

THE PRESSURE JUMP LINE OF APRIL 2-3, 1956

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The first major outbreak of tornadoes of the 1956 season took place on April 2-3, 1956. The majority of these fell in Kansas; however, nine were reported in Oklahoma including a particularly devastating tornado at Drumright, Okla., in the late evening of the 2d [1].

The 1956 Severe Local Storms Research Network covers most of Oklahoma and Texas, and microbarograms from the network stations were examined covering the period of the tornado outbreaks. A well-defined pressure jump line was traced from the western limits of the network, the New Mexico-Texas border, at 1300 CST of the 2d across the network to extreme eastern Texas at 0300 CST of April 3. The southern extremity of the line was limited by the southern boundary of the network (about Lat. 30° N.). The northern extent of the system was limited by lack of data through the Panhandle region of Texas but was evident as it passed into the network area in western Oklahoma. Microbarograms from regular stations in and around the network were not available for study at the time of this analysis, but the system covered the entire network area and quite probably extended some distance beyond, particularly into both southern Texas and Kansas.

The average speed of the line over the network was approximately 40 m. p. h. The fastest movement during the period was 50 m. p. h. in the 4-hour interval 1300-1700 CST over western Texas.

Intensities of individual pressure jumps as read from the network barograms are plotted in figure 1 using established criteria and station model. To be considered a pressure jump, the pressure must rise at least 0.02 in. Hg at a rate of at least 0.01 in. per 2 minutes. The ratios of total pressure rise versus total time of rise are plotted to the left and the time of beginning of rise to the right of the station circle. Amounts of pressure rise have been entered in thousandths of an inch and total time of rise in minutes on the map. Any rise not meeting the criteria but apparently part of the system is indicated by "GR" (gradual rise) and stations for which no barograms are available are indicated by "M" (missing). One exception to the criteria was made at Carlsbad, N. Mex., where a rise of 0.06 in. in 20 minutes was entered. This report, and those from several other regular reporting stations, were obtained from teletypewriter circuit reports of pressure jumps.

Continuity through eastern Oklahoma following the outbreak of tornadoes was not as well defined as in other areas. This is shown by the dashed isochrones through that area. Extraneous influences on the pressure characteristics were also noted in the Fort Worth-Dallas area.

Intensities of the individual pressure jumps were fairly strong throughout most of the system. The large jumps in Oklahoma from 1800 to 2000 CST are of particular interest. These occurred just prior to the majority of tornadoes in that State.

The National Weather Analysis Center surface analysis at 1230 CST indicated a cold front extending along the New Mexico-Texas border from a Low in extreme north-eastern New Mexico. This front was carried eastward, corresponding closely to the jump line, until 0030 CST of April 3. After this time the speed of the front dropped from an average of 30 m. p. h. to about 10 m. p. h., the position at 1230 CST of April 3 corresponding to the 0330 CST isochrone of the jump line.

The only storms included in this study were the tornado reports collected to date by the Office of Climatology. All nine tornadoes in Oklahoma are shown on the map in the form of a V-like symbol, the apex of which is at the reported tornado location. All reported times of occurrence were in close agreement with the corresponding isochrone of the pressure jump line, with tornadoes occurring either on the line or within a few minutes after the passage of the system. The tornado at Drumright, for example, struck at 2133 CST—the analysis shows the pressure jump line to have passed at approximately 2115 CST. Although two or three funnels fell just north of the network limits, they fit the extension of the respective isochrones, which, as mentioned earlier, probably extend northward into Kansas.

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REFERENCES

1. Howard H. Hanks, Jr., and Georgina M. Neubrand, "Tornadoes of April 2-3, 1956," *Monthly Weather Review*, vol. 84, No. 4, April 1956, pp. 155-162.

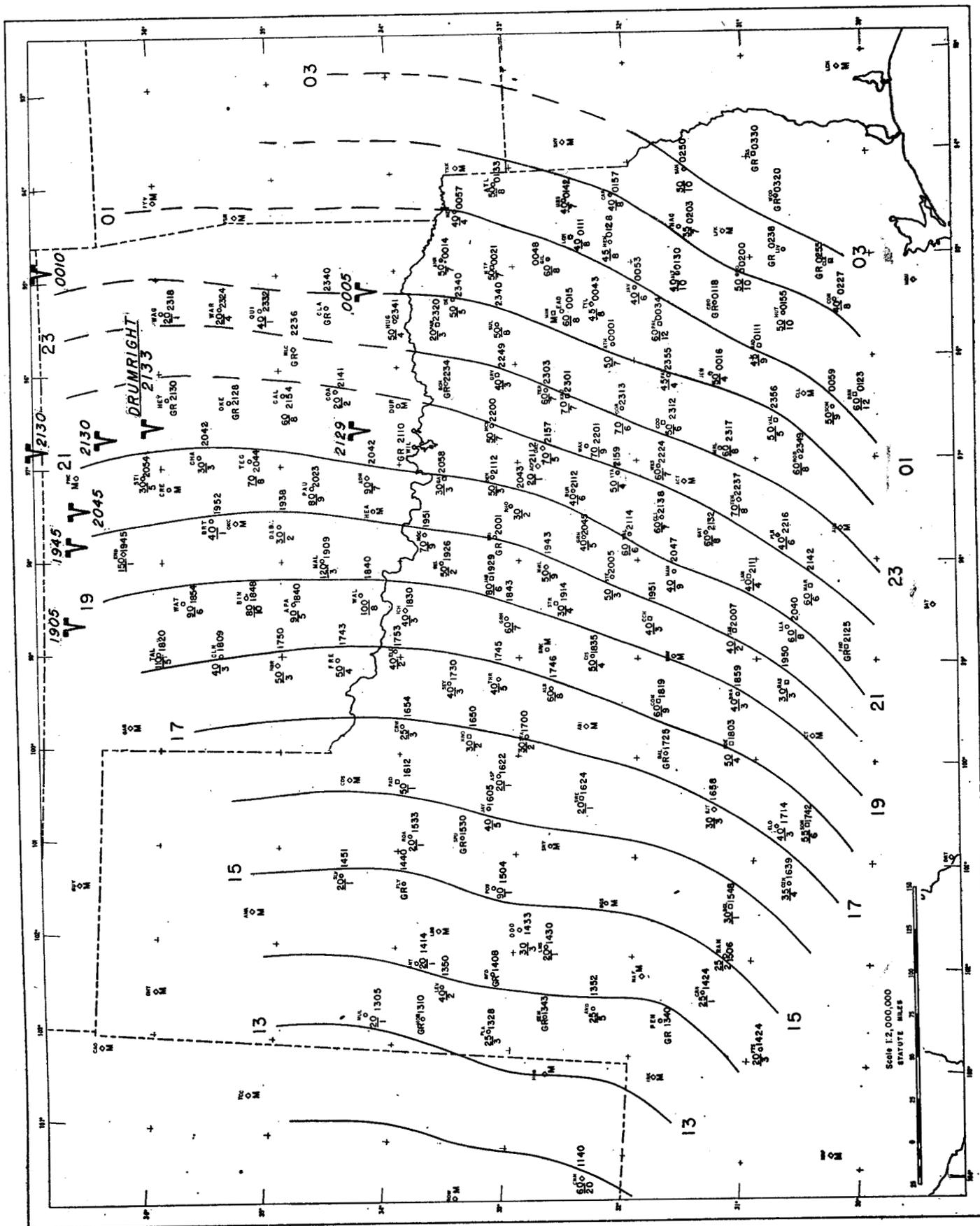


FIGURE 1.—Isochrones of pressure jump line of April 2-3, 1956. Ratio of total pressure rise in thousandths of an inch to total time of rise in minutes is plotted to left of each station circle. GR=gradual rise; M=missing; V=tornado.