Your Magazine for Air Force Weather

OBSERVER

May/June 1997

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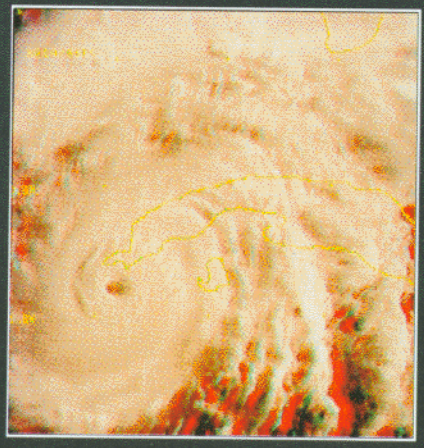
The 53rd Weather Reconnaissance Squadron

Weather Warriors Meeting Hurricanes Head-on

What's Inside for MAY/JUNE 1997

SPOTLIGHT



It all started in 1943 as a barroom dare, when two Army Air Corps pilots challenged each other to fly through a tropical storm. Today, the resultant one-of-a-kind DoD organization routinely flys into one of nature's most awesome and powerful forces. Learn more about the Hurricane Hunters ....

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OBSERVER

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Perspectives from the Top

The AFW Strategic Plan Our Path to *"Owning the Weather"*

by Brig. Gen. Fred Lewis, Air Force Director of Weather

As you probably realize, our effort to reengineer Air Force Weather has been a Total Force, wall-to-wall initiative that has yielded a quality Strategic Plan for the future. The Plan will guide us in making substantial improvements in our support for worldwide weather operations, training, and resource protection. We've systematically reviewed Air Force Weather products, processes, organizations, training programs, and technical tools and have found many opportunities to improve support to the operators and warfighters. The Air Force Weather Strategic Plan (now nearing approval) shows why we need to change and lays out, in significant detail, how we plan to implement these changes. It also identifies the goals and objectives that will make us the joint operators' choice to "OWN THE WEATHER."

The Strategic Plan was sent to Air Force MAJCOMs, Army MACOMs, AFRES, ANG, the FOA, the Army Staff, and the Air Staff for review. We have received favorable coordination with many supportive comments on how to make the plan even better. We've also made the plan available on the reengineering homepage (http://www.safb.af.mil:81/afw/rat/index.html) for your review and comments. This document paints a detailed picture of what we expect Air Force Weather operations to be like as we enter the 21st Century; what might well become one of the most significant and rewarding eras in the history of weather support to military operations.

Section IV of the plan, The Envisioned End State, is what I would call the meat of the plan. This section covers operational processes, technology, training, and career progression. While more details will be fleshed out over the next few months, this section sets the direction in which we are headed: a tiered approach to weather operations.

Strategic centers will provide weather support for large-scale planning and execution guidance. Operational weather squadrons (also referred to as Regional Hubs) will produce fine-scale, highly accurate forecast information for Joint operations around the world and for Air Force and Army installations within their regions of responsibility. Finally, combat/base weather teams (CWTs) will work directly with the front-line operators, focusing on their needs and tailoring products to meet them (that is, adding value through close customer contact and situational awareness). This tiered approach offers great possibilities to help us make significant improvements to the timeliness, accuracy, and relevance of our weather support.

Now, what part does technology play in our efforts? As we've said before, technology is the enabler. It is rapidly evolving and will directly help us improve operational support as we implement the right products, processes, and organizational structure. I think we will all be pleasantly surprised with the new capabilities that we will soon begin fielding to help provide more accurate, timely, and relevant weather support for worldwide operations.

We already discussed our new approach to training in my article last month. This new approach will ensure our people receive the right training at the right time and at the right place. Additionally, assignments and career progression will be based on training and experience paths which, I think, will yield very positive results.

Does the Strategic Plan outline a perfect solution? No. Is everything locked in? Not really. However, we think we're close. The Plan is a living document that will continue to expand and change as we get feedback from the MAJCOMs, MACOMs, FOA, AFRES, ANG, **and you**. It will probably also change as we start to implement individual programs. One of our greatest strengths in this reengineering effort has been our ability to respond to the concerns of the operators (and concerns from many of you in the Air Force Weather community). We will continue to use the implementation philosophy of "build a little, test a little, field a little" to ensure we get the absolute best results. Together we will make our "solid Plan" into the "best solution."

In closing, I would say that we must not forget that adapting to the needs of our customers with a strong

operational focus will be the key to our success. This has been the goal of the hard-working Reengineering Action Team (including the people from the AF Center for Quality Management and Innovation), our Air Force Weather chief master sergeants, my executive board of Air Force Weather senior MAJCOM and FOA representatives (Weather colonels and lieutenant colonels), and many of **you**. Everyone's efforts have been nothing short of outstanding and we owe all of those who have worked so hard to make our reengineering plan a success a special thanks for a job well done. The bottom line is simple: We have a good plan with an even better solution. Now, **we need your inputs AND, MOST IMPORTANT, YOUR SUPPORT to make the plan a reality**. Please be involved, ask questions, forward suggestions to your MAJCOMs, FOA, AFRES, and ANG representatives, and then roll up your sleeves and help us get the plan implemented. Thanks in advance for all the hard work that will be necessary as we move forward. I expect nothing less then amazing results with your continued support!

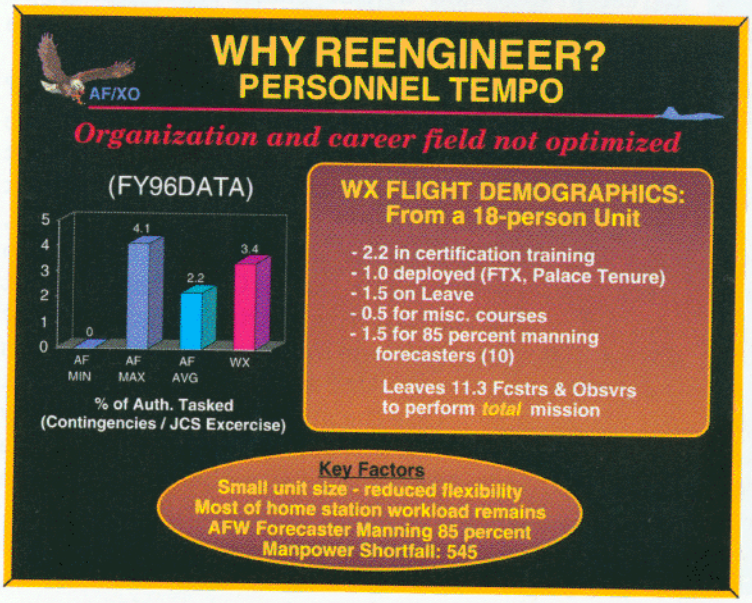
OWN THE WEATHER!

Doing "Less with More"
Reengineering Personnel Structure to Ease OPS Tempo

by Brig. Gen. Fred Lewis, Air Force Director of Weather

The two slides accompanying this article were specifically designed for our briefings to General Fogleman, Air Force Chief of Staff and CORONA TOP (Air Force senior leaders). These slides capture several of our main concerns with the health of our career field and simply show how reengineering will improve this situation. High operations tempo (OPS TEMPO), chronic undermanning, and small unit size are hampering our ability to produce the high quality forecasters and leaders needed to provide our customers the timely, highly-accurate, relevant weather support they require.

OPS TEMPO is depicted based on the percent of our total weather force deployed to contingencies and Joint exercises at any one time. This metric was obtained from AF/XPM which keeps regular statistics in this area. The metric doesn't include MAJCOM and MACOM unique taskings or exercises, but does provide a good baseline measure of deployments around the world. So what's the bottom line? AFW OPS TEMPO continues to run above the Air Force average, consistently about fourth or fifth overall when compared to other career fields. That averages out to be about one person from every weather unit deployed at any given time. Of course, some units are busier and some are less busy based on customers, taskings, and location. As you can see from the slides, several demographic issues tend to aggravate the OPS TEMPO problem. Let me review a few of them.



Almost all weather stations are small units (about 18 people on average) with several lesser experienced people. Now, given that forecasters can backfill observers but observers can't backfill forecasters, this results in what I will call OPS TEMPO stress. Not only does the normal weather station get tasked more than the Air Force average, it can't use all its people as effectively to cover these taskings—both at home and deployed. The result of this is more 12 hours shifts and less time to train—that's OPS TEMPO stress.

There's more. Forecasters are currently only manned at about 86%. Almost all weather stations are at least one forecaster "short." When a unit does get a forecaster, training is usually compressed to get the person position qualified and "on the counter" as quickly as possible—more OPS TEMPO stress.

A combination of this stress, low forecaster manning, and the way we employ our newest people (our first term weather observers) caused reenlistment rates to hit a record low last year. This only worsened forecaster manning. Although we were successful at acquiring an increase to our first term reenlistment bonus (multiple of two) and reenlistment rates have improved, this is by no means a long term solution.

Most certainly all is not lost. I see areas of excellence every time I travel. Air Force Weather people, all of you, are doing your absolute best. But unless we build a structure that will support sufficient manning, OPS TEMPO, and effective training, we won't be able to build the right career field for the 21st Century. More importantly, we will not be able to properly "mentor" tomorrow's

AFW leaders. Our reengineering strategic plan outlines the process and organizational structure changes needed to better grow our people—to properly grow our future.

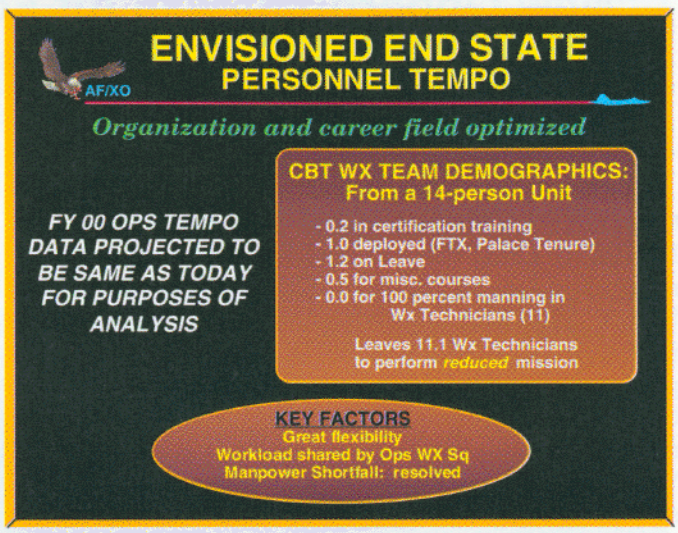
OPS TEMPO probably won't change. We must find ways to better support our worldwide taskings and exercise/training workload given that reality. Contingency taskings and Joint exercises will probably continue to drive our operations for the next several years. However, our reengineering effort has shown us that we can solve many of today's OPS TEMPO issues ourselves—and without more resources. We can deploy to meet contingency requirements and everyone left behind will be qualified to perform all unit operational functions. The combat/base weather teams (CWTs) described in our strategic plan can expect to have one person deployed at all times. But every member of the team will be experienced (at least 3 years of forecasting experience), skilled (at least a 5-level), and certified to observe and forecast after being at the CWT for a short period of time. The result will be maximum flexibility for CWT operations.

Unit size at the base level may become smaller as the operational weather squadrons stand up. The "average" 18 person unit will be reduced to about 14 people. But with the loss of about four people will go the workload of about six people. This is not a smoke and mirrors equation. Your Air Force Weather senior officers and NCOs are working hard to ensure this transfer of workload occurs as we transition people out of the weather stations and to the operational weather squadrons.

Changing to a single career ladder with our newest people going to an operational weather squadron for their first assignment (usually for 3 years) before going to a CWT does several things for us. People assigned to CWTs will be mission ready weather technicians (5-level Journeyman minimum) who can do the "entire" CWT job. Creating weather technicians instead of "observers and forecasters" should also allow the CWT to be manned at near 100% and further will dramatically improve reenlistment rates. (This is one of the best news stories to come out of our reengineering efforts!)

Position qualification and upgrade training programs will be more standardized and manageable in the new structure. But in addition to a better training programs, we will once again have the time and the right structure at the operational weather squadrons and combat/base weather teams to "mentor" our junior to mid-level enlisted and officers. They will have the benefit of learning in a mission focused, "anticipate and exploit" environment.

We can't help but get excited about the results of our reengineering efforts. We're capitalizing on our strengths by more fully utilizing our young and bright people. We're putting our experienced people in direct contact with the operators, focused on operational needs. And we've minimized our weaknesses by taking workload away from the combat/base weather teams while providing them the tools and training needed to better accomplish the mission of providing timely, highly accurate, and relevant weather support to our customers. What other benefits occur by making these changes? First, we have been able to resolve a 545-person shortfall (the number of people we believe are needed to solve



base weather station problems within today's organizational structure) without needing more people. Further, we can now solve one of our most challenging support dilemmas of today's environment, the way we train our people. Today, "*we put our least experienced people at our smallest units to get trained supporting our most important customers—the operators and warfighters.*" Once we implement the changes proposed in our strategic plan, "*we will put our experienced people at combat/base weather teams to provide on-target support for our most important customers—the operators and warfighters.*" This significant change will help us realize our #1 goal of improving the quality of operational weather support by 15 percent. Note also that we will effectively be "*doing less with more people*" as we move forward to implement these changes. What makes me say that? Well, looking at the two slides, today's 18-person unit has approximately 11 people to do the "entire" customer support mission while the 14-person CWT of the future will have approximately 11 people to do a "reduced" mission (since the operational weather squadrons will provide a significant portion of today's support). What a great side-benefit for our people and, more importantly, for our customers!

As I close this article, let me state once again that in my opinion and the opinion of your AFW senior officers and Chiefs, we are headed in the right direction. This direction will make us the "operators choice" for weather information "on demand" allowing the operators to "OWN THE WEATHER." With your support, ideas, and hard work we will succeed! As they say in Korea—WEATHER ON TARGET!

Command Line

Charting Your Course

"New Opportunities in Air Force Weather"

by Col (S) Richard C. Clayton, Senior METOC Officer, U.S. Special Operations Command

Greetings from the United States Special Operations Command (USSOCOM), located at MacDill AFB, FL. I'm Col (S) Craig Clayton, and I am the Senior Meteorology and Oceanography (METOC) Officer (SMO) for USSOCOM. In this position I serve as the functional manager for all joint special operations METOC support. One thing I've learned in my 22 years of service is that the special operations mission provides one of the most exciting and rewarding opportunities in Air Force Weather (AFW) to serve our nation and grow professionally and personally. It's not for everyone, but for those of you who love a challenge, there has never been a greater opportunity to join us, become one of the "Quiet Professionals," and support the special operations mission than there is today.

THE FORCE

Two recent developments signaled the arrival of a robust SOF METOC support career path in AFW. First, USSOCOM assumed responsibility for funding those METOC personnel providing direct support to special operations forces (SOF). Second, Air Force Special Operations Command (AFSOC) stood-up the 10th Combat Weather Squadron (10CWS) at Hurlburt Field, with subordinate units aligned with the Army Special Operations Command (USASOC) units they directly support (i.e., Special Forces, Rangers, etc.). Now, from enlisted forecaster to CINC SMO, we have a cohesive team, working together with our USSOCOM component Navy Special Warfare Command (NAVSPECWARCOM) counterparts to excel in SOF METOC support. In addition to the 10CWS's five detachments supporting Army SOF units in the United States, two units of AFW jumpers provide dedicated weather support to forward deployed Army SOF units in Germany and Japan. The 16th Special Operations Wing, and the 352nd and 353rd Special Operations Groups are the primary Air Force SOF units, and along with special units at Fort Bragg, NC, round out the AFW SOF METOC operations umbrella. Supporting these speartip units are the 10CWS headquarters at Hurlburt, its' parent Major Command—AFSOC/DOW, Staff Weather Officers at USASOC and the Joint Special Operations Command, and my staff and I here at HQ USSOCOM.

THE BASIC USSOCOM TENET: "PEOPLE ARE MORE IMPORTANT THAN EQUIPMENT"

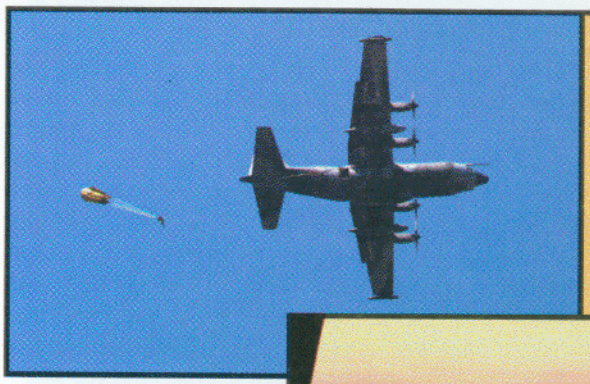
When people talk about SOF, the image that usually comes to mind is a lonely warrior, out in the middle of nowhere, trusting only his wits and training to accomplish the mission. While that is not far from the truth, supporting the SOF warrior is also a demanding mission. SOF METOC forces are an integral part of a combat-ready team, providing valuable information on the state of the environment and ensuring the optimum mix of weapons systems to successfully complete the mission. The typical SOF METOC person is a forecaster with one or two tours of forecasting experience, has successfully completed the Basic Airborne Course (static line qualified) at Ft Benning, and has received other specialized training required by the customer. For those more adventurous, more physically fit, and seeking greater challenges, there is now a new combat weather team that truly represents the tip of the spear. These men are getting trained in combat and specialized skills that will allow them to be eyes forward in hostile environments. The bottom line is, there is room for motivated and skilled AFW people of all grades and levels of experience in SOF METOC support.

THE CHALLENGE AND OPPORTUNITY

Due to a low number of volunteers, our SOF METOC forces are currently undermanned. In a recent message from HQ AFPC Enlisted Assignments, SMSgt David Shingledecker highlighted the challenge, "Posted today on the Equal Plus boards are 18 requirements for *(AFW)* jumpers in jump positions *(this was in mid-May)*. As of today, AFSOC is 53% manned in forecaster jump positions. When I arrived at this job the hope was to lure new blood into the jump field. It's been merely a trickle. We need more volunteers to overcome the low numbers. There's been some limited success but more jumpers are required in jumper positions. The tip of the spear is beginning to wear a little bit...." This is not only a challenge, but a great opportunity for a few of you to step up to the personal challenge and volunteer for what will be the most satisfying assignment of your career.

CALL ME!

Now that I'm on board as the new USSOCOM Senior METOC Officer, I'm looking forward to working closely with the AFW community to ensure "world class" METOC support for our SOF forces—they deserve the best! Please keep the communication channels open; call us if you have any questions, and let me know if there is anything my staff and I can do to assist you in helping us accomplish this vitally important mission. You can reach me at DSN 968-4295, or e-mail *claytorc@hqsocom.af.mil.*



USSOCOM AT A GLANCE

U.S. Air Force Photos

Imagine this; cloud ceilings around 100 feet, visibility 1/4 mile or less, rain-showers and snow-showers across the area, and the rugged terrain of the Croatian coastline... enough to stop most aircraft. Yet, when Secretary Ron Brown's plane went down outside of Dubrovnik, Croatia on 2 April 1996, this is exactly what faced the crews of two MH53As and an MC-130P as they began the arduous task of search and rescue. These aircraft, under the command of Special Operations Command Implementation Force (SOCIFOR), were the first aircraft to respond to the disaster and were the only aircraft to operate with success in the first couple of days after the T-43 crash. Such is the courage and skill of our special operations soldiers, sailors, and airmen.

U.S. special operations forces (SOF) are conducting more missions, in more places, and under a broader range of conditions than has ever been the case before. In 1996, SOF forces deployed to 135 countries around the world. As the speartip of every major operation, and operating alone in thousands of other minor ones, SOF forces perform their global mission out of the glare of the public eye, giving the United States a combat-ready team to conduct special operations across the entire spectrum of military operations. More than ever, SOF meteorology and oceanography (METOC) forces are an integral part of that combat-ready team, providing valuable information on the state of the environment and ensuring the optimum mix of weapons systems to successfully complete the mission. As the functional manager for joint SOF METOC support, the senior METOC officer at the United States Special Operations Command (USSOCOM) is charged with providing trained, ready, and equipped SOF METOC forces to SOF commanders worldwide.

USSOCOM is one of nine unified commands in the U.S. military's combatant command structure. It is composed of Army, Navy and Air Force special operations forces. USSOCOM exists to support the geographic commander-in-chief (CINCs), ambassadors and their country teams, and other government agencies. The Command prepares SOF to successfully conduct special operations missions when directed by the National Command Authorities. Congress created USSOCOM in 1987 to correct serious shortcomings in the United States' ability to conduct special operations and engage in low-intensity conflict activities. The command was assigned many service-like responsibilities, including training, ensuring combat readiness, monitoring personnel promotions and assignments, and developing and acquiring SOF-peculiar equipment.

Officer Talk

ASSIGNMENT ADVICE

by Maj Lou Zuccarello, Chief, Weather Officer Assignments, Air Force Personnel Center

As I begin my assignment at the Air Force Personnel Center, I wanted to take the opportunity to introduce myself and pass on the latest information regarding the Officer Assignment System. Maj Tim Hutchison and I had a great period of overlap and I want to thank him for his help and the great job he did managing AFW officer assignments for the past two years.

My background includes assignments to AFGWC, RAF Mildenhall, AFIT, and HQ AWS. Although I haven't done or seen it all, I hope to provide each and every officer in AFW with the best service possible when working their next assignment. I also have an obligation to meet commanders' needs to fill weather positions throughout the Air Force so they can accomplish their missions. It becomes a matter of striking a balance between AF needs and our individual officer's desires. With every assignment action made here we ask ourselves the following questions: Is it the right thing to do? Does it make sense? Is it legal and moral? Would you like to be treated like this? The underlying philosophy is "equity with sensitivity."

I am now going to focus on the Officer Assignment System. The first thing I would like to emphasize is the importance of starting early when looking for your next assignment. Officers should begin looking for their next job when they are within 9 to 12 months of one of the following: 3 years time-on-station (TOS) in a CONUS assignment, established DEROS, or end of a controlled tour. Make sure to talk with commanders, senior leaders, and your AFPC assignment officer to discuss career goals and potential assignments. When looking for jobs, don't focus on a specific job or location. Instead, pick a level of responsibility and see what jobs meet your career goals.

If an officer does not volunteer for and ultimately get hired for a job or has never been overseas, the officer may be vulnerable for a non-volunteer assignment. There are different factors taken into account depending on the type of job that needs to be filled. For CONUS-to-CONUS assignments, vulnerability is based on time-on-station (TOS). For CONUS-to-overseas long assignments, vulnerability is based on overseas return date. If an officer has never been overseas, then the overseas return date is the same as the total active federal military service date. Finally, to fill short tour vacancies, vulnerability is based on short tour return date. Naturally, if a person has never been overseas, that person's name rises to the top of the short and long tour lists. An important thing to remember is that vulnerability for an overseas assignment is based on overseas return date and not TOS; therefore, an officer could receive a "non-vol" assignment overseas well before reaching 3 years TOS.

Officers can check their vulnerability through the Air Force Personnel Center (AFPC) Assignments Homepage via the Internet at *"http://www.afpc.af.mil/asgnment/htdocs/newinfo.htm"*. The most current information available is listed under the heading "Officer News, Information, and Updates." The lists below contain the latest vulnerability criteria for weather officers:

I also want to explain the new "More Voice/More Choice" enhancement to the Officer Assignment System and how it affects the mechanics of the assignment notification process. When a job ad closes out, I compile a list of all qualified and eligible volunteers and forward that list to the gaining commander or hiring authority. That commander has approximately two weeks to select an officer to fill the job. The commander then forwards his choice to me. If that officer is still available (hasn't been picked for another job), I send the losing commander notification that the officer has been selected for an assignment and ask the commander to verify that the officer is qualified for the job. Once I receive that, the assignment is loaded. The folks here at AFPC are working on a process that will notify all volunteers (both the selectee and all non-selects) of their status once an officer has been selected for a job.

Please feel free to contact me anytime to discuss assignments, career management, officer professional development, or any other personnel issues you may have. I can be reached via email at *"zuccarel@hq.afpc.af.mil"* or DSN 487-4768. I look forward to working with you in the near future.

CONUS-TO-CONUS VULNERABILITY

Capt	3 years TOS by report date
Maj	3 years TOS by report date
Lt Col	Date Arrived Station of 30 Dec 92

LONG TOUR VULNERABILITY

Capt	Overseas Return Date of Jun 85 (never been overseas)
Maj	Overseas Return Date of Oct 83 (never been overseas)
Lt Col	Overseas Return Date of May 84

SHORT TOUR VULNERABILITY

1Lt	Overseas Return Date of Jun 95 (never been overseas)
Capt	Same as long tour
Maj	Same as long tour
Lt Col	Same as long tour

WASHINGTON (AFNS) — Integrity forms the foundation of Air Force core values. The other values — "service before self" and "excellence in all we do" — depend on "integrity first," according to senior Air Force leaders.

At the recently concluded long-range planning CORONA Conference, the Air Force leaders reaffirmed their commitment to these core values for the service. The core values from "Global Reach, Global Power" remain intact as part of the new Air Force strategic vision document, "Global Engagement: A Vision for the 21st Century Air Force." That vision calls for the integration of instruction in core values throughout Air Force training and education programs.

Secretary of the Air Force Sheila E. Widnall emphasized that, "These core values represent the fundamental principles by which airmen, Air Force civilians and Air Force contractors must carry out their work and live their daily lives.

"They make the Air Force what it is. They are the values that instill confidence, earn lasting respect and create willing followers. They are the pillars of professionalism that provide the foundation for military leadership at every level."

Air Force Chief of Staff Gen. Ronald R. Fogleman said, "These core values and the sense of community and professionalism they bring to our service are vitally important to the future of our Air Force."

That is why, he said, "integrity is the bedrock of our core values. At the heart of our military profession has to be the idea that a person's word is his bond. If you're going to be in this business, if you're going to talk about the profession, you must have integrity."

The chief of staff stressed that, "In the Air Force, we don't pencil-whip training reports, we don't cover up tech data violations, we don't falsify documents, and we don't submit misleading readiness indicators. The bottom line is we don't lie."

According to the new basic guide, "U.S. Air Force Core Values," integrity also covers other moral traits such as having the courage of one's convictions, creating an open environment within one's unit, treating people in a just manner, taking responsibility for one's actions and standing accountable for them.

In this regard, Fogleman said, "We're entrusted with the security of our nation. The tools of our trade are lethal, and we engage in operations that involve risk to human lives and national treasure. That's why integrity is so important to the profession we're in, and why the standards we are judged by must be higher than the society we serve."

The chief of staff said integrity is particularly essential for Air Force leaders if they expect their troops to execute the mission.

He said, "When you ask young men and women to go and die for their country, when you are put in a situation where you make decisions that employ those people, it's essential that they believe you are a person of honor and integrity who has their best interests at heart."

The general said it wasn't long after he was commissioned that he came face to face with integrity issues in the real world. Based on that, he said, young airmen and officers would do well to build upon integrity as a core value.

"That will give you a framework within which you can make decisions," Fogleman said. "Stay within that framework. Selfless service with integrity at the foundation will serve you well."

In a similar manner, the new basic guide emphasizes the need to not only teach core values, but to continually live and practice them in day-to-day activities in the field.

(Editor's note: This is part of a series on the Air Force's core values and core competencies.)

HURRICANE HUNTERS

by Maj. Valerie Schmid, 53rd Weather Reconnaissance Squadron

June 1 is the start of the Atlantic Basin hurricane season. For over 50 years, the men and women of the Hurricane Hunters have answered the call to measure these awesome storms in person, in a very rewarding effort to save lives.

Hurricane Opal

The four huge turboprops struggle to bite the turbulent air, and the droning of the powerful engines surge each time the WC-130 aircraft rocks in the wind shear. Rain nails the metal skin of the plane and blinding flashes of lightning alternate with the deep darkness found inside a hurricane at night. It's just another 16-hour shift at the office for an Air Force Reserve Command aircrew from the 53rd Weather Reconnaissance Squadron: the "Hurricane Hunters."

"We're about to break out," announces the navigator, his eyes riveted to the radar scope as he studies a characteristic orange crescent, the signature of a hurricane eyewall.

The hiss of rain shuts off in an instant, but the crew is too busy to notice. The flight smoothes out — they are in the eye — but at 4 a.m., it's still too dark to see the "stadium effect." Senior Master Sgt. Robert E. Lee, the dropsonde system operator, or "Drop," alone at the back of the cargo compartment, loads a dropwindsonde instrument into the launch chamber, closes the chamber and depressurizes it in preparation for the imminent launch.

Master Sgt. Bob Petty loads a dropwindsonde into the launch chamber.

"Ten degrees right," the weather officer directs, and the pilot executes a quick sharp bank to nose the aircraft directly towards the center of the storm — their fourth penetration tonight.

"Ready when you are!" calls the Drop.

The weather officer, Maj. Steve Renwick, watches a row of numbers flashing each second across his computer screen and sees the wind speed beginning to drop off. Then comes the wind shift he's waiting for.

"Drop — release sonde now," he commands as he locks in the computer's readings at the exact center of the storm. "Nav — mark it here!"

As Renwick cross-checks the observations against the long stream of flight-level data recorded by the computer every 30 seconds, the pilots turn the aircraft away from the calm center of the storm back into the fury of the eyewall.

Renwick finishes up the Vortex Data Message with some of his personal observations of the eye on radar: "Most eyes have a diameter of 10 to 30 miles, but this one had tightened up to a mere eight miles across." He adds a remark about the frequent lightning and within seconds the preliminary observation bounces from the Air Force Satellite Communications System directly to the computers at the National Hurricane Center (NHC).

Only one piece of data is still missing—the sea-level pressure measured by the dropwindsonde instrument. Falling at 1,000 feet per minute, it will take ten minutes for the instrument to complete its run, transmitting temperature, pressure, humidity and winds all the way down.

The crew had spent the previous two and a half hours mapping the extent of damaging winds 150 to 200 miles to the east and north of the

hurricane as it charged the Florida panhandle. Unsuspecting residents in her path had gone to sleep that night with reports that Opal was a Category 1 weak hurricane. Now, the crew of "Teal 14" was amazed to find pressures plummeting 15 millibars down to 933 millibars over the course of three passes through the eye, a sure sign the storm was strengthening. Forecasters at the NHC eagerly wait the next update.

"Sonde's in the water," Lee informs the crew. "Looks good so far."

The aircraft computer plots a miniature adiabatic chart of the vertical profile of the storm from the 700 millibar level where the plane flies, down to the surface. The drop cleans up the wild points from the data stream, then stuns the crew with the final sea-level pressure.

916 millibars—an almost unprecedented deepening of pressure which shows the storm picking up strength explosively. Hurricane Opal is now a strong Category 4 on the Saffir-Simpson scale; a dangerous storm only 11 hours from slamming ashore in Florida. Emergency managers have no choice but to step up the evacuations immediately.

The Mission of the 53rd WRS

Hurricane Opal provides one answer to the question of why we risk lives to fly into the storms when today's weather satellites are overhead.

Such sudden, dangerous changes in hurricane intensity are very difficult to detect by satellite alone. Studies by the NHC demonstrate that highly accurate data from aircraft improves the average hurricane forecast by about 25 percent.

"So far, aircraft reconnaissance is the only reliable tool for measuring winds and pressure in a hurricane," said NHC Hurricane Specialist, Lixion Avila. "Everything else is just an estimate."

Each improvement in the forecast is critical and cost effective. Today, a typical hurricane warning event costs approximately $192 million due to preparation, evacuation, and lost commerce. Narrowing the warning area could save $640,000 per mile or more, lend greater credibility to forecasts, and foster more controlled and limited coastal evacuations. Furthermore, as coastal populations continue to grow, evacuation decisions need to be made earlier; a few areas already require more than 48 hours to clear in advance of a major hurricane.

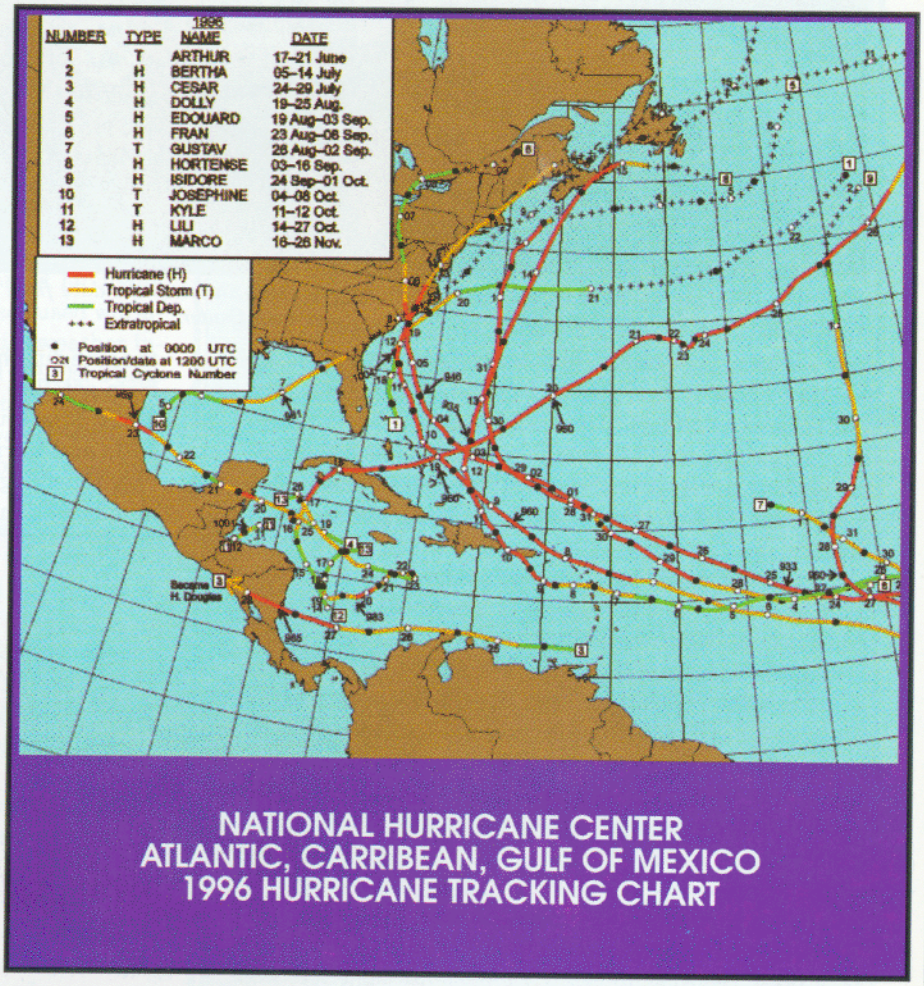
This is one of the few missions for which the Air Force Reserve has no active duty counterpart, but that wasn't always true. In 1976, the Air Force Reserve's 815th Weather Reconnaissance Squadron began sharing the mission with the active duty 53rd WRS, a relationship that lasted 16 years.

Widely publicized budget cuts forced the closure of the active duty 54th WRS "Typhoon Chasers" on Guam in 1987, followed by the inactivation of the 53rd in 1991. However, Congress insisted weather reconnaissance continue in the Atlantic, Caribbean, Gulf of Mexico, and Central Pacific, and this mission passed entirely to the Reserves. The squadron is line-item funded in the Congressional budget, a reflection of the value of aircraft data to the storm warning system.

In 1993, the squadron adopted the more recognized name of the 53rd WRS "Hurricane Hunters." Today, many people are surprised the Hurricane Hunters are still around.

"When I started in this business in 1969, they told me not to get too comfortable because weather recce was going to close in six months," laughs veteran dropsonde operator, Master Sgt. Lee Snyder. "I've been hearing that for 28 years."

While the early 1990's saw relatively few storms in the 53rd's area of responsibility, the squadron was soon challenged with consecutive record-setting seasons. In 1994, a strong El Nino kicked off an astonishing level of activity in the Central Pacific, with three of the five storms flown reaching Category 5. The very next year saw a daisy-chain of hurricanes forming across the Atlantic, for the busiest season ever flown. At one point, as Tropical Storm Karen was being absorbed by Hurricane Iris, a crew flew across both storms in a single mission to collect unprecedented data on cyclone interaction.



NATIONAL HURRICANE CENTER
ATLANTIC, CARRIBEAN, GULF OF MEXICO
1996 HURRICANE TRACKING CHART

The People of the 53rd WRS

A typical Hurricane Hunter aircrew includes six people: two pilots, a navigator, a flight engineer and two weather specialists. The Aerial Reconnaissance Weather Officer (ARWO) is a forecaster-qualified meteorologist, while the Drop holds dual-qualification as weather observer and C-130 loadmaster; many are also forecaster qualified.

Half of the crew members are "traditional" reservists, which means they drill with the Hurricane Hunters at least one weekend per month plus two weeks during the hurricane season. Most of the reservists volunteer for extra duty, with the generous support of their employers.

U.S. Air Force Photo

Technical Sgt. Chuck Cahill plots an adiabatic diagram and processes the data from the dropsonde for satellite transmission to the National Hurricane Center.

Tech. Sgt. Chuck Cahill, a dropsonde operator, is a manager of informational systems for a children's rehabilitation firm in his civilian life. "It's difficult keeping everyone happy in both jobs," admits Cahill. "But it is worth the effort. It fills my desires for community service and love of flying," he explains. "I told Senior Master Sgt. (Mike) Scaffidi (chief Drop) that I'd sweep the floors on the plane if I could fly."

For other reservists working in the weather community, their Reserve work directly enhances their civilian job. Weather School instructor Capt. Rich Henning found his master's thesis topic in the anecdotal stories of his fellow crewmembers which link unusual lightning around the eye to hurricane intensification.

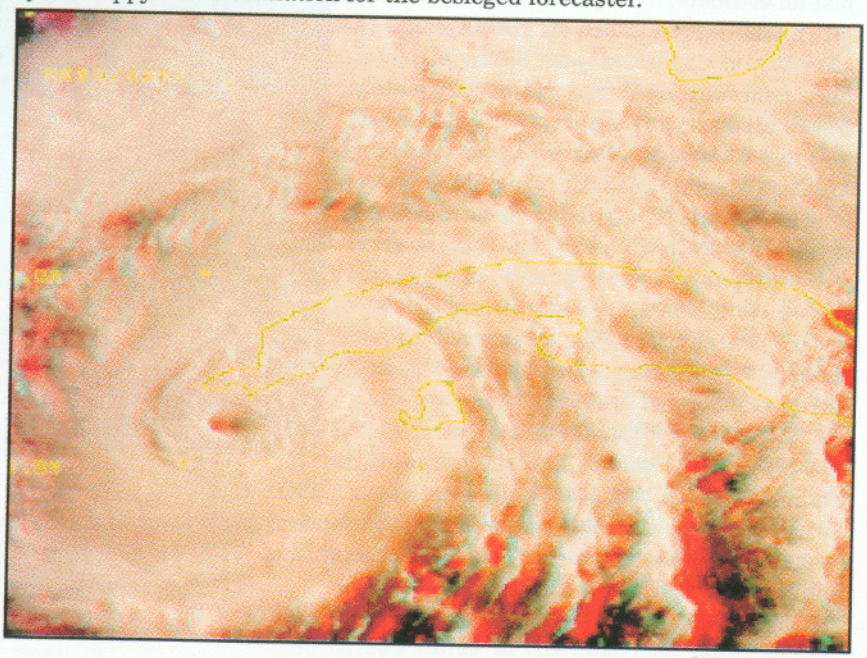
"It's great to see the weather first hand," Henning said. "It isn't just a bunch of equations in a book—you get to see it right before your eyes."

The other half of the crewmembers are Air Reserve Technicians, which essentially means they work in a full-time civil service position for the Hurricane Hunters, and serve as military reservists in the same role when needed on nights and weekends. This keeps enough people available for instant recall when a storm pops up. While most reserve units have at least two or three days notice before deploying, nature does not give the Hunters the luxury of an advance schedule.

"The reason I've stayed with this job is there's a definite sense of meaning and accomplishment," explains Capt. Roy Deatherage, one of several flight meteorologists who transferred to the reserves after serving with the active-duty 53rd WS.

One of the best-kept secrets is the position of Chief, Aerial Reconnaissance Coordination, All Hurricanes (CARCAH). Three Air Force Reserve civilian personnel assigned to the 53rd WRS hold that title and have the rare privilege to work in the National Hurricane Center. These folks work around-the-clock as liaisons between the NHC and the military. They may call the Air Force Global Weather Center (AFGWC) at Offutt AFB, Neb., to provide additional fixes from military weather satellites, and may request additional upper-air soundings and radar observations from coastal military bases. They also generate the tasking orders for the 53rd and NOAA aircraft and provide quality control and dissemination of the data.

The NHC is an incredible pressure-cooker during a landfalling hurricane. CARCAH personnel holding the latest aircraft report must vie for the attention of the lone duty hurricane specialist, who is inundated with data from satellite analysts, multiple computer model runs, and other data sources. Imagine putting out such critical forecasts and warnings under the glare of TV spotlights. But it's very satisfying when an aircraft observation reveals a key piece of information for the besieged forecaster.



U.S. Air Force Photo

"This is a great place to be!" sums up John Pavone, a former flight meteorologist and current CARCAH.

Winter Storms Too

A lesser known responsibility is the winter storm mission. From Nov. 1-Apr. 15, the Hurricane Hunters may be called by the National Center for Environmental Prediction to fly the cyclones that may intensify just off the coastline of the U.S., such as the famous "nor'easter" blizzards on the eastern seaboard. These missions are flown at 300 millibars (about 30,000 feet), and involve an array of dropsonde releases to pin down the conditions for intensification. While the turbulence is typically not as severe as in the hurricanes, the crews usually must endure hours of stomach-wrenching light chop, plus lightning and icing rarely seen on the tropical missions.

The squadron also may participate in research projects in the national interest. In January and February of this year, the 53rd joined several nations in the Fronts and Atlantic Storm Tracks Experiment (FASTEX). Kerry Emmanuel, a meteorology professor at Massachusetts Institute of Technology and a lead FASTEX scientist, commended the 53rd for their work on the project.

"The USAF WC-130 missions have added substantially to our ability to test the working theories that form the basis of the FASTEX project," Emmanuel said. Many of the observations can be found real-time on the Automated Weather Distribution System (AWDS) and on the Internet, and are archived for researchers.

So You Want To Be a Hurricane Hunter

The ten WC-130H aircraft are not reinforced for flying hurricanes; they are the same sturdy workhorses used worldwide in a variety of interesting missions. Special weather instruments distinguish these birds from standard C-130s. These sensors are tied directly into weather computers that measure data up to eight times per second, and save observations every 30 seconds for real-time transmission to the customer at the NHC. For research purposes, data may be archived in ten-second and even one-second intervals. These data include position, temperature, dewpoint, winds, radar altitude, pressure altitude, height of standard surface, and other parameters.

For those qualified military meteorologists interested in joining the Hurricane Hunters, the squadron's chief meteorologist, Lt. Col. Gale Carter, encourages them to call for the requirements and for information on how to orient their career towards that goal.

"It's a demanding, intense job, especially for the part-timers," explains Carter, "but it will be the most rewarding job they'll ever have."

The Hurricane Hunters are proud to serve as a vital link in the hurricane surveillance and warning network. "We couldn't live without it," insists Ed Rappaport, Hurricane Specialist at the NHC, "and neither could the public."

If you'd like to learn more about the 53rd WRS, or to take a virutal flight into a hurricane, visit the Hurricane Hunters' website at "*www.hurricanehunters.com*".

HURRICANE HUNTERS

HEAD NORTH FOR WINTER

by Maj. Jon Talbot, 53rd Weather Reconnaissance Squadron

For two weeks in January and February, two aircraft and crews from the 53rd Weather Reconnaissance Squadron at Keesler AFB, Miss., found themselves in St. Johns, Newfoundland, Canada, as part of the Fronts and Atlantic Storm Track Experiment (FASTEX) and the Labrador Sea Experiment (LABSEA) in an effort to help improve the understanding of oceanic storms.

During FASTEX, 53rd WS WC-130s joined aircraft and ships from the United States, Great Britain, France and the Ukraine probing storms over the North Atlantic. The experiment, lasting for nearly two months, looked at why and how storms intensify over ocean areas. Data collected helped to increase the accuracy of weather forecasts along west coasts of continents.

For the Hurricane Hunters, it was an opportunity to train under cold weather conditions and in areas where they usually don't fly. "This was a test of the capabilities of both aircrew and maintenance in an environment that we operate in infrequently. The severe weather conditions gave a new meaning to the word 'training'," said Lt. Col. Bob Peterson, mission commander for the deployment.

"Our aircrews performed admirably, but I must take my hat off to the tremendous dedication and performance of our maintenance team. They worked in temperatures of less than 20 degrees Fahrenheit with winds in excess of 50 knots," Peterson said. "The wind chill factors were no less than horrible, yet they were highly motivated and never failed to provide a mission aircraft ready for flight. Top-notch work!"

The Labrador Sea Experiment, a joint experiment involving the U.S. Navy and Canada, focused on the formation of Arctic storms over the Labrador Sea. Crews flew both high- and low-level missions, sampling the atmosphere over and near the arctic ice pack while ships deployed weather buoys over the Labrador Sea.

According to Lt. Col. Bob Katz, assistant mission commander, the deployment combined real-world requirements with training opportunities. "We were releasing weather instruments over and near the major commercial air routes between North America and Europe, which made an enormous amount of coordination necessary between the unit, individual crews and Canadian air traffic controllers," he said. "This provided excellent training for the mission staff and our crews."

When the deployed crews returned to Keesler Feb. 10, they had flown 126.3 hours and had released more than 100 weather instruments.

Kerry Emmanuael, a meteorology professor at the Massachusetts Institute of Technology, and a leading FASTEX scientist commended the Hurricane Hunters for their work on the project.

"They provided truly outstanding support to the FASTEX project," Emmanuel said. "The Air Force WC-130 missions have added very substantially to our ability to test the working theories that form the basis of the FASTEX project."

COMMUNICATIONS TECHNOLOGY

Rapid Changes Bring Challenges, Advantages

By 1Lt Michael W. Moyles, Communications Acquisition Officer, HQ AWS/SCTA

I grew up overseas, with one television channel. Today, the thought that literally hundreds of channels are readily available is almost inconceivable to me. If you own a car that was made after 1994, it has more computing power than the Apollo 13 aircraft that took men to the moon. It's amazing to think that there is more computing power in most kindergarten classrooms today than there was in the entire Department of Defense only a decade ago. In fact, industry experts estimate that technology is advancing at a ten-year rate of approximately 4000:1. In other words, in ten years, you will be able to purchase four thousand times the computing power you can today with the same amount of money. All of these statistics point to one undeniable fact: the face of technology is changing, and it is changing rapidly.

As communicators, we are faced with the difficult position of being *service providers*. The pace at which technology is advancing makes this all the more difficult. The current transitions in weather communications – from legacy, dedicated, analog circuits to high-speed, digital, common-user communications – are also subject to these rapid changes and to their consequences. Take, for example, Global Broadcast Service (GBS).

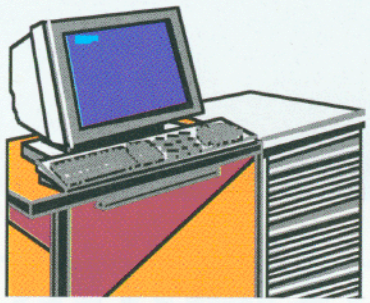
When this project was originally conceived in the early 1990s, it was designed around then-available technology. Satellites were designed, transponders were leased, and launches were scheduled. Unfortunately, this project was designed in the early 1990s for implementation in the early 21st Century – therefore, the primary transponder on GBS, which covers 2000 nautical miles, has a bandwidth of only 1.544 Mbps (T1). Given the footprint of this transponder and the fact that the available bandwidth will be shared by all users in that footprint, T1 suddenly appears very small. We, *as service providers,* must not let our communications networks succumb to this same short-sightedness. We must design our networks not around current technology and requirements, but in anticipation of future requirements and technological advancements. We can use the rapid pace with which technology advances to our advantage, instead of defining "adequate" technology as a goal that we will never reach.

Such transitions in weather communications seem to be making many of our weather customers somewhat nervous. There is serious doubt as to whether or not common-user communications will be able to support the unique requirements of the weather warfighter. In reality, we are making every possible effort to ensure that these networks will not only meet, but will exceed your requirements. It is no secret that not only weather but the whole Department of Defense is going to common-user communications. However, it is also no secret that we're not there yet. The pace at which communications technology is advancing seems only to be outdistanced by the requirements which such technology is designed to support. If we can have the patience to allow the technology and expansion of common-user communications to catch up to our requirements, then we can truly begin to see the significant advantages it provides.

"What advantages?" you may well ask.

Imagine an environment where a Joint Task Force (JTF) Commander can look at a single screen and see not only the weather forecast covering his Area of Responsibility (AOR), but also his troops and their movement, enemy positions and their movement, combined with a complete readout of available logistics and tactical communications, supplies, and other support. What about a network of computer systems running different platforms, operating systems, and applications, yet able to interchange and share not only data but entire applications, all without violating system integrity or security, and minus the headaches of conversion and reformatting? These are not hypothetical situations – they are gradually becoming a reality under the Defense Information Infrastructure Common Operating Environment (DIICOE). Platforms like the Global Command and Control System (GCCS) and the Global Combat Support System (GCSS) are already on their way to realizing this vision.

This is where we are headed with weather communications. A lofty goal, some may say, but I'll let you in on a little secret: *we are closer than you think.* The day is not far away when weather, intelligence, command and control all will operate seamlessly over high-bandwidth, high-speed, robust and reliable common-user communications media, providing a Common Operating Picture that will expand and enhance our warfighting efficiency. If we recognize our position as service providers, focus on emerging technologies and future requirements, and have the patience and vision to let common-user communications reach its full potential, then we can reap the powerful benefits of the ongoing explosion in information technology.



"Out With the Old, In With the New" One system does it all....

By Staff Sgt. David Kellam, Weather Systems Program Manager, HQ AWS/SCMO

Mission demands for more sophisticated weather products over the past two decades have generated some stovepipe weather and communications systems which have become fixtures in many Air Force Weather facilities. Periodic upgrades to these systems throughout the years have improved the distribution of weather products from Air Force Global Weather Center (AFGWC) and from the Automated Digital Weather Switch (ADWS) to the user. Outdated technology, supportability limitations, lease and maintenance costs, and the need for flexibility have led to the development of the Meteorological Information Standard Terminal (MIST) program to replace Air Force Digital Graphics System (AFDIGS), Automated Digital Facsimile System (ADFS), Meteorological Environmental Data System (MEDS), and Geostationary Operational Environmental Satellites (GOES) Loopers. This new system is scheduled to be fielded in two blocks beginning in October.

MIST is designed to provide decision makers with accurate and timely weather information to support flight operations, ground operations, and provide resource protection support at Air Force, Army, Navy and other DOD agencies. The MIST will provide a scaleable, modular, common software solution portable to multiple platforms supporting the five core meteorological processes (observing, forecasting, analysis, tailored applications, and dissemination) and Notices to Airman (NOTAMs) for the warfighter. MIST relies on common user communications capable of providing assured delivery and timely receipt of alphanumeric and graphic products, polar orbiting and geostationary satellite imagery, and NOTAM products. All of this and more can be done at a single work station no larger than a standard desktop personal computer.

Initially, two systems have been selected to be replaced by MIST in block one of the installation: the AFDIGS, which has been in the field for about 17 years, and the ADFS which is 9 years old. Weather graphics are currently distributed to over 50 AF, Army and Navy sites via AFDIGS. Polar orbit and geostationary meteorological satellite imagery are sent to 7 sites via ADFS. Although both systems have been very dependable over the years, a standardized multi-function system was required to meet the demand for weather data in garrison. These two systems were selected for priority replacement because current lease/maintenance contracts expire in January 1998. Replacing these systems will eliminate the need to initiate new contracts to support these systems and will eliminate over $100K in monthly recurring costs for both systems.

Once AFDIGS and ADFS have been replaced, the second installation block will focus on replacing MEDS and GOES Loopers. In July 1998, these contracts will also expire. MEDS has been in place for over 20 years and supports nearly 400 users with alphanumeric weather forecast data as well as NOTAM capability. GOES currently provides over 80 locations with geostationary satellite imagery. Most of these systems are also contractor maintained and are very costly to the government. MEDS equipment is leased in the continental United States as well as Hawaii, while OCONUS locations have government-owned systems. At over $225K a month, MEDS is by far the most costly of the four programs being replaced. GOES uses government-owned equipment with contractor maintenance costs of about $7K a month.

As Air Weather Service migrates towards implementation of a standardized system(s) to replace the current systems, we have made a concerted effort to identify and categorize our user requirements. Current users (AFDIGS, ADFS, MEDS, & GOES) can be assured that their requirements have been included in the MIST implementation schedule. Units not currently using any of these four systems, but having valid requirements, will be considered on a case by case basis. If you have questions concerning the status of your location, contact 1Lt Mike Moyles, HQ AWS/SCT, DSN 576-4731 Ext. 256 or the AWS Project Officer, Maj. Tim Lambert, HQ AWS/SYD, DSN 576-4731 Ext 324.

If your location is currently receiving adequate weather products via Internet browsers or other sources and no longer requires ADFS, AFDIGS, COMEDS OR GOES, please contact Mr. Charles Caldwell or Staff Sgt. David Kellam, HQ AWS/SCMO, DSN 576-4731, Ext. 757/758. They will assist you with turn-in procedures. Leased hardware must be returned to the contractor according to the terms of the contract(s) or be purchased by the government. Removal of systems prior to installation of MIST will not affect your standing in the implementation schedule but it will reduce monthly recurring costs for leased maintenance and equipment.

by Capt. Ricardo C. Davila and
Maj. William H. Bauman, HQ AWS/XOXT

Using the Global Position

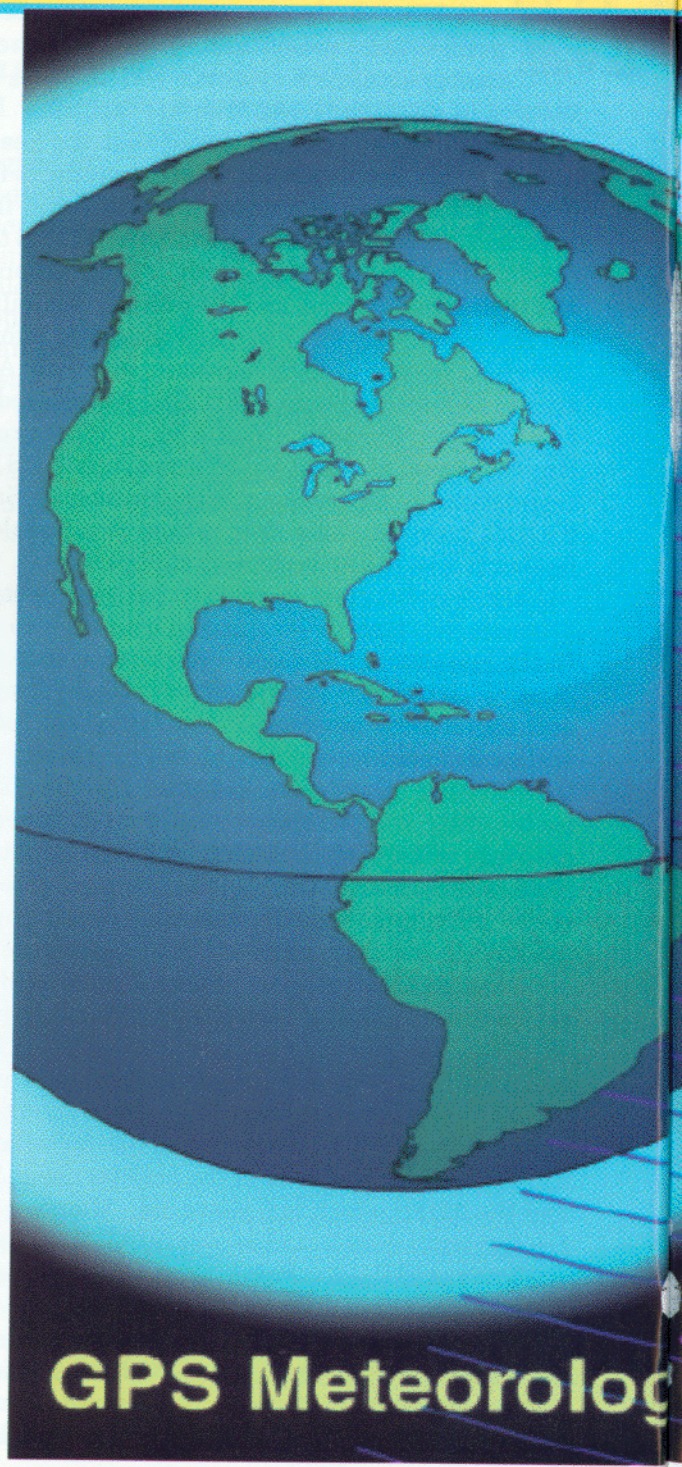
"GPS Meteorology" is the term given to the body of science and technology which makes use of the Global Positioning System (GPS) for active remote sensing of Earth's atmosphere.

On 18 March, HQ AWS hosted a meeting that brought together scientists from NOAA's Forecast Systems Laboratory (FSL) and the University Corporation for Atmospheric Research (UCAR) to discuss two of the most promising GPS Meteorology applications: GPS Integrated Precipitable Water (GPS-IPW) and GPS-Meteorology (GPS/MET) systems.

GPS-IPW

GPS-IPW consists of two parts: a ground-based receiver and the GPS satellite. GPS satellite signals reaching ground-based receivers are delayed along the signal path due to electron density in the ionosphere and the presence of water vapor in the troposphere. The amount of precipitable water in the atmospheric column is determined based on the signal delay. The ionospheric delay is easily determined and removed. The remaining delay in the electrically neutral atmosphere can be divided into two parts: a hydrostatic delay and a wet delay. The hydrostatic delay is easily determined from surface pressure measurements[1]. The wet delay is closely related to the quantity of water vapor in a column of air above the ground-based GPS receiver. Ground-based GPS-IPW observations provide high frequency, accurate observations unaffected by weather conditions, but they have poor spatial resolution. Precipitable water estimates using satellite-borne infrared sensors are reliable only in cloud-free areas while precipitable water estimates using microwave sensors on satellites are only available over oceans. GPS-IPW measurements are most valuable where satellites cannot obtain good measurements—mainly in cloudy regions where the need to have accurate measurements is greatest.

GPS-IPW is a promising technology as shown in Figure 1. On 22-23 July 1996 total precipitable water vapor observed by the GPS-IPW system at the Lamont, Oklahoma National Profiler Network (NPN) site rose more than 3.5 cm in about 6 hours, and then fell almost as much in the next 6 hours. This was the result of thunderstorm outflow, confirmed by surface measurements. There was an increase in surface pressure of 5 mb in 3 hours, a temperature drop of about 15^{o} F, winds gusts to 29 kt, and rainfall at the rate of 0.12 inches per hour. Nearby radiosonde data also confirmed the event and agreed well with the GPS measurement; however, radiosondes do not have the detail provided by GPS.[2]



A joint effort between two NOAA Environmental Research Laboratories (ERL) in Boulder has led to development of an *operational* surface-based GPS-IPW. By September 1996, NOAA installed 10 ERL GPS-IPW systems: nine at NPN sites and one at the NWS National Data Buoy Center at the NASA Stennis Space Center in Mississippi (Figure 2).

ng System for Meteorology

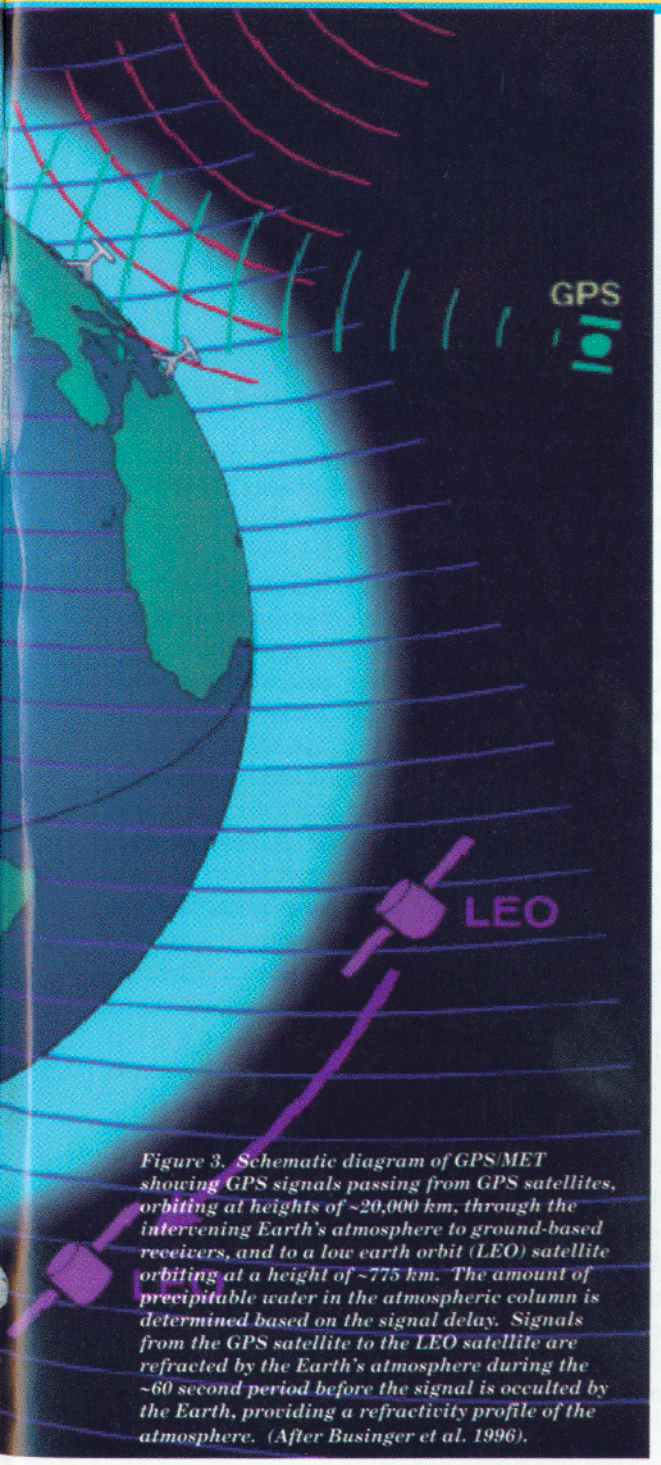


Figure 3. Schematic diagram of GPS/MET showing GPS signals passing from GPS satellites, orbiting at heights of ~20,000 km, through the intervening Earth's atmosphere to ground-based receivers, and to a low earth orbit (LEO) satellite orbiting at a height of ~775 km. The amount of precipitable water in the atmospheric column is determined based on the signal delay. Signals from the GPS satellite to the LEO satellite are refracted by the Earth's atmosphere during the ~60 second period before the signal is occulted by the Earth, providing a refractivity profile of the atmosphere. (After Businger et al. 1996).

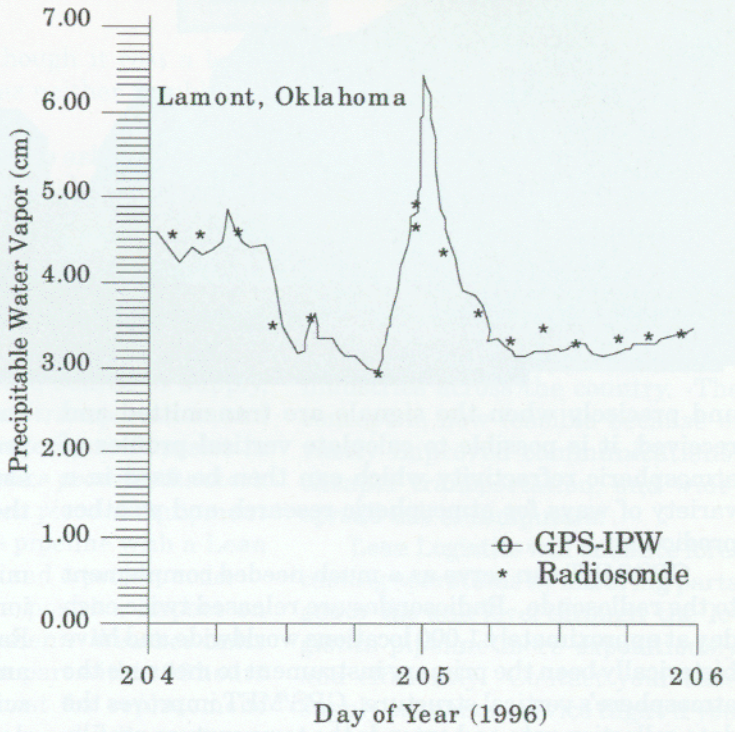


Figure 1. Very rapid change in total precipitable water vapor observed at Lamont, Oklahoma NPN site in July 1996 (From FSL Forum, NOAA Forecast Systems Laboratory, December 1996)

GPS/MET

On April 3, 1995, a Pegasus rocket carried a small satellite, MicroLab-1, into a low-Earth orbit. The successful launch of MicroLab 1 was a major milestone in the project known as GPS/MET. GPS/MET is a University NAVSTAR Consortium (UNAVCO)[3] proof-of-concept experiment designed to obtain accurate and high-resolution vertical profiles of temperature on a global basis. The GPS/MET receiver, no larger than a shoebox, circles the earth every 100 minutes aboard the MicroLab-1 satellite. As it orbits, the receiver picks up signals transmitted from 24 GPS satellites (Figure 3). Approximately 500 times a day, the ray path between the receiver and one of the GPS satellites passes through the earth's atmosphere. These events, known as radio occultations, provide a means to take soundings of the atmosphere. Knowing precisely where the satellites are (within centimeters)

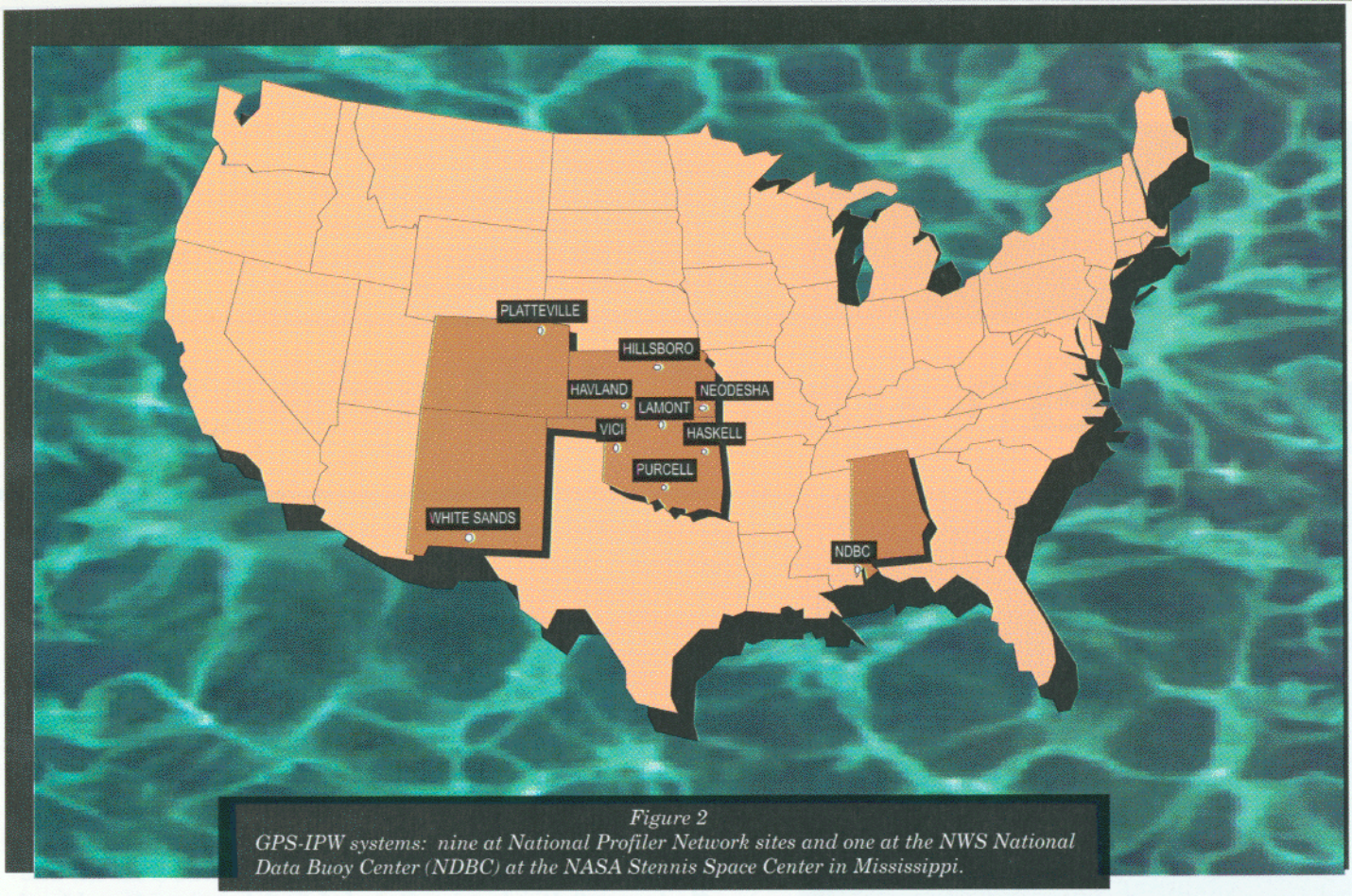


Figure 2
GPS-IPW systems: nine at National Profiler Network sites and one at the NWS National Data Buoy Center (NDBC) at the NASA Stennis Space Center in Mississippi.

and precisely when the signals are transmitted and received, it is possible to calculate vertical profiles of atmospheric refractivity which can then be used in a variety of ways for atmospheric research and weather prediction[4].

GPS/MET can serve as a much needed complement to the radiosonde. Radiosondes are released twice each day at approximately 1,000 locations worldwide and have historically been the primary instrument to measure the atmosphere's vertical structure. GPS/MET improves the data collection rate and extends the temperature profile. The GPS/MET system performs each of its vertical scans in only a minute or two, compared to around 100 minutes for a radiosonde. The radiosonde's ascent ends at 25 to 30 kilometers while GPS/MET can measure data from as high as 60 kilometers. Initial studies show that accurate vertical temperature profiles may be obtained using the GPS occultation technique from approximately 40 km to about 5-7 km in altitude where moisture effects are negligible. These studies also showed that the GPS/MET temperatures in this region agree to within 2^{0} C with other independent sources of data. Below 5 km, higher concentrations of water vapor can cause large gradients in the refractivity profile which can result in larger temperature errors for this region. GPS/MET is unhindered by oceans or other settings where regular balloon releases are hard to implement. Although radiosondes have the advantage of making direct temperature and humidity measurements, some studies show that the indirect readings derived from GPS/MET may work as well as radiosonde data within the gridded data bases that are fed into computer models. If projections prove accurate, a constellation of GPS/MET satellites could provide global coverage for a fraction of the cost of today's radiosonde network.

While neutral atmosphere monitoring is the main mission of GPS/MET, interest in using the data for ionospheric studies and space weather is increasing. Early results show that GPS/MET phase, range, and amplitude data hold promise for monitoring ionospheric scintillation, Total Electron Content, and electron density profiles. The GPS/MET team will continue to work with academia as well as DoD and civilian laboratories to explore these potential applications for current and future space weather operations.

Both GPS-IPW and GPS/MET are new techniques that promise to enhance our observations of moisture and temperature throughout the atmosphere. The next step is to determine how these GPS measurements can most effectively be processed in combination with other data resources and assimilated into weather prediction models.

[1] Businger et al., 1996, The Promise of GPS in Atmospheric Monitoring, *Bulletin of the American Meteorological Society,* **77,** 5-17.

[2] See *December 1996 FSL Forum* at http://www.fsl.noaa.gov/fsl/docs/publ/forum1296/f1296e.html

[3] See http://pocc.gpsmet.ucar.edu/ for more details on the UNAVCO GPS/MET program

[4] Ware et al., 1996, GPS Sounding of the Atmosphere from Low Earth Orbit: Preliminary Results, *Bulletin of the American Meteorological Society,* **77,** 19-40.

Systems Directorate

Lean Logistics Lessons

by 2nd Lt. John A. DeWald, Weather Project Engineer, HQ AWS/SYX, and Chief Master Sgt. Donna E. Jackson, Chief, Logistics and Configuration Management Branch, HQAWS/SYXL

The Air Force faces a smaller force and ever increasing worldwide commitments, making the logistics support process absolutely vital in maintaining full combat readiness. Headquarters Air Force Material Command (HQ AFMC) and the air logistics centers (ALCs) have worked the last few years to improve the logistics process. Since the spring of 1993, AFMC has been working on "Lean Logistics," an effort to make the depots more responsive to the needs of their customers, the operational commands.

The theory of Lean Logistics is to reduce the time a part spends in the "pipeline." The pipeline is the route a spare part takes from the time it is removed from a weapon system until it is returned to the depot, repaired, shipped out again, and available for use. Repair times haven't changed much. What did change was having parts sitting around waiting for the next thing to happen to them.

In the old process, a part spent a large amount of time waiting for repairs at the depot until depot managers received like parts to repair all at once — batch processing — or waiting for a consolidated shipment.

The depot repair process remained relatively unchanged since World War II. This process led to depot inventories bulging with equipment, and a slow and expensive logistics process. Cycle time for items returned to the depot took months. Transportation was slow and depot repair took three or four weeks. Total depot processing time often took more than a month. It worked ... although it cost a lot of money and was neither flexible nor reliable.

Lean Logistics asks "why wait?" When a part breaks, it's express shipped directly to who needs to fix it, is repaired, and goes right back out again as a good spare. It replaces inventory size with inventory speed. The idea is to move equipment quickly from the source of supply, along the lines of transportation, and back to the customer. To assist in the Lean Logistics process, the stock number for each piece of equipment is coded in the pipeline with a Lean Logistics code and a project code.

This has a positive impact on weather equipment. Weather units should have the part within 96 hours after the request for replacement arrives at base supply. Better turnaround time for weather equipment will result in better up-time maintenance data collection rates, improved weather sustained efforts, and will ensure weather war-fighters' capabilities are unchallenged.

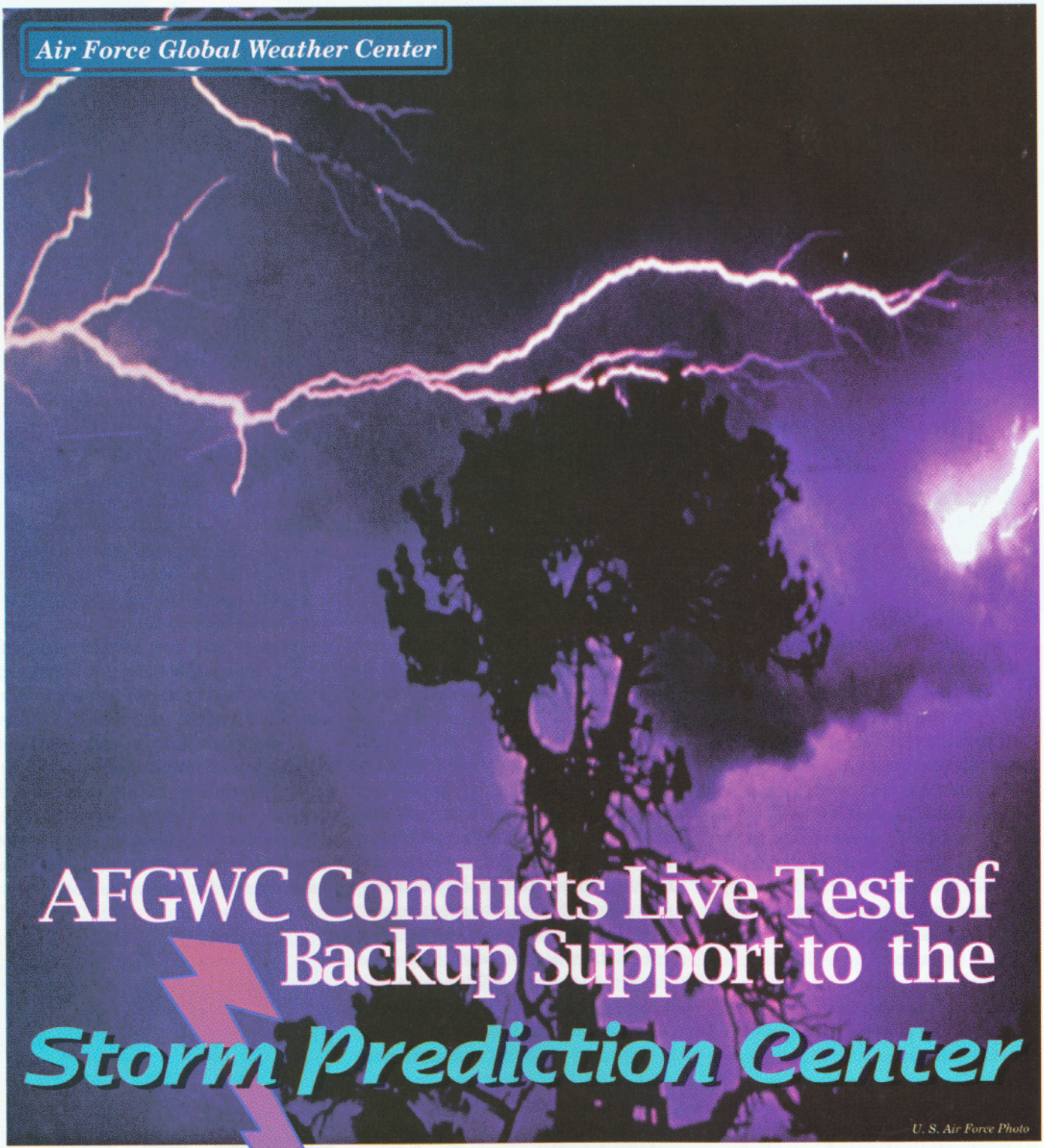
Weather systems conversion to Lean Logistics began in January 1997. There might be some problems initially, until everyone becomes accustomed to the new way of doing business.

"The basic concepts of Lean Logistics are simple: repair the right parts faster, move them to the user faster, and return broken parts back to the repair facility faster," said Gen. Henry Viccellio Jr., AFMC commander. "If we can do that consistently, the number of people, spare parts, and ultimately, costs involved in the logistics pipeline can be reduced significantly."

The faster the inventory of spare parts moves, the fewer spare parts required at the unit and depot. This saves money in reduced inventories and improves customer support.

The concept of Lean Logistics is not new — it is used successfully in industries across the country. The concept is now feasible because of vastly improved communications, cheaper transportation, and widespread use of computers.

Lean Logistics will enhance forecasting operations by ensuring parts get to the unit level through the logistics pipeline more expeditiously and efficiently. Contact your base supply customer service flight if you have delays for parts replacement.



AFGWC Conducts Live Test of Backup Support to the Storm Prediction Center

U. S. Air Force Photo

by Maj. William Moak, Central Liaison Manager, Air Force Global Weather Center

Thursday, 27 Mar 97, 5:51 PM CST. The National Weather Service issues a weather watch (WW-110) for severe thunderstorms with large hail, dangerous lightning and damaging winds possible. WW-110 covers an area 135 statute miles north and south of a line extending from a point 35 miles west-northwest of Ponca City, Okla., to a point 65 miles southeast of Olathe, Kan., and is valid until 10:00 PM CST. At 7:10 PM CST, the Weather Forecast Office at Tulsa, Okla., follows up with a weather warning for severe thunderstorms for Tulsa County with golf ball-size hail and wind gusts to 70 MPH. At 7:43 PM CST, golf ball-sized hail is reported 4 miles southwest of Tulsa. At 8:01 PM CST, a tornado touches down 6 miles

south-southwest of Tulsa. And 9 minutes later, grapefruit-size hail is reported 4 miles southwest of Tulsa.

Just another smooth execution of the NWS mission to predict and warn the public of hazardous weather, right? Well . . . not quite. WW-110 was actually issued by Air Force forecasters at AFGWC during a live test of backup support to the NWS Storm Prediction Center.

As part of a cooperative arrangement with the National Centers for Environmental Prediction (NCEP), AFGWC serves as backup to both the Storm Prediction Center (SPC) at Norman, Okla., and the Aviation Weather Center (AWC) at Kansas City, Mo. AFGWC has had a long relationship with the SPC (formerly the National Severe Storms Forecast Center). However, in this day of shrinking budgets in both the Department of Defense and the Department of Commerce, AFGWC and NCEP have stepped up cooperative efforts. Last December, the Directors of the SPC and AWC met with the AFGWC Commander to discuss opportunities to work together and map out plans to develop, implement and routinely test a capability at AFGWC to back up the SPC and AWC.

When AFGWC backs up the SPC--for exercise or for real--AFGWC forecasters prepare all required products and send them to the AWC for distribution to the NWS weather forecast offices (WFOs). Forecasters in the CONUS Severe section at AFGWC use NWS software and data to monitor weather conditions and prepare SPC products. AFGWC produces the Day 1 and Day 2 Outlooks for severe weather potential and issues any weather watches that are required for severe thunderstorms or tornados.

At about 10:00 AM CST on 27 March, the SPC handed over the reins of national hazardous weather prediction to AFGWC for a live 10-hour back-up test. That responsibility was now in the capable hands of Capt. Mark Mesenbrink, Master Sgt. Chris Boczek, and Tech. Sgt. Chuck Elford. The SPC monitored AFGWC's performance and was available to resume this mission if conditions warranted. Grant Newby and John Hart, forecasters from the SPC, were also on hand at AFGWC to observe and offer technical assistance. The AFGWC team poured over model data to prepare the Day 2 Outlook and issued an area of "moderate risk" over parts of the Tennessee and lower Mississippi Valleys. Their forecast verified repeatedly the next day as a significant tornado outbreak ripped through the Tennessee and Ohio Valleys. Next, they issued the 19Z Day 1 Outlook, placing an area of "slight risk" over eastern Oklahoma and Kansas and western Arkansas and Missouri. This outlook also verified later during the test. The AFGWC forecasters issued a mock tornado watch box for northeast Colorado in order to test the product generation software and comm infrastructure. They then turned their attention to Kansas, Oklahoma and Missouri where the potential for severe weather was improving.

A few thunderstorms began developing over southwest Kansas beneath an upper-level low and the threat of damaging winds was increasing. At 4:15 PM CST, AFGWC issued a severe thunderstorm watch (WW-109) for northwestern Oklahoma and south central Kansas. AFGWC forecasters were also watching an area of thunderstorms over southeastern Kansas and central Oklahoma where slightly more unstable air was in place and issued WW-110 at 5:51 PM CST. They continued to monitor weather conditions over the lower midwest but determined that no further watches were necessary. After issuing the 02Z Day 1 Outlook, AFGWC handed the controls back over to the SPC. The test was deemed a success. Although some work remains in the data, communication, and procedural areas, the performance of Mesenbrink, Boczek, and Elford was lauded by the SPC.

This test provided an excellent opportunity for both AFGWC and the SPC to learn more about each other. AFGWC forecasters learned some fundamentals of "boxology"—the art of sizing and shaping watch boxes. (For instance, don't draw the edge of a watch box through a large city). They also developed an appreciation for the importance of maintaining a dialogue with the WFOs that are affected by weather watches. Our guests from the SPC garnered a better understanding of how AFGWC conducts business--the data, equipment, and techniques we use--and how we balance backup support with our primary mission to the DoD community. AFGWC and the SPC will continue to work together to refine our backup role. We're upgrading our equipment and communications to effectively mirror the SPC capability and ensure a near-seamless transition of national severe weather prediction to AFGWC. Our next "live" back-up is scheduled for July.

SPC back-up is just one of many initiatives that AFGWC is pursuing with NCEP. We are also actively working with the AWC to develop and test back-up procedures for their mission. The AWC monitors flying weather conditions over the CONUS, Atlantic and Pacific, and issues SIGMETS and AIRMETS as necessary as well as outlook products. AFGWC will conduct a live back-up test to the AWC this summer for the Northeast Region (one of six forecast regions). AFGWC is also working with the Environmental Modeling Center in Camp Springs, MD, to acquire ensemble forecast data and tailor it to our customers. These cooperative efforts have achieved big dividends for both AFGWC and NCEP and promise even bigger returns in the future.

Weather History

Did You Know?

Our 60th Anniversary Will Be July 1997!

The month of May in Air Weather Service History—

~~ 1942:

Jan-May: Approximately 15 5th Weather Squadron enlisted men were among the last-ditch defenders at Bataan and Corregidor. Tragically, most were killed or taken prisoner.

~~ 1945:

Revised Army Regulation 95-150 gave Army Air Force Weather Service responsibility for providing weather service to all US Army components except those specifically exempted by the War Department.

~~ 1958:

The 29th Weather Squadron was inactivated at Wheelus AB, Libya.

~ The Centralized Forecast Facility began forecasting officially for the Central United States, from Kansas City.

~~ 1963:

Colonel William S. Barney, 1st Weather Wing Commander, Fuchu AS, Japan, became Vice Commander, AWS. He had been a member of AWS from its inception in 1937.

~ IBM 7090 computer at Global Weather Central converted to IBM 7094

~~ 1967:

In a television interview at Tan Son Nhut AB, Republic of Vietnam, the Seventh Air Force Commander, Lt General William W. Momyer, said, "This weather [satellite] picture is probably the greatest innovation of the war."

~ 31 May to 1 June: Detachment 10, 15th Weather Squadron, 7th Weather Wing, provided weather support to two Aerospace Rescue and Recovery Service HH-3E helicopters making a record non-stop transatlantic flight from Floyd Bennet Naval Air Station, New York, to LeBourget Airfield, France.

~~ 1972:

A provisional weather detachment was established at Takhli RTAFB, Thailand, with forecasters on temporary duty from the 1st and 5th Weather Wings. Personnel from these two wings provided support to both the deployed TAC fighter units and the MAC airlift forces.

~~ 1980:

Palehua became a fully-automated Solar Electro-Optical Network (SEON) observatory (Det 6, 1WW) with activation of the automated AN/FRR-95 RSTN system.

~~ 1987:

A network of automated observing stations was established in Honduras to provide network meteorological sensing and reporting in support of continuing heavy exercise commitments. The network consisted of two fixed and four mobile stations that automatically transmitted into the AWN observations including temperature, dewpoint, wind, and pressure data.

Did You Know is brought to you by your friendly Air Weather Service History Office ~~

For more information contact:
Lil Wilbur at e-mail *wilburl @ hqaws.safb.af.mil* or call 618-256-5654 x258 or DSN 576-5654 x258.

by Master Sgt. Rob Fuller, Chief, Tactics Branch, AFCWC and Gene Barnes, Joint Development Coordinator, Army Research Laboratory

FORCE XXI: Weather Warriors Task Technology

Fierce battles had raged for days, yet neither side had gained a distinct advantage. Determined to emerge victorious, the commanding general poises his armored forces for a decisive counter-attack. Meanwhile, the staff weather officer downloads the new operations order and verifies the locations of friendly and enemy forces on one of his workstations. He then displays and confirms the current aircraft situation and proposed attack routes. After a battle update, the forecaster analyzes the latest real-time mission-tailored products loaded on the homepage. With the touch of a button, a multitude of products are instantly transmitted to other tactical centers at brigade and below enabling commanders and staffs to select weather products showing impacts on their operations.

A vision of the future? No—a reality for today's Air Force Weather warrior as demonstrated in the blowing sands and heat of Ft. Irwin, Calif., during Brigade Task Force XXI (BTFXXI), a major US Army Advanced Warfighting Experiment (AWE).

Air Force Weather personnel from the Air Force Combat Weather Center, 3rd Weather Squadron, and the Air National Guard 209th Weather Flight teamed with the technology experts of the Army Research Laboratory (ARL), Project Director-Integrated Meteorological System (PD-IMETS), and US Army Space Command (USARSPACE) to support this premier AWE at Ft. Irwin's National Training Center Feb. 24 through Mar. 31, 1997. Using an advanced Integrated Meteorological System (IMETS) block II prototype, and state-of-the-art high-resolution meteorological satellite receiving capabilities, the BTFXXI Weather Team produced and disseminated digital weather products and satellite imagery to the 1st Brigade Combat Team of Ft. Hood's 4th Infantry Division (Mechanized). In all, 6000 Experimental Force soldiers, equipped with the latest in digital communications systems, weapons systems and sensors (including unmanned aerial vehicles), went head-to-head with the elite National Training Center Opposing Force.

The Task Force XXI Weather Team (WETM) operated the prototype IMETS deployed adjacent to the 4th ID's Tactical Operation Center (TOC). The IMETS was augmented with USARSPACE's Deployable Weather Satellite Workstation (a Joint Task Force Small Satellite Terminal surrogate) which provided real-time high-resolution weather satellite imagery from military (Defense Meteorological Satellite Program) and civilian (GOES NOAA) satellites. The Division WETM employed a combination of TFS-derived synoptic scale capabilities, an ARL-developed mesoscale model (the Battlescale Forecast Model), and current high-resolution satellite imagery (including multispectral and special sensor data) to generate tailored weather and weather effects information and place it on a homepage accessible by all battlefield functional areas (i.e. armor, aviation, etc.).

BTFXXI brought several new technological innovations to the battlefield. For the first time in an operational setting, the WETM received vector graphic, uniform gridded data fields, raster scan, and alphanumeric data through satellite-based communications with a reliability rivaling that of any base weather station. They also successfully transmitted digital weather products to brigade and below elements, including the forward-deployed Aviation Brigade WETM, using the Global Broadcast Service and Battlefield real-time high-resolution satellite data as often as every 30 minutes, annotated it with the local area forecast, and placed it on the weather homepage. In fact, this annotated imagery proved to be the most popular weather product of the AWE, receiving spirited praise from warfighters and distinguished visitors alike. Moreover, using a client-server architecture over a local area network, Army operators could access displays of the weather effects on weapons systems on demand using Integrated Weather Effects Decision Aid software. Daily, over 140 timely, relevant, and accurate weather products were developed by the WETM and placed on the homepage, ensuring decision makers at all levels enjoyed unprecedented access to weather information throughout the AWE.

Lessons learned from the AWE will be incorporated into the Division XXI AWE a Ft. Hood, Texas in November 1997 and into the soon-to-be-fielded IMETS Block II. AFCWC will also prepare a final report on BTFXXI and crossfeed it to all MAJCOM Directors of Weather.

The exercise was the culmination of two years of intensive engineering with government and private industry personnel. Technologies demonstrated and lessons learned from BTFXXI and subsequent AWEs will pave the way for the 21st century Army.

Weather News

WEATHER SYSTEMS SUPPORT CADRE
Team Activaters to Provide Field Support

by Maj. Douglas D. Owen, Air Combat Command Chief, Weather Programs and Master Sgt. Christopher M. Rambali, WSSC-E, Supt., Weather System Support Flight

Have you been contacted by a WSSC (pronounced whisk) representative yet? No, we're not talking about the Fuller Brush Man. The Weather Systems Support Cadres (WSSC) were recently activated at Robins AFB GA (WSSC-East) and Tinker AFB OK (WSSC-West) to support current and soon-to-be- fielded Air Force Weather (AFW) tactical weather systems. The concept for the WSSC grew out of lessons learned during DESERT STORM along with new support requirements generated by the operator maintenance concept for systems such as the Small Tactical Terminal.

During DESERT STORM, tactical meteorological equipment (weather sensors and forecast systems) and a unique, stand-alone communication architecture to disseminate weather information (i.e., GOLDWING/Quick Reaction Communication Terminal), was limited. Additionally, when these systems failed; for whatever reason (training, communication outages, logistics, etc.), we quickly learned "the weather support system was broke."

The strategy to correct these operational deficiencies was development of smaller, more capable tactical weather systems, in increased numbers. The core of the new tactical weather systems are the Tactical Forecast System (TFS) and the Defense Meteorological Satellite Program Small Tactical Terminal (STT). While the new systems address the operational mission requirements, they create new communications and logistics support challenges as a result of the operator maintainer concept. The solution is to reuse manpower authorizations from the Transportable Automated Weather Distribution System (TAWDS) to support the WSSC concept. WSSCs will supplement operator maintenance, and were determined to be a cost and operationally effective method to resolve many of the new tactical weather system support challenges.

The WSSC mission is to deploy worldwide with combat communications forces and conduct tactical weather system support to all levels of command. WSSC Teams will provide technical assistance on maintenance, system administration functions, and communication connectivity. Additionally, WSSCs will conduct enhanced organizational-level maintenance of in-theater weather systems and assist with intra-theater logistics support issues. Each WSSC consists of a combination of communications and weather personnel, all capable of performing maintenance, communications, and system administration tasks on tactical weather systems. WSSC personnel will have thorough understanding and skill in the performance of each system's operations and the equipment's associated logistics support. Deployed weather teams will call upon this expertise throughout the deployment to aid in establishing and sustaining support to their associated warfighting unit. Usually, a deployed WSSC team will be centrally located in-theater; however, they can also travel to sites to conduct system maintenance, as required.

The WSSC will have an established Unit Type Code and may be tasked in increments commensurate with theater requirements, ranging from a few technicians with minimal support equipment to the complete WSSC manning complement. Possible configurations include :

- Quick Response Package (QRP): A 3-person team to provide a rapid first-in capability to support short term emergency operations.
- Limited Response Package (LRP): An 8-person team to provide a rapid initial capability to support intermediate operations.
- Theater Response Package (TRP): A 13-person team to provide a sustaining capability to support operations during major conflicts.

During contingencies, the WSSC will primarily support theater-wide tactical weather systems with remote service (e.g., telephonic support). WSSC members can also travel to locations when remote support procedures fail. The WSSCs have an on-going peacetime mission to provide technical assistance for fielded tactical weather systems. They are available to help resolve communications and/or maintenance problems that units incur on a day-to-day basis with their tactical weather systems. This will be accomplished via the WSSC help line and homepage. In-person TDY support, when possible on a non-interference basis to the overall WSSC mission, will also be available. Part of the WSSC mission is to provide site activation support for STTs and TFSs which are being delivered to all USAF weather flights with mobility missions. WSSC site activation teams will ensure that AFW units are fully capable of operating and maintaining these new tactical weather systems.

WSSC Points of Contact:

WSSC-E Help Line: DSN 468-5934 or toll-free at 1-800-344-5625.
WSSC-W Help Line: DSN 884-5788
The WSSC World Wide Web Homepage: *http://wssc.robins.af.mil*

Air Force Force Structure Changes Affect Air Force Weather

Air Force officials announced in May that changes in force structures will affect the location of Air Force Weather people and organizations. These changes are the result of changes in the mission, adjustments for efficiency and to meet congressional directives. The actions, outlined below, are projected to take place in fiscal year 1998.

The Air Force will combine the Air Weather Service Headquarters and the Air Force Global Weather Center to form the Air Force Weather Agency at Offutt Air Force Base, Neb. This restructuring is designed to reduce management overhead, improve efficiencies and increase the effectiveness of combat weather support.

This action complements the on-going move of the Air Force Combat Climatology Center to Asheville, N.C., to consolidate with the operating location already there and to collocate with the National Climatic Data Center.

The restructuring of Air Weather Service Headquarters and Air Force Global Weather Center to form the new Air Force Weather Agency will result in a decrease of 132 military and 57 civilian personnel authorizations at Scott.

Eglin Lab Duplicates Mother Nature

EGLIN AIR FORCE BASE, Fla. (AFNS) — The Air Force is playing Mother Nature again after a three-year $75 million series of renovations at the McKinley Climatic Laboratory here.

Eglin's most famous landmark re-opened June 3 with a dedication ceremony. Present at the ceremony were a P-51 Mustang, the first aircraft tested in the chamber in 1947, and a C-130J, the first aircraft scheduled to be tested in the renovated chamber.

Originally constructed during the closing stages of World War II, the laboratory is the only one of its kind in the world. During its 50 years, the lab has frozen, fried and abused more than 350 aircraft, 70 missile support systems and approximately 2,000 equipment items. It has also tested space-bound systems, such as the Apollo space capsule.

The lab was built with a 20-year life expectancy, which before the renovations were started, had been exceeded by 27 years. Modern renovations were sorely needed.

A B1-B Lancer undergoes testing at the McKinley Climatic Laboratory.

"There were many problems with the facility," said Kirk Velasco, chief of the climatic lab. "The main item was the fact that the thermal walls inside the main chamber were not insulated properly. This made icicles grow overhead, which were potential hazards to the aircraft and equipment in the chamber. It also made the temperature difficult to maintain."

The climatic lab can reproduce virtually any weather condition on Earth including high winds, fog, icing clouds, sand storms, heavy rainfall and snow. The lab is capable of temperatures ranging from minus 85 degrees Fahrenheit to plus 165 degrees Fahrenheit.

The facility has six separate testing chambers, and each is unique in its capabilities. The main chamber is large enough to accommodate the C-5 Galaxy. The other chambers include the equipment test chamber, the sun, wind, rain and dust chamber, all-weather room, salt-fog chamber, and the temperature/altitude chamber.

Air Force News

Members Earn Joint Meritorious Unit Award

RANDOLPH AIR FORCE BASE, Texas (AFNS) — Air Force members assigned to various units during the specific time frames indicated may be eligible for the Joint Meritorious Unit Award.

The following joint activities earned the award:

Headquarters, U.S. Transportation Command—July 1, 1993 to June 30, 1996 — during this period, the men and women of the U.S. Transportation Command demonstrated outstanding performance through remarkable and significant contributions to virtually every contingency and humanitarian, disaster relief, and peacekeeping action recognized by the president, Department of Defense and State Department.

Joint Task Force Operation Safe Border—July 26, 1995 to Feb. 16, 1996 — during this period, the men and women of JTF Operation Safe Border performed peacekeeping operations with the Military Observer Mission Ecuador-Peru (MOMEP) in which they ensured that both countries adhered to the Treaty of Itamaraty within the Demilitarized Zone. Without the efforts of JTF Operation Safe Border, the stability of the democratic governments of Ecuador and Peru, regional peace and cooperation and the success of MOMEP would not have been possible.

Headquarters U.S. Forces Haiti and Headquarters UN Mission in Haiti—from June 1, 1995 to Oct. 29, 1995 — during this period, while operating in the Haitian theater of operations, the service members continued to provide stable, secure conditions, thereby establishing an environment conducive to the organization of free and fair election.

Headquarters U.S. Forces Haiti—from Oct. 30, 1995 to March 5, 1996 — during this period, the servicemembers' skillful and professional execution of all missions ensured the expeditious and efficient execution of UN Security Council Resolutions 940, 975, and 1007. U.S. Forces Haiti was also responsible for the successful continuation of a secure and stable environment, thereby allowing the fledgling democracy to grow.

Joint Task Force Operation Assured Response—from April 8, 1996 to Aug. 12, 1996 — during this period, the JTF was responsible for the planning, coordination, and execution of the emergency evacuation of thousands of civilians from the chaos of civil war in Liberia and the Central African Republic.

Combined Task Force Operation Provide Comfort—from May 1, 1994 to June 30, 1995 — during this period, the selfless dedication of the coalition forces ensured the survival of over 600,000 people in northern Iraq by providing crucial all-source support and ensuring the safe conduct of coalition operations.

Joint Task Force-Olympics, from Oct. 2, 1995 to Sept. 30, 1996 — during this period, Department of Defense personnel were dedicated to support the safety and success of the 1996 Olympic and Paralympic Games.

For more information regarding the JMUA, contact your local military personnel flight's career enhancement section.

Audit cites need for web site controls

WASHINGTON (AFNS) — An audit of seven Air Force bases has shown that electronic bulletin boards and World Wide Web sites are often not in compliance with Air Force policy.

The Air Force Audit Agency report states that managers at five out of seven bases surveyed did not effectively control such electronic information sites. "We reviewed bulletin boards and home pages because they pose a serious risk of disclosing or compromising sensitive defense information," the report stated.

Auditors looked at whether Air Force managers properly justified and approved home pages, placed appropriate and approved information on this media and adequately controlled access to the information.

Auditors found such controls lacking and cited all seven bases for establishing home pages without prior approval from the designated approving authority and having unapproved information. Five bases allowed uncontrolled access to inappropriate information.

At one base, two squadrons had established home pages without proper authorization or documentation. This, according to the audit, occurred because home page administrators were not always aware of or did not follow Air Force policy.

"Education is the key to effectively using this new tool," said Captain Terry Bowman, chief of technology integration for Air Force Public Affairs. "I think we are beyond the initial instinct of slapping everything on the web. Commanders have become very savvy about how to use the World Wide Web to communicate their missions to the world while effectively using it to reach their own people."

Bowman emphasized the important distinction between public web sites and those designed to communicate with employees. Besides compromising sensitive information, "establishing bulletin boards and home pages without valid requirements wastes valuable computer and personnel resources," Bowman said.

A new Air Force Instruction addresses transmission of information via the Internet. This instruction, along with more than a half dozen other policies and guidelines, provides a road map for effectively using the web, according to Bowman.

Advertising and endorsements, inappropriate links to commercial sites and information inappropriate for the general public were some of the more notable problems encountered.

Web policy can be found on the Internet at *http://www.af.mil/webpolicy/*.
Information about the Five-Star Web Site Award can be found at *http://www.af.mil/5star/*.

Tuskegee Airmen Exhibit Opens at Robins AFB

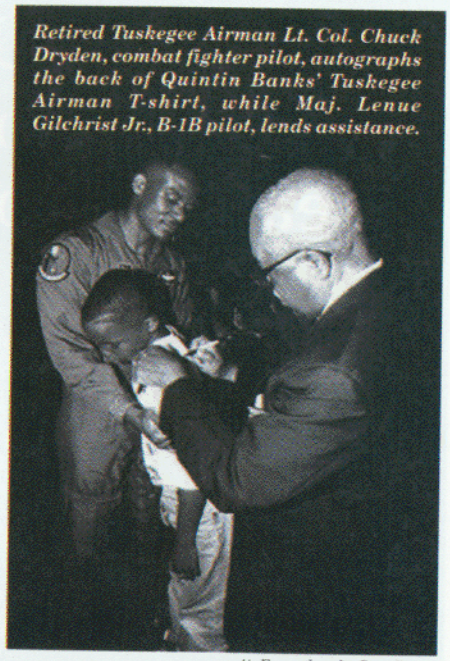
ROBINS AFB, Ga (AFNS) - One of the largest exhibits in the country featuring the Tuskegee Airmen and black aviators opened at the Museum of Aviation here May 3. The 50th anniversary Air Force exhibit is called, "America's Black Eagles: The Tuskegee Pioneers ... And Beyond."

Among the audience witnessing the ribbon cutting were some of the Tuskegee Airmen themselves —the pilots in the red-tail fighters who fought in Europe and never lost a bomber; and those who fought so valiantly after them.

The 5,000 square-foot permanent exhibit includes the BT-13 aircraft that served as a basic flight trainer. Also on display is a re-creation of the "Tuskegee Airmen" experience at Tuskegee Army Air Field near Tuskegee Institute, Ala., site of segregated military aviation training for blacks in World War II, is also on display. The institute's chapel tower, a familiar landmark that burned down in 1957, has been re-created along side the image of institute founder Booker T. Washington.

In the exhibit, the Tuskegee experience is explored with barracks and classroom scenes, a display of an actual Link trainer from WW II, and films of cadets in training. Historic photographs and highlights of 477th Bombardment Group members who trained, but never got into combat, are also featured.

The museum, located near the base's main gate, is open 10 a.m. to 5 p.m. daily. Admission is free.



Retired Tuskegee Airman Lt. Col. Chuck Dryden, combat fighter pilot, autographs the back of Quintin Banks' Tuskegee Airman T-shirt, while Maj. Lenue Gilchrist Jr., B-1B pilot, lends assistance.

Air Force photo by Gary Cutrell

'Piercing' Camera Eliminates *Fog, Smoke, Clouds*

HOUSTON (AFNS) – Air traffic delays due to poor visibility caused by weather can be virtually eliminated if technology being developed by U. S. industry and government looks as good in the air as it does on the ground.

NASA's Langley Research Center, Hampton, Va., is working with a consortium led by TRW Space & Electronics Group, Redondo Beach, Calif., and which includes the Air Force's Wright Labs, Wright Patterson Air Force Base, Ohio; the Air Force Flight Test Center, Edwards AFB, Calif.; and the U.S. Army Research Lab, Adelphi, Md.

The consortium is preparing to demonstrate in flight a weather-piercing camera that has allowed researchers to see through fog, smoke and clouds. System checkout beginning June, 1997, will be followed by 60 hours of test and demonstration flights in September.

The camera "sees" in the millimeter wave portion of the electromagnetic spectrum, a portion that is invisible to the human eye. It produces video images that enable a pilot to discern features like runways, obstacles and the horizon. These features are sufficient to safely land, take off, and taxi at any airline terminal in the country – not just the three dozen or so major airports that have costly systems to aid in low visibility approach and landings. The camera is a passive sensor that does not emit signals in an airport environment, allowing multiple equipped aircraft to operate simultaneously on the ground without risk of interference.

"This sensor program directly supports NASA's new goal to safely triple capacity at our nation's commercial airports within the next ten years – regardless of fog, clouds, smoke and dust, or other conditions that normally limit pilot visibility," said Tom Campbell, head of Langley's Electromagnetic Research Branch.

In 1994, the TRW-led Passive Millimeter Wave Camera Consortium was awarded a multi-year, $15 million cost-sharing contract under the Department of Defense Advanced Dual-Use Technology Initiative to adapt this technology to an airborne camera for military and civilian users.

Langley, serving as the government's principal representative, is funding the flight test element of the program.

In addition, Langley is performing lab tests to determine which materials are most "invisible" to millimeter waves and therefore, are good candidates for the protective nose radome that will house the camera on the flight test aircraft. The tests also will provide the consortium's radome design team with data about optimum material thicknesses, protection from rain erosion and protection from static build-up.

The aircraft, a one-of-a-kind Air Force C-135C aircraft nicknamed the "Speckled Trout," is to be fitted with the millimeter-wave and its new radome this summer. Once installed, the camera will generate video images of the forward scene in low-visibility conditions. These images will be displayed on a see-through heads-up display suspended between the pilot and the windscreen.

Other consortium members are McDonnell Douglas, Long Beach, Calif.; Honeywell, Minneapolis, Minn.; Composite Optics Inc., San Diego, Calif.; and NASA's Ames Research Center, Mountain View, Calif. (Courtesy of NASA News Service)

What's YOUR Most Memorable Weather Story?

Recently, members of the Air Combat Command Directorate of Weather got together and took the time to talk about the most memorable weather stories they had experienced in their careers. No set structure was used here, just a narrative of an event that still stood out in that person's memory to this day.

Some of the stories sent along to the OBSERVER were so amusing or interesting, that the idea came up to publish a few of these stories in the hope of getting some more feedback from the weather troops in the field.

So here it goes — send us YOUR most interesting or amusing or unique weather story. Keep it short — no more than one or two medium-length paragraphs. Names need not be used, although a specific or general geographic location would be appreciated. Also, give us the year when this event happened. You may remain anonymous or have your name printed.

Naturally, keep your story within the realms of good taste — no off-color or risqué stories, please! Send your stories by E-Mail to *"observer@hqaws.safb.af.mil"* or *"schmidtd@hqaws.safb.af.mil"* or fax them to DSN 576-5401. If you don't have the modern conveniences of a computer E-mail or a fax machine, mail them to HQ AWS/RMA, 102 W. Losey St., Rm. 105, Scott AFB, IL 62225-5206.

We cannot guarantee your story will be used, and if it is, we reserve the right to edit it to conform to Air Force public affairs editorial standards. So, have fun, dig out all those old memories, and send us a line! Meanwhile, enjoy some of these stories ...

It was late spring of 1980 and I was a young, eager E-4 working a swing shift at Reese AFB, Texas.

I had been forecaster certified for about five or six months. The person I relieved briefed me that there was a change of command for the base commander later that afternoon — but not to worry! Only isolated thunderstorms in the vicinity — nothing severe (famous last words!).

Moderate CU/TCU was developing southwest of the base, and appeared to be moving in a northerly direction — my trusty FPS-77 confirmed that. I thought I was in pretty good shape and began to accomplish other duties in the weather station. However, when I checked the radar again after 10-15 minutes, I was surprised to find a 60,000 footer about eight miles west! It was still moving northward and I'm still thinking the base is out of danger.

Then I though, "I've never seen a CB that high! Boy, would I like to see that!" So I went outside to take a look.

Well, my friends, it was HUGE and I was fairly impressed. After about 30 seconds, I noticed something beneath the base of the storm ..."It's a tornado!" "It's a swarm of bees!"

No, it's the red dirt of Texas ... and what was kicking up all this dirt? You guessed it — a gust front! So I dashed back into the weather station to issue a weather warning. But while I was doing this, the base got a gust to 65 knots with little or no lead-time. Keep in mind, this event took place DURING the change of command ceremony ... which was taking place outside.

To say the least, neither the base commander nor my flight commander were very happy. For me, it was a day I will never forget.

Here's another one:

A few short years ago, I was a young staff sergeant forecaster at Carswell AFB, Texas.

I was at the end of a particularly busy mid-shift and was briefing my fourth B-52 crew, with three other crews waiting in the hallway between the weather section and the flight planning room.

It was late November and take-off temperatures below 44 degrees Fahrenheit impacted aircraft takeoff calculations. It had been an evening with temperatures overnight dropping into the mid-30s, but temperatures were rising. All was forecast to be well with the morning crews and all mankind.

As I was briefing my fourth crew, I announced that the takeoff temperature would be 44 degrees.

Just then, a young captain from the back of the pack piped in, "Say, Sarge, as I was driving into the base this morning, the temperature reading on the top of the CNBB Building downtown registered 33 degrees!"

Without thinking twice or hesitating, I responded, "Well, sir, are you taking off from the top of that building or from my airfield?"
I knew I had made a friend for life!

AFW MASTER SERGEANTS SELECTED

Congratulations to the following Air Force Weather people who were selected for promotion to master sergeant by the 1997 Master Sergeant Central Selection Board. The Air Force selection rate was 21.62% and the 1 W selection rate was 21.36%.

AIR FORCE WIDE WEATHER SELECTS

Anderson, William M.
Baldauf, Donald P.
Bergmann, Joan K.
Briggs, Robert J.
Brock, James G.
Campbell, Rodger D.
Chisholm, Antonia R.
Czopkiewicz, Edward
Debord, Joshua P.
Dombek, Stephen W.
Druckenmiller, Harry
Duncan, Billy D. Jr.
Fincher, David A.
Getzandanner, Ralph
Gist, John D.
Gould, Jeffrey M.
Grimes, Steven R.
Harris, Jasper E.
Hart, Joel D.
Hewko, Wasyl
Hirl, Robert L.
Hopwood, Andrew J.
Hunter, Clyde R. Jr.
Johnson, Constance
Kellaway, Bradford
Kogut, Michael J.
Kohler, William A.I.
LeBouff, Joseph W.
Limberg, Duane M.
Linde, Bruce S.
Long, Terry L
Miller, Dennis W.
Nitso, George G.
Obermeyer, Darren
Olsen, Thomas E.
Pfaff, Craig L.
Prioleau, Norman A.
Reid, William A.
Scholl, Jerry L.
Sipperley, Bradford
Stanziano, Christopher
Straw, Scott A.
Vereen, Jonathon K.
Vogel, Richard A. Jr.
Ward, David M.
Wiatt, Matthew C.
Williams, Donovan N.
Wiseman, Thomas D J

AIR FORCE MERITORIOUS SERVICE MEDAL

Lt. Col. Jackson L. Pellet, 121st WF, Andrews AFB, Md. (ANG)
Master Sgt. Susan C. Murray, 121st WF, Andrews AFB, Md. (ANG)
Tech. Sgt. Lynne M. Morrison, 121st WF, Andrews AFB, Md. (ANG)
Capt. Roy Merritt, OL-B, 18th WS, Fort Eustis, Va.
Lt. Col. Nathan S. Feldman, 3rd WS, Fort Hood, Texas
Maj. David Sjostedt, 3rd WS, Fort Hood, Texas

AIR FORCE COMMENDATION MEDAL

Staff Sgt. Steve Elliott, HQ AWS/PA, Scott AFB, Ill. (2nd OLC)
Staff Sgt. John Leurck, 35th OSS/OSW, Misawa AB, Japan
Capt. Timothy J. Schott, 121st WF, Andrews AFB, Md. (ANG)
Tech. Sgt. Ryan J. Marben, 126th WF, Milwaukee, Wisc. (ANG)
Tech. Sgt. Patricia Callaghan, 121st WF, Andrews AFB, Md. (ANG)
Tech. Sgt. Arthur L. Roye, 121st WF, Andrews AFB, Md. (ANG)
Staff Sgt. Lisa E. Waltenberry, 126th WF, Milwaukee, Wisc. (ANG)
Staff Sgt. Patrick Shannon, 51st OSS/OSW, Osan AB, Korea
Staff Sgt. Alphonza V. Lesene, 3rd WS, Fort Hood, Texas
Tech. Sgt. Leon Bass, Jr., 366th OG/OSW, Mountain Home AFB, Idaho
Staff Sgt. James E. Slisik, 1st OSS/OSW, Langley AFB, Va. (1st OLC)
Tech. Sgt. Richard Butler, 89th OSS/OSW, Andrews AFB, Md.
Staff Sgt. Dennis Anglin, 89th OSS/OSW, Andrews AFB, Md.
Master Sgt. Robin R. Smith, HQ AMC, TACC/XOW, Scott AFB, Ill.
Staff Sgt. Angela Uribe-Olsen, 16th OSS, Hurlburt Field, Fla.
Capt. Layne E. Kasper, 47th OSS/OSW, Laughlin AFB, Texas
Senior Airman Scott M. Maier, 46th WS, Eglin AFB, Fla.

ARMY COMMENDATION MEDAL

Staff Sgt. Roseanne I. Sinn, 5th OSS/OSW, Minot AFB, N.D.
Master Sgt. Milton G. Kooyman, 3rd WS, Fort Hood, Texas

JOINT SERVICE ACHIEVEMENT MEDAL

Staff Sgt. Glenn R. Adams, 5th OSS/OSW, Minot AFB, N.D.

AIR FORCE ACHIEVEMENT MEDAL

Senior Airman Craig M Hays, 46th WS, Eglin AFB, Fla.
Staff Sgt. Jairam Singh, 35th OSS/OSW, Misawa AB, Japan
Staff Sgt. Scott Dixon, 35th OSS/OSW, Misawa AB, Japan
Airman 1st Class Troy Misiak, 51st OSS/OSW, Osan AB, Korea
Tech. Sgt. Tim Bondy, 5th OSS/OSW, Minot AFB, N.D. (2nd OLC)
Tech. Sgt. Roseanne I. Sinn, 5th OSS/OSW, Minot AFB, N.D. (1st OLC)
Staff Sgt. Steven J. Grabowski, Jr., 5th OSS/OSW, Minot AFB, N.D.
Staff Sgt. Victor Waldon, 5th OSS/OSW, Minot AFB, N.D.
Staff Sgt. Scott E. Wirebraugh, 5th OSS/OSW, Minot AFB, N.D.
Senior Airman Christopher A. Blanch, 5th OSS/OSW, Minot AFB, N.D.
Senior Airman Erwin Gove, 6th WF, 18th WS, Fort Rucker, Ala.
Staff Sgt. Kevin Bourne, 353rd OSS/WX, Kadena AB, Japan
Airman 1st Class John Carpenter, 16th OSS/DOW, Hurlburt Field, Fla.

ARMY ACHIEVEMENT MEDAL

Senior Airman Leslie Rouell, Dragon Flight, 18th WS, Fort Bragg, N.C.
Senior Airman Erwin Gove, 6th WF, 18th WS, Fort Rucker, Ala.
Staff Sgt. Ann C. Stubbs, 3rd WS, Fort Hood, Texas

AIR FORCE OUTSTANDING UNIT AWARD

5th OSS/OSW, Minot AFB, N.D.

COMBAT READINESS MEDAL

Staff Sgt. Roseanne I. Sinn, 5th OSS/OSW, Minot AFB, N.D.
Staff Sgt. Steven J. Grabowski, Jr., 5th OSS/OSW, Minot AFB, N.D.
Staff Sgt. Scott E. Wirebraugh, 5th OSS/OSW, Minot AFB, N.D.

AIR FORCE GOOD CONDUCT MEDAL

Senior Airman Patrick Berry, 3rd WS, Fort Hood, Texas
Senior Airman Christopher E. Conklin, 3rd WS, Fort Hood, Texas
Senior Airman Brian D. Bishop, 3rd WS, Fort Hood, Texas

ARMED FORCES EXPEDITIONARY MEDAL

Staff Sgt. Scott E. Wirebraugh, 5th OSS/OSW, Minot AFB, N.D.

AIR FORCE LONGEVITY SERVICE RIBBON

Tech. Sgt. James W. Geiger, 110th WF, St. Louis, Mo. (ANG)
Senior Airman Gregory W. McDowell, 110th WF, St. Louis, Mo. (ANG)

NATO MEDAL

Staff Sgt. John M. Cain, Det. 5, 7th WS, Katterbach, Germany

ARKANSAS SERVICE RIBBON (ANG)

Senior Airman Charles E. Bibb, 154th WF, Little Rock AFB, Ark.

PROMOTIONS

Richard W. Taylor, 81st CSG, Keesler AFB, Miss.

Louis V. Zuccarello, HQ AWS/CCE, Scott AFB, Ill.
John J. Pereira, 121st WF, Andrews AFB, Md. (ANG)
Stephen Sutherland, 204th WF, McGuire AFB, N.J. (ANG)

Kimberly A. Pacheco, 210th WF, Ontario, Calif. (ANG)

Brian A. Schnitker, 4th OSS/OSW, Seymour Johnson AFB, N.C.
Douglas M. Brunell, U.S. Air Force Reserve

Penny Heinen, HQ AWS, Scott AFB, Ill.
Donna E. Jackson, HQ AWS, Scott AFB, Ill.
Steven L. Rosemier, OL-A, 3rd WS, Fort Sill, Okla.

Robert F. DeFrane, 3rd WS, Fort Hood, Texas
Robert E. Haney, 104th WF, Baltimore, Md. (ANG)

Robert N. Thomas, 104th WF, Baltimore, Md. (ANG)
Donald D. Tompkins, 110th WF, St. Louis, Mo. (ANG)
James C. Adams, OL-A, 3rd WS, Fort Sill, Okla.
William T. Wheaton. OL-D, 3rd WS, Fort Bliss, Texas
Craig M. Cross, 207th WF, Indianapolis, Ind. (ANG)

James P. Gary, Jr., 104th WF, Baltimore, Md. (ANG)
Tim Bondy, 5th OSS/OSW, Minot AFB, N.D.
Bradley Davis, 4th OSS/OSW, Seymour Johnson AFB, N.C. (STEP Promotee)

Theone L. Blackwood, 154th WF, Little Rock AFB, Ark. (ANG)
David J. Stout, 207th WF, Indianapolis, Ind. (ANG)

Nancy A. Tranter, 46th WS, Eglin AFB, Fla. (Below The Zone)
Daniel K. Ackerman, 104th WF, Baltimore, Md. (ANG)
James E. Green, 204th WF, McGuire AFB, N.J. (ANG)
Brian Drennan, 3rd ASOS/WE, Fort Wainwright, Alaska
Hilton Wells, 3rd ASOS/WE, Fort Wainwright, Alaska
Salvatore Lumetta, OL-B, 18th WS, Fort Eustis, Va.
Jennifer Baker, OL-B, 18th WS, Fort Eustis, Va.
Patrick Berry, 3rd WS, Fort Hood, Texas
Amy Whiteman, 16th OSS/DOW, Hurlburt Field, Fla.
Sarah B. Alexander, 56th OSS/OSW, Luke AFB, Ariz.
Christopher Jones, 4th OSS/OSW, Seymour Johnson AFB, N.C.
Sharon M. Burnett, 4th OSS/OSW, Seymour Johnson AFB, N.C.
Larry D. Sosbey, Jr., 207th WF, Indianapolis, Ind. (ANG)

Josh Murray, 3rd OSS/WE. Elmendorf AFB, Alaska
Edward P. Scherzer, 202th WF, Otis ANGB, Mass. (ANG)
Brenda Frickel, 3rd ASOS/WE, Fort Wainwright, Alaska
Adrian L. Freeman, Det. 5, 7th WS, Katterbach, Germany
James M. Kramer, 3rd WS, Fort Hood, Texas
Melanie D. Kytola, 3rd WS, Fort Hood, Texas
Jonathan Barnes, 3rd WS, Fort Hood, Texas
Eric M. Isrow, OL-A, 3rd WS, Fort Sill, Okla.
Lakeesha Grayson, 374th OSS/OSW, Yokota AB, Japan

James E. Adams, 104th WF, Baltimore, Md. (ANG)

HAILS AND FAREWELLS

Staff Sgt. Steve Elliott — to 8th FW/PA, Kunsan AB, Korea, from HQ AWS/PA, Scott AFB, Ill.
Ms. Diana R. Melton — to Air Force Communication Agency, Scott AFB, Ill., from HQ AWS/RMC, Scott AFB, Ill.
Airman Jeanie E. Bullock — to 46th WS, Eglin AFB, Fla., from Keesler AFB, Miss.
Senior Airman Andrew J. Kowal — to 334th TTS, Keesler AFB, Miss., from 46th WS, Eglin AFB, Fla.
Senior Airman Christopher Goode — to 202nd WF, Otis ANGB, Mass., from 116th WF, Seattle, Wash. (ANG)
Senior Airman Melanie D. Weger — to 181st WF, Dallas, Texas, from 116th WF, Seattle, Wash. (ANG)
Airman 1st Class Troy Misiak — to 51st OSS/OSW, Osan AB, Korea, from MacDill AFB, Fla.
Airman 1st Class Angella Gregoire — to 51st OSS/OSW, Osan AB, Korea, from Cannon AFB, N.M.
Tech. Sgt. Bill Hilsenbeck — to Fort Riley, Kan., from 51st OSS/OSW, Osan AB, Korea
Staff Sgt. Jose Chavarria — to Vandenberg AFB, Korea, from 51st OSS/OSW, Osan AB, Korea
1st Lt. Douglas M. Brunnell — to U.S. Air Force Reserve, from Air National Guard
Airman Brett J. Helms — to Dragon Flight, 18th WS, Fort Bragg, N.C., from Keesler AFB, Miss.
Tech. Sgt. Catherine Sheehe — to Incirlik AB, Turkey, from Dragon Flight, 18th WS, Fort Bragg, N.C.
Tech. Sgt. Edward Sheehe — to Incirlik AB, Turkey, from Simmons Flight, 18th WS, Fort Bragg, N.C.
Tech. Sgt. Karl W. Lumbra -- to Osan AB, Korea, from 3rd WS, Fort Hood, Texas
Tech Sgt. Edward Amhrein — to Texas A&M University (AECP), from 3rd WS, Fort Hood, Texas
Senior Airman Michael S. Lemon — to Scott AFB, Ill, from OL-A, 3rd WS, Fort Sill, Okla.
Senior Airman Brian Newman — to Camp Red Cloud, Korea, from 3rd WS, Fort Hood, Texas
Senior Airman Kevin M. Healy — to Keesler AFB, Miss., from 3rd WS, Fort Hood, Texas
Senior Airman Patrick K. Berry — to 3rd WS, Fort Hood, Texas, from 45th WS, Patrick AFB, Fla.
Airman Sean T. Coleman — to 3rd WS, Fort Hood, Texas, from Keesler AFB, Miss.
Senior Airman Franklin M. Koehler — to 3rd WS, Fort Hood, Texas, from 712th ASOS, Fort Hood, Texas
Staff Sgt. John S. Kovachich — to 3rd WS, Fort Hood, Texas, from Keesler AFB, Miss.
Master Sgt. William M. Luther — to 3rd WS, Fort Hood, Texas, from 3rd ASOS, Fort Hood, Texas
Senior Airman Jason D. Miller — to 3rd WS, Fort Hood, Texas, from Keesler AFB, Miss.
Staff Sgt. Ann C. Stubbs — to 3rd WS, Fort Hood, Texas, from 19th ASOS, Fort Campbell, Ky.
Master Sgt. Steven M. Yelenic — to 3rd WS, Fort Hood, Texas, from 45th Airlift Squadron, Keesler AFB, Miss.
1st Lt. Lendy G. Renegar — to Vance AFB, Okla., from HQ AMC TACC/XOW, Scott AFB, Ill.
Staff Sgt. Robert A. Russ — to HQ AMC TACC/XOW, Scott AFB, Ill., from Yongsan AIN, Korea
Tech. Sgt. Kevin Johnson — to 353rd OSS/WX, Kadena AB, Japan, from Charleston AFB, S.C.
Airman 1st Class Daniel Wolentarski — to 341st OSS/OSW, Aviano AB, Italy, from 341st OSS/OSW, Malmstrom AFB, Mont.
Senior Airman Christopher Browning — to Traben-Trarbach, Germany, from 16th OSS/DOW, Hurlburt Field, Fla.
Senior Master Sgt. Lawrence Alexander — to Fort Belvoir, Va., from 16th OSS/DOW, Hurlburt Field, Fla.
1st Lt. Colin Sindell — to 16th OSS/DOW, Hurlburt Field, Fla., from Fort Benning, Ga.
Master Sgt. Frank Hall — to 16th OSS/DOW, Hurlburt Field, Fla., from HQ AFSOC, Hurlburt Field, Fla.
Senior Airman Jeffrey Price — to 56th OSS/OSW, Luke AFB, Ariz., from Keesler AFB, Miss.
Staff Sgt. Anthony Walswick — to 374th OSS/OSW, Yokota AB, Japan, from Pope AFB, N.C.
Senior Airman Geraldo J. Jaime — to 47th OSS/OSW, Laughlin AFB, Texas, from Keesler AFB, Miss.
Senior Airman Michael Vick — to 47th OSS/OSW, Laughlin AFB, Texas, from Keesler AFB, Miss.
Staff Sgt. Barry Sanders — to 47th OSS/OSW, Laughlin AFB, Texas, from Lackland AFB, Texas
Airman 1st Class Jolie Brendlinger — to 47th OSS/OSW, Laughlin AFB, Texas, from Keesler AFB, Miss.
Senior Airman Johnnie L. Church — to Howard AFB, Panama, from 47th OSS/OSW, Laughlin AFB, Texas
Staff Sgt. Carlos A. Espinosa — to 412th OSS/OSW, Edwards AFB, Calif., from Ramstein AB, Germany
Staff Sgt. Sven Atkins — to 3rd OSS/WE, Elmendorf AFB, Alaska, from Kunsan AB, Korea
Airman 1st Class Dalia Sutton — to 3rd OSS/WE, Elmendorf AFB, Alaska, from Randolph AFB, Texas

REENLISTMENTS

Staff Sgt. Thomas Cross, 3rd ASOS/WE, Fort Wainwright, Alaska
Senior Airman Jeremiah E. Story, OL-B, 18th WS, Fort Eustis, Va.
Staff Sgt. John H. Suther, 25th ASOS/DOW, Wheeler AAF, Hawaii
Staff Sgt. Mario B. Viray, 56th OSS/OSW, Luke AFB, Ariz.

RETIREMENTS

Lt. Col. James K. Liberda, 127th WF, Topeka, Kan. (ANG)
Master Sgt. Ernie Haswell, HQ AWS/SYXL, Scott AFB, Ill.

SEPARATIONS

Sgt. Kim Sykes, 56th OSS/OSW, Luke AFB, Ariz.
Capt. Layne E. Kaspar, 47th OSS/OSW, Laughlin AFB, Texas

DEPLOYMENTS

Capt. Kevin Stone, 25th ASOS/DOW, Wheeler AAF, Hawaii, to OPERATION JOINT GUARD (Taszar, Hungary)
Sgt. Steve Bell, 16th OSS/DOW, Hurlburt Field, Fla., to Brindisi, Italy
Senior Airman Brent Persinger, 3rd OSS/WE, Elmendorf AFB, Alaska, to OPERATION JOINT GUARD

EDUCATION

Weather Satellite Course
Master Sgt. Paul A. Armitage, 46th WS, Eglin AFB, Fla.
Staff Sgt. Pichai Polpraset, 3rd WS, Fort Hood, Texas

Tropical Forecasting Course
1st Lt. Nicole M. Pendley, 46th WS, Eglin AFB, Fla.

CCAF Degree, Weather Technology
Senior Airman Scott M. Maier, 46th WS, Eglin AFB, Fla.

Airman Leadership School
Senior Airman Gary Ellingson, 3rd OSS/WE. Elmendorf AFB, Alaska (Distinguished Graduate)
Senior Airman Dave Tyler, 3rd ASOS/WE, Fort Wainwright, Alaska (Commandants Award)
Senior Airman Richard Speed-Witkowski, 56th OSS/OSW, Luke AFB, Ariz. (Levitow Award/Military Citizenship Award)
Senior Airman Johnnie L. Church, 47th OSS/OSW, Laughlin AFB, Texas (Distinguished Graduate/Leadership Award)

NCO Academy
Tech. Sgt. Tim Bondy, 5th OSS/OSW, Minot AFB, N.D.
Tech. Sgt. Scott A. Straw, HQ AMC TACC/XOW, Scott AFB, Ill.

Arctic Survival School
Capt. Gerald Smith, 3rd ASOS/WE, Fort Wainwright, Alaska
Master Sgt. Dave Hiatt, 3rd ASOS/WE, Fort Wainwright, Alaska
Senior Airman Brian Drennan, 3rd ASOS/WE, Fort Wainwright, Alaska
Airman 1st Class Clint Dobry, 3rd ASOS/WE, Fort Wainwright, Alaska
Airman 1st Class Carlise Hill, 3rd ASOS/WE, Fort Wainwright, Alaska
Airman 1st Class Brenda Frickel, 3rd ASOS/WE, Fort Wainwright, Alaska
Senior Airman Hilton Wells, 3rd ASOS/WE, Fort Wainwright, Alaska

Weather Apprentice Course (Classes 961017 and 961024)
Staff Sgt. David Cook
Senior Airman Mark Copeland
Airman Scott Daniel
Airman 1st Class Daniel Davenport
Airman 1st Class Marc Finch
Airman 1st Class Eric R. Griggs
Senior Airman Devlon Hawkins
Senior Airman Andrea Hill (Distinguished Graduate)
Staff Sgt. Darren Hooks
Airman 1st Class Joseph Ingram (Distinguished Graduate)
Airman Marilyn Lucas
Airman Clint Perrone
Airman William Rehkamp (Distinguished Graduate)
Airman 1st Class Michael C. Ross II
Staff Sgt. Scott Tammaro
Airman Clarence White, Jr.
Airman Lori A. Williams

Weather Apprentice Course (Class 961107)
Staff Sgt. John Burton (Distinguished Graduate)
Airman 1st Class Chenae Bertholf (Distinguished Graduate)
Senior Airman Ronald Gasparri
Airman 1st Class Steven Giese
Airman Lila Pearl
Airman Matthew Stack
Airman Perry Sweat
Airman Michele Whiting

Weather Apprentice Course (Class 970218)
Staff Sgt. Brent Baker
Senior Airman Scott Dalon
Senior Airman Christopher Fitts (Distinguished Graduate)
Senior Airman Drew Moore (Distinguished Graduate)
Senior Airman Miguel Rosado
Airman 1st Class Deidra Brown
Airman 1st Class Joseph Davis
Airman 1st Class Howard Hardin
Airman 1st Class Christina Roberts
Airman Kelley Harris
Airman Eugene Jocson
Airman Michael Morgan
Airman Shela Tarwater
Airman Vernee White

STT School, FOT/E
Tech. Sgt. Keith Johnson, Dragon Flight, 18th WS, Fort Bragg, N.C.

U.S. Army Basic Airborne School
Airman 1st Class Derrick M. Gildner, Dragon Flight, 18th WS, Fort Bragg, N.C.

WSR-88D UCP Course
Senior Airman Mark Reed, 3rd WS, Fort Hood, Texas

WSR-88D PUP Course
Senior Airman Mark Reed, 3rd WS, Fort Hood, Texas

Advanced Weather and Able Forecaster Course Graduates (Class 970128)
Staff Sgt. Brian Argutto — to 131st WF, Westfield, Mass. ANG (Distiguished Graduate)
Senior Airman Alula Berhane — to Maxwell AFB, Ala.
Senior Airman Daniel Harrison — to Virginia ANG
Staff Sgt. William Von Almen — to Robbins AFB, Ga.

Advanced Weather and Able Forecaster Course Graduates (Class 970113)
Staff Sgt. Lamar Belton — to North Carolina ANG
Airman 1st Class Penelope Hatton — to Ramstein AB, Germany
Staff Sgt. Thomas Lane — to Hunter AAF, Ga.
Senior Airman Stephen Moore — to Randolph AFB, Texas

AWDS System Manager Course
Senior Airman Dawn M. Ross, 47th OSS/OSW, Laughlin AFB, Texas

AWARDS

46th OG Airman of the Year
Senior Airman Scott M. Maier, 46th WS, Eglin AFB, Fla.

Indonesian Jump Wings
Staff Sgt. Michael F. Mohr, Det. 1, 10th CWS, Fort Lewis, Wash.
Staff Sgt. Brian W. Jacobi, Det. 1, 10th CWS, Fort Lewis, Wash.

AMC Outstanding Weather Readiness Award
60th OSS/WX, Travis AFB, Calif.

AMC Outstanding Weather Operation Support — NCO
Staff Sgt. Jay S. Curtis, 60th OSS/WX, Travis AFB, Calif.

AMC Outstanding Weather Operations Support — Airman
Senior Airman Barry C. Patterson, 60th OSS/WX, Travis AFB, Calif.

60th OSS Company Grade Officer of the Year (1996)
1st Lt. Gregory J. Goar, 60th OSS/WX, Travis AFB, Calif.

60th OG Senior NCO of the Quarter (Oct.-Dec. 1996)
Master Sgt. Marty J. Kaczmarek, 60th OSS/WX, Travis AFB, Calif.

5th OSS/OG Senior NCO of the Year
Master Sgt. Stanley G. Grell, 5th OSS/OSW, Minot AFB, N.D.

5th OSS NCO of the Year
Staff Sgt. Brett W. Wisdom, 5th OSS/OSW, Minot AFB, N.D.

5th OSS/OG NCO of the Quarter (Oct.-Dec. 1996)
Staff Sgt. Glenn R. Adams, 5th OSS/OSW, Minot AFB, N.D.

4th ASOG Company Grade Officer of the Year
2nd Lt. Kelly B. Doser, Det. 5, 7th WS, Katterbach, Germany

ACC Merewether Award
Capt. Roy Merritt, OL-B, 18th WS, Fort Eustis, Va.

18th WS Senior NCO of the Year
Master Sgt. Nathaniel W. Thomas, OL-A, 18th WS, Fort Belvoir, Va.

18th WS NCO of the Year
Staff Sgt. Robert E. Jarrell, OL-C, 18th WS, Fort Knox, Ky.

18th WS Airman of the Year
Senior Airman Bryan R. Pontius, OL-A, 18th WS, Fort Belvoir, Va.

18th WS NCO of the Quarter (4th qtr. 1996)
Staff Sgt. Willis Bearden, OL-B, 18th WS, Fort Eustis, Va.

OL-B, 18th WS NCO of the Year
Staff Sgt. Willis Bearden, OL-B, 18th WS, Fort Eustis, Va.

OL-B, 18th WS Airman of the Year
Airman 1st Class Salvatore Lumetta, OL-B, 18th WS, Fort Eustis, Va.

OL-C, 18th WS Airman of the Year
Senior Airman Paul B. Krewson, OL-C, 18th WS, Fort Knox, Ky.

ACC Grimes Award — Outstanding Weather Readiness Unit
3rd WS, Fort Hood, Texas

3rd ASOG Airman of the Year
Senior Airman Charles J. Sernik, 3rd WS, Fort Hood, Texas

3rd WS Company Grade Officer of the Year
2nd Lt. Michael M. Scott, 3rd WS, Fort Hood, Texas

3rd WS Senior NCO of the Year
Master Sgt. William M. Luther, 3rd WS, Fort Hood, Texas

3rd WS NCO of the Year
Tech. Sgt. James C. Herron, 3rd WS, Fort Hood, Texas

3rd WS Airman of the Year
Senior Airman Charles J. Sernik, 3rd WS, Fort Hood, Texas

3rd WS Williams Award
OL-A, 3rd WS, Fort Sill, Okla.

3rd WS Weather Civilian of the Year
Mr. George P. Wright, OL-B, 3rd WS, Fort Leonard Wood, Mo.

3rd WS Pierce Award
Staff Sgt. Marston Johnston, OL-A, 3rd WS, Fort Sill, Okla.

3rd WS Dodson Award
Airman 1st Class Anthony J. Colavecchio, OL-A, 3rd WS, Fort Sill, Okla.

3rd WS Weather CGO of the Year
2nd Lt. Michael Scott, 3rd WS, Fort Hood, Texas

3rd WS Weather Senior NCO of thr Year
Master Sgt. James C. Adams. OL-A, 3rd WS, Fort Sill, Texas

3rd WS Weather NCO of the Year
Tech. Sgt. James C. Baker, 3rd WS, Fort Hood, Texas

3rd WS Weather Airman of the Year
Senior Airman Charles J. Sernik, 3rd WS, Fort Hood, Texas

3rd WS Best Award
Master Sgt. William M. Luther, 3rd WS, Fort Hood, Texas

3rd WS Merewether Award
Master Sgt. Michael A. Calvert
Tech. Sgt. Jasper E. Harris
Staff Sgt Todd A. Winters, Task Force XXI, 3rd WS, Fort Hood, Texas

8th Air Force Senior NCO of the Quarter (4th qtr. 1996)
Master Sgt. William M. Luther, 3rd WS, Fort Hood, Texas

8th AF Airman of the Quarter
Senior Airman Brian D. Bishop, 3rd WS, Fort Hood, Texas

3rd ASOG/3rd WS Senior NCO of the Quarter
Master Sgt. William M. Luther, 3rd WS, Fort Hood, Texas

3rd WS NCO of the Quarter
Tech. Sgt. James C. Baker, 3rd WS, Fort Hood, Texas

3rd ASOG/3rd WS Airman of the Quarter
Senior Airman Brian D. Bishop, 3rd WS, Fort Hood, Texas

55th OSS NCO of the Year
Tech. Sgt. James Branda, 55th OSS/OSW, Offutt AFB, Neb.

55th OSS CGO of the Year
Capt. Jeffrey R. Linskens, 55th OSS/OSW, Offutt AFB, Neb.

55th OG NCO of the Quarter (4th qtr. 1996)
Staff Sgt. Mark Sheldon, 55th OSS/OSW, Offutt AFB, Neb.

353rd OSS/SOG CGO of the Year
Capt. Don Shannon, 353rd OSS/WX, Kadena AB, Japan

353rd OSS/SOG NCO of the Quarter (2nd qtr. 1996)
Staff Sgt. Kevin Bourne, 353rd OSS/WX, Kadena AB, Japan

353rd NCO of the Quarter (3rd qtr. 1996)
Staff Sgt. Kevin Bourne, 353rd OSS/WX, Kadena AB, Japan

353rd OSS NCO of the Year
Staff Sgt. Kevin Bourne, 353rd OSS/WX, Kadena AB, Japan

25th ASOS/DOW Airman of the Month (January 1997)
Airman 1st Class Stacey R. Branch, 25th ASOS/DOW, Wheeler AAF, Hawaii

25th ASOS/DOW NCO of the Month
Staff Sgt. Anthony G. Soots, 25th ASOS/DOW, Wheeler AAF, Hawaii

Military Outstanding Volunteer Service Medal
Master Sgt. David Rose, 334th TRS/TTMV, Keesler AFB, Miss.

AFSOC Weather Observer of the Year
Senior Airman Amy Whiteman, 16th OSS/DOW, Hurlburt Field, Fla.

47th OSS NCO of the Year
Tech. Sgt. Raul Loyo-Rodriguez, 47th OSS/OSW, Laughlin AFB, Texas

47th OSS NCO of the Quarter (4th qtr. 1996)
Staff Sgt. Kevin A. Josephson, 47th OSS/OSW, Laughlin AFB, Texas

20th OSS Specialist of the Year
Staff Sgt. David P. Jordan, 20th OSS/OSW, Shaw AFB, S.C.

20th OSS Support Person of the Quarter (1st qtr. 1997)
Master Sgt. Richard M. Grotzinger, 20th OSS/OSW, Shaw AFB, S.C.

412th OSS/OSW NCO of the Quarter
Tech. Sgt. Doug D. Golden, 412th OSS/OSW, Edwards AFB, Calif.

412th OSS/OSW Airman of the Quarter
Airman 1st Class Monica E. Preble, 412th OSS/OSW, Edwards AFB, Calif.

4th OG Civilian of the Quarter (4th qtr. 1996)
Mr. Craig Lewis, 4th OSS/OSW, Seymour Johnson AFB, N.C.

4th OSS Airman of the Quarter (1st qtr. 1997)
Airman 1st Class Mike Jones, 4th OSS/OSW, Seymour Johnson AFB, N.C.

HQ AWS Company Grade Officer of the Year (1st qtr. 1997)
2nd Lt. Robert H. Epstein, HQ AWS/SCMO, Scott AFB, Ill.

HQ AWS Senior NCO of the Year
Master Sergeant Rodney S. Rabenneck, HQ AWS/XONS, Scott AFB, Ill.

HQ AWS NCO of the Quarter
Staff Sgt. Steve Elliott, HQ AWS/RMA, Scott AFB, Ill.

HQ AWS Junior Enlisted of the Quarter
Senior Airman Shai-Anne Gallant, HQ AWS/CCQ, Scott AFB, Ill.

HQ AWS Senior Civilian of the Quarter
Mr. Joel K. Banks, HQ AWS/RMX, Scott AFB, Ill.

HQ AWS Junior Civilian of the Quarter
Ms. Janice E. Hoffman, HQ AWS/RM, Scott AFB, Ill.

MARRIAGES

Senior Airman Shannon Flowers and **Senior Airman Christopher Mann**, 3rd ASOS/WE, Fort Wainwright, Alaska

ENGAGEMENTS

Capt. Layne E. Kaspar, 47th OSS/OSW, Laughlin AFB, Texas, to **Jessica Glendening**
Staff Sgt. Steve Elliott, HQ AWS/PA, Scott AFB, Ill., to **Betty Beck**, Chilton, Wisc.

BIRTHS

Darren Murray — to Airman Josh and Amy Murray, 3rd OSS/WE. Elmendorf AFB, Alaska
Nicholas Anthony Figuly — to Tech. Sgt. Robert and Judith Figuly, 18th WS, Fort Bragg, N.C.
Faith Erin Kramer — to Airman 1st Class James M. and Robyn Kramer, 3rd WS, Fort Hood, Texas
Alissa Jeanette Sapp — to 2nd Lt. Frederick M. and Rebecca Sapp, 3rd WS, Fort Hood, Texas
Meghan Adams — to Senior Airman Jennifer Adams, 374th OSS/OSW, Yokota AB, Japan

MISCELLANEOUS

Selected for Commissioning (SOAR LEAD PHASE II — ROTC scholarship)
Senior Airman Jose M. Zuniga, 3rd WS, Fort Hood, Texas

353rd OSS and 353rd SOG Company Grade Officer of the Year
Capt. Don Shannon, 353rd OSS/WX, Kadena AB, Japan

353rd OSS NCO of the Year and 353rd SOC NOC of the Quarter
Staff Sgt. Kevin Bourne, 353rd OSS/WX, Kadena AB, Japan


HURRICANE HUNTERS