printed by Leesburg Printing, Leesburg, FL.

Board of Directors -

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Association of Air Force Missileers, PO Box 5693, Breckenridge, CO 80424 970-453-0500
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