



## AAFAM, Omaha, and 50 Years of ICBMs



AAFAM on the way to STRATCOM

### Omaha in May - Our Recent National Meeting

Our National Meeting in Omaha is over - and by all accounts, it was the best ever. About 170 people attended one or more of the events. The busy schedule began at noon on Wednesday, 19 May, when the hospitality suite in the Omaha Marriott opened for registration. We discovered that several members arrived the day before - we had a good crowd in the suite all of the first afternoon. The evening, about 125 of us gathered for the welcome party, and the Marriott did a superb job for what was much more than the advertised “standup buffet.” Each morning, about 100 of us met for a great breakfast buffet and a chance to visit informally with old friends and make new ones

On Thursday, we had tours and briefings at Offutt, including mission briefs from the 55th Wing, AF Weather Agency, Airborne Launch Control System and STRATCOM. During our luncheon at the Offutt Club, our US Naval Academy Midshipman member, John

*(Continued on Page 8)*

### 50 Years of ICBMs - by AAFM President

*LtGen (Ret) Jay Kelley, Presented at the May 2004 AAFM Meeting in Omaha*

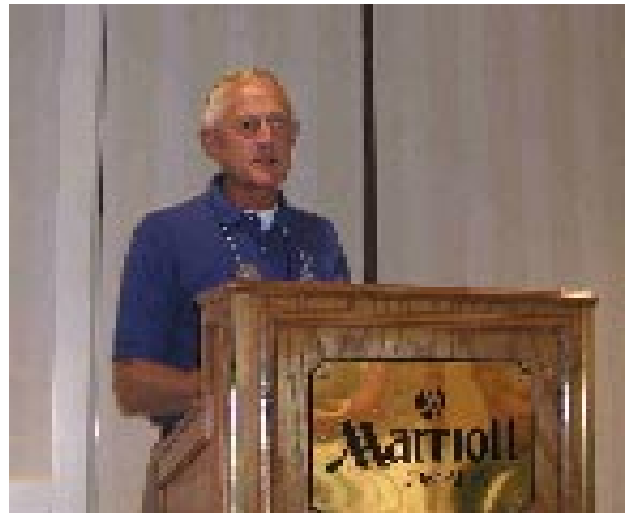
With ICBMs and the AF, it all started a long time ago in a place far away .... and I can tell you it was not a natural act!! Remember, at the end of WW II, the AF asked for and got the V-1.... the great grandfather of today’s UAVs ( Uninhabited Aerial Vehicles)!! It was the Army that got the V-2!!

Our AF, back then, viewed missiles as non-operational, not serious, plus they were considered rather dangerous, and they usually didn’t work! So how could anyone expect a missile to throw a payload thousands of miles, let alone hit a target ?!!

Well, all that thinking changed thanks to folks like Gen King, Gen Schriever, Gen Phillips, many others .. and a few successes!

So let me take the next few minutes and say a few words about the missiles, the strategy and tactics, and the people.

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AAFAM President Jay Kelley at the General Membership Meeting

### 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

## A Word from the Association

**2004 Member Directory** - Most of you should have the new directory by now - we sent over 1400 copies by e-mail in Adobe PDF format to those members with current e-mail addresses, and Bob Kelchner mailed over 450 to those without. If you have not received a copy, let AAFM know - we can provide it by e-mail, on CD-ROM or as a printed document. Keep in mind that each printed copy costs AAFM about \$3 - the e-mail method is a big money saver for us. The 57 page document lists all current members, including address and system and unit experience. It also lists all noncurrent members (by name only).

**Newsletter Content** - as usual, we get a lot of great articles and stories for each issue - if you submitted an article and have not seen it yet - it is in the file for future use. Even with the larger 16 page issues, it is impossible to fit all the superb submissions we get. If you sent us something some time ago and still haven't seen it, remind the editor - we want to print all the good stories but we have lost a couple in the filing system.

**E-Mail Addresses** - with over 1600 addresses on file for our updates, it is a challenge to keep your address current. If you change addresses, make sure you include your name in the message to AAFM and tell us if we need to delete an old address. Note that I still get error messages for most AOL and MSN addresses - but it appears you get the message.

*AAFM is a non-profit, tax-exempt organization under section 501(c)(3) of the IRS Code. The Newsletter is published quarterly, printed by Allegra Print and Imaging, 20905 Western Ave, Torrance, CA 90501, 310-212-7727.*

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**Minuteman Question** - If you know when we started using the Enable Codes in the Enable Control Group, let AAFM know.

**Museums** - Reports on the Altus and Peterson museum projects in the next issue. AAFM member and 577SMS vet Samuel Jones recently represented us and spoke at the dedication of a new exhibit at Altus.

## Letters to the Association

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

**From a former CINCSAC** - To LtGen (Ret) Jay Kelley, President AAFM.

Dear Jay - I want to contact you so that I can say my respect and best wishes to you and, through you, express similar emotions to every one of our SAC Missileers. We are all getting a bit "long in the tooth" but, in my case travelling is no longer an option for me, so I was unable to accept your invitation to Omaha, nor will I be able to make the SAC reunion at Barksdale later in the year. I really regret this turn of events, for reunions such as you are having provide magnificent opportunities to rekindle the warm camaraderie we shared during our active duty days and I, for one, thoroughly enjoy sharing memories and experiences. I was ADO at 15th AF at March when we opened Vandenberg - and I was at Whiteman when they took our missile crews off alert; the intervening 30 years were full ones indeed and many who will be in Omaha lived every minute of those "alert years." I am truly sorry to miss this memorable gathering. Please pass my greetings to everyone in attendance - and say my unending appreciation and gratitude for their magnificent contribution toward our victory in the Cold War. I am glad that Tom Reed is coming - I was always proud to work with him - and for him - for he was the only AF Secretary that was truly an Air Force Officer .... and almost a Missileer!.

Also, he served during the peak of the intense activity on our side that drove the Soviets into self destruction as they tried, unsuccessfully, to keep pace with us! While it may sound maudlin, there is no way to describe my feeling toward you wonderful people of Strategic Air Command - America's greatest combat command, and its successor commands, other than to say that "I love you," and I do! God Bless and keep each and every one of you! Have a great reunion! *Russell E. Dougherty, General, USAF (Retired), CINCSAC 1974-77*

**Rocket Test Stand** - In the March 2004 Newsletter Daniel R. Barker, asked if any other members served at  
*(Continued on Page 3)*

the Rocket Test Facility at Edwards AFB, CA. I arrived at the Rocket Site in November 1959 and served with the 6510th Test Gp (Missile), Thor Test Branch. I worked at Test Stand 1-2, which was an environmental chamber that could accommodate a complete missile. After extensive preparation we finally performed a short, but successful, Thor full thrust engine firing. A short time later the AF decided the program was not cost effective and closed down the operation. In January of 1961 I and a number of others transferred to the 6594th Launch Sq, ARDC at Vandenberg for work with Atlas Agena. *SMSgt (Ret) Max Meyer, MbrNo A1043, San Diego, CA*

**Omaha Thanks** - I wanted to thank the membership for welcoming me to the National Meeting in Omaha. I enjoyed very much the ability to speak with everyone about their missileer stories and experiences. I learned a great deal about what it meant to serve alerts in the missile forces and how vital the maintenance crews were to mission success. No matter where my military career takes me, I will remain a full supporter of the missile forces and hope to contribute wherever I am able. I look forward to the next meeting! *John Topolski, MbrNo SA042, US Naval Academy*

**OAY-04** - We received a number of thank you notes from AFSPC participants in the annual Outstanding Airmen on the Year awards - AAFM is a sponsor of this annual event that recognizes the top enlisted men and women in the command.

## Taps for Missileers

**Col (Ret) Burton C. Andrus, Jr**, an AAFM member, was the first commander of the first Minuteman wing, the 341SMW and lived in Colorado Springs

**LtCol (Ret) Jack Chandler**, an AAFM member, served in Titan II, Minuteman in the 90SMW and 351SMW, at SAC and NASA, and lived in Lompoc, CA

**Col (Ret) Hollis Baker**, who served in Minuteman in the 351SMW and lived in Lompoc, CA

**LtCol (Ret) Glenn Fornes**, an AAFM member, was in Minuteman in the 90SMW and 91SMW, and lived in Denver.

**Col (Ret) Sabato (John) Melone**, an AAFM member, was in Minuteman in the 90SMW, Titan II in the 381SMW, HqSAC and 3901SMES, and lived in Lompoc, CA

**Col (Ret) Gary Neighbors**, an AAFM member, was in Minuteman in the 351SMW, 321SMW and 3901SMES, the Pentagon and Hq SAC, and lived in Waco, TX

## PRESIDENTIAL LAUNCH - *by CMSgt*

*(Ret) Rodolfo (Rudy) Armenta, MbrNo L203, Clovis NM*

Hope you don't mind another story about this infamous 1962 Atlas launch for President Kennedy. This view is from the support side of the house, a perspective yet to be heard from. Here's the untold story of what transpired, prior to, during, and after, that launch, to the best of my recollection. We couldn't ask for a better working environment, our needs in support of this launch were fulfilled to the maximum extent possible. To illustrate, I need to recall an unfortunate incident in which a fellow worker, who will remain anonymous, experienced car trouble on his way to the site (about seven miles from the base proper and ten miles from Lompoc). In order to correct the problem, so he could return home that night, he needed a very common hose clamp which he found in the forward supply point. When he took the part he noticed it was the last one, so as per policy red tagged the bin for restock. Next shift over the blockhouse address system came the announcement, "Base supply is relaying a message to us regarding yesterday's hose clamp work stoppage." We could hear background radio communication. Then we heard our worst nightmare came true "This is Air Force 123 now departing Ogden - have located six clamps. Will this be sufficient?" We all knew we did not have any work stoppage for clamps, however, after a short silence we all responded in unison YES. Later as the story unfolded it was found that someone in supply mistook the red tag to mean work stoppage - the person that started it all, by taking the last clamp, was never the same.

In addition to normal tasking required for a missile launch we were confronted with the responsibility of raising the aesthetic image of the place to a Presidential level. Suffice to say, the blockhouse was scrubbed and polished. The flooring in the control center was polished to a high gloss then covered with brown butcher paper (more on the paper later) held in place with masking tape (this was before duct tape). I doubt if the base operating room was as clean as the blockhouse on that day. Then came the day of the launch - we all went to work looking the best we could. Those that could afford to purchased new uniforms for the occasion. The Warren crew was manning the missile Launch Consoles with the rest of us at our designated support stations. The missile coffin door was rolled back and the missile was erected to 90 degrees. On the blockhouse TV monitors we had one on the missile and the other on the viewing ridge, now vacant except for a flightline follow-me truck with a very large

*(Continued on Page 4)*

**Launch** (Continued) - reflective panel attached to the back. We understood this was so Range Safety could pinpoint the President's location with radar.

After hours of waiting the PA speaker announced "Air Force One is on final." With that, missile launch sequence was allowed to proceed, the boom clamp and the boom continued back to 110 degrees and the fueling sequence was started. After fuel loading was completed a temporary hold was in place. When the announcement came that the President's party had departed the flightline LOX load was initiated. By the time the President arrived at the observation point LOX load was completed. On one blockhouse monitor we could see the President and his party, and on the other the missile covered in white frost with white vapor venting out the boil-off valve. Then came the announcement, "Mr. President, Sir, The missile is ready for launch on your command." It is said that when the President gave the nod someone in his group said "here goes my job." Whether it was said or not we will never know, but I'm here to tell you everyone in the blockhouse said it. The crew commander initiated the launch sequence. Then silence came over the blockhouse. You could hear the banks of relays in the master launch sequence energizing and deenergizing getting the bird ready for flight. A couple of maintenance people standing by the relay racks had new crisp one dollar bills in their top pockets - the best tool to clean and polish dirty relay contacts. On the monitor we could see the venting of white oxygen vapors stop when the boil-off valve closed, meaning that the missile had transferred to internal pressurization. The instrumentation personnel started in-flight data records. Someone in the background started a count down, 10, 9, 8, 7, 6, 5 then no sooner did we hear IGNITION than the blockhouse started shaking and dust was falling from the overhead fixtures. Within seconds instrumentation reported the two inch rise off switch had closed - successful launch - now it was up to the ground guidance crew to get her the rest of the way.

Immediately someone started "GO-GO-GO", but that was short lived, we hadn't got to the second verse when there was pounding on the blockhouse door and an announcement "all personnel must depart the blockhouse and await in the parking lot for further instructions". As we departed, the Warren crew was in various states of dress as they as got into their Sunday best highly starched white coveralls. Having us all form outside could mean only one thing, we would be part of the reception committee for the President. That thought, however, was not long lasting. What waited for us in the parking lot was a

large bus and several mission oriented individuals directing us, in few words, "get on the bus". Our illusions went from being on the reception committee to "What went wrong? Are we being sequestered? Did our bird go rogue?" Our apprehension was somewhat put at ease when we where informed that one volunteer would be allowed to stay behind in the blockhouse during the President's visit. As we departed the parking lot the lucky volunteer, with tongue in cheek, wished us luck and ran back into the blockhouse. To our surprise and relief the ride was a short one, about a quarter of a mile. Just about the time we could see the red lights from the President's convoy coming into view the bus took a turn onto a dirt road that went around a large sand dune, out of sight, and stopped. Then the old "smoke them if you got them, we will be here for about thirty minutes."

After a long wait, the bus headed back to the blockhouse. Approaching the now empty parking lot we could see our volunteer standing in front of the blockhouse door shielding his eyes as if he was coming from a dark room into the bright sun light. Most of us couldn't wait to find out all the details surrounding the President's visit, what was said, and if he got to shake the President's hand. Still with a look of confusion on his face he said he now had a better understanding of the adage "never volunteer". He said that as soon as our bus departed he was told to go to the far end of the launch control center and to start rolling up the butcher paper covering the flooring, and continue rolling all the paper out of the control center down the hall and into the service elevator and down to the basement. He went on to say that as he was approaching the elevator doors a couple of agents pushed him and the now four or five foot paper ball into the elevator, closed the doors and started the elevator down. About the time the elevator was between floors the power went off, every thing got dark and the elevator came to a stop. He heard a voice saying "everything is OK, we will have the power on in just a few minutes - in the mean time make yourself comfortable and be quiet". In retrospect, sitting in a bus behind the sand dune was not that bad, after all. And that is just about the way it went for all of us support personnel that day. With that we all went to our respective areas of responsibilities. Launch pad crew, to the launch pad to inventory damage. Instrumentation personnel, to collect flight data material collected by the numerous flight data recorders. Blockhouse personnel, to get ready for the next bird. And, as for myself the 576SMS QC&E Inspector assigned for this launch, to close out paper work as my charge, thanks to the Warren crew, was now over 4,000 miles away.



EC-135

## The Airborne Launch Control System - Part I -

by LtCol (Ret) Jon McLean,  
MbrNo A2204, Marquette, MI

**Author's Comments** - This article is accurate to the best of my memory. I've been out of the system since 1985, however, and the little gray cells may have a few short circuits. I haven't done anything as rigorous as actual research, mind you, so don't bet the farm on my accuracy. I'm sure that a great many former ALCS crewmembers will be able to detect errors in this article, especially regarding the early days. Some of what follows may seem awfully basic to many readers (and overly detailed to others), but it will probably be new to the folks who worked outside Minuteman. Please refer to the glossary at the end for the acronym definitions.

**The Threat** - Minuteman's basic tactical unit is the squadron. Each of five crews in their own launch control centers monitor and control ten missiles in remotely-located launch facilities. These five flights are interconnected, giving LCCs in the various subsets of the Minuteman system (WS-133A, AM, and B, plus CDB and ILCS in the time frame under consideration) varying degrees of control over the LFs in other flights. Originally, the concept was that a Soviet attack would not destroy all of the squadron LCCs and therefore launch of the Minuteman force was assured. As Soviet missile accuracy improved, however, it became clear that an LCC-only attack could make launch impossible unless retaliation was directed and implemented before LCC destruction. The airborne launch control system (ALCS) was developed in the early- to mid-1960s to counter this threat. (Please note that this was pre-MIRV technology, so an attack on the LFs would have gone a long way toward disarming the attacker.)

**What is ALCS?** - The ALCS mission was, and is, to provide an alternate retargeting and launch capability in the event of the incapacitation of the ground missile combat crews, destruction of the LCCs, or electrical isolation of the LFs. It consists of equipment on specially equipped and crewed aircraft, and UHF antennae and receivers at the LFs. It was part of the SAC's Post Attack Command Control System (PACCS), but now exists only on the STRATCOM airborne command post, which is still called Looking Glass. The aircraft, operated by the Navy, is the E-6B Mercury, which also flies the TACAMO (take charge and move out) mission of transmitting VLF messages to the fleet ballistic missile submarines. ALCS, while not part of Minuteman as originally deployed, has been an integral part of the weapon system since ALCS's development in the mid-1960s.

**Deployment** - The original ALCS crews were part of the 44SMW at Ellsworth AFB, SD and 91SMW at Minot AFB, ND. Fairly soon after the system became operational, the 4th Airborne Command Control Squadron stood up at Ellsworth as part of the 28BW, and ALCS crews transferred to it. There were, during the time I was involved, ALCS crews and equipment stationed at Ellsworth (4ACCS) and at Offutt AFB, NE (2ACCS). ALCS crews and aircraft from Ellsworth pulled alert there, with the 28th Air Refueling Squadron tanker crews (the WAUXCP crews pulled alert at the bomber alert pad), and at Minot, with Minot's 5BW B-52 crews. The ALCS function at Offutt was aboard Looking Glass, the SAC Airborne Command Post. Although an EC-135C was on ground alert there as the CINCSAC Support Aircraft, it did not have ALCS group B equipment (black boxes) aboard in that role. When that aircraft came off alert and returned to the Looking Glass rotation, the ALCS group B equipment was reinstalled. (The group A equipment - racks and wiring - stayed on the aircraft.)

**PACCS** - ALCS was a part of PACCS, which primarily provided airborne command control for SAC forces. The SAC ABNCP (Looking Glass) anchored the system, with operating areas in the vicinity of Offutt and Whiteman AFB (home of the 351SMW, including the Emergency Rocket Communications System (ERCS). Heading east, the East Auxiliary Command Post was next in the chain, followed by Radio Relays 1 and 2, which linked PACCS to the NMCC, ANMCC, and NEACP. To the west were the WAUXCP and ALCCs 1, 2, and 3. A series of ground entry points gave PACCS the ability to access landline communications. An air-to-air-to-ground UHF link para-

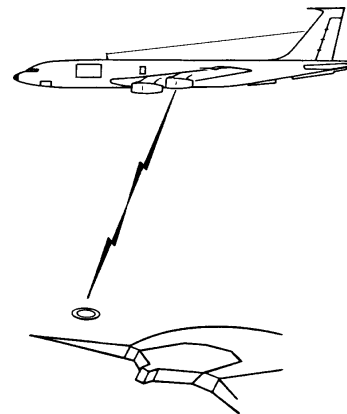
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**ALCS** (continued) - leled the primary alerting system and provided other voice communications. Collectively, PACCS could provide EAMs to SAC bases and airborne aircraft by a number of means, including UHF AM, HF, SATCOM, PAS, and SLFCS. Looking Glass covered Whiteman (351SMW). It was the only sortie on continuous airborne alert. ALCC-1 covered Ellsworth (44SMW) and Warren (90SMW). It and the WAUXCP, which was also ALCS-capable as the system spare, pulled ground alert at Ellsworth. ALCC-2 covered Malmstrom (341SMW). ALCC-3 covered Minot (91SMW) and Grand Forks (321SMW, my alma mater). ALCC-2 and -3 pulled ground alert at Minot, but were based at Ellsworth. The EAUXCP and radio relays were based at Grissom AFB, IN; none had ALCS capability. When 3ACCS at Grissom deactivated, the EAUXCP aircraft and some of their aircrew, battle staff, and comm personnel moved to 2ACCS. Thereafter the EAUXCP had ALCS capability available but was not primarily responsible for any missile wing.

The Airborne Division, Directorate of Command Control was the Hq SAC agency which dealt with PACCS. Within DOCA, the three-man ALCS Branch (DOCAL) was responsible for maintaining the ALCS tech data, monitoring and supporting the APTs, coordinating test missions, publishing the SAC regulations pertaining to ALCS, and interfacing with contractors for system upgrades.

**The Aircraft** - ALCS equipment, during the SAC years, was installed in EC-135A, C, G, and L aircraft, and briefly, in the early 1980s, on the E-4B NEACP while SAC conducted operational testing to determine the feasibility of the E-4B as a replacement SAC ABNCP aircraft. (As it turns out, it wasn't feasible: it cost too much and burned too much JP-4, thus driving the tanker requirements beyond acceptable numbers. It was, however, superbly comfortable compared to the EC-135: quiet, spacious, and even equipped with a microwave, trash compactor, and copier. It was large enough to move around in with comfort, and the nose-high attitude at economy cruise provided some exercise as you walked forward.)

All models of the EC-135 had at least three compartments aft of the cockpit. Compartment 1 held most of the radios, most of the ALCS equipment, and the switchboard. Compartment 2 held the radio operators and radio maintenance technicians, with all their associated control and diagnostic equipment. The ROs set up the UHF radios for ALCC data transmission, and also relayed EAMs. The RMs were the unsung heroes of PACCS: with their airborne performance monitors and soldering irons, they worked magic to keep the equipment operating (or to re-



turn it to operation), thus greatly enhancing PACCS and ALCS reliability. Compartment 3 held the MCC-A or battle staff, depending on the mission. Behind compartment 3 on the C-models were the galley, rest area, and head. On the As and Gs that area held the auxiliary power unit, an electrical generator powered by a small, hot, and very loud turbine engine. All 135s had air refueling capability, like any standard KC-135; they also could receive fuel. (These aircraft were sometimes known as "Christines" for this tanker/receiver capability; the origin of the term is best left unexplained.) This gave PACCS a great deal of flexibility, since the ABNCP battle staff could direct air refueling without stealing a bomber's mated tanker.

The dedicated ALCS aircraft were the A and G models. The L model had been equipped with ALCS in the very early days, but by 1973 when I entered the system the L models were all used as radio relay aircraft. All of these were "water wagons," powered by J-57 turbojet engines. They used demineralized water to augment thrust during takeoff, a feature which introduced some interesting considerations. The water- (600 gallons) couldn't be used in extremely cold weather. This resulted in dumping it on the ramp as the temperature dropped, then refilling the tank as the temperature rose. At the low end of the temperature range in which water was on board, heating was necessary to keep it from freezing. The main impact on the MCC-A was to be sure the heater switches were left on so the crew chief could apply power from the ground power unit without entering the aircraft. If the switches were off (or for any other reason anyone had to enter the aircraft), a team of two positive control crew members had to enter first and deplane last. The pilot, copilot, navigator, and MCC-A were the positive control crew members, so they split the duty. At 0300 on a cold Minot morning, this was not a

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**ALCS** (*continued*) - privilege. The only serious problem I heard of concerning heating water happened at Langley AFB, VA. It seems something went wrong while heating water on an aircraft, and it burned up on the ramp. Oops.

The EC-135A was the best aircraft for the dedicated ALCS mission. The MCC-A compartment looked a lot like a basic KC-135: there was only a fairly large table at the MCCC-A position, a smaller one for the DMCCC-A, a steel box in which to secure the sealed authenticators and other classified, and a couple of extra seats. The MCCC-A position with its large table and multiple seats was ideal for crew coordination during exercises-plenty of room to spread out checklists, targeting documents, call sign lists, crew logs, all the impedimenta of SAC operations. The intercom system was simple, which made it reliable and easy to use. The G-model, while visually impressive-it looked very much like the C-model battle staff compartment-wasn't as convenient. Its internal comm system included an automatic switchboard-complex and unreliable. A- and G-model aircraft were equally noisy.

The C-models were used for the SAC airborne command post and auxiliary command post missions. The most significant difference, particularly between the Cs and the Gs, is the engines. The Cs had TF-33 turbofan engines, and weren't water wagons. The TF-33s were powerful, clean-burning, quiet (think airliner, not tanker), and produced a lot more electrical power. All EC-135s were capable of cartridge start, used only for alert responses. The cartridge was essentially a large black powder shell which, when fired, spun the engine up to starting speed without application of external power. It made for fast engine starts but a lot of smoke. An engine start or taxi exercise at Minot or Ellsworth was pretty impressive; just don't inhale deeply.

The E-4B was used as the SAC ABNCP only during a test program. It had six compartments plus forward and aft lower lobes and the upper deck, air refueling receiver (but not tanker) capability, and, of course, no water to heat. It never pulled ground alert as the SAC ABNCP, only as NEACP. The ALCS positions were at the rear of the battle staff compartment, facing aft, with the MCCC-A on the starboard side (right as you face forward) and the DMCCC-A on the port side. A rack adjacent to the DMCCC-A held most of the ALCS equipment. The circuit breakers were in the aft lower lobe - an inconvenience - but most of the upload took place at the two crew positions, which greatly simplified code

control. **Watch for Part II in September**

## Glossary

ABNCP: airborne command post  
 ACCS: airborne command control squadron  
 AEAO: airborne emergency actions officer  
 AFCC: Air Force Communications Command  
 ALCC: airborne launch control center  
 ALCS: airborne launch control system  
 AM: amplitude modulation  
 ANMCC: alternate national military command center  
 APT: airborne procedures trainer (ALCS simulator)  
 ARC-89: UHF radio set used by ALCS (5 per aircraft)  
 ATM: automated teller machine  
 AUTO: automatic launch command (combines enable and ELC)  
 AUXCP: auxiliary command post  
 BMAT: ballistic missile analysis technician  
 CCC: classified command control switch (inside CPA/CPE)  
 CCTS: combat crew training squadron  
 CEP: circular error probable (retargeting mode which maximizes accuracy)  
 CDB: command data buffer (remote retargeting capability)  
 CLIP: cancel launch in process  
 CPA: code processor assembly (KI-21)  
 CPE: code processor equipment (KI-45)  
 Deuce: WS-133B (Sylvania ground system, often called Minuteman II, hence the nickname)  
 DMCCC-A: deputy missile combat crew member-airborne  
 DPU: data processor unit  
 EAM: emergency actions message  
 EAUXCP: East AUXCP  
 ELC: execute launch command  
 ERCS: emergency rocket communications system (AKA 494L)  
 EWO: emergency war order; often refers to wartime conditions  
 FKE: fracturable keying element  
 FSK: frequency shift keying  
 HF: high frequency  
 ILCS: improved launch control system (A-M with CDB capability and LGM-30F missile)  
 JP-4: jet propellant type 4  
 LF: launch facility  
 LCC: launch control center  
 LCP: launch control panel  
 LFRT: launch facility radio test  
 Luger: 2nd ACCS ALCS code custodian  
 MCC-A: missile combat crew-airborne  
 MCCC-A: missile combat crew commander-airborne  
 MFT: missile facilities technician  
 MOD: WS-133A-M (also called Force Mod, as in modernized)  
 MRT: minimum reaction time (retargeting mode which prioritized speed over accuracy)  
 NEACP: national emergency airborne command post  
 NMCC: national military command center  
 ORT: operational readiness training  
 PACCS: Post Attack Command Control System  
 PAS: primary alerting system (SAC's voice landline system)  
 PSM-6: multimeter used by Titan II crews for troubleshooting  
 RM: radio maintenance technician  
 RO: radio operator  
 SAC: Strategic Air Command

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**ALCS** (*continued*) - SATCOM: satellite communications  
SELM: simulated electronic launch—Minuteman  
SIOP: single integrated operational plan  
SLFCS: survivable low frequency communications system (AKA 487L or 616A)  
SMS: strategic missile squadron (now missile squadron)  
SMW: strategic missile wing (now space wing)  
STRATCOM: United States Strategic Command  
TACAMO: take charge and move out (Navy communications mission)  
UHF: ultra high frequency  
VKA: volatile keying assembly  
VLF: very low frequency  
WAUXCP: West AUXCP  
WSSR: weapon system safety rules  
Websites  
System designations: <http://www.designation-systems.net/usmilav/projects.html>  
2nd ACCS home page (lots of good photos, including ALCS equipment and people): <http://www.2accs.com/>  
Lots of interesting material, including a good (and short!) article about ALCS by Bill Huey: <http://www.siloworld.com/>  
ALCS WSSRs:  
<http://www.fas.org/nuke/guide/usa/doctrine/usaf/91011700.pdf>  
STRATCOM ABNCP: <http://www.stratcom.mil/factsheetshtml/ABNCP.htm>



*The Four Chiefs - Hines, Kelchner, Kenderes, Andrew*

**Omaha** (*Continued*) - Topolski, told us a little about life at the Naval Academy. That evening, we had dinner and toured the Strategic Air and Space Museum, with an Italian buffet catered by Access 66 Catering of Omaha. The museum was disappointing to many of us because they have done a poor job of displaying missile artifacts. Even though we had specifically asked the museum director to discuss the situation and future plans with us, he only talked about the 9/11 Display, the recent Star Wars movie display and other issues totally unrelated to SAC, ICBMs and Air Force missiles.

Friday, some of us played golf (our art project artist, Darrell Anderson, won our tourney) and others toured the Henry Doorly Zoo and Durham Western Heritage Museum. That evening, we had a western trail dinner - another superb meal by the folks at Marriott.

Saturday morning, we had a superb general membership meeting, with over 120 in attendance. Former Secretary of the Air Force (and as an AF lieutenant, he worked on the Mark 11 RV for MM) Tom Reed gave a fascinating summary of his new book about the Cold War, *At the Abyss*. Gary Powers, Jr (son of the U-2 pilot) told about his Cold War Museum project, to be located in Virginia outside Washington. Our project artist, Darrell Anderson, told us about the progress of our art project. At the board meeting, with 10 of our board members present, the board selected Cheyenne at the site of our 2006 National Meeting - probably in the late September-early October 2006 time frame. Mike Lehnertz was elected as vice president to replace Jim Burba, at Jim's request, and the other officers, Jay Kelley, Bob Kelchner and Dayna Castro were reelected for another two year term. The board also discussed nominating an officer and enlisted missileer pioneer for the Space Foundation's Hall of Fame - that project is currently in work. The board also agreed to incorporate the membership of the GLCM Heritage Foundation into AAFM, at the foundation's request. That evening, about 160 of us heard a superb talk by Admiral James Ellis, Commander of STRATCOM. He was introduced by Gen Lance Lord, Commander, AF Space Command. Looking Glass, a group that is part of the Air Force Band of the Heartland, entertained us at the end of the evening. All agreed that the Marriott Hotel did an exceptional job in all respects, with great food, superb facilities and excellent service.

Start thinking now about 2006 - our planned meeting in Cheyenne, with informative tours of Warren and even a visit to an Atlas site, will make it an even better event. The folks at Cheyenne are already working to make it a great meeting, and we have already starting making the arrangements for 27 Sept - 1 Oct 2006.



*AAFM Board Meeting*

## 50 Years (Continued) - The Missiles

Named for Greek Gods and American heroes... Jupiter, Thor, Atlas, Titan and Minuteman, Wow !! It just doesn't get any better than that!

And while initially we were considered by many to be a "joker in the hole", by the time of Cuba in '62 and for the rest of the Cold War and on to today, we are respected as America's "Ace in the Hole" !!

Initially, it seemed to take forever to get it up and loaded, but soon enough, the boys out west ( the Western Development Division, WDD )gave us the capability to stay loaded and launch from the hole or silo. Big deal! Really big deal!! This reduced launch time from many 10's of minutes to less than five! That's huge!

We learned about things like LOX, RP-1, hypergolic, N2O4, and UDMH.

We dressed up in RFHCO, chased BFRC's and became conversant in PPM!

We installed start cartridges, stages, and RVs and checked engine gimbals, monitored tank pressures, and changed G&C cans.

We also learned about the importance of little scratches on that thing called an RV!

We learned a whole new language!

We operated first in "coffins" and only later in silos!

We talked about Oscar and Alpha 9, 3155FB, Deuce, Mod, Shape 2, Mk 11C with Mk1A.....damn it was great!

Our systems were not designed for re-launch, although we discovered at Vandenberg AFB and Ellsworth AFB, that we could indeed do it ... we just needed some of that space age stuff called ... pucky!

We loved our hard rock silos and hated the "squish and squash" of some of that mid-west geology.

We learned about nuclear effects ..... overpressure was pretty straightforward, but EMP ( Electro Magnetic Pulse) and neutrons were something else entirely .... but we adapted ... surge arrestors forever!!

And our reliability and accuracy steadily improved. Today we even have our own version of a "glass cockpit" ..... we call it REACT!

And while I am on the missile, I must take exception to a comment my good friend Gen Lance Lord made the other day. He said that Titan II IOC was Apr 62 and that MM I IOC was Dec 62, and here is where I take exception, "and making Titan II obsolete!" Now I gotta tell ya, being a Titan guy, back then we looked at MM I as a bottle rocket with a B-B on it!! Back in those

days it took a lot of B-Bs to make up for that Cannon ball setting on top of our Titan!! Of course I also have to admit that times have changed and accuracy and yield have improved and there's no doubt about the effectiveness of MM ... today!

## Strategy and Tactics

When the ICBMs began to enter the Cold War, planning moved beyond the NSTAP (National Strategic Targeting and Attack Policy) and basic "massive retaliation" with Attack Options 1,2,3,4.

And while initially, missiles may have been more dangerous and vulnerable than powerful and effective, it was the thought that counted ... we knew we were on the right track for America!

Assured Destruction and Damage Limitation became terms of strategy and we moved beyond the NSTAP and "4 Charlie" to selective response, NSDM 242 and SIOP 5.

We moved from a strategy of launching them all to being able to launch just one.....from AO 1,2,3,4 to limited options, selective options and major options.

And it all came from the SAC Senior Controller, Skybird this is Drop Kick, copy.....

We studied and executed IAW 55-18 and 55-28, while we listened to Looking Glass, and we launched IAW with the SIOP and the FL / FIS.

Initially, the concern was just getting the missiles launched and out of the hole as soon as possible ..... but soon enough, other factors entered in.

Nuclear effects and vulnerability on this end became a concern....we didn't want all our missiles in the air in boost phase at the same time.....just in case of a lucky enemy strike ... but neither did we want them to get caught in the hole!

So we came up with "ripple" and "wave block" launch times .... to stagger 'em and spread 'em out.

Some will even remember the early 70s and the huge conflict with America's Safeguard ABM and the impact its fire-out and intercept had on ICBM launch !! Let's not forget that learning as we deploy America's National Missile Defense system!

But launch times are also controlled by time on target considerations, so we had to worry about, flight time, re-entry angle, target altitude, defenses, friendly forces ( bombers, fighters and SLBMs) and our own weapons and weapon effects ( fratricide).

And then add in that new thing called a MIRV (Multiple Independently Targeted Re-entry Vehicle), and things really got complex. A lot of stuff coming down real

(Continued on Page 10)

**50 Years** (*Continued*) - fast with extraordinarily tight timing .... to the second!

I remember while at the JSTPS ( Joint Strategic Target Planning Staff) we used to talk about “measuring the target with a micrometer, marking it with a grease pencil and smashing it with an axe” As time has moved on and capability right along with it, we can hear similar comments today .... but with important improvement. We still talk about “measuring it with a micrometer, but now we mark it with a crosshair and then poke it right in the eye!”

## The People

Our heritage and learning came from the bomb groups of WW II .... the B-17s and B-24s .... and so did our leadership!

My first wing commander, DO, squadron commander, chief of standboard and chief of training were all pilots from WW II. And nearly every other key position in the wing down to crew commanders were filled by aviators of one type or another. Our wing structure was just like a bomb wing.

We learned operations and maintenance from our air brothers. And then, only then ..... were we allowed to step up. And step up we did!

We even got our own missile badge, the beloved pocket rocket ..... part of the original criteria was that it couldn't be bigger than wings nor even look like wings! And it doesn't!

And we all wore the same badge, ops, maintenance, officer, enlisted. We loved it!!

At least we did until the ops designator was added! Disagreed then and still do today!

We had an ICBM travel team back then. Went anywhere and everywhere. Briefed every new general that came into SAC and most of the ones at the Air Staff we could get to listen us. And when we were done, we pinned a missile badge on 'em. We wanted them to understand missiles and we wanted their buy-in! And we usually got it!!

Remember the BMSC, the Ballistic Missile Staff Course ? Best darn staff course ever ! It taught the AF about missiles and most all the DoD for that matter, uniforms and civilians alike!!

We pulled 8-10 alerts a month plus had recurring weapon system and EWO training.

On alert, we had the launch keys and “cookies” around our neck and guns on our waist! The “cookies” were the positive control documents, the PC. They were a bit brittle at times and we were always afraid that dur-

ing the 2-3 hours of rest we MIGHT get during the alert, that we might roll over and crack or break the PC. Big deal! That meant the entire SAC Alert Force had to change out documents. And of course YOU got to explain this dumb stunt to your wing commander!

We didn't know what our target was, just a TIDGZ ( Target Island Desired Ground Zero). But we knew the “Heartland” .... America's Heartland. It's where we lived and worked and operated and maintained and secured America's Strategic Deterrent Force. We knew the farmers and landowners around every LF and LCF, the gas station owners, what places were open to eat and where the chow was best at anytime day or night, and every sheriff and police officer around . .we knew the Heartland!

We had MCCCs and DMCCCs and BMATs and MFTs and MMTs and EMTs. Remember that old ditty, “I'm a lousy ole deputy and I sit on the right. I'm very courageous and wonderfully bright. My job is remembering what the captain forgets and he makes no mistakes so I have no regrets”! Remember that? That too came from our air brothers!!

We knew tech data, and checklists, the -1, TCCPs ( Tactical Countdown and Continuation Procedures) and PARPs ( Post Attack Readiness Procedures), we could make it work when it didn't want to work ! All in a world of EWO, tight timing and no mistakes !

Some of us got to take a bird to Vandenberg for a Glory Trip OT (Operational Test) shot. What a great experience ..... at least it was unless you got cross-wise with Jack Watkins who seemed to command at 1STRAD forever!!

We earned our way, we established and matured a career field ... we taught our AF about missiles .... and we learned how to be part of our AF warfighting team!

And your missileers are still doing that today as they engage the AoAs ( Analysis of Alternatives) presently underway.

And there's one more thing ..... we are deeply indebted to our air brothers and our contractor parents who gave us the opportunity to become the World's Greatest Missile Force!!

*Gen Kelley gave a similar presentation as part of the 20th Space Symposium on 1 April in Colorado Springs and as part of the Missile and Space Panel Discussion at Guardian Challenge in May.*

## The Missile and Space Organizations - 20th Air Force

This new feature was the idea of members at our recent National Meeting - one or more missile and space units will be highlighted each issue.



**History** - Twentieth Air Force was established 4 April 1944 under the direct command of General Henry H. Arnold at Washington DC. In 1944, 20AF B-29 Bombers flew missions throughout Southeast Asia, China and the Japanese home islands. In January 1945, MGen Curtis LeMay took command of XXI Bomber Command at Harmon Field, Guam and on 16 July 1945, Headquarters 20AF moved from Washington to Guam. With over 1,000 superfortresses, the B-29s flew daily missions against the Japanese islands. 20AF bombers carried the first and only wartime atomic bombs. On 6 August 1945, the Enola Gay dropped the first atomic bomb on Hiroshima. Three days later, Maj Charles W. Sweeney, flying Bock's Car, dropped the second one on Nagasaki. The headquarters moved to Kadena AFB, Okinawa on 16 May 1949, and inactivated at Okinawa on 1 March 1955. The Air Force reactivated 20AF at Vandenberg AFB, California on 1 September 1991. After the inactivation of Strategic Air Command, 20AF transferred to the newly formed Air Combat Command. On 1 July 1993, 20AF transferred to Air Force Space Command (AFSPC) and relocated to Warren Air Force Base, Wyoming on 1 October 1993.

**The Unit and the Mission** - 20AF maintains responsibility for all intercontinental ballistic missile (ICBM) operations. At its reactivation in 1991 it exercised operational command over six combat missile wings and one training and test wing. The mission included taking all 450 Minuteman IIs off alert, leaving 500 Minuteman III and 50 Peacekeeper missiles providing the country's primary land-based nuclear deterrence. By July 1998, the Air Force inactivated the 44th Missile Wing, Ellsworth AFB, the 351st Missile Wing, Whiteman AFB and the 321st Missile Group, Grand Forks AFB, along with the 310th Training and Test Wing. 20AF replaced the older Minuteman IIs at Malmstrom AFB, Montana, with Minuteman IIIs from Grand Forks. 20AF performs

its mission at Warren AFB as a tenant of the 90th Space Wing (SW). The Moscow Treaty signed by President Bush and President Putin in May 2002 mandated further deep cuts in operationally deployed nuclear weapons and prompted the deactivation of the Peacekeeper missile. On 1 October 2002 the 90SW performed the first removal of a Peacekeeper missile. 20AF reports to AFSPC as one of two numbered air forces and USSTRATCOM, with its operational responsibility for the nation's ICBMs. In its day-to-day operations, 20AF organizes, trains, and equips ICBM forces under AFSPC. 20AF moved ahead with sustainment programs to ensure the nuclear deterrent remained viable into the year 2020. Modernization programs like the Guidance Replacement Program and Propulsion Replacement Program for the Minuteman III fleet and alert facility upgrades promise to keep the remaining weapons on alert well into the next century. Force reduction continues to impact future ICBM force structure as 20AF moves toward a single weapon system, Minuteman III.

**20AF Today** - 20AF performs its deterrent mission with 500 remaining Minuteman III missiles and a steadily declining force of Peacekeeper ICBMs. Completion of Peacekeeper deactivation is planned for fiscal year 2005 with further reductions in deployed nuclear warheads expected. 20AF exercises operational control of three wings: The 90SW, Warren AFB, WY; the 91SW, Minot AFB, ND; and the 341SW, Malmstrom AFB, MT. The ICBM wings controlled missiles deployed over an area of over 45,820 square miles in Colorado, Nebraska, Wyoming, Montana and North Dakota. Approximately 9,600 military and civilian personnel operate, maintain and support the weapons on 24-hour alert.



## The Missile and Space Organizations - 90th Space Wing



**History** – The 90th Bombardment Group (Heavy) was activated on 15 April 1942 flying B-24 Liberators. After training the unit flew combat missions throughout the Southwest Pacific assigned to Fifth AF. They moved to the Philippines in January 1945 bombing railways, airfields, and harbor facilities on the Asiatic mainland. The group moved to Ie Shima in August 1945, and after the war flew reconnaissance missions over Japan. The group inactivated on 27 Jan 1946. The 90th Bombardment Wing, Medium was reactivated on 2 January 1951 and served as an operational training unit for B-29 aircrews and mechanics. Redesignated the 90th Strategic Reconnaissance Wing, Medium, on 16 June 1956, they flew air refueling missions and served as an RB-47 combat crew training wing. The unit was discontinued on 20 June 1960. The 90th Space Wing was activated 1 July 1963 with the original designation of the 90th Strategic Missile Wing. Warren AFB became the nation's first operational Intercontinental Ballistic Missile (ICBM) base with the introduction of the Atlas missile in 1958. In the early 1960s, 200 Minuteman I missiles replaced the Atlas. Unlike previous weapon systems, these had the capability of being fired from hardened and widely dispersed underground silo launchers. The first Minuteman missiles deployed at Warren were the "B" models, with single warheads. These missiles incorporated significant advances beyond the liquid-fueled, remote-controlled Atlas missiles. During the early 1970s, the SAC ICBM Force Modernization Program began, replacing Minuteman I with Minuteman III missiles. In November 1973, the 400th Strategic Missile Squadron marked the transition by becoming the first all Minuteman III squadron at Warren. In 1988, 50 Peacekeeper missiles were brought on alert in modified Minuteman III missile silos. The 90SMW was redesignated the 90th Missile Wing on 1 September 1991 and was redesignated the 90th Space Wing on 1 October 1997.

**The Unit and Mission** - The 90SW was selected as the first missile base to upgrade Minuteman III Launch Control Centers (LCCs) with the Rapid Execution and Combat Targeting (REACT) modification. Existing LCC's had not been upgraded significantly since being brought on line in the early 1960's. REACT replaced the outdated command and control consoles with a single, integrated, computer system. Major improvements in automation allowed combat crews to more rapidly process message traffic and carry out execution orders if needed. As a result of mandated cuts in deployed nuclear warheads under START I, the 90SW was directed to reduce the fleet from three warheads to single warhead configuration. On 6 August 2001, the 90SW completed the conversion all 150 Minuteman IIIs to single warheads. In response to the 2001 Nuclear Posture Review and the 2002 Moscow Treaty the 400MS began deactivation of the Peacekeeper missile system. On 1 October 2002, the 90SW performed the first removal of a Peacekeeper missile.

**90SW Today** - The 90SW employs about 3,500 military personnel and 930 civilian employees. Family members of assigned military personnel add another 5,445 to the local population. The wing controls 150 Minuteman III missiles and a declining force of Peacekeeper ICBMs. The Minuteman III and Peacekeeper missiles are deployed over a 12,600-square mile area in three states: eastern Wyoming, western Nebraska and northern Colorado. They are dispersed in hardened silos to protect against attack and connected to 20 underground missile alert facilities through a system of hardened cables. Launch crews consisting of two officers perform around-the-clock alert in launch control centers. Final deactivation of Peacekeeper missiles is planned for fiscal year 2005.



*Titan I Crew*

## The IG is Coming, Part III, Recollections of the early SAC IG Missile Team - by Col (Ret) Frank D.

*Bailey, AAFM MbrNo AI1971, Scottsdale, AZ*

Thanks to AAFM for the excellent manner in which you keep alive our recollections of the marvelous development of the Intercontinental Ballistic Missile Program, particularly of the Strategic Air Command in my case.

Your request for information concerning the SAC Inspector General (IG) operation, as it related to the ICBM force, prompted my attempt to recall events beginnings in 1962 when the SAC IG was expanded to include missile specialists to provide inspection coverage for units manned within the six different ICBM systems (Atlas D, E, & F, Titan I and II and Minuteman). These systems were in various stages of being brought up to EWO alert ready status.

My entry into the ICBM program came following 10 years as Bombardier/Radar Navigator on B-29 and B-47 aircraft. My initial assignment as a Titan I Guidance Control Officer to the 451st Strategic Missile Wing at Lowry AFB was an enlightening experience as the missile sites were still under construction and we spent many hours observing the Martin Marietta construction force and getting acquainted with the missile facility. Shortly after being checked out as a missile crew member, I was startled to receive orders assigning me to the SAC IG at Offutt AFB in Nebraska.

On August 1, 1962 six officers with varying levels of experience reported to the SAC IG assigned the new IG Missile Branch, Aircraft Operation and Training Division. They were: Majors Frank Bailey, Gordon Carmichael, Richard Dunkin, William Flaughter, Captains Robert Eve and Preston Maddocks. Colonel Milton Connell, an aircraft inspector, was the Branch Chief. This

group included an Atlas D MCCC, Atlas F MCCC, Atlas D Guidance Officer and a Titan I Guidance Officer. (Can't recall the exact background of the other two officers.) Subsequently assigned during the first year were LtCol Robert F. Mullin as Chief of Missile Operations Section, Major John Snyder and CWO Robert Sands, Maintenance Specialist. Initial assignment was for two years. MGen. S. W. Wells, the SAC Inspector General, provided emphatic direction that the missile units were to be held to a high degree of accomplishment both in operations and maintenance areas. He repeatedly emphasized that precise adherence to technical data was imperative in all areas but particularly to be stressed among the maintenance people coming from the aircraft units where some errors could be corrected after "test hops". A carry-over habit from aircraft maintenance was the accumulation of extra spare parts and strong attention was given to curtailing this practice.

After an intensive period of preparation in planning of procedures and checklists the team began a hectic two years of inspecting combat missile crews EWO launch procedures, maintenance and housekeeping practices, training effectiveness, staff administrative compliance, and determining the operational readiness of the missile units.

In addition to traveling with the SAC IG aircraft inspection team to wings that included both aircraft and missile units, the SAC missile inspectors augmented the three numbered air force IG teams to inspect missile units at bases in their commands. Very few of the early missile systems would meet the launch time criteria established to insure launch of our ICBMs before arrival of enemy missiles. Early-on more units failed than passed the Operational Readiness Inspection (ORI) phase of the inspection. Higher headquarters concern was apparent as the missile team was dispatched several straight weeks (out on Sunday and home on Saturday for clean laundry) to conduct an ORI inspection at a different unit each week. In February 1963 we were sent to Warren AFB one week and sent back the next week. Over a dozen missiles were exercised before one met the launch timing criteria. Someone commented that the landscape of Wyoming and Colorado was densely dotted with "popsicles".

Some other unusual experience occurred during the inspection visits. Many were disappointing to the inspectors as well as to the missile unit members. At an Atlas F unit, two inspectors had observed a successful inspection including the missile "launch" phase. While the missile was still topside the 10 members were cleared to leave the site which necessitated passing close beneath

*(Continued on Page 14)*

the "loxing" missile. As they drove off the site they glanced in their rear view mirror just in time to see the missile blow up. Ironically, passing the ORI was dependent upon the success of this missile.

Upon completion of the two year IG assignment four of the original missile inspectors were assigned to 1STRAD at Vandenberg AFB, then commanded by MGen Wells. My assignments there included 1STRAD Director of Quality Control and Evaluation. Our responsibility was to oversee the Vandenberg-peculiar functions related to Titan and Minuteman Operational Test (OT) missile launches. These special missiles were selected at SAC Headquarters, taken off alert at designated missile units, removed from silos, brought to Vandenberg. installed by the missile unit maintenance personal then launched by a unit missile combat crew. Another significant 1STRAD QC function was insuring that each missile launch tube was protected as much as possible from launch damage and correctly refurbished after each launch.

In 1969 I was reassigned to the SAC IG as Chief, Missile Maintenance Branch. Missile Inspection Division. Five years had passed since the first ICBM IG inspection team had been organized and many changes in organization and inspection results had occurred. The missile inspection team reflected a higher degree of experience, manning had increased, the missile fleet (Minuteman I & II and Titan 11) was an extremely reliable force, and missile units and personnel had significantly increased in experience and performance. This second IG tour was the most satisfying and rewarding of all my Air Force assignments.



*The Minot Roughriders*

**AAFM and GC04** - Jay Kelley, Jim Burba, Bob Kelchner and your executive director all attended Guardian Challenge this year. Once again, AAFM provided a coin for each participant, and members Jay Kelley, Tom Neary, Dirk Jameson and Frank Klotz took part in a superb panel discussion on missiles and space. Jim Burba (the Voice of the big Board in the early 1970s) introduced Gen Lord at the final night's banquet, score posting and awards.



*Minot Crew S-261*

## Guardian Challenge 2004 - AFSPC

*News Service, Guardian Challenge Public Affairs*

The Aldridge, Blanchard and Schriever Trophies were presented to AFSPC's top space and missile warriors during a ceremony on 6May at Vandenberg AFB. The 21SW, Peterson AFB, CO, earned the Aldridge Trophy, which is awarded to the best space operations wing. The 91SW at Minot AFB, ND, took home the Blanchard Trophy for best Intercontinental Ballistic Missile space wing, and the 45SW at Patrick AFB, FL, captured the Schriever Trophy for best space launch wing.

"Tonight, we honor you - the finest space and missile professionals in the world," said BGen Douglas M. Fraser, director of Air and Space Operations at Headquarters AFSPC. Functional area winners were: best code controllers, 341SW, Malmstrom AFB; best chefs, 90SW, Warren AFB; best helicopters, 341SW; best space communications, 460ABW, Buckley AFB; best missile communications, 91SW; best security forces team, 91SW; best space launch maintenance team, 30SW, Vandenberg AFB; best missile maintenance team, 341SW; best space launch operations crew, 45SW; best space operations crew, 20SPCS; best missile operations crew, S-261, 91SW; best missile operations team, 91SW; best space operations team, 21SW. Guardian Challenge assesses Air Force Space Command's mission readiness as teams from throughout the command challenge each other to determine which unit is the best of the best in their respective fields. The competition provides the testing ground for the combat capabilities key to America's space and missile professionals while investing in esprit de corps.

## Air Force Celebrates First 50 years of Space and Missiles - *By Jenna K. McMullin, AFSPC Public Affairs*

*K. McMullin, AFSPC Public Affairs*

What was once a secret society of space power visionaries is now a fraternity of pioneers whose belief that the Air Force could fly higher, farther and faster is realized every day by the service's space and missile professionals. Brought together to recognize the 50th anniversary of Air Force space and missiles at the 20th Space Symposium April 1, five visionaries reminisced about the leaps and bounds such programs have made and what the next step is following the first half of the first century of the space and missile era. "It's not well understood how the military has been at the forefront of developing the technologies we use in space," said MGen. Michael Hamel, 14th Air Force commander and panel moderator.

The technologies General Hamel referred to encompass today's satellites and intercontinental ballistic missiles. The roots of this space advantage trace back to the 1954 establishment of the Western Development Division, which was the first Air Force office dedicated to the advancement of space and missile concepts. Led by General Bernard A. Schriever, WDD was the catalyst for the rapid development of satellites and missiles - the first players in the space race between the U.S. and Russia. "I didn't realize the pressure that was on the program to be successful," LtGen (Ret) Forrest S. McCartney said. BGen (Ret) William G. King, Jr., related stories of meetings at the geophysical lab at Hanscom AFB, MA, and the early trials of getting the American public and Air Force members to understand what the space program was all about. But, the early successes of the launch program validated its existence.

"In 1960, we had six space launches, which was one every two months. In 1961, there were 20 launches, or one every 18 days. In 1962, 29 launches - one every 12-and-a-half days," General King said, and then turned to General Hamel in jest. "How many did you have last year?" While the groundwork was being laid for the satellite and launch portion of Air Force space programs, "the boys out west" - as LtGen (Ret) Jay W. Kelley called the WDD - were developing America's third leg of the nuclear triad, the ICBM. Also motivated by Soviet advances, American missile endeavors sought to exploit new rocket propulsion technologies, new warheads and new computer-based methods of targeting. With early missile names of Thor, Delta and Titan, they became prototypes for today's Minuteman III and Peacekeeper forces. "While we were considered by many to be the joker in the hole,

when it came to Cuba and throughout the Cold War, we became America's ace in the hole," said General Kelley. With the foundation laid by the WDD and these space and missile trailblazers still in place, space and missiles became key components of the warfighting Air Force. Often referred to as the first space war, 1992's

Operation DESERT STORM was a coming-of-age occasion for space and missile forces as joint direct attack munitions made their major conflict debut and troop use of military satellite communications flourished. General Moorman called the conflict a referendum for the creation of Air Force Space Command 10 years earlier.

"I maintain [Operation DESERT STORM] was the first war where the full range of space capabilities came to bear," General (Ret) Thomas S. Moorman, Jr., said. From that point on, space and missiles have continued to gain momentum in both the military and commercial sectors. Modern society's reliance on space technology is exhibited by satellite television providers, the prevalence of Global Positioning System in activities ranging from golf to fishing (General McCartney called GPS the "sweetheart" of space systems), and most critically on the battlefields of recent military operations. Enabling warfighters to perform surgical strikes, to communicate instantaneously with remote portions of the globe, to warn of theater missile attacks and to deter adversaries via the ICBM force, today's space and missile developments are more important than ever. "Space is a routine, reliable and regular part of our military structure," General Hamel said. Future issues space and missile technologies may confront include potential threats to capabilities, looking at how to avert such threats and the advent of responsive launch capabilities, said LtGen (Ret) Eugene D. Santarelli.

AFSPC will celebrate the anniversary throughout 2004. In addition to the panel at the Space Symposium, the command plans to recognize the anniversary at military events around the country, each AFSPC wing will have their own activities recognizing their heritage, and the annual induction ceremony of the Space and Missile Pioneers Hall of Fame Aug. 30 through Sept. 2 will have an anniversary theme. "Throughout the anniversary year, our goal is to inspire a greater understanding and appreciation of the strides made during the space and missile era," said Maj. Corvin Connolly, command lead for the anniversary celebration. "Our heritage is important to us, and this anniversary is a tremendous milestone of space power." The space and missile leadership panel will reconvene in May at the 37th Guardian Challenge at Vandenberg AFB, Calif.

## AAFM Board Members

Last issue we had the results of our recent election and the bios of two of our new board members - here are short bios of the other two newly elected members who joined our board in May. Ten of AAFM's board attended the 2004 National Meeting. Your board members represent experience in almost every Air Force missile system and specialty.

CMSgt (Ret) Mike Kenderes served as a Titan 1 Electronic Maintenance Technician in the 451SMW at Lowry, Minuteman I Ballistic Missile Analyst Technician, Minuteman II Targeting Team Quality Control Evaluator and Curtain Raiser competitor from the 90SMW at Warren, 3901 Strategic Missile Evaluation Squadron (SMES) Evaluator for Minuteman I and II, and ICBM Maintenance Manager for 8th Air Force Headquarters. He was also the Noncommissioned Officer in Charge (NCOIC) of Quality Control Inspections and the Team Training Branch in the 341SMW at Malmstrom AFB, Montana, the NCOIC of the 3901 SMES Minuteman Evaluation Team at Vandenberg AFB, and the NCOIC of the Air Force Operational Test and Evaluation Center (AFOTEC) Peacekeeper ICBM test team at Vandenberg AFB. Following his retirement from active duty in 1985, after 25 years of service in missiles, Chief Kenderes spent a further 13 years working as an Aerospace Field Engineer for GTE Corporation, supporting the Air Force in the deployment of the Peacekeeper system and in the implementation of the Rapid Execution and Combat Targeting (REACT) modification for the Airborne Launch Control System and ground operations. He and his wife Martha live in currently resides in Santa Maria, California.

CMSgt (Ret) Mark Silliman started his missile career in the 321SMW as an Electro-Mechanical Team member, and served as a team chief, instructor, evaluator, weapon system controller and technical engineer at Grand Forks. He was in launch analysis in the ISTRAD at Vandenberg, at SAC Headquarters in ICBM Requirements, at Headquarters, Air Combat Command, also in Requirements, and at Headquarters, Air Force Space Command as the major command missile maintenance functional manager. He was superintendent of quality assurance, maintenance superintendent and commander's technical supervisor in the 90th Logistics Group at Warren, the Command Chief Master Sergeant in the 341SW at Malmstrom, and the Command Chief Master Sergeant at 20AF at Warren. He retired in 2003 and now lives in Colorado Springs, Colorado.

## Reunions

**321SMW/MW/MG**, 13-15 August 2004, Grand Forks, ND - **Canceled**

**390SMW (Titan II)**, Tucson, AZ, 29 Sept - 3 Oct 2004, Tucson, contact the Lashers at elainelasher@aol.com.

**51st Munitions Maintenance Squadron**, October 2004, Tucson, details when available.

**567SMS (Atlas)**, 22-26 September 2004, Branson MO, contact Jim Henderson, 6628 Dare Cir, Columbia, SC, 29206-1127, phone 803-782-2977, e-mail chieftarheel@webtv.net

**1st, 11th, 69th Pilotless Bomber Squadrons**, 6-10 October 2004, Secaucus, NJ (across the river from New York City), contact Micky Hart, 156 East 2nd South Preston ID 208-852-1863, e-mail qhart@plmw.com

**Sampson AFB Veterans** - looking for folks who were at Sampson AFB, NY, contact Chip Phillips at 716-633-1119, e-mail chip34@aol.com

**TAC Missileers**, 2005 in Nashville, contact Joe Perkins at 904-282-9064 or e-mail PERKSTER@FCOL.COM

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