Central Illinois Lincoln Logs

Volume 4 Issue 3 FALL 2001

New Wind Chill Chart to be Introduced for This Winter...see page 7 for details!

COOP Corner

by Chris Geelhart, HMT

AWARDS PRESENTATIONS... Glen Oest, of station Havana 4NNE, was presented with a 20 year Length of Service Award on July 11th. Glen has been taking observations full-time since 1981, but assisted his son with observations from 1977 to 1981.

Glen Oest, Havana 4NNE

Mike Lowe, station manager and Jim Clinton, Ag Director, accept a 50 year Length of Service Award on behalf of radio station WVLN in Olney. John Parr, ILX HMT presented the award on March 9th. WVLN personnel began observations in November 1949.

Jim Clinton & Mike Lowe, Olney, accept award from John Parr, ILX HMT

In this issue...

Also due awards this year are the following:

- Orris Seng, of Windsor (30 year Length of Service)
- Clinton Sanitary District (25 year Institutional Length of Service)
- Dalais Price, of Charleston (40 year Length of Service)

In addition, the Hoopeston station marks its 50th year of operation by the Mushrush family, and Morrisonville's station has been maintained by the Bullard family for the past 40 years.

ROSA Information

Recently, a computer failure affected the Milwaukee ROSA system. In receiving calls from observers after this happened, it appears that many of you either had old backup numbers or no backup numbers at all.

For those of you who use ROSA or Compu-ROSA, here is the current listing of ROSA phone numbers available. Note that the Milwaukee numbers are the ones that should be considered your "main" numbers.

<u>For people using ROSA PHONES:</u>
Main Number: 1-800-858-8978 (Milwaukee, WI)
1st Backup: 1-800-916-3343 (Bismarck, ND)
2nd Backup: 1-800-852-2897 (Sioux Falls, SD)

<u>For people using Compu-ROSA WITH 300 BAUD MODEMS (also can be used by ROSA phones):</u>
Main Number: 1-888-265-4893 (Milwaukee, WI)
1st Backup: 1-800-251-9941 (Bismarck, ND)
2nd Backup: 1-800-251-9940 (Sioux Falls, SD)

<u>For people using Compu-ROSA WITH HIGHER-SPEED MODEMS:</u>
Main Number: 1-888-265-4895 (Milwaukee, WI)
1st Backup: 1-888-825-4879 (Bismarck, ND)
2nd Backup: 1-800-916-3326 (Sioux Falls, SD)

Note that these numbers do not apply to people that phone in their observations to us, or for those that use the WXCODER system for observation transmission. WXCODER uses your Internet browser for transmission. If you would like to use this system in place of ROSA or Compu-ROSA, please contact us for more information.

A New Addition To Severe Weather Operations At The Central Illinois NWS

by Dan Smith, Lead Forecaster

A new storm verification program has been added to the severe weather operations at the National Weather Service Office in Lincoln this past summer. The program is named "CALLSPOT" which stands for Spotter Call-up and Warning Assistance Program. Callspot was designed to provide critical storm information to the radar operator

Figure 1

and warning forecaster during severe weather episodes. In addition...Callspot was developed to assist in verifying and logging severe weather information across the Central Illinois county warning area. Calls during and after severe storms would normally start with our ESDA directors and county officials, and then work our way through the NWS COOP network as well as other NWS volunteer spotters.

Callspot got it's start with the National Weather Service several years ago out in Sioux Falls, South Dakota. It has grown in its popularity across the Central Region of the National Weather Service with now 6 offices running the beta version of the program, including the Weather Office in Lincoln, Illinois. The program was written in Visual Basic 5 and will eventually have the capabilities or working with an AWIPS (Advanced Weather Interactive Processing System) workstation. Spotters included in the Callspot database will have specific spotter numbers/IDs that will be compatible with some of the AWIPS overlays (specifically adding spotter numbers/IDs on to radar overlays). Figure 1 is the Callspot start page and identifies the program version number and the programmers who have contributed their efforts in to getting this program operational.

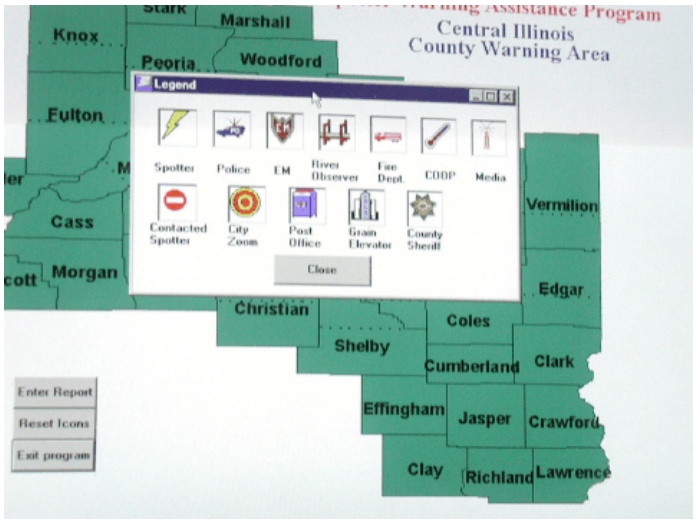


Figure 2

Figure 2 represents the County Warning Area background map and icons used with the ILX (Lincoln) version of Callspot. The operator would click on a county of interest and the background county would appear similar to Figure 3 (in this example, McLean county is illustrated. The red dot with the circle inside gives the operator the flexibility to zoom in on a

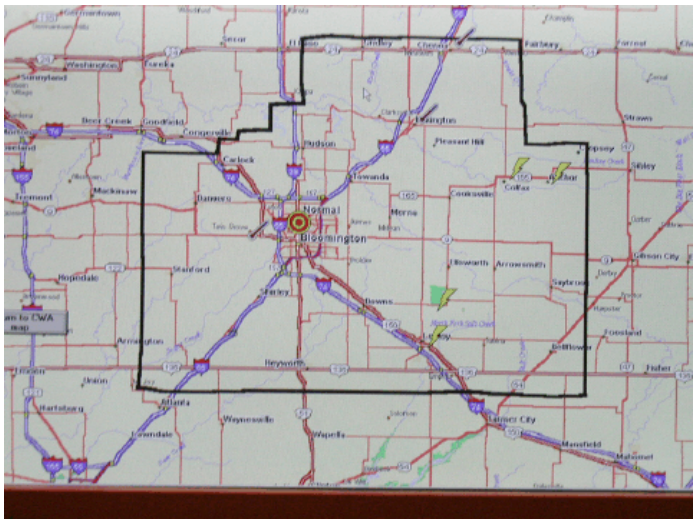


Figure 3

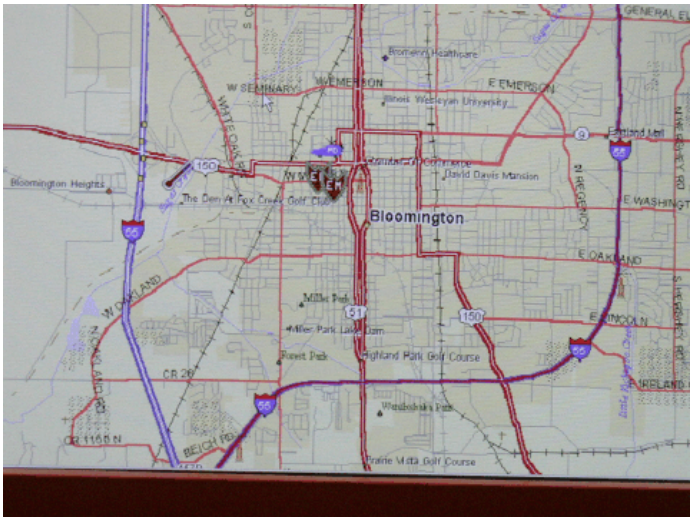


Figure 4

town or city. In this example, you would get the zoomed in portion of Bloomington/Normal (Figure 4).

The operator would then click on (for example) the ESDA icon (represented by the brown EM

patches northwest of Bloomington). These represent the locations of a particular ESDA official or spotter. Once you click on the icon, the following display would appear as illustrated in Figure 5. The name and telephone numbers (home, work or cell numbers) of the individual would be displayed in the upper left hand corner of the map. The Callspot operator would then click on either Call Work or Call Home, and the phone call would automatically be made to the official. Once all the storm information is gathered, the Callspot operator would then have the capability of logging all the storm damage information in the log form contained in the program. After an event, the operator would then be able to view or print all the storm information out for record.

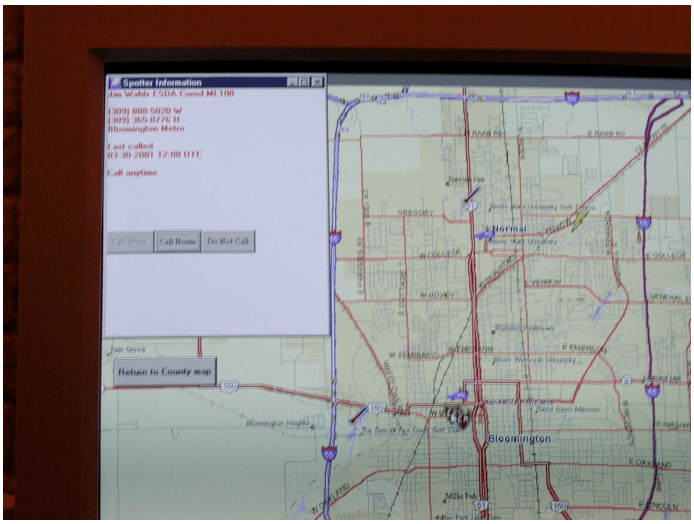


Figure 5

As of August of 2001, the National Weather Service Office in Lincoln has approximately 500 spotters in its database. For comparison, offices that have had Callspot for 3 years, have anywhere from 2500-3000 spotters in their database! As you can see, this is an ongoing project and will continue to grow in our area as well. Not only do we have our ESDA and law enforcement officials in our database, but in addition, we have local fire and highway departments, utility companies, state parks, media outlets (including radio, television and newspapers), NWS Cooperative observers, SWOP (Significant Weather Observation Program volunteers...mainly non-internet based) and skywarn volunteers.

In summary, not only does Callspot "centralize" the verification process for the National Weather Service, it also now puts a name to a location on a caller list rather than having a forecaster search through a database for a name and number and not really getting "a feel" or understanding where this particular spotter is located in the county warning area. For post storm analysis, using the map should give at least a basic understanding of how and where a particular storm moved based on the spotter reports. Rather than having 3 or 4 people taking storm reports and having literally 15 to 20 pages of storm reports scattered across the office, one or two individuals can now access the same information from our ESDA officials and volunteer spotters and log it in one central location.

Words of Wisdom From the WCM

by Rod Palmer, Warning Coordination Meteorologist

FUN AT THE FAIR. For the second year, the NWS shared a booth with the Illinois Emergency Management Agency in the Exposition Building at the Illinois State Fair. HAM radio volunteers from the Volunteer HAM Severe Weather Team at the Lincoln office helped staff the booth on several days. Our main thrust this year was the NOAA Weather Radio Expansion Program in Illinois where we contrasted the seven weather broadcast stations in 1997 with the 27 that will be on-line as of October 1, 2001. We estimate that 95+ percent of the citizens of Illinois will be able to receive severe weather watches, warnings, and advisories as well as routine daily information 24

hours a day. We were able to meet people with a large variety of interests in weather from all over the state and some from out of state that were visiting.

NOAA WEATHER RADIO (NWR)

NWR CONTINUED.....

The **NWR Expanded Network for Illinois** is expected to be completed by **September 30, 2001.**

In the counties served by the Lincoln NWS Forecast Office, new transmitters be on the air by early fall are located near Galesburg, serving Knox County and near Bloomington-Normal, serving Mc Lean County. People in Mc Lean County will have to purchase the newer type digital or analog receivers to receive weather information on a new frequency. Digital receivers retail for around $50 and analog receivers retail at around $20 - $25.

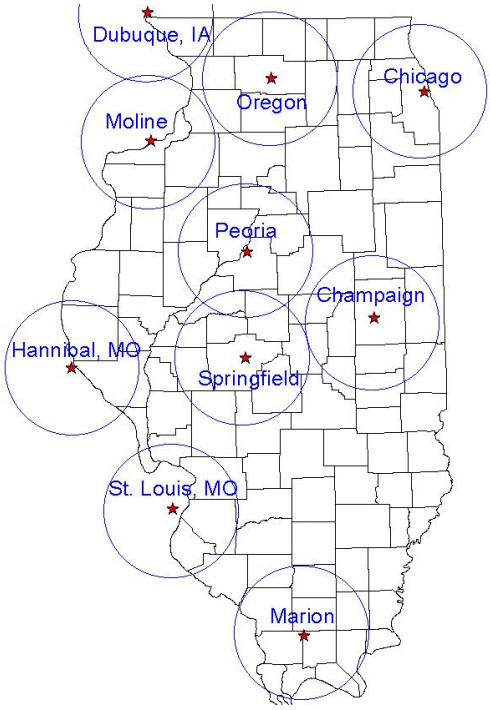
Following are frequencies and call-signs for the new transmitters:

Galesburg	KZZ-66	162.400 Mhz	300 Watts
Bloomington	KZZ-65	162.525 Mhz	300 Watts

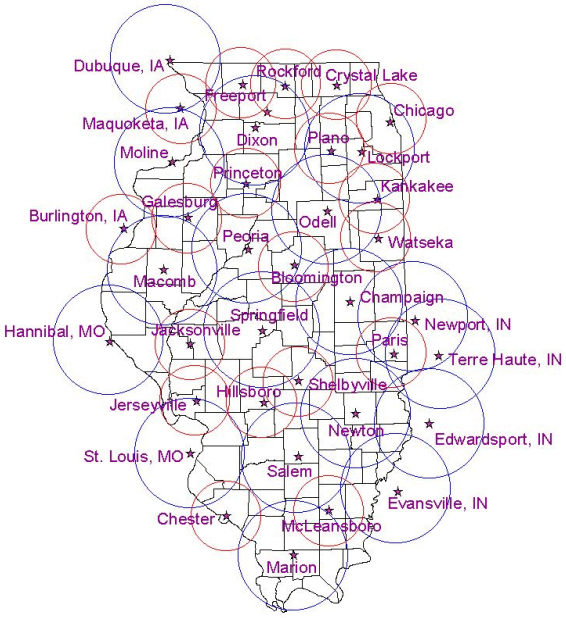
NEW VOICE FOR NOAA WEATHER RADIO!

A new voice has been selected for NWR. It will replace the old voice just after the first of the year. A male and a female voice are available for weather offices to use. To sample the new voices, go to the Lincoln NWS web site at www.crh.noaa.gov/ilx or www.nws.noaa.gov/nwr/newvoice.htm

1997 NOAA Weather Radio Network



2001 NOAA Weather Radio Network



The DAPM Corner

by Billy Ousley, DAPM

Cooperative Weather Observers are selected to take observations at predetermined locations in order to aid in defining the climate of an area. While Cooperative Weather Observers may take several different kinds of observations, they usually make daily readings of maximum and minimum temperatures and precipitation. A Cooperative station observation represents the "official" observation for that site/station.

Observers are usually selected from permanent residents in a community who have an interest in weather conditions, so a consistent record can be assured for that area. Observations must be taken seven days a week throughout the year. The value of data is enhanced by records that extend over a number of years. Many Cooperative Observers have served from 25 to 50 years.

This Cooperative Observer Program never ceases to amaze Meteorologists, Hydrologists and Climatologists. The program and its many successes routinely arouse the envy of other countries. All too often, those of us working within the program are lulled into complacency as, day after day and year after year, valuable information from more than 11,500 observers flows into the National Climatic Data Center.

It seems that many times the full significance of the contributions of the Cooperative Observer surfaces only when extremes in weather occur. However, be it winter snowfalls, spring time rains, summer storms, and/or crisp, cool autumn weather, the dedication and devotion to duty of the Cooperative Observer is always on display.

Cooperative Observers of Central Illinois, the National Weather Service (NWS) salutes you for your devotion to duty and civic minded attitude. Without you, our success would be limited. We continue to need your help to ensure the success in our (NWS) mission:
"protection of life and property and the enhancement of the national economy."

Again, we thank you for your help.

From the Desk of the State Climatologist

by Jim Angel, State Climatologist

With the coming of fall comes the concern for frost. Based on 1971-2000 averages, in central Illinois the average date of the first fall frost ranges from October 18th in the southern counties to October 11th in the northern counties of the region. In this case, we are using 32 degrees as the definition of frost. I always hesitate to give an average date because the date varies quite a bit from year to year. For example, in the same 1971-2000 period the earliest date was September 22 which occurred across the region in 1995. The latest date of the first fall frost ranged from November 4th in the north to November 14th in the south.

Despite all the publicity on global warming, did you know that the average first fall frost date has actually been occurring a little earlier at most locations since the early 1970s? An examination of data from four long-term cooperative observer sites in central Illinois reveals that the date is about 14 day earlier in Urbana, 9 days earlier in Hoopeston, 9 days earlier in Windsor, and 5 days earlier in Minonk. This pattern appears to be prevalent across Illinois, although northern Illinois has experienced slightly smaller changes similar to Minonk.

As mentioned earlier, for convenience we use 32 degrees as the definition for the first frost. Based on personal experience, we all know that frost can occur when temperatures are slightly above 32 degrees on calm, clear nights. There are two

types of frost. Radiation frost occurs on calm, clear nights when heat is allowed to radiate back into space without being stopped by clouds. In these cases, the occurrence of frost can vary considerably from place to place. Open, grassy areas are usually the first to experience frost. Meanwhile, areas under trees are safer because the trees help to trap the heat. The same help can be given to flowers by covering them. Areas near heated buildings are sometimes spared as well. Because the winds are light, cold dense air will collect near the ground. As a result it can be a few degrees cooler near the ground than the temperature measured at the height of the MMTS. Cars tend to see frost early and often because they are very efficient at radiating their heat into the atmosphere, causing them to cool off rapidly. Living in town can delay that first fall frost because they tend to have more trees and more heated buildings (leading to slightly warmer temperatures). Advection frost occurs when a cold air mass pushes into the region out of Canada. This was certainly the case with the September 22, 1995, frost when the entire state was impacted. These events can be quite dramatic by rapidly dropping the temperatures into the 20s. In many cases they lead to hard freezes that kill most vegetation.

New Wind Chill Chart To Be Introduced For This Winter

by Rod Palmer, Warning Coordination Meteorologist

For the past year, the National Weather Service (NWS), acting on behalf of the U.S. Office of the Federal Coordinator for Meteorological Services and Supporting Research, has led a team of international scientists with the goal of creating an international standard wind chill index among the meteorological community. Last spring, the scientists conducted clinical trials on human subjects and the results helped to verify and improve the accuracy of the new wind chill index formula.

Starting with the 2001-02 winter, NWS forecasters will use a new Wind Chill Temperature Index, designed to calculate a more accurate reading of how the cold air feels on the human skin.

Since 1945, the United States and Canada have used an index which relied on observed winds measured at 33 feet above the ground (standard height for airport wind equipment for aviation purposes), and focused on how fast the cold temperatures, combined with winds, made water freeze. The new index accounts for the wind effects at face level (5 foot standard above the ground) and is a better representation of body heat loss. For example, under the ***old index*** system, an air temperature of 20 degrees, with a 15 mph wind, translated into a reading of ***five degrees below zero***. The ***new index*** calculation would translate the same conditions to ***six degrees above zero***.

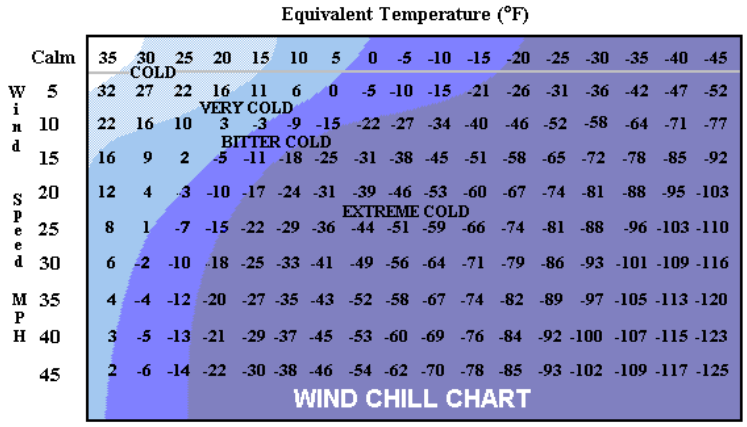
The goal is to use modern science in revising the index so that it's more accurate and makes the human impact more reliable.

The new index will be based on:

Wind speed calculated at the average height of the human face, about five feet (the human face is most often exposed to the cold). An algorithm will reduce the measured wind from 33 feet down to 5 feet.

An updated heat transfer theory which factors in heat loss from the body to its surroundings during cold, windy days.
A consistent standard for skin tissue resistance.
Clear night sky conditions.
A lowered calm wind threshold from four mph to three mph.
A factor to account for a few degrees warming from partial or full sunshine during the day will be added to the index by 2003.

NOTE: This chart highlights the combination of wind speed and temperature to produce frostbite to exposed skin in 15 minutes.



Old Wind Chill Index Chart

Information about the new wind chill index now available on the Lincoln Forecast Office website at
www.crh.noaa.gov/ilx/newwindchill.htm

New Wind Chill Chart

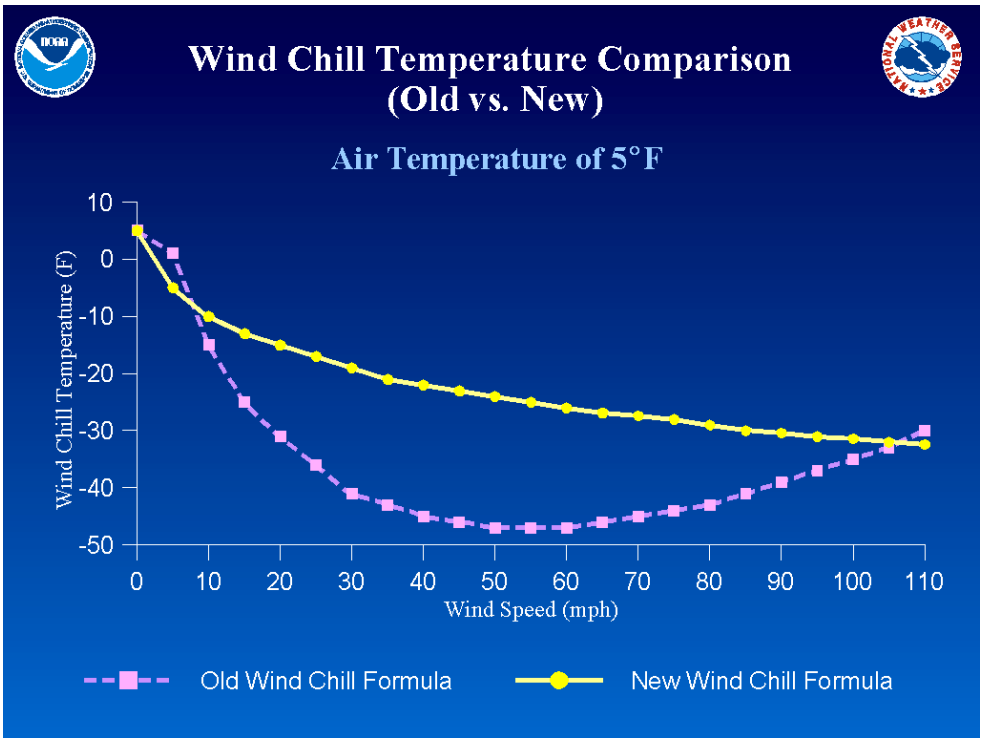
Temperature (°F)

Wind (mph)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite occurs in 15 minutes or less

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T = Air Temperature (°F)
V = Wind Speed (mph)



NOAA Wind Chill Index Chart comparing old and new formulas.

Components of the NWS 88D Doppler Radar

By Chris Miller, NWS Lincoln
Lead Forecaster/Doppler Radar Program Leader

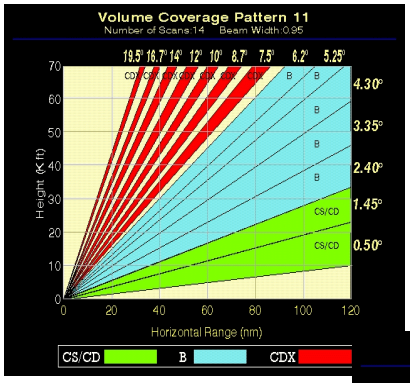
When I teach radar interpretation classes for emergency managers or storm spotters, I always start out by describing the various components that comprise what we call the "Doppler Radar". I believe it is important to know what is involved in creating the radar product you are viewing so you can understand the strengths and limitations of each image, and that you know how to properly interpret them. In this article I will discuss the two main parts of the radar that work together to create the products you see as an image on the Internet or TV.

The **Radar Data Acquisition** unit (**RDA**) is the origination point of the radar data. The **RDA** is made up of four primary components - the **transmitter**, **antenna**, **receiver**, and **signal processor**.

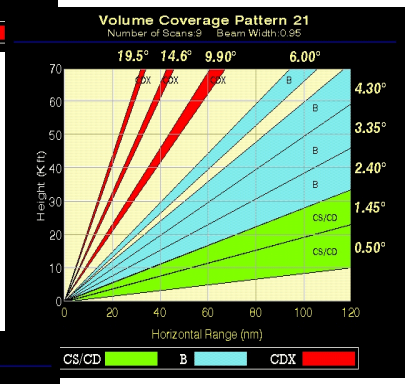
The **transmitter** generates and transmits a very stable, 10 centimeter wavelength, radio frequency signal with 750,000 watts of peak power. In comparison, the average microwave oven has an output of roughly 1,000 watts of power! The transmitter sends the pulse to the antenna, which broadcasts the signal into the atmosphere. The **antenna** measures 28 feet in diameter, and is located under the protective shell that resembles a soccer ball.

The range of angles employed by the **antenna** are selected from four predetermined **Volume Coverage Patterns (VCP)**. Two are in precipitation mode (when there are precipitation targets on the radar), and two are in clear air mode (when the radar is only detecting very light precipitation, dust or other very small targets). **VCP 11**, in precipitation mode, scans 14 elevation angles from 0.5 to 19.5 degrees in 5 minutes. This is used to analyze strong or severe thunderstorms. **VCP 21**, in precipitation mode, scans 9 elevation angles in 6 minutes. This VCP is used during normal, non-severe precipitation events. **VCPs 31 and 32**, in clear air mode, scan 5 elevation angles in 10 minutes. It takes these VCPs longer because the radar is "listening" for very faint returns from very small objects. The difference between VCPs 31 and 32 is in the pulse length of the signal. Speaking of "listening", for each hour that the **antenna** is in operation, it spends a *total time* of approximately

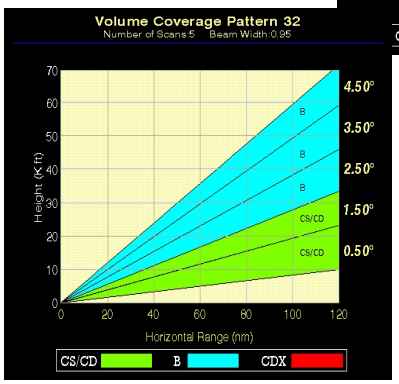
7 seconds transmitting radar signals, while the remaining 59 minutes 53 seconds are spent listening! Talk about an effective listener...



VCP 11



VCP 21



VCP 31/32

Since the amount of returning energy that reflects off of the various particles, raindrops, etc... is very small in comparison to what was originally emitted, the signal must be amplified by the **receiver**. The receiver then sends the data in an analog state to the **signal processor**. The signal processor accomplishes three important functions: **clutter suppression** (ground targets or other targets aloft with little or no movement are removed), **conversion of analog data to digital data**, and **range unfolding** of Doppler velocity data (simply put, it determines the proper velocity information at the various distances from the radar when there are many precipitation targets).

The RDA now sends the digital information of three base data via a wideband communications line to the **Radar Product Generator (RPG)**. The base data sent to the RPG are **Reflectivity** (the location of precipitation and other targets, which is most commonly viewed on the Internet and TV), **Velocity** (the speed and direction of movement of the precipitation and other targets) and **Spectrum Width** (which is a measure of the variability of the velocity estimates).

The **RPG** is a multi-function unit that ingests, processes, and produces products from the three pieces of base data received from the RDA. The RPG creates viewable, useable products from the three pieces of base data (Reflectivity, Velocity, and Spectrum Width). The RPG also uses these base data as input into computer programs (or algorithms) to create a wide variety of more than 35 derived products. Some of these products include the Storm Total Precipitation (STP), Mesocyclone (MESO), Tornadic Vortex Signature (TVS), Storm Relative Velocity map (SRM), and the Composite Reflectivity (CR) product, just to name a few.

The **RPG** also serves as a **communications and distribution center**. It has a series of modems and other dedicated communications lines to send the created radar products to the NWS internal computer system (AWIPS), to other NWS offices, to other government agencies (Departments of Defense, and Transportation) and to the Radar Product Central Collection Dissemination Service (RPCCDS) which sends the radar data from our site to the Internet, TV stations, and other vendors. The RPG also has

archive capabilities, which collect data for transmittal to the National Climatic Data Center in Asheville, NC. This is where radar data from every NWS radar site is stored for future studies/needs.

In the time it took you to read this article, the NWS Lincoln Doppler radar has just scanned a large portion of the atmosphere out to 250 miles, has sent the base data for product generation, has created a suite of more than 35 derived products, and has communicated it to various places for you to view on the Internet or TV!

If you have any questions regarding the Doppler radar, or interpretation of radar imagery, you can contact me via e-mail at Chris.Miller@noaa.gov. I'll answer your radar interpretation questions, and may even use them as topics in future Lincoln Logs newsletters.

More Co-op Observing News & Information

by Billy Ousley, DAPM

Equipment Siting Standards

Temperature sensor siting: The sensor should be mounted 5 feet +/- 1 foot above the ground. The ground over which the shelter [radiation] is located should be typical of the surrounding area. A level, open clearing is desirable so the thermometers are freely ventilated by air flow. Do not install the sensor on a steep slope or in a sheltered hollow unless it is typical of the area or unless data from that type of site are desired. When possible, the shelter should be no closer than four times the height of any obstruction (tree, fence, building, etc.). The sensor should be at least 100 feet from any paved or concrete surface.

Precipitation gauge siting: The exposure of a rain gauge is very important for obtaining accurate measurements. Gauges should not be located close to isolated obstructions such as trees and buildings, which may deflect precipitation due to erratic turbulence. To avoid wind and resulting turbulence problems, do not locate gauges in wide-open spaces or on elevated sites, such as the tops of buildings. The best site for a gauge is one in which it is protected in all directions, such as in an opening in a grove of trees. The height of the protection should not exceed twice its distance from the gauge. As a general rule, the windier the gauge location is, the greater the precipitation error will be.

Transmitting Your Observation and its Importance

By whatever means (**ROSA, COMPU-ROSA, WXCODER, or 800#**) has been arranged to transmit your data, here are a few general guidelines:

1. Try to transmit your data no later than 0800L. Evening and afternoon reporters should report at their prescribed time.
2. Transmit your observation on a daily basis - this included whenever you have zero precipitation. Include in your report snowfall, and snow depth, each day during the winter season, usually from October to April.
3. If you transmit your observation via ROSA, COMPU-ROSA, OR WXCODER, make sure you do not have a future time in your observation report. Example: Lets say your regular observation time is 7 A.M., but for some reason you need to send your observation report in early, say 6 A.M. If you put an observation time of 7 A.M. in your report and transmit it at 6 A.M., the computer will reject your observation since it sees the time of 7 A.M. as a future time. In this case, just change your observation time in the transmitted report to 6 A.M.

If you have questions in this area, just give us a call.

4. The ROSA phone (in most cases) has been set up to expedite the sending of zero precipitation or trace amounts.
5. If you experience any troubles transmitting your data, please notify us here at the office via the 800#. Most transmission problems are a result of NWS's computer that receives the data and not with your computer or phone.
6. The following list identifies some of the users of your 'realtime' and daily observation data. It also illustrates why it is important to transmit a "no precipitation" or "trace" precipitation report:
   a. NWS - River Forecast Center. All data is loaded into computer models which then illustrates areal coverage of where precipitation did or did not occur.
   b. Illinois State Water Survey - this agency has various customers that need as complete a data set as possible for planning purposes.
   c. Federal Emergency Agency and Illinois State Emergency Agency - "realtime" data is used for planning purposes (possibility of declaration of state emergency, disaster relief, etc.)
   d. Army Corps of Engineers - water flow or lack of into dams, rivers, etc.
   e. Media - every morning and evening the NWS sends a round up of all Cooperative Observation sites that reported. This round up is also available on our website.

The Central Illinois Lincoln Logs is a quarterly review of NWS activities in Central Illinois and is also available on our internet page at www.crh.noaa.gov/ilx.

Your comments are welcomed and can be addressed to either editor at our office. If you are currently receiving the newsletter through the mail and now obtain it through the Internet...please send us an email and we will remove your name from the mailing list. Winter Central Illinois Lincoln Logs Issue to be issued by the end of October 2001.

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