

ARES/RACES Group

Amateur Radio Serving Monroe County Indiana

February 2005

Volume 2, Number 2



Dits & Dahs

With storm season just a few short weeks away, I thought we would discuss one of the many reasons storm spotting is necessary.

Our lead article was adapted from Doppler Radar and Its Limitations by David Andra, from the Spring 2003 issue of *Southern Plains Cyclone*, a newsletter of the Oklahoma National Weather Service. Mr. Andra described quite nicely how Doppler weather radar still needs an on-the-ground human component to make the warning system work.

Show this article to anyone who asks you why the National Weather Service, with all their resources – radar, satellites, radiosondes and the network of reporting stations - still needs storm spotters.

Hope you enjoy.

73's

KB9WVI

Why the Human Observer is Important

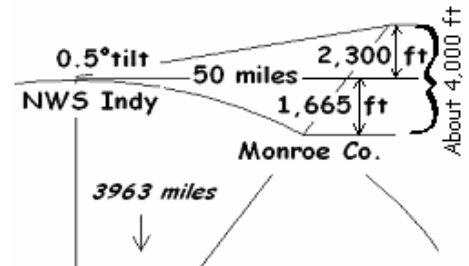
Few tools are more important to detecting and warning of severe weather than Doppler weather radar. While Doppler radar revolutionized the way meteorologists detect and warn for severe thunderstorms, it is important to remember that storm spotters remain a vital link in the warning process.

Given the capabilities of radar, it is reasonable to ask, "Why are human observers so important?" The answers lie in some basic limitations, one of which arises from the curvature of the Earth.

Like a flashlight beam, the beam of radar energy travels in essentially a straight line. As a result, the Earth's surface tends to "fall away" from the beam as the Earth's surface curves below the horizon. This causes the radar to sample increasingly higher altitudes of the atmosphere as it moves away from the radar antenna.

At longer ranges from the radar site, the weather near the Earth's surface may not be observed by the radar. This can have important implications for detecting rainfall and snowfall, thunderstorm outflow winds, and even some tornadoes. In these cases, human observers in the local area provide important ground truth reports that supplement the radar information used by forecasters.

(Continued "Why" Page 5)



Based on a perfect circle with a radius of 3,963 miles, this diagram demonstrates a radar "blind spot" over Monroe County to nearly 4,000 feet above ground level. While not completely accurate, it does make the point!



Photo [NOAA](#)

In an average thunderstorm, the energy released amounts to about 10,000,000 kilowatt-hours or a 20-kiloton nuclear warhead. A large, severe thunderstorm might be 10 to 100 times more energetic.

Table of Contents

Monroe County ARES/RACES News & Notes	Page 2
January Flooding	Page 3
The Tsunami and Amateur Radio	Page 4
Temperature Conversion Tricks	Page 5

Monroe County ARES/RACES News & Notes



Standard First Aid
Saturday, Feb 26 (9 AM to 3 PM) or over 2 sessions
Monday (6 pm to 10 pm)
and Wednesday (6 pm to 8 PM) Feb 21 & 23.

Adult, Infant and Child CPR will be offered
Saturday Feb 12 (9 AM to 4 PM).

Disaster Services Volunteer Training:

Family Services Monday Feb 7 or Wednesday Feb 9 (both dates 6 PM to 9:30 PM)

Shelter Ops/Simulation
Saturday Feb 19 (9 AM to 12 PM restarting at 1 PM to 5 PM)

Volunteer Orientation for new volunteers Monday Feb 21 (4 PM to 5 PM)

Call 332-7292 to enroll or for fee information



Serious meteorological training!

www.meted.ucar.edu

Now offering certificates of accomplishment! see the "Registration" link on the meted.ucar web site

Southern Indiana Simplex Net 146.580

Every Monday at 8:00 p.m. or after
K9OK net NCS Maynard Raggio N9PTG
Net Procedure: Make a list of stations you hear from your location. Check in your call sign alphabetically. NCS will come back to you and ask for your location, radio output, antenna type, and the list of stations you heard. This gives us valuable information regarding our ability to cover the region with simplex communications. Please join us!

State Skywarn Net

First Monday each month 8:00 p.m.
Indy repeater 146.790 (-) PL 77.
Freetown link 147.435 simplex PL 77

VE Testing

1st Saturday each month 12:00 noon at the First United Church on East Third Street Bloomington, just west of Eastland Plaza behind PromptCare and the IU Credit Union. Please arrive 20-30 minutes early
What to bring:

Note new testing fees: \$14.

If 1st time testing: 2 pieces of I.D. one *must* be a photo I.D.

If upgrading: bring FCC license and CSCE's you may have along with photo copies of these documents as well as a photo I.D.

BLOOMINGTON AMATEUR RADIO CLUB

Friday February 4th topic:

Emergency Communications

led by the **ARES/RACES Committee**
with special guest panelist

John Hooker

Director of Emergency Management for Monroe County. Please plan to attend this important meeting
7:00 P.M. Wegmiller Auditorium
in Bloomington Hospital

K9OK

NCS Schedule

Monday evenings 7:30
146.640 (- offset)

FEBRUARY

7 KF9RA ALLEN
14 N9RGI MIKE
21 WA9MTH RICK
28 WB8WOR TOM
Back-up for Tom will be WB9VPG NEIL
And KC9GKX BARB

K9IU

Sunday Night Net Featuring Amateur Radio NewsLine

7 P.M. 146.940 pl136.5
Every Sunday, with the exception of the 3rd Sunday of each month.

The K9IU IRLP Node is back on line. For info on IRLP See the K9IU Amateur Radio Club web site at:
<http://www.indiana.edu/~k9iu/>

NCS Schedule

Jan 30 Mark KC9EVN
Feb 6 AJ KC9EVU
Feb 13 Bryan KB9QVT



Buy's-Ballot Law -
With the wind at your back, low pressure is to your left in the Northern Hemisphere.

JANUARY FLOODING



USGS. hydrographers make stream flow measurement at the White River at Petersburg USGS photo

This January heavy rains and snows led to some of the worst flooding in Indiana history. On January 5th Monroe County Red Cross opened a shelter in the elementary school in Spencer in Owen County. The National Guard Armory had been used in the past but the flooding threatened to reach the Armory itself. The shelter was closed on the 9th, however a Disaster Service Center is still active at the Owen County Red Cross office and may handle casework for weeks to come.

On January 18th I asked David Pifer N9YNF, ARRL Section Emergency Coordinator, if there was any "official" amateur radio responses to the flooding in Indiana.

"Basically there was a varied amount of activity across the state. SEMA activated late last week and was keeping in touch with Knox and other counties along the White and Wabash Rivers; mostly monitoring river stages and keeping in touch with EMA offices."

"The Red Cross has a DR running for Indiana and Ohio floods. There have been varied activity with Hams in that aspect with Red Cross activities."

"The National Weather Service has been working with other local hams getting updates of River Depths here in Vigo and Vermillion County just in the past few days. This is not counting all the local activity that may have been going on. While there was lots of activity on the local levels the situation never quite merited activity on a full state level."

Hearing through the grapevine that SEMA had hams working in southern Indiana using the EARS repeater system, I contacted Neil Rapp WB9VPG ARRL Central Division Assistant Director.

"The town of Hazelton, a small town of about 500 in northern Gibson County, is right next to the White River. The National Guard and SEMA were called in because the river had overflowed the banks and they needed people to fill and place sandbags round the clock for several days to keep the town from going under water. SEMA decided to investigate a backup means of communication between the home office in Indianapolis and the SEMA trailer which was taken to Hazelton."

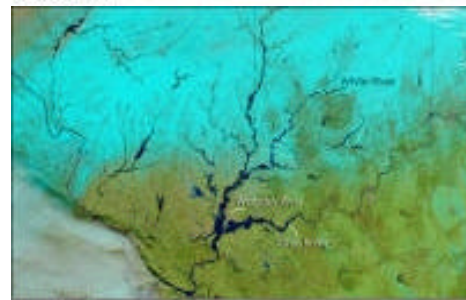
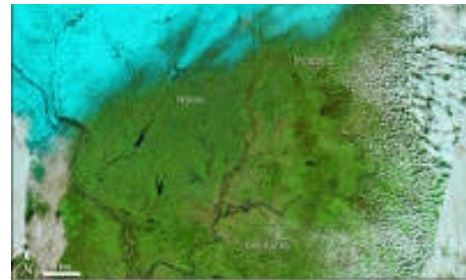
"The guys at Hazelton found that the 146.925

repeater had great coverage in that area, and so they researched and discovered that the SEMA people in Indy could also access the EARS system since we have a remote receiver in Farmersburg on the Vincennes repeater. So there was some minimal traffic passed, mostly to make sure the connection was possible. I believe they did pass some traffic about conditions and items needed for the project."

"Since the trip from Indy to Farmersburg required an outside antenna either high or directional and 50 watts to make a clear connection due to some problems with the duplexers at the time, they decided to investigate the possibility of linking the 146.925 in Bloomington to 443.775, which would tie the EARS network to the W9WIN network, which would provide HT coverage in Indianapolis."

"I caught the conversation on the 443.775, and was able to jump in and try it. I had to work a ballgame that night, so I couldn't leave it on unattended, but it worked just fine. Dwight WB9TLH among others were also ready to provide the cross band link from their homes if needed. So that evening they were ready to link if the need arose."

"Saturday I went to the Vincennes site and retuned the duplexers and did some other work on the repeater, and then proceeded to Ft. Branch, so I went by the flooded area. It was definitely the worst I have ever seen in that part of the state. It normally floods in that area but the flooded river went (I would estimate) a mile on either side. ...Pretty ugly."

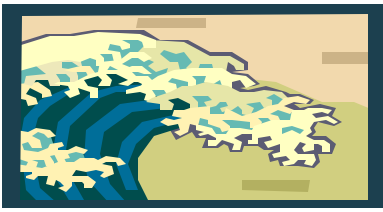


Compare this Nov 25 photo (top) with the same area taken on Jan 17th (bottom). The West Fork of the White River is clearly visible in later view..

More photos at the USGS.gov web site.

<http://in.water.usgs.gov/flood/floodpics.shtml>

Photographs from the USGS web site courtesy of NASA Earth Observatory



The Tsunami and Amateur Radio

With wall-to-wall coverage of the tsunami disaster many of us have been curious to hear if amateur radio would ever be mentioned in the news media. Searching Indonesian newspapers on the web revealed several stories about local ham radio responses. The following is a nice representative piece that appeared in *the India Times On-Line*.

As in most any disaster, emergency communications through amateur radio was up and running from the onset. Our Indonesian counterparts have risen to the call and I hope that at some point there will be a way to convey that we are proud of them and grateful for their efforts. Until then, keep them in your thoughts and prayers. They will be kept quite busy for some time to come and many will face hardships as they work to recover from this monumental tragedy.

Radio lifeline for stricken islands

Dateline: *Kolkata India, Sunday, January 2, 2005.*

It is sheer providence that a team from the National Institute of Amateur Radio was in the Andamans on an expedition when the Tsunami struck on December 26. And even more providential that Port Blair's first HAM radio station got operational on December 15 - the 1987 bar on amateur radio operators was lifted last year.

Within hours of the tragedy, two stations had been set up at Port Blair and one more at Car Nicobar. Conventional communication links between the islands and the mainland having been snapped, these amateur radiomen turned out to be the only hope for thousands of marooned survivors. Now, a direct control room has been set up in Kolkata which acts as a relay centre between the islands and the rest of the country. "It is easier to reach Kolkata by radio from the Andamans.

"We are relaying messages for the administration and relief organisations, such as the International Red Cross. A number of personal requests are also coming in from people whose relatives are still missing. We are doing our best to locate them but it is very difficult to trace individuals as we lack the manpower and the means. We have succeeded in helping out only 15-20

percent of those approaching us with such requests," admits Indranil Majumdar of the Calcutta VHS Amateur Radio Society.

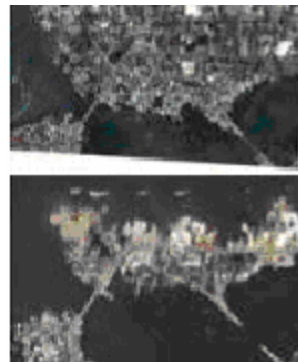
However, they have managed to provide accurate information about the state of affairs on individual islands. "Many have asked us to find out about the situation on a particular island. We have been able to tell them whether that island has been affected or not," Mukherjee added. According to him, 14-15 amateur radiomen will be soon leaving Chennai for the Andamans to set up additional stations at Little Andamans and other islands.

Normally, no amateur radio licence is issued for the Andaman and Nicobar Islands due to their strategic location. However, in international circles, the islands continue to remain an important radio address. "The last expedition had been to the Andamans in 1987.

The home ministry does not allow radio transmission from the Andamans. A team from NIAR began their expedition from December 1, 2004, but it was cut short by the Tsunami. Teams were then created to set up the stations at Port Blair and Car Nicobar," Majumdar said.

In the past, the amateur radiomen have performed wonders, particularly during the Bhuj earthquake and the supercyclone in Orissa. Every year during the Gangasagar Mela in South 24-Parganas, these radiomen continue to remain the backbone of communication.

"For the Andamans, we have set up an emergency net and have kept the 20-and 40-metre bands open. Even for the Gangasagar Mela this year, we shall take along high frequency sets and special antennae, so that we can be ready for any eventuality," Majumdar said. Amateur radio stations in Kolkata, Bangalore, Hyderabad are connected to a Delhi-based Ham operator.



Dramatic before & after images of Banda Aceh, Sumatra, Indonesia

NOAA photos

Continued "Why":

Another limitation is caused by the radar beam tending to spread and become wider as it moves away from the radar site. This tendency leads to a loss of resolution or detail. For example, a strong circulation associated with a developing tornado appears to be weaker than it really is when located far from the radar. While meteorologists are trained to help compensate for this loss of detail, observers and spotters in the local area again provide valuable information.

In the past, radars have had difficulty determining both precipitation intensity and precipitation type. As a result, another important piece of information provided by humans has to do with, what kind of precipitation is falling (is it light rain, heavy rain, snow, sleet, or hail?) and how much has fallen. The difference between 2 and 12 inches of snow is often hard to determine based on radar data alone. Similarly, radar rainfall estimates may be in error by a factor of two or three just because of variations in rain drop size. Rainfall estimates during severe thunderstorms can be especially tainted because of the presence of hail. Hailstones are much larger than average raindrops, and since the radar cannot differentiate between liquid and ice, hailstones are seen as very big raindrops. This can lead to overestimates. Therefore, the questions of "What is it?" and "How much is there?" are often ultimately answered by human observers.

Research continues to make radar even more capable. The recent introduction of the VIPIR radar interpretation software used by television weather forecasters demonstrates one advancement coming on-line. However, it will be a long time, if ever, before radar can provide all of the answers to the warning and forecast questions facing forecasters. Therefore, warning forecasters must continue to use a variety of resources, including spotter reports, experience, and other meteorological data to accurately assess what is happening.



National Weather Service radar in Indianapolis
NWS photo



Temp. Conversion Tricks

An approximate value for Celsius or Fahrenheit or vice versa can be found just by memorizing a few landmark values and by knowing there are about 2 ° F in 1 ° C. With each 10 degree Celsius temperature change there is an 18 degree Fahrenheit change. Let's start with the temperature conversion everyone knows, 0 ° C = 32 ° F, each time 10 ° is added or subtracted to the Celsius temperature, add or subtract another 18 Fahrenheit. The result is the following:

**$-10 \cdot C = 14 \cdot F$, $0 \cdot C = 32 \cdot F$, $10 \cdot C = 50 \cdot F$,
 $20 \cdot C = 68 \cdot F$, $30 \cdot C = 86 \cdot F$, $40 \cdot C = 104 \cdot F$**

After memorizing these key values, you can interpolate the values in between. For example, suppose an 850 mb observation has a temperature of 15 ° C. You know that 10 ° C is 50 ° F and 20 ° C is 68 ° F, therefore 15 ° C must be exactly in between 50 and 68, which is 59 ° F. Now try, 18 ° C. You know that 20 ° C is 68 ° F and you know that there are almost 2 ° F in a degree Celsius (actually there are 1.8 ° F in a 1 ° C temperature change) therefore the temperature is approx. 68 - 4, or 64 ° F.

The same process can be used to convert Fahrenheit to Celsius temperatures. Suppose you want to know what 100 ° F is in Celsius. You have memorized that 104 ° F is 40 ° C, therefore the temperature is approximately 40 - 2, or 38 ° C. The 2 came from the temperature difference between 104 and 100; that is a 4 degree difference in Fahrenheit but about a 2 degree difference in Celsius.

Another way to convert Celsius to Fahrenheit and vice versa in your head is to simplify the formulas:

$$F = 2 \times C + 30$$

$$C = (F - 30) / 2$$

Not receiving the ARES/RACES Group newsletter? Have a topic relating to *Emergency Communications* you'd like to share? Like to write a product review on an item useful in ARES/RACES activities?

Contact us at:

kwpauley@peoplepc.com

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