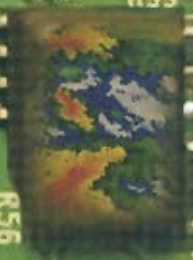
Your Magazine for Air Force Weather

OBSERVER

Sep/Oct 01

AFW: Technology Built on People



What's Inside:

On the back cover: The flags of the parade grounds at Offutt AFB, Neb., during the evening of Sep. 12. Photo by Senior Airman Billy Rogers, artwork by Tech. Sgt. Lou Pell, and design layout by Jodie Grigsby.

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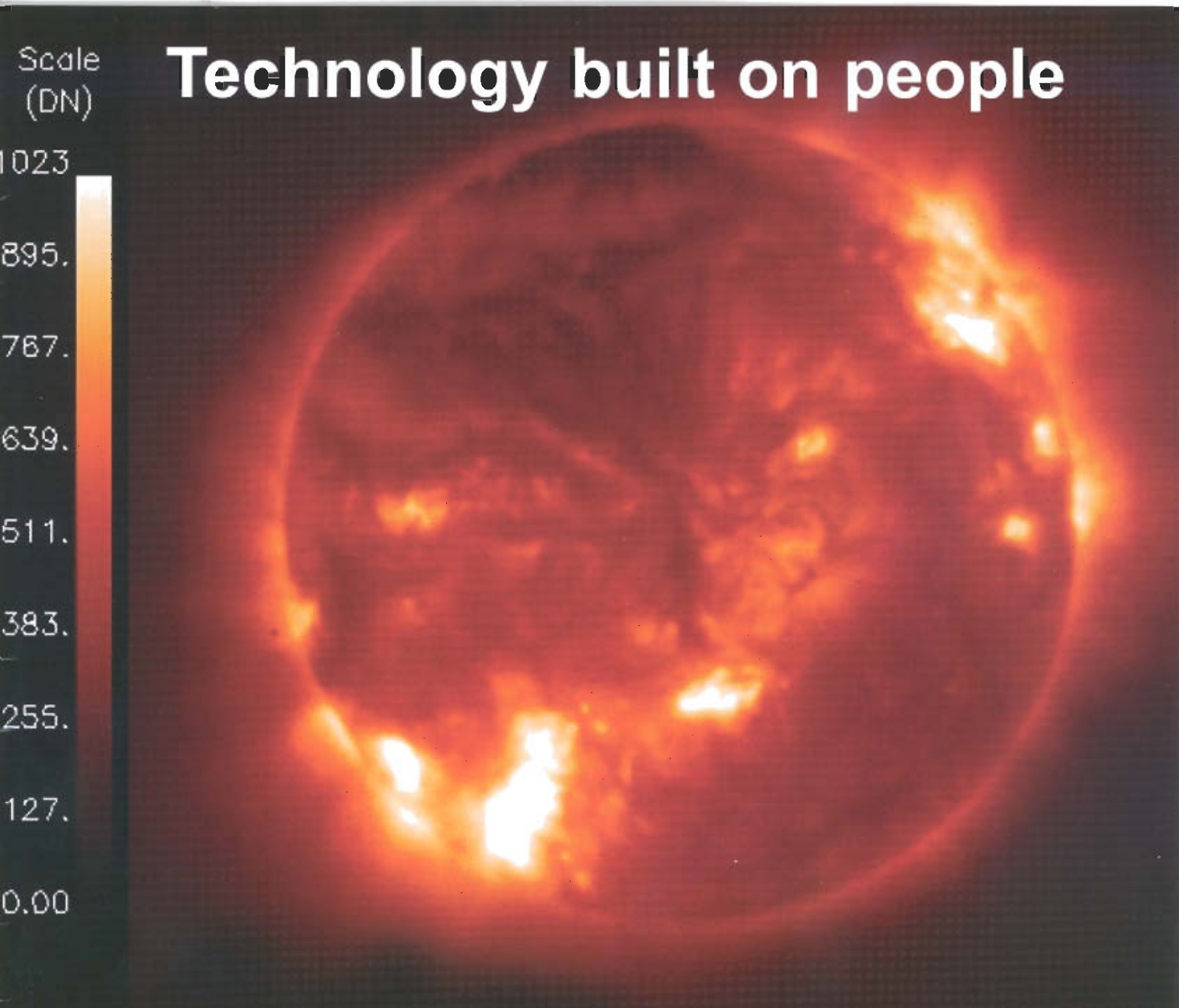
Technology built on people



This image of the sun, shown unprocessed, is from the GOES-12 SXI, taken Sept. 7, 2001. The GOES-12 Solar X-ray Imager took its first official image after successfully concluding the first phase of post-launch testing. This SXI is a culmination of more than twenty years of effort and was funded by the U.S. Air Force and built and supported by NASA. When fully operational, the instrument will provide full-disk solar images at a one-minute cadence around the clock. (Photo courtesy of NOAA)

Technology is by definition a scientific method of achieving a practical purpose. That purpose for Air Force Weather is to provide specific terrestrial and space weather support for Air Force and Army military operations, contingency missions, and humanitarian relief efforts conducted by the United States.

This mission is enhanced by technological advances, but could not be accomplished without the people behind the machines. These highly skilled men and women are AFW's most valuable resource and the main reason AFW is able to deliver high-quality tailored weather and space environment information, products and services to the Nation's combat forces; anytime, anywhere - from the mud to the sun.

Equipment, systems, and programs will continue to measure more accurately, perform more functions, and accomplish these operations faster. These advances will serve to aid AFW meteorologists; but ultimately, it is the weather professionals who generate the best quality weather products in the business.

AMC weather operations: Technology, People Build Future

By Col. Philip Yavorsky
AMC/Director of Weather

It's easy to cover your head, stay out of the way, and play it safe in life; or you can grab onto the world and risk falling off, but have a chance of moving ahead. When we started to reengineer AFW, some covered their heads; but fortunately, a critical mass of folks didn't. They looked ahead, and got ahead, and brought the career field with them.

The OWSs had those kind of folks, and they looked up and grabbed on to anything they could to help accomplish the totally new mission they were charged with. The Air Staff, AFWA, and CWTs had many folks like that too.

Among the many things they needed to make the new organization succeed were new technology and systems, and they pursued them with vigor. In fact, one of the main goals of the CSAF-approved AFW Strategic Plan, 1997, was to improve weather technology. We are in a career field absolutely dependent on modern technology, and we need continual enhancements to move ahead.

The article on page 20, written by the 15th OWS, describes the technology used to build a leading-edge forecast center. The other OWSs did the same, but there was no set template to go by. Whether intentional or not, this situation generated different creative solutions among the OWSs, each with their own particular strengths, but together producing tremendous new capability. "Necessity" mothered a lot of good things.

Parallel with this were the efforts of AFWA, contractors, and others to build "standard" systems for the OWSs and meld in all their creative ideas as well. As I look at it now, the synergy was, and still is, tremendous. Though not all is finished or standardized yet, we have capabilities to support the warfighter as never before.

However, all new technology is worthless without the people to apply it, and they must be properly trained. Better training was another main goal of our AFW strategic plan, and technology played a role there as well. With new software, systems, and training material developed by the OWSs, AFWA, contractors, and the schoolhouse, our forecasters have the best training tools in our history.

We injected a new human element into the equation with contract trainers at the hubs. These are experienced professionals, dedicated to weather training, who add a great new dimension over what we had before. With super people leading the way, we have made tremendous progress.

Since I have the pulpit, I will also say that all those trained people are only fully effective when working as a team; you all know that. We are good at this, within our individual units, but we have more teambuilding to do between OWSs and CWTs. CWTs need to listen to OWSs, and OWSs need to defer to CWTs to make the "one team forecast." With practice and understanding, we'll help each other with collaborative forecasting and improve our skills, and our customers will be the big winners.

The CWT "eyes forward" function is a critical part of teamwork too, especially during marginal weather. This function is backed up by new AOS systems to transfer real-time sensor data, and advanced OS-21 observing technology is not far down the road. Our people and technology are intimately interwoven and can do amazing things.

We have never had such an advanced technology setup before. However, new hardware and software are expensive, and funding all this for the field has been a major challenge for AFWA and AF/XOW. Though we aren't getting all we want or think we need, or as lightning fast as possible, they have done a tremendous job with prioritization, economizing, and developing creative solutions, and we should thank them. We need to work with them to understand their efforts, support them, and propose new solutions if we can.

You can all contribute solutions to move us ahead. You know your mission and requirements best. Who knows where the next great idea will come from. It is hard to list all the things AFW can be proud of over the last couple of years – all accomplished by people with good ideas, new technology, and lots of hard work.

Chief's Mentoring:

Exploit the Weather

By Chief Master Sgt. Penny Braverman
XOW Chief Enlisted Manager

"Exploit the weather" – a phrase frequently heard by weather units from higher headquarters the past few years; however, does anyone really know what the term means? Well read on, and hopefully, this article will help answer that burning question and also provide a little insight on how to "exploit the weather."

Webster's dictionary defines exploit as "to utilize to the greatest advantage," and that is what we need to do in the weather career field and with our products. In general, we need to make weather services an everyday thought on the minds and lips of our customers to utilize weather services properly. With this understanding from the customers comes the positive and negative recognition. Most weather people say "they always remember when I am wrong, but never when I am right," but have any of us thought about why this saying is so true?

Normally, weather units seldom get recognized unless the local or mission weather turns bad. Then we have everyone from the wing commander to the CE airmen asking us for weather support. Weather information and the unit's importance to the mission are easy to explain during these significant weather periods. But have you ever asked the question "what if they listened to me **before** the weather turned bad? If they had, the mission could have been moved to a different time."

We must be proactive and demonstrate to the rest of the Air Force our value, by getting the word out to the person or people responsible for the decisions that could save the mission. We need to get that person's ear and demonstrate that we know what we are talking about and we can help salvage the mission, ensure training can be done, or recommend the best time for the outdoor function.

So, how do I get my unit to that level of customer knowledge? You start by knowing your customers thoroughly, more than just their name and unit mission. As a start – you need to learn how, where, when, or why your customer trains, and finally, how you can add value to the mission. Go visit your customers' units and gather information to help you understand the mission and support they will need. Read regulations and see how they tie into your unit and your other customers' units, and how you can use the guidance to help the decision-makers. Get out to meet all your customers and their customers, face-to-face, instead of relying on the hotline as your only voice and contact with the customers. This approach builds trust and confidence with your customers and allows this rapport to grow and build stronger as time goes on. Always offer to learn more about the customer's unit so your weather warriors can provide better support to their mission requirements. Provide a forecast for your customer's unit functions and always admit when you miss a forecast – weather people know this never happens in our business.

Invite the customers to visit your unit to learn more about your unit's capabilities to support their mission and people. In short, you must sell your unit to the customers! You do this by discussing your unit's operational shortfalls and your plans for fixes to these significant problems or your alternative methods to provide better customer support. Show the operators how the equipment operates (radar is always fascinating to non-weather people) and discuss the limitations of each piece of equipment. Once the customers have an understanding of your operations, they know what your unit can provide and how your people will provide better support for their operations.

Take every opportunity to get weather into the customer's and boss' face – example, the operations people talk about an upcoming mission at a staff meeting and you provide the climatology information to help select the timing of the mission. You know the mission is coming, your intelligence community knows you care, and you want a heads up on all missions to provide better weather support. Another example is in the space information arena and the effects on your customers. A solar flare erupts and the mission involves HF communications – you can brief the staff of the potential for their radios to fail or GPS to fail due to the solar flare by providing the space forecast. These examples clearly show how "exploiting the weather" is a daily practice.

Bottom line: you must take the initiative to let other units on your base or post know we are a valued member of the operations team and we can provide them valuable terrestrial and space information that ensures mission success. But you also need to realize your unit's strengths and weaknesses, so you will never promise the world. Promise only that your unit will provide the best possible weather information and forecasts, tailored for all your customers and their needs.

AFMC weather operations:

STAFFMETs and beyond

By Lt. Col. Dave Sautter
AFMC/Chief, Weather Division
Directorate of Operations

I have two goals with my opportunity to speak to everyone in Air Force Weather. My first goal is to make everyone in AFW a Staff Meteorologist. My second goal is to give you a heads up on another reengineering effort that you may not be aware of, the formation of a STAFFMET hub. What is a STAFFMET? A STAFFMET is an advanced degreed weather officer or civilian whose mission is to ensure that realistic atmospheric parameters are continually integrated into the design, development, acquisition and testing phases of new weapons systems, and to ensure AFW capabilities to support future AF weapons systems are developed and maintained.

Why should everyone think of themselves as STAFFMETs? Because just like everywhere else, we have to do more with less. We have fewer established STAFFMET billets across the Air Force, and at the same time, we see a future filled with more technological developments, more sophisticated weapon systems coming on line, and more reliance on these higher-tech systems. It will be even more critical that the Air Force meteorology community remains integrated with these developing systems.

Two concerns come to mind in the STAFFMET world that drive me to ask for your involvement. The first is a recent memo from AFRL/CC, which stated, "AFRL is unable to invest in Terrestrial Weather and the Air Force must look to other methods to address user requirements." This is a trend we need to reverse. I'm sure you would agree that continued improvements are required in the systems of today, like Target Acquisition Weather Software, Night-Vision Goggle software, MM5, etc., as well as fine-tuning of future systems awaiting fielding.

My second concern is our (Air Force) record of developing weapon platforms in a weather "vacuum." Most AF meteorologists and forecasters can quickly list a number of aircraft and weather constraints that were applied "after the fact," after the aircraft became operational. These constraints limit the aircraft and make our job as meteorologists and forecasters more challenging. I will not list them here, but you know what I'm talking about.

The above two concerns are why I need all of you to think of yourselves as STAFFMETs each and every day. If you wear the AFW Suit, then you probably have the belief that weather information is a vital need of the operator. Defend that need! Constantly remind the customer to integrate realistic weather parameters into their daily and long-range plans! Be opportunistic. If a customer MIGHT need weather information, lean forward and volunteer this information. STAFFMET victories, a result of leaning forward, include: less restrictive engineering specifications, fine-tuned recommendations on where/when to conduct specific flight tests, vital feedback into the development of a climatological data base (ExPERT) now used Air Force-wide by the engineering community, and the input of climatology data into the design of new composite materials used in stealth technologies.

My second goal is to see the eventual implementation of a STAFFMET hub. After ten years of force reductions, the physical distribution of STAFFMETs across AFMC no longer matches the distribution of STAFFMET workload. Centrally managing these efforts will improve quality of support by assuring high levels of expertise for each acquisition effort, increasing cross-feed of technical information, providing specialized STAFFMET training (where none currently exists) and providing career management of these geographically disparate officers. Hopefully, by the time you read this, the coordination and approval steps will be complete and we will be programming the required movement of the officers. The hub will be organized under the 88th WS, Wright-Patterson AFB, Ohio, and will be completed over a period of time by adding more manpower and funds to their mission.

So as you can see, there are lots of opportunities for STAFFMETs and all AFW personnel to contribute to the AFMC and Air Force mission. Lets all lean forward and improve the short- and long-term combat capability of our operators!

AFWA watches world for volcanic ash, backs-up NOAA

By Tech. Sgt. Miles Brown
AFWA Public Affairs

The Air Force Weather Agency assumed the operational backup role for the National Oceanic and Atmospheric Administration's Washington Volcanic Ash Advisory Center in Camp Springs, Md., as of Aug. 1.

AFWA's Meteorological Satellite Applications Branch has generated volcano summaries since 1998 and has monitored volcanic emissions for DoD agencies for more than a year.

"METSAT analysts track, on average, 60 active volcanoes worldwide," said Tech. Sgt. John Kramer, superintendent of METSAT Applications at AFWA. "From these observations, we generate warnings every six hours. If the eruption intensity or ash level increases, we update our warnings to ensure all DoD agencies have the most current information."

These warnings keep flying units and commanders on top of changing conditions in active volcanic regions, where ash clouds from large eruptions can reach altitudes of 60,000 to 65,000 feet and cover several hundred square miles, according to Kramer. The ash and debris from an active eruption can clog engine intakes and reduce visibility to near zero. Because of this, current ash advisories are critical to all flying units operating in active volcanic regions.

AFWA is now the backup for civilian flights in an area of responsibility that includes the continental U.S. southward through Central America and the Caribbean, to 10 degrees South in South America, and the U.S.-controlled oceanic flight information regions.

In the event of a failure at the NOAA advisory center, located at the World Weather Building in Camp Spring, Md., the METSAT Applications Branch will furnish text advisories and graphical ash plume forecast products via the National Weather Service's communications gateway center in Silver Springs, Md.

This is not the only service agreement between NOAA and AFWA, according to Lt. Col. John Egentowich, Chief of the Global Weather Center Division at AFWA.

"We have several arrangements, all of which are aimed at providing uninterrupted support in case of a long-lasting outage at one of the government forecasting agencies," said Egentowich. "These agreements highlight the interoperability between forecasting agencies and are a positive assurance of continuation of services for the country."

AFW moves back to EQUAL system

Since its inception, EQUAL and EQUAL-Plus have provided enlisted weather people greater visibility of the enlisted assignment system. EQUAL allows airmen the opportunity to align their preferences to actual Air Force needs during an Overseas or Overseas Returnee Cycle.

EQUAL-Plus, on the other hand, was designed to supplement EQUAL and is used to advertise requirements for special duty, Joint/Departmental, Chief Master Sergeant, and short-notice overseas assignments. Over time, the weather career field moved away from using EQUAL and increasingly relied on EQUAL-Plus to fill recurring vacancies. Most of these positions do not inherently have special requirements, and should be filled through the standard assignment process.

Because of this, the weather career field will once again use EQUAL to fill our normal requirements and use EQUAL-Plus for its originally intended purpose. There will be little impact to individuals during this transition, but everyone is reminded to check the EQUAL listings during the Overseas and Overseas Returnee Cycles to determine all available assignment locations. When there are positions that need to be filled quickly or have special requirements, EQUAL-Plus will be used.

Both programs are available through your orderly room, the base Military Personnel Flight, or on the HQ AFPC World Wide Web homepage. Please contact Chief Master Sgt. Jeff Fluegge or Tech. Sgt. Karen Findorak at DSN 665-4156 if you have any questions.

(Information supplied by the Chief of Air Force Enlisted Weather Assignments)

FIFTY YEARS OF AFW EXPERIENCE, AND COUNTING

By Tech. Sgt. Miles Brown
AFWA Public Affairs

Forecasting the weather for many regions around the world can be difficult. However, imagine the challenges faced by forecasters ten or fifteen years ago; prior to Doppler radar, the Internet and e-mail. Better yet, go back thirty-five years prior, to satellite images. How about going back fifty years? What did they use back then – chicken bones and Tarot cards?

Not according to Gene Weber, SAIC special consultant to the Technical Training Branch, AFWA, Offutt AFB, Neb. He should know, because he has worked for and with Air Force Weather for the last fifty years, and has seen the technology and art of forecasting change dramatically over the last half century.

When Weber started as a weather observer in 1951, the weather stations had almost none of the technology used by today's weather professional. They did have radar systems, but most of these were salvaged from WWII aircraft and adapted for use as crude weather radars.

"Using the old radar system did give us an indication of incoming storm fronts," said Weber. "We could look out fifty to one hundred miles and see a line of storms and estimate the storm cloud heights."

They had PIBAL balloons, which when released, were tracked with theodolites to give observers wind speed and direction. The weather instrument shelters located on the flightlines or weather stations had a barograph to track atmospheric pressure, a thermograph to record temperature readings, and a sling psychrometer for hourly temperature and humidity reading.

"To determine cloud cover, we would break the sky into tenths at low, middle and high levels," said Weber. "At night, we used a fixed ceiling light and a clinometer, called a beer bottle, to calculate the ceiling height. During the day, we used balloons and aircraft reports when ceilings were low; otherwise, the ceiling heights were estimated. Airfield visibility was determined using fixed references at different distances. Observers plotted all these weather conditions on local weather charts by hand everyday for the local forecasters."

During Weber's fifty years of weather experience, he has worked as an observer, forecaster, satellite observer, and technical writer. He retired as a chief master sergeant after 31 years on active duty – all in weather. Weber's military career took him the world over, seeing duty in the Korean and Vietnam Wars, and tours in the U.K., Lajes Field, Azores, Portugal, and several sites in the CONUS, including the 3rd Weather Wing Headquarters, Offutt AFB, Neb.

After his 1983 retirement from active duty, Weber

Weather observers from the 12th Marine Garrison, at Pyontaek Marine AB, Korea, launch a weather balloon. (Summer, 1952)

Photo courtesy of Gene Weber

started his second career as a lead forecaster in the Severe Weather section at the Global Weather Center, Offutt AFB, Neb. He ended his 16-year stint in the Civil Service in 1999 and then started a part-time position with an AFW contractor.

During his many years of forecasting experience, Weber has seen weather technology change by leaps and bounds.

"In the late 50s, the weather stations started to get the new CPS-9 weather radar units," said Weber. "This unit gave forecasters the ability to determine the height of the snow/rain line with the Bright Band function. When a storm line was approaching the weather station, the radar could be offset to focus in on the storm. Not bad for a unit that filled a room," added Weber.

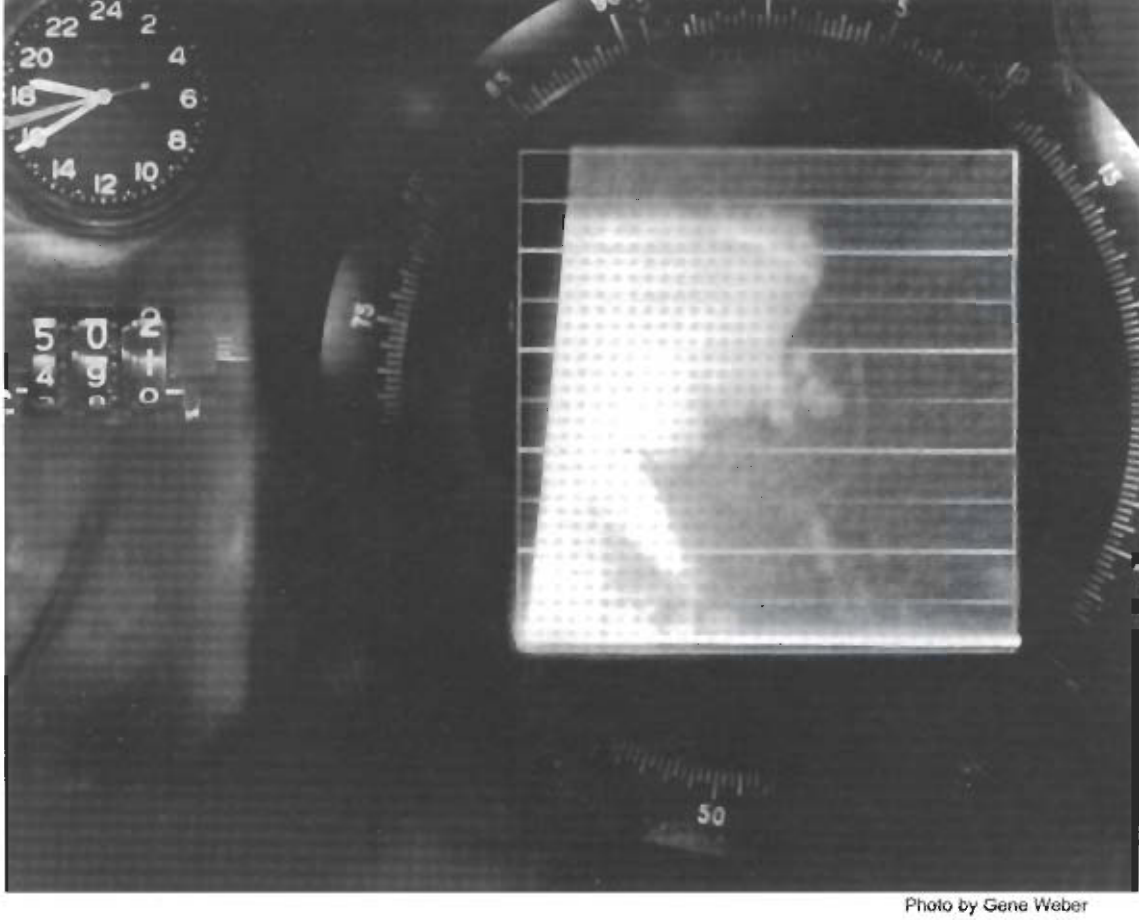


Photo by Gene Weber

A funnel cloud touching down in eastern Missouri, April 10, 1965, near Whiteman AFB, Mo., as seen on the AN/CPS-9 RHI scope by Gene Weber. This tornado was a small prelude to the 48 tornadoes to hit the Midwest that Palm Sunday, April 11, 1965. The severe line of storms that formed west of Whiteman, continued thru the night and intensified the next day spawning the devastating twisters. Twenty-one of these were killers, producing 256 fatalities and more than 3,000 injuries. The tornadoes raked parts of Wisconsin, Illinois, Iowa, Michigan, Indiana, and Ohio. Nineteen of the tornadoes were violent (F-4 or F-5), the most reported in an outbreak at the time, and to this day, second only to the 1974 Super Outbreak total of 30.

At that time, the stations received weather charts from the National Weather Service via facsimile machines and observations and bulletins over Teletype circuits.

In the early 60s, the weather stations added the ability to see images from space. The satellites were polar orbiting systems, and operators had to know when these satellites passed overhead to capture images. Data was received during short time windows, which yielded only a few usable images.

"We would use a chart to track the satellite location, and once a day, when it was overhead, we would flip a switch and after a few minutes, we would have a couple visual satellite images," Weber recalls.

Another source of satellite images during the 70s was the NWS. They transmitted images several times daily, via FAX, to most weather stations around the world. The only drawback was that these images were hard to read, given the limitations of FAX machines of that time.

According to Weber, the late 60s and early 70s saw the Air Force purchase much better equipment for observing weather to include rotating beam ceilometers, transmissometers, and remote recording equipment with digital readouts in the weather stations. The forecasters also received more accurate, smaller radar units.

It wasn't until the 80s, when Geostationary satellites were put into orbit, that weather forecasters started to really use satellite images as part of their everyday work, said Weber. As computers started to make their way into the forecasting business, the ability to animate satellite images greatly added to the forecasters tools. And in the early 90s, Doppler radar and super computers with the capabilities to calculate numerical forecasts were added to the arsenal.

Even with all these technological advances, old-fashion forecasting skills are still at a premium. Weber is currently working on a series of comprehensive technical notes to assist today's forecaster with recognition of daily weather patterns and season trends.

"I just hope these notes will help today's weather warriors continue the battle for accurate, timely weather forecast for our armed forces," said Weber.

New Weather Radar *SWEEPs* South America

By Majs. John Knowles and Pat Ludford
25th OWS, Davis-Monthan AFB, Ariz.

Back in 1996, the 24th WS, Howard AB, Panama, put together a formal study on how they could increase weather data collection in South America. Observations and forecasts were always tough to get, satellite imagery was often 2-3 hours old, and weather radar information was nonexistent. Yet, the need for timely and accurate information on thunderstorms, precipitation areas, and intensities to aid in the determination of severe weather was felt every day.

U.S. Southern Command requires detailed meteorological data across the breadth and depth of their Area of Responsibility to support DoD operations, refine mission tactics, manage combat resources, and provide resource protection. Law enforcement agency personnel and participating nation's forces deployed in theater require accurate local and near-area weather information for effective planning, deployment, employment, and redeployment of counter-drug assets in response to narco-trafficking movements. Any additional data could significantly enhance their ability to provide weather support for these operations. One possibility was modifying existing ground-based surveillance radars (TPS-43s, now upgraded to TPS-70s) located throughout northern South America.

The TPS-70's primary mission is to provide surveillance, detection, and monitoring for counter-drug operations in the USSOUTHCOM AOR; the radar also detects precipitation, which is filtered out of the final image. A proposal was made to determine the feasibility of isolating the precipitation returns and making the images available to weather forecasters and air traffic controllers. Initial experiments were successful and funding for the project was obtained from USSOUTHCOM. As a result, the Digital Weather Intelligence Data system was born.

The DWID's capability allows existing sensor assets to produce meteorological information to support combined counter-drug operations and provide resource protection for military assets at deployed and fixed, forward-based installations.

The 25th OWS, working with Air Combat Command, the Counter-drug Surveillance and Control System, USSOUTHCOM, and Electronic Systems Center developed a working Concept of Operations and Operations Requirement Document to give potential contractors an accurate description of what was needed. The DWID system is designed to provide timely precipitation (reflectivity) data. The capability can also be used as an intelligence tool that identifies areas of suspect activity. Since aircraft will avoid areas of severe weather, knowing where the severe weather is reduces the area to search. DWID's products will be made available over common-user communications systems to distribute products to operational customers, including USSOUTHCOM, Joint Inter-Agency Task Force-East, participating nations, and numerous U.S. agencies. Images will be in a standard format with the capability to allow looping and the ability to transmit, via NIPRNET and SIPRNET, to other data servers.

Installation of the DWID's hardware, including a data server, communications lines, and integration into the OPS-II system, began this spring at the 25th OWS and AFWA. Installation of the filtering hardware at the first of five radar locations began in July, and the remaining locations are scheduled for completion by early 2002. These five Colombia locations are:

- San Andres
- Riohacha
- San Jose DG
- Marandua
- Tres Esquinas

Additional locations in the theater may be included as funding becomes available.

Further expansion of the DWID's concept to other radar systems may be possible as demonstrated by this proof of concept. It may even be possible to get weather radar imagery from a base or civilian airfield approach radar, thus giving each location its own weather radar. Imagery from the first site should be available for end-state users in September via the 25th OWS homepage. For additional information on the DWID system, call Maj. Pat Ludford, 25 OWS/DO.

Joint initiative produces better winds

By Paige Rowland
AFWA Public Affairs

An Air Force and Navy initiative culminates with the ability to use satellite images to track wind speeds in data sparse areas from anywhere in the world.

The feature-tracking winds product is a result of a joint endeavor providing both Navy and Air Force forecasters with weather information in areas where little or no wind data is available. The product, also known as geostationary satellite derived winds, provides ten times the weather data previously available over the Pacific, Atlantic and Indian Oceans and several continents.

The Navy drove the requirement looking for a way to improve their weather model, NOGAPS.

"The ability to use satellite data is crucial to our forecasting for remote locations, which is primarily where the Navy operates," said Chuck Skupniewicz, a Navy meteorologist in the Models and Data Department, Fleet Numerical Meteorology and Oceanography Center, Monterey, Calif.

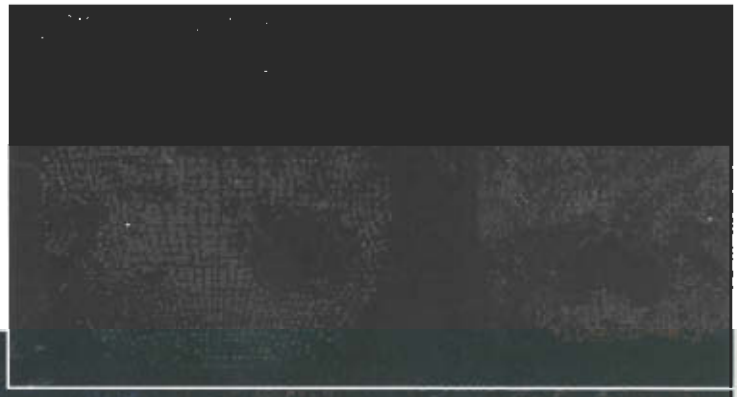
The product will be used by both services as a data source for global weather prediction models, and can be used as a real-time source for operational forecasting.

"The product will be most useful as a data set for model initialization," said Mark Conner, a consultant to the Air Force Weather Agency's Meteorological Satellite Branch, Offutt AFB, Neb. AFWA is the DoD's METSAT Center of Excellence and is responsible for the operational processing of the feature-tracking winds product.

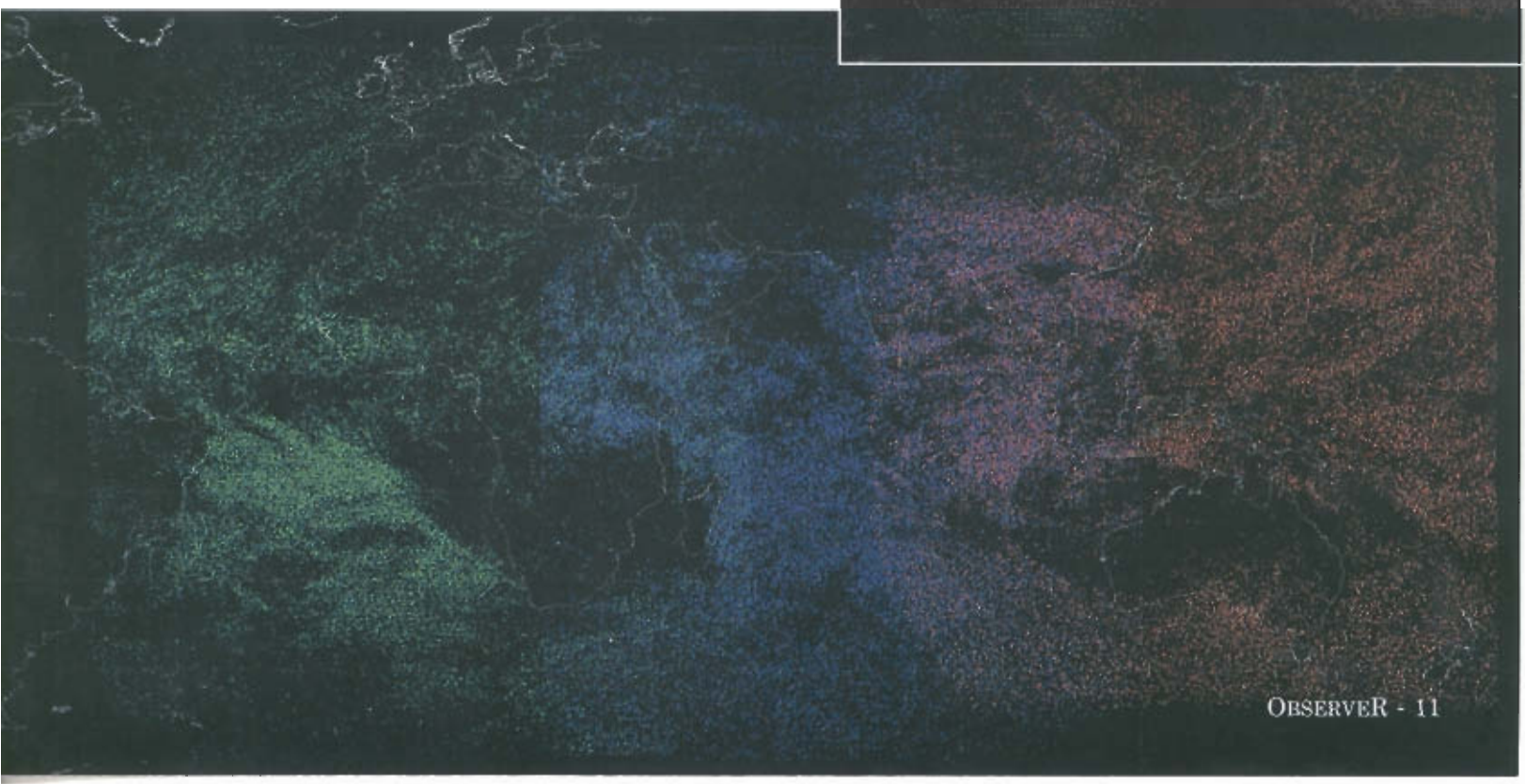
The new data is derived by an automated review of three sequential satellite images. "In short, the process looks for clouds or other 'features' and tracks the movement of the features from one satellite image to the next," said Capt. Troy Johnson, chief, AFWA's Space Missions Branch.

"The cloud height of the wind vector is determined by

See **Winds**, Page 29



Below is a map showing all the new wind data points attained with the feature-tracking winds product. The small view, right, is an example of a data point map prior to the joint initiative.



SCOMP passes tests

The first operational tests and evaluations in European theater demonstrate SCOMP is ready for next step

By Romme Burch
AFWA Dissemination Branch

HQ Air Force Weather Agency, Offutt AFB, Neb., started the worldwide implementation of the Strategic Communications Program, Very Small Aperture Terminal weather product broadcast.

The operational SCOMP VSAT data flow began first in Europe in June. An operational test and evaluation was conducted at three sites in the European theater, clearly demonstrating the SCOMP can deliver timely, accurate and reliable weather support worldwide to Air Force and Army warfighters, unified commands, National Programs, and the National Command Authorities. The CONUS and Pacific implementation started in July and a number of tests have been conducted at test sites in the CONUS since June. The evolutionary move to SCOMP will convert the Air Force Weather product distribution system from the 9.6 legacy circuit centric architecture to a VSAT and NIPRNET centric architecture.

SCOMP allows CWTs to send locally produced weather products through the VSAT back-channel to other CWTs, to an OWS, or back to AFWA. The flow allows forward deployed CWTs, equipped with Tactical VSATs, to receive the same full suite of weather data that the in-garrison, fixed-site CWTs receive; thereby allowing the required set of forecast model data to flow into an Integrated Meteorological System for Weather Effects Workstation operations.

SCOMP provides for the development and acquisition of an integrated AFW communications system that in turn provides the required weather product distribution between the re-engineered AFWA, 11 OWSs and 164 WF/Dets. It is built upon a foundation of wideband, 1-2 Mbps, common user communication systems. T-1 tail circuits, communications satellite 1-2 Mbps space segment, security and firewall equipment, and other base cable equipment will be provided by various agencies.

Key components of SCOMP are the VSAT satellite communication capability, which sends/receives to and from the New Tactical Forecast System at all weather flights and squadrons worldwide. SCOMP data flow is central to weather and associated war fighter operations in every theater and at all echelons.

The VSAT system consists of three separate satellite hubs and 1-2 Mbps space segments servicing the CONUS, Pacific, and European theaters, two-way fixed, and one-way tactical VSAT earth terminals. In addition to providing data to NTFS, VSAT also provides data to other operational systems, including the Army's Integrated Meteorological System and the Small Tactical Terminal.

The IMETS and STT systems allow forecasters to integrate strategic center-developed, ground-based and space-based observational data with centrally produced forecast products to provide tailored, mission-specific weather support. The VSAT communications method has been identified as the most economical and reliable means for transmitting a large volume of weather data to multiple, geographically distributed users. AFWWS VSAT broadcast now provides an extremely efficient forward error correction and packet rebuilding capability, and eliminates the waste of a large amount of bandwidth for packet acknowledgments.

How did we get to this evolutionary point in Air Force Weather? In January 1995, HQ Air Weather Service formally directed the Electronic Systems Center to procure VSAT in order to deliver Meteorological Satellite imagery to CWTs, deliver improved METSAT to CINCs, and improve and consolidate weather communication circuits. In other words, create a single communication capability to ship weather products over VSAT, and terminate all AWDS and AWN legacy circuits. SCOMP satisfies this requirement, and delivers much more.

When fielded, SCOMP will deliver Formatted Binary Data, Uniformed-Gridded Data Fields, Vector Graphics, Alphanumerics, Raster Scan imagery, GRIB - TRIMGrib, MMLite and NOGAPS, and GIF/JPG/MPGs of Model Visualizations, METEOGRAMs, Lightning Data, and METSAT imagery. All these products will be available to CWTs and OWSs.

To ensure each site receives all of its required weather

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Automated Weather Network support moves to HQ AFWA

By Staff Sgt. Lori Powell
Det. 7, Tinker AFB, Okla.

The Automated Digital Weather Switch at Det. 7, HQ Air Force Weather Agency, Tinker AFB, Okla., acts as the central clearinghouse for all Air Force Weather related alphanumeric environmental data. Over the years, Det. 7 has incorporated and integrated many different pieces of equipment, software, operating systems, protocols, and communications paths to accommodate customer processing and throughput requirements, dating back to the start of the Cold War. These items are approaching the end of their operational life and continue to grow more logistically and architecturally unsupportable.

Currently, Det. 7 operations personnel are responsible for the efficient operation of primary and secondary ADWS mainframe computer systems valued at more than $4 million. Operators ensure accurate and timely delivery of alphanumeric weather data to Automated Weather Network customers worldwide. They provide direct support to AFWA, Fleet Numerical Meteorological Oceanographic Command, National Weather Service, Federal Aviation Administration, and numerous other DoD, federal, and allied agencies. Day-to-day activities include monitoring, troubleshooting, and completion of user-level maintenance of assigned hardware and software that is used to process more than 1.5 billion weather data groups through the system monthly. Their diligence ensures a 99.5 percent or better ADWS availability rate for worldwide customers.

To meet customer demands well into the 21st century, AFW is reengineering the AWN processes and architecture in order to enhance the mission effectiveness of DoD and National Programs operations and planning efforts, providing the warfighter more timely and relevant environmental products and services. As long as Det. 7 is functioning with its current architecture, the reengineering process will have to deal with non-standard data and multiple communications paths. Det. 7 will be inactivated in March, 2002, as part of AFW's reengineering goals.

As part of the inactivation activities, Det. 7 is preparing HQ AFWA, Offutt AFB, Neb., to manage the AWN customer base. Members of the detachment have laid the groundwork for the AFWA Help Desk team to ensure their ability to remotely monitor, troubleshoot, and take corrective action for ADWS circuits. This effort provides AFWA with critical day-to-day interaction with Det. 7 customers and prepares them to handle customer calls and analyze ADWS hardware, software, and communications reliability. The architecture and communication pathways will be different once the AWN is reengineered and the ADWS is deactivated. In addition, to ensure the AFWA Help Desk has the expertise to properly take care of customers, Dave Bayless, a weather network duty officer, will be moving to Offutt AFB to become a member of the AFWA team.

Det. 7 has a vested interest in AFWA Help Desk support. Currently, Det. 7 duty officers manage the ADWS network on a real-time basis. They ensure customer inquiries and problems concerning hardware, software, communication circuits, and data flow are expeditiously resolved. They coordinate efforts between operations personnel, technical control facilities, commercial line and equipment companies, and customers to guarantee the receipt and delivery of critical weather data. Det. 7's interaction with AFWA, as part of the reengineering effort, ensures the Help Desk is ready to continue these responsibilities.

AWN customers should continue to call Det. 7 at DSN 884-5761, commercial 405-734-5761 or email *afwa.wndo@tinker.af.mil*. Once the reengineering effort is completed, customers will call the AFWA Help Desk at DSN 271-2586 or CMCL 405-294-2586.

G⊕⊕d Hunting Weather

By Tech. Sgt. Joseph Nichols, Jr.,
1st Cavalry Division Weather Team
3rd WS, Fort Hood, Texas

Imagine you are responsible for providing weather support for an aircraft with a very important, high-visibility mission. It is barely a category 1 aircraft and can't fly in any icing. The mission is a failure if a cloud deck obscures the target anywhere from 100 to 10,000 feet above the ground. Anything greater than a 15-knot cross wind during take off or landing means almost certain disaster. During the entire flight, you can see everything that the pilot sees and know immediately if you made a mistake or were on the money. That's what it's like to provide weather support to the Hunter Unmanned Aerial Vehicle.

Alpha Company, 15th Military Intelligence Battalion of the 504th Military Intelligence Brigade, from Fort Hood, Texas, is the only deployable Hunter UAV unit in the U.S. Army. Because of this, they are in high demand and have spent spring through fall in the Balkans for the past 3 years. Many of the 15th's soldiers are making their second or third trip. Unlike the Air Force's Predator UAV, which are operated by commissioned officers, the pilots and payload operators of the Hunter are all enlisted soldiers in the ranks of private first class to staff sergeant.

Since 1999, the 3rd Weather Squadron from Fort Hood has deployed forecasters to Camp Able Sentry located near Skopje, Macedonia, in support of the 15th MI's Hunter UAV mission. My AEF tasking number came up in May and it was my turn to deploy with the Hunters. Staff Sgt. Gerry Thompson from the 15th ASOS WF, Hunter AAF, Ga., is the other half of the weather support team. Even with all the advice and information from forecasters from prior deployments, it has been quite a learning experience for both of us.

The first thing we had to learn was the Hunter UAV itself. The Hunter is a small, twin-engine aircraft guided using line-of-sight radio signals. When taking off and landing, pilots control it using hand-held controls very similar to those used by radio-controlled model airplane hobbyists. Upon reaching an altitude of 2,000 feet, control is handed off to operators in Humvee-mounted shelters. Soldiers taxi it to the takeoff point and recover it after landing by pushing it. It doesn't have brakes, so it uses a tail hook and cable arresting gear to catch it on landing, similar to aircraft carrier operations, but much

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Private 1st Class Bradley Thurkow, bottom, and Private 1st Class Christopher Logue, top, soldiers from A Company, 15th Military Intelligence Battalion, conduct pre-flight checks on the Hunter UAV.

Photo by
Maj. Norman Johnson

Air Force UAV Battlelab Enters the Wonderful World of Weather

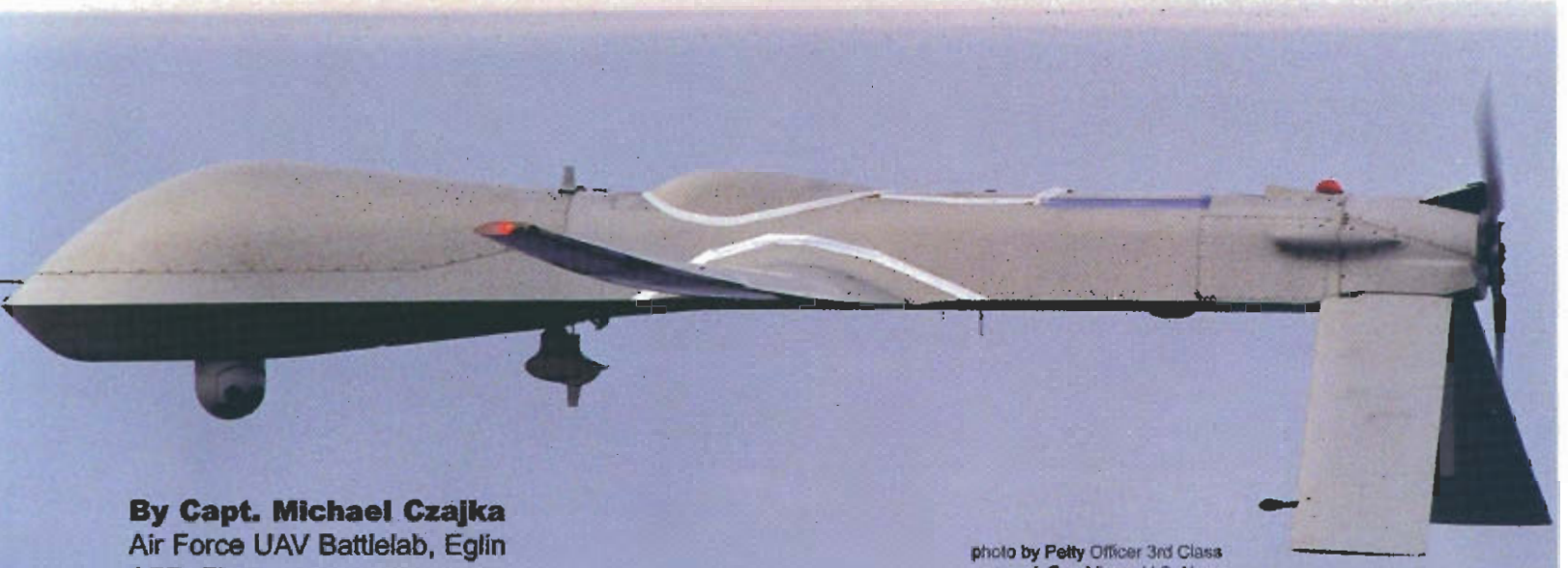


photo by Petty Officer 3rd Class Jeffrey Viano, U.S. Navy

By Capt. Michael Czajka
Air Force UAV Battlelab, Eglin AFB, Fla.

The Air Force Unmanned Aerial Vehicle Battlelab at Eglin AFB, Fla., has introduced two initiatives to demonstrate the ability to provide weather information to military forces operating in data-sparse regions.

One initiative is UAV Delivered Sensors. This initiative adapts a proven air-droppable weather sensor for air release from a Predator UAV. Observing a demonstration of the airdropped sensor fostered another initiative, simply called "Weather UAV", which plans to equip a UAV with internal weather sensors. These sensors will collect in-flight weather data and eject weather radiosondes to collect column weather data as the "sonde" falls to earth.

The lack of near-real-time weather data in data-sparse and data-denied regions created a real challenge during Operation Allied Force, OAF, where quality weather data was required to support the warfighter. The Office of the Secretary of Defense's study, *Operation Allied Force Lesson's Learned*, noted that adverse weather in OAF impacted target acquisition and identification, increased risk to aircrews, and complicated collateral damage concerns. Air operations and strike execution in OAF was affected by the requirement for favorable weather in up to four geographically dispersed locations: target areas, strike aircraft operating bases, support aircraft operating bases, and orbit locations for tankers. Adverse weather in any of these locations impacted NATO's ability to put bombs on target and highlighted the need for accurate weather prediction in all these areas.

The Need for Weather Data – OSD's Perspective

In April of 2001, OSD released its *Unmanned Aerial Vehicle Roadmap-2000 - 2025*. The roadmap documented the critical importance of weather data, pertaining to future UAV operations, stating, "The reporting of basic meteorological conditions can and should be made an integral part of all future sensor systems acquired for UAVs."

The Battlelab's *Weather UAV* initiative teams with the Navy's Space and Naval Warfare Systems Command, SPAWAR, and intends to prove the concept of equipping and flying a UAV with an on-board weather sensor to provide real-time, forward-area weather observations. OAF lessons learned highlighted the critical need for accurate target area weather data.

Weather UAV hopes to show the benefits to the warfighter by providing the Joint Forces Air Component Commander with information for weapons selection, air operations support, and mission planning in target areas, high-value asset orbit locations, and precision-guided munitions release areas. To validate accuracy, the Battlelab plans to compare data collected by the UAV weather sensor to weather balloon data collected near the UAV's flight path. The ability of the weather sensor to pass information via satellite will also be tested.

Due to the operational tempo of Predator UAV, coupled with current acquisition constraints, the Battlelab

Battlelab, continued

plans to demonstrate the *Weather UAV* initiative on the Army's Hunter UAV.

The UAV Delivered Sensors Initiative will adapt a proven bomb rack on the Predator UAV. The bomb rack will give the UAV a standard 14-inch lug, gravity drop capability. This spacing allows the rack to carry most stores in the Air Force inventory under 1,000 pounds.

Initially envisioned as a method to drop intelligence sensors, the initiative quickly expanded its scope to include weather sensors and possibly Raytheon's Microglider. The weather sensor, manufactured by McQ Associates of Fredricksburg, Va., proved its value as a tactical weather instrument in Kosovo, supporting OLF warfighters. Once deployed, the weather sensor collected surface weather observations and relayed the data to Allied weather centers via Low Earth Orbiting Satellites.

The Big Picture

In the weather community's architecture, a weather UAV is not the only weather sensor available to weather personnel in a theater. UAVs are potentially a critical part of a family of sensors. Ground, air, and satellite sensors will assist in collecting weather information from previously inaccessible areas. Air Force, Army, and Navy weather personnel in theater then tailor the data collected by all sensors to satisfy operational and forecasting needs.

Other concepts involve loading the weather sondes in chaff dispensers of operational aircraft, such as F-15s, F-16s, and C-130s. Once loaded, the aircraft could dispense the sondes while the UAV or Combat Weather Team receive and retransmit the data back to the theater weather unit and AOC.

UAVs are not only emerging as the "instrument of choice" for surveillance and reconnaissance, but according to Gen. John Jumper, former commander Air Combat Command, the Unmanned Combat Air Vehicle, "promises to give us greater leverage" in high risk combat missions such as suppression of enemy air defenses. Accurate, timely weather information enhances the effectiveness of any air campaign; accurate and timely weather information provided by UAVs will ultimately improve the accuracy of our weapons and the efficiency of flight operations. Y

Editor's Note: The Air Force UAV Battlelab was established by the Air Force Chief of Staff, General Ronald R. Fogelman, and became operational July 1, 1997, as part of the original six Air Force Battlelabs. The battlelab concept emerged from the Air Force's long-range planning effort and the publication of Global Engagement: A Vision for the 21st Century Air Force. Their mission is to rapidly identify and demonstrate the military worth of innovative concepts, which exploit unique characteristics of UAVs to advance Air Force combat capability.

Hunter, continued from Page 14

smaller. The fact that it is so light and has no deicing capability makes it extremely sensitive to weather. With a mission that requires it to see unobstructed all the way to the ground, the difference between a scattered and broken cloud deck becomes very important. All of this information must be considered to understand how weather impacts the customer's mission and how you can minimize those impacts.

The forecaster shift begins with a short ride to Petrovec Airport from Camp Able Sentry. We arrive one hour prior to the mission brief to prepare the weather briefing. A check of the various products available on the USAFE OWS homepage, JAAWIN from our laptop, and the images on our Small Tactical Terminal, and we are ready to fill out the briefing sheet. This briefing has evolved over the past three deployments to focus on the Hunter's unique weather sensitivities. The weather forecaster briefs after the nights' target briefing. Special emphasis is given to takeoff and recovery winds, freezing level, cloud cover, and thunderstorms. Using satellite images from the STT, we are able to show the commander and operators where the best chance of cloud-free conditions are for the mission. With this information they can maximize their flight time by concentrating on the targets with the least cloud cover.

Once launched, we monitor the mission using images from the STT, JAAWIN, and the Hunter itself. The Hunter's constant video feed gives the forecaster a unique capability. It's like having a pilots eye view during the entire flight. While most of the time is spent looking for targets on the ground, we can request a "weather check". The payload operator puts the camera in "pilot's view" and pans the camera 360 degrees. This gives us a good look at the current weather conditions at flight level. This is very valuable because of the almost non-existent radar and observation coverage in the area. Several times we have detected building thunderstorms and diverted the aircraft to a less hazardous target area. Other times we were able to return to base before the storms blocked our route home and put Hunter in danger of running out of fuel waiting to land.

Sometimes the Hunter has to fly above the freezing level due to the line of sight radio control and

mountainous terrain. The video feed becoming fuzzy due to ice forming on the lens is often the first sign that the aircraft is too high. The next thing you hear is the mission commander's voice saying, "Weather, where's the freezing level and where do these clouds end?" Fortunately, the camera has a heater to keep the lens clear of condensation. The first clue to icing is the Hunter struggling to maintain altitude and a quick scan with the camera shows cold patches forming on the leading edges of the airframe. It's then a race to warmer and or drier air before the pilot loses complete control of the airplane.

The shift is over for us after the Hunter catches the wire and comes to a stop on the runway and the debriefing has taken place.

The weather mission impacts the UAV mission even when Hunter is no longer flying. The aircraft self-deploys a parachute if it is in danger of crashing when the link is lost. This happened in a remote and mountainous section of Western Kosovo about a month into our deployment. Operators lost radio link and all control of one of the aircraft. By factoring in the upper level winds at the time of the signal loss, we were able to help units searching for the downed aircraft by predicting the direction Hunter traveled as the aircraft descended. This considerably reduced the search area and time required to find the Hunter. Soldiers from Alpha Company quickly and safely recovered the aircraft.

The Hunter's mission is never more important than when performing in a force protection role. Hunter gives commanders real time images of the situation and the ability to see what forces on the ground can see and what they can't see. The Hunter recently played a key role in helping NATO peacekeepers avoid a very tense and dangerous situation. A column of NATO peacekeepers, under an agreement with the Macedonian government, was escorting busloads of Albanian rebels being withdrawn from Aracinovo, a town very close to the capital of Skopje and the Petrovec Airport. This angered the local Macedonian population who inturn set up obstacles to block the NATO column as they were trying to get home after droping off the rebels. Roadblocks were constructed and bonfires started to block the column. Many of the protesters were armed. The column was blocked from going forward or going back the way they came. The 15th MI was directed to provide on-scene imagery intelligence and to scout out an escape route to the main road. Alpha Company, using Hunter, found a dirt road leading to the highway. The commander in contact with the column was able to direct them to the road and a potentially life-threatening situation was avoided. Hunter surveyed the route all the way to the gates of Camp Able Sentry to make sure the soldiers could return home safely. That was definitely the highlight of my deployment to date.

"We're on the leading edge for weather support to the Army's tactical UAVs here in our squadron," said Lt. Col. William George, commander, 3rd Weather Squadron. "While doctrine within Air Force Weather is currently evolving to add dedicated manpower for tactical UAV support, we've actually been doing it since 1999 when Task Force Hunter deployed to the Balkans during Operation Allied Force. It's an extremely demanding, yet satisfying role. Rarely do we get to work so closely with operators of a weapon or surveillance system and have immediate feedback on how well we aid the accomplishment of the mission."

Supporting the Hunter in Macedonia is a challenging and rewarding job for several reasons. For one, it's a real-world mission in a very unstable part of the world. What we do has a definite impact on maintaining peace and protecting forces in the Balkans. Additionally, we have constant interaction with, and feedback from, the customer, reinforcing your immediate impact on the outcome of the mission. Plus, you get to see some amazing live video directly from the Hunter and be a part of something important.

Editor's note: Tech. Sgt. Nichols wrote this article while deployed with the 15th Military Intelligence Battalion to Skopje, Macedonia, supporting Task Force Hunter.

OPUP – New Radar Environn
Re-Engineered Air Force W

By Joe Chrisman
ROC/Engineering, OPUP Development Team

There's a new Principal User Processor under development for the Air Force weather forecaster. The new WSR-88D PUP system, called the Open Systems Principal User Processor, is a cooperative effort between the Air Force Weather Agency, the National Severe Storms Laboratory, and the Next Generation Weather Radar (NEXRAD) Radar Operations Center, formerly known as the Operational Support Facility.

The basic charter has the OPUP program divided into four phases. The first phase is to develop, and field a scalable computer hardware/software suite, based on open systems technology, to replace the aging PUPs. Phase two is to include all current PUP product acquisition, display and manipulation functions. The third phase will add functionality to interface multiple radars and simultaneously support multiple forecast and warning missions. Finally, an interface will be added with indigenous display equipment and computer networks to support an integrated, multiworkstation environment. By addressing these requirements, the OPUP, when completed in FY03, will fulfill the new radar data display requirements that are a result of the re-engineered AFW support philosophy.

There was an added requirement to field a system early to provide assistance to the four large CONUS OWSs. This requirement changed the development plan to Spirals, where a level of functionality was initially provided, and then built on through additional "Spirals." Spiral I provided multiple radar connectivity with 90% of the legacy PUP capability as a stand-alone system with its own workstations. It was fielded in June and July. Spiral II will provide full PUP functionality and interface to the OPS II/NTFS in early 2003 for the OWSs. Spiral III is hardware only, and will field small OPUPs at selected CWTs.

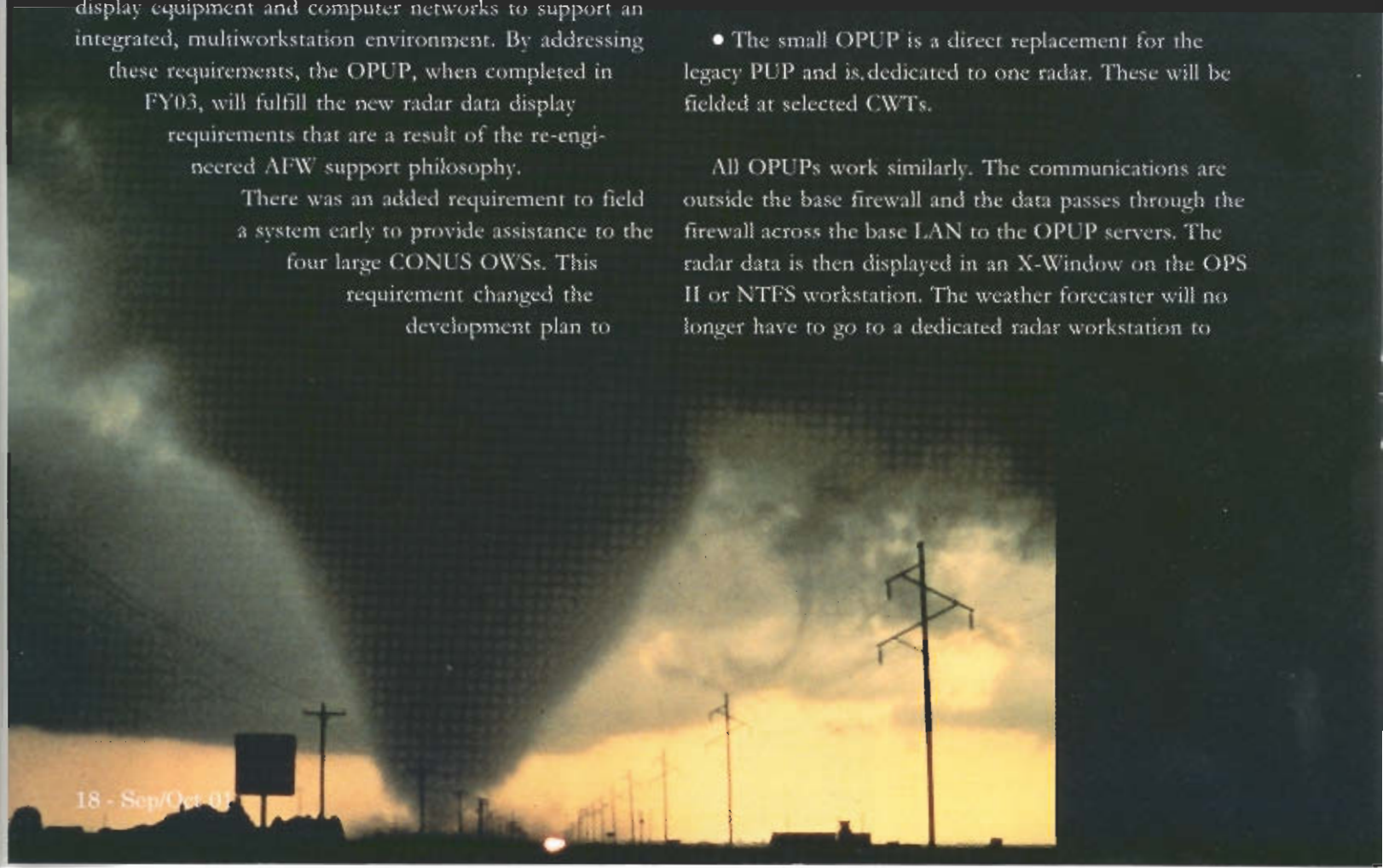
There are three primary configurations of OPUP based on the unit's mission requirements:

- The large OPUP will have dedicated connections to as many as 20 different radars. Spiral I versions are fielded at the 15th, 25th, 26th, and 28th OWS.

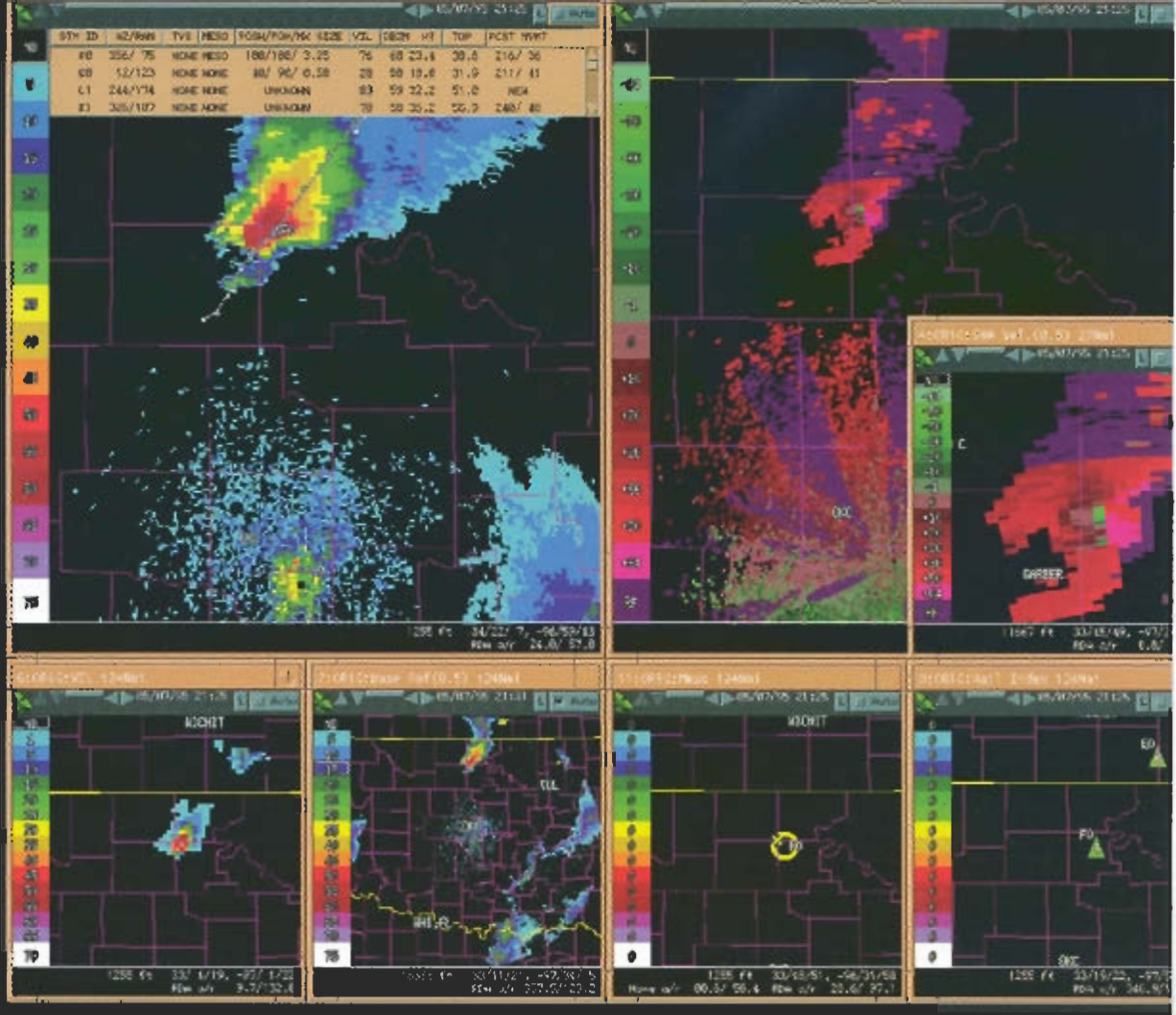
- The medium OPUP will have dedicated connections to as many as seven different radars. It will be fielded at the 11th, 17th, and 20th OWS.

- The small OPUP is a direct replacement for the legacy PUP and is dedicated to one radar. These will be fielded at selected CWTs.

All OPUPs work similarly. The communications are outside the base firewall and the data passes through the firewall across the base LAN to the OPUP servers. The radar data is then displayed in an X-Window on the OPS II or NTFS workstation. The weather forecaster will no longer have to go to a dedicated radar workstation to



hent for Weather



This is an example of one popular display configuration – two large display windows and four small windows displayed on the lower portion of the screen. This example also has a small display window as an inset on one of the larger displays. The mouse and the controls in the toolbar can be used to manipulate these windows.

manipulate radar data.

In addition to the hardware size issue, another major issue was the required functionality and the impacts of the multiradar, multiuser environment on product acquisition, display, and manipulation. Building on the tried and true reputation of the legacy PUP, the team is implementing virtually all the functionality resident in the legacy PUP. The new AFW requirements drive significant changes from legacy PUP to OPUP. For example, the OPUP will support dedicated communications to multiple radars and maintain separate Routine Product Set lists, one-time requests, and meteorological alert criteria for each radar.

Another innovation is the redesigned product display screen format (see Figure 1). The legacy PUP hardware limited the display to a maximum of four products per screen for a total of eight products available at one time. The new display technology employed by OPUP allows up to 12 independent product display windows per screen, each an "autonomous" display. Operators can resize and move each window and can specify the product type, source radar, and color pallet independent of any other window.

Additionally, each product can be manipulated without affecting any other product in any other window. However, to simplify multiple window manipulations, the operator may use the "Linked Windows" function to simultaneously perform the same display manipulation on any number of windows. While this sounds complicated, the OPUP is significantly easier to use than the legacy PUP. Changing windows is as easy as using the mouse to grab a window or drop down menu and selecting what you want. The OPUP replaces the applications terminal, systems console, and the graphics tablet with a mouse and GUIs.

The OPUP will be the new baseline WSR-88D display system for the Air Force. Therefore, the OPUP, like the current PUP, will be fully supported by the WSR-88D ROC support staff. This support includes 24-hour/day hotline assistance, appropriate documentation, hardware improvements, and periodic software upgrades providing new and improved products and functionality.

The multipleuser, real-time support provided by OPUP represents a major technological leap forward in radar data display systems. Access to multiple radars, radar-specific alert criteria and product requests, workstation-independent product manipulation and alert registration, and a user-friendly graphical user interface enable OPUP to provide unparalleled radar support to today's Air Force Weather Warriors.

Technology – driving 15th OWS's mission success

On June 21, 2001, the 15th Operational Weather Squadron, Scott AFB, Ill., achieved full operational capability. Today, the unit provides mission planning and execution forecasts to 126 flying units executing 250-300 sorties daily; installation forecasts and warnings for 11 active duty locations; garrison and exercise support to 14 National Guard weather flights; fully integrated weather services enabling Air Mobility Command's safe, effective and efficient execution of over 300 strategic missions daily; and has provided training for more than 90 3-level forecasters and new lieutenants over the last two years.

During the past 30 months, timely integration of cutting-edge technology has allowed the 15 OWS and other hubs to achieve levels of effectiveness and efficiency never imagined; however, it is important to recognize it is the people who make reengineering happen.

The OWS production floor has grown immensely since early 1999. The big question in the beginning was "where to start?" The 15 OWS decided to transition services by functional area rather than location, since focusing on one function at a time allowed the unit to concentrate resources on leveraging technology and building the most efficient processes possible. The unit decided to transfer Air Force and Army Guard and Reserve off-station aircrew services first, providing the CWTs immediate workload relief. At the time, the 11 CWTs were producing 3,000 off-station briefings and 1,200 manpower-intensive flimsies a month for 30 Air National Guard fighter and Army units. Thirty individuals at the 11 active duty sites, including the Regional Briefing Center at Minot AFB, N.D., were fulfilling these services – the 15 OWS only had 15 people for this workload.

The OWS decided to mitigate the shortfall by prototyping a web-based flight weather brief scheduling and dissemination system and developing unit-tailored web pages, an 11th OWS initiative, to deliver regional graphics and other weather information to replace the 30 flimsies. The 15 OWS received AFWA and contractor support to develop the briefing database and dissemination system, allowing customers to input their own requests and retrieve them via the web, e-mail or facsimile.

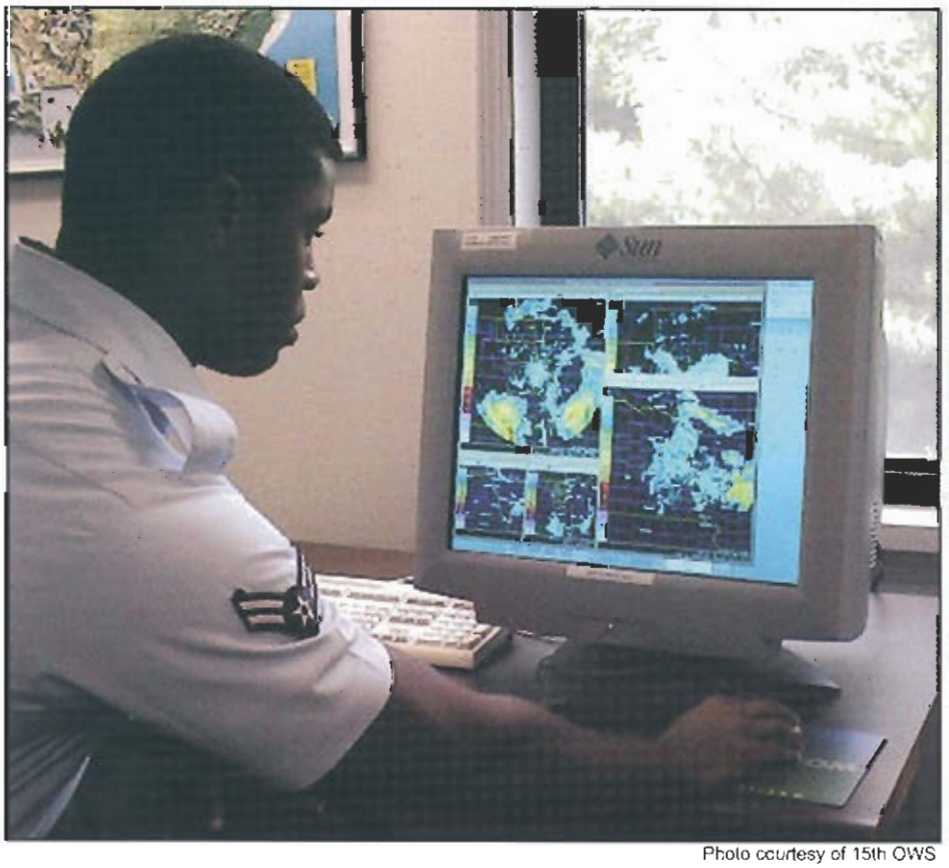


Photo courtesy of 15th OWS

Airman 1st Class Terrance Feagan, 15th OWS forecaster, evaluates severe weather using the Open System Principal User Processor. The 15th OWS started to use the new OPUP system in mid July, 2000. Read more about OPUP on Page 18.

This system has evolved into the Product Generation Scheduler System, which leveraged the best features from the AFWA MAIS software, and has become the standard briefing system under the OWS Production System II. PGSS automatically populates launch, arrival and alternate weather, and electronically faxes briefings to the customers, greatly reducing phone calls and administrative tasks.

The squadron also streamlined the flimsy development and delivery process. In place of individual flimsies, the squadron uses the Joint METOC Viewer software to create aircrew mission graphics that evolved into the Air Force standard graphics suite. To ensure a good refresh rate, products are constantly amended throughout the day and posted to the web. To augment

the graphics, a web page populated with radar and satellite data, observations and forecasts, and any other requested mission-critical data is available. This allows flying customers to access data directly and further reduces the number of incoming calls. The 15 OWS homepage recorded more than three million hits in July.

The final piece of the Guard and Reserve support was streamlining the telephone transmission of 1,500-2,000 AFWA Point Weather Warnings each month. The squadron purchased and integrated a dissemination server that allows a forecaster to record a message and disseminate warnings to multiple units simultaneously. The server integration reduced the time required to pass 20 warnings from 45 minutes to less than ten. The server is also used to update flying units when the OWS adds or deletes severe weather criteria on graphics charts, passes hurricane information and web page status, and conducts unit recalls. Today, AFWA has a dissemination server to pass warnings directly to customers. And soon, the OPS II program will deliver a dissemination server to each hub.

The 15th OWS homepage recorded more than three million hits in July.

Following the migration of all Guard and Reserve services in August 1999, the 15 OWS began developing processes and procedures for providing combat weather teams "top of the funnel" products via the web page. These products included upper air and surface analyses, model analyses, and guidance bulletins. The 15th's goal was to provide these products and post them to the web as fast as anyone in the business – government or civilian.

Additionally, starting in January 2000, the 15 OWS recognized the training challenges of the new Airmen accessions. Products were needed to kick off hub internal production processes and serve as a training aid to quickly assimulate these new airmen into operations. Linking relevant checklists and regime information streamlined the work at the combat weather teams and guided young forecasters; and is now a staple of the unit's on-the-job-training program.

The hub also assumed terminal aerodrome forecast and watch, warning and advisory responsibility in 2000. The 15 OWS has three sub-regions broken down into two positions, TAF Forecaster and Metwatch Forecaster. The sole responsibility of the TAF Forecaster is to produce installation forecasts for the active duty locations in the AOR. Forecasters also write location-specific discussion bulletins with hyperlinks to products and regime information. These bulletins significantly reduce phone time, provide a written record of forecaster thought processes and give CWT forecasters time to prepare for final collaboration. The TAF position was developed with the new 3-level forecaster in mind. By focusing on the original TAF development and collaboration processes, it minimizes chaos and allows junior forecasters to produce sound 24-hour forecasts for up to four locations per day.

Conversely, to effectively metwatch four bases in one sub-region is a difficult task at best. The 15 OWS commonly refers to the metwatch position as "Chaos Control." Not only do Metwatch Forecasters issue all the TAF amendments, watches, warnings and advisories, they also collaborate with the CWT throughout the process. The metwatch function relies on technological tools like the Open System Principal User Processor, Automated Observing System, Weather Warning and Advisory Management System, and New Tactical Forecasting System to ensure this process runs smooth as possible.

The OPUP quickly became one of the most valued systems in the hub. This system connects a normal desktop PC with more than 20 radar sites simultaneously, providing all the same products available on the legacy NEXRAD system.

The AOS provides direct sensor readout for CWT locations and allows metwatch forecasters immediate access to critical data needed to amend TAFs or issue warnings/advisories. AOS data flow allows some CWTs to close when the airfield tower is closed, helping to ease manning shortfalls.

Shaw's WWAMS, on which forecasters and production floor managers also rely, is a critical management system that tracks weather watches, warnings, and advisories issued for the installations. The software automatically provides verification, computes lead times, and computes performance statistics for a wide variety of applications. This allows forecasters to spend more time focusing on the weather and less time completing paperwork and computing statistics.

NTFS is the main TAF and warning dissemination interface with the field and provides product generation capability. To streamline TAF verification for the 11 sites, the 15 OWS also developed a semi-automated TAF verification program to bridge the gap until an AFW-wide program is delivered through OPS II.

While all this work was getting accomplished in the Northeast CONUS portion of the OWS, processes in the Global Mobility Weather Flight, located in Air Mobility Command's Tanker Airlift Control Center at Scott AFB, were relatively mature and did not need significant

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Operation Northern Watch, Incirlik AB Turkey:

WEATHER FOR WARFIGHTERS

By 1st Lt. Lee Price
39th OSS/OSW, Incirlik AB, Turkey

As the sun begins to set directly behind the largest mosque in the Middle East, the Combined Forces Air Component Commander approaches the forecast counter. The CFACC has been apprised of the weather situation throughout the day, and has come for one last briefing before retiring for the evening. His decision, based on the most current weather information, will determine whether to execute tomorrow's mission, or instead, save hundreds of thousands of dollars in fuel and hundreds of maintenance man-hours for another day. Your British counterpart and you are prepared to answer the CFACC's question, "What's the latest on the weather outlook for the mission tomorrow?" That mission is Operation NORTHERN WATCH, ONW, and the forecasters at Incirlik Air Base, Turkey are an integral part of its execution.

Like the Operation itself, the forecasting team at Incirlik is a multinational force consisting of American and British forecasters. The U.S. Air Force personnel are either permanently assigned to the base as members of the 39th Operations Support Squadron weather flight or augment the flight as part of an Air Expeditionary Force rotation. The British forecaster hails from the United Kingdom's Mobile Meteorological Unit and is affectionately know to all as the "METMAN."

Providing the warfighter the weather support needed to carry out the ONW mission is a daunting task...fast and furious, but also rewarding. The mission takes place over two nations, and the Combat Weather Team's vast AOR involves roughly 50,000 square miles of varied terrain, from the Mediterranean coastline to 13,000-foot mountains to the Tigris River Valley. The CWT utilizes critical tools such as Small Tactical Terminal and NATO Meteorological Information System, and tailors top-notch products from the USAFE OWS at Sembach AB, Germany, the 28th OWS at Shaw AFB, S.C., and AFWA at Offutt AFB, Neb., to provide the warfighter the information they need to enforce the no-fly zone over northern Iraq.

With more than 10 different airframes from the U. S. Air Force, Army, Navy, Marines, and the United Kingdom's Royal Air Force; and various weapons and communication systems involved in the day to day flying mission, it is essential that forecasters not only be able to provide accurate weather information, but that they also tailor their support a specific unit's particular piece of the overall ONW mission. Here are just a few examples:

- A thin deck of high cirrus will more distinctly outline fighter aircraft to Iraqi gunners on the ground
- Mid-level clouds in the ROZ hamper refueling operations
- Low-level clouds in the AOR impact the quality of reconnaissance runs
- Dense mountain and valley fog prevents search and rescue helicopters from getting to forward operating areas
- Haze layer depth and sun angle affect the optimum attack angle for precision guided munitions

Forecasters must take all aspects of the weather into account when putting together the Mission Execution Forecast for ONW. Additionally, coordination between the METMAN and Air Force forecasters is critical to mission success. The importance of horizontal consistency is highlighted when supporting a combat mission with multiple facets, where lives are on the line every day.

Familiarization flights aboard British VC-10s for the flight forecasters are training devices used to impress the importance of weather support to ONW success. Nearly all members of the flight have seen, firsthand, the operational challenges presented by poor slant range visibility, thick haze layer depth, and the valley fog of southeastern Turkey's rugged and varied terrain. Up until then, the team had only heard about these conditions during debriefings. They also get to view, up close and personal, the refueling operations of a live mission flying within five miles of the Iraqi border.

Working with the British METMAN presents the flight a unique opportunity to work hand in hand with forecasters with decades of experience. Indeed, many of the British forecasters are twice the age of some of the Air Force forecasters. Most of the British forecasters have

Photo courtesy of 39th OSS/OWS

Flight Lieutenant Bruce Sherratt, United Kingdom Mobile Meteorological Unit, reviews the ONW mission execution briefing with Staff Sgts. Greg Strong and Jodi Janssen, 39th OSS/OSW Weather Flight.

done multiple one- to two-month tours at Incirlik over the past 10 years, including tours during Operation DESERT SHIELD and DESERT STORM. Additionally, each British forecaster deploys several times each year, around the world. This experience, background, and maturity that the British METMAN brings to the combined weather team provides Air Force forecasters with a unique opportunity to learn and grow.

In July of 2001, the Incirlik CWT and the Royal Air Force Mobile Meteorological Unit celebrated 10 years of combined support to various missions over northern Iraq. The opportunity to support an engaging and rewarding mission and the to learn from the meteorological expertise and military professionalism of a RAF weather officer translates into Incirlik being a premier assignment for any USAF forecaster.

The dedication to mission and service of the 39 OSS/OSW has not gone unnoticed by the rest of Incirlik Air Base. Over the past six months, the team achieved a rare feat for any unit when an Incirlik CWT forecaster was named the 39th Wing NCO of the Quarter in back-to-back quarters. SSgt Greg Strong was the 39th Wing NCO of the Quarter for the 4th quarter, 2000 and SSgt Jodi Janssen was awarded the 39th Wing NCO of the Quarter for the 1st quarter, 2001.

Forecasters and observers also have an interface with the *istidlalri,* or Turkish forecasters, who work at the base supporting the Turkish Air Force. Although more limited in scope, the relationship is good for exchanging observations, sharing weather maps, or just for learning colorful Turkish idioms. Unquestionably, forecasting for the tip of the sword at Incirlik is a tremendous experience with lifelong memories.

The return of the AWACS marks the end of another safe and successful mission. We pause to give thanks for the return of the aircrews we support day after day, but this pause is short-lived... planning for tomorrow's mission has already begun.

Staff Sgt. Greg Strong, 39th OSS/OSW Weather Flight, performs preventative maintenance on the NAMIS satellite dish.

Photo courtesy of 39th OSS/OWS

A look at the past...

OBSERVING, FORECASTING AND LIVING IN A REMOTE COLD-WAR DESERT

Martin Hershkowitz, a former AWS observer, recalls his days in the weather detachment at Ben Guerir AB, French Morocco, in 1955

By Martin Hershkowitz
Former Air Weather Service observer

IN THE BEGINNING.....

It was July 1955 and my wife and I were celebrating our 1st anniversary while on 30 days of leave. I was an Airman 2nd Class shift observer at Kirtland AFB, N.M. expecting notification that I should prepare to report to Chanute AFB, Ill., to begin the Weather Instructor's course that my Detachment commander had slyly arranged for me by losing a golf game to the AWS Personnel Director. That's when I received a telegram ordering us to report back yesterday.

I reported in to the Detachment three days later and was told: one, I was selected for a special assignment, unknown to my commander; two, report to the Headquarters building, to a room in the basement, by 1330; and, three, tell no one, not even my wife. This was the start of a whirlwind chain of events that started with a secret assignment to a NATO weather-training unit in Turkey, detoured through Wheelus Field, Tripoli, and eventually landed me in the North-African desert, working at the weather detachment at Ben Guerir Air Base, French Morocco.

My 12-month assignment to Ben Guerir started at Nouasseur AB, just outside of Casablanca, Morocco. I found a carryall loaded with mail going to the Ben Guerir AB. Halfway there I found out why it was only a 12-month assignment. Coming down over a hill there was a French Foreign Legion mechanized unit dug in on one side of the road and on the other, a mass of Berber tribesmen on horses, donkeys and dromedary camels, sporting swords and huge 6-foot long, .65 cal. muzzle loading rifles. Some of the camels even had saddle-mounted mortars. As we drove through a tree-thickened grove near the base, we heard small arms and cannon fire in the near distance.

I arrived at the Detachment just in time to meet Maj. Pitt, the commander. He showed me my desk in his office and introduced me to the duty staff. Then he had the detachment clerk drive me to my "hutch," a tent with wooden half-walls and floor, which I shared with the clerk. Officers eventually got to move into brick 2-man room barracks.

The next morning the commander called for a detachment formation and introduced me to all. He was the Chief Forecaster, a first lieutenant was the Deputy CO and forecaster, there were two technical sergeant enlisted forecasters and nine enlisted observers, including the clerk, who was also the records checker, all of whom were airmen third class recently out of Observer's school. Later, we obtained a second lieutenant forecaster and a real clerk, but lost an observer. They were told that I was both Chief Observer and the equivalent of a First Sergeant; the two techs were considered to be Warrant Officers for my purposes. Of the observers, two were prior service, one from the Infantry and one from the Navy; the others were all 18-year-olds.

Next, he took me to the Strategic Air Command Base Headquarters and introduced me to the Command Sergeant Major. I was told to attend all first shirt calls, but to enter the NCO Club, where the meetings were held, through the backdoor. I was then told to prepare a duty roster for guard duty and KP, but the Major reminded him that his Material Air Transport Command detached personnel do not pull such duty, and that was the end of that.

THE WEATHER STATION REAL WORLD.....

The Facility

Ben Guerir AB was originally a German fighter base used against the Americans landing in French Morrocco in 1942. By the 1940-1950s it was a French Foreign Legion fighter/bomber air base and

was eventually brought into SAC's Operation Leap Frog, where B-47 bomber and KC-97 refueler groups popped in for a 90-day visit. Between visits there were about 300 American cadre stationed there; however, when the bombers arrived we were filled to overflowing with about 5,000 Americans, which overwhelmed in the consolidated mess and the clubs. The runways were lengthened to about two miles long, the second longest runway in the world at that time, and widened to accommodate two B-47s landing at one time (but no one ever tried that little trick). At the peak of summer, runway temperatures were recorded at more than 130 degrees Fahrenheit, in the shade.

Officers and enlisted men lived in the "hutches" and families, who were moved from Marrakech to the base for safety, lived in trailers. The hutches had an oil-burning, pot-belly stove on a bed of rocks for the winter, but it wasn't enough; we slept in "long-johns," two sets of fatigues, the dress blue "Great-Coat" and at least two blankets. In summer we tried to remove our skin, but settled for sleeping in our under garments.

The food was really bad, as only a consolidated mess in the middle of a desert can be. "Mid-Night Chow" was the only good meal of the day so special passes had to be obtained to eat them. I excelled in getting passes, so that all duty personnel could eat twice most days and the Fire Detachment, right near our detachment station, often fed us really good chow for lunch and dinner. In-Flight Rations, IFR-6, (ugh!) was another source of almost edible food that successfully competed with the consolidated mess. Later, I was able to set up an exchange program with a British Engineer battalion operating in the Atlas Mountains, approximately 50 miles south of the base. Their World War II C-Rations had some edible items, and they loved our desserts.

State-of-the-Art Observing Technology

Observing was state of the art for the time. We had our eyeballs; wet and dry bulb thermometers; the Atlas Mountains and one Berber village for a visibility checkpoint; mercury and hygroscopic Barometers; weather balloons with a broken-axis theodolite; and a ceiling light with a hand-held decliner for angle measurement.

Ceiling balloons were available, but tedious to set up, particularly when the curious 12-foot, 6-inch thick snakes came by to check us out. Fortunately, we shared hutch space with the Air Police Squadron and they would come out at night with their shotguns to give us some peace of mind.

Observing was a special treat. Seeking new visibility checkpoints became a staff passion, particularly because of the sandstorms and the fog. The Siroccos, or local sandstorms, obscured visibility in any direction, including up and down and essentially closed the runway; however, if a pilot could see that it was relatively self-contained and moving rapidly, he could simply circle until he could see the surface and we could open the runway. One problem during the Sirocco was we couldn't communicate directly with the aircraft and had to do a 3-way with Base Operations.

Another weather phenomenon that endeared itself to the observers was the locust plagues. Right out of the Bible, these creatures would cover the earth, all of it. Locusts covered and were fried to the ceiling lights, they got into the rain gauges, they blocked visibility to near zero, they prevented the jeeps from starting and running, they choked anyone that tried to breath, they covered the hutches so that we sweltered inside, and worst of all, the only forecasters and observers who got to go to the showers or bathroom were those in the detachment station when they arrived. Afterward, the observer deep on the proverbial list got to scrape them off the ceiling light and clean them out of the temperature shack. For protection against being stranded in the hutches during the Siroccos and locust plagues, we hung 5-gallon cans from the center pole in each hutch, one containing water and the other orange juice.

Thick ground fog created another runway hazard. One time late in my tour, when a flight of B-47s were incoming and low on

fuel, GCA could bring them in almost to the threshold, but they couldn't see the runway and were afraid that they would either land short in the sand or too long to stop before running out of real estate. They couldn't be rerouted to Nouasseur AB because of fuel and all of Operations was in a frenzy. Finally, a joint solution was hammered out by the troops and six jeeps were sent out: two to the end of the runway, one on each side; two more were sent 50 feet short of the runway; and the last two were sent out 100 feet short. The first two sent up red weather balloons, the second two sent up white weather balloons and the third sent up black weather balloons. Each balloon had a wet cell battery light attached. When they were about 150 feet up the Tower told us through walky-talkies that they could see the balloons and relayed their height and location relative to the runway threshold to the aircraft. The aircraft landed safely, but there were near accidents as they tried to taxi off the runway. Since no one else was expected, Tower simply told then to shutdown their engines and wait for the fog to dissipate. Obviously no one could come out to get the crews for fear of hitting the aircraft.

State of the Art Forecasting

Forecasting was a special treat. Try forecasting when there is little or no observation data other than from your own station. Col. Pitt remembers that they would view Ben Guerir as if it was in Arizona and do a climatological best guess. He was famous for predicting a Sirocco based on a single weather report, when we could get it, from the Northwest Sahara. No one was sure if it was real or not, but his Sirocco forecasts were usually right.

In general, all duty personnel took a great deal of pride in good forecasts and ignored the busted ones. Shift observers would work hard at learning how to analyze charts and shift forecasters would grumble about learning how to take observations. However, since this was a pet activity of the Major's, I began to records check their observations to rub it in.

State-of-the-Art Weather Communication

Communication was also state of the art at that time. We had data lines using microwave towers that went down every time the wind blew sand aloft; a cocoa-channel voice network that likewise disliked sand; and teletypewriters for receiving and transmitting data and official correspondence. As the Berber tribesmen became restless, they assumed that the telephone and other communications lines leading to the base were for the Legionnaires' use and would cut them down every morning. Col. Pitt can remember driving in from Marrakech in the morning and betting on how many telephone poles would be cut down that day. As a result, forecasts were often made stating, "No weather data was available."

Other official communications were likewise not readily available and we would have to wait for a squadron traveler to pass through with any news. Often, information on orders, promotions and travel authorizations would arrive this way and then they would be cut locally on an off-line teletypewriter to be replaced later when official hard copy arrived in the mail. If the news was good, the visitor would be given an inner spring mattress in one of the detachment's hutches for the visit; if it was bad, the visitor got straw-filled ticking in SAC's transit hutches.

HOME AT LAST.....

My replacement was on board and my orders to report to McGuire AFB, N.J., finally arrived in my fiftieth week. The new Commander decided that I was a short fuse, short-timer and deserved some R&R before my flight home. Accordingly, while he had my belongings packed, he retrieved my key to the ammunition locker under my cot; my M1A2 Carbine, replete with a loaded 50-round banana clip, thanks to the British Engineer Battalion armorer; my Colt 1911 automatic; and my 24-inch World War I bayonet. Then, he sent me to Casablanca to play golf on the Sultan's prize course in the 105-degree temperature. I have never played golf since. Despite the adverse conditions during my time in North Africa, I lived through it, landed at McGuire AFB, N.J., kissed the ground, and immediately called my wife.

Editor's note: Martin Hershkowitz served four years on active duty before moving to the Maryland State Guard from which he retired as a Colonel. He has worked for many state and federal agencies and holds advanced degrees in mathematics, physics and physical sciences. Currently, Hershkowitz is the Executive Consultant for Hershkowitz Associates, Germantown, Md.

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products, sites must complete subscription with the Weather Subscription Service. Users at each site will log into the WSS Subscription Page and use this service to identify their own product requirements. The WSS is an HTML/Web based product listing, accessible primarily via shared communications networks, Non-secure Internet Protocol Router Network – NIPRNET, or over the Internet. WSS subscriptions will determine which products are broadcast to which sites. This subscription process should be completed for the site 15-30 days before becoming fully VSAT operational.

For more information on the WSS process, go to the AFWA/DNT web site and select "DNT-Training Division," then "Products," then "Weather Systems Information," and then "WSS." The Ops Digest article on this site may help users set up WSS accounts and provides other useful information. Also, the PowerPoint presentation at this site is a good training tool on how to use WSS, to include subscribing to products, ARQing, etc.

This capability, as with any communications path, is subject to outages. Should failure of any VSAT system hardware or software occur at an operational CWT or OWS, and it cannot be resolved by a local site administrator, the users can contact the AFWA Help Desk. If the Help Desk cannot resolve the issue, they will notify the appropriate contractor to effect repairs in a timely manner, as outlined in the contractor logistics support contract. The exception to this is in Europe, where the first contact point is the Help Desk at the USAFE OWS at Sembach AB, Germany. If the USAFE OWS Help Desk cannot resolve the problem, they will in turn call the AFWA Help Desk.

The AFW VSAT system is a very broadband weather product delivery system. It is capable of delivering up to 90 times more data per day to operational sites than the legacy circuits. SCOMP will result in operational success, and will fundamentally change the way we do business. Y

15 OWS, continued from Page 21

reengineering, until last summer. The Mobility 2000 program was introduced as a prototype by AMC, which will change the way AMC does business, allowing the command to operate more like the civilian airlines with a centralized dispatch function.

The goal is to have the dispatch function position, called the Flight Manager, become a virtual crewmember on the ground, doing all the planning and providing all the paperwork an aircrew needs to accomplish the mission. This will give crewmembers more time to accomplish necessary tasks vital to the mission itself. The FM ensures that everything essential to the mission's success is complete prior to takeoff, including weather, NOTAMs, and diplomatic clearances.

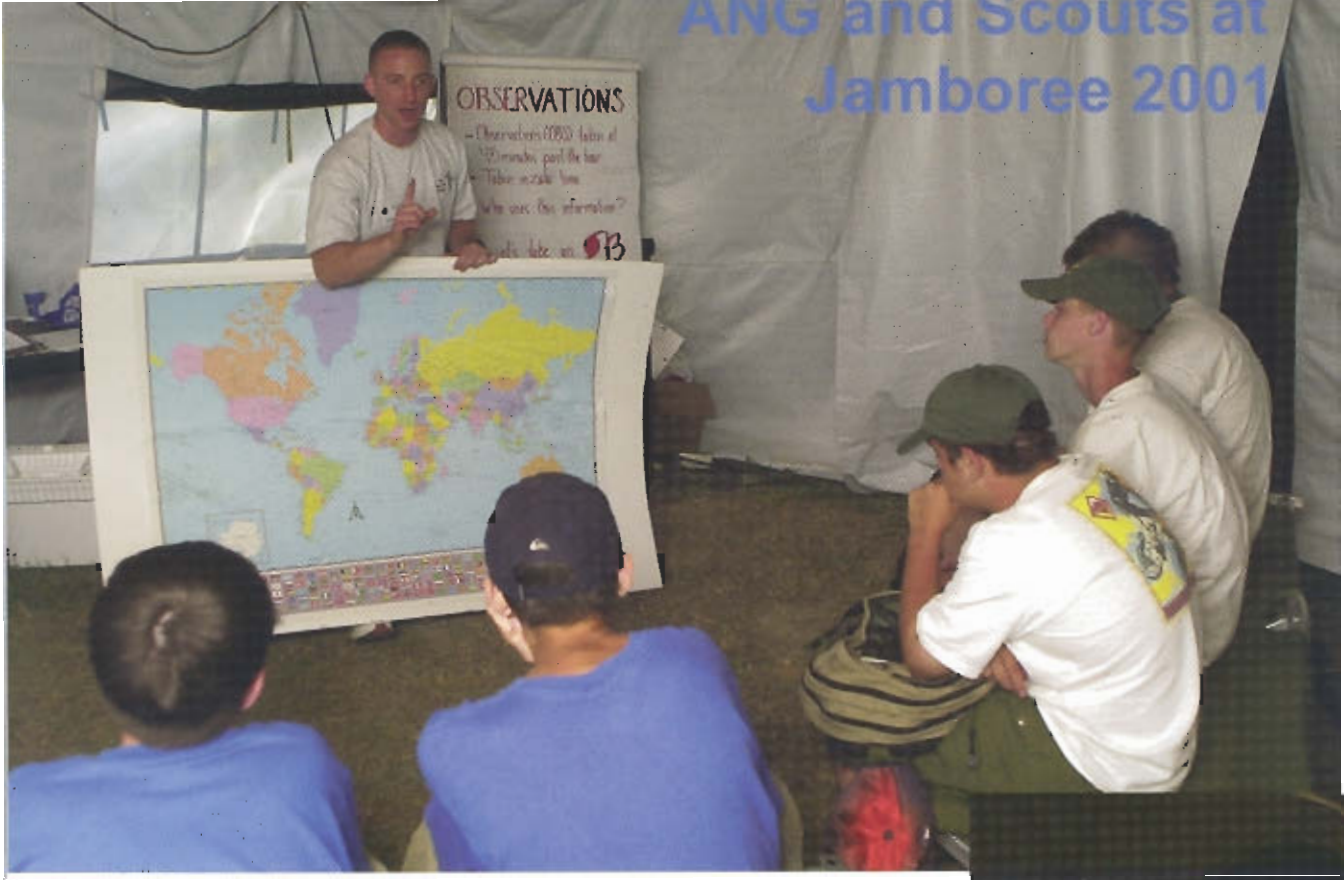
Each FM will also have a weather forecaster overseeing the missions from the planning phase through mission completion. If potential problems are anticipated for takeoff, landing, or along the scheduled flight path, the forecaster aids the FM in mitigating mission risk by providing options and solutions. Based on input from 15 OWS forecasters, mission profiles/routes have actually been altered to ensure mission success, while saving money and airlift resources.

With up to 300 scheduled missions projected every day and limited manning, 15 OWS is developing a more efficient method for assembling mission weather packages. Once again, technology to the rescue! Engineers are currently developing software designed to streamline the weather package assembly process and produce a DD Form 175-1 replacement. Each package will include a set of mission-specific hazards products created on OPS II. These charts will be tailored to the specific airframe, time of flight, flight level, etc. The 15 OWS and FMs are also leveraging data feed from AFWA that directly populates the FM's mission tracking system and color-codes threshold with observations and forecasts. This provides weather-impact situational awareness to everyone involved in planning and executing the mission, allowing for the development of alternate plans.

In summary, technology has allowed the hubs to accomplish remarkable feats in little time. By the time this article is published, the 15 OWS will have disseminated more than 50,000 flight weather briefings, published nearly 30,000 aircrew graphics charts, passed 30,000 Point Weather Warnings and issued 2,000 watches, warnings and advisories in concert with the CWTs. The TACC weather flight will have provided more than 36,000 decision-assistance products supporting 35,000 missions to 147 countries around the world. Finally, one of the most rewarding accomplishments is turning 90 recent Initial Skills Course graduates and lieutenants into exceptional weather technicians and young meteorologists. All of this could not have been accomplished without the right mix of people, process, and technology. Not bad for our first 30 months! Y

Editor's note: This article was written as a joint effort within the 15th OWS.

ANG and Scouts at Jamboree 2001



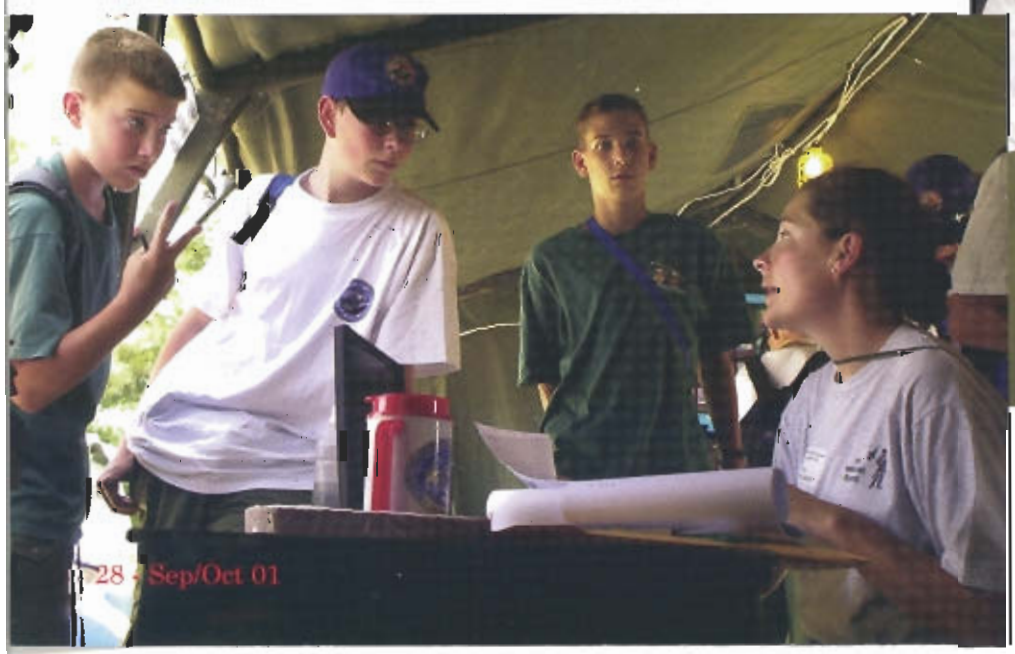
Left, Staff Sgt. Rodney Webber, a weather forecaster from the Pennsylvania Air National Guard's 146th WF, instructs a classroom of Boy Scouts on the fundamentals of meteorology at Fort A.P. Hill, Va., July 25, 2001. The scouts took part in the Boy Scout National Jamboree at A.P. Hill. During the Jamboree, more than 39,000 scouts earned merit badges in a variety of skills.

The Air National Guard arrived at the 2001 National Scout Jamboree at Fort A.P. Hill, Va., ready for anything, and that's just what they got. More than 40,000 scouts roamed the jamboree every day, and 24 ANG weather and 18 support members educated the scouts about weather.

According to Master Sgt. Steve Gamache, 200th WF, Sandston, Va., the Guard spent 17 days at the Jamboree with $3.2 million of weather equipment and helped more than 600 scouts earn their weather merit badge.

"This was a team effort," said Gamache. "We could not have pulled this off without the hard work of all our guard members and the technical support of the 28 OWS at Shaw, S.C."

Right, Chief Master Sgt. Bob Thomas, a weather forecaster with the Maryland Air National Guard's 104th WF, demonstrates to Boy Scouts Andy Bartush and Chris Colgin, both 13, how he determines weather conditions around the country during the Jamboree, July 24, 2001.



U.S. Air Force photos by Tech. Sgt. Ken Wright

Staff Sgt. Chrissie Engh, a weather forecaster with the VANG's 200th WF, registers Boy Scouts for classes given by her unit during the Jamboree.

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comparing the brightness temperature of the cloud feature with the NOGAPS temperature field," said Johnson. The Space Missions Branch is responsible for managing and executing software and data flow for the feature-track winds product.

The success of the project stemmed, in part, from the research conducted by the Cooperative Institute for Meteorological Satellite Studies at the University of Wisconsin. According to Conner, CIMSS has been experimenting with tracking winds using satellite data, however the information was not produced often enough for operational use.

The Naval Research Lab in Monterey funded the research done by CIMSS and AFWA provided the needed satellite data.

"This is a great success story featuring the cooperation between the Navy, Air Force and CIMSS," said Skupniewicz.

The weather information for the current product is gathered from three of five possible geostationary satellites every 6 hours. Eventually, AFWA will produce the feature-track winds product globally by using all five satellites. "When fully operational, AFWA will be the only government agency producing the feature-tracking winds product worldwide and using the product operationally," said Conner.

IMA Opening

The Air Force Reserve Command has an immediate vacancy for an IMA at the Air Force Weather Agency, Offutt AFB, Neb.

DUTY TITLE: Staff Scientist, Meteorological Models
GRADE: Capt./Maj./Lt. Col.
POSITION: 00005225
AFSC: V15W3A
JOB DESCRIPTION: Leads weather and programming personnel in the development of new Air Force Weather (AFW) capabilities on the cutting edge of the science of meteorology. Primary efforts focus in the area of numerical weather prediction (NWP), with an emphasis in synoptic meteorology, mesoscale meteorology, satellite meteorology, or coupled modeling. Member will be required to solve highly technical and complex tasks associated with this position. A detailed knowledge of both meteorology and computer science is necessary.
QUALIFICATIONS: Advanced academic degree required. MS is mandatory; Ph.D. is desired. Base weather station or Weather Flight and/or Operational Weather Squadron with operational forecasting experience highly desired. A strong computer background with experience in UNIX, scripting, FORTRAN, C, Java, HTML, C++, Vis5D, and/or GrADS software is highly desired. Previous work in data assimilation, satellite meteorology or oceanography would be very valuable (but not required).

For more information, call Tech. Sgt. Rachel Cox at DSN 272-8209, CMCL (402) 294-7465, or check the AFRC website at http://arpc.afrc .af.mil:8080/assignments/index.htm

Questions from the field? Answers from the Staff!

The Director of Air Force Weather, Brig. Gen. David Johnson, and his staff are working to dispel rumors and educate the career field on "hot issues" in weather. Questions may be submitted to the Air Staff via e-mail at afxow@pentagon.af.mil

Q. Comm in the field is still bad. When are you guys going to fix that?

A. We have a strategy, which leverages all capabilities. We are aware of T-VSAT reception problems in PACAF, CENTCOM and some parts of CONUS. The Combat Weather Center is examining a new collapsible dish, which increases the folded-out size from 1 to 1.2 meters. Increased output signal strength is also being addressed. We are going do deploy our folks to various parts of the world to make sure that the changes work. Once we accomplish that, we will buy another 100-plus T-VSATs to complete the hardware fielding. Finally, we will ensure that all OWS products are available via T-VSAT. All this should be in place this year.

Since T-VSAT doesn't blanket the world, our next options are to leverage INMARSAT and commercial capabilities. Our plan is to establish four WSSC locations (3 already exist), 2 in CONUS, 1 in USAFE and 1 in PACAF. These WSSC locations would have INMARSAT Ms for checkout. Before deploying, a unit would coordinate with its supporting OWS for a WX.ZIP package. This package would contain the JOAF/A/N data and graphics. The deployed team calls in once every several hours to download the latest package using the INMARSAT 64kbs transfer. This capability is good for short duration or very small deployments. Customers should bring in SIRPNET for larger and long-term operations. If this doesn't work, we are also looking at the ICAO Satellite Display Information System as a worldwide source of wx information.

Q. The OWSs just aren't responsive. Why won't they help me?

A. This is a two-edged sword, so let me answer it carefully. An OWS should take on current tasks as outlined in AFIs and AFMANs. If your unit is suddenly tasked with a new critical requirement, the OWS should rise to the challenge and support your need. On the other hand, if you have always wanted to provide a certain level of support but never could, many units are finding it easy to simply task the OWS with lots of new requirements. Just like you, OWSs are manpower constrained for the time being. As the complete OWS support package comes on line, we can start plugging the holes in our requirements. If you really have a need, contact your OWS. If you really feel that you aren't being supported contact your MAJCOM first, or call the Reengineering Support line, at (703) 696-4745.

Q. These OWSs just don't know what they are doing. Why can't I just keep doing business as always?

A. First, we are reengineering, so you must change. You may have the resources today to keep the old process going, but as we implement the new manpower numbers, you won't be able to continue business as usual. Second, as your experienced forecasters PCS out, the OWS will gain the upper hand and you will find their products are as good and better than the ones you did locally.

Q. How come I keep having all these communication problems with AMIS? I'm not a comm person, and I can't fix it!

A. AMIS, like many Air Force systems, uses the common-user NIPRNET communications pathway to pass data. All bases have installed "firewalls" in their communications systems to prevent hacker attacks and other unauthorized access. In order for comm to work between you and the OWS, the firewall at your base and the firewall at the OWS base must be configured correctly so they pass data between them.

If comm squadrons change their settings, the two bases are no longer configured correctly. The Air Force has recognized this problem and is working it. AF/SC has proposed the establishment of an Air Force-wide Intranet, which would eliminate many base firewalls, thus easing the communications flow. In addition, AFW is working with AFPC to add additional communications personnel to our OWSs. In the short term, however, we still need to work with our local comm folks to make sure the lines stay open.

Senior Master Sgt. Paul Rano
15th OWS, Scott AFB, Ill.
Superintendent, Weather Operations
Years in Service: 21
Hometown: Worcester, MA
Family Status: Married with three daughters
Role model / why? My Mother. She always thought of others before herself.
Reason joined the Air Force: To be a security policeman. Then, I could get out and challenge the state of Massachusetts state law excluding people under 5'6" from becoming a state trooper.
Personal Motto: This is the day that the Lord has made, let us rejoice and be glad in it.
Most memorable AFW experience: I'd have to say it was a microburst event at McGuire AFB, N.J., in June, 1996. Our ROS was destroyed. Our observer at the time was running down the stairs as the second story walls caved in. Quite a brave airman, she started taking observations from inside the weather station within minutes.

WEATHER WARRIORS

Capt. Tony Krogh
88th WS, Wright-Patterson AFB, Ohio
Aeronautical Systems Meteorologist
Years in service: 18
Hometown: Seattle, Wash.
Role model / why? Jesus Christ, He always put his whole heart in everything he did, never accepting second best, and always showed humility and caring for the other person.
Reason joined the air force: To continue my college education.
Most memorable AFW experience: I was the Det. 1 commander stationed at Camp Red Cloud, Korea. During my second month of command, the notorious korean monsoonal boundary, known as "Changma boundary," decided to park over the country. We proceeded to get 34" of rain in just 4 days. The 2nd Infantry Division, who we supported, had 7 camps or installations partly under water and a real mess on their hands. The commanding general, an army two-star, was not happy with the situation, or with me. On top of all of this, we had typhoon Olga closing in on us from the south, toward the end of the event. My forecasters were the first to pick up on the fact that when Olga made landfall, it began to fall apart rapidly. Trusting my forecasters' experienced judgment, I briefed the general that they could begin recovery operations in about 2 hours, not 4-6 as the current warnings showed. The rain and wind stopped within 30 minutes of the time forecast by my folks! Recovery operations were carried out and my folks made AFW shine yet again! They were the most outstanding group of forecasters I have ever had the pleasure to work with.

Capt. Tony Krogh, right, and Capt. Glenn Keer confering over weather charts for a Global Hawk mission.

SALUTES

The weather community lost two Brothers in Arms during the Sep. 11 attack on the Pentagon. **AG1 Edward Thomas Earhart**, 26, Salt Lick, Ky. and **AG2 Matthew Michael Flocco**, 21, Newark, Del., both worked in the Navy Command Center in the Pentagon and were killed during the attack.

Retirements

Master Sgt. Steve Grimes, 18th WS, Ft. Bragg, N.C.
Master Sgt. Richard Nieman, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Charlene Przybysz, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Derek Hester, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Wayne Lacosse, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Russel Louk, HQ AFWA. Offutt AFB, Neb.
Tech. Sgt. Linda Strange, HQ AFWA, Offutt AFB, Neb.
Robert Madison, 18th WS, Ft. Bragg, N.C.

Awards and Decorations

MERITORIOUS SERVICE MEDAL

Col. Lawrence Key, HQ AFWA, Offutt AFB, Neb.
Lt. Col. Ray Clark, HQ AFWA, Offutt AFB, Neb.
Lt. Col. Gregory Engel, HQ AFWA, Offutt AFB, Neb.
Maj. Frank Halbert, AFCWC, Hurlburt Field, Fla.
Maj. Sylvia Taylor, HQ AFWA, Offutt AFB, Neb.
Capt. David McDaniel, AFCCC, Ashville, N.C.
Capt. David Runge, 7th WS, Heidelberg, Germany
Chief Master Sgt. Dale Roth, Jr., HQ AFWA, Offutt AFB, Neb.
Senior Master Sgt. Bruce Perkins, 7th WS, Heidelberg, Germany
Senior Master Sgt. Rodney Rabenneck, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Antonio Chisholm, HQ AFWA, Offutt AFB, Neb.
Master Sgt. William Dennis, 7th WS, Heidelberg, Germany
Master Sgt. Danny Leaphart, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Richard Nieman, HQ AFWA, Offutt AFB, Neb.
Master Sgt. James Pickard, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Charlene Przbysz, HQ AFWA, Offutt AFB, Neb.
Master Sgt. Diana Ruhlig, HQ AFWA, Offutt AFB, Neb.
Master Sgt. William Wheaton, Det. 1, 607th WS, Camp Red Cloud, Korea
Tech Sgt. W.G. Ingle, HQ AFWA, Offutt AFB, Neb.

AIR RESERVE FORCES MERITORIOUS SERVICE MEDAL

Master Sgt. Phillip Richard, 140th WF, Willow Grove ARS, Pa.
Tech. Sgt. Jerome Oliver, 140th WF, Willow Grove ARS, Pa.
Staff Sgt. Fitzgerld Mark, 140th WF, Willow Grove ARS, Pa.
Senior Airman Carl Davis, 140th WF, Willow Grove ARS, Pa.

AIR FORCE COMMENDATION MEDAL

Capt. Mark Fitzgerald, HQ AFWA, Offutt AFB, Neb.
1st Lt. Duane Nordeen, HQ AFWA, Offutt AFB, Neb.
1st Lt. John Kurian, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Michael Buchanan, AFCCC, AFWA, Ashville, N.C.
Tech. Sgt. Robert Caron, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Victor Carson, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. William Courtney, 55th SWSX, AFWA, Schriever AFB, Colo.
Tech. Sgt. Scott Daves, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. James George, HQ AFWA, Offutt AFB, Neb.

Tech. Sgt. Randall Gilless, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. Derek Hester, HQ AFWA, Offutt AFB, Neb.
Tech. Sgt. James Kerzwick, AFCCC, AFWA, Ashville, N.C.
Tech. Sgt. Richard Jacobsen, Det. 4, SWXS, AFWA, Holloman AFB, N.M.
Tech Sgt. Linda Strange, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Scott Darling, Det. 3, 7th WS, Illesheim, Germany
Staff Sgt. Kristian Eberhardt, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Scott Losenicky, Det. 1, 607th WS, Camp Red Cloud, Korea
Staff Sgt. Robert Miller, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Terry Prime, Det. 1, 607th WS, Camp Red Cloud, Korea
Staff Sgt. Cathleen Rayshich, 140th WF, Willow Grove ARS, Pa.
Staff Sgt. Jon Schiefelbein, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Robert Williams, Det. 1, 55 SWXS, AFWA, Learmonth, Australia
Senior Airman John Henfey, HQ AFWA, Offutt AFB, Neb.
Senior Airman Michele Hild, HQ AFWA, Offutt AFB, Neb.
Senior Airman Darrel Sydlo, HQ AFWA, Offutt AFB, Neb.
Senior Airman Michael Puskar, HQ AFWA, Offutt AFB, Neb.

ARMY COMMENDATION MEDAL
Master Sgt. Jerry Scholl, 7th WS, Heidelberg, Germany
Tech. Sgt. Jeffrey Marshall, Det. 2, 7th WS, Hanau, Germany
Staff Sgt. Glen DeMars, 18th OSS/OSW, Kadena AB, Japan
Staff Sgt. Nicholas Ditondo, Det. 3, 7th WS, Illesheim, Germany
Staff Sgt. David Quinn, Det. 6, 7th WS, Wiesbaden, Germany
Staff Sgt. Victoria White, Det. 10, 7th WS, Giebelstadt, Germany
Staff Sgt. Ralph Wright, Det. 6, 7th WS, Wiesbaden, Germany
Senior Airman Michael Morgan, Det. 6, 7th WS, Wiesbaden, Germany
Senior Airman Joseph Walz, Det. 6, 7th WS, Wiesbaden, Germany

AIR FORCE ACHIEVEMENT MEDAL
Capt. Danielle Lewis, 7th WS, Heidelberg, Germany
1st Lt. James Weaver, 7th WS, Heidelberg, Germany
Tech. Sgt. Daniel Colwell, Det. 7, 7th WS, Wiesbaden, Germany
Staff Sgt. Bart Hopkins, Det. 3, 7th WS, Illesheim, Germany
Staff Sgt. Jennifer Nuy, 7th WS, Heidelberg, Germany
Senior Airman Richard Goines, 7th WS, Heidelberg, Germany
Senior Airman Anthony Lausterer, HQ AFWA, Offutt AFB, Neb.
Senior Airman Joshua Tannehill, HQ AFWA, Offutt AFB, Neb.
Airman 1st Class Kiwani Brown, Det. 1, 607th WS, Camp Red Cloud, Korea
Airman 1st Class Terri Mitchell, Det. 7, AFWA, Tinker AFB, Okla.
Airman 1st Class Dawn Perez, Det. 1, 607th WS, Camp Red Cloud, Korea

ARMY ACHIEVEMNET MEDAL
Senior Airman Angel Rivera, 49th OSS/OSW, Holloman AFB, N.M.
Senior Airman Glenn Wilbur, Det. 6, 7th WS, Wiesbaden, Germany
Staff Sgt. Kevin McNeely, Det. 6, 7th WS, Wiesbaden, Germany
Staff Sgt. Nathan Taylor, Det. 11, 7th WS, Heidelberg, Germany

PA MERITORORIOUS SERVICE MEDAL
Staff Sgt. Cathleen Rayshich, 140th WF, Willow Grove ARS, Pa.

MICHIGAN STATE LEGION OF MERIT MEDAL
Tech. Sgt. Greg Bell, 140th WF, Willow Grove ARS, Pa.
Senior Airman Jane Hilton, 140th WF, Willow Grove ARS, Pa.

KOSOVO CAMPAIGN MEDAL
Senior Airman Angel Rivera, 49th OSS/OSW, Holloman AFB, N.M.

NATO MEDAL
Senior Airman Angel Rivera, 49th OSS/OSW, Holloman AFB, N.M.

AMERICAN METEOROLOGICAL SOCIETY'S CHARLES L. MITCHELL AWARD
Gene Weber, HQ AFWA, Offutt AFB, Neb.

Education

WEATHER CRAFTMAN'S COURSE
Tech. Sgt. Craig Clark, 15th ASOS/ASWB, Hunter AAF, Ga.
Staff Sgt. Jacob Arfa, 412th OSS/75th OSW, Edwards AFB, Calif.
Staff Sgt. William Barnwell, 18th WS, Ft. Bragg, N.C.
Staff Sgt. David Christensen, 208th WF, St. Paul, Minn.
Staff Sgt. Ronald Combs, 20th ASOS/E Flight, Ft. Drum, N.Y.
Staff Sgt. Steven Forshee, Det. 3, 55th SWXS, AFWA, Ramey, Puerto Rico
Staff Sgt. Taylor Jacobs, 15th OWS/WXM, Scott AFB, Ill.
Staff Sgt. Landon King, 43rd OSS, Pope AFB, N.C.
Staff Sgt. Robert Knight, 6th OSS, MacDill AFB, Fla.
Staff Sgt. Daniel Kuepper, Det. 6, 7th WS, Wiesbaden ABS, Germany
Staff Sgt. Jason Miller, 11th & 15th RS/DOW, Indian Springs AFAS, Nev.
Staff Sgt. Brion Rockel, 18th WS, Ft. Bragg, N.C.
Staff Sgt. Kenneth Sutton, 20th ASOS/E Flight, Ft. Drum, N.Y.
Staff Sgt. Cameron Thomas, 21st OSS/OSW, Peterson AFB, Colo.
Staff Sgt. Craig Towlson, OL-A, 18th WS, Ft. Belvoir, Va.
Staff Sgt. Johnny Whitehead, 335th TRS/UOA, Keesler AFB, Miss.
Staff Sgt. Robert Yancey, 26th OWS, Barksdale AFB, La.

FORECASTER COURSE
Tech. Sgt. James Lee, HQ AFWA, Offutt AFB, Neb.
Staff Sgt. Robert Benton, 43rd OSS, Pope AFB, N.C.
Staff Sgt. Tina Grewell, 3rd OSS, Elmendorf AFB, Alaska
Staff Sgt. Jamie Jenner, 62nd OSS/OSW, McChord AFB, Wash.
Staff Sgt. Warren LaBare, 19th ASOS, Ft. Campbell, Ky.
Staff Sgt. Kenneth Roberts, Jr., 6th OSS, MacDill AFB, Fla.
Senior Airman Shalanda Alexander, 19th ASOS, Ft. Campbell, Ky.
Senior Airman Eric Bauer, 28th OSS, Ellsworth AFB, S.D.
Senior Airman John Galdamez, Det. 3, 10th CWS, Ft. Carson, Colo.
Senior Airman Mario Luna, Det. 1, 10th CWS, Ft. Lewis, Wash.
Senior Airman Frank Howard, 6th OSS, MacDill AFB, Fla.
Senior Airman Nicholas Patterson, 22nd OSS, McConnell AFB, Kan.
Senior Airman Robert Phillips, 43rd OSS, Pope AFB, N.C.
Airman 1st Class Timothy Huffman, 47th OSS/OSW, Laughlin AFB, Texas
MST1 Jeanne Cato, CGC Polar Sea

US ARMY BASIC AIRBORNE COURSE
Staff Sgt. Brion Rockel, 18th WS, Ft. Bragg, N.C.

IMETS TRAINING COURSE
1st Lt. Jonathon Mason, Det.1, 607th WS, Camp Red Cloud, Korea
Staff Sgt. Scott Losenicky, Det.1, 607th WS, Camp Red Cloud, Korea
Staff Sgt. Erick Pedicone, Det.1, 607th WS, Camp Red Cloud, Korea
Senior Airman Andrew Kowal, Det.1, 607th WS, Camp Red Cloud, Korea
Airman Bradford Carpenter, Det.1, 607th WS, Camp Red Cloud, Korea

NCO ACADEMY

Tech. Sgt. James Fashing, 9th OSS/OSW, Beale AFB, Calif.

Tech. Sgt. Todd Herman, HQ AFWA, Offutt AFB, Neb.

AIRMAN LEADERSHIP SCHOOL

Senior Airman Victor Pimentel, 18th WS, Ft. Bragg, N.C.

Senior Airman Jerome Adams, HQ AFWA, Offutt AFB, Neb.

Senior Airman Estefpany Allen Allen, HQ AFWA, Offutt AFB, Neb.

Senior Airman Andrew Appleby, HQ AFWA, Offutt AFB, Neb.

Senior Airman Robert Brown, HQ AFWA, Offutt AFB, Neb.

Senior Airman Thomas Chelmowski, HQ AFWA, Offutt AFB, Neb.

Senior Airman Elizabeth Covairt, HQ AFWA, Offutt AFB, Neb.

Senior Airman Traci Gaines, HQ AFWA, Offutt AFB, Neb.

Senior Airman Amy Harmon, HQ AFWA, Offutt AFB, Neb.

Senior Airman Joshua Hicks, HQ AFWA, Offutt AFB, Neb.

Senior Airman Jarvis Jones, HQ AFWA, Offutt AFB, Neb.

Senior Airman Mackenzie Mercer, HQ AFWA, Offutt AFB, Neb.

Senior Airman Jason McGimsey, HQ AFWA, Offutt AFB, Neb.

Senior Airman John Murphy, Jr., HQ AFWA, Offutt AFB, Neb.

Senior Airman Ursula Smith, HQ AFWA, Offutt AFB, Neb.

Senior Airman Karla Szczr, HQ AFWA, Offutt AFB, Neb.

Senior Airman Anthony Walker , HQ AFWA, Offutt AFB, Neb. (Distinguished Graduate)

Promotions

Promotion to:

Lieutenant Colonel

Blaine Asato, 18th OSS/OSW, Kadena AB, Japan

Captain

Charles Morgan, 18th OSS/OSW, Kadena AB, Japan

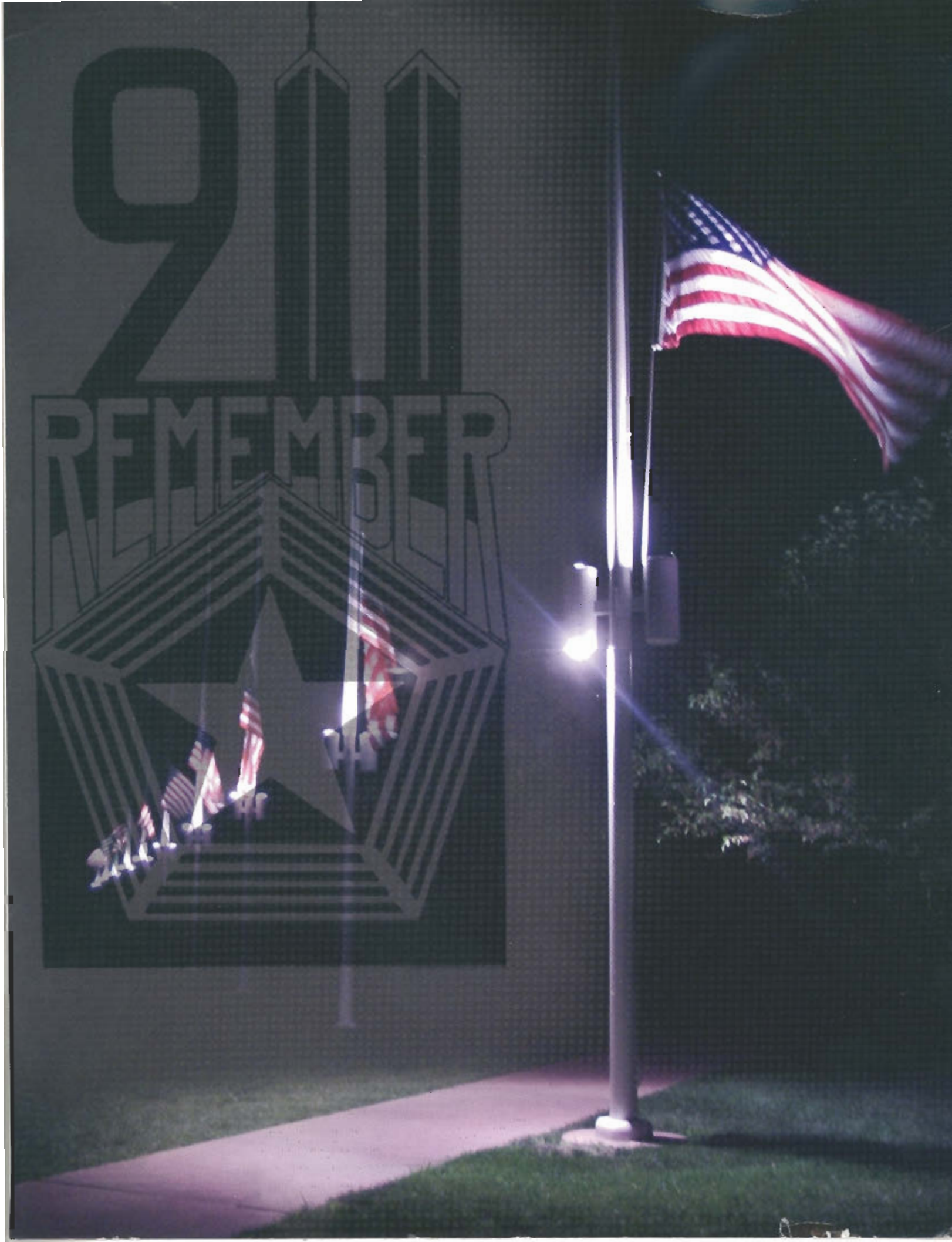
Melissa Lewis, AFCWC, Hurlburt Field, Fla., STEP promotion to Technical Sergeant

Coin Corner

Senior Airman Stephanie Aluffi, 31st OSS/OSW, Weather Specialist, received her coin from the General for her participation and weather observations for exercise Operation JOINT GUARDIAN. She also volunteered for a short notice deployment.

Staff Sgt. Luis Vazquez, 26th OWS, Training Manager, received his coin from the Chief for outstanding support to the Barksdale Hub Training Flight. He developed and guided his unit in a solid CDC program for the new ISC graduates with no failures in any exams by the airmen for their first year.

Bryan Goforth, SAIC, USAFE Hub, received his coin from the General for his work as a trainer in the Sembach hub. He was identified as the most outstanding trainer, not only from the trainees, but also from the unit leadership.


9/11
REMEMBER