Your Magazine for Air Force Weather

OBSERVER

Feb/Mar 2000

What's Inside

ON THE COVER

Pre-jump equipment check

This issue focuses on Special Operations Forces and Army support. Weather plays a unique role in their ability to fulfill their mission objectives. Pictured on the cover are Master Sgts. Ron Kellerman and Ralph Ley. Kellerman (left), performs a Jumpmaster inspection on Ley (right), for a High Altitude Low Opening parachute jump. All items required for a mission must be carried in the attached rucksack. Oxygen masks, like those worn by Kellerman and Ley, are used if jumping from altitudes above 12,000 feet.

Photo by Senior Airman Carrie Minks
16th Communications Squadron

OBSERVER

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GUIDELINES FOR TODAY

In-Sync...Army Weather Support

By Brig. Gen. Fred P. Lewis
Air Force Director of Weather

Our Air Force Weather reengineering efforts have always focused on improving support to Air Force and Army warfighters, operators and trainers, and reducing the workload on weather personnel wherever possible. This reengineering process has been both an Air Force and Army effort as we work together to synchronize the Army modernization and AFW reengineering programs, concepts and procedures. Our AFW reengineering concept of operations has provided the foundation for this synchronization effort, and the hard work and teamwork of Air Force and Army personnel have allowed us to take advantage of the best ideas and programs both services have to offer. This edition of ***The Observer*** brings you several articles on how we are synchronizing Army and Air Force weather concepts, programs, and training.

> *To keep pace...we have picked up the pace to better synchronize the Army's modernization efforts with AFW's Reengineering.*

In the 1999 Almanac Edition of ***The Observer,*** I laid out how the Expeditionary Aerospace Force concept will make our reengineering plans work even better, and how we took action to include Army support taskings in the EAF construct also. We have continued to refine our reengineering and EAF plans to ensure we keep the "EAF predictability contract" with all our people—Army and Air Force. These refinements have taken into account the Combat Brigade Team concept, as announced by the Army last fall.

The Army's CBT concept calls for rapid development of a medium-weight force with the footprint of a large brigade but significantly greater lethality. The force would have the responsibility to deploy anywhere in the world within 96 hours. To achieve sufficient punch and still be deployable, the brigade will depend on reach-back for many of the services the divisions provide for themselves today. This plan meshes well with AFW reengineering and the Air Force's EAF concepts—it did not require us to change our reengineering vision or concept—we just wove it into our reengineering plans.

To keep pace with continually changing Air Force and Army warfighting concepts, we have picked up the pace to better synchronize the Army's modernization efforts with AFW's Reengineering. We saw the chance to re-vector or accelerate programs to more quickly improve support to the warfighter while reducing workload on our own weather people.

The Army's modernization effort, Force XXI, is moving into the digital Command, Control, Communications, Computers, Intelligence and Strategic Reconnaissance arena to provide commanders with information superiority and allow them to make better decisions on a leaner battlefield. One goal is to provide a seamless C2 capability from the strategic echelon to the foxhole and be interoperable with joint and combined systems. Our AFW Reengineering is in-sync with this vision. When totally synchronized, Army Modernization and AFW Reengineering efforts will provide the best opportunity to give more accurate, timely, and relevant weather support to Army operators while at the same time provide the opportunity to reduce manpower on the battlefield.

The key to effective synchronization of Army Modernization and AFW Reengineering centers on four areas; 1) efficient concepts for operating the Integrated Meteorological System, 2) receipt of Meteorological Satellite data and imagery at the CWTs, 3) robust communications between CWTs, the Air Force Weather Agency, and regional Operational Weather Squadrons, and 4) automated weather observations disseminated from the area of operations.

IMETS—For effective use on the battlefield, weather information must be fully integrated into the

Army's command and control structure Army Battle Command System. The IMETS, integrated with the ABCS, provides Army warfighters at all echelons with access to an automated weather system that receives, tailors, and disseminates weather observations, forecasts and weather/environmental effects decision aids to all battlefield functional areas within the ABCS. We are working to find ways to quickly make the IMETS lighter and easier use to support both the Army's IB and the AF EAF vision.

METSAT—Army CWTs require high-resolution METSAT imagery and Environmental Data Records to perform their mission. Numerous exercises and contingency deployments, to include Operation ALLIED FORCE and Task Force Hawk, have demonstrated the importance the warfighter places on METSAT imagery. A high-resolution METSAT system must give CWTs an indigenous capability to receive and ingest high resolution imagery and required EDRs with enough flexibility to allow CWTs to tailor equipment to meet the warfighters requirements for a reduced equipment footprint on the battlefield.

COMMUNICATIONS—Army CWTs must maintain connectivity with the AFWA, regional OWSs, and other CWTs. The AFW developed Tactical –Very Small Aperture Satellite Terminal acquisition project will meet this need. Initially, T-VSAT will provide an interim one-way push of weather information to Army CWTs within the broadcast footprint. Meanwhile, CWTs must use common-user or Army-provided communications systems to communicate with other CWTs and back-channel communicate with the AFWA and regional OWSs. Eventually, we must meet the Army CWTs more stringent requirement for two-way, worldwide assured secure communications of sufficient bandwidth to receive weather data from higher echelon CWTs, regional OWSs, and the AFWA.

AUTOMATED OBSERVING— One of the primary goals of Army Modernization and AFW Reengineering is to reduce the footprint of the CWT on the battlefield. The Remote/ Expendable version of Observing System 21 provides an opportunity to reduce manpower required at Army CWTs to take observations. This system is also an automated observation sensor suite to be used in data sparse or data denied areas. The system will have an expandable capability for addition of mission-specific sensors (i.e. soil moisture, soil temperature, water temperature, stream flow, etc.). We want to purchase and deploy these systems soonest to reduce deployed observing workload.

RESULTS EXPECTED—Army Modernization and AFW Reengineering have allowed CWTs to make a fundamental change in how support is provided to the warfighter. AFW Reengineering creates regional OWSs to focus on *what the weather is going to be over the area of operations* and allows CWTs to focus on the *mission-specific operational impacts* of the weather. Army Modernization allows CWTs to seamlessly integrate weather information into all echelons of Army C2. Together, Army Modernization and AFW Reengineering will leverage the capability of the AFWA and regional OWSs to provide high quality, centralized weather forecast products, thus streamlining CWT functions to reduce the footprint of forward-deployed forces.

As you will read in this Observer edition, AFW reengineering is already providing tangible improvements in weather support to joint, combined and Army operations in Korea—and it's happening in the other theaters too! The United States Forces Korea J3 said, "the weather products are accurate and exactly tailored to our needs…great job!" The 17th Aviation Brigade Commander also commented on the increased level of support and said, "best weather support received in my 22 years in the Army!" These are just a few examples of the kind of improved warfighter support that represents what AFW reengineering is all about—and it's the weather person in the field that is making the vision a reality!

The other Army-related articles in this edition will provide greater insight into how we are all (Army and Air Force personnel) working together to achieve the AFW Reengineering vision in support of Army and Air Force modernization efforts. These are indeed exciting times to be a part of the AFW community improving weather support operations—— and our customers, the operators, the trainers, and warfighters are taking notice! As I have said before—it is truly amazing what we have done and can do as a team.

With the Combat Weather Teams, the OWSs, the AFWA and our Army weather counterparts all working as a ***TEAM***; we are proving our reengineering effort does work! We need to stay the reengineering course and we need each of you stay with us as a part of the AFW team—the best operations-focused weather team there is today!

AIR FORCE COMBAT SPECIAL OPERATIONS COMMAND WEATHER TEAMS

When most people think of AFSOC weather personnel assigned to Army special operations units, they think of Airmen trudging through swamps or hiding somewhere high in a remote mountain pass. Once on target, he sends back an observation and single-station forecast to a waiting aircraft, or ground commander who will make the go/no-go decision to attack the target. Although this is one scenario of what AFSOC Combat Weather Teams (Airborne) do, there are many other facets to their exciting and demanding job.

The majority of weather personnel that provide Army special operations support are assigned to the 10th Combat Weather Squadron, headquartered at Hurlburt Field, Florida. The 10th CWS is comprised of five detachments and one operating location. Additionally, two other overseas units are assigned to forward-deployed Army special operations units that are not part of the 10th CWS.

Army conventional and Army special operations weather units provide much of the same types of services. Both kinds of weather units deploy for long periods, get dirty, sweaty, and nasty, while providing critical weather information to their customers.

While conventional units operate out of tents, the back of a Humvee, or a 5-ton expandable van, special operations units work almost anywhere using small, portable equipment. The biggest difference in their missions is how they "get to work" and the size of the weather teams deployed forward.

AFSOC personnel assigned to Army special operations units are all jump qualified. They have the capability to "go to work" by air, sea, or land. This increases the employment options available to force commanders. Unit personnel are often deployed in small, one or two-man elements directly attached as a member of an Army special operations team.

Personnel must have

See AIR FORCE p.6

AFSOC Combat Weather Team (A) members take a tactical observation.

AFSOC CWT (A)s and associated Army units

a. Detachment 1, Fort Lewis AIN, Wash.; assigned to the 1st Special Forces Group (Airborne) [SFG(A)], and the 2d Battalion (Bn), 75th Ranger Regiment (Rgr Rgt).

b. Detachment 2, Fort Campbell AIN, Ky.; assigned to the 5th SFG (A), and the 160th Special Operations Aviation Regiment (Airborne) [SOAR (A)].

c. Detachment 3, Fort Carson AIN, Colo., assigned to the 10th SFG (A).

d. Detachment 4, Fort Benning AIN, Ga., assigned to the 75th Rgr Rgt.

e. Detachment 5, Fort Bragg AIN, N.C. assigned to the 3d SFG (A), and the 7th SFG (A).

f. Operating Location-Alpha, 10th CWS, Hunter Army Airfield, Ga.; assigned to the 3d Bn/160 SOAR (A), and the 1st Bn/75th Rgr Rgt.

g. Operating Location-Alpha, 320th Special Tactics Squadron, Torii Station, Japan, assigned to the 1st Bn/1st SFG(A).

h. Operating Location-Alpha, 321st Special Tactics Squadron, Stuttgart, Germany, assigned to the 1st Bn/10th SFG(A).

AIR FORCE cont. from p. 5

the knowledge, skills, and confidence to provide the weather products required. There is a lot of responsibility put on these young Airmen and it takes a special type of person to handle this job.

The AFSOC CWT (A) mission is to provide specialized meteorological, environmental, and oceanographic services for worldwide employment with joint special operations forces. This mission statement sounds as if it could be applicable to almost any weather unit in today's Air Force. The difference, however, is that these weather personnel are attached to units that perform some of the most unique and hazardous missions in today's military.

The Army Green Berets, Rangers, and 160th Special Operations Aviation Regiment are the Army's best. Being assigned to an AFSOC CWT (A) requires the combat weatherman to possess unique skills to move, shoot, and communicate with his Army special operations element as a team member, not as a liability.

Consequently, select members are trained in maritime operations, mountain/arctic/jungle and desert warfare, military free-fall infiltration, water infiltration, and are proficient in foreign languages required by his Army special operations commander.

Of all the missions that an AFSOC CWT (A) has, the special reconnaissance mission is the one most people associate with the teams. Being attached to an Army special operations team is an experience like no other. These teams expect their weatherman to be the expert in his specialty and highly qualified in other areas such as communications and special weapons.

The SR mission is conducted when there is a need to obtain or verify, by visual or other collection methods, information concerning the capabilities, intentions and activities of an actual or potential enemy. It is also conducted to secure data concerning the meteorological, hydrographic, geographical, or demographical characteristics of a particular area. It includes target acquisition, area assessment, and post-strike reconnaissance.

Even with all the technological advantages available today, it is an accepted fact within the intelligence community that nothing can replace human, or "eyes-on," intelligence in a tactical environment. The AFSOC CWT (A)s provides this capability.

Technical Sgt. Jeff Barker constructs a tactical visibility chart after SCUBA infiltration to a coastal area.

The demands and hazards of their mission breed an amazing amount of esprit de corp. Units are comprised of a tight-knit group of personnel. These personnel have earned the right to wear the "grey beret." Only 124 weather personnel in the weather career field are authorized to wear the "grey beret."

This puts added visibility on everything they do. Col. Keith Grimes first introduced the "grey beret" during the Vietnam War. One reason he obtained authorization for his men to wear the "grey beret" was he felt they deserved special recognition for the missions with which they were involved. Most of those missions are still classified today.

Another reason he requested authorization was because of the arduous training all personnel had to endure prior to acceptance to his unit. Not everyone successfully completed the training. Today, both factors remain the essence of the "grey beret." The burden on each unit to provide initial qualification and recurring training is heavy.

Technical proficiency training is practiced continuously like at other weather units. There is, however, much more tactical proficiency training necessary because of all the additional tactical skills required. The personnel assigned to the special operations units are up to the challenge. They have all volunteered for this type of duty with the intent of giving 110 percent everyday.

Part of giving their all starts at 6:30 a.m. every morning during Physical Training. PT at these units has changed over the years; it isn't all push-ups,

See AIR FORCE p.7

Combat weatherman graduates from ranger course

Staff Sgt. John Sosa and his wife, Amanda, at his graduation from Ranger Class 3-00. Sergeant Sosa is the only current Combat Weatherman to earn a Ranger tab.

By Technical Sgt. Hoover E. Hodge Jr.
10th Combat Weather Squadron

HURLBURT FIELD, Fla. (Night Flyer News Service) — An Air Force Combat Weather specialist has earned the right to wear the U.S. Army's Ranger Staff Sgt. John C. Sosa graduated from the Army's Ranger Course, Feb. 18. Sergeant Sosa is assigned to Detachment 4, 10th Combat Weather Squadron, Fort Benning, Ga.

His graduation from Ranger Class 3-00 has earned Sergeant Sosa the distinction of being the only current member of the weather career field to be "Ranger tabbed."

As a Combat Weatherman, Sergeant Sosa is charged with providing weather to the 3rd Battalion of the 75th Ranger Regiment.

The Ranger Course is 61 days long. Course members average 19 hours of training each day, seven days a week. Training is non-stop and intense. It is divided into three phases: the Benning Phase held at Camp Rogers and Camp Darby, Fort Benning; the Mountain Phase held at Camp Frank D. Merrill near Dahlonega, Ga.; and the Florida Phase held at Camp James E. Rudder, Eglin Air Force Base, Fla. The emphasis during the course is on practical, realistic and strenuous fieldwork. A goal of the course is to develop individual leadership abilities through the application of the principles of leadership.

"John is an outstanding example of the type of young airmen and NCOs we have in the 10th Combat Weather Squadron," said Lt. Col. Scott Funk, 10th CWS commander. "This training will enable him to go forward with his Ranger customers as a team member, rather than as a liability, pushing weather forward and keeping a weather eye on target. The experience he is gaining is invaluable."

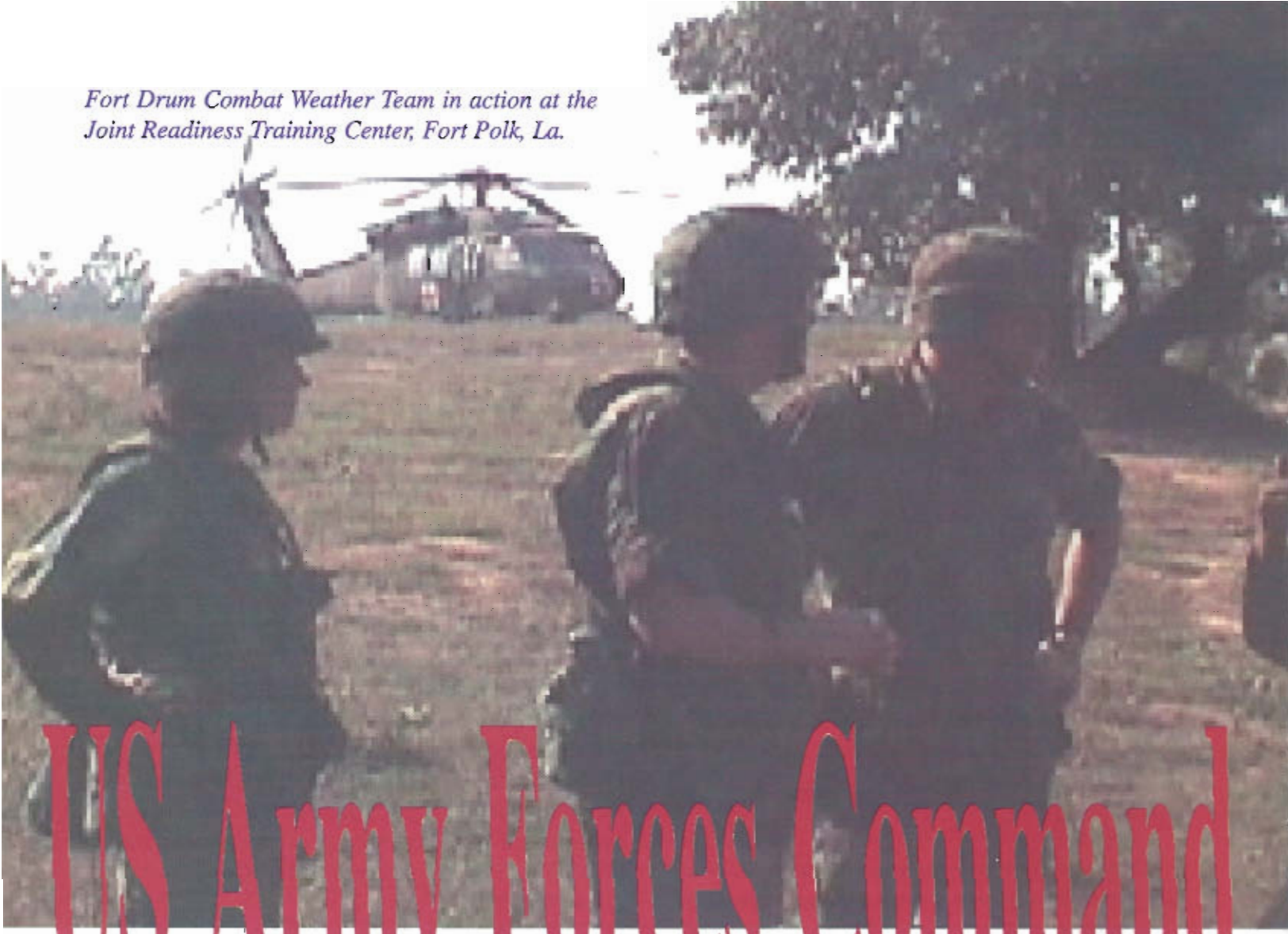
According to the colonel, Sergeant Sosa understands that in order to make the weather mission successful, Combat Weathermen have to be intimately familiar with their customer's operations and know when to inject weather intelligence into the mission planning or execution process.

"Our goal in the 10th, and within Air Force Special Operations Command, is to provide our weather operators with the skills to move, shoot and communicate successfully with our customers," said Colonel Funk. "Our paradigm is weather forward because our customer demands it."

AIR FORCE cont. from p. 6

sit-ups, and running. It is a well-rounded program geared to strengthen all of the muscles and preparing the body to handle the same stresses encountered in the field. An example of what a one week PT period might consist might be: swimming on day one, a 20-mile road march with a weapon and 50 pound rucksack on day two, weight training on day three, calisthenics and a 3-mile run on day four, and running the obstacle course on day five.

Being assigned to an AFSOC CWT (A) is the toughest job that the Air Force Weather career field has to offer. Still, when asked, team members indicate they wouldn't trade their jobs for any "regular" weather assignment. They deploy on exercises and real world missions with little fanfare and little or no public rewards due to the inherent classified nature of special operations. Frankly, they prefer it that way.



Fort Drum Combat Weather Team in action at the Joint Readiness Training Center, Fort Polk, La.

US Army Forces Command

By Technical Sgt. Hoover E. Hodge Jr.
10th Combat Weather Squadron

US Army Forces Command is the Army's largest major command. It is headquartered at Fort McPherson, Georgia, and consists of more than 760,000 Active Army, US Army Reserve and Army National Guard soldiers. These soldiers account for approximately 85 percent of the Army's combat power.

FORSCOM trains, mobilizes, deploys, and sustains combat ready forces capable of responding rapidly to crises worldwide. FORSCOM develops and cares for people, optimizes available resources, develops quality installations and establishes major facilities to project power globally.

FORSCOM is the Army component of US Joint Forces Command. Joint Forces Command's mission is to provide US military forces where needed throughout the world and to ensure they are integrated and trained as unified forces ready for any assigned task. The FORSCOM commander serves as commander of the Army forces of this unified command. The mission includes planning and providing military support to civil authorities, including response to natural disasters, civil emergencies, and weapons of mass destruction events anywhere in the United States.

FORSCOM has 11 major installations, including the National Training Center at Fort Irwin, California, and the Joint Readiness Training Center at Fort Polk, Louisiana. The Active Army of FORSCOM has nearly 200,000 soldiers. Third US Army, also located at Fort McPherson, is the Army component of US Central Command, the joint command responsible for Southwest Asia and the Horn of Africa. FORSCOM also commands two Army Corps:

III Corps at Fort Hood, Texas and XVIII Airborne Corps at Fort Bragg, North Carolina. Together they include six divisions, two armored cavalry regiments, five separate brigades, and a range of other corps combat, combat support and combat service support units.

Two Continental US Armies, First US Army at Fort Gillem, Georgia and Fifth US Army at Fort Sam Houston, Texas, are responsible for training, mobilization and deployment support to Reserve Component units in FORSCOM. A major subordinate command of FORSCOM, the US Army Reserve Command, also headquartered at Fort McPherson, Georgia, commands all US Army Reserve units in the continental United States, except those assigned to Special Operations Command.

FORSCOM's Army Reserve strength stands at about 196,000 soldiers. USARC units are part of the federal force and make their primary contribution to FORSCOM combat power in combat support and combat service support specialties such as medical, civil affairs, transportation, maintenance and supply. Many USARC units are designated to deploy early for contingency operations worldwide.

The ARNG provides FORSCOM a balanced force of eight National Guard combat divisions, 15 enhanced separate brigades, and extensive combat support and combat service support units. The current FORSCOM ARNG strength is approximately 367,000 soldiers. Mobilizing the ARNG into active federal service would bring the total strength of FORSCOM to nearly 85 percent of the Army's combat ground forces.

US Army Signal Command, located at Fort Huachuca, Arizona, also falls under control of FORSCOM and provides all Echelon Above Corps tactical, power projection, and strategic signal support to warfighting unified commanders, as well as Army component commanders, in both war and peace.

WEATHER SUPPORT TO FORSCOM

Weather operations are also diverse and demanding. Weather support to FORSCOM's Active Army units comes from dedicated Air Force weather teams aligned under three Air Support Operations Groups: 1st ASOG at Fort Lewis, Washington; 3rd ASOG at Fort Hood, Texas and 18th ASOG at Pope AFB, North Carolina. A weather squadron for each ASOG makes up the corps combat weather team.

Each Army division has their own dedicated CWT. These CWTs are aligned under an Air Support Operations Squadron or one of the weather squadrons at their respective installations. Corps and division CWTs are authorized enough personnel and equipment to support a variety of missions at the various Army echelons. Currently, there are nearly 350 Air Force weather authorizations supporting various echelons across FORSCOM.

2D WEATHER FLIGHT

2d Weather Flight was formed in 1994 out of the remaining weather assets from 1st Weather Group after the reorganization of continental US weather units supporting the Army. Under this reorganization, weather units were aligned with Tactical Air Control Party units, forming ASOGs and ASOSes. 2WF, commanded by Col. Douglas C. Pearson, consists of nine active duty military members, three Individual Mobility Augmentees, and two civilians.

It is aligned directly under 18th ASOG and its main missions are to provide staff and operational weather support to commanding generals of FORSCOM and Third US Army, the Army component of US Central Command. It is also responsible for weather support to the First CONUSA at Fort Gillem, Georgia and the Fifth CONUSA at Fort Sam Houston, Texas, through the IMAs. On a daily basis, half of the unit serves as weather functional manager for Headquarters, FORSCOM and its subordinate units, while the other half provides staff and operational support to Third US Army.

US Army Forces Command

FORSCOM WEATHER TEAM

The FORSCOM weather staff interacts with all echelons of Army, the ASOG staffs, MAJCOM/MACOM staffs, unified command staffs, and Headquarters, Army/Air Force, on weather topics and initiatives. One important effort was the development of a survey for each weather unit's Army Modification Table of Organizational and Equipment.

Follow-up actions, with the support of FORSCOM's Directorate of Logistics, enabled those units with a lower-than-average filled MTOE to be substantially upgraded to meet wartime mission readiness. Weather personnel at FORSCOM are now key members on FORSCOM's Aviation Resource Management Surveys – the equivalent of Air Combat Command's Unit Compliance Inspections. Recent efforts with FORSCOM and ACC/IG enable the weather portion of these two critical inspections to be nearly identical, eliminating redundant visits.

In 1998, the FORSCOM staff weather office was able to garner FORSCOM-level Army Integrated Meteorological System sustainment funds and: (1) provide units additional hard drives to the IMETS Weather Effects Workstation; (2) procure 15 T-VSATs for improving communications to the Corps and Division IMETS; and (3) complete an IMETS set-up and tear-down video with help from the Air Force Combat Weather Center and Air Force Weather Agency. In another effort, coordination with the FORSCOM Science Advisor enabled the purchase and fielding of a prototype automated observing station, presently deployed at Camp Doha, Kuwait.

One of the key duties in 2WF is the war planning function. The 2WF war planner helps to determine meteorological policy in support of FORSCOM's operational war plans. This involves identifying deploying FORSCOM units, reviewing their weather support requirements, and advising both ACC and the ASOGs of the weather support requirements needed to accompany these deploying FORSCOM units. To ensure people and equipment deploy properly, the war planner prepares, coordinates, and publishes weather support documents and annexes for joint exercises, operations plans, concept and contingency plans that involve FORSCOM.

For example, during a contingency, a typical planning process would include a busy set of procedures. When FORSCOM is notified that one of their units will be included in an upcoming operation, the FORSCOM planning staff notifies their resource managers. As one of these managers, the 2WF war planner begins to review the tasking document to determine how many weather support personnel will be needed and which unit will be tasked.

This information is then coordinated with both ACC and the ASOG of the weather unit involved in the contingency. Final requirements are established and this support solution is then entered into the contingency plan, or time phased force and deployment data. This action ensures that the correct weather support is given to the FORSCOM unit. It also ensures that the weather units deploy with their deploying customers, and that the Air Force is able to track their weather units' movements.

By Maj. Martin R. Martino & Mr. John E. Shaughnessy

THIRD US ARMY WEATHER TEAM

US Army Forces Command

By Capt. Eugene M. Wall

"Third...Always First"...the motto of Third United States Army says it all. From its inception, Third Army has played a major role in America's military history. From its first mission in 1918 to disarm and disband World War I German forces, to keeping Iraq in compliance with United Nations resolutions during Operation DESERT FOX, Third Army has been at the tip of the spear for some of the world's most memorable military victories.

Third Army is most commonly recognized as Gen. George S. Patton's army because it was under him that Third Army led Allied forces across Europe during World War II to conquer the Axis forces occupying the European continent. On Dec. 3, 1982, Third Army was given a new mission to serve as the Army component in USCENTCOM.

USCENTCOM is the unified command which has responsibility for a vast overseas area covering parts of Africa, Asia, and the Persian Gulf. To meet its responsibility, Third Army draws upon a reservoir of Army units, and is responsible for planning, exercising, and rapidly deploying these units in crisis situations. Third Army also functions as a Joint Forces Land Component Command or Coalition Joint Task Force when designated by the Commander-in-Chief, USCENTCOM.

In response to the 1990 Iraqi invasion of Kuwait, Third US Army/ ARCENT, under the command of Lt. Gen. John Yeosock, deployed a force of more than 303,000 soldiers, including nearly 245 weather personnel in Operation DESERT SHIELD/ DESERT STORM. Since the end of the Gulf War, ARCENT and an appropriately-sized weather team has been actively engaged in SWA.

ARCENT is the Army's only field-deployable EAC headquarters. This fact makes ARCENT stand out among other US Army Headquarters. The ARCENT CWT provides the backbone for combat weather support to the US Army deployed to SWA.

During peacetime, the ARCENT CWT provides daily weather support to three forward-deployed headquarters located in Kuwait, Saudi Arabia, and Qatar. Maintaining the combat readiness of the 31-member CWT from eight separate military installations across the continental United States poses unique challenges. The combat effectiveness of this EAC CWT is measured several times a year by providing weather support to some of the Department of Defense's largest exercises and operations.

Exercise BRIGHT STAR in Egypt, Exercise INTERNAL LOOK from various locations around the globe, Operation INTRINSIC ACTION and Exercise LUCKY SENTINEL in Kuwait are just a few examples of high visibility exercises that rely on deployable weather operations.

The ARCENT CWT oversees operational planning for USCENTCOM contingencies which involve fully integrating over 200 deployed weather personnel for support to ARCENT's combat mission in SWA.

For more information about 2d Weather Flight, visit the public domain homepage at www.forscom.army.mil/weathr/default.htm or SIPRNET homepage at http://arcent86.arcent.army.smil.mil/sub/g2/swo/swofram.html.

6 Major Rapid Response Forces have been deployed since DESERT STORM:

October 1994 – Operation VIGILANT WARRIOR
August 1995 – Operation VIGILANT SENTINEL
September 1996 – Operation DESERT STRIKE
January 1998 – Operation DESERT THUNDER I
November 1998 – Operation DESERT THUNDER II
December 1998 – Operation DESERT FOX

Fort Hood leads tactical weather into 21st century

By 2Lt. Geoffrey Dawson
4th Infantry Division
Staff Weather Officer

It is not very often that an individual weather unit can play a large role in shaping the future of military weather support. The 3d Weather Squadron, specifically the 4th Infantry Division Weather Team, at Fort Hood, Texas, was lucky to be afforded this opportunity via our involvement in the Army's Force XXI initiative. Since the summer of 1994, 3WS has been deeply involved with training, experimentation, and providing constant feedback to help Air Force Weather and the US Army shape weather support for the 21st century.

Force XXI is a Department of the Army incentive designed to transform today's force into the Army of the new millennium. The essential feature of this new and improved Army will be the ability to exploit information and new technology. Electronic connectivity between and within all echelons of command will result in such speed and precision in communication that the entire organization's situational awareness and agility will far exceed that of today's force.

This new-found situational awareness will allow them to cut through the fog of war, and, with the click of a mouse, see where they are, where their buddies are, and where the enemy is. There will be no holding back forces due to uncertainty or playing it safe. Battlefield decision-makers will have such an advantage with the abundant information available to them that they will be able to pursue options that were previously unavailable or too risky. With the real-time data available to them, commanders will be able to make better informed decisions.

Force XXI will be ideally suited for joint operations and will be fully compatible with the operational systems of the other services. Seamless information connectivity with the other elements of the joint force will be its primary characteristic and is essential for the success of joint operations.

The Force XXI Plan combines three complementary efforts in a joint, overlapping endeavor and organizes the entire campaign into three phases. Each phase centers on a specific echelon, beginning with the brigade, moving through the division, and on to the corps. Each phase culminates in an exercise or test. 3WS and the 4ID WETM have played a key role throughout all the phases, testing new weather technology and providing continuous feedback, all while supporting garrison flight operations and regularly contributing to AF contingency temporary duty assignments.

While our effort has been spread out over many tactical weather systems, our main area of concentration has been in the development and testing of the Integrated Meteorological System. In 1994, 3WS was asked by the Army's Test and Experimentation Command to help test the Army's new all-in-one weather system, IMETS. There was an increasing

A 3rd Weather Squadron member connects cables to an antenna designed to track polar orbiting satellites during a 4th Infantry Division Force 21 field test.

gap between the newest technology being fielded by the Army and the ability of the tactical weather team to interface with these new systems. The Army recognized the disparity and working through the intelligence branch of their service adopted the phrase, "Owning the Weather" to plan and develop IMETS. This system would allow the weather team to actually link into, and be a part of, the Army's Advanced Tactical Command and Control System.

The first IMETS (Block I) consisted of a hardened shelter mounted on the back of a heavy HMMWV. Major components were the Weather Effects Workstation, Systems West weather satellite receiver, Single Channel Ground to Air Radio System, Harris HF radio, Global Positioning Satellite, and two Environmental Control Units. 3WS was the primary force in the final development and testing phase of IMETS. We did the Initial Operational Testing & Evaluation of the fielded Block I IMETS. Thousands of man hours were dedicated to this testing and greatly taxed our squadron.

In December 1995, 2d Armored Division retired its colors and was redesignated 4th Infantry Division. They became the Army's experimental force and were tasked as the test bed for emerging new technology to allow the US Army to acquire a deadly dominance over any other force in the world. 4ID became the spearhead of the Force XXI initiative.

In early 1996 3WS, and specifically the 4ID WETM, was tasked to be part of Force XXI. We were given another IMETS, but this one was different. This Block II system was a prototype that had vast improvements over the Block I IMETS. Technology had developed so fast that the Army's systems were unable to support them. Advancements in the Block II system included real-time downlink of data and imagery every 30 minutes (down from every 1-2 hours), weather imagery resolution down to 550 meters (from 10 kilometers), real-time downlink of vertical sounding data, and Integrated Weather Effects Decision Aid software.

This software translates 24-hour weather forecasts into a "stoplight" weather effects matrix. In addition, we were given a satellite system that would simulate the Small Tactical Terminal. It was called the Deployable Weather Satellite System developed for use by the Army's Space Command. This was the first phase of Force XXI, designated Task Force XXI.

This phase would culminate in a rotation at the National Training Center in California. Experts came to Fort Hood to train our TFXXI team on every system in the Block II IMETS. The WEW had many applications that we had to learn from the ground up to use and apply to specific Army demands. We spent months learning and using the most up-to-date software that existed. The WEW is important because it is our only link to the Army's ATTCS.

The WEW manipulates data taken from other systems within the IMETS and creates products that are given to the customer. This is the system that Army operators query for weather effects on battle systems, missions, and personnel. The tactical weather web page was another significant development during the TFXXI train-up. This homepage technology provides tailored weather products sorted by combat functions in addition to weather observations and forecasts. In February, 1997, a weather team deployed to NTC with the rest of TFXXI.

Using HUBS, LANs, phones, satellite, and FM the test was a resounding success. Nearly 150 graphic products were created everyday. The volume of weather data being passed by defense satellites was staggering. The data was available to the entire TFXXI and anyone else who had an ATTCS link. Using the IMETS, the TFXXI WETM could take a request, create a brand new product, and have it out to the users within minutes.

Since then, 3WS has been involved in each successive testing of Force XXI. Phase II ended with a Division XXI exercise in 1997, and a Corps XXI exercise took place in 1998. We have continued to be intricately involved with all software/hardware upgrades and continue to train and educate our Army customer on weather products the WETM can bring to the fight. 3WS members have briefed and informed people from company commanders to US Senators and the Secretary of Defense. During an exhibition of ATTCS in Washington, DC for the US House and Senate, 3WS members demonstrated the new, state-of-the-art tactical weather system, and answered questions on the performance and reliability of the IMETS. Our work with Force XXI has produced two Merewether Awards for outstanding technical contribution to AF Weather.

As we're approaching the year 2000, the end result of the Force XXI initiative is about to be realized.

See FORT HOOD p.27

HQ US Army Training an

Where Tomorrow's Victories Begin

By Maj. David Landers
TRADOC Staff Weather Officer

A few of the primary missions of Headquarters US Army Training and Doctrine Command are to assess the Army's force, train it for war and set its standards and requirements. HQ TRADOC accomplishes this mission by assessing and training the Army's soldiers and leaders, and providing disciplined combined arms training environments to ensure decisive victory when engaged in joint and coalition operations.

Further, HQ TRADOC develops balanced concepts, requirements and products in doctrine, training, leadership, organizations, material, and soldiers. As the Army enters the 21st century, HQ TRADOC is leading the way to ensure Army soldiers are trained and equipped for future battles.

Some of the initiatives being worked to ensure future victories in battle are the preparations for September's Joint Contingency Force Advanced Warfighting Experiment; developing new weather operations concepts to support the Combat Brigade Team, and the introduction of advanced weather training for Army intelligence analysts at the US Army Intelligence School at Fort Huachuca. The TRADOC Staff Weather Officer works to ensure that these initiatives enhance Air Force weather operations in support of the Army warfighter. A key part of this effort is to ensure Army modernization efforts and Air Force Weather re-engineering goals are in-sync.

This coordination allows Army forces to gain the maximum advantage of the best ideas and programs both services have to offer.

Joint Contingency Force Advanced Warfighting Experiment

This large-scale experiment will take place

Primary initiatives to test will include:

- Direct feed of gridded meteorological databases from the Air Force Weather Agency to the deployed Integrated Meteorological System via Tactical -Very Small Aperature Terminal Using High Resolution MM5 model output to provide customers fine-scale weather intelligence
- Using IMETS Integrated Weather Effects Decision Aid to create customized weather intelligence overlays on the common operating picture
- Determining how these products enhanced weather operations and customer response to them
- Testing distribution of weather databases to the Digital Terrain Support System, Field Battle Command Brigade and below, and the Joint Common Data Base
- Evaluation of the viability of automated observing systems on the battlefield
- Up-link of Remote Miniature Weather Station observations to experiment participants
- Crossfeed observations from the battlefield to Joint Expeditionary Force Experiment participants via collocated Joint Weather Information Server terminal at the Corps Main Headquarters
- Several JEFX aircraft will have Real Time Information in the Cockpit Terminals. RTIC-equipped aircraft could see Remote Minuature Weather System-observed weather in the target area in near-real time before entering
- Assessing re-engineered weather teams personnel structure
- Crossfeed of lessons learned through appropriate Army and Air Force channels

d Doctrine Command

at Fort Polk, La., in September. Combat Weather Teams from 10th Mountain Division and XVIII ABC will provide the weather intelligence. The goal for weather involvement is to assess weather operational architecture. This assessment will leverage advances in the Army's Integrated Meteorological Tactical System with emerging capabilities from Air Force Weather reengineering.

The assessment's goal is to enhance capability of the warfighter. Combat Weather Teams will provide easy-to-understand digital overlays of weather's impact on friendly and threat forces and integrate them onto the common operating picture.

Combat Brigade Team

The Army Chief of Staff recently unveiled plans to develop a medium- weight force with the footprint of a large brigade, but significantly greater lethality. The force would be deployable anywhere in the world within 96 hrs. To achieve sufficient punch and still be deployable, the brigade will depend on reach-back capability for many of the services divisions provide for themselves today.

This plan meshes well with AFW re-engineering. First of the two medium-weight brigades will stand up at Fort Lewis, Washington within 14 months. The TRADOC Staff Weather Officer is currently working with concept developers at HQ TRADOC, as well as the intelligence school at Fort Huachuca, to develop a statement of requirements for weather operations in support of this new fighting force.

Plug and Play Laboratory

Concept developers, in conjunction with systems supporters at Fort Huachuca, have developed a computer-based system to train new Army intelligence analysts. The "Plug and Play" Laboratory is a suite of desktops networked together to simulate the data feeds an intelligence analyst would see in a "real life" tactical operations center.

Machines replicate data feeds from the All Source Analysis System, Digital Terrain Support System, and Advanced Field Artillery Tactical Data System. The analyst is taught to weed through incoming data to develop a picture for the ground commander of what is going on around him. Until now, weather intelligence was the one missing piece of the puzzle.

The plan is to use IMETS, or something similar, to feed weather intelligence for the scenario location. Newer versions of IMETS have increased capabilities to display a myriad of weather intelligence information.

Personnel from the Army Research Laboratory, Program Director-IMETS, AFWA, TRADOC, and XOWX met in January at Fort Huachuca to work out the details in this system. This capability has allowed us to train green suiters for the first time on exactly what that weather intelligence means, and seek feedback on how to make it better.

Ensuring the readiness of US warfighters is the primary role of the Combined Arms Center

By Maj. Mike Bramhall
CAC Staff Weather Officer

The mission of the ***Combined Arms Center*** is to educate officers in the art of command and staff functions of the combined arms at the tactical level, and to educate officers in the operational art of war. CAC has responsibility for writing the doctrine for war fighting at the division and corps levels. CAC has a training development function for leader development and battle command, and for experimenting with the concepts, methods, procedures and means of battle command.

In addition, CAC is responsible for providing vigorous training exercises for commanders and staffs, from brigade through corps levels, in the exercise of battle command. The major activities of CAC include the Command and General Staff College, the Combined Arms Center-Combined Arms Training, the National Simulation Center, the U.S. Disciplinary Barracks, and the Garrison Command.

One of my key jobs as the CAC Staff Weather Officer is to make sure Air Force Weather concepts for weather support get translated to students in the CAC schools so they will understand how weather might impact their operations and what weather support they can expect from their SWOs. This helps keep Army and Air Force concepts in-sync and ensure we can provide what the Army warfighter needs.

The Combined Arms Center-Combined Arms Training is responsible for combined arms training at the combat training centers and the TRADOC supporting organizations. The CAC-CAT provides oversight for the Battle Command Training Program, the Center for Army Lessons Learned and the Combined Arms Training Directorate at Fort Leavenworth, Kansas; and the Army Joint Support Team at Hurlburt Field, Florida and Nellis Air Force Base, Nevada.

The Battle Command Training Program provides realistic and challenging command and control training to Army corps, divisions, and selected brigades. BCTP assists in improving Army doctrine, training, organizations, materiel, and leadership. The CAC SWO supports BCTP by providing weather scenarios for warfighter exercises and training seminars and functioning as weather support subject matter expert during warfighters and seminars.

The Center for Army Lessons Learned provides timely and relevant lessons learned, tactics, techniques and procedures, research material and foreign assessments to Army units around the world. CALL deploys Combined Arms Assessment Teams to contingency and Army collective training operations

to collect operational documents and make observations. With CALL's military analysts, team members publish products that address problems that soldiers and leaders experience at the tactical and operational levels, and provide information to follow-on deployments or units facing similar situations.

In addition, CALL encourages input from the field, which is disseminated in the form of articles, newsletters and bulletins. The Virtual Research Library, a centerpiece of the University After next, is also under CALL. The CAC SWO provides the Air Staff and MAJCOM DOWs with pertinent lessons learned to provide the Army with the best weather support possible.

The TRADOC Analysis Center, headquartered at Fort Leavenworth, provides relevant, credible analysis to assist in decision making for TRADOC, Department of the Army, the Office of the Secretary of Defense, the Joint Staff and the CINCs. TRAC, the principle analytic organization of TRADOC, conducts studies and analyses of the integrated, joint and combined arms battlefield related to doctrine, organization, training and materiel.

TRAC leads Army-wide analytic planning and execution for Force XXI and Army After Next research and experimentation that focuses on doctrine, design and equipping the 2010 force and beyond. The CAC SWO support TRAC with weather analysis packages used in studies and analyses of the integrated, joint and combined arms battlefield related to doctrine, organization, training and materiel.

The Command and General Staff College is the Army's senior tactical school. It develops officers able to lead fighting units at the tactical and operational levels of war. The CGSC trains over 22,000 officers annually through its resident and non-resident programs. The college was established at Fort Leavenworth in 1881. Nearly 1,100 mid-career officers (majors and some promotable captains) attend the 10-month Command and General Staff Officer Course.

The course educates selected officers in the values of the profession of arms, and in the conduct of military operations during peace, conflict, and war with emphasis at corps and division level. Students include Army active and reserve component officers, international officers, and officers from other branches of the U.S. Armed Forces. Every year 64 Air Force officers are selected to attend CGSC, weather officers selected to attend ISS in-residence can request CGSC when they fill out there school dream sheet. The CAC SWO provides the CGSC students with a class on the Army Weather Support Structure and how to use weather during all phases of military operations.

The Battle Command Battle Laboratory develops, experiments with and evaluates all battle command activities and actions that support force modernization decisions needed to maintain the technological edge soldiers must have to win wars. The BCBL, with its partnership labs at Fort Gordon, Ga., and Fort Huachuca, Ariz., focuses its efforts on analyzing battle command; developing battle command capabilities for mobile operations; and optimizing communication technologies to enable units to receive critical, time-sensitive data and delivering the data through a digitized Army Battle Command System. It also improves and streamlines interoperability with joint and coalition battle command networks, and develops, manages, and validates concepts and requirements of the battle command vehicle.

The mission of the TRADOC Program Integration Office for Army Battle Command System (TPID-ABCS) is two-fold. It serves as the Army's centralized manager and integrator of the Army Battle Command System to ensure horizontal and vertical information flow across the battle space at each echelon.

Additionally, it defines and/or integrates all battle command requirements and responsibilities from the theater Army to the individual soldier or platform. The TPIO ABCS focus is across the entire spectrum of doctrine, training, leader development, organizations, and material and soldier elements. The CAC SWO has worked closely with TPIO-ABCS, the BCBL-Leavenworth and the Army Research Lab in the development of weather visualizations and how to improve the integration of weather information into ABCS.

The TRADOC System Manager Maneuver Control System and Army Global Command and Control System is the Army's centralized manager for all combat development, training development, and user activities associated with the development and fielding of the Maneuver Control System and the Army Global Command and Control System.

The TSM, as the designated combat developer, identifies and validates user requirement, integrates functional system requirements, and assesses the system's overall performance within the Maneuver Battlefield Functional Area and the Command and Control Battlefield Operating System. The TSM coordinates with training developers to identify requirements for appropriate system training aids and all aspects of training development; and associated training products are synchronized with the system acquisition process and fielding plan.

The Force Design Directorate is a directorate of the Deputy Chief of Staff for Combat Developments at TRADOC. It is responsible for changes to current force design (tables of organization and equipment) through the Force Design Update process and future force designs being evaluated in Force XXI. FDD is also the coordinating agent for TRADOC's development of doctrinal forces used in the construction of the program force through the Department of Army program of Total Army Analysis.

The Requirements Documentation Directorate is a directorate of the U.S. Army Force Management Support Agency, a field operating agency of Department of the Army. The directorate manages the Army organization documentation program; determines organizational personnel and equipment requirements; prepares organization requirements documents (tables of organization and equipment, basis of issue plans, and manpower requirements criteria); manages the document development schedule; and provides policy implementing guidance and exceptions for the Department of the Army. The CAC SWO works closely with FDD and RDD in the development of the TO&E for Combat Weather Teams, the paragraphs below explain how that process works and how units SWO can manage the MTO&E.

Table of Organization and Equipment is key to the survival and mission capability of every Army Combat Weather Team is their Modified Table of Organization and Equipment. The MTO&E is developed from the TO&E. TO&Es are

developed by TRADOC to provide standard organizational structure. They are designed to support approved Army doctrine.

A TO&E is not an authorization document for equipment or people, but is the minimum equipment required by the unit to accomplish its mission and as the basis from which to develop MTO&Es. As the Combined Arms Center SWO at Fort Leavenworth, Kan., it is my responsibility to ensure the CWT's TO&Es are designed to meet their mission requirements.

Recently, all CWT TO&Es were scrubbed to ensure the power (generators) and transportation (vehicles) meet the CWTs requirements. Based on this review, larger generators and ¾ ton trailers were added to the TO&Es.

The TO&E process is a very lengthy process. TO&Es are developed by TRADOC to provide standard organizational structure. They are designed to support approved Army doctrine. A TO&E is not an authorization document for equipment or people, but is the minimum equipment required by the unit to accomplish its mission and as the basis from which to develop MTO&Es.

The TO&E process consists of two major phases; the draft TO&E and published TO&E. The draft TO&E contains the rationale for the new TO&E, organizational charts, and listings of personnel, positions, and equipment. Proponents develop the TO&E, such as the USA John F. Kennedy Special Warfare Center for SFGs. The Organization Directorate at Fort Leavenworth, Kansas, is the overall proponent for the WETM TO&E.

When new units are formed or a new design is implemented, the SWOs at HQ TRADOC and the Combined Arms Center, and representatives from the Force Design Directorates develop the weather section of the draft TO&E. An SWO from the design unit (ACR and light infantry division) is usually invited to provide the necessary expertise. After the draft is approved within TRADOC, it is sent to the other MACOMs such as the United States Army Forces Command, and the United States Army, Europe for review.

At this point, the MACOM SWOs can review the TO&E and recommend changes. TRADOC reviews the inputs from the MACOMs and can incorporate changes prior to submitting the draft TO&E to HQ, Department of the Army for final approval. HQDA resolves any disagreements between TRADOC and other MACOMs before approval. HQDA then forwards the TO&E to HQ TRADOC to be published and distributed.

The MACOM uses the approved TO&E to build the MTO&E. The MACOM and parent unit use mission description and priority and available funding to determine the level to which the TO&E will be fielded. Based on the unique capabilities of the unit specialized changes are made to the TO&E to build the final MTO&E. Any unit can request changes to the MTO&E by submitting a DA Form 2028 through Army channels (parent unit to MACOM; MACOM to HQ TRADOC) to HQ TRADOC. TRADOC staffs the proposed changes to the Force Design Directorate, at Fort Leavenworth, and FDD, with concurrence from the CAC SWO provides a recommendation to TRADOC who in-turn sends the recommendation to HQDA.

Once HQDA approves the change, the new MTO&E is sent to the MACOM/Unit for fielding. The TO&E development process is based on approved Army doctrine, and is a difficult and lengthy process. The SWOs to HQ TRADOC and CAC are the primary points of contact for weather TO&E issues. MACOM SWOs must ensure they review and comment on the draft MTO&Es as they are staffed through Army units.

Unit SWOs must also work with the installation Property Book Officer and the HHC Commander to ensure the CWT is properly issued items on the MTO&E. The CWTs MTO&E level should be equal to the supporting units MTO&E level. In other words, if the entire division only has 75 percent of the authorized vehicles the CWT should have at least 75 percent of their authorized vehicles.

Preparing the Weather Warrior

A job the staff at the Weather ReadinessTraining Center takes seriously

Preparing the "Weather Warrior" for battle is what the Air National Guard Weather Readiness Training Center is all about. The WRTC has evolved into a multi-functional training facility. It provides a hands-on environment for instructing not only combat skills, but also operation of the latest weather equipment and weather flight management training. The WRTC also provides a facility to conduct readiness exercises to enhance technical and wartime skills.

Located at Camp Blanding Training Site, 25 miles southwest of Jacksonville, Florida, the WRTC has access to facilities and 72,000 acres of Army training ranges. Current WRTC facilities include 4 classrooms, an administrative building, warehouse, tactical training area and dormitory.

Since the 1970's, Army weather support has been the primary mission for most ANG Weather Flights. ANG Weather personnel must meet the same training requirements as the active duty weather counterparts but with only one weekend per month and 15 days of active duty a year. Training time is precious. The Weather Readiness Training Center was established in 1992 to provide standardized combat skills training not available elsewhere. With a skeletal staff of three master sergeants and temporary duty augmentee instructors, the task proved challenging. Initially, many hurdles had to be overcome, including availability of adequate facilities, equipment, funding, and lack of personnel.

Training began with a Combat Skills Course. However, within a short time, the WRTC curriculum expanded, providing training on Goldwing, AWDS and STT systems. During this curriculum expansion the number of students trained continued to increase. Total Force training has always been a consideration of

Sergeant First Class George Barthelmes, Florida National Guard, teaches the Mines and Booby Traps Class during the Tactical Weather Operations Course.

the WRTC. In addition to ANG Weather Warriors, active duty Air Force, Navy, Marine and Army personnel attend courses at the WRTC. "The active duty and ANG fight together, now we train together," says Master Sgt. Bill Jones, noncommissioned officer in charge of Air Force Combat Weather Center's Operating Location A. He is also the active duty liaison assigned to the WRTC.

All courses at the WRTC are formal schools listed on the Air Force Education and Training Course announcements website. These courses are open to all Air Force Weather personnel, ANG, AF Reserve and active duty. Readiness training is the primary focus of the WRTC. The goal is to prepare weather warriors with the readiness skills necessary for mission accomplishment. Numerous WRTC graduates have deployed to hot spots around the world to support the high operations tempo of Air Force Weather. Recent deployment locations of ANG Weather Warriors include Bosnia, Southwest Asia, Ecuador, Bolivia, Peru, Italy, France and Germany, in addition to several Continental United States locations.

(Top) Student defends himself from his prepared fighting position. (Right) Technical Sgt. Galo Nieves and Senior Airman Nick Barnhardt use compass and map during the Land Navigation Class.

"The STT training I received prior to deploying to Camp Doha, Kuwait, was invaluable," said Capt. Jeffrey Leising of the 126th Weather Flight. "When I arrived at Doha, the STT was inoperable, but I was able to trouble-shoot the problems and be operational the same day because of the training I received from the STT course I attended at the WRTC."

Recently the WRTC has become the focal point for MARWIN and STT training in AFW. March 2000 will mark another first. Thor's Thunder, a weather mobility and field exercise is scheduled. The exercise's purpose is to test the deploying capabilities of ANG Weather Flights whose wartime tasking is the Army Weather Support Mission.

Participating units will be graded on their abilities to deploy according to current tasking documents. The evaluation process begins with the official unit notification and will encompass deployment, employment in a tactical environment and redeployment to home station. Thor's Thunder will expand in size and scope in the future, with the intent of becoming an annual event.

The future is bright for the WRTC. The permanent staff has increased from three to eight members. A new 78-acre training complex is planned as a future home for WRTC. It will include a 32,000 square foot training facility and an 84-person dormitory. Several new courses are also scheduled to come online this year. The Air Expeditionary Force Course emphasizes the training of wartime skills needed for AEF weather support mission.

The Weather Software Applications Course will give students hands-on-training on the latest applicable weather Government Off-the-Shelf and Commercial Off-the-Shelf software. The Tactical Very Small Aperture Terminal Course will provide instruction on the setup and operation of the newest tactical weather communications system.

We invite everyone to make a visit to the Weather Readiness Training Center, and welcome the opportunity to share our training expertise with you. More details on the WRTC can be found on our website at http://airguard.ang.af.mil/DO/DOO/doos/weather/wrtc.htm, click on ANG Weather Readiness Training Center.

Feature

Tirana, Albania

TASK FORCE HAWK'S HOME AWAY FROM HOME

By Capt. Neil Edens
Det. 3, 7th WS

The deafening roar of the C-17 aircraft engines churned for hours as we rode in hardened seats lining the interior of the plane's fuselage. After circling the airfield for what seemed an eternity, although it was only 20 minutes, the plane finally landed. Impeded by our "full battle-rattle," consisting of kevlar helmets, flak vests, load bearing equipment, rucksack, and weapons, we unnervingly waited to discover exactly what Tirana, Albania, had in store for us.

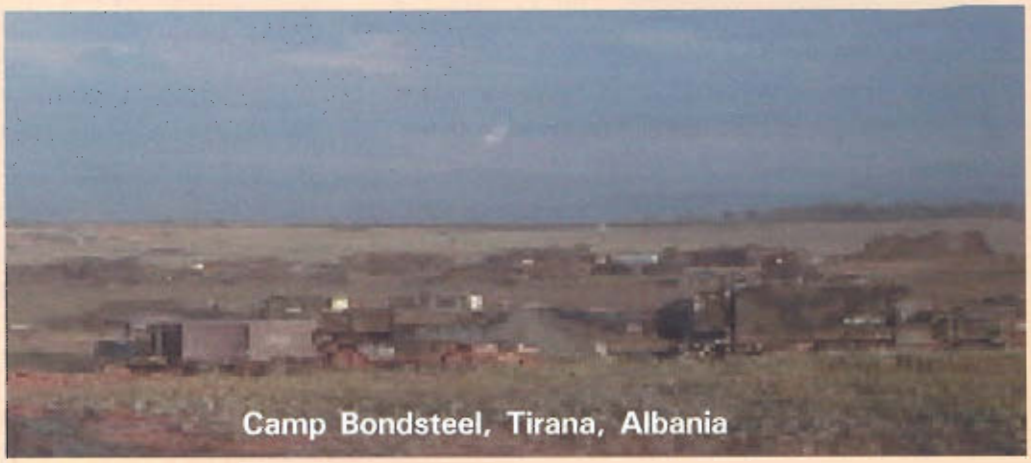
The back of the C-17 opened to reveal a flurry of activity, drenching rain, and boot-sucking mud. The ramp, big enough for only a few aircraft at a time, was a sea of tactical vehicles, cargo, and equipment anxious to reach their home away from home. The wings of C-130s traversed overhead as the propellers pass distressingly close to our tactical vehicles lined along the edge of the taxiways.

We reached the opposite side of the runway where increasing vehicle traffic and a flood of rain created a field of mud as far as the eye could see. It was the kind of mud that brings all but tracked vehicles to a standstill and made even simple tasks, like walking, cumbersome challenges.

Every step you took might be the one that would leave you buried above your kneecaps, wrenching your back to pull your foot free, all the while packing you deeper in the oozy stuff. The ooze seeped into our boots and even through the tightly woven fabric of our Battle Dress Uniforms. We were at the mercy of a Bradley or Armored Personnel Carrier in order to get our vehicles in place to support the mission. Our expressions slowly reflected the grim reality of our surroundings as our unique weather mission was about to get underway.

That night in Tirana, Detachments 3, 6, and 11 from the 7th Weather Squadron joined to become the 7th Expeditionary Weather Squadron. Our mission? To provide relevant world class weather intelligence to Army, Air Force, and multinational ground and air assets during combat operations.

These operations were supporting the Task Force HAWK component of Operation ALLIED FORCE, by implementing the Air Force Weather re-engineering



Camp Bondsteel, Tirana, Albania

concept of operations. The primary focus of TFH's mission was centered on successful AH-64 Apache helicopter attacks of Serbian targets. The consolidation of all TFH assets in one location created the requirement for a consolidated weather team for which neither the Army nor the detachments comprising the 7th EWS had trained for. Quick improvisation led to success.

Following re-engineering concepts, the USAFE Operational Weather Squadron at Sembach AB, Germany, provided regional forecast products so we could focus on integrating weather intelligence into the daily tactical decision making process. The OWS met our requirements by transmitting data through a robust communications architecture to a vast array of weather equipment at TFH.

The 7th EWS had every piece of weather equipment in operation including IMETS, STT, NAMIS, two lightning detection systems and a live UAV feed for continuous PIREP coverage over target areas. The UAV video connection linked us with the customer by also providing access to all TFH briefings.

We knew what operations top leadership had planned by monitoring the briefings. We had five Remote Miniature Weather Stations and a Deployable Weather Satellite Workstation on loan to us from Army Space Command. The 12th Aviation Brigade used their UH-60 Black Hawk helicopters to help us plant sensors along meteorologically significant points.

Our observers flew many of the missions to install or recover the systems over rugged terrain close to the Kosovo border. On one of the missions, they searched for a suitable, concealed location among two perilous, wooded mountaintops.

They set down on only two wheels of the helicopter and jumped out to position, install, and ops check the equipment. Later recovery of this sensor proved to be just as challenging. These slightly dangerous and thrilling missions allowed us to receive invaluable data in a data-void region.

Our observers were also integral in the reception of upper air data through the ARTYMET team. The team, when not in transit, telephoned the data twice a day to the duty observer who generated a Skew-T.

Non-weather related systems included the Army's SINCGARS radio for pilot-to-metro support and a color-coded terrain map generated to illustrate where low ceilings would meet the terrain. We created acetate overlays for hypothetical ceilings at various levels. Observers strained their eyes to read elevation data on finely detailed maps, shading areas with elevations above a selected level.

These maps proved to be the secret to our success. They amounted to a recipe for generating specific area forecasts by combining these overlays with routes, engagement areas, checkpoints, and other areas. We used the maps to pinpoint weather effects along the planned mission route and to suggest alternate, safer routes with fewer weather impacts to mission success. Not only were we integrally involved in the decision process, we made weather a key force-multiplier for the warfighter!

TFH commander extends welcome

Capt. Thomas J. Goulter, Jr.
Deployed 7th EWS commander

Welcome to Camp Bondsteel, Kosovo, home of Task Force Falcon and the 7th Expeditionary Weather Squadron. This is a great TDY here and we're looking forward to having you join the team! The quality of life here is really good compared to most Army assignments and we support a very important and exciting mission. Our day-to-day customers include the Task Force Commanding General, the Aviation Task Force, other nations assets here (United Arab Emirates and the Ukraine), as well as numerous other agencies on post.

The 7th EWS is a critical piece of the peacekeeping mission here in Kosovo. All aspects of the mission are impacted by our observations and forecasts. This is a living example of where weather support is applied as a true combat force multiplier! Weatherwise, you will be coming here during a very challenging time of the year. Your products will be especially critical to mission success. Please come prepared and ready to work hard. The best thing you can bring with you is a positive attitude! The greatest reward is knowing that you are providing a very important service to the mission. I know you'll find this TDY as rewarding as I have.

I've included my email address if you have any questions about the tour. I can be reached at goulterr@bondsteel2.areur.army.mil.

Looking forward to your safe arrival and welcoming you as a new member of the 7EWS!

Additionally, the Army's Deep Operations Coordination System enabled us to obtain current routes, engagement areas, checkpoints, detailed terrain data, and other information pertinent to the mission. The daily mission-cycle started early in the morning with the night shift acquiring a thorough understanding of the mission for the next night.

Observers used the military grid reference system ruler to plot all routes, engagement areas, checkpoints, and other areas on a map. The SWO handcarried that map to all of the mission-related briefings. Forecasters tailored the hub's products to the mission and generated a first-guess at the microscale forecast.

They completed the briefing slides and ensured the map board was ready by mid-morning. After the day shift arrived they spent their first couple of hours reviewing the latest data and honing the forecast details, including terrain effects and mission-weather impacts in preparation to brief the task force commander. Forecasters used high-resolution DMSP imagery from STT to monitor the status of our current forecast and observers posted the images on a TFH homepage to provide mission planners with a birds eye view.

Heated forecast discussions resulted in pinpoint forecasts that narrowed the areas where missions would have to possibly abort due to inclement weather. Once we established the forecast it was easy to recommend alternative routes. The SWO briefed the information to commanders in the afternoon and the forecasters began generating the mission execution forecast.

The Deep Operations Coordination Cell was responsible for planning, coordinating, and implementing all aspects of the TFH mission. Key TFH leaders, an occasional visiting dignitary, and frequent media representatives granted special access assembled several times a day into a five-ton expando van that provided standing room only space.

> *"...the SWO's team has been right on target every time."*
>
> Brig. Gen. "Dick" Cody
> TFH Deputy Commander

Section leaders from intelligence, the air liaison office, operations, and weather presented their findings to be used in the final decision-making process. Commanders scrutinized each detail before making potentially life-threatening decisions.

Commanders needed to know weather impacts in concise formats. We translated customer-identified weather impacts into simple bubble categories colored red, amber, or green to indicate high, moderate, and low mission impact. Forecasts for the first three mission rehearsal exercises verified our pinpoint accuracy when the missions were launched, but later aborted at exact locations we identified.

We knew our primary customer, Apache expert and TFH deputy commander, Brig. Gen. "Dick" Cody, had as much confidence in our forecasts as we did when he proclaimed, "There's no doubt about it, when you say it's red, it's been red!" The TFH commander announced his satisfaction with our efforts when he said, "I know weather is not always right, but it's been damn good so far! With the one exception of the artillery raid, the SWO's team has been right on target every time."

The artillery raid was the only perceived blemish on our otherwise impeccable record. From that mission we learned that the rotor-wash from CH-47 Chinook helicopters are infamous for creating their own weather. The Chinook crews identified evidence of fog forming as they approached the mountain and knew they had a 50-50 chance of a successful artillery mission before landing on the mountain.

They realize the significance of their own rotor-wash as a catalyst to weather development where it otherwise might not develop. The rotor-wash from the helicopters lifted dust and artillery debris off the mountain into the already saturated atmosphere. The resulting fog development forced crews and commanders to spend the night on the mountain in their own self-induced battlefield meteorological soup.

Forecasts for all other missions were a complete success. Our customer valued our inputs to the tactical decision-making process and never lost trust or confidence in our forecasts. The 7th EWS provided 98 percent accuracy for 30 mission rehearsal exercises and more than 700 flying missions in some of the most rugged, austere terrain in the European Theater.

We achieved forecast accuracy unmatched in the history of combat weather operations, a testament to re-engineering. Slowly, real-world field conditions transformed our teamwork and confidence into success. The TFH commander summarized our efforts and their testament to re-engineering, lauding, "In all honesty, these guys are the best I've ever seen."

AVALANCHE

Threat forecasting for the Army's Special Forces

Avalanches, like an enemy army, have the ability to kill people and break things. They can release a slab of snowpack the size of a football field that stretches across a mountain slope with depths ranging from a few inches to several feet.

A large slab avalanche can displace thousands of tons of snow in a violent rush downhill at speeds in excess of 100 miles per hour. Any living thing or man-made structure is typically wiped from its location and encased in a tomb of suffocating, cement-like snow.

Every year, scores of deaths and hundreds of millions of dollars in property damage worldwide are attributable to avalanches. Mitigating this ominous threat to personnel and equipment operating in these environments is understandably of deep interest to the U.S. Army.

In response to this specific customer need, the Special Tactics combat weathermen of AFSOC's 10th Combat Weather Squadron have blazed a unique trail in support of the U.S. Army's Special Operations Command. Since 1997, the members of Det 3, 10th CWS have acquired increasing expertise in the discipline of avalanche threat forecasting.

Their customer, the Army's 10th Special Forces Group (Airborne) at Fort Carson, Colorado, is engaged in operations primarily in Europe, often in avalanche-prone mountains from the Balkan Peninsula to the Alps of southern and central Europe, as well as far to the north in Scandinavia.

Through extensive formal training and field training exercises, special tactics weather operators from Fort Carson now have the capability to analyze different regional snowpacks throughout Europe and North America. From the overlying new snow to the ground surface beneath, this detailed scientific snow analysis enables them to produce a mission-tailored avalanche threat forecast for Special Forces commanders in the field.

Conducting operations with a specialized customer like the Special Forces soldier in both arctic and alpine environments also necessitates a high level of skill in mobility techniques such as downhill and cross-country skiing, snowshoeing, and snowmobiling.

Having weathermen skilled in snow mobility tactics and snowpack analysis, and dual-hatted as meteorologists and avalanche forecasters, has added immensely to the mission of the 10th Special Forces combat weathermen.

In fact, their diverse skills have provided these special weathermen the credibility to be asked to perform this mission all the way down to the Special Forces Operational Detachment Alpha, or A-team, level. Individual weather operators will deploy with different SF teams this winter for a number of training exercises in the U.S. and Europe.

They will serve as multi-specialists exercising their skills as weather forecasters, avalanche forecasters and cold weather survival instructors. This SF team-level integration represents an entirely new way for Air Force weather to become a force multiplier.

RE-ENGINEERED TO SUPPORT THE WARFIGHTER—THE 10TH COMBAT WEATHER SQUADRON!

Senior Airman Jeremy Thunberg conducts a snowpack assessment at Alta, Utah in December 1999.

Feature

Re-engineering in the Land of the Morning Calm

By Capt. Michael S. Petrocco
607th Weather Squadron

607th WS members deploy camo netting

Re-engineering in the "Land of the Morning Calm" has been everything but calm. While units in other theaters train to deploy, we within the Korean theater are already deployed! Our location positions us within range of hostile artillery on a daily basis. That proximaty dictates that we support numerous wartime preparedness exercises throughout the year. But amid the high operations tempo, one-year rotations, and wartime preparedness exercises, the fire of re-engineering is getting hotter and paying large dividends for combat operations in Korea.

The 607th Weather Squadron, along with the Kunsan and Osan Air Base Combat Weather Teams, are providing enhanced, well-rounded support to its warfighters. This support began when the 607th assumed forecast responsibility for Kunsan AB July 1, 1999. Kunsan's CWT is now completely integrated into squadron operations and is learning more about the "Wolf Pack" mission and the aircraft flown. Kunsan's 8th Fighter Wing commander believes that the current re-engineering initiatives are "Spot-on!"

Local squadron commanders have also lauded the Kunsan CWT citing their "appreciation of the extra support." Other benefits include forecasters learning specific details about the weapons systems they support. These insights are allowing the tailoring of 607th products to meet mission objectives. These efforts have yielded more specific weapons and target forecasts for aircrews, enhanced sortie effectiveness, and increased bombs on target for each squadron. The 607th also assumed forecast responsibility for Osan AB Oct. 1, 1999 and anticipates assuming forecast responsibility for Camps Humphreys, Stanley, Red Cloud, Stanton, Page, and Eagle by late Spring 2000.

Technical Sgt. Max Boulton, 607th WS, sets up the Integrated Meteorological System.

Exploiting indigenous weather data has also been a key part to the Korea-wide re-engineering effort. In July of this last year the 607th and Korean Meteorological Administration began a new partnership with the signing of a memorandum of understanding permitting weather-data sharing. The two weather centers are now electronically linked, allowing Korean and USAF weather forecasters to share data and products—improving forecasting ability, enhancing flight safety, and increasing protection of resources.

The 607th is now able to

See MORNING CALM p.28

Weather squadron uses training and real-world experience to customize customer products

By Technical Sgt. Jonathan Morris
Det 5, 7th Weather Squadron

In the small town of Katterbach, located in Germany's scenic state of Bavaria, Detachment 5, 7th Weather Squadron provides weather support to the United States Army 1st Infantry Division's 4th Combat Aviation Brigade.

The 4th CAB is made up of one battalion of AH-64 Apache helicopters and one battalion of UH-60 Blackhawk helicopters. In addition, Det 5 provides support to the 45th Medical Company, an emergency medical evacuation unit with 15 UH-60's assigned.

During an average month Detachment 5 produces 550 observations and provides support for 1500 sorties. But this isn't where the weather support ends; being a Combat Weather Team, Det 5 has seen its share of real-world contingencies. As the 1st Armored Division's Staff Weather Office, Det 5 deployed with the division in support of Operation DESERT SHIELD, later to become Operation DESERT STORM, earning high praise for their support from the division commanding general. Just over four years later, Det 5 again experienced life in the deployed lane while supporting the initial Implementation Force of U.S. and United Nations forces providing peacekeeping duties in Bosnia and Herzegovina during Operation JOINT ENDEAVOR. Then last year, Det 5 provided nearly half its personnel strength to support their customer during its lead role in Task Force Falcon, the United States' contingent in the NATO peacekeeping mission dubbed Operation JOINT GUARDIAN.

The periods between these real-world contingencies have been spent training with their customer during field exercises. These exercises have allowed the unit to hone its combat weather support skills in wartime environments. They've also provided garrison weather briefing support to any aviator requiring it. Det 5's routine operations include gathering garrison weather observations and flight weather briefing support. The majority of the remaining personnel are equally as active as they undergo increasingly important training on tactical skills and deployed combat weather support. During field exercises the unit uses a five-ton expando van as its deployed weather station and two HMMWV's for logistical support functions. A typical field deployment lasts one to two weeks and stages wargames involving nuclear, biological and chemical attacks, defense of the perimeter from attempted infiltration by opposing force units, providing observations, forecasts and briefings to aircrews, and getting used to being in a field environment.

A challenging but satisfying assignment, Detachment 5's history of excellent customer support during peacetime and in hostile environments lays the bedrock for the pride of service displayed by members of the unit, past and present.

FORT HOOD cont. from p. 13

Next year, the 4th Infantry Division will be become the First Digitized Division. Using all the experimenting and lessons learned from the Force XXI exercises, 4ID will be digitally linked from the battalion all the way through the division command post.

They will be the first of what will become a digital transformation of the entire US Army; the prototype division of the 21st century. Attached to 4ID will be the weather team who, through their participation in Force XXI, has shaped the 21st century tactical weather support. Combat Weather Teams of the future can rest assured knowing they have at their disposal the IMETS allowing them to have seamless data flow to the Tactical Operation Center and everyone else connected to the ATTCS.

The hard work, dedication, and thorough testing of new weather systems by 3WS and the 4ID WETM over the past five years have ensured that the AF WETMs attached to Army units will continue to excel and let the Army commanders "own the weather."

AIR FORCE

WEATHER WARRIOR

NAME: **Leslie Hymel, Senior Airman**
UNIT: **Det 3, 7th WS (Supporting V Corps' 11th Aviation Regiment)**
JOB TITLE: **Weather Journeyman**
YEARS IN SERVICE: **4**
HOMETOWN: **New Orleans, La.**
FAMILY STATUS: **Married to Terry**
HOBBIES: **Reading, Scrapbook making, volksmarching**
REASON JOINED THE AIR FORCE: **I wanted to do something I could be proud of**
PERSONAL MOTTO: **Train, Train, Train**
MOST MEMORABLE AIR FORCE WEATHER EXPERIENCE: **My first deployment was Tirane, Albania as part of Task Force HAWK. I was amazed at how easy it was to overcome the mud and other day-to-day challenges to produce on time and accurate weather products when everyone worked TOGETHER. It was a lesson I'll never forget.**

MORNING CALM cont. from p. 26

receive more than 400 surface weather observations from automated sensors across the Republic of Korea, plots of lightning strikes as they occur, and access to Korean weather forecasting models run by the fastest computer in Asia. In addition, the 607th is linked electronically to the ROK Air Force's 73rd Weather Group—furthering our leveraging of local expertise.

The Korean Weather Warriors are a team of dedicated professionals who provide resource protection for a contingent of 36,000 Department of Defense personnel deployed to more than 80 locations supporting Air Force, Army, Joint, and Combined operations. They also provide mission execution forecasts for two fighter wings, and spend more than 2,500 personnel-days annually supporting Army operations in the field. This intense effort is accomplished while the unit is continually engaged in building a foundation for sustained weather operations in a wartime theater and integrating into squadron, battalion, and combined forces operations.

From supporting Army aviation operations in the field to providing CFLOS forecasts for reconnaissance missions, Korean Weather Warriors are ready to deliver the highest quality weather support to Korean defenders anytime, anyplace.

Overall, the re-engineering effort in Korea has significantly increased the knowledge base of wartime operations and has developed an operator-confidence that continues to grow today. The United States Forces Korea J3 said, "the weather products are accurate and exactly tailored to our needs...great job!" The 17th Aviation Brigade commander also commented on the increased level of support and said, "best weather support received in my 22 years in the Army!"

Armed with an arsenal of new mission focused products, over $300 thousand in facility improvements, and exploiting state of the art technology, the 607th WS continues to lead the charge in Korea with a re-engineering effort that is achieving mission-oriented results for combined wartime operations.

Did You Know?

Civilian women were an integral part of the Army Air Force Weather Service during World War II? A special study was accomplished in February of 1945 by the Army Air Force Weather Wing at Asheville, North Carolina. The following information came from that study:

Women's Airforce Service Pilots, commonly referred to as WASPs, were brought into service as civilians to "replace AAF pilots qualified for combat duty, by the AAF Weather Wing and the Domestic Weather Regions." They were intended to save military manpower and were used by some organizations to ferry aircraft from the manufacturer to various sites throughout the world.

Jacqueline Cochran was the Director of Women Pilots, appointed to that position by General Henry "Hap" Arnold. In October 1943, Cochran said that "qualified women pilots were available in sufficient numbers for assignment to the Weather Wing and that the wing was amenable to their assignment." It did not take the Army Air Force Weather Wing long to put in their request for 10 of these well-qualified pilots.

The policy at the wing was to "use the largest number possible for primary and basic training; for ferrying, towing, or any other type flight duty whereby they can be used to replace men for combat assignments."

When these women came to work in the weather arena, they were given two weeks of indoctrination training to familiarize them with operations. They were then checked out on the different types of aircraft assigned to the unit. This was followed by a refresher course in meteorology.

These first ten women did such an outstanding job that the commander submitted a request for five more. Not only did they ferry aircraft and personnel on administrative and technical inspection trips, but sometimes they would carry meteorological equipment and other necessary cargo to its intended destination.

Colonel William O. Senter said of the WASPs assigned to weather, "the history of the WASP program is the history of a job well done. WASPs assigned to wing headquarters performed their duties faithfully and capably.

Although the WASP program ended in November 1944 for Weather and officially for the Army Air Force in December, "Each WASP with an honorable record and in good standing at the time of inactivation was given a certificate of service comparable to the honorable discharge granted military personnel. A certificate of pilot qualification and horsepower rating was also issued to each WASP in good standing.

Thus was terminated a valuable phase of service by a group of women who had a genuine love for flying and a sincere devotion to duty."

One of those outstanding individuals was Virginia Hope, shown in this photo [front row second from left]. Hope's duties included ferrying AAF personnel in the 2nd Weather Regions UC-78. In addition, Hope made countless cargo runs and was checked out in numerous aircraft to include: C-78, AT-17, PT-19, C-45, C-40, AT-6, and the A-24. She flew the C-78, C-64, C-47 and C-45 most often.

Remember though that Hope was just one of the many women who came forward and did the best job possible in service of their country. Women Army Service Pilots, like those you see here were willing to serve their country in any capacity necessary to assist with the war effort.

Let us remember and be proud!!!

Feature

Weathering th

By Capt. Mike Gauthier
Commander, Det 1, 614th
Space Operations Group

The solar environment is neither empty nor benign. Many space environmental hazards exist which can adversely impact Department of Defense operations, both in space and on Earth. One such hazard is that of cometary debris. In November of 1999 Air Force satellites sailed through the worst meteoroid shower in 33 years, the first time many of these systems have experienced such a threat.

Background... In February of 1998, for the third time this century, Comet 55P, better known as Temple-Tuttle, reached perihelion, the point at which the comet is closest to the Sun. Temple-Tuttle travels in a highly elongated ellipse with a period of 33 years. Each time the comet approaches the Sun, ice is boiled off leaving dust and bits of rock along its path.

This debris continues to follow the same orbital path as the comet, eventually spreading out over the entire orbit. As a result, every revolution of the comet around the Sun creates a separate and distinct trail of debris. The highest density of particles are found nearest the comet.

It's solar orbit forces the Earth to travel through the debris stream from Temple-Tuttle each year in mid-November, giving rise to the annual Leonid Meteor Shower, so named because the meteors appear to emanate from the constellation Leo. Typically, visual observations of this annual meteor shower are on the order of 10-20 meteors per hour entering the atmosphere (this measure is known as the Zenith Hourly Rate – ZHR).

However, this year, following the perihelion passage of Temple-Tuttle, the Earth passed through a relatively high-density debris field, resulting in observations as high as 5,000 meteors per hour, providing the second most impressive showing this century. Observations from the Middle East to Europe reported a spectacular shower of meteors with the peak of activity centered on 02:05 UT on Thursday, Nov. 18, 1999 as the Earth passed through the debris stream of comet Temple-Tuttle.

The Threat... Although visually impressive, the majority of the particles that make up the Leonids are smaller than the diameter of a human hair and tend to burn up at very high altitudes. None of the particles reach the surface of the Earth so there's no threat to the Earth's surface or to aircraft. However, in space there are more than 500 operational satellites orbiting the Earth.

These satellites do not have the shielding benefit offered by the Earth's atmosphere and that makes them vulnerable to collisions with these meteoroids. Although the particles of rock and dust are very small, the encounter velocities are enormous—about 71 km/second, 155,000 miles per hour, or more than 200 times the speed of sound. These great velocities result in particles the size of a grain of sand having the same kinetic energy as a .22 caliber bullet!

At these speeds, collisions can create an electrically charged cloud, known as a plasma, to form. This plasma can cause a sudden electrical pulse that can upset sensitive electronics. Impacts of small particles can also cause pitting of optical surfaces and mirrors degrading the performance of critical sensors. Although it is unlikely that satellites

... the majority of the particles that make up the Leonids are smaller than the diameter of a human hair and tend to burn up at very high altitudes

ne Storm

None of the particles reach the surface of the Earth so there's no threat to the Earth's surface or to aircraft

will be "knocked out", or taken off-line, as a result of such an event, the threat of damage to satellite systems does exist.

The form of damage is probably not going to be from a rock "blasting a hole" in a satellite, but rather, from the creation of a plasma, or free electric charge on the spacecraft. The charge could cause damage to computers and other sensitive electronic circuits on board the spacecraft, and ultimately cause the spacecraft to fail. One example of satellite damage was observed during the 1993 Perseid meteor shower. Here, it was determined that the Olympus communications satellite was damaged by a meteor strike, and went off-line shortly thereafter as a result of an electrical failure.

Mitigation Efforts and Warfighter Support...

A mobile multi-frequency radar located in Canada coupled with sensitive electro-optical video equipment at sites in Hawaii, Florida, the Canary Islands, Kwajalein Atoll in the Marshall Islands and at two sites in the Israeli Negev Desert were used to provide 24-hour observations of the intensity of the meteor shower. Additionally, two aircraft were deployed to perform high-altitude, stereoscopic, observation of the storm. Collected data was transmitted, near real-time, to NASA's Leonid Environmental Operations Center, headquarted at Marshall Space Flight Center in Huntsville, Ala.

Here the data was processed and disseminated to customers via secure NIPRNET web site. Detachment 1, 614th Space Operations Group served as the lead agency monitoring the storm for DoD customers while the 55th Space Weather Squadron provided support to National Program customers. Working with NASA, Detachment 1 provided near real-time, mission- tailored support to warfighters via the SIPRNET.

Storm intensity and critical mass flux values associated with the meteor fluxes were monitored and cross-referenced with warfighter specific thresholds. In all, more than 100 graphical products were generated and disseminated to field units. Satellite controllers used the information provided by Detachment 1 in the timing of their mitigation efforts, whether it be powering down a given sub-system, rotating solar arrays to minimize the exposed cross-sectional area, or ceasing critical command and control procedures to minimize the potential for electro-static discharge.

Storm Summary... The Leonids of 1999 came in as predicted, peaking at 0205Z $\pm$ 5 min on Nov. 18, 1999. The storm peaked rapidly, lasting less than one hour with averaged ZHRs of 1,688. Although there have been no reported operational impacts associated with this storm, the threat was very real. Researchers originally thought the peak storm would occur in 1999. However, new models tend to suggest the potential for more intense storming in 2001 and 2002 as the Earth passes directly through trails of debris nearly three centuries old.

Whether the density of the particles contained in this debris field is enough sufficient to pose a threat remains to be seen. Realistically, however, any single meteoroid impacting a satellite has the potential for disrupting operations. One of the greatest frustrations of satellite operators is the estimation of the impact of probable future events on their vehicle, be it an X class solar flare, or the increase in atmospheric density at the coming peak of the solar cycle.

The Leonid storms are yet another such set of events, only in this case the uncertainties lie not in the event timing, but in the magnitude of the occurrence.

The Adventures of Sergeant Joseph J. Conaty, Jr.

PIONEERING COMBAT WEATHERMAN

By Master Sgt. Ralph Ley
HQ AFSOC/DOW

On December 1, 1943, Allied leaders meeting in the Iranian capitol of Teheran initialed a secret "military conclusion" that called for a major supply effort to support Partisan forces led by Marshal Tito in Yugoslavia. Although the British took the lead in airlifting supplies to Partisans, Gen. Ira C. Eaker, commander of the Mediterranean Allied Air Forces, was determined that Americans should help the effort.

Early in February 1944, Eaker placed two squadrons of the 62nd Troop Carrier Group, 24 U.S. Army Air Force C-47s, with the Royal Air Force in southern Italy. Missions were scheduled, aircraft were loaded, and crews were briefed. However, weather conditions forced cancellation after cancellation. Even when aircraft were able to depart Italy, weather conditions in Yugoslavia often obscured the designated drop zones. About the only cargo to reach the Balkans with any regularity were propaganda leaflets. Accuracy in these cases meant locating the country, not pinpoint drop zones.

The Army Air Force had anticipated the need for better weather information about conditions in Yugoslavia, both to assist the supply effort and to support bombing operations by the 15th Air Force against enemy targets in Central and Eastern Europe. Following the Teheran Conference, recruiters from the Office of Strategic Services in Cairo interviewed meteorologists from the 19th Weather Squadron about a clandestine assignment behind enemy lines. Among the volunteers for this hazardous duty was Sergeant Joseph J. Conaty, Jr., a 27-year-old weather observer in search of adventure.

He was destined to find it in full measure. Conaty, a Brookline, Mass. native grew up in an affluent suburb of Boston. He was drafted in April 1942 and attended basic training in Biloxi, Miss. After basic training he was sent to Air Corps Technical School at Chanute Field, Illinois, for training as a weather observer. Learning the fundamentals of meteorology at Chanute, Conaty's skills in taking both surface and upper air observations grew. He was sent to Australia following his graduation from technical school. After a brief stop at Perth, however, the ship was diverted to the Persian Gulf. By the time the OSS recruiters showed up, he had seen enough of the Middle East to last a lifetime.

The AAF/OSS plan called for seven teams to be sent to Yugoslavia. Each team would consist of a forecaster, observer, and radio operator. In January 1944, the volunteer weathermen were sent to the British parachute school in Palestine for a short course in parachuting techniques; the training took nine days. First came a rigorous five-day physical fitness regimen, followed by five jumps during the final four days, including one night jump.

The first insertion occurred on Feb. 27, 1944. Two C-47s departed Bari, Italy, each carrying a three-man weather team across the Adriatic with an escort of 24 P-47s. The transports made landfall on the Dalmation coast, just south of Sibernic, then proceeded inland. Flying through heavy snowstorms, they soon reached the area of their drop zone, northeast of the town of Prekaja and close to Tito's headquarters at Drvar.

The first C-47 could not locate its target due to heavy cloud cover and returned to Bari. Conaty's C-47 managed to get down through the overcast, spot the recognition signal, and drop the three-man weather team and their equipment. Conaty and his companions made a soft landing in snow and were met by Partisan guides. After collecting their equipment, they were taken to Drvar.

The American weathermen were assigned quarters in two houses that where located one and a half miles west of the village. They soon settled into a routine collecting weather data four times a day. The information was coded and transmitted to Bari by the team's radio operator. Thanks to better weather information, the AAF supply efforts began to show dramatic improvement. By April, even more impressive results were seen.

The growth and success of Partisan forces and

Sgt. Conaty in 1944 wearing British parachutist wings

Marshal Tito had not escaped the attention of German commanders in the Balkans. At 0630 on May 25, a Partisan guard rushed into Conaty's room shouting a warning. Conaty threw on his clothes and rushed outside to take cover in an adjacent slit trench. He listened to the roar of engines as some 30 Stuka Dive Bombers attacked positions in the valley. At 0700, Conaty saw a flight of large transport planes, JU-52 Tri-motors, fly up the valley, turn around, then return toward the village. The fist wave of 314 German SS paratroopers jumped out at such a low level that Conaty witnessed several soldiers thud into the ground before their chutes had opened.

Marshal Tito's headquarters

It took only a few minutes for the paratroopers to secure a landing zone. Airplanes towing gliders that contained the other 320 members of the parachute battalion soon appeared. Once the gliders landed and the troops disembarked, intense fighting broke out as the Germans advanced toward Tito's headquarters. Conaty and the weather party decided to move higher into the hills. They distributed their extra guns and ammunition to their Partisan guards, then collected codes, ciphers, radio crystals and recent messages. Everything else had to be left behind.

They climbed to a hilltop overlooking Drvar, where they had a clear view of the valley and mountainside where Tito's cave was located, and watched the progress of the German assault. Tito's escort battalion fired from protected locations and their machine guns took a heavy toll on the paratroopers. The Germans later reported that the Parachute Battalion was nearly wiped out. Tito and his headquarters group managed to escape into the hills while the battle raged.

At around 1400, as German reinforcements began to arrive, the weathermen became part of a larger group that started for Potoci.

The group marched, walked, ran, hid, dodged, and did whatever it took to escape the German trap. It took two days to reach Potoci and the decision was made to evacuate some to the Allied personnel. The weathermen were scheduled for evacuation, but two days passed with no sign of aircraft. The Germans were beginning to tighten the noose around the area and everyone was forced to leave Potoci.

The group marched through the night of 29-30 May, reaching the foot of the Sador Mountains. After a short rest, the group split up and the weathermen continued toward Preodac for a possible evacuation. When Conaty and his comrades reached Preodac on June 1, they found a rock-strewn field that would have to be cleared prior to the arrival of the aircraft. They worked all afternoon and into the night to clear a runway.

The next morning, the evacuees took positions along the cleared area and eagerly listened for the sound of aircraft engines. Instead, they heard gunfire as German troops poured into the valley. Conaty's group fled into the mountains and for the next two days they marched through the countryside trying to elude the Germans. On the morning of June 4, they reached the Polez Mountains. By the afternoon, the Germans had the group surrounded. The Partisans launched a desperate attack that managed to clear the enemy from one ridge on the north side of the mountains. In order to escape the Germans, however, they would have to descend a nearly vertical cliff of several hundred feet.

The Partisans, with no other choice, were forced to abandon their horses, cattle, food and supplies. Even the wounded had to be left behind and were hidden in the woods. The hazardous decent began in darkness. Everyone tried to stay quiet, but loose rocks and dirt made it difficult.

Conaty and the group finally reached the bottom without incident, then marched through the night. The group outwitted the Germans by doubling back on their trail a couple of times in a range of hills near the Polez Mountains. They continued to move with brief rest periods until they finally stopped at 2300 on June 4 and had their first meal in four days.

Over the next four days Conaty's group slowly made their way toward an emergency landing area near Malo Ticero. At 0830 on the morning of June 9, four British Dakotas landed and took the party to Bari. The weathermen had been on the run for 16 days. After a brief period of hospitalization, Conaty returned to the United States.

Discharged in 1945, Sergeant Joseph J. Conaty, Jr. went on to spend over 30 years with the U.S. Department of Labor's Bureau of Labor Statistics.

Master Sgt. Johnny Reid, 107th Combat Weather Flight, supplemented this article with information gained from an interview he conducted with Sgt. Conaty

Salutes

BRONZE STAR

Capt. Mark Mesenbrink 75th OSS/OSW, Hill AFB, Utah

MERITORIOUS SERVICE MEDAL

Technical Sgt. Derek S. Lacey, 156th WF Charlotte, N.C.
Staff Sgt. Robert G. Branham, 146th WF, Pittsburgh, Pa.
Senior Airman Bradley T. Wrenn, 156th WF Charlotte, N.C.

AIR FORCE COMMENDATION MEDAL

1st Lt. Christian W. Barnes, Det. 1, 607th WS, Camp Red Cloud, Korea
Master Sgt. Nancy Eakle, 75th OSS/OSW, Hill AFB, Utah
Technical Sgt. Dennis C. Rittle, 110th WF, St. Louis, Mo.
Technical Sgt. Michael Sterle, 75th OSS/OSW, Hill AFB, Utah
Staff Sgt. Christina M. Lowery, 121st WF, Andrews AFB, Md.

JOINT SERVICE ACHIEVEMENT MEDAL

Master Sgt. Michael Jacobs, 46th WS Eglin AFB, Fla.

AIR FORCE ACHIEVEMENT MEDAL

Lt. Col. Steven P. Weaver, 164th WF, Rickenbacker ANGB, Ohio
Maj. Robert F. Crosby, 110th WF, St. Louis, Mo.
Maj. Wilson R. Dodge, Jr., 164th WF, Rickenbacker ANGB, Ohio
Maj. Anthony D. Moninski, 57th OSS/OSW, Nellis AFB, Nev.
Capt. Sean M. Nolan, 110th WF, St. Louis, Mo.
2nd Lt. John G. Sichel, 164th WF, Rickenbacker ANGB, Ohio
Senior Master Sgt. Larry K. Williams, 110th WF, St. Louis, Mo.
Master Sgt. Robert S. Buhrts, 164th WF, Rickenbacker ANGB, Ohio
Master Sgt. Donald D.Tompkins, 110th WF, St. Louis, Mo.
Master Sgt. Darryl J. Walters, 164th WF, Rickenbacker ANGB, Ohio
Technical Sgt. David L. Brown, 159th WF Camp Blanding, Fla.
Technical Sgt. Norman A. Olson, 123rd WF, Portland, Ore.
Technical Sgt. Richard Slominsky(6th), 110th WF, St. Louis, Mo.
Staff Sgt. Daniel K. Ackerman, 104th WF, Baltimore, Md.
Staff Sgt. Mark E. Augustine, 146th WF, Pittsburgh, Pa.
Staff Sgt. John C. Cunningham, 104th WF, Baltimore, Md.
Staff Sgt. Christopher W. Fitts, 123rd WF, Portland, Ore.
Staff Sgt. Alexander J. Good, 164th WF Rickenbacker, ANGB, Ohio
Staff Sgt. Joseph K. Ingram, 104th WF, Baltimore, Md.
Staff Sgt. Phillip R. King, 110th WF, St. Louis, Mo.
Staff Sgt. Jason P. Noe, 104th WF, Baltimore, Md.
Staff Sgt. Christopher C. Payne, 123rd WF, Portland, Ore.
Staff Sgt. Jennifer Shields, 46th WS Eglin AFB, Fla.
Staff Sgt. Todd L. Swindell, 110th WF, St. Louis, Mo.
Senior Airman Heath Alexander, 75th OSS/OSW, Hill AFB, Utah
Senior Airman Jolie K. Brendlinger, Det. 1, 607th WS, Camp Stanton, Korea
Senior Airman Fany Colon DeHayes, 305th OSS/OSW, McGuire AFB, N.J.
Senior Airman Michael T. Gaither, 146th WF, Pittsburgh, Pa.
Senior Airman Jane A. Hilton, 140th WF, Willow Grove, Pa.
Senior Airman Norman S. Keith, 159th WF Camp Blanding, Fla.
Senior Airman Jill C. Schweigert, 57th OSS/OSW, Nellis AFB, Nev.

ON THE BACK COVER

Air Force Weather now has an official Lithograph

The wait for a lithograph that commerates the dedication of the AFW community is over!! Captured by well-known European artist Ronald Wong and commissioned by AFWA's Global Top 3 Organization, Booster Club, and Airmen's Career Enhancement Group, the lithograph is a magnificent representation of Air Force Weather.

The lithograph captures unique milestones of Air Force Weather history. Reproduced in limited quantities, the first 200 are hand-signed and numbered by the artist. For more information contact SMSgt. Donna Hnebner at Donna.Huebner@afwa.af.mil or phone at (402) 232-8039 or MSgt. Larry Pitsenbarger, Larry.Pitsenbarger@afwa.af.mil or (402) 294-1623.