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QUICK CHECK FOR SEVERE STORMS

[Editor's Note - The following was first published as a Southern Region Technical Attachment and has application in the Western Region as well.]

Technical Attachment

QUICK CHECK FOR SEVERE STORMS

BY BEN BARKER

I would like to pass on some radar information that might be of use to other radar operators in obtaining a quick check on developing or severe thunderstorms. This check is very simple and has proven useful in spotting developing storms to examine more closely with the Lemon Method. The entire scope can be checked in about 2 or 3 minutes.

Follow these (3) easy steps.

Step 1: Select VIP4. Elevate the antenna to 2 1/2 degrees. You do not have to stop rotating. Next, move the range strobe to 130 km (70 nm). With a grease pencil, mark on the PPI scope those VIP4 cells that appear OUTSIDE the 130 km or 70 nm range. (This is important...disregard for now those VIP4's that appear from 0 to 130 km. Use only the cells from 130 to 230 km).

Step 2: Still rotating with VIP4 level selected, elevate the radar slowly to 5 degrees. This figure is exactly twice the elevation used in Step 1 and it is easy to remember. Now move the strobe to 65 km (35 nm). Again, this setting is easy to remember. The new strobe setting is exactly 1/2 of the previous range. Once again, with a grease pencil mark only those cells appearing outside the 65 km ring from 65 to 230 km. If you have an echo that was previously marked, make a double circle. A storm that has a double mark is very likely to be severe or is developing rapidly into a severe storm.

Step 3: Once again, with VIP4 still in place, double the elevation from 5 to 10 degrees. Now take 1/2 the former range of 65 km and move the strobe inward to 32 1/2 km. Repeat the same marking with the grease pencil. Mark only those cells from 32 1/2 to 230 km.

If the activity is very close to the station, you can move the range to 16 km (8 nm) and raise the antenna to 20 degrees. Always remember to double the elevation setting and take 1/2 the range.

These three or four steps can easily be repeated every 10 or 15 minutes for a quick check on the growth or decay of thunderstorms throughout your area.

Several researchers, as quoted by Grebe (1982), have found a correlation between high reflectivity (VIP4 or greater) in the mid or upper levels of thunderstorms and the occurrence of hail and other types of severe weather.

It has also been observed, according to the same paper by Grebe, that the beginning of many severe storms start inside the thunderstorm at about 24,000 to 30,000 feet above the ground.

Finally, according to Lemon (1980) and Grebe (1982) the best area to check out a developing thunderstorm for severe indications may be from 18,000 to 39,000 feet.

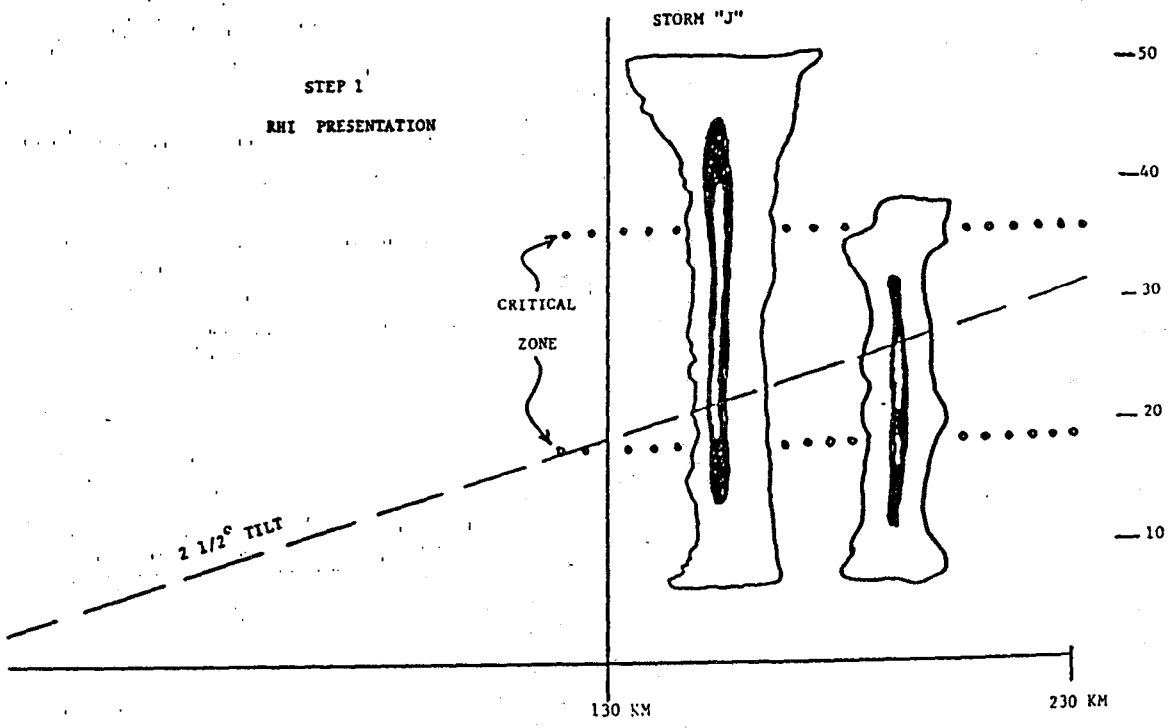
The above-mentioned quick check method has tried to use researchers' suggestions and provide radar operators with an easy to remember set of numbers that would keep the radar antenna searching in the most critical part of developing storms. Having quickly spotted the most severe storms, the operator can now examine a few storms in more detail using the rules suggested by Lemon.

Grebe, R., 1982: An Outline of Severe Local Storms With the Morphology of Associated Radar Echoes. NOAA Technical Memorandum. NWS TC 1.

Lemon, L.R., 1980: Severe Thunderstorm Radar Identification Techniques and Warning Criteria. NOAA Technical Memorandum. NWS NSSFC-3.

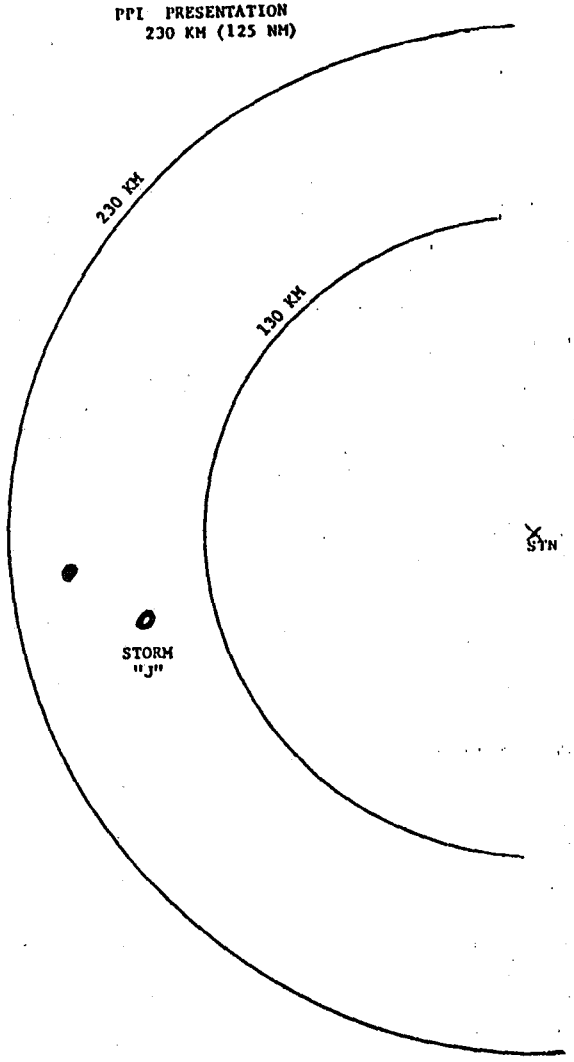
STEP 1

RHI PRESENTATION



STEP 1

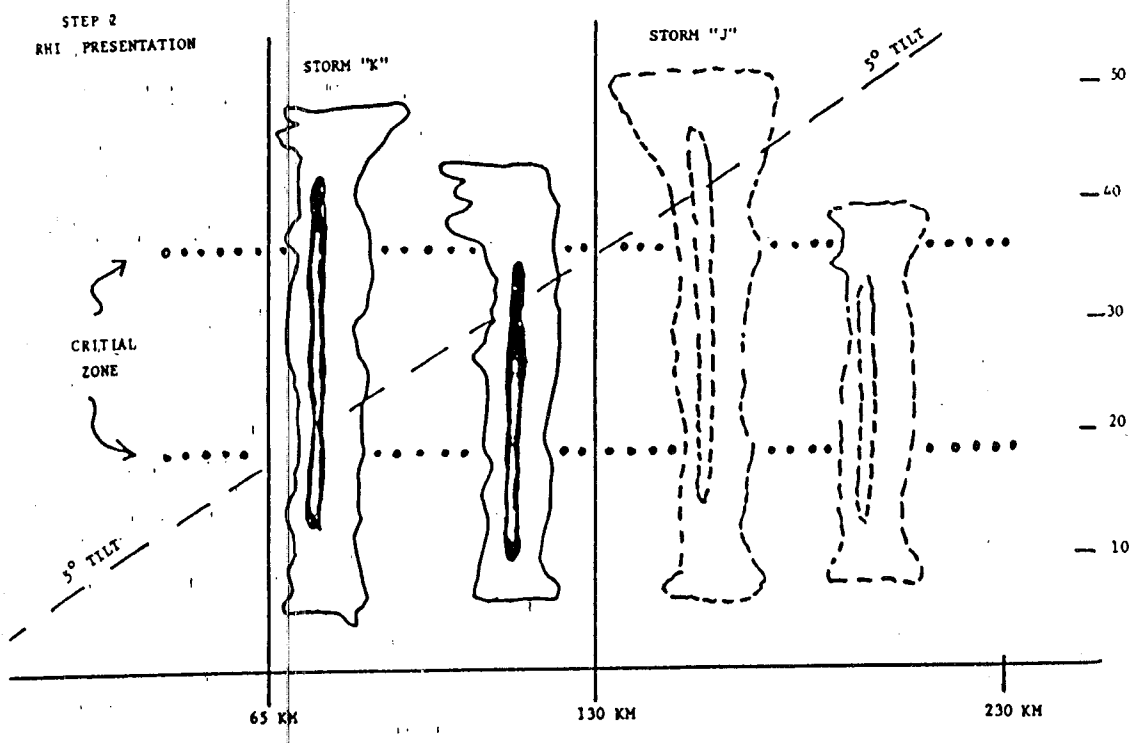
PPI PRESENTATION
230 KM (125 NM)



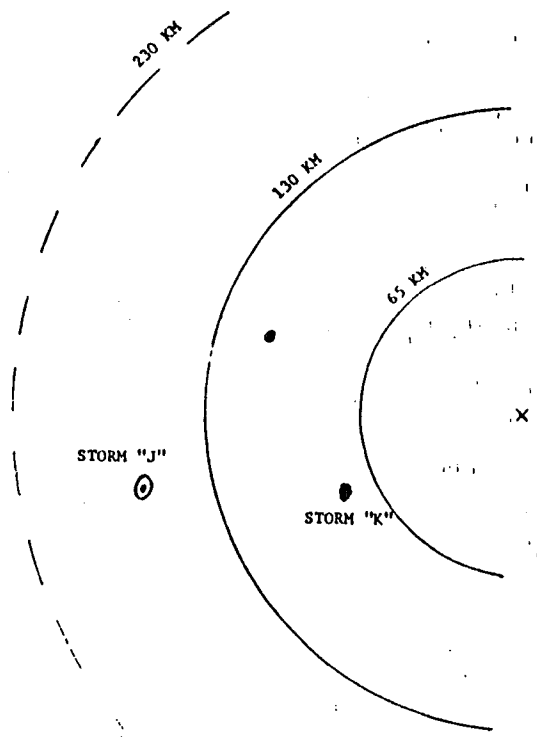
STEP 1:

VIP 4
ELEVATION 2 1/2°

MARK ONLY VIP4 ECHOES BETWEEN 130 KM AND THE OUTER EDGE OF SCOPE (230KM).



STEP 2
PPI PRESENTATION



STEP 2:

VIP
ELEVATION 5°

MARK ONLY VIP4 ECHOES BETWEEN 65 KM AND THE OUTER EDGE OF SCOPE.

MAKE DOUBLE CIRCLE IF CELL WAS PREVIOUSLY MARKED.