Your Magazine for Air Force Weather

OBSERVER

Oct/Nov 00

Weather in SPACE

Forecasting the Final Frontier

OBSERVER

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This funded Air Force Weather magazine is an authorized publication for members of the U.S. military services. Contents of the OBSERVER are not necessarily the official view of, or endorsed by, the United States Government, the Department of Defense or the Department of the Air Force. Editorial content edited, prepared and provided by the public affairs office of the Headquarters, Air Force Weather Agency, Offutt AFB, Neb. All photographs are Air Force photographs unless otherwise indicated. All written material and photos to be considered for publication must arrive at HQ AFWA/PA by the first week of the month prior to the month being published. Photos must be mailed to:

HQ AFWA/PA
106 Peacekeeper Dr., Ste. 2N3
Offutt AFB, NE 68113-4039

Please call (402) 294-3115, or DSN: 271-3115, for more information about this publication. Electronic mail should be addressed to:

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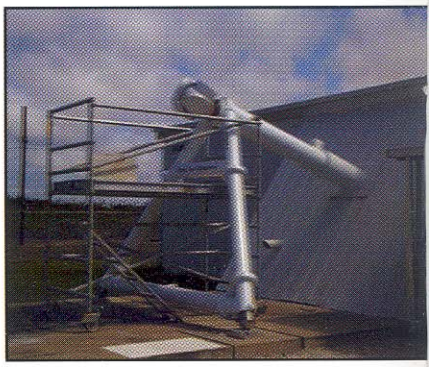

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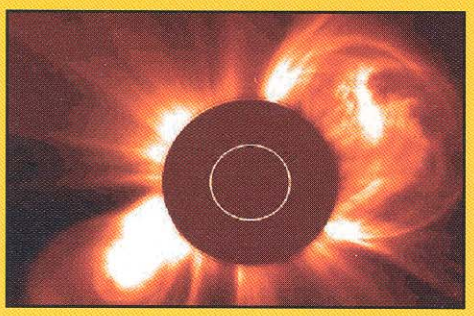
Thunderbirds fly over Peterson AFB, Colo., where the 21st OSS Weahter Flight is located. The 21st supports USSPACECOM, NORAD and AFSPC among other weather flight functions.

Editor's Record:

The author of "Learning the ABCs of Training" in the June/July ObserveR issue is Master Sgt. Michael R. Wieand

Brig. Gen. Johnson's article in the June/July ObserveR misstated Special Duty Assignment Pay (SDAP) for weather paratroopers. It should be stated we now have SDAP for weather people assigned to selective Army units.

ON THE COVER



Ramey Solar Observatory accomplishes the mission with a 10-inch refracting telescope used to locate and classify sunspots, flares, and other solar activity.

The Nov. 8 eruption of the sun as seen in this corona-graph image, which allows analyzers to view the outer portion of the sun's envi-ronment.

SEE FULL STORY on PAGE 31.

AFWA Under New Command

By Ms. Paige Rowland
AFWA Public Affairs

Col. Robert H. Allen assumed command of the Air Force Weather Agency from Col. Charles W. French in a change-of-command ceremony Nov. 13. at Offutt AFB, Neb.

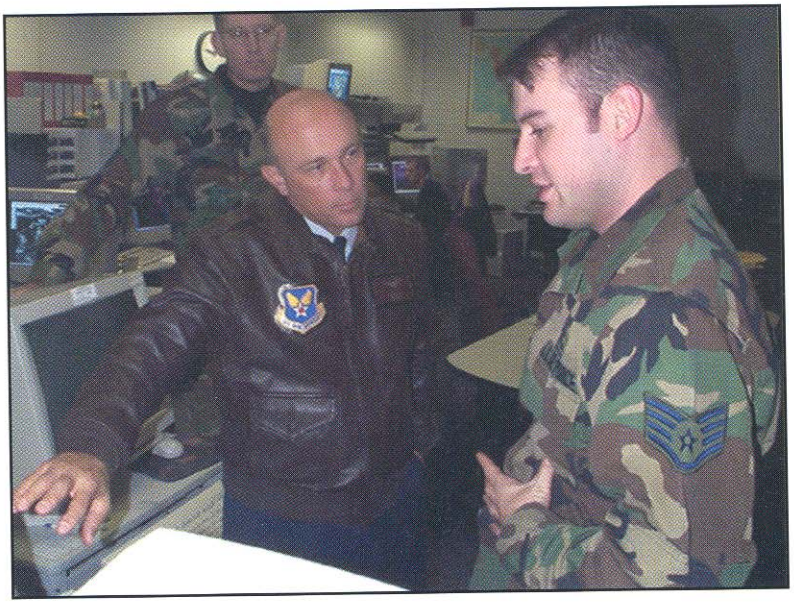
> "We are very fortunate to have Col. Allen taking up the reigns...He has the trust and confidence of the Secretary of the Air Force and me."
>
> *--Brig. Gen. David L. Johnson, director of weather*

Brig. Gen. David L. Johnson, director of weather, deputy chief of staff for Air and Space Operations, Washington, D.C., presided over the ceremony.

Johnson praised Allen's accomplishments during his military career and expressed his support. "We are very fortunate to have Allen taking up the reigns," Johnson said. "He has the trust and confidence of the Secretary of the Air Force and me."

Allen spent the last two years as the chief of weather operations, Headquarters Pacific Air Force, Hickam Air Force Base, Hawaii. While there, he carried out Air Force and Air Force Weather reengineering initiatives, including the move and systems upgrade of the Joint Typhoon Warning Center. Additionally, he facilitated the stand-up and operational capability of two Operational Weather Squadrons: the 20 Operational Weather Squadron, Yokota Air Base, Japan and the 17 Operational Weather Squadron, Hickam Air Force Base, Hawaii.

The new AFWA commander, Col. Robert H. Allen, is briefed by Staff Sgt. Brandon Orr on Strategic Forecasting Operations.



In his remarks during the change-of-command, Allen applauded the men and women of Air Force Weather and AFWA saying they are "extraordinary people doing extraordinary missions."

Allen entered active duty in 1973 after graduating from the U. S. Air Force Academy, Colorado Springs, Colo., and is no stranger to AFWA. In July of 1985, he spent three

years here as a branch chief for production and then, for special projects. And then, in August 1997, he returned to AFWA as the vice-commander. While vice-commander, Allen saw the agency through the initial phase of Air Force Weather reengineering, assisting in the transition of AFWA from a strictly operational facility to a world class strategic center.

"I am proud to be a part of the team as we chart the course ahead." -- Col. Robert H. Allen, commander, AFWA

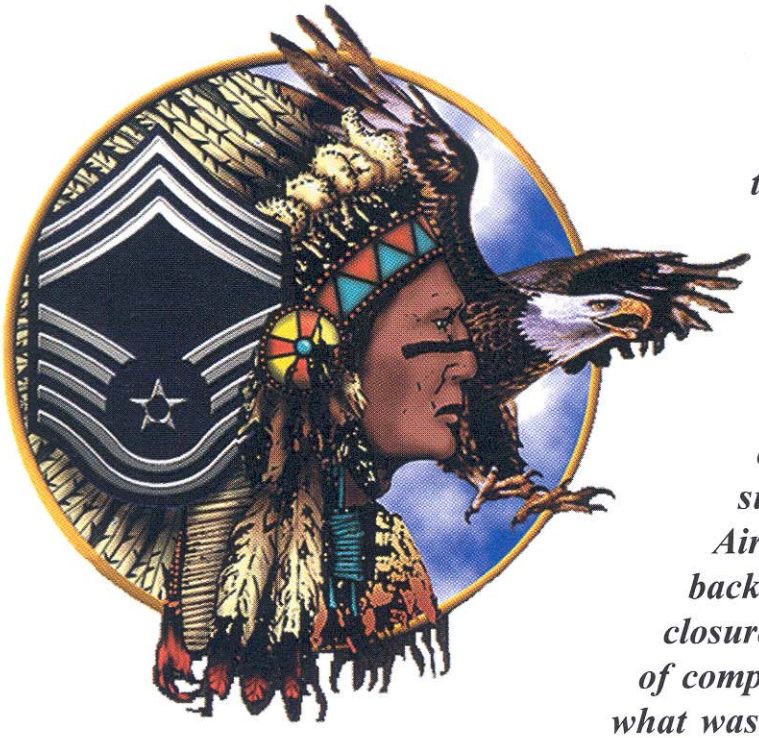
"I am proud to be a part of the team as we chart the course ahead," said Allen.

As the commander of AFWA, Allen leads more than 1000 agency members at 21 locations around the world. He oversees the distribution of centralized weather products and services, including climatological and space weather support. More than 385,000 products - 125 Gigabytes - are produced by AFWA daily.

Under Allen's direction, the worldwide weather support mission of AFWA provides decision assistance to combat, reconnaissance, command and control, presidential support, treaty verification and airlift missions for every military operation, contingency mission, and humanitarian relief effort conducted by the United States.

The COIN Corner

2nd Lt. Melissa A. Kalla, 21 OSS/ *OSW, Peterson AFB Colo.,* received the AFW Excellence coin from Brig. Gen. David Johnson for her heroic act of saving three people. She witnessed a hot air balloon was descending into powerlines and acted quickly to save lives.



CHIEF'S MENTORING

By Chief Master Sgt. Penny Heinen
Chief Enlisted Manager

The Air Force defines leadership as the art of influencing and directing people to accomplish the mission. In any weather unit today, most of us find leadership to be extremely challenging and rewarding. We find it challenging because of the changing face of Air Force Weather and the Air Force missions, manpower constraints, and training. But it is also rewarding because we have some of the most educated young people ever entering the Air Force today. These airmen work with career airmen who survived the Air Force cut backs and base closures, the entry of computers into what was previously a manually driven system, and at least one, if not two wars. You need a strong technical background and creative leadership skills to meet the everyday mission and people needs. So how do you get to be a good AFW leader?

The AFW leader today is techni cally competent. We define technically competent as the ability to work any area or task in your unit with some measure of skill. Then you utilize these skills by jumping in to help the worker bees when work gets rough in the trenches. How do you get there? There are many methods to improve your technical competence.

You must keep abreast of changes in procedures and equipment as well as new ideas. You do this by reading publications and articles on new methods and changes, practice old and new skills, or even ask the younger troops to show you how to complete tasks. Take what you learn and show others in the unit how to use that new technique or procedure. Ask technical questions, not only at the morning or afternoon discussions, but also as you and the weather technicians work on a mission. Always remember if you do not understand a forecast process, ask someone to explain the process to you. We have a lot of corporate knowledge out in the field that is untapped. Never close your mind to new ways to do business and keep learning. You know you're a good technical leader when your people ask for your help and then don't rue the time you work a shift.

Technical competence is great but not the only answer. You must be customer competent as well. If you know your customers' missions and requirements you are customer competent. You've heard the term "in bed with the customer" used by your previous supervisors. This old cliche means you work very closely with all the users of your products to ensure you meet their needs. Do you know who all your customers are on your base? So what do you need to know about your customers? You must know the local aircraft weather sensitivities, the field troops sensitivities, etc., and how weather affects their completion of a mission. What will stop a mission for your customers? What are the flying or Army limits? Seek this information out by coordinating laterally with your military counterparts or civilians. If at an Army unit, you need to work with your G-2 to let you talk at the Officers Profes-

sional Development meetings. This offers an opportunity to discuss what you do with other Army troops and provides an avenue for feedback on your products and services. Relationships blossom when you build a good rapport on a base or post with other agencies. Don't assume everyone will come to you first—you must get into their unit no matter where they work. By attending staff meetings, first sergeant meetings, sitting on base boards, etc., you help to build those relationships and this helps you build your customer competence.

"Remember the troops are watching you and your behavior during these situations—you set the tone for success or failure in the unit!"

We hear speakers cite lead by example, and a good leader is a good follower, as being keys to success. So logic follows that a good leader is a team player who sets the example for others to follow and follows examples set by other leaders. A team player follows guidance and regulations to the best of their ability and ensures their people do the same. Even if your ideas differ from your leadership or you have concerns about decisions, express these ideas and concerns to management in a logical manner. You should recommend solutions to problems and not just complain. Since we are in the military, your unit must complete all the tasks required for the mission in the interim. You must follow up on your solutions and recommendations, not only to ensure closure, but also to learn the reason for success or failure and to grow. Whatever the outcome, your unit must continue with the mission with the same gusto. Remember the troops are watching you and your behavior during these situations—you set the tone for success or failure in the unit!

Recognize your people at every opportunity. We usually fail to do our troops justice in this area often because we procrastinate or just forget. We fail in writing a meaningful award for our troops. You must take responsibility to make time for this process, not only for the troop's morale, but also for the unit morale. You and key supervisors should participate in base boards to get ideas for composing the write-ups. This helps you learn what tools, skills, and concepts you need to incorporate into your recognition program to get your people that prize. Mentor the younger supervisors. Let the younger supervisors write the award for the experience and training. Next, you ensure a quality product as you work with the supervisor on changes as a team. The key for success in winning the awards is the team completing the award.

Finally, mentor, mentor, and mentor. We should be mentoring younger troops at all levels. You must prepare the people in your unit to follow in your footsteps—both enlisted and officer. Give your people opportunities to shine and fail because they can learn from both experiences. Guide them toward success at every opportunity and minimize the failures. An example I have seen is allowing supervisors the experience to draft a schedule or SOP. Always provide constructive feedback on the write-up and let them clean the project up with your help. Mentoring is an Air Force standard we all need to practice everyday to ensure we train our replacements for the future.

Hopefully, you now understand that good leadership is a full time job and time is your worst enemy. No one said leadership positions would be easy—just challenging and rewarding. The challenge is keeping the unit running and training your replacement. You can understand the rewarding part of the job when you see your people get the next stripe, captain's bars, or medal. The challenge is getting your people to the point of success in all their endeavors. Your mentoring skills are the key to training your replacements and the future leadership for Air Force Weather! Practice them daily.

A LOOK AT SPACE WEATHER REENGINEERING

WITHIN AIR FORCE SPACE COMMAND... ONE YEAR LATER

By Capt. Mike Gauthier
HQ AFSPC/DOOW

In October 1999, the 55th Space Weather Squadron realigned from under Air Force Space Command to the Air Force Weather Agency in an effort to consolidate strategic-level weather support. This realignment enables the 55 SWXS to leverage the visualization, modeling, and dissemination capabilities of AFWA, resulting in a mud-to-sun approach to weather support at the strategic level. Coincident with this realignment, two new AFSPC weather units, Detachment 1, 614th Space Operations Group and the 50th Operations Support Squadron Weather Flight, stood-up to provide mission tailored space weather support at the operational and tactical levels.

At the operational-level, space weather support was aligned beneath 14th Air Force's 614th Space Operations Group. Originally stood-up at Schriever AFB, Col., Detachment 1, 614th SOPG served as the lead agency monitoring the 1999 Leonid Meteor Storm, the greatest threat to space assets in 33 years. Det 1 also spearheaded the development of the first-ever interactive Space Weather Training / Education Module cross-fed to AFW units around the world. After laying the foundation for integrating space weather into the 14th Air Force Aerospace Operations Center (SPACEAF AOC), the unit was relocated to Vandenberg AFB, Calif., where it was re-designated the 614th Aerospace Weather Team. Charged with providing real time space and terrestrial weather support to SPACEAF and USSPACE operations, the 614 SOPG/AWT declared Initial Operational Capability on Oct. 1, 2000.

The SPACEAF AOC serves as the warfighter's "24/7 space belly-button" providing reach-back support to deployed warfighters in the areas of space operations and intelligence. Integration of the AWT expands their support to include space weather. In

See AFSPC page 12

Space Weather, USSPACECOM and NORAD

By Mike Baker
USSPACECOM/J33TW

One of the more obvious users of space weather products and services is the United States Space Command , located at Peterson AFB, Col. Located in the same building as Headquarters North American Aerospace Defense Command (NORAD), for whom they are a supporting command, USSPACECOM operates the satellites and radars that support NORAD as well as other world-wide missions.

All of USSPACECOM's missions, Space Support, Force Enhancement, Space Control, Force Application, Computer Network Defense, Ballistic Missile Defense, and Space Advocacy, have weather and space weather requirements. Of these, the most significant space weather user is the Space Support mission, according to one of the two full time meteorologists supporting both NORAD and USSPACECOM, Mr. Mike Baker.

Subordinate units of the command's service components, Army Space Command, Naval Space Command, and 14th Air Force, that operate the satellite and radar systems receive 24-hour support from the Air Force Weather Agency and the 55th Space Weather Squadron. Space weather has the potential to damage or destroy satellites, and can interfere with command and control of the satellites as well as the payloads. The 55th Space Weather Squadron notifies the units of charging events, geomagnetic storms, and radio bursts, and assists with trouble shooting when satellite anomalies occur. Satellite operators can take protective action during some of the more severe events by minimizing satellite commanding, which reduces the likelihood of damage.

NORAD's missions of Aerospace Warning and Aerospace Control ; surveillance, counter drug, and air sovereignty rely on an unique blend of terrestrial and space weather. The Cheyenne Mountain Operations Center has a hot line to the 21st OSS/OSW, the weather unit at Peterson AFB Col., to help Command Directors rule out weather and space weather as factors when they are assessing whether information from NORAD's sensor network indicate an attack on North America may be occurring. The space surveillance radars that make up a portion of this network are extremely susceptible to space weather. Of course the alert aircraft that would respond to "air-breathing" attack rely heavily on terrestrial weather support.

The USSPACECOM 24-hour Space Operations Center (SPOC) monitors all the command's activities, and serves as a clearing house of space information for warfighting commands, as well as ensuring CINCSPACE is aware of the status of his forces and their involvement and effect on theater operations. The SPOC passes notices to theater command centers when space weather events have significant potential to affect military operations.

The Global SATCOM Support Center, located in the SPOC, monitors the activities of the Regional SATCOM Support Centers. In order to be aware of possible terrestrial and space weather effects on worldwide communications, the GSSC keeps an eye on solar radio bursts, scintillation forecasts, and worldwide thunderstorms. They use the AFWA and 55th SWXS products available via SAFWIN to keep this weather situational awareness in their daily operations.

Products on the 55th web page also support the Global Positioning System Support Center, as well. This center, located at Schriever Air Force Base Colo., is the DoD point of contact for GPS issues. The 55th produces a product that shows the effects of ionospheric scintillation on GPS accuracy based on forecast ionospheric conditions and GPS satellite geometry.

See NORAD page 12

Space Weather: On th

With the advent of the millennium, the best-kept secret in the weather career field, Palehua Solar Observatory, prepares to step into the 21st century.

When you think of weather in Hawaii, chances are you think of lots of sunshine, trade winds, and perhaps the occasional hurricane. Very few people know that the very first Air Force *owned and operated* solar observatory is here as well.

Detachment 5 of the 55th Space Weather Squadron, Air Force Weather Agency, operates the Palehua Solar Observatory, which overlooks the picturesque leeward coast on the island of Oahu. The observatory is one of six unique Air Force observatories. As part of the worldwide Solar Electro-Optical Network , the SEON provides data to the 55th SWXS whose mission is to analyze and forecast solar/space environmental phenomena and provide alerts, warnings, and assessments of operational impacts to Air Force and other DoD agencies to enhance the capability of worldwide forces. Det 5 executes this mission by observing, encoding, and transmitting highly accurate and timely solar radio information. Solar alerts and analyses provided by the observatory are used to support high-priority National Space Programs, United States Space Command, Air Force Space Command and its component commands, NORAD, NASA, space shuttle operations, and military surveillance and communications systems. Additionally, data provided by Det 5 is used by the National Oceanic and Atmospheric Administration's Space Environment Center in Boulder, Colo., to support other U.S. government agencies, international scientific research, and private corporations. Palehua is the Central Repair Activity for all Radio Solar Telescope Network systems and also serves as the test site for new solar radio equipment. Maintenance is performed by members of the 15th Communications Squadron from Hickam Air Force Base.

> "The bottom line is Team Palehua does a great job with equipment that has stood the test of time... Now we're taking advantage of emerging technologies that are going to help us perform our job faster and with greater accuracy,"
>
> -- Master Sgt. Sheila Dollison, Chief, Solar Observatory Operations.

Just after the launch of the first Sputnik satellite, the Air Force asked Air Weather Service to consider extending its mission to include space. As a result, AWS began training officers in geophysics and astrophysics. The first Solar Forecast was issued Oct 1, 1962 from the Space Forecast Center in Boulder, Colo.

As interest in solar data increased, AWS began training more people and sending them to augment civilian observatories. By the mid 1960's, 4th Weather Wing had personnel in 10 Operating Locations across the globe. The predecessor to the Palehua Solar Observatory was OL 3, 4WW which had AWS personnel augmenting the university staff of Hawaii's Mees Observatory atop Mount Haleakala on the island of Maui.

In October 1967, Maj Jack L. Buckingham and Master Sgt. John Higman arrived on Oahu to relocate OL 3 and establish an Air Force owned and operated solar observatory in Hawaii. The site was to be located at a former Army National Guard Nike-Hercules missile site.

Over the next fourteen months the AWS personnel worked long and hard to stand up this new unit. With minimal support and having to overcome several roadblocks, their diligence paid off. Palehua began its first white light observation in December 1968. On Dec. 21, 1968, coin-

e Eve of the Millennium

ciding with the launch of Apollo 8, the first operational report from the Palehua Solar Observatory was transmitted to the Space Forecast Center via the Mees Observatory.

On July 8, 1969, OL 3, 4WW was redesignated OL 6, 1WW. Palehua was officially opened for business on August 6th with then 1WW/CC Col. Stiles and Major General Roy Lassiter, Commanding General of US Army Hawaii, in attendance. A local television station was on hand to record the event.

Today, Palehua's mission remains as vital as ever. Perhaps even more so. As we move into the next century, the United States is becoming increasingly dependent upon space-based assets for military and civilian use.

"Nearly all facets of U. S. military operations worldwide are wholly or in part dependent upon these platforms. Not to mention the myriad of uses on the civilian side. Communications, scientific research, finance, and industry to name a few," said Capt. Shawn D. Filby, commander of Palehua Solar Observatory.

Thirty years ago, there were maybe a handful of satellites in orbit around the earth. They were large, cumbersome, and not very complex. The technology has come a long way. But design constraints make them very susceptible to solar influences.

Most people have heard of solar flares, but many people may not know what their significance is to us on earth. The sun sends streams of highly charged matter, such as protons and gamma rays, racing toward the earth at speeds that can exceed one million miles per hour. Large solar flares can wreak havoc with communications, spacecraft systems, radar, surveillance systems and even electrical power distribution systems. The people at Palehua watch for these eruptions, determine their intensity and duration, and report their findings to agencies responsible for safeguarding space assets.

The unit uses several telescopes and computer systems to accomplish their mission, including the three-antenna Radio Solar Telescope Networks (RSTN) system. The RSTN is comprised of a 28ft, an 8ft, and a 3ft radio telescope. This system monitors eight discrete frequencies ranging from 245 megahertz (MHz) up to 15.4 gigahertz. Each of these frequencies are used for communication, surveillance, or telemetry and tracking for satellites.

Det 5 also uses the Swept Frequency Interferometric Radiometer which monitors radio signals from 25-75MHz. These frequencies originate in the sun's outer corona. Any ejection of energetic particles from the sun would pass through this region on its way toward earth. An analyst can determine its relative speed with the output from the SFIR, using a shock speed nomogram. This aids forecasters at the Space Environmental Operations Center in predicting if and when these particles will interact with space-based assets and earthbound communication systems.

Palehua's equipment is capable of detecting high-energy eruptions in near real-time and our findings help support high priority DoD and civilian customers. But some of the systems are of 60's and 70's design and haven't completely utilized the latest technology.

Currently the network is upgrading computers and solar antennas for expanding monitoring capability. New PCs have already been introduced into the network due to the efforts of programmers, operators, and maintenance personnel at Palehua. Part of the radio network has been completely redesigned. An updated version of the SFIR, which extends Det 5's listening range from 25-180MHz, has been built and is being tested now. It also incorporates tunable filters to block the influence of local television and radio station broadcasts, called RFI for radio frequency interference.

"The bottom line is Team Palehua does a great job with equipment that has stood the test of time. This equipment has served us well. Now we're taking advantage of emerging technologies that are going to help us perform our job faster and with greater accuracy," said Master Sgt. Sheila Dollison, Chief, Solar Observatory Operations.

The upcoming Solar Maximum, the period in the 11-year solar cycle when the sun's activity is at its highest, is scheduled to peak during 2000-2001. Everyone at Palehua is ready to meet the challenge.

"Our peacetime and wartime missions are the same", said TSgt Michael Blount, head of the radio section. "We are open from sunrise to sunset 365 days a year, but SolarMax is when all the training, all the processes we've refined, and all the new equipment gets put to the test."

From the first lunar landing and into the next millennium, Palehua's motto is unchanged: "The world's best solar observatory team providing the highest quality environmental data and network training."

AFSPC cont. from page 8

addition to providing education and training to theater Space Weapons Officers NCOs, AWT personnel provide satellite, radar, and communications anomaly assessments, provide trend analysis for space systems, and build requirements for long-term theater support for AFWA space weather products. The 614 SOPG/AWT is expected to declare Full Operational Capability in April 2001, when manning and capabilities will provide for 24-hour operations in the SPACEAF AOC.

At the tactical level, the 50 OSS/OSW was created to provide real-time space and terrestrial environmental support to 50th Space Wing, Schriever AFB, Colo. satellite controllers and personnel.

The 50 OSS/OSW primarily focuses on the solar environment to assist satellite controllers in executing their missions. A large aspect of space environmental support involves performing "quick-turn" satellite anomaly assessments supporting satellite controllers in the eight different Space Operations Squadrons (SOPS); five are located at Schriever AFB, two are at Onizuka AFS, Calif., and one is at New Boston AFS, N.H. When a SOPS detects a problem (anomaly) with one of their satellites, their operational checklists require an assessment of the solar environment to help determine the correct course of action to expedite satellite recovery. The 50 OSS/OSW utilizes solar environmental data to provide an immediate assessment to determine if the solar environment might have caused the anomaly. Their efforts help minimize satellite down-time and enhance coverage for the warfighter. In addition to responding to satellite anomalies, the 50 OSS/OSW provides operators a heads up to potential impacts on their systems resulting from enhanced solar activity, highlighting possible impacts and times of occurrence.

Although not yet having reached IOC,currently scheduled for April 2001, the 50 OSS/OSW is providing value-added support to the 50th Space Wing. They are integrated members of the wing sub-battle staff, participate in all wing-level exercises, and provide crew change-over and wing leadership briefings. In April 2001 the 50 OSS/OSW will have completed the acquisition of requisite equipment and will begin providing "24/7" support to their customers.

The reengineering effort that took place just over a year ago marked the beginning of a new era of weather operations. Air Force Space Command units are leading the way in this effort, fusing the space and terrestrial environments into a seamless battle-space environment, providing "mud-to-sun" weather support to warfighters around the globe.

NORAD cont. from page 9

Another important mission of USSPACECOM is warfighter advocacy. Except for HF radio support and warnings for NORAD warning radars, operators of most ground-based systems are not aware of the impacts of space weather on their operations, and do not receive support. Through theater support teams and other outreach efforts, the USSPACECOM's weather office is trying to educate radio, radar, and navigation users of the potential impacts and the means for obtaining support. The office is also working to help the services in identifying or developing space weather thresholds for systems that depend on radar, radio communication, or GPS signals. The object is to publish decision thresholds for these customers similar to the ones that exist for the flying community. A pilot whose mission may depend on hf radio has just as much need for forecasts of radio outages as he has for forecasts of excess cross winds or low ceilings, since lack of communication can have the same mission impact as not being able to fly.

USSPACECOM also participates in joint training command post exercises with other unified commands. When possible, the weather office provides scripted space weather, along with related communication or radar outages, in order to increase theater awareness of possible space weather impacts to operations.

The Weather Office supports these missions partially through their SIPRNET web page, which links relevant 55th SWXS, AFWA, and Navy products for use by USSPACECOM customers. Support to USSPACECOM and NORAD will be expanded in the future through a new weather unit at SPACEAF, which will provide 24 hour terrestrial and space weather support to elements of Space Command and NORAD that do not currently have dedicated weather support.

Additional information on the supported commands can be obtained at USSPACECOM web sites on NIPRNET at www.peterson.af.mil/usspace/index.htm, and on SIPRNET at www.usspace.spacecom.smil.mil/frameset1.htm.

11TH OWS SPACE WEATHER OPERATIONS

By Capt. De Leon C. Narcisse
11th OWS

In Alaska, many notice the Aurora Borealis or Northern Lights. This beautiful natural phenomenon is a highlight during our long, dark winters. As spectacular as it is to observe, this very active space weather occurrence can negatively impact a variety of systems. Some of the specific communications and electrical systems space weather can impact include High Frequency communications, Satellite Communications , Surveillance radars, Satellite operations, Global Positioning Systems, High Altitude Vehicle/Spacecraft Operations, and Electrical Power Systems. Key to helping your customers mitigate space weather effects is integrating space weather forecast products into their daily operational cycle. By sharing with you some of our past experiences, I hope to help you build a successful space weather program.

To get our program off the ground, we hosted a working group meeting with a number of Alaskan theater communications and space system users and with the space weather experts: the 55th Space Weather Squadron . The purpose of this working group was to inform customers of space weather forecast capabilities, gain an entry-level understanding of our customer's requirements, and to build a good rapport. Attendees to this meeting included representatives from the Alaskan North American Aerospace Defense Command Region 611th Air Control Squadron, Alaskan Command joint frequency management office, 962nd Airborne Air Control Squadron, 381st Intelligence Squadron, personnel from various bases in theater and members from the Army and Navy. Also included in the working group were two representatives from the Alaskan Geophysical Institute, members of the University Partnering in Operational Support. The UPOS community provides research that addresses key areas of terrestrial and space environmental concerns that pertain to the state of Alaska.

The meeting started with a briefing relating space weather events to operational impacts and showing a sampling of current and future space weather forecasts products given by Maj. Rick Davila, 55th SWXS. Users were initially surprised to see these forecast products and became very excited when they realized help was available to potentially offset some or all of their solar related impacts. The meeting continued with the users sharing a sampling of their systems and the frequencies they use. An overview of past system impacts resulting from solar activity was also provided. We wrapped up the day's activities by discussing ways in which the 55th SWXS might provide mission tailored products.

Next came the task of following up where the working group left off—helping the customers define and document their requirements. Once a requirement was identified, we worked with the 55th SWXS to send the user existing space weather products to see if they would meet their needs. If the product was inadequate, a refining process ensued that either modified the space weather product or, in a worse case situation, created an entirely new product. This step is an ongoing process. Even today, after several months of follow-up, we continue to refine customer requirements and products.

One of our initial customers, the 611th Air Control Squadron , uses a space weather product to brief their operations crews on the forecasted effects to their radars and high frequency communications. They have had communication problems in the past, but now, thanks in part to the new product; they can adapt their communications when negative solar impacts are expected.

Another of our initial space weather customers is the 11th Rescue Coordination Center. The 11th Operational Weather Squadron

See 11th OWS page 29

Meteorological Satellite Updates

By Maj. Michael Simpson
HQ AF/XOWX (Weather Plans)

Flight 16 Launch

The newest Defense Meteorological Satellite Program (DMSP) satellite will be launched in January 2001. This satellite, Flight 16 (F-16), is the first full-fledged Block 5D3 spacecraft of the series. Among the improvements over the previous block of satellites (Block 5D2) are an upgraded sensor suite, Solid State Recorders (SSRs), a higher-rate command uplink capability, and new real-time broadcast transmitters.

Sensor Upgrades

The upgraded sensor suite consists of 3 new packages. The Special Sensor Microwave Imager Sounder (SSM/IS) is a follow-on to the SSM/I and replaces the current vertical temperature profiler (SSM/T-1) & vertical moisture profiler (SSM/T-2). The Limb Scanning Ultraviolet Imager/Spectrometer (SSULI) will provide vertical profiles of atmospheric and electron densities. The Nadir Scanning Ultraviolet Imager/Spectrometer & Photometer (SSUSI) will provide horizon-to-horizon observations of ionospheric parameters and neutral densities. These new sensors will enhance specification and forecasting abilities by AFWA and the 55th Space Weather Squadron.

Recorders

All mission sensor data and spacecraft state-of-health telemetry will be recorded on four Solid State Recorders. This will be the first DMSP spacecraft launch with all SSRs. Flight 15 (launched December 1999) had 2 SSRs and 2 of the series' heritage Digital Tape Recorders (DTRs). These new SSRs will increase the data storage capacity over Block 5D2 spacecraft by four times.

Data

Data uplink and downlink is a little different on this satellite, too. Commands will be uplinked to the spacecraft at a 10K rate instead of the 2 kbps rate of the previous spacecraft. A new UHF real-time broadcast transmitter will operate on the spacecraft and will allow for dedicated low data rate downlinks for future use by high-mobility and field units. This UHF transmitter will operate at 400.328MHz - 400.822MHz. Also, another S-Band transmitter,operating on SGLS Channel 5 – 2222.5MHz, has been added to the spacecraft to allow for dedicated, high data rate downlinks.

Timing

The launch on Jan. 15, 2001 will place Flight 16 into the planned Local Time Ascending Node (LTAN) of 1735 Local time. This will put it in the same general orbit as Flight 13 that was launched in 1995. All systems are ready for the 15 January 2001 launch date.

F11 De-Activation Orbit

On 30 August 2000, DMSP operations performed the deactivation of Flight 11. The team essentially 'pulled the plug' on the older spacecraft that was launched in November 1991 by turning off the remaining mission sensors, disconnecting the battery charge and connecting the discharge paths, and performing a maneuver to orient the solar array away from the sun. It has never been the practice of the program to permanently decommission one of its satellites in this manner, but the spacecraft had become less and less able to carry out its mission. The highly eclipsing orbit put the spacecraft through long periods of darkness that eventually led to power subsystem problems and partial battery failures. These problems, coupled with failing recorders, strained the DMSP operations and engineering infrastructure and made the spacecraft overly difficult to maintain. These high-maintenance operations detracted from the care of the other four operational spacecraft. The de-activation of Flight 11 leaves 5 other DMSP spacecraft on orbit (two primary – F15, F13; two secondary – F14, F12; one test & checkout – F8) with the next one scheduled for launch in January 2001.

NPOESS Update

Background

On 5 May 1994, the President directed the Department of Commerce (DoC) National Oceanic and Atmospheric Administration's (NOAA) Polar-orbiting Operational Environmental Satellite (POES) program and the Department of Defense (DoD) Defense Meteorological Satellite Program (DMSP) to be converged to satisfy both

civil and national security requirements. The current inventory of POES and DMSP satellites will 'fly out' and the launch of the first converged spacecraft should occur in 2008 with overlapping operations to ensure weather satellite data continuity. The resulting system will be called the National Polar-orbiting Operational Environmental Satellite System (NPOESS) and it will consist of three evenly spaced, polar-orbiting satellites in sun-synchronous orbits.

Program Office

The Integrated Program Office (IPO) in Silver Spring, MD, fuses acquisition and technology transition, with operations and employs members of the three agencies (DoD, DOC, NASA). On May 19, 1998, NOAA's Satellite Operations Control Center in Suitland, MD, assumed operation of the DMSP constellation from the 6th Satellite Operations Squadron. The IPO upgraded NOAA's Command Data Acquisition station in Fairbanks, Alaska to receive DMSP data. Initial operational capability of these new antennas was achieved on July 17, 1998. This upgrade will supplement the Air Force Satellite Control Network (AFSCN) tracking stations in the command, control, and mission data recovery of the DMSP constellation.

Sensors and Requirements

NPOESS completed source selection for five primary sensors in Fall 1997. These five sensors will fly on all NPOESS satellites and provide global observations of 61 atmospheric and space environmental parameters. The program office team continues to meet successive milestones in the buildup to spacecraft integration.

Requirements for these sensors are defined by a number of groups: the Joint Agency Requirements Group, Senior Users Advisory Group currently chaired by the Oceanographer of the Navy and the Joint Agency Requirements Council at the Vice Chairman Joint Chiefs of Staff level. In the end, the requirements process is designed to ensure that warfighter weather satellite data requirements are met. Below is a more detailed breakout of some of these requirements for the different users.

Air Force warfighter applications of polar orbiting weather satellite information include:

- Use of fine-scale imagery to support the Air Tasking Order (ATO) planning and execution cycle.

--They enable the operational practice of "flex targeting" based on current weather information up to mission launch time resulting in fewer air aborts due to weather in the target area, less "rerolling" the same targets.

- Employment of high-resolution data for weapons selection and targeting pod employment.

--GPS-aided munitions are best employed against fixed targets or known locations whereas dynamic targets require the flexibility of TV/IR/Laser guidance, accurate weather information is critical to employment of these weapons for close air support (CAS) and air interdiction (AI) missions.

-Application to optimize Intelligence, Surveillance, and Reconnaissance (ISR) schedules for Battle Damage Assessment (BDA) collection.

--Minimizes the need for retasking of High Demand/ Low Density ISR assets thus improving BDA effectiveness and reduce the need to readdress targets multiple times.

Army warfighter applications include:

-Soil moisture measurements for determining trafficability and cross-country mobility.

-Identification of clouds and fog in mountain valleys and passes for low level helicopter route planning and ground force operations.

Naval applications include:

-Ingest of microwave data as primary source of worldwide atmospheric profile and ocean surface wind speed data for weather models used by the DoD.

-Analysis of tropical storm winds and heavy rain bands used to route ships out of potentially dangerous conditions.

-Antisubmarine warfare applications enhancing freedom of operations for carrier battle groups.

-Source of ice analysis for submarine and surface polar ocean operations.

Polar-orbiting weather satellites (DMSP, NPOESS) crucial to high priority national programs.

-Two polar-orbiters required for necessary level of support ensures maximum utility of vital national resources.

Final Word

In summary, the DMSP/ NPOESS support to the warfighter is invaluable. Knowledge of the weather provides a significant operational advantage on the battlefield. This was proven during the Gulf War and again over the Balkans. NPOESS is on track to meet warfighter requirements with its first launch scheduled for 2008.

Ramey Solar Observatory
A Mud-to-Sun, Joint Service Operation

By Capt. Steven E. Cahanin
Commander
and Master Sgt. Bob Silvernail
Chief of Operations

At Detachment 3, 55th Space Weather Squadron (Ramey Solar Observatory) our primary mission is no different than the other observatories in the network of the 55th Space Weather Squadron. However, what it takes to accomplish our mission is very different. Our remote location is geographically separated from all support facilities and located on a U.S. territory in the middle of the main Atlantic hurricane track. This makes Ramey Solar Observatory one of the more unique missions in Air Force Weather and one of the most challenging. Working at Ramey Solar Observatory is one of the coolest jobs in AF weather…I'll get to the cool part in a minute.

People make Ramey the world class Air Force unit it is today—and after reading this article, I hope you'll agree. It takes all personnel utilizing all their talents to ensure mission accomplishment. Our team of professionals routinely consists of nine people—one officer and eight NCO's. The operations section consists of an operations chief and three space environmental analysts, all of which are 1W071A personnel. To maintain the telescope we have a maintenance chief and two "Met/Nav" technicians who are 2E172 personnel. A commander and information manager provides the command section/ administrative support. Because we're a geographically separated unit, all aspects of our mission are a daily challenge.

Ramey Solar Observatory accomplishes the mission with a 10-inch refracting telescope used to locate and classify sunspots, flares, and other solar activity. Our analysts are responsible for observing and analyzing all solar activity and reporting it to both the 55th Space Weather Squadron at Schriever AFB, and the Space Environmental Center of the National Oceanic and Atmospheric Administration in Boulder, Colo. United States Space Command, Air Force Space Command, NORAD and NASA manned space flight operations among many other customers use the solar activity information we disseminate. That's the serious aspect of our mission. The cool part is we get to see things very few people on earth ever do—we get to look at the surface of the sun and observe in detail it's activity every day.

Prior to the emergence of science over myth, the Sun was thought to be a tranquil, perfect, life-giving blemish-free sphere. It was worshipped as a god. The Greeks made the earliest attempt to understand the sun, but it wasn't until the invention of the telescope in 1608 that we really started to see the sun in a different light .We now know it is anything but blemish-free and it is the antithesis of tranquillity. It is a seething, boiling place of constant change and extreme violence. Highs and lows of magnetic activity characterize these changes over an 11-year period. We are now at the peak of this cycle of magnetic activity and it's called Solar Maximum.

Solar Maximum revels itself in some of the most phenomenal features seen in nature. Incredible features such as sunspots are small in comparison to the solar disk, but are often many times larger than the entire earth. Loops of charged gas spinning around like a Ferris wheel rising to heights of 30,000 miles. Large gas clouds suspended above the surface 100,000 miles across. Solar flare eruptions releasing the energy of two billion atomic bombs. Billion-ton bubbles of hot gas exploding off the sun in a Coronal Mass Ejection. Pretty scary stuff! We get to view this awesome display of nature every day and we love it!

Some history about the observatory land is necessary to gain perspective of our community. Prior to 1940, the Air Force acquired the land where our observatory is located as part of the old Ramey Air Force Base. Located on the extreme northwest corner of Puerto Rico, Ramey Solar Observatory owns 77 acres that were initially used as a radio-transmitting site in support of Ramey AFB airfield operations. On July 1, 1966 Air Weather Service established the solar observatory on this land. After the Air Force closed Ramey AFB the U.S. Coast Guard took over the airfield, along with a portion of the housing, and began Search and Rescue and Counter-drug operations. Our land is about

two miles down the road from the Coast Guard base. All our personnel reside in the housing area on what is now Coast Guard Air Station Borinquen. This Coast Guard Air Station is also home to many other folks from various government agencies working in the local area including the FBI, U. S. Customs, U.S. Border Patrol, DEA and U.S. Army personnel. Consequently, our Coast Guard hosts weren't exactly aware of what we do down the road at the observatory, or our backgrounds and training. They pretty much just knew a bunch of Air Force guys and their families live on their base and work in the local area "watching the sun." All that changed on September 21, 1998 when Hurricane Georges destroyed the island of Puerto Rico.

Located on a 180-foot cliff overlooking the Atlantic Ocean on the northwest coast of Puerto Rico, Ramey Solar Observatory is an ideal location to observe the sun. Unfortunately, it is also an ideal location for hurricanes to pass by on their way through the Caribbean. In mid September of 1998 Hurricane Georges formed off the West Coast of Africa and proceeded directly westward for the Caribbean. Four days prior to the hurricane landfall on the island we contacted the Coast Guard commander at Air Station Borinquen and offered our meteorological expertise. Extremely relieved to learn he had a contingent of Air Force meteorologists in his community he quickly accepted our offer.

The Coast Guard is very small compared to the other military services. Their total service is made up of only 36,000 people. Even though they have meteorologists in the Coast Guard, there are none stationed at Air Station Borinquen. Having a flying mission and no weather support is odd to the Air Force, but not unusual to the Coast Guard. They get general weather conditions from the National Weather Service in San Juan, but it is certainly no more detailed than the weather one gets from the evening news. Master Sgt. Silvernail and I briefed the commander and his staff on Hurricane Georges in a forum similar to an Air Force Battle Staff four days before landfall and every 6 hours until passage. The eye of Georges passed 50 miles to our south and caused incredible damage to the local area. However, because of our forecast and intense preparations, our observatory and the Coast Guard base suffered only minor damage and no injuries. So impressed with our forecast capabilities during Hurricane Georges, the USCG commanding officer added us to his staff for all future crisis action briefings.

After the passage of Hurricane Georges we went about developing ways of improving day to day weather support capabilities for Coast Guard Air Station Borinquen aviators. MSgt Silvernail created a computer-based file of both commercial and military web sites that they can now access. This tool now provides detailed forecasts, observations, radar and satellite pictures for their aviators and has made flight weather briefings a reality for all SAR and Counter-drug missions. Directly because of our interaction between the Detachment 3 and the Coast Guard during and after the Hurricane Georges disaster, a bond of respect and friendship has developed. This bond has become both mutual and beneficial to both services.

In the two years since this disaster, our involvement with the Coast Guard has blossomed into what can only be described as a truly "joint service" effort. Our endeavors include joint work to improve the USCG operations hangar, housing area and the medical clinic. We are strong advocates for the expansion of the local USCG clinic. This effort will eventually result in increased capability to support more family members. We coordinated Air Force Guard Civil Engineering Prime Beef teams to come and work on electrical grid projects in the Coast Guard operations hanger in addition to refurbishing the housing area. This effort will come to fruition in January 2001 as three teams arrive to begin work. This hurricane season we provided expert hurricane analysis and forecasting support to the USCG and Capt. Glenn Gunn, Commander USCG stated that our "perspective has saved [the Coast Guard] an unimaginable amount of prep time" though accurate and relevant forecasts.

Ramey Solar Observatory is truly a mud-to-sun, joint-service operation and one of the coolest jobs in the Air Force today. The people have made this observatory a shining example of what a small team of Air Force professionals can accomplish. Never forget it is people who ensure mission success—not just the leader. Leaders enable people to achieve though mission planning, focus and execution. Take care of the people and their families. This will ensure mission success.

This is undoubtedly the best assignment in my 19-year career, and I hope every Air Force member has the opportunity and the pleasure to be a part of a team as great as Ramey Solar Observatory.

A Relationship with Air Force Space Command

By Kelly J Hand
HQ AFSPC/DRFF

Air Force Space Command has a unique role in its relationship to AF Weather. As the DoD is becoming more and more dependent upon space for military operations, and because space and terrestrial weather impacts so many space systems, information dominance concerning the physical environment is becoming more and more critical. From an Air Force Weather customer's perspective, SPACEAF—the AF operational Component of USSPACECOM—relies upon AFWA for specification and forecast of the terrestrial and space environment to support its Space Control, Force Enhancement, Force Application, and Space Support missions.

Therefore as the "organize, train, and equip" MAJCOM for SPACEAF, AFSPC advocates for AF Weather POM initiatives related to AFSPC related terrestrial weather requirements, as well as requirements for ground-based space environmental systems and models.

Additionally, as the Lead Command for Modernization and Acquisition of the total Space Environment Support System, AFSPC works closely with and relies upon AFWA and Air Force Weather to assure requirements related to space weather impacts are identified and addressed for the DoD and national program communities.

Finally, as space information service provider in the Environmental Monitoring sub-mission area of the Force Enhancement mission, AFSPC is responsible to POM for space-based terrestrial and space weather sensors.

So whether from a customer or provider perspective, AFSPC teams with Air Force Weather to assure environmental monitoring capabilities in general, and space environmental monitoring capabilities in particular, keep pace with the increasing demands for environmental information in military operations.

COMBAT WEATHERME SHOOT, COMMUNICAT

By Tech. Sgt. Ginger Schreitmueller
Air Force Special Operations Command
Public Affairs

They are a small band of Air Force men wearing gray berets, living and working with the U.S. Army Special Operations Command community. They are the only ones of their kind within Air Force Special Operations Command, and within the Department of Defense.

These gray berets are AFSOC's Combat Weathermen. But, they aren't your "typical" weathermen, boasts the 10th Combat Weather Squadron commander.

"We do things a bit differently than our conventional Air Force counterparts," said Maj. Bob Russell. "Our guys have to move, shoot and communicate within the units they live and work with everyday without being actual members of those units. They do all the normal tasks a weatherman does, but then we tack on more qualifications – such as maintaining proficiency in parachuting, survival skills and Special Operations unit tactics."

Though Air Force airmen, Combat Weathermen are not assigned to Air Force bases. They are tasked to support U. S. Special Operations Command missions, specifically Army Special Operations units. The 10th CWS, which falls under the 720th Special Tactics Group, has five detachments and one operating location in the continental United States. There are also two overseas Combat Weather operating locations, and two Air National Guard Combat Weather Flights.

Along with being weather forecasters, the gray berets have to be soldiers, too, said the major.

"They can't be a liability to the units they're assigned with," he said. "These guys are not just weathermen, they're ground forces — they're Air Force soldiers.

"They are living, sleeping, eating, jumping, shooting, fighting and working side by side with Army Special Forces wherever they go. If they make a bad call on winds for a jump, their parachute is going to feel the same gusts as the Army guys they're jumping with. They too are operators and have a vested interest in accurate forecasting."

Conventional military weathermen often have a different perspec-

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tive to forecasting, said the 10th CWS superintendent.

"Combat Weathermen have to be technically proficient as a weather forecaster and observer, and tactically keen in soldiering and Special Tactics skills," said Senior Master Sgt. Bruce Perkins, who's worn the gray beret since 1997. "Conventional weathermen rely on data to analyze and predict. Often we are deployed in places where we can only rely on our technical skills and senses to forecast."

"We're not just inside a building looking at a screen and pulling data down off a system," added Major Russell. "We're out in the middle of it."

Being in the midst of a battlefield is another aspect that sets the Combat Weatherman apart from other Air Force weathermen.

"You'll find weathermen at nearly all military operations and installations – most at existing or forward bases," said the major. "But, our focus is forward of that airfield. You'll find us walking around in the dirt, in nowhere land, providing weather input for a ground commander and the operational structure above him."

The information a Combat Weatherman provides is above and beyond what a home-based weatherman can interject, he said.

"A satellite can only do so much; it's looking from the top down. We're on the battlefield looking up. Aircrews and decision-makers need details beyond what a satellite or remote sensor can provide. Our guys are on the ground making those tough calls," Major Russell said. "It's more than reading data and analyzing information; they're observing, measuring, forecasting, communicating and, when needed, fighting."

A Combat Weatherman is often the sole weather link on the ground, said Sergeant Perkins.

"He's often the only source of weather information in a region. He has to provide the products to the Special Forces team he's sitting with and relay it back to the other decision-makers."

"They are at the pointy end of the spear — on the ground with Army Special Forces," Major Russell said. "Looking back up that spear is a whole chain of people counting on that Combat Weatherman's input. He is everyone's forward eyes on the battlefield."

The information the Combat Weatherman is relaying up and down the chain has to be passed along in user-friendly terms.

"Combat Weathermen have to be translators — bilingual in a sense," said Major Russell. "They have to meld the meteorological world with the operations world in a Special Ops context. They have to 'de-geek' the technical meteorology and provide it to the operator in terms he'll understand. They're making the recommendations on how weather will affect deliberate and contingency plans, all the way to recovery and reconstitution, and everything in between."

Though Combat Weathermen have a unique skill, they are not a separate career field.

"Combat Weather is not it's own career field, or even a shredout of the weather community," said Sergeant Perkins "They learn how to be weathermen first, then volunteer to add the additional combat aspect into their job description. Right now, by the time they've completed their basic technical and upgrade training, they'll have almost 3 years as weathermen before they can volunteer for Combat Weather."

When someone volunteers for Combat Weather, and the right to wear the gray beret, he's entering a high-impact job, said Major Russell.

"Weather is a diverse mission area. It somehow effects everyone, everywhere. When it comes to a military mission, weather can impact everything from the tactical to the strategic level operations and decisions," said Major Russell. "Combat Weathermen bring together that vital weather information at the right place, in the right format to meet operational needs at all levels. They provide a combination you won't find anywhere else."

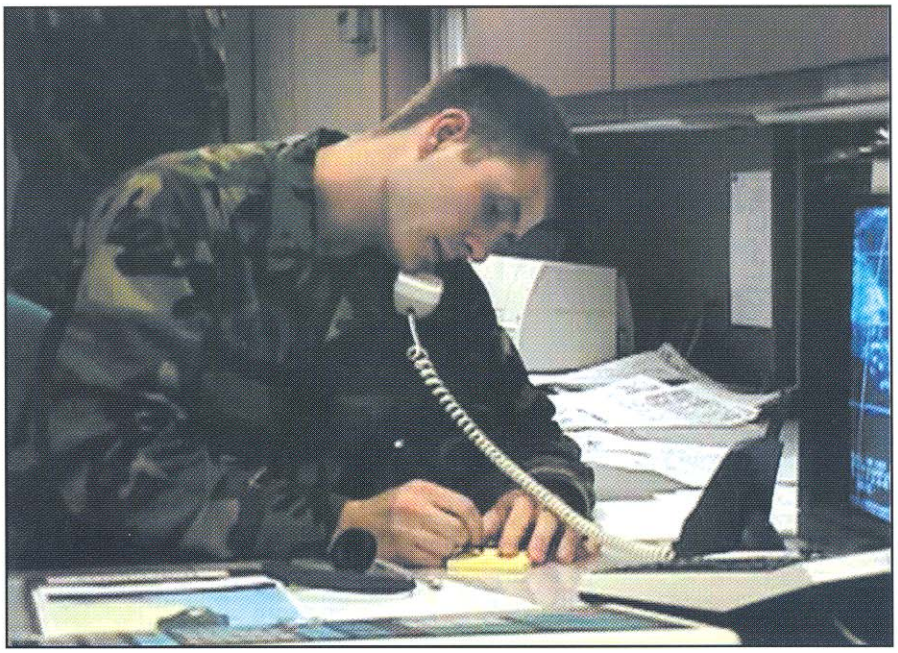
A Combat Weatherman makes a static line jump.

Editorial:

CWTs and OWSs—

Making it Happen for Air Force Weather

By Senior Master Sgt. Salinda Larabee
Policy and Procedures Division
Director of Weather



2nd Lt Jonathan Mason of the McChord AFB CWT takes notes on the upcoming weather warning being issued by the 25th OWS.

It's one of those sad facts of life—bad news spreads a lot faster than good news.

One study showed that when a person has a bad experience, they told friends, and the friends passed it on to their friends. In the end, up to 100 people heard the story of how the original person had a bad experience and it was exaggerated to extreme proportions.

Another fact of life is that the success of Air Force Weather reengineering becomes tarnished every time a single person, much less 100 people, hear a negative story about an OWS or a particular CWT. We've all heard that strong communication and teamwork are the cornerstones of reengineering; it's true!

It doesn't matter whether you're at an OWS or a CWT, you can enhance positive communications by following a few fundamental techniques.

The only way to get the best of an argument is to avoid it. When faced with a forecast challenge and a difference of opinion, first ask yourself, "is it operationally significant?" If it is, then pursue your position with tact and sound reasoning. If it isn't operationally significant, drop the discussion. Does it really matter that the forecast high temperature is off by a single degree? Don't sweat the small stuff.

Show respect for the other person's opinions. Never say, "You're wrong." Have you ever met a person who has never blown a forecast? Use the forecast discussion as a training opportunity for the person you think is wrong. You may find out that you learn a little something in the exchange and they may not be so "wrong" as you first thought.

If you are wrong, admit it quickly and emphatically. You'll find this honesty will take you a long way the next time you have a difference of opinion with another forecaster.

Honestly try to see things from the other person's point of view. We all have different experiences and levels of training. Sharing those experiences with each other is a win-win situation for all involved, especially as the new weather Journeymen from the abbreviated weather school come on board.

Try some empathy. Where would you prefer to work? OWS technicians work an incredibly tough rotating shift schedule where every minute is busy and every decision scrutinized. CWT technicians have an unpredictable life and work long hours with extremely limited resources. These are tough times in the career field—no single weather technician has an easy job and frustrations are high. By placing yourself in the other person's shoes, you may find that you understand their constraints and can give a little support where it's needed. It will be greatly appreciated!

See CWTS and OWS s page 26

21st Operations Support Squadron Weather Flight

By Capt. Frank Tersigini
21 OSS/OSW

Nestled at the base of Colorado's majestic Rocky Mountains is an Air Force weather flight with a uniquely challenging mission. In addition to the usual weather flight functions for Peterson AFB, this flight performs a number of other functions to support United States Space Command, North American Aerospace Defense Command (NORAD), and Air Force Space Command.

Forecasters and staff at this base weather station not only monitor weather conditions at dozens of sites worldwide, but also gauge how solar activity affects radar, communications, and satellite systems. Essentially, they monitor terrestrial and space weather for a true mud-to-sun mission support posture.

The unique character of this flight doesn't stop there. Besides the usual AEF contingency support, they deploy a member to a Trans-Atlantic Abort Landing site every time NASA launches a space shuttle. The flight also provides all the usual weather station services for Schriever AFB, Cheyenne Mountain Air Force Station , Det 1, 7th OSS in La Junta, Col.; as well as after-hours support for Fort Carson, Col. and the United States Air Force Academy. Put all this together and finally you are getting close to describing the Peterson AFB weather flight.

In 1994, both Cheyenne Mountain and the 50th Space Wing at Schriever AFB had their own weather support units. The AFSPC weather functional manager provided daily weather support to the commander-in-chief of NORAD, USSPACE, and AFSPC. Then came the realities of Air Force downsizing.

Today, the 21st Space Wing owns all these functions, and more. Along with the increased support responsibility came organizational challenges, additional training requirements, and the opportunity to support a diverse customer base—each with their own unique needs.

The Peterson AFB weather flight is an integral part of the 21st Operations Support Squadron with a chain of command through the 21st Operations Group, 21st Space Wing, and 14th Air Force to Headquarters Air Force Space Command. All echelons, with the exception of 14th Air Force at Vandenberg AFB, Calif., are at Peterson Air Force Base.

The mission of the flight's 20 members is to provide decision-makers with timely, accurate space environment and terrestrial weather information.

To accomplish this mission, the flight operates two 24-hour, seven-day-a week duty sections: an aviation weather forecast section and a NORAD support section.

The aviation section provides aircrew briefings and local resource protection. They complete their work with the typical assortment of equipment including ASOS, AWDS, a NEXRAD PUP, lightning detection system, and the Internet. They also have access to a Low-Level Wind shear Alert System operated by the FAA. The airfield is shared with the Colorado

Springs Airport and has one of the United States' busiest distinguished visitor schedules.

The NORAD support section provides continual space environmental and terrestrial weather awareness to the NORAD Command Director—the person responsible for assessing possible threats to North America whether by air or space. They accomplish this with an assortment of communications and equipment capabilities. Primary means include NIPRnet and SIPRnet terminals, AWDS, a NORAD classified remote briefing terminal, a Cheyenne Mountain Operations Center weather information display running continuously at CMOC via a dedicated T1 circuit, and a classified voice communication circuit, also known as the "operations loop," linking the section directly to all work centers at CMOC.

The Peterson weather team understands the importance of environmental phenomena, both space and terrestrial, and its potential impacts to DoD ground and space-based systems. They must account for all environmental factors, from mud to sun.

Essentially, the NORAD forecaster is a Cheyenne Mountain Operations Center crew member. This crew member monitors airfield conditions at NORAD alert bases, as well as weather conditions for dozens of worldwide NORAD collateral sites that provide integrated missile warning, space control, air defense, and counter-narcotics information essential to the defense of North America. Additionally, support is provided to 14th Air Force weather staff via daily briefings encompassing space and terrestrial weather data.

As mentioned, the support is not limited to tropospheric weather. The NORAD forecaster uses forecasts, bulletins, and graphical products from various agencies including AFWA, 55th Space Weather Squadron, and the NOAA Space Environment Center to monitor solar phenomena such as flares, high-energy particle flows, and solar bursts of energy emitted within various frequency bands. Near-earth phenomena such as geomagnetic storms, meteor showers, and atmospheric refractive conditions are also tracked.

All of this data is necessary for the forecaster to provide the NORAD Command Director with a complete picture of environmental effects upon military operations. In fact, flight personnel have less than three minutes after notification by the NORAD Command Director to determine whether the space or terrestrial environment played a role in causing unexplained upsets to radar, communication, or satellite systems. The forecaster sitting in the NORAD support "hot seat" cannot afford to view space weather and tropospheric weather as independent phenomena. They must fuse all data inputs and effectively assess a completely integrated environmental picture.

The fused space and terrestrial weather focus does not stop at the operations support level. 21st OSS/OSW staff personnel provide daily CINC briefings to three commands and 21st Space Wing leadership. The briefings are an integrated picture of environmental conditions including both space and terrestrial weather data. An additional part of their responsibility is to provide environmental support to the USSPACE Mobile Consolidated Command Center, which manages both U.S. and NORAD forces in times of conflict.

Not surprisingly, the flight earned the Williams Award in 1999 recognizing it as the best weather flight in Air Force Space Command. For the 21st OSS weather flight, the mud and the sun are indeed their only boundaries.

Team Combat Weather Center...YOUR TEAM!

By Team AFCWC

Air Force Weather Reengineering initiatives have levied many challenges to all Air Force Weather units as they boldly marched toward the year 2000. Likewise, the Air Force Combat Weather Center and its Operating Locations at White Sands Missile Range, N. M., and Camp Blanding, Fla., received a new mission charter, in February 1998, resulting in changes to structure, personnel, and resources. AFCWC's new charter is to act as a proponent for all Combat Weather Teams. The Chief of Staff Air Force, through HQ AF/XOW titled AFCWC as the USAF Center of Excellence for all Combat Weather Team operational issues and in turn, appointed AFCWC as an official AFW reengeneering test bed for CWT initiatives.

The major emphasis associated with test bed responsibilities is the successful infusion of new and innovative technologies to CWTs. As a "Reinvention Laboratory," AFCWC provides the Air Force Weather career field with a systematic means to examine weather warfighting needs, explore new ideas, and test emerging technologies. AFCWC works closely with DoD Battlelabs, MAJCOMs, Army MACOMs, Electronic Systems Center Program Managers, Army Research Lab Program Directors, AFWA Project Directors, and a host of vendors and contractors. AFCWC is responsible for developing, evaluating, testing and transitioning new technologies to the Air Force Combat Weather Teams of tomorrow.

These new technologies can be categorized into two types: AF/Army Standard Systems and Commercial and Non-developmental Items equipment or systems. AFCWC is heavily engaged with technology research and exploitation under the Forecast System 21st Century and the Observing System 21st Century umbrellas. Additionally, AFCWC plays a key role to the Army's Integrated Meteorological System (IMETS)/ Weather Effects Workstation, Very Small Aperture Terminal/Tactical VSAT programs, as well as other reengineering initiatives.

So, one may ask, what exactly is AFCWC doing?

TEST and EVALUATION:

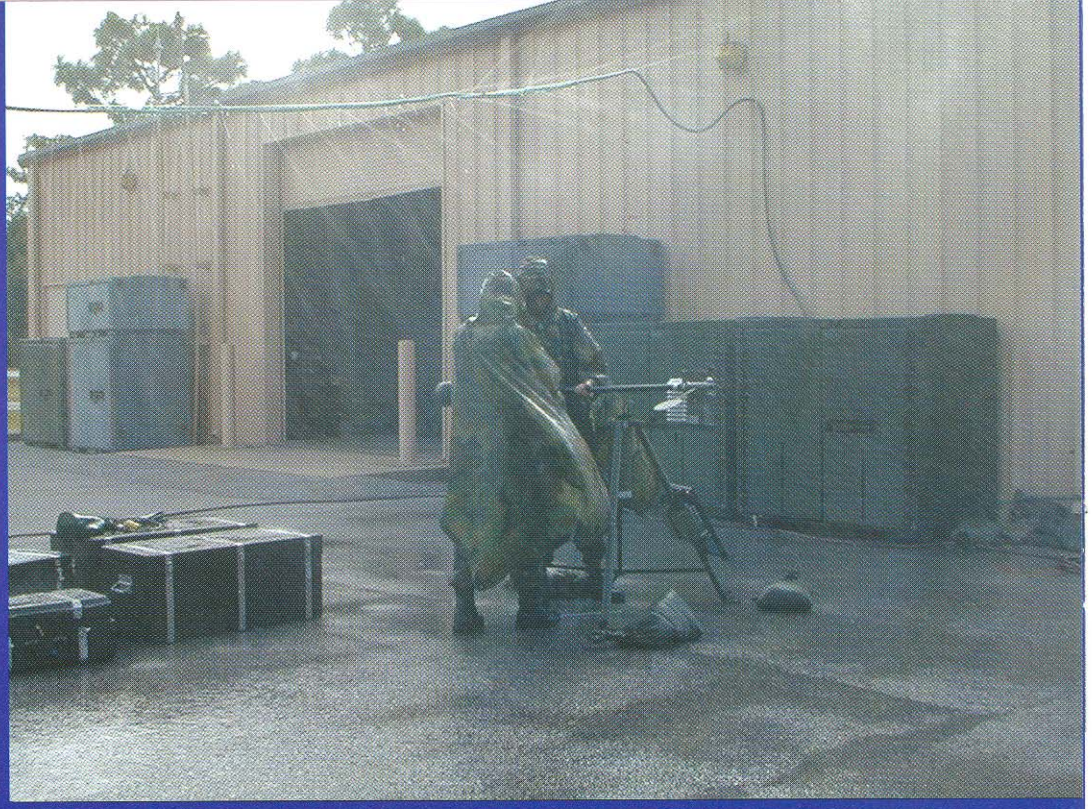
AN/TMQ-53, Tactical Meteorological Observing System (TMOS)

AFCWC has worked in the development of the TMOS, originally TACMET Mod, and acted as lead agent for the Operational Test and Evaluation of the system. AFCWC led a 12-person, multiple-MAJCOM team during the two-week assessment that resulted in numerous hardware and software changes. Nearly 95 percent of recommended changes were accepted and implemented prior to final production, ultimately creating a more CWT-friendly system. The AN/TMQ-53s began fielding in September 2000.

The Automated Observing System software, capable of displaying and taking full advantage of the multiple sensors incorporated into the TMOS, is currently being developed. This software is a significantly modified and improved version over the one being fielded at fixed Air Force and Army locations. Part of this development includes the creation of an automated or augmented METAR/SPECI observation that can be automatically forwarded to the Tinker Weather Network. The user interface and data assimilation concepts were developed by AFCWC and AFWA, and are currently undergoing extensive testing by AFCWC at Hurlburt Field. This new software should be fielded in conjunction with the next version of the New Tactical Forecast System /Advanced Meteorological Information System by the end of the year.

To help the CWT community prior to the fielding of AOS, AFCWC developed a new version of the "AutoObs" software. This software, fielded with each TMOS, creates an automated or augmented observa-

tion generation capability to fill the gap until AOS is released. "AutoObs" originally was developed for use with the "WeatherScene" sensor equipment, a commercial version of the USSOCOM Remote Miniature Weather Station (RMWS) program, being used operationally in Kuwait. With the AFCWC software, WeatherScene automatically sends an abbreviated METAR observation to the Tinker Weather Network every 20 minutes. The TMOS version of "AutoObs" will take both METAR and SPECI observations, can function either in automated or user-augmented roles, can send observations to Tinker and three other networked locations, and can generate a webpage and send it as well.



CWC members simulate weather conditions, testing TMOS capabilities and durability.

AFCWC is also working with the TMOS leads and developers of the RMWS in adding a low-earth orbit data transmission capability to the AN/TMQ-53. This remote transmission feature will use the same ORMCOMM commercial satellite system as the RMWS to allow for distant communications when a network connection is not available. AFCWC is helping assemble a data requirement package for this new feature on the data compression and interface specification. The existing Command and Control Software and RMWS Relay software will be modified to add the new TMOS capabilities for remote sensor and data transmission control, as well as METAR observation generation and forwarding capabilities.

New Tactical Forecast System (NTFS)/Advanced Meteorological Information System

Say goodbye to the Automated Weather Distribution System look and feel and say hello to AMIS. AFCWC is lead test agency for the NTFS/AMIS enterprise and continues to work on fielded versions and future releases of the NTFS/AMIS. AFCWC brought a year's worth of effort to fruition in leading a 15-person, multiple-MAJCOM test and evaluation team through a rigorous Operational Certification, interim process prior to OT&E. Sights are now set on leading a 12-person team through OT&E of NTFS 2.0/ AMIS 3.1, scheduled to be tested in Europe during November 2000. The AMIS 3.1 software release will provide weather operators sophisticated meteorological tools with advanced technology to conduct their missions. The new and improved graphical user interface will field with the look and feel requested by CWTs.

IMETS 6.X Development and Testing

AFCWC, in concert with the Army Research Laboratory, has been working hard to test and field the next-generation IMETS. The new IMETS software, called IMETS 6.2, is due to replace the legacy systems starting in 2001. The new weather applications software will allow the weather operator to take the output of weather applications, plot the specific effects of weather upon a Common Operating Picture, and ship the output to other Army Battle Command Systems. As the US Army marches forward in their quest to digitize the Command and Control systems within the Tactical Operations Centers, so will IMETS continue to be integrally involved with providing specific effects of weather, overlaid upon Army missions.

Collapsible T-VSAT

Together with ESC and AFWA, AFCWC hosted a vendor source selection for a collapsible, lightweight T-VSAT solution. Vendors demonstrated the latest in commercial off-the-shelf technology as the source selection team evaluated potential systems for CWT operations. The major goal is to transition a collapsible, lightweight, easily transportable T-VSAT solution to AFW. Source selection has been accomplished and two collapsible T-VSAT antennas have been purchased. Testing and exploitation of this initiative will continue.

TRAINING:

AN/TMQ-53 TMOS

During August 2000, AFCWC personnel developed the initial fielding training package, then conducted Mobile Training Team Instructor training on the TMOS. Over 15 personnel from four MAJCOMs received this three-day training course and in turn will assist in the training of CWTs on the newly fielded TMOS systems. During September 2000, AFCWC and 31 CCS/CYW (WSSC-West) personnel deployed to Sembach, Germany to field the first four TMOS's and successfully accomplished fielding training to 13 USAFE weather and WSSC personnel. Over 50 TMOS's will be fielded to operational weather units over the next three months.

Just-In-Time Training

AFCWC began the JITT program in July 2000. The courses were developed in response to a litany of CWT requests for "refresher training" on selective AFW standard systems. The goal is to provide user-requested training, when they need it, as to help alleviate training deficiencies due to high operations tempo and personnel turnover rates. Classes are conducted two weeks each month and tailored to the requests from the field. The first three months of JITT consisted of training on the IMETS/WEW and the T-VSAT. As of September 30th, 17 weather personnel from various units, such as Fort Campbell, Fort Stewart, and Fort Polk, have received training. Also, AFCWC is ready to provide JITT on other systems such as the AN-TMQ53, Remote Miniature Weather Station, and Quick Reaction Communications Terminal III.

SOF Training

During July 2000, AFCWC personnel responded to a 10th CWS (AFSOC) request to train 30 Special Operations Weather personnel on the RMWS and T-VSAT systems.

Operating Location Alpha (OL-A), Camp Blanding Florida

OL-A, AFCWC is located at Camp Blanding, Starke, Florida. OL-A currently has one position that serves as the active duty liaison to the Air National Guard Weather Readiness Training Center. The Operating Location plans to bring two more active duty instructors on board by the end of November. Current duties include keeping the Air National Guard abreast of changes in the weather operations arena. This includes equipment and procedures. The three-person cadre assigned will also be instructors for the Air National Guard follow on training program. The instructors primary block of instruction is block IV Tactical Weather Operations. The students in this block will be from active units and Air National Guard units as well as Navy personnel. This will provide an excellent opportunity for Total Force as well as Joint Operations Training.

EXERCISES:

JCF AWE 2000 Fort Polk

This forum provided the first large-scale effort, to test the Army's Digital systems and link them together into Command and Control TOCS. For the IMETS 6.X system, the experiment provided the perfect opportunity for the Fort Drum Combat Weather Teams to use the IMETS 6.X and TVSAT systems at both the Aviation Brigade and the Division Assault Command Post positions. Army operators learned to fuse the specific effects of weather upon their specific missions. Also, nearly 40 US Army flag officers and nearly 100 distinguished visitors received briefings on the IMETS system by AFCWC Liaison Officer.

JCF AWE 2000 (Fort Bragg)

Another "first" for IMETS during the JCF AWE was its use at the Joint Task Force level in the Joint Operations Center, Ft Bragg, NC. On 5 Sep 00 the Joint Task Force Headquarters transitioned from the 2nd Fleet (JTF-2) to the XVIII ABC. The XVIII ABC

SWO used both the Joint Forces Command webpage and the IMETS to support decision-makers in the JOC and CWTs at Fort Polk. The combined weather products contributed to a successful critical paradrop mission in threatening weather conditions in the early entry phase of the AWE.

JEFX 2000

Provided Interactive Weather Effects Decision Aids products focusing on the weather effects on both ground and air component weapon systems. Visualizations based on live data were made available to the Combined Air Operations Center on a prototype of the Integrated Meteorological System-Light over SIPRNET. The Joint Forces Air Component Commander was able to incorporate weather effects on joint forces during both the planning and execution phases of the experiment.

VENETO RESCUE

AFCWC in conjunction with Det 12, 7th WS (USAFE) CWT personnel tested the capabilities of the AN-PSC5 MILSATCOM Radio (Spitfire) and MILSATCOM DAMA Channels to transmit and receive weather information. The primary goal of the Det 12, 7th WS personnel was to download pre-coordinated weather products using the AN-PSC5. Det 12 personnel parachuted into the exercise AOR (Europe) with the PSC5s, setup and established connectivity with a simulated Operation Weather Squadron (AFCWC in CONUS). The effort provided all involved valuable knowledge and understanding of this enterprise and AFCWC will continue to test, evaluate, and infuse this technology into AFW.

PENTAGON OPERATION SUCCESS

OPERATION SUCCESS represented a weeklong effort by the Program Executive Office for US Army Command, Control, and Communications to showcase the emerging, tactical, interoperable C3S systems into the next millenium. AFCWC demonstrated the crucial weather capabilities that Air Force Weather brings to the US Army through the IMETS 6.X system.

CWTS and OWSs cont. from page 20

Most CWT-OWS communications occur via the telephone. Have you evaluated your telephone skills lately?

Be aware. A casual attitude can undermine your efforts. Your undivided attention to the conversation at hand can prevent relaying unintentional "signals" that you aren't really in tune with the other person. No one likes to be blown off. Pay attention to the conversation as if the world depended on it—your world does, whether it be at the OWS or CWT, for those few short minutes of the forecast discussion.

Get organized. Keep your worksheets, weather information, and a writing utensil at your fingertips so you can answer questions and refer to pertinent weather data as needed. Fumbling around looking for things and sounding disorganized throws a shadow on your credibility.

Be prepared. When the call comes to discuss a forecast issue, don't count on being able to remember everything—if necessary, write a script. The script can be a list of bulleted items you want to make sure are covered, or it may be as detailed as the exact phrasing you wish to use during discussions. Avoid the embarrassing moments when you finish the forecast discussion and realize that there was one more thing you wished the discussion covered.

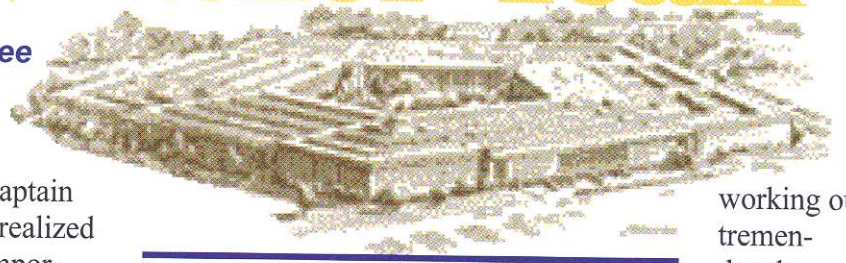
Review and confirm your agreements on the forecast. Repeat back to the other party the understanding you've come to agree upon. This overview of the forecast may prevent any confusion on the issues at hand and if nothing else, cements the conversation in each person's mind.

Reengineering will succeed, but excellent communication skills between all the players at the CWTs and OWSs make it even easier. Now is a good time to ask yourself—do I communicate effectively and most importantly, can I improve?

Air Force Weather is counting that you can, and do communicate and improve.

The Chief's Own Combat Weather Team

By Senior Master Sgt. Salinda Larabee
Policy and Procedures Division
Director of Weather



Within the winding corridors of the Pentagon is an operations-focused combat weather team that has the distinction of working directly for the Chief of Staff, General Michael Ryan. Hence the name, "The Chief's Own CWT".

It sounds impressive, and indeed it is. The CWT, a division within the Air Force Operations Group at the Pentagon, consists of 13 personnel. Six work at Operating Location A in Pennsylvania. On a daily basis, they are called upon to answer detailed questions regarding weather conditions and effects worldwide. They support the Deputy Chief of Staff for Air and Space Operations, the Headquarters Air Force Crisis Action Team, the National Military Command Center and the White House.

When a CAT convenes, life becomes very intense with questions fired from all directions by the military's top decision-makers. The decisions resolved from the weather briefings are not much different from other levels of command, but their impacts help shape the future direction of Air Force operations.

Capt. Steve Callis, one of the shift leaders, remembers a particular night shift during Operation ALLIED FORCE. He prepared a routine weather impacts slide for a CAT briefing, never thinking twice about it. He went home to bed and still remembers his surprise when he woke up, turned on the news, and saw Lt. Gen. Wald, Vice Director for Strategic Plans and Policy for the Joint Staff, briefing a version of his weather slide on CNN. That's when the Captain truly realized the importance of his job.

"I was amazed! Can you imagine the weather slide I thought no one else paid much attention to being briefed by a 3-star General on national T.V?" Callis said.

> "It's a great opportunity to see how leaders of our nation and the Air Force guide our future. It gives me a new appreciation and understanding of how our military, and the Air Force in particular, operates,"
>
> Tech. Sgt. Kirk Bailey
> Operating Location A

The Captain has never underestimated the magnitude of his work again. Nor does anyone else assigned to the Chief's Own CWT.

"It's a great opportunity to see how leaders of our nation and the Air Force guide our future. It gives me a new appreciation and understanding of how our military, and the Air Force in particular, operates," said one of only two enlisted forecasters assigned to the unit, Tech. Sgt. Kirk Bailey.

"The part I like best, is that every day brings something new and exciting!" Bailey said

Bailey is right at home in the highly visible, fast-paced environment. He and Tech. Sgt. Ani Stubbs were recently handpicked, via special duty assignment, to bring their technical talents to the mission. It's the first time enlisted forecasters have been stationed at the Pentagon. The mix is working out tremendously according to the Weather Operations Division Chief, Maj. Andy Terzakis.

"Tech. Sgt. Bailey and Tech. Sgt. Stubbs bring a complete set of talents to the team. They're operationally focused, experienced and are well trained to apply the appropriate forecasting tools to the situation," said Terzakis.

The seven person team work with the typical weather person's tools: a NEXRAD radar, the Automated Weather Distribution System a New Tactical Forecast System as well as web-based products. Due to the worldwide focus, however, they rely heavily on the products of other forecast agencies. The goal, "one operation, one forecast", requires coordination beyond the typical scope of a CWT.

"In part we are a collection agency," said Terzakis.

"We coordinate forecast products with the appropriate Operational Weather Squadron, unified command weather staff, or deployed weather personnel and

then package the information for the daily situational awareness briefings to the Air Staff. Obviously, we require assistance from the entire Air Force Weather team to stay on top of local effects around the world and to present a consistent forecast," he said.

Representing weather operations at the tip of the Air Force information spear requires frequent briefings to senior Air Force leaders.

"It's a great opportunity for all of us to really show what the weather community can do," said Capt. P.J. Yuson, a recent arrival to the team.

At the Pentagon, the visibility the forecasters receive is apparent. It begins each day at 5:45 a.m. with a detailed weather briefing to the Director of Weather and his staff. Brig. Gen. Johnson receives an update on the hot spots of the world since he could be called upon at any moment to answer a weather-related question. The CWT's slides are then briefed up the chain of command, ultimately to the Air Force Chief of Staff. Forecasters also provide worldwide travel weather packages for Service Chiefs, Cabinet Officials, and Congressional Delegations. During periods impending severe weather, such as winter storms, they are called upon by the Air Force Vice Chief of Staff to provide a weather input as part of the decision to curtail or cancel work—which could impact over 30,000 government workers in the National Capital Region. A "spot-on" forecast can save over a million dollars in otherwise lost productivity.

At OL-A, weather personnel provide highly specialized operational and tactical weather support to the White House and Camp David. Their mission defines the word "joint." OL-A is an Air Force operation staffed with both Air Force and Navy forecasters and observers who work on Army and Navy installations in direct support of Marine One helicopter crews transporting the Commander-in-Chief to and from Camp David. Their operations surge while he is on site, such as last summer during the Middle East Peace talks. At other times, OL-A focuses its attention on daily weather support of the White House Military Office, the Army at Fort Detrick, the Naval Support Facility in Thurmont, Md. and various elements at the Pentagon.

"It's truly a unique and challenging opportunity to coordinate with, work for, and provide support to organizations spanning across all the services. I know there are not many other CWTs that can say they work with and for four military departments. We are an outstanding example of Navy-Air Force cooperation," said the OIC of OL-A, Capt. Tim Hall

The assignment at OL-A is "perhaps one of the best kept secrets in Air Force Weather," Hall said

Although all the weather people assigned to the Chief's Own, whether in the Pentagon or at OL-A, are far away from the general public's eye, the role they play is one of the most highly visible in the world. Where else can you say, "The President's staff called for a weather forecast today?"

Back to Basics... The Unit Snack Bar

By Lt. Col. Robert Thorp
Inspector General, Air Force Weather Agency

Have you ever been faced with procuring a shadow box for a retirement or flowers for a going away dinner? These events don't lend themselves to the use of government funds. So where does the money come from? The unit snack

Under AFI 34-223, unit snack bars are unofficial activities with limited assets. Specifically, unit coffee funds, flower funds, and soda funds fall into this category and are not considered "private organizations."

Snack bar funds must comply with all federal, state, and local laws governing such activities including federal tax laws. If you decide to locate earnings from these activities, any interest accumulated must be reported to the IRS. We would suggest you use only non-interest bearing accounts.

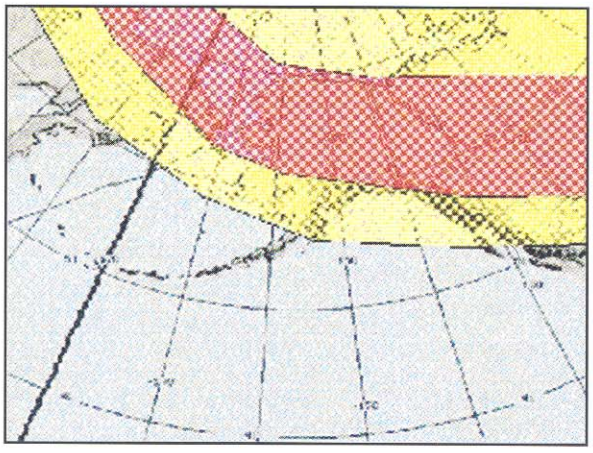
Use common sense when establishing your activities. Limit the worth of the activity to $1000 over a three month period (including the worth of the goods on hand), purchase the items for your activity outside your duty hours, and post a letter from the commander authorizing the activity where the goods are sold. Remember, if in doubt, consult with the experts that can guide you in the right direction.

11th OWS cont. from page 13

has for years supported the highly visible search and rescue mission of the RCC with terrestrial weather, but until now, we have never been able to support them with space weather. Now we provide support by tailoring the space environment outlook product available via AFWIN to our area of responsibility. Using this tailored product, the RCC can ascertain which type of communications has a higher probability of properly working. Feedback on this product has been very positive. The customer stated after one successful rescue mission, "using the chart, we gained a higher degree of confidence that HF would be effective in accomplishing the mission."

In order to facilitate meeting future customer requirements, we defined, with the assistance of the 55 SWXS, a comprehensive support action request process. As a part of the process, a detailed request form was developed to accurately and thoroughly address a customer's requirement.

You may ask, "What things should be identified in the request form?" The requirement must establish how the product will help the unit accomplish its mission. Next, identify the space weather phenomena or customer mission you need covered (fore example: high frequency communications covering the frequency range from 3 to30 MHz). Establish thresholds that may be used as color schemes in the finished product, to alert the user to approaching critical thresholds. Give an impact statement about how the lack of the product will degrade the unit's mission.



The 611th ACS, now available on AFWIN, can now predict the effectiveness of satellites for communications.

Find out the frequency your customer needs the product updated, once a day or once of week? Give them an idea about format such as color charts or black and white lines. And don't forget to include a date the product is required by.

Hopefully, these few steps I've outlined above will help you establish your space weather program and provide some brainstorming material for potential customers and products. No magical process must be followed for your support to evolve. Do not be intimidated by tackling what may appear to be an enormous task of tracking down users. Once the word gets out that you are working to help customers understand and mitigate space weather impacts, they will come looking for you. Space weather support is vital and has a direct link to military operations allowing the Air Force to ensure successful attainment of one of our core competencies — air and space superiority. If operational users are aware of the potential for solar activity to degrade the performance of their systems and that the weather community is poised and ready to provide space environmental support to help minimize these impacts improved rapport between the operational user and the weather community will naturally develop. Integrating space weather products into your customers daily operations is the bottom line.

If you have any questions, please feel free to contact me, Capt De Leon C. Narcisse, at DSN 317-552-3014 or via e-mail at deleon.narcisse@elmendorf.af.mil or the 55 SWXS POC, Capt. Kelly Law, at DSN 560-6954, kelly.law@schriever.af.mil.

Why is Forecasting so Difficult?

Consider a rotating spherical envelope of a mixture of gases – occasionally murky and always somewhat viscous.

Place it around an astronomical object nearly 8000 miles in diameter.

Tilt the whole system back and forth with respect to its source of heat and light.

Freeze it at the poles of its axis of rotation and intensely heat it in the middle.

Cover most of the surface of the sphere with a liquid that continually feeds moisture into the atmosphere.

Subject the whole to tidal forces induced by the sun and a captive satellite.

Then try to predict the conditions of one small portion of that atmosphere for a period of one to several days in advance.

— Author Unknown

News:

Thunderstorms Blast Kelly

By Karen Edge
San Antonio Air Logistics Center Public Affairs

Ferocious winds gusting up to 59 mph tore through Kelly Air Force Base Nov. 5, doing severe damage to base property. Two buildings were completely demolished, at least 12 buildings were damaged, and many trees were uprooted or split in half by the winds.

Building 1564/1565, a combined warehouse, received the most noticeable damage, when the wind gusts blew their way in and forced new ways out. The windows were shattered and walls toppled.

Inside was all the turned-in office supplies, including computers, lumber, office furniture and more. These items were being stored as part of the base's closure and realignment preparations. The torrential rains accompanying the winds then soaked everything housed in the building.

Buildings in the 1500 area on Kelly AFB are mostly warehouses.

A dollar estimate has yet to be calculated for the building but base officials are compiling information.

There was speculation around the base that a tornado had done the damage. But reinforcing the 59-mph wind gusts, Kelly's weather control center said no tornadoes registered on its radar.

"We have a weather radar that uses algorithm to calculate winds, based on how close they are together going in opposite directions — a speed couplet, that will alert us to a tornado," said Master Sgt. Greg Bond. "The winds came from one consistent direction — straight from the west. If you look at the way the debris and trees fell, you will see everything ended up in an easterly pattern. A tornado would not leave debris in such a consistent, straight line."

Staff Sgt. Edward Puttbrese was working in the weather center during the storm and said it was "awesome."

"Our radar rarely misses a tornado. Sometimes it says we have one when we don't because it is so sensitive, but the percentage of not calculating a tornado is too small," Puttbrese said. "We had what is called a microburst. A microburst results when a storm loses all its mass and dumps all its water at once."

Puttbrese said that once the storm loses all its mass it creates a huge downdraft of wind, and the only place it can go is to the ground and it can only go in one direction. This is what weather center officials said happened.

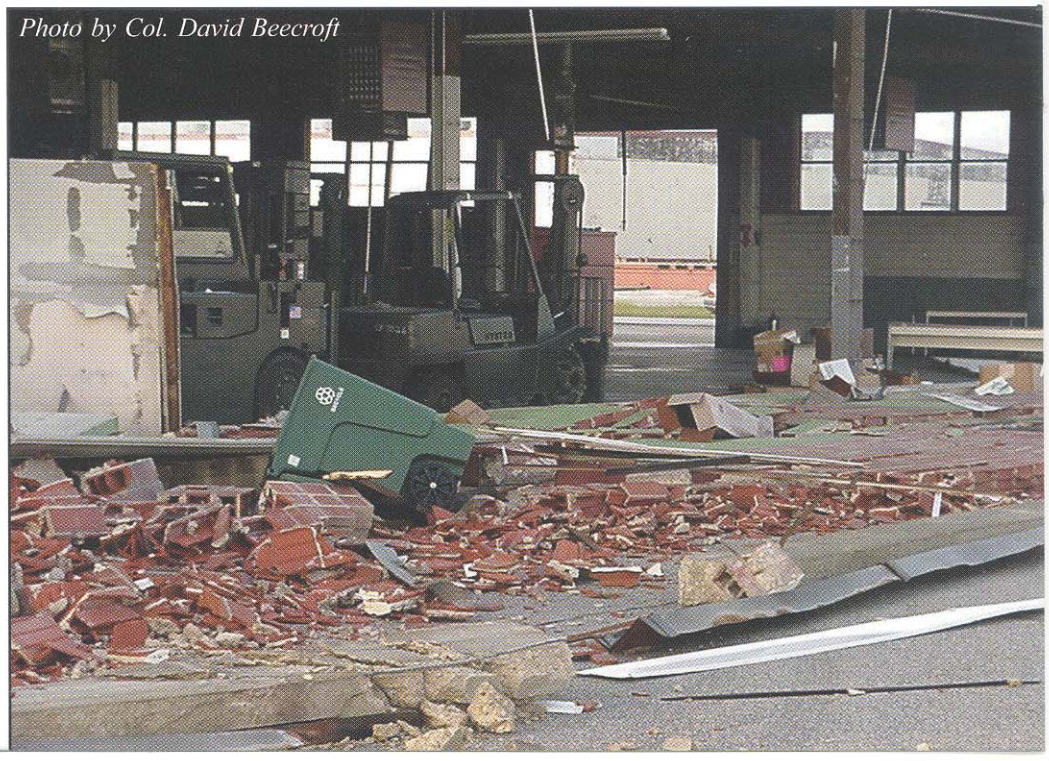
"We are 99.9 percent sure that we did not have any tornadoes on base last night," Bond said.

Several trees were downed in Billy Mitchell Village, Kelly's enlisted housing area, but only minor damage was done. The Kelly Golf Course lost most of its netting at the driving range; a dorm lost rain gutters; base parks had many tree limbs downed; communication lines were brought down; the dining facility lost parts of its roof and received water damage. A hangar on main base had a 20 by 40-foot section of roof torn off by the wind and debris was scattered across the base. The Kelly commissary lost its generator and has had to throw away anything that lost refrigeration during the power outage on base.

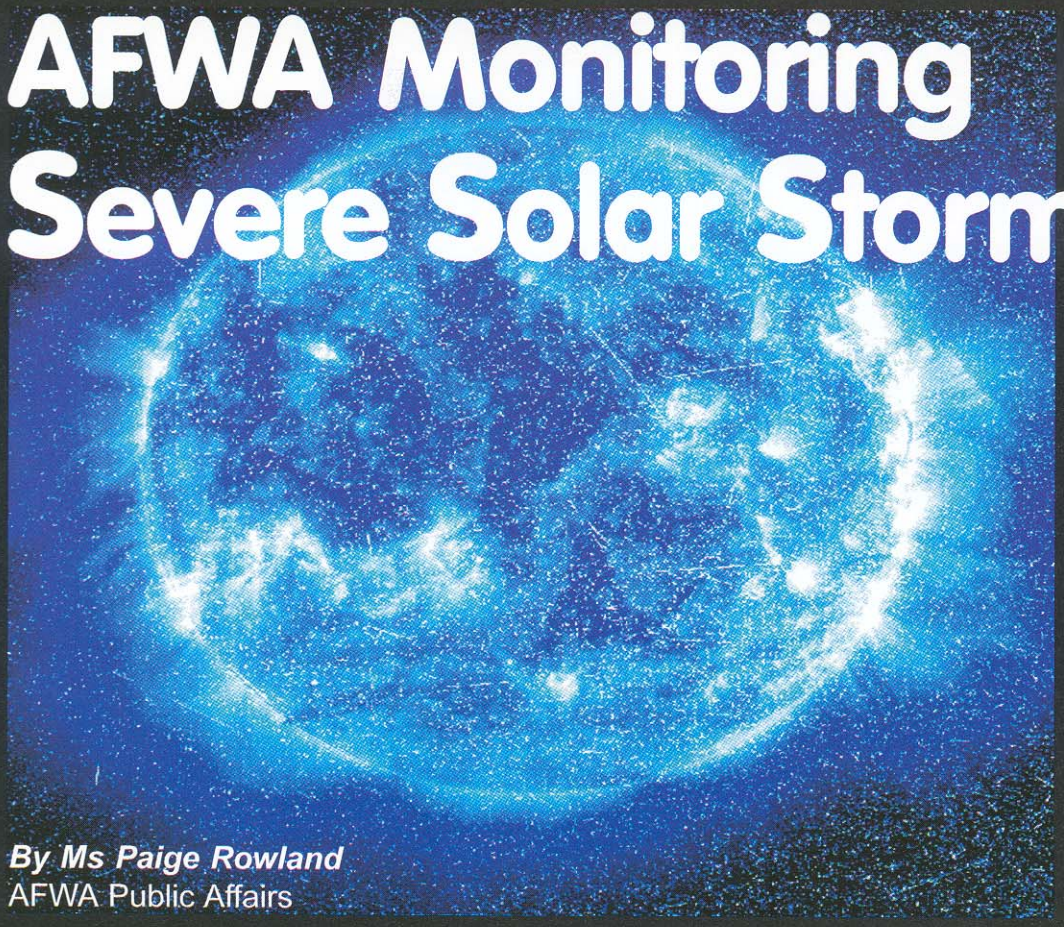
Kelly Air Force Base, Texas (AFPN)

Ferocious winds gusting up to 59 mph tore through Kelly Air Force Base, Texas, Nov. 5, causing severe damage to base property. Building 1564/1565, a combined warehouse, received the most noticeable damage, when the wind gusts shattered windows and toppled walls.

Photo by Col. David Beecroft



AFWA Monitoring Severe Solar Storm



An EIT FE IX/X 171 Angstrom, acquired from SOHO - Solar Helio-spheric Observatory. Solar Analyst use this type of image to discern magnetic and radiative energy features which are linked to phenomena which affect the near earth environment and our space platforms, i.e. satellites and the new ISS International Space Station. The grainy appearance of this image with its pocks and strikes indicate that the sensor is being saturated by high energy protons. Some of our other sensing tools where completely obscured.

By Ms Paige Rowland
AFWA Public Affairs

Space weather forecasters at the 55th Space Weather Squadron, Schriever Air Force Base, Colo., a unit under the command of Air Force Weather Agency, monitored a severe solar radiation storm that erupted Nov. 8 effecting some satellite operations.

"A flare erupted from the sun Wednesday evening," said Tech. Sgt. Robert J. Joyce, crew chief and space weather forecaster. "This event was so energetic that many of our sensing instruments were saturated moments after the flare erupted."

A number of space weather forecast products, including an initial warning, were sent to various Department of Defense agencies. "We issued a space weather advisory three minutes after we recorded the burst," said Joyce. "Since the onset, updated products have been sent out every three hours," added Joyce.

According to Capt. Kelly Law, space weather officer, there are typically three types of phenomena associated with flares of the sun. Light energy reaches Earth instantaneously and can impact HF communications. Next, energetic particles, called protons, reach Earth within minutes to hours and can damage satellites, increase radiation in higher altitudes and cause communication outages in the polar caps. Finally, lower energy particles, or electrons, reach Earth hours or days after the flare and cause geomagnetic storming and the aurora borealis.

"Our job is to forecast those events so our DoD customers can determine the impacts to their mission," said Law. One of those products is the high altitude radiation forecast, which warns pilots flying at high altitudes of increased radiation levels. "Our sensors indicated high altitude radiation levels were elevated with this event," said Law.

"Geomagnetic storming peaked early Nov. 10 morning, with particles continuing to impact the near-Earth environment," added Law. "This may cause HF communication problems in the polar regions through the weekend."

Events, like this one, occur 18 to 20 times a year around the peak of the solar maximum. Space weather forecasters expect the solar maximum to take place in the next few months. This solar storm is produced the fourth highest measured proton levels since they began monitoring them in 1978. The highest recorded proton event occurred in March of 1991.

AFWA space weather forecasters analyze and forecast space weather conditions that can adversely affect satellite operations, communications, intelligence collection, GPS navigation, space tracking and high altitude human flight.

Weather Library has Moving Experience

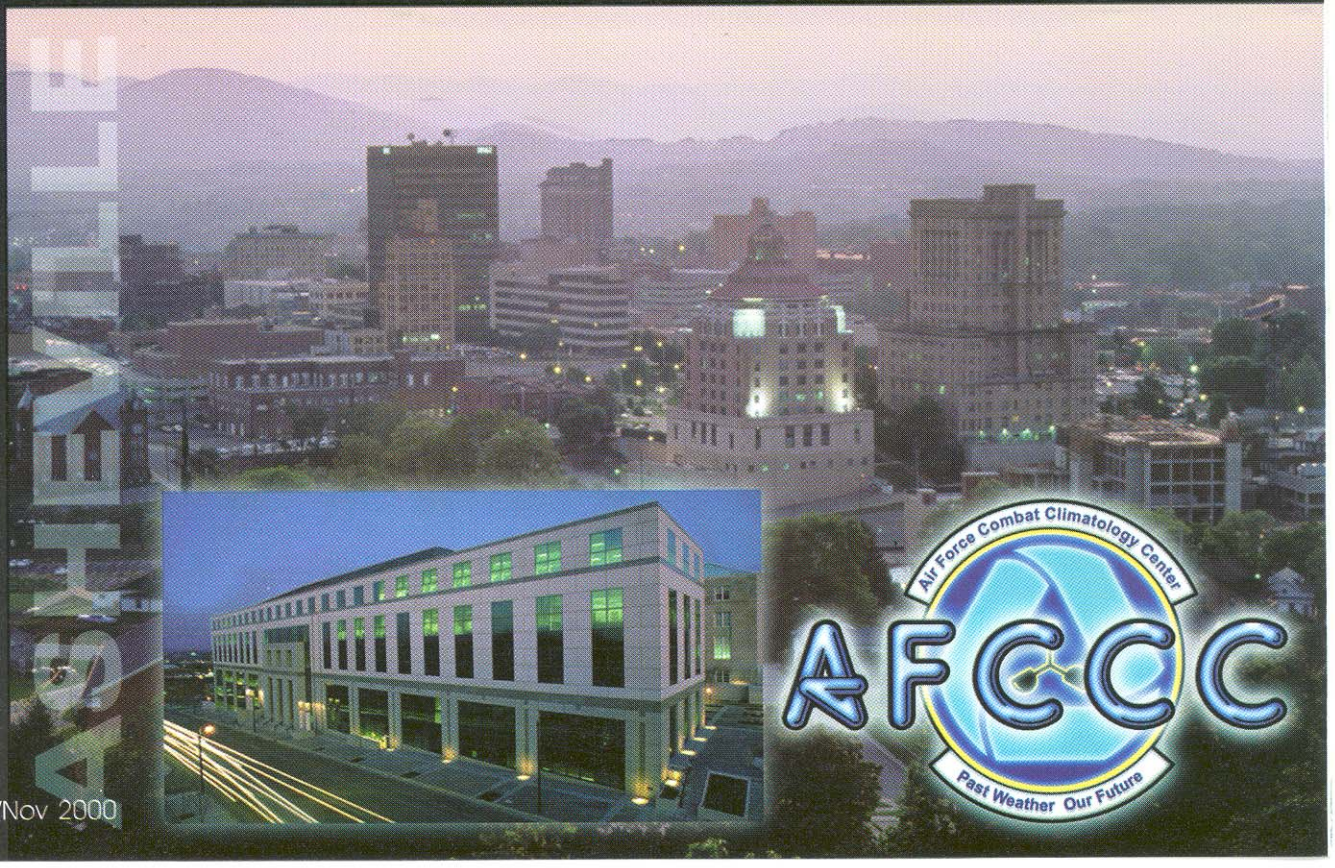
By Ms. Susan Tarbell
Cataloging Librarian

It has been a little over two years since nine large moving vans of over 250,000 volumes of library materials arrived in Asheville, NC from Scott AFB, Ill. The Air Force Weather Technical Library relocated with its parent organization, the Air Force Combat Climatology Center, to the Federal Building in downtown Asheville, N.C. AFCCC merged with its operating location, already located in Asheville, to consolidate the military climatology services. The merger put DoD climatology services in the same building with the National Climatic Data Center.

The AFWTL houses one of the largest collections of atmospheric sciences information in the world. It is the biggest single-site library dedicated to military meteorology and provides scientific and technical information to all Air Force Weather units, other DoD agencies and U.S. Government agencies. As one of 15 technical libraries in the Air Force, AFWTL handles material on meteorology, climatology, weather effects on various systems, related environmental sciences, astrogeophysics, and aerospace topics. The library maintains information sources for these disciplines in sufficient depth and diversity to permit study for both current and historical perspectives. And, the AFWTL staff collectively has over 200 years of library and meteorological experience to very effectively locate resources and interpret the material, if necessary.

The AFWTL is a key resource for the Air Force Weather Agency. It assists AFCCC in the development and production of special climate information used in the planning and execution of multi-service and multi-national worldwide military operations, including the preparation of descriptive climatologies. These narratives are used for planning, contingency support, and training. More than just an AFWA resource, the AFWTL also helps Air Force researchers, trainers, planners, and operational troops gather the information they need to successfully accomplish their mission. In partnership with the Defense Technical Information Center. National Technical Information Service, NASA, Department of Energy, and other agencies, the AFWTL can provide a wealth of meteorological and climatological information, as well as over 120 periodicals subscribed to and archived in the library.

The library lends out articles, books, journals,



microforms, climatic data summaries, maps, technical reports, and assorted audiovisual materials. It also distributes small computer programs related to meteorology. If the requested material is unavailable at the AFWTL, it can access over 35,000 libraries around the world to locate and borrow the product for you. The AFWTL is online to the Online Computer Library Center, the Defense Technical Information Center, and has dial-in access to several commercial databases and subscription services. Although the library's facilities are open five days a week to local users, most of the services and workload are focused on satisfying the needs of DoD and AFW units around the world.

A forecaster assigned to Camp Casey, Korea might ask where he or she can find background material on east Asia climate. An AFIT student or government researcher may ask where they can get a back issue of La Meteorologie or Journal of Atmospheric and Terrestrial Physics. Where can a new Air Force Weather unit commander purchase books and/or serials be purchased for the office collection? What meteorological software is available for small computers? The answer to all of these questions is the same: the Air Force Weather Technical Library.

The AFWTL has an extensive collection of climatic data summaries and professional journals. There are over 23,000 atmospheric science documents that describe meteorological or climatological information of almost every area of the world. Information from this section would enable the forecaster at Camp Casey, Korea to find climatology for eastern Asia. The AFIT student and government researcher would find the extensive collections of textbooks, data, reports, and exhaustive collection of back issues of 200 periodicals invaluable.

For the new Air Force Weather unit commander; the AFWTL provides centralized technical document and subscription acquisition services; reference services and information retrieval; some translation services; and guidance to field units in maintaining office collections and field libraries. Unfortunately, the library cannot buy books or subscriptions for other than AFW direct reporting units, other AFW units receive those services from base or command libraries, but we are here to serve you in many other ways.

For the student, researcher, or operational forecaster, additional services provided by the AFWTL include the preparation of subject bibliographies. The library staff can search the collections and other on-line databases to produce a list of published items related to a specific area of interest based on requests from Air Force Weather personnel. A subject bibliography on "Atmospheric conditions conducive to severe winter weather" or one on the "Effects of El Niño on the weather in the CONUS" are excellent examples of this service.

Computerized on-line search and Internet access to bibliographic retrieval capabilities allow the AFWTL staff to provide library service to meteorologists around the world. Technology makes it possible for instant communication to nearly every other library, information center, or private vendor that provides scientific and technical information. The AFWTL has incorporated the Internet as a major link with its customers. This link is most apparent in AFWTL's World Wide Web home page. Documents can be delivered to the warfighter without any analyst intervention.

The AFWTL is constantly expanding the library services available on its Web page. It recently added the updated AFWA Technical Documents Catalog, which lists all AFWA produced technical documents through August 2000. The library patron has the capability to electronically download several of these technical documents. The library will continue to increase the availability of on-line documents. In a related project, the AFWTL is working to add several hundred Terminal Forecast Reference Notes and Local Forecasting Studies, some that date back 60 years, into an electronic format. Site-specific forecasting tips to operational forecasters would then be readily available.

An on-line patron can also access a listing of the library's holdings via the on-line catalog. Thirty-five thousand DTIC reports were recently added to the catalog. The library will continue to add more of the library's holdings to this on-line catalog. This listing includes the library's extensive collection of restricted DTIC and National Intelligence Studies (NIS). These are available to qualified Air Force customers via request. To access the AFWTL home page go to http://www.afccc.af.mil/climo/html/afwtl/afwtl.html . You can also request other library services and give us feedback on our support to you via the Web page. Our long-term commitment is to continue to expand the usefulness of the library Web page to fit your needs.

Customers anywhere are just a phone call or a click away from one of the largest "mail order" information stores in the DoD. To get what you need from the Air Force Weather Technical Library, just call or send a letter, fax, or electronic mail.

Col. French Retires

By Ms. Paige Rowland
AFWA Public Affairs

Col. Charles W. French retired from a 27-year Air Force career after the Air Force Weather Agency change of command ceremony Nov. 13 at Offutt AFB, Neb.

Brig. Gen. David L. Johnson, director of weather, Deputy Chief of Staff for Air and Space Operations, Washington, D.C. presided over the retirement ceremony.

"He is inspirational, a real stickler for doing things right," said Johnson of French. "He's quiet spoken, but when he speaks people listen."

> **"You can take me out of the Air Force, but you can't take the Air Force out of me."**
>
> *Col Charles French, former AFWA Commander*

French arrived at Offutt AFB on his first duty assignment in August of 1973 and throughout his career has served approximately seven years here. "Freedom has always been a by-product of this place," said French, "and no other place has had a more powerful influence on my career. It's the right place for me to retire."

French's career in weather actually began long before his commissioning. In elementary school in the suburbs of Philadelphia, he volunteered to be the 6th grade weather forecaster. "I gave a news weather show every morning for the entire year," remembers French. On career day in 9th grade, he interviewed a renowned television meteorologist, Wally Kinan, and became even more convinced of a career in weather.

French brought that dream to fruition in 1973 shortly after recieving a master's degree in meteorology from PennState University. 2nd Lt. French arrived at Offutt AFB to the then 700 person unit which relied more on grease pencils then computers. He began. mapping and gridding satellite data for the then classified Defense Meteorological Satellite Program.

Early in his career, he was mentored by some of Air Force Weather's best including retired colonel's Tom Accola and John Lasley, both leaving a lasting impression on the young French. "They were refreshing to work for and impressed me with their commitment," said French of his mentors. "The slogan 'service before self' stuck with me early on."

He has had many unforgettable moments. One of the most memorable, according to French, was accepting the Air Force Association's Theodore von Karman award in September of this year. Another came early in his career when he served his first overseas assignment. "I was a one-man weather shop, conducting three to seven briefings a week to the Commanded of U.S. Southern Commander. At one of those briefings, a 4-star turned to me to get a better understanding of weather support for his assets around the world," explain French. "It was then I realized what an impact my job had on the mission."

French sees completing reengineering over the next few years as the key for Air Force Weather. He advises young airmen and officers to become integrated into the concept. "Put your trust and belief in those above you, get fully engaged in learning weather," advises French. "Those folks that make the transition to becoming Air Force 24/7 are the future leaders."

As he transitions his life into retirement, French applauds the men and women who have made his military career so rewarding. "I salute each of you and am honored to have been your commander."

Of his retirement, French added "you can take me out of the Air Force, but you can't take the Air Force out of me."

IDEA TAKES NETWORK BY $TORM

RADIO $OLAR TELESCOPE ANALYST $WEEPS $10,000 INTO HIS POCKET

By Tech. Sgt. Ric Reynolds

One of the first things one notices when visiting the Radio Solar Observatory: two old monochromatic computer terminals sitting in the midst of some of the most up to date PC platforms available.

What's amazing to most people, these two 1970's-technology HP-1000 terminals and the mainframe CPU connected to them are the heart and soul of the operation.

Tech Sgt. (S) Charles Hoffman noticed this when he first reported for duty in May, 1998 to Sagamore Hill Solar Observatory, located on a secluded hilltop in north-eastern Massachusetts. However, he not only wondered about it; he decided to find out why.

That question has led to a money saving new system upgrade for the Radio Solar Telescope Network (RSTN) and a $10,000 reward for Hoffman.

He began researching what the current system does and if this could be accomplished on a modern and affordable PC platform.

What he discovered was remarkable: Not only could the software be ported to a smaller and faster system but it would end up saving the Air Force considerable money… to the tune of around $300,000!

Hoffman found the older system is no longer in production, making it difficult to maintain. In fact the manufacturer, Hewlett Packard, could no longer support the system and just this year the local maintenance contract was switched to Radian Corp. Before Radian took over the maintenance it was nearly impossible to find spare parts and they had to be scrounged; for example, it cost $5,000 just to replace a 50MB hard drive!

His suggestion, submitted through the Innovative Development through Employee Awareness (IDEA) program, was first disapproved seven months after initial submission; a new system already in development was to be brought into operation before any cost savings from his IDEA could be realized. However, after it was determined the new system wasn't going into production as planned Hoffman reloaded and resubmitted his IDEA.

The second time was a charm! After strong persistence on his part, including many letters and phone calls, AFWA gave the go ahead for the IDEA. Now the Solar Electro-optical Network programmers at Hill AFB are working on the project.

Hoffman's idea will upgrade the RSTN operating systems just in time for the sun's solar maximum. This will enhance RSTN's mission supporting the 55th Space Weather Squadron and the Air Force, DOD, and other federal agencies by observing, encoding, and transmitting highly accurate and timely solar radio information. This information is critical to anyone working in, with, or through the space environment.

As for Hoffman, his patience and perseverance have been rewarded. He's satisfied that his efforts in pushing the idea through has ended up with the network doing business in a smarter, more cost effective way.

Of course $10,000 doesn't hurt either!

DET 2, 55 SWXS, Sagamore Hill Solar Observatory, Hamilton, Mass.

Three Recognized for Role in Early Space and Missile Programs

By Lynn Gonzales
Air Force Space Command
Public Affairs

Air Force Space Command recognized three men who played prominent roles in Air Force early space and missile programs during a ceremony on Sept. 21, 2000.

Col. Joseph Kittinger Jr., Col. Thomas O'Regan Haig and Dr. Ruben "Rube" Mettler were presented with the Air Force Space and Missile Pioneers Award, which includes induction into the Air Force Space and Missile Pioneers Hall of Fame. Kittinger, Haig and Mettler made significant contributions to many of the Air Force's and the nation's advances in space and missile technology during the 1950s and 1960s.

IN 1960, HE PARACHUTED FROM A BALLOON AT AN ALTITUDE OF 102,800 FEET, BREAKING THE SOUNDBARRIER BEFORE HIS CHUTE OPENED 16 MILES AND 4 MINUTES AND 36 SECONDS LATER.

Kittinger participated in the early stratospheric balloon programs, Projects Man High and Excelsior, and holds world records for a series of parachute jumps that provided some of the earliest data on the effects of a near-space environment on the human body. In 1960, he parachuted from a balloon at an altitude of 102,800 feet, breaking the sound barrier before his chute opened 16 miles and 4 minutes and 36 seconds later.

As an Air Force pilot, he flew several operational and experimental aircraft. In May 1972, Kittinger was shot down in his F-4 Phantom over Hanoi and served 10 months as a prisoner of war. He went on to command an F-4 squadron and served as vice commander of an F-4 fighter wing.

Haig played an important role in precursor programs to the Air Force's Defense Meteorological Satellite Program. In the 1960s, he led efforts which laid the groundwork for today's weather and environmental satellites by developing early military systems to monitor cloud cover and establishing a network of ground stations and control centers.

Mettler managed the development program for Thor, the first Air Force missile to use inertial guidance. Following the program's success in 1956, he oversaw system engineering and technical direction for the Minuteman intercontinental ballistic missile program for three years.

The Air Force Space and Missile Pioneers Award Program began in 1989 with the National Space Club's selection of 10 space pioneers. The program formalized in 1997 as the Air Force Space and Missile Pioneers Award during the Air Force's 50th Anniversary celebrations. With the induction of Kittinger, Haig and Mettler, the Hall of Fame will include 21 members.

I PUT MY UNIFORM ON THIS MORNING DIDN'T I?

By Chief Master Sgt. Vincent D. Dicks
91st Space Wing command chief master sergeant, Minot AFB, ND.

A chief master sergeant was sitting at his desk just down the hall from the operations group commander's office at Pope AFB, N.C. As the chief finished his second cup of coffee after reviewing the last of the morning messages, the commander stepped into his office.

"Chief," the colonel said, "I hate to ask you this, but you need to be in the desert six days from now for a 90-day rotation. Can you go?"

With no emotion in his voice or without even looking up, the chief replied, "I put on my uniform this morning, didn't I?"

The colonel was a little taken back by the chief's response because he wasn't one to talk in riddles. The colonel thought to himself, "Has this veteran of 28 years finally gone off the deep end on me?"

The wise old protector of the enlisted corps smiled and began to explain. "Sir, I made a promise to myself more than 20 years ago that I would only put this uniform on as long as I'm available and ready to do the duty it requires of me."

While this story may be obvious to many Air Force members, it seems to completely escape others. Available for duty means more than negotiating premium assignments and TDYs, or scheming to get a suite vs. a regular billeting room, and how much time off you can muster out of those tours. Available for duty really means we are ready to go any place in the world we are required at any time.

Recently, I've seen some Air Force members spending more time and energy getting out of an assignment or duty than it would have taken to just suck it up and do it. Thinking back on patriots that have come before, I reviewed some history with our wing historian and we talked about the soldiers who were at Valley Forge, Pa. and Omaha Beach. I'm glad they weren't worried about assignments, billeting rooms vs. suites, and time off. Many of those warriors sacrificed a great deal; some gave the ultimate sacrifice to obtain and ensure the freedoms we often take for granted today.

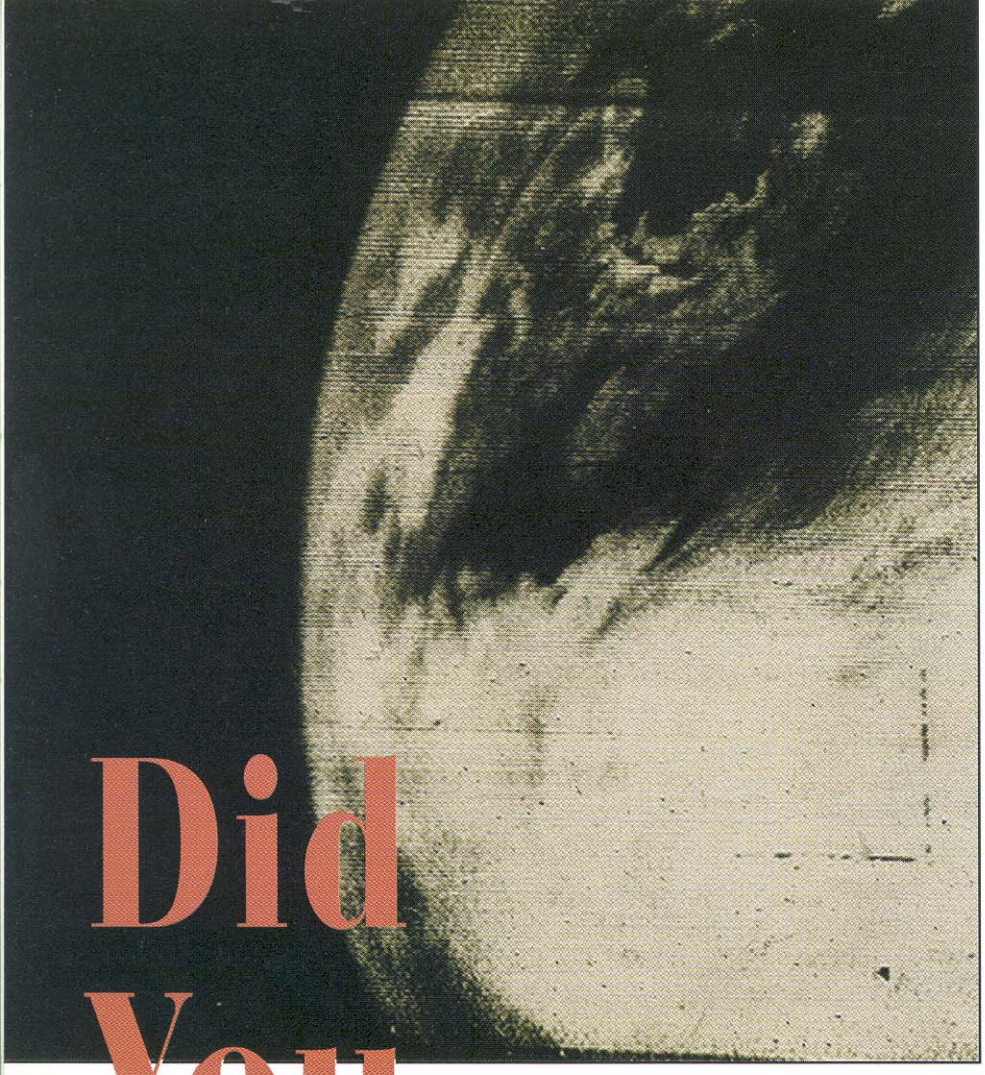
Their approach may have seemed overly simplistic; however, when it comes to defining service to our country, the answer is just that simple. Those patriots were available for duty and they did their jobs well. In today's world of what can you do for me, it's easy to lose sight of what service before self is all about. Service goes far beyond the individual, it affects the well being of our nation. Sitting in Minot, N.D., enjoying our great American way of life, it's easy to forget the sacrifices we have agreed to endure in the service of our country.

When deployed to the desert, Italy, Kosovo or Bosnia, the sacrifices become much clearer. The bottom line today is we are an all-volunteer force serving our great nation. During the Air Force Space Command's Expeditionary Air Force Road Show, I was reminded by Headquarters Air Force Space Command mission support team chief Col. Cynthia Deese's briefing that our forces have been reduced by two-thirds in recent years. Even with these reductions, we still maintain a highly mobilized, continually-tasked Air Force. Because of this fact, EAF was formed.

As I visit organizations in both wings, they are constantly wrestling with manning authorizations, present for duty rates and filling deployment and ready augmentee requests to meet the mission at home and around the world. If a single member doesn't pull his or her weight, another member is forced to fill the slot causing a ripple effect felt not only at our base, but throughout our Air Force. These slots must be filled by people available and ready for duty.

Everyone's families would like for them to be home for holidays, birthday parties and anniversaries. I can't think of anyone who would intentionally miss those events. Many of us are well aware of the pain felt when we lose a loved one and the grief that's compounded by the fact we weren't there in the final moments.

Military members are asked to sacrifice all of this continuously. We must remember we are serving our country as volunteers -not forced to do it. I believe each of us as true professionals need to take a good look in the mirror and ask "am I available for duty?" Everyone must decide for himself or herself, just as the chief did. I too put on my uniform today and I am available for duty. **How about you?**



Did You Know?

By Ms. Lillian Nolan
AFW Historian

On October 1, 1999, the 55th Space Weather Squadron was reassigned to Air Force Weather Agency from Air Force Space Command. This restructure enables the 55th to provide support for the US Space Command, North American Aerospace Defense Command, and Air Force Space Command Missions.

Interest in Space as a means of collecting data and exploration is not a new concept - - it goes back to the first days of ballooning as a form of military reconnaissance used by the French in 1794, and was revived for military use in America by Adolphus Greely in the 1890s.

The Japanese were inter ested in high-altitude cloud photography and actually sent balloons across the North Pacific to North America in 1944. They sent over 9,000 of them and estimates say that between 900 and 1,000 reached America. At that time it was already obvious to meteorologists that high-altitude, free-floating, manned and unmanned balloons might prove convenient vehicles for very-high-altitude photographic cloud reconnaissance.

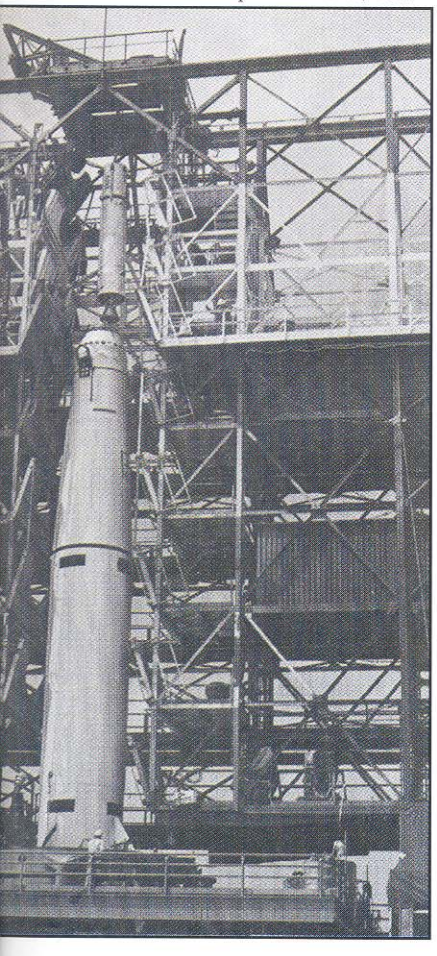
Erection of TIROS-I atop the Thc

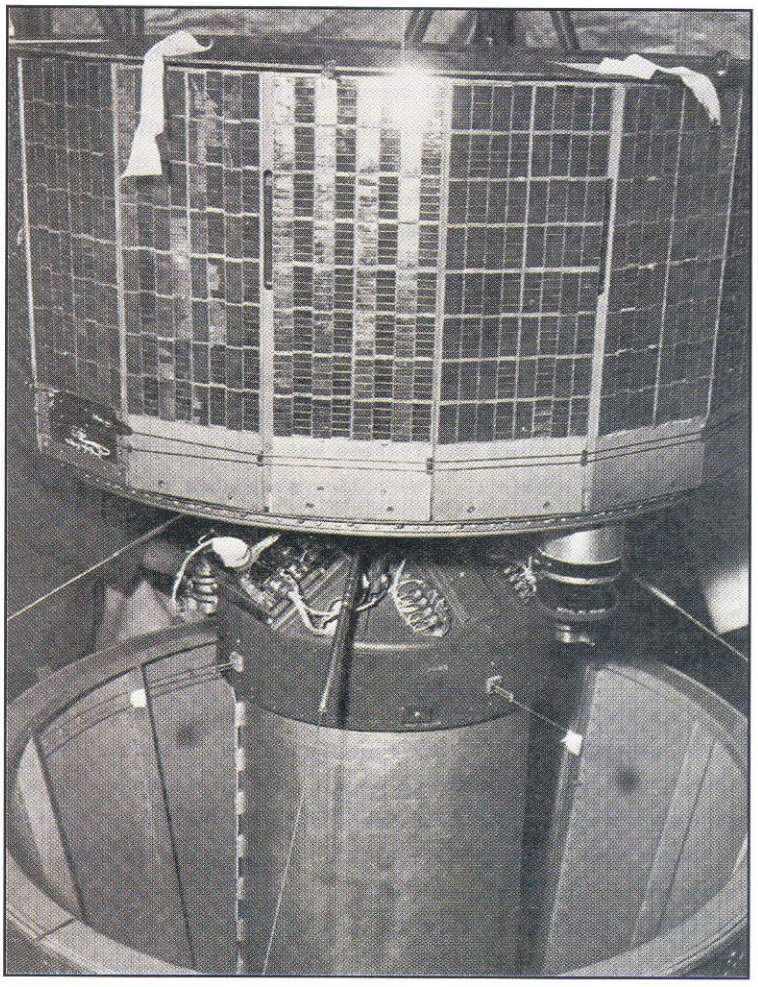
Air Weather Service stepped into the satellite weather picture in February 1959, when Headquarters Air Force, requested that Air Weather Service set down its initial meteorological satellite requirements. At that time AWS believed the

satellites would provide basic meteorological and geophysical information of common value to both civil and military users. From a purely military standpoint, AWS believed that continuous meteorological satellite coverage would enhance cloud climatology in areas of special interest.

When TIROS I activities first began, AWS played an active part initially in a technical capacity but eventually, when the launch slipped from 1959 to 1960, it became apparent that the best use of TIROS facilities and data would be gained by pooling people and communications at the ground readout stations. With that in mind, the Weather Bureau, AWS, GRD (Geophysical Research Directorate of the Air Force Cambridge Research Center), the Army Signal Corps, and the Naval Weather Service agreed to jointly operate readout stations at Camp Evans, New Jersey and Kaena Point, Hawaii.

r-Able boost vehicle at Cape Canaveral, Fla.



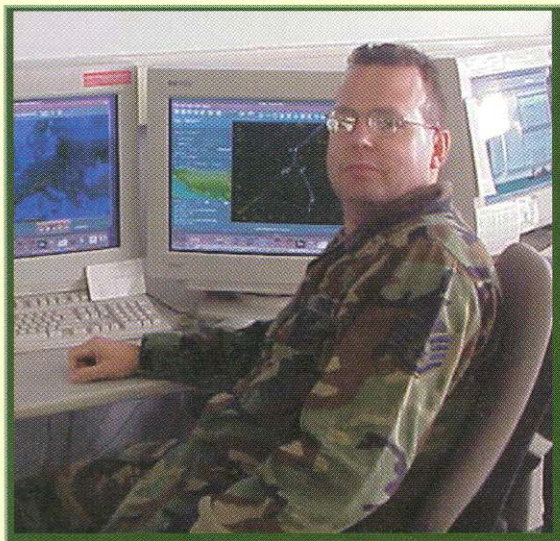


The TIROS I meteorological satellite and live, third-stage of the Thor-Able boost vehicle. (NASA Photo)

Air Weather Service felt this satellite, which was a part of the weather service from its inception, would not be just another research instrument. TIROS was expected to provide the best over-all cloud picture, and be of "some" value in determining upper-level winds. The television cameras would provide actual pictures of clouds over an areap about 800 miles wide and some 6,000 miles in length. Weather folks knew that clouds alone were not all that was important in defining weather patterns, but felt they would provide clues to the middle-scale behavior of the atmosphere.

On April 1, 1960, NASA launched TIROS I from Cape Canaveral, Florida. During its first ten days approximately 2,000 photographs were transmitted. Those photos of the earth, and its cloud cover, produced a convincing demonstration that satellites could be used to survey weather conditions and surface features from space.

That was four decades ago - - look at how far technology has advanced – we are truly at the dawn of a new era!



AFSPC

NAME: Staff Sgt. William E. Figgins
UNIT: 614 Space Operations Group Aerospace Weather Team
JOB TITLE: Aerospace Forecaster
YEARS IN SERVICE: 13
HOMETOWN: Clarksburg, Mo.
FAMILY STATUS: Married to Cathy; one daughter, Cassandra
HOBBIES: Softball, bowling, walking, spending time with my family
REASON JOINED THE AIR FORCE: The idea of serving my country while continuing to follow in the tradition of my family held great appeal for me. Both of my parents served in the military, which had a significant influence on my choosing the Air Force as a career.
PERSONAL MOTTO: Serving the customer is why I'm here!
MOST MEMORABLE AIR FORCE WEATHER EXPERIENCE: No single experience stands out, but the past three and a half years would qualify as memorable as I have been involved in the growing, and exciting, field of space environment.

WEATHER WARRIORS

55th SWXS

NAME: Tech. Sgt. Jim Slisik
UNIT: Detachment 1, 55th Space Weather Squadron - Learmonth Solar Observatory, Learmonth Australia
JOB TITLE: Chief, Solar Radio Operations
YEARS IN SERVICE: 12
HOMETOWN: Canton, Ohio
FAMILY STATUS: Married with two children.
HOBBIES: Traveling, gardening and skiing.
REASON JOINED THE AIR FORCE: Needed a change in my life.
PERSONAL MOTTO: You can't always get what you want but if you try sometimes, you get what you need.
MOST MEMORABLE AIR FORCE WEATHER EXPERIENCE: The deployment to Jordan because of the people I worked with and met and the opportunity to travel to a different country.

Air Force Weather SALUTES

PROMOTIONS

TO MAJOR
David R. Helms, *104 WF Baltimore Md.*
Stephen D. Krage, *204 WF, McGuire AFB N.J.*

TO CAPTAIN
John H.Waltbillig, *127 WF Topeka Kan.*

TO 1ST LIEUTENANT
Martin T. Stickney, *208 WF Minneapolis Minn.*
Steven K. Storms, *57 OSS/OSW, Nellis AFB Nev.*

TO CHIEF MASTER SERGEANT
Joseph L. Cardimona, *154 WF Little Rock AFB Ark.*
Forrest, Hendricks, *146 WF, Pittsburgh Pa.*

TO MASTER SERGEANT
Robert A. Courtway, *154 WF Little Rock AFB Ark.*
Mary R. Whitney, *154 WF Little Rock AFB Ark.*

TO TECHNICAL SERGEANT
Robert C. Jr. Bohlin, *199 WF Wheeler AAF Hawaii*
Dean P. Chapman, *123 WF Portland Ore.*
David A. Dawson, *57 OSS/OSW, Nellis AFB Nev.*
Luther W. Hagy III, *159 WF Camp Blanding Fla.*
Norman S. Keith, *159 WF Camp Blanding Fla.*
Joseph A. Korotko, *107th WF, Selfridge ANGB, Mich.*
Carrie A. Meyls, *203 WF Ft Indiantown Gap Pa.*
James J. Profita, *200 WF, Richmond Va.*
Jeffrey A. Salesman, *113 WF, Terre Haute Ind.*
David H. Spens, *107th WF, Selfridge ANGB, Mich.*

TO STAFF SERGEANT
Patrick D. Becker, *126 WF Milwaukee Wis.*
Anthony A. Gomez, *116 WF Camp Murray Wash.*
Carrie A. McKinnon, *156 WF Charlotte N.C.*
John F. Spangenberg, *126 WF, Milwaukee Wis.*
Jason A. Wilfong, *116 WF Camp Murray Wash.*
Paul A. Wilkerson, *154 WF, Little Rock AFB Ark.*

TO SENIOR AIRMAN
David J.Bauer, *208 WF, Minneapolis Minn.*
Stephen F. Burke, *202 WF Otis ANGB Mass.*
Alonda D. Foster, *110 WF St Louis Mo.*
Mark J. Gibson, *123 WF Portland Ore.*
Earl D. Jenkins III, *156 WF, Charlotte N.C.*
Megan I. Lumsden, *202 WF Otis ANGB Mass.*
David J. Martin, *107th WF, Selfridge ANGB, Mich.*
Johanna T. Peltonen (BTZ), *57 OSS/OSW, Nellis AFB Nev.*
Angel R. Portocarrero, *57 OSS/OSW, Nellis AFB Nev.*

AWARDS

DEFENSE MERITOURIOUS SERVICE MEDAL
Col. Michael L. Jamilkowski, *OASD(C3I) Pentagon*

AIR FORCE MERITORIOUS SERVICE MEDAL
Lt. Col. Michael R. Babcock, *AF/XOWX Pentagon,* (3RD OLC)
Lt. Col. Charles J. Kennedy, *AF/XOWX, Pentagon,* (3RD OLC)
Lt. Col. Robert D. LaFebre, *AF/XOWR, Pentagon,* (3RD OLC)
Lt. Col. David A. Smarsh, *OFCM, Washington DC,* (3RD OLC)
Major John Coulter, *AF/XOWR, Pentagon,* (2ND OLC)
Major Jay S. Fitzgerald, *AF/XOWX, Pentagon,* (2ND OLC)
Master Sgt. John M. Fritz, *HQ AMC/DOW, Scott AFB Ill.*
Tech. Sgt. Robert F. Warren, *146 WF, Pittsburgh Pa.*

AIR FORCE COMMENDATION MEDAL
Tech. Sgt. Paul D. Bravard, *207 WF, Indianapolis Ind.*
Staff Sgt. William Hennix, *39 OSS/OSW, Incirlik AB Turkey*
Staff Sgt. Kyle Sutherland, *110 WF, St Louis Mo.*

AIR FORCE ACHIEVEMENT MEDAL
Master Sgt. Michael W. Clark, *57 OSS/OSW, Nellis AFB Nev.*

JOINT MERITORIOUS UNIT AWARD
Tech. Sgt. John C. Tunney, *146 WF, Pittsburgh Pa.*

AIR RESERVE FORCES MERITORIOUS SERVICE MEDAL
Staff Sgt. Daniel K. Ackerman, *104 WF Baltimore Md.*

AIR RESERVE FORCES MERITORIOUS SERVICE MEDAL
Master Sgt. David L. Tucker II, *146 WF, Pittsburgh Pa.* (3RD OLC)

AIR FORCE LONGEVITY SERVICE AWARD
Staff Sgt. Shawn E. Gabel, *146 WF, Pittsburgh Pa.*

PENNSYLVANIA MERITORIOUS SERVICE MEDAL
Tech. Sgt. Robert F. Warren,*146 WF, Pittsburgh Pa.*

PENNSYLVANIA COMMENDATION MEDAL
2nd Lt. Valentina McNamara, *146 WF, Pittsburgh Pa.*

PENNSYLVANIA GENERAL WHITE MEDAL
Master Sgt. James S. Malia, *146 WF, Pittsburgh Pa.*

PENNSYLVANIA GENERAL STEWART MEDAL
Staff Sgt. Shawn E. Gabel, *146 WF, Pittsburgh Pa.*
Senior Airman Michael T. Gaither, *146 WF, Pittsburgh Pa.*

MICHIGAN NATIONAL GUARD LEGION OF MERIT
Master Sgt. John H. Reid II, *107th WF, Selfridge ANGB, Mich.*
Staff Sgt. David J. Martin, *107th WF, Selfridge ANGB, Mich.*

39TH OPERATIONS GROUP, UNSUNG HERO OF THE QUARTER
APRIL - JUNE 2000
Staff Sgt. Generoso "JR" Perez, *39 OSS/OSW , Incirlik AB Turkey*

JULY - SEPT 2000
Staff Sgt. Brad Godwin, *39 OSS/OSW , Incirlik AB Turkey*

57 OSS SNCO OF THE QUARTER, JUL-SEP 2000
Master Sgt. Michael W. Clark, *57 OSS/OSW, Nellis AFB Nev.*

57 OSS AIRMAN OF THE QUARTER, JUL-SEP 2000
Staff Sgt. (sel) Richelle R. Bigata, *57 OSS/OSW, Nellis AFB Nev.*

EDUCATION

ABLE FORECASTER COURSE
Staff Sgt. Tijuan M. Smith, *107th WF, Selfridge ANGB, Mich.*

FORECASTER APPRENTICE COURSE
Staff Sgt. Patrick A. Walker, *107th WF, Selfridge ANGB, Mich.*

US ARMY BASIC AIRBORNE COURSE (PARA-CHUTIST)
Tech. Sgt. John L. Buursma, *107th WF, Selfridge ANGB, Mich.*

STATIC-LINE JUMPMASTER COURSE
Staff Sgt. David J. Martin, *107th WF, Selfridge ANGB, Mich.*

MILITARY FREEFALL PARACHUTIST COURSE
Tech. Sgt. Henry G. Christle Jr., *107th WF, Selfridge ANGB, Mich.*

COMBAT SURVIVAL TRAINING COURSE
Staff Sgt. David J. Martin, *107th WF, Selfridge ANGB, Mich.*

LATIN AMERICA ORIENTATION COURSE
Master Sgt. Mitchell K. Ellis, *107th WF, Selfridge ANGB, Mich.*
Master Sgt. John H. Reid II, *107th WF, Selfridge ANGB, Mich.*
Tech. Sgt. John L. Buursma, *107th WF, Selfridge ANGB, Mich.*
Tech. Sgt. David H. Spens, *107th WF, Selfridge ANGB, Mich.*
Staff Sgt. David J. Martin, *107th WF, Selfridge ANGB, Mich.*
Senior Airman Karl S. Carlysle, *107th WF, Selfridge ANGB, Mich.*

INTRODUCTION TO SPECIAL OPERATIONS COURSE

Major John E. Hogan, *107th WF, Selfridge ANGB, Mich.*
Master Sgt. Craig M. Cross, *107th WF, Selfridge ANGB, Mich.*
Master Sgt. Mitchell K. Ellis, *107th WF, Selfridge ANGB, Mich.*
Tech. Sgt. David H Spens, *107th WF, Selfridge ANGB, Mich.*

JOINT FIREPOWER CONTROL COURSE

Master Sgt. John H. Reid II, *107th WF, Selfridge ANGB, Mich.*
Tech. Sgt. John L. Buursma, *107th WF, Selfridge ANGB, Mich.*
Staff Sgt. Jesse R. English, *107th WF, Selfridge ANGB, Mich.*

CROSS-CULTURAL COMMUNICATIONS COURSE

Tech. Sgt. Joseph A. Korotko, *107th WF, Selfridge ANGB, Mich.*
Staff Sgt. Jesse R. English, *107th WF, Selfridge ANGB, Mich.*
Senior Airman Karl S. Carlysle, *107th WF, Selfridge ANGB, Mich.*

JOINT PSYCHOLOGICAL OPERATIONS COURSE

Major John E. Hogan, *107th WF, Selfridge ANGB, Mich.*
Tech. Sgt. Henry G. Christle Jr., *107th WF, Selfridge ANGB, Mich.*

MIDDLE EAST ORIENTATION COURSE

Staff Sgt. Jesse R. English, *107th WF, Selfridge ANGB, Mich.*
Staff Sgt. Patrick A. Walker, *107th WF, Selfridge ANGB, Mich.*

ASIA PACIFIC ORIENTATION COURSE

Staff Sgt. Jesse R. English, *107th WF, Selfridge ANGB, Mich.*

REVOLUTIONARY WARFARE COURSE

Staff Sgt. Jesse R. English, *107th WF, Selfridge ANGB, Mich.*

ANTI-TERRORISM/FORCE PROTECTION LEVEL II COURSE

Master Sgt. John H. Reid II, *107th WF, Selfridge ANGB, Mich.*

US ARMY PARACHUTE OPERATIONS MALFUNCTION PREVENTION ORIENTATION COURSE

Master Sgt. John H. Reid II, *107th WF, Selfridge ANGB, Mich.*

US ARMY MASTER FITNESS TRAINER COURSE

Senior Airman Karl S. Carlysle, *107th WF, Selfridge ANGB, Mich.*

Airman Leadership School, Distinguished Graduate
Staff Sgt. Scott Maier, 39 *OSS/OSW, Incirlik AB Turkey*

AIRMAN LEADERSHIP SCHOOL

Staff Sgt. (sel) Adam B. Weiner, 57 OSS/OSW, Nellis AFB Nev.
Staff Sgt. (sel) Earl A. Stoll, 57 OSS/OSW, Nellis AFB Nev.
Staff Sgt. (sel) Huan C. Duong, 57 OSS/OSW, Nellis AFB Nev.

AWDS MANAGER'S COURSE

Staff Sgt. (sel) Adam B. Weiner

EOTDA DISTANCE LEARNING COURSE

Staff Sgt. Rickie D. Davis
Staff Sgt. (sel) Adam B. Weiner

The following Air Force Weather Staff Sergeant Selectees were inadverntly left off the Aug/Sept issue. Please accept the ObserveR staff's apology for the mistake.

Congratulations to you all!!

Cornett, Westley B., *Fort Bragg, N.C.*
Coumbs, Michelle M., *Seymour Johnson AFB, N.C.*
Covert, Collen P., *Andrews AFB,* Md.
Cowen, Sylvia G., *Eglin AFB, Fla.*
Crabeels, Shawn C., *Dover AFB, Del.*
Crouse, Jeremy L., *Offutt AFB, Neb.*
Dauphinais, Jill M., *Fort Hood, Texas*
Deanda, Esteban J., *Davis Monthan, Ariz.*
Deehan, John T., *Raf Lakenheath, UK*
Deery, Sandi L., *Offutt AFB, Neb.*
Dobbins, Jason R., *Keesler AFB, Miss.*
Dobry, Clinton N., *Keesler AFB, Miss.*
Dollar, Helen J., *Eglin AFB, Fla.*
Duong Huan Cong, *Nellis AFB, Nev.*
Egnew, Megan K., *Fort Rucker, Ala.*
Eifert, Carol A., *Dyess AFB, Texas*