They stand watch for severe storms

Jim Wades checks information from the teletype machine at his amateur radio station in his Farmington Hills home.

By Randy Borst
staff writer

Despite the availability of high speed computers to analyze data and sophisticated radars to probe the clouds, there is still a need to have trained people in the field to watch the skies when severe weather threatens.

Five years ago, Farmington Hills resident Jim Wades decided to organize the Oakland County chapter of Skywarn and its parent organization the Radio Amateur Civil Emergency Service (RACES).

Since that time the group has grown to 125 active members in Oakland County, 30 of whom live in Farmington and Farmington Hills. Another 100 Oakland County residents have been trained by the National Weather Service as spotters.

WADES, 23, IS an electrical engineering student at the Dearborn campus of the University of Michigan. He holds an Extra Class amateur radio license — the most advanced license the Federal Communication Commission issues.

Skywarn spotters are trained by the National Weather Service to identify clouds that are capable of producing severe weather.

"The value of training is very important," said Wades. "Certain cloud formations can be mistaken for tornadoes by untrained individuals."

THIS VOLUNTEER group of amateur radio operators takes to the highways during threatening weather when most of us are seeking shelter indoors. Their job is to be on the lookout for thunderstorms that are producing hail, high winds or tornadoes. When threatening conditions are sighted the spotters radio the location, speed and direction of the cloud movement.

"One of the things we stress is accuracy," said Wades.

Reports from the field are sent to other members of the Skywarn team located in the Oakland County Emergency Operations Center or the Oak Park Public Safety Office. From there the reports can be sent to the National Weather Service at Detroit Metropolitan Airport.

WADES ADMITS TO "a little bit of fear for my personal safety" when out on patrol.

"We had a ham (amatuer radio operator) in Wayne County who had the windows busted out of his car by the heavy hail in early May," Wades said.

But despite the potential danger, Wades enjoys his position as director for the Oakland County Skywarn program because, "you feel like you're doing something for the public.

He also feels that Skywarn spotters provide a valuable service in the overall weather warning program.

"Radar is not the infallible tool for predicting tornadoes that a lot of people think it is. In a lot of cases it only reports the largest tornadoes. Tornadoes have been sighted by spotters and even ripped up neighborhoods but never showed up on the radar screens. The spotter is an important tool for the weather bureau."

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Gathering storm

A towering cumulonimbus or thunderhead looms over the city of Farmington. This storm is still in its developing stage and produced no rain as it passed over the city. The billowing, cauliflower appearance around the edges of the cloud are caused by hundreds of individual cells of rapidly rising air. About 40 minutes after this picture was taken the cloud formation had traveled northeast, and rain began to fall in the city of Rochester, approximately 40 miles away from Farmington.

photos by RANDY BORST/staff photographer

Thunderstorm: Fury in the clouds

By Randy Borst
staff writer

In a darkened room, Iola Patton stares intently at a glowing screen as one-half-million watts of radar energy sweep the skies of southeast Michigan. The invisible beams are searching for what can be one of nature's most violent weather phenomenon — the thunderstorm.

As a National Weather Service radar specialist at Detroit Metropolitan Airport, she is watching for the bright radar echoes of large hail and rain drops that are the tell-tale signs of a severe storm.

"Sometimes my heart jumps when I see severe weather on the screen," she said.

THE FURY OF thunderstorms can be witnessed by state residents 30 to 40 days a year. This year the Detroit area has been particularly hard hit by wet weather. For instance, May 2 will stand out in many persons' minds as the day hail stones, some the size of golf balls, battered their automobiles.

But not all storms are violent. The atmosphere must contain the proper ingredients in just the right amounts to produce a thunderstorm. While most of us rely on dark clouds as a warning to cancel that family picnic or bring the outdoor wedding inside, some more scientific ways to predict thunderstorms do exist.

Three basic conditions are necessary for thunderstorm formation:

● WARM, HUMID AIR — Humidity is the measure of how much water vapor the atmosphere contains. When humidity is high a hot summer day can feel very uncomfortable.

● UNSTABLE AIR — Instability of the atmosphere promotes the lifting of air near the ground to higher altitudes. Stable air resists the up and down movements of air currents.

● LIFTING ACTION — Something has to act as a trigger to make the air rise. This can be caused by cool air passing over land that has been heated by the sun. The warm ground heats the air above it forcing it to ascend. A cold air mass sliding under warm air can also force the warm air to rise.

"The typical weather situation that produces the most violent type of thunderstorm is extremely warm, moist air being displaced by much cooler, drier air," explains Joe Schaefer, chief scientist at the National Severe Storms Forecast Center in Kansas City, Mo.

THE AREA WHERE two air masses of different temperature meet is called a front. How severe a storm will be is determined by the difference in temperature between the two air masses.

All thunderstorms begin their lives as small, puffy, white cumulus or fair weather clouds. These are formed by warm, humid air lifting from ground level through an unstable layer of air. As it rises the warm air begins to cool and the water vapor it contains condenses or clings to small particles in the atmosphere forming liquid cloud droplets. This is called condensation. At this point the cloud droplets become visible and the young storm has entered its first phase of development — the cumulus stage.

AS WATER VAPOR changes from a gas to a liquid during the process of condensation it releases latent heat. This keeps the air within the cloud warmer than the surrounding air, allowing the cloud to build in size.

"Latent heat gives it the kick that starts the thing going," says Schaefer.

Cumulus clouds can build rapidly at this point depending on the strength of the updraft. The base of the cloud begins to darken and the top takes on a billowing "cauliflower" shape. The gathering cumulus merge and are transformed into giant cumulonimbus or thunderheads.

THE FLICKERING OF lightning can be seen within the cloud and the distant rumble of thunder rolls across the landscape. A dark, ragged rain shaft appears at the base of the cloud as precipitation begins to fall. As rain plummets through the cloud it drags air with it, creating strong downdrafts felt on the ground as cold blasts of gusty wind about three miles ahead of the main body of the cloud.

Warm, humid air is sucked into the storm increasing the velocity of the updrafts and pushing the cloud tops up to ten miles above the Earth. Latent heat from rapidly condensing air now provides the main energy source for the storm as it grows in intensity. The mature stage has begun; the thunderstorm has come to life.

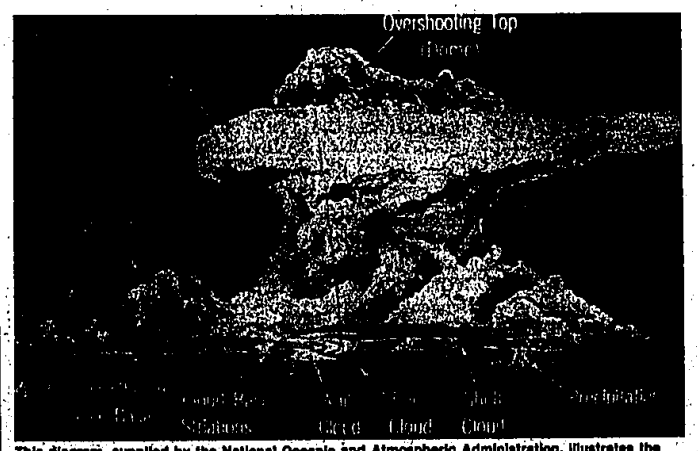
MANY OF THE common side effects of thunderstorms such as lightning, hail and tornadoes occur during the mature phase of the storm.

Lightning is the massive discharge of static electricity. Large charges build inside the cloud due to friction of rapidly moving rain, hail and air.

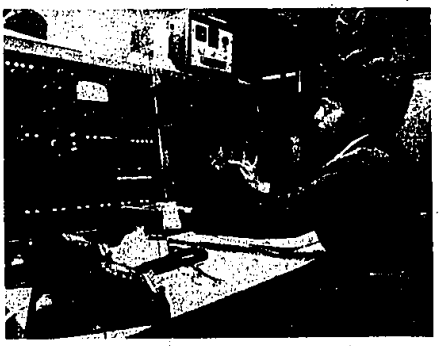
"The close proximity of rising air next to descending air acts in concert with ice crystals that are beginning to form to give the cloud its charge; much like when you rub a balloon across your hair the balloon will pick up a charge. It's basically the same thing," says Schaefer.

Please turn to Page 2

The tremendous energy the thunderstorm expends takes it toll not only on people below the storm, but on the storm itself.



This diagram, supplied by the National Oceanic and Atmospheric Administration, illustrates the fully developed thunderstorm.



Iola Patton adjusts the controls of the Weather Service Radar at the National Weather Service office at Detroit Metropolitan Airport. The radar has a range of about 280 miles.