

## **Storm Spotting Operating Procedure**

### OVERVIEW

Volunteer severe storm spotters serve an important function in the Kansas City system of severe storm warning. In the Kansas City area, dedicated ham operators, with their mobile and other communication capabilities do the heavy lifting in the volunteer storm spotting service.

Spotter groups that make up our Metro area exist as part of city or county emergency management and/or ARES® group. The spotter groups report severe weather information to the governmental agencies that they serve. This remains their first responsibility. In addition, spotters providing information to the National Weather Service also have network connections to the National Weather Service office at Pleasant Hill. Spotter reports might come to the National Weather Service over the Metropolitan Emergency Radio System or MERS. The Metropolitan Emergency Management Committee operates this radio system. It is a committee of the Mid-America Regional Council or MARC. Several area police, fire, sheriff and emergency preparedness offices use MERS. MERS is a tone activated repeater system with an output on 154.130 MHz. Only authorized agencies may use the MERS system.

The other radio storm reporting network available to the National Weather Service is the amateur radio operated SKYWARN Network. This network backs up the other radio and telephone systems that an emergency preparedness office may use to contact the National Weather Service office. For some spotter groups, this network provides a primary means of contact with the National Weather Service. The SKYWARN Network operates in parallel with other communication methods employed by National Weather Service and spotter groups. The SKYWARN Net is intended for use of National Weather Service. It is not intended for public reception. Other means exist to inform the public. To function as an effective backup system, the SKYWARN network activates whenever requested by the National Weather Service. If the SKYWARN Network is only activated upon failure of a telecommunication system, it may not be possible to get it operational in time to be of benefit. Due to the brief nature of certain weather situations, if a ham were requested to go to the National Weather Service upon failure of a communications system, he might not arrive in time to be useful.

The SKYWARN voice net normally operates at 146.82 MHz, a Kansas City Amateur Radio Club repeater. The 146.700 MHz. repeater is the alternative voice repeater for SKYWARN to use in the event the 146.82 MHz repeater is unusable. The 146.70 MHz repeater normally requires a 107.2 Hz. CTCSS tone for access.

Any ARES® station may activate the Jackson County ARES® storm spotting net. Additional information about activation follows. When we operate our Jackson County spotter's net, one of our net stations needs to serve as liaison with the SKYWARN Net. A fixed station may perform this liaison. The operator must be able to listen to our spotter net and SKYWARN Net simultaneously. This liaison station shall relay important reports to the SKYWARN Net from our spotter net as directed by Jackson County ARES® net control. The liaison station also reports information from the National Weather Service on the SKYWARN Net back to our spotter net. The liaison station therefore operates under direction of two net control stations. We always seek a station to perform liaison duty when we operate a spotter net.

There are dual two-meter voice stations at the Pleasant Hill Weather Service office. This enables the operators there to monitor or communicate directly with individual spotter nets. A station identifying itself as Pleasant Hill National Weather Service may enter our spotter net. This station should inform the net when entering or leaving the net frequency. During the time this station is resident on the net, communication to the weather service office will bypass the appointed SKYWARN liaison station, and be conducted directly on our net frequency. In such case, it may be possible for a spotter to communicate directly with the ham operator at the weather service office, thus eliminating at least one intermediary level.

KCØSKY, an APRS station at Pleasant Hill, will also accept spotter reports.

## WEATHER AWARENESS

A weather spotter should possess an awareness of the possibility for severe weather occurrence on a given day. Morning local and network TV news programs identify potential severe weather areas for the day during their weather segments. Most TV and broadcast radio weather forecasts at other times during the day should mention if severe weather is likely that day. The Cable Weather Channel carries information on prospects for severe weather once or twice an hour.

Daily, about 6 A.M., again about 1P.M. and also about 6 P.M. during severe storm season the National Weather Service Pleasant hill office issues a Hazardous Weather Outlook for the remainder of the day. This forecast contains statements that predict the likelihood for severe weather and the anticipated need for spotters that day. This forecast is available from many sources. Upon release, it is read over the MERS radio system on 154.130 MHz. The Hazardous Weather Outlook broadcasts over the NOAA Weather Radio station callsign: KID-77 on 162.55 MHz between 6 and 9 A.M., again between 1 and 4 P.M. daily and between 5 and 8 P.M. during severe storm season. The Emergency Managers Weather Information System or EMWIN captures these Hazardous Weather Outlook forecasts. These forecasts are also available on the Internet at [www.weather.gov/kc](http://www.weather.gov/kc).

One of the best methods of severe weather danger notification is by means of an alarm equipped weather radio. One may buy these radios at local ham equipment and other stores at reasonable prices. If you are contemplating purchase of such a radio, you might consider the models with the specific county messaging feature.

The Cable Weather Channel carries repetitive printed statements of watches and warnings following an alert tone. These statements usually follow by some minutes the alert available on KID-77.

It is hoped that, by being aware of weather situations, you will be able, in your personal circumstances, to be available for weather spotting. We understand that not every trained spotter may be able to participate every time. This is why we want as many ARES® members as possible to have recent spotter training. We need a large pool of spotters from which to draw.

## PREPARATION

Be prepared to participate in severe weather spotting. It would be good to have some printed instructional, and reference information at hand. If you browse the Internet, check <http://www.crh.noaa.gov/eax/skywarn.htm>. There is a Storm Spotter Training Guide there. If you picked up printed spotter information at a recent spotter training session, use that material

Review your materials from time to time. I suggest you keep your materials in your mobile. Some spotters recommend the use of binoculars and blue-light-filtering sunglasses.

## NET PROCEDURES

When you become aware of a severe thunderstorm or tornado watch, monitor our spotter frequency for announcements. We would normally use the frequency of 147.27 MHz. In the event, the 147.27 MHz repeater is off the air we have trouble with it or interference, we will use our alternate ARES® frequency. Our alternate frequency is 146.97 MHz for weather spotting and other emergency communications situations.

Our ARES® spotter net may or may not activate during a severe thunderstorm watch or warning. Factors such as the location of the affected area may have a bearing on whether we activate. If the SKYWARN Net goes on the air, expect our spotter net to operate in some fashion. Our spotter net activation status probably will follow the lead of the status of SKYWARN net. If the SKYWARN Net activates and after about fifteen minutes of monitoring our net frequency, you do not hear a net control station, call for a net control station. A net control, if there is one, should respond. If no net control station responds, those stations on frequency should establish among themselves a net control station. If our ARES® net is not activated and you experience severe weather you feel needs reporting to the National Weather Service, there are non-radio methods for doing so. If you can do so safely, call your local law enforcement agency. Identify yourself as a National Weather Service trained spotter. Give your report and request it be forwarded to the National Weather Service. You may also call the National Weather Service with your report to their toll-free telephone number. The number is 816-540-6126 or 1-800-438-0596. When offering a report by telephone, include all the information you would as if you were making a spotting report over the radio.

For those with Internet connectivity, there are a couple of ways for you to report severe weather. Using your browser, go to <http://www.crh.noaa.gov/espotter>. Before you can use this link to report severe weather, you will need to register certain information with the National Weather Service to obtain a password.

Following the issuance of a watch by the National Weather Service, there may be a time before the spotter net starts and spotters deploy. During such a period, the ARES® net is in standby status. If the SKYWARN net is in standby status, our spotter net may also be in standby status. Consider the net on standby status as an alert period during which preparations are made for possible spotter activities. During standby status, normal repeater activity can continue without causing a problem to net activities. As repeater usage allows, the net control station should make periodic announcements of the net and weather status and may ask for stations to declare their availability for subsequent spotter duty.

### NET CONTROL RESPONSIBILITIES

The responsibility of the net control station includes determining when and where spotters are assigned. When net control station requests spotters, report your availability status and location. The net control station will try to assign you to a spotter post near your current location. If it appears we have a sudden need for more spotters than we have currently on the net, we may call you by telephone. We would appreciate your help, but we understand if you cannot participate at this particular time. Your caller will likely not have time to listen to a lengthy explanation of your situation or engage in conversation about other subjects.

The net control, or a designated operator needs to notify the Kansas City Emergency Manager when our spotter net is in operation. Do so by sending an e-mail to <steven\_bean@kcmo.org>. The e-mail should contain unambiguous notice that the Jackson County ARES spotter net is activated, the net frequency and a contact telephone number.

The net control station needs to appoint a station to liaison with SKYWARN Net. The liaison must be able to receive the SKYWARN Net and our spotter net simultaneously. This station should act as liaison for our spotter group only and not attempt to be liaison for other groups as well. The liaison station enters the SKYWARN Net by identifying as the liaison from Jackson County ARES® and by reporting the status of our spotter operation. Thereafter, the liaison should inform the Jackson County ARES® net of any specific reporting requests made by SKYWARN.

The net control also needs to assign a station the responsibility of recording our net. A voice-operated tape recorder would be best for this purpose. Alternatively, a recorder continuously running or turned on and off to record transmissions will do. Recordings are desired in case transmission content is questioned and for critique purposes. Recordings need only be kept for a week. The station doing the recording, like SKYWARN liaison, should ideally be with the net for the duration of operation.

A function of our spotter group activity with the National Weather Service is to assist in the issuance of warnings and advisories. The National Weather Service has a mission to save lives and reduce property damage through the issuance of warnings and forecasts. It is the intent that warnings be issued with sufficient time to prepare and with enough information to motivate those in the storm's path to seek shelter. The Pleasant Hill office issues warnings for 43 counties besides Jackson County. If the National Weather Service issues warnings for our county, the focus of our spotter activities may change. During a tornado warning, the net may be suspended so participants in the warned area may take cover. Following a tornado or severe thunderstorm warning, spotters may be asked to survey damage. If sufficient rain falls during a storm, we may ask spotters to observe locations suspected to be prone to flooding.

### SPOTTER SAFETY PROCEDURE

Volunteer spotters carry out spotting activity at their own risk. The personal safety of the spotter is of utmost importance in selection of your best spotter location. Avoid being near overhead electric power lines or trees that could attract lightning or be blown onto your vehicle. Be sure you have multiple exit routes from your spotter location. Avoid cul-de-sacs and dead-end streets. Be aware of sites affording protection from hail, such as covered parking or drive-through teller lanes. When parked, point the car into the wind to avoid being struck broadside by wind gusts.

Be observant of the local environment always. When near a thunderstorm, keep a three to four mile "buffer zone" between you and the storm. Do not drive into the North or West side of a supercell storm. For best visibility and safety, it is best to stay on the South side of the storm with an eye to the North. Frequently check the sky overhead and behind to ensure against unexpected events such as a new tornado development. It is easy to become engrossed in developing weather phenomenon to the disregard of the total weather environment. Even during severe thunderstorm watches, tornadoes may develop. Spotters should always be on guard for tornado development.

Electrical hazard is the most common danger facing the spotter. The spotter can have a lightning strike exposure due to his position in an area such as a hilltop clearing. Whenever possible, remain in your vehicle to minimize the chance of being struck by lightning. If you must leave your vehicle, maintain a low profile when lightning is nearby. Remember lightning can strike some miles from a thunderstorm cloud. Do not drive over electrical power lines.

If a tornado approaches your location, drive away from the tornado to the South or East. Do so only if you are in open country, if the location and motion of the tornado are known and if you are familiar with the local road network. If you are in an urban area and escape is not possible for some reason, abandon your vehicle and seek shelter in a reinforced building. If a reinforced building is not available, get into a culvert, ditch or other depression in the ground not prone to flooding. Protect your head with your arms.

Never drive through water of unknown depth. Flowing water, exceeding a foot in depth, is capable of moving a vehicle off the pavement with a force of 1500 pounds.

Remember that you never need net control's approval to take self-protective steps. Take care of your safety first. Inform net control of the situation when you can do so safely.

## SPOTTER PROCEDURE

Upon arriving at your spotter location, adjust your position to have good lines of sight. Remember visibility to the Northwest and West is the most desirable. From time to time spotters discover additional suitable spotter locations or we get new spotters who have access to high rise buildings. We are always open for suggestions of good spotter locations.

When you arrive at your spotting position, notify net control of your location and the current weather condition. Report whenever your weather condition changes. At some point in a spotter operation, the net control may ask for only reports of severe weather. Thereafter initiate only reports of severe weather as follows.

- Report hail occurrences when the hailstones have a diameter of a penny or larger.
- Report wind gusts when their speed exceeds 50 miles per hour.
- Obviously, one should report tornadoes and funnel clouds. If a funnel cloud reaches more than half of the way to the ground, report it as a tornado.
- Pre-tornadic phenomena such as rotating wall clouds should be reported.
- Report rainfall exceeding an inch per hour or resulting flash flooding.
- Report any storm or water damage.

When reporting, cover the following points:

- 1) Location of the spotter
- 2) Location of weather phenomenon (cross street or well known landmark)
- 3) Time of observation
- 4) Type of severe weather phenomenon
  - In the case of a tornado or funnel, cloud report speed and direction of travel
  - In the case of a wall cloud, report existence of rotation and speed and direction of travel and the length of time you have observed this
  - In the case of hail, report size using size descriptors in your spotter guide
  - In the case of wind, report speed and direction and if speed was measured or estimated

- Any physical damage
- In the case of heavy rain, the amount of rain over what period and if it was measured or estimated
- In the case of flooding, the current extent of the flooding.

This information constitutes a complete report. Take time to formulate a complete report. If necessary, take a few moments to outline your report on paper. From time to time, net control may request reports on current conditions.

If you are not certain of weather phenomenon you are seeing, observe it for a little longer before making your report. If you do make a report and remain uncertain of what you observe, always state this uncertainty in your report. Perhaps another spotter can confirm your report.

If you report something on the spotter net overheard on another radio frequency or something you didn't see with your own eyes; report the source of the information. We wish to avoid confusion over whether a report on the net is a live observation from one of our spotters or a hearsay report.

### **Important Frequencies**

Jackson County ARES®	147.270 MHz <sup>+</sup> primary, 146.970 MHz <sup>-</sup> alternate
MERS	154.130 MHz
SKYWARN	146.820 MHz <sup>-</sup> primary
	146.700 MHz <sup>-</sup> (107.2 Hz. CTCSS) alternate
KID-77	162.550 MHz

### **HAIL DIAMETER SIZE DESCRIPTION**

1/4"	Pea Size
1/2"	
5/8"	Dime Size
3/4"	Penny Size
7/8"	Nickel Size
1" (Severe Criteria)	Quarter Size
1 1/4"	Half Dollar Size
1 1/2"	Walnut or Ping Pong Ball Size
1 3/4"	Golf Ball Size (often accompanies tornadic conditions)
2"	Hen Egg Size
2 1/2"	Tennis Ball Size
2 3/4"	Baseball Size
3"	Teacup Size
4"	Grapefruit Size
4 1/2"	Softball Size

<b>WIND SPEED ESTIMATE</b>	<b>DESCRIPTION</b>
25-31 mph	Large branches in motion; whistling heard in telephone wires
32-38 mph	Whole trees in motion; resistance felt walking against the wind
39-54 mph	Twigs break off trees; wind generally impedes progress
55-72 mph	Damage to chimneys and TV antennas; pushes over shallow rooted trees
73-112 mph	Peels surfaces off roofs; windows broken; light mobile homes pushed or overturned; moving cars pushed off road
113-157 mph	Roofs torn off houses; cars lifted off ground

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