Lansing Area Skywarn
Portable Spotter Reference

Dennis Boone

April 2, 2007

1. Contact Information

Location	Means
Lansing ECC	Phone 517-702-2703 Radio 145.390 - (net) Radio 146.700 - (backup) Radio 146.580 simplex (backup)
Ingham County ECC	Phone 517-676-8244
State of Michigan EOC	517-336-2037
NWS GRR	800-647-3836 Radio 145.270- 94.8 (callsign WX8GRR) Radio (backup) 147.260+ 94.8 www.weather.gov/grr/

2. Reporting Severe Weather

2.1. How to report

Report severe weather events to your local Skywarn net (see below), or to the NWS by telephone. Do not make individual reports on the frequency used for liaison between local nets and NWS.

You should report only events you personally witnessed.

2.2. Information to report

(1) TIME - Local clock time (preferred over "five minutes ago").

(2) EFFECT - Weather event (see list below), and any damage caused.

(3) LOCATION - direction and distance from major crossroads or names of small towns; also direction of movement of the weather event. NWS finds township names helpful as well.

2.3. Events to report

(1) Tornado (on the ground)
(2) Funnel cloud (not on the ground)
(3) Wall cloud (rotating?)
(4) Hail ¼ inch or larger (report size in inches, not as compared to some common object)
(5) Flash floods
(6) Downed trees or tree limbs (report size of limb in inches, and whether live or rotten)
(7) Downed power lines
(8) Damage to buildings (report size and number of buildings, severity of damage)
(9) Road washouts
(10) Extremely heavy rain (several inches in a short time)
(11) Dam breaks
(12) Street or small stream flooding
(13) Deaths and injuries

3. Favorable storm conditions

(1) Dewpoint of 60 degrees or higher
(2) Cold or warm front approaching
(3) Overcast layer dissipates by mid-day (indicates adequate warming)
(4) Sky color is milky blue
(5) Brisk wind from E, SE, S, or SW
(6) Presence of tufted altocumulus clouds
(7) Building cumulus clouds
(8) Strong jet stream from SW, W or NW
(9) Crisply defined cloud towers

4. Beaufort Wind Speed Scale

Wind Speed	Effects
Calm	Smoke rises vertically. Tree leaves are quiet.
1-3	Smoke drifts
4-7	Wind is noticeable on face. Wind vanes move. Leaves rustle.
8-12	Light flags "fly". Force of wind is noticeable when walking. Twigs move.
13-18	Dust and loose paper move. Dry snow drifts. Small branches move.
19-24	Dust and loose snow fly to several feet in height. Small trees sway.
25-30	Loose clothing flaps. Blowing snow flies high. Large branches move. Wind whistles in utility wires.
30-40	Large trees move. Small twigs break off.
40-50	Walking is difficult. Half inch limbs break. Some shingles blow off roofs. Garbage cans and lawn furniture blow around.
50-60	Driving is difficult. Two inch limbs break. Many shingles blow off roofs. Metal lawn buildings blow around. Chimneys and TV antennas may be damaged. Open garages, sheds and pole barns may trap enough wind to be damaged.
60-70	Six inch limbs break off. Utility wires blow down, or are damaged by falling tree matter. Shallow rooted trees topple. Pole buildings are destroyed.
70-110	Some roof surfaces are peeled off. Windows break due to wind pressure. Mobile homes overturn. Well rooted trees snap off or topple. Moving automobiles are pushed off the road.
110-160	Mobile homes are destroyed. Roof structures are torn off of houses. Many well-rooted trees are snapped off or toppled. Railroad boxcars tip over.
160-210	Frame houses are destroyed. Trains overturn. Steel frame buildings are torn. Automobiles are lifted and moved short distances. Forests are levelled.
210-260	Steel buildings are severely damaged. Trees are debarked by flying debris. Carns and trains fly or roll significant distances. Medium sized objects such as branches or poles become flying missiles.
260-320	Entire houses are moved as units. Steel reinforced concrete structures are badly damaged. Large objects such as trucks, buses and railroad cars become flying missiles.

5. Relationship of Beaufort, Fujita, Mach numbers

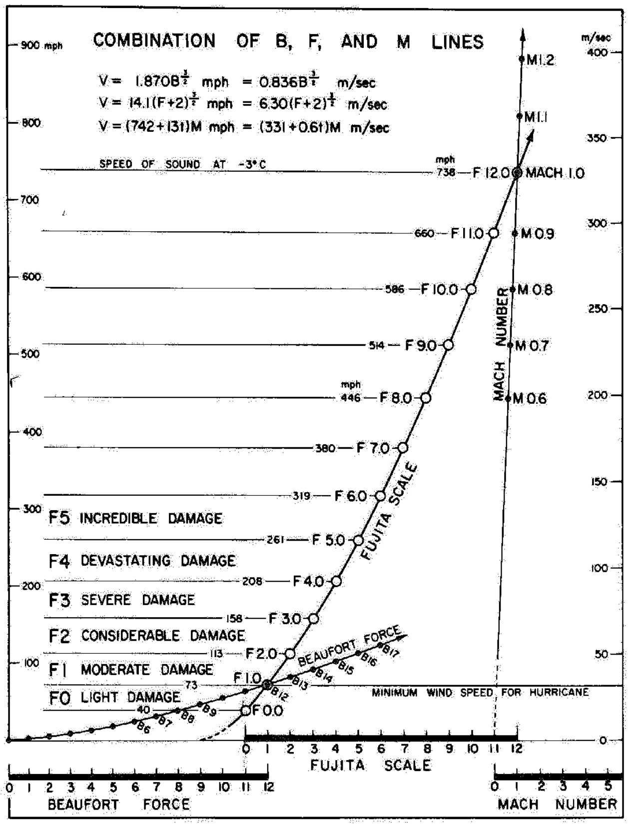


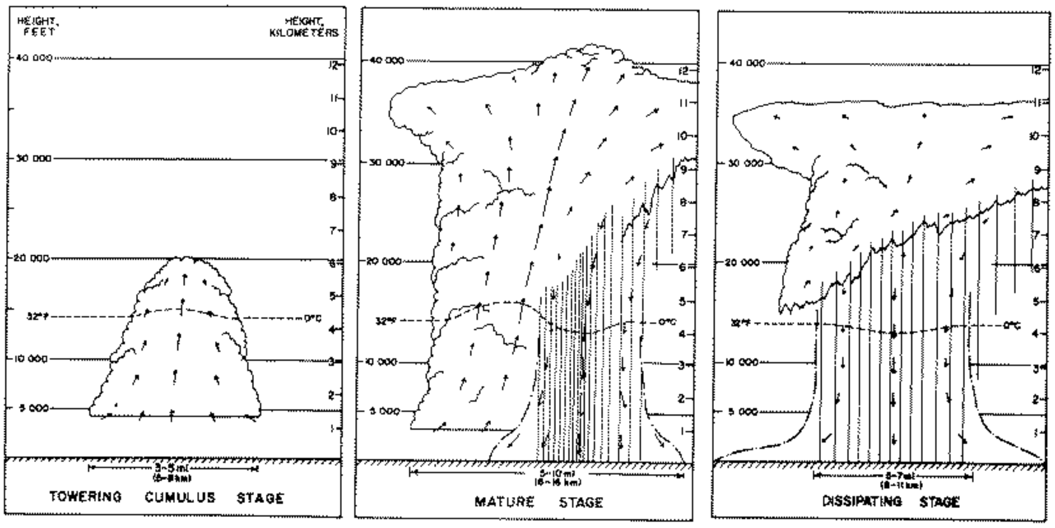
Fig. 1. Connection of Beaufort force, Fujita scale and Mach number. In deriving the equation for F-scale wind computation, the following considerations were made. (1) To connect Beaufort force 12 with Mach number 1 with a smooth curve, (2) To correspond B 12 with F 1 and M 1 with F 12, so that a 1 through 12 graduated scale, as in the case Beaufort force, covers the desired speed range. (3) Beaufort 0 indicates calm or no wind and Fujita 0 likewise denotes the wind speed causing no damage on most structures, (4) To give wider speed range as the speed increases because the faster the wind speed the wider the speed range to allow a visual distinction of damage from one scale to the next, and (5) An exponent 3/2 is likely to serve the above purpose. Furthermore, the square of the speed or the kinetic energy is proportional to the cube of F + 2. About 20 formulas to satisfy partial or total conditions listed above were examined before adopting Eq (2), the final equation, which was used to obtain the F-scale curve presented in this figure.

6. GRR District County Skywarn Nets

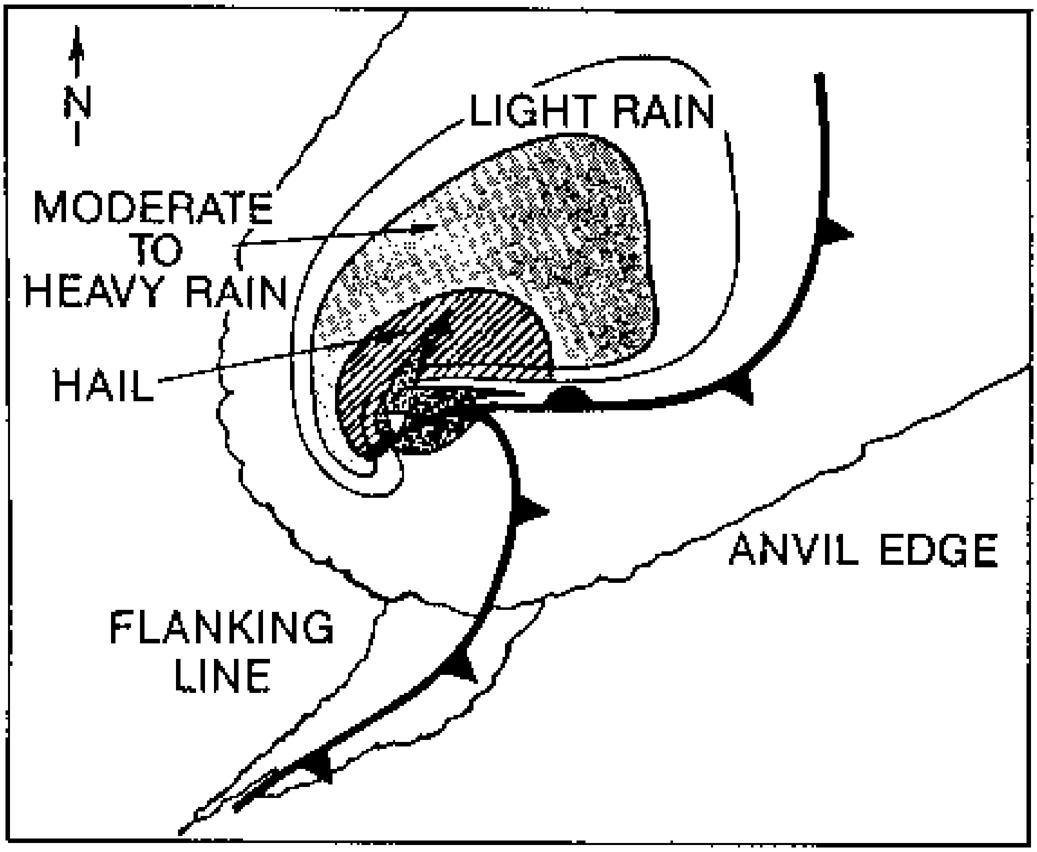
County	Frequency	Offset	PL
Allegan	147.240	+	94.8
Barry	146.500	+1Mhz	110.9
Calhoun	147.120 146.660	- -	186.2 94.8
Clare	147.200	+	
Clinton	444.850 147.480	+ simplex	141.3
Eaton	147.080	+	103.5
Gratiot	145.370	-	
Ingham	145.390	-	100.0
Ionia	145.130	-	94.8
Isabella	147.200	+	103.5
Jackson	146.880	-	100.0
Kalamazoo	147.000	+	94.8
Kent	145.110 145.410	- -	94.8 94.8
Lake	146.740	-	
Mason	145.470	-	103.5
Mecosta	146.740	-	
Montcalm	146.800	-	103.5
Muskegon	146.820	-	94.8
Newaygo	145.450	-	94.8
Oceana	146.640	-	94.8
Osceola	146.740	-	
Ottawa	147.060 145.490	+ -	94.8 94.8
Van Buren	147.360	+	94.8

7. Thunderstorm Structure Diagrams

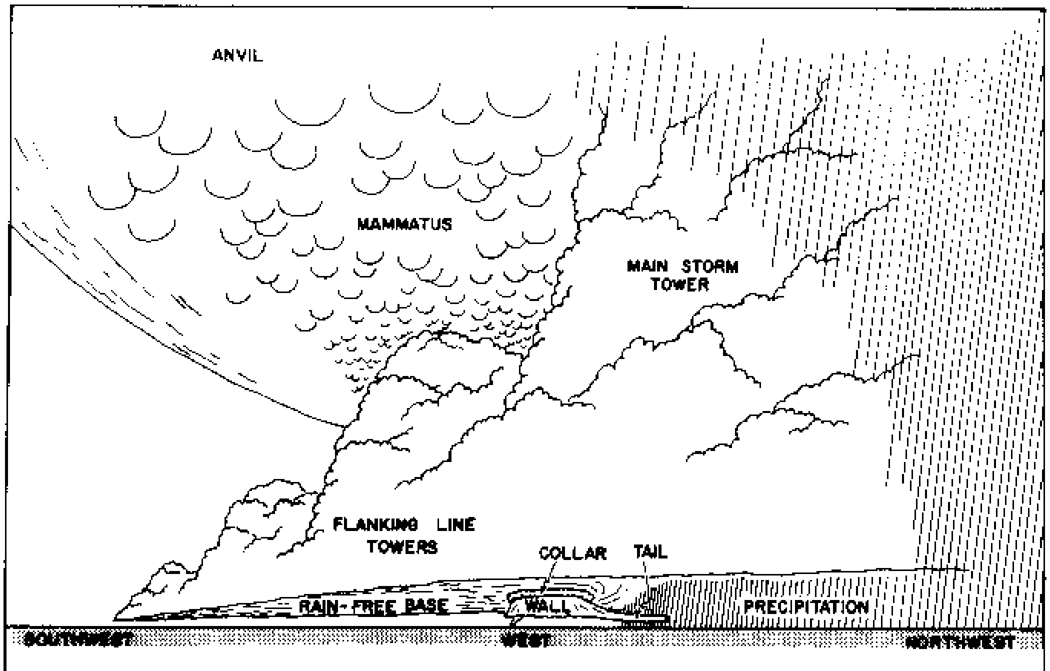
7.1. Thunderstorm Life Cycle



7.2. Supercell Structure – looking down

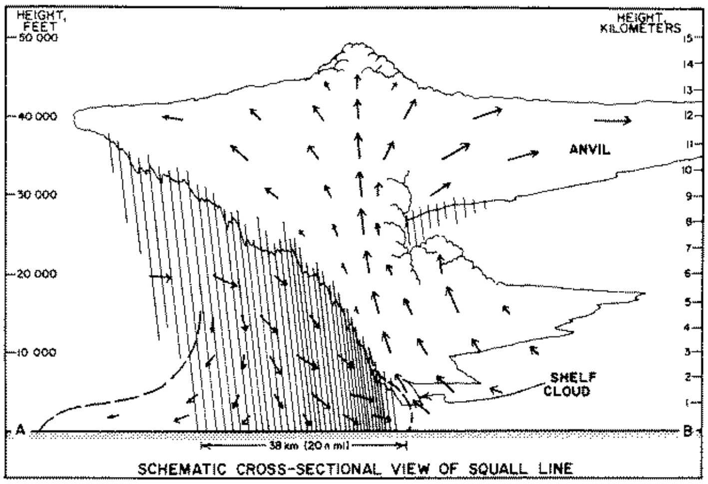


7.3. Tornadic Storm Structure

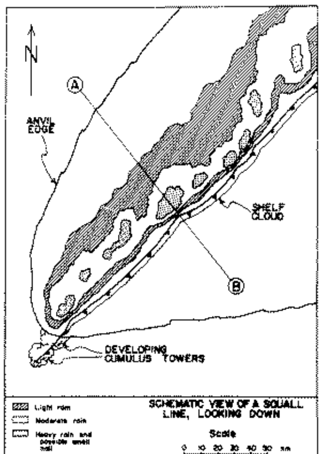


SCHEMATIC VIEW OF A TORNADIC THUNDERSTORM

7.4. Squall Line Structure



SCHEMATIC CROSS-SECTIONAL VIEW OF SQUALL LINE



SCHEMATIC VIEW OF A SQUALL LINE, LOOKING DOWN

7.5. Multicell Storm Structure