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STORM FORCE WINDS AND SATELLITE IMAGERY

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The appearance of certain features on satellite imagery may provide a method by which storm force winds can be forecast with a certain amount of confidence.

The following case (February 8, 1978) is used to illustrate this point.

On examining the Ir picture (Figure 1) for February 8, 2015Z one is able to see the low cloud comma emerging from beneath the higher cirrus deck at location A. An examination of the Visible imagery (Figure 2) for February 8, 2015Z shows that the high level cirrus is casting a shadow on the lower comma clouds, indicating that the high level jet is crossing the coast in Northern Oregon. However, more important, it can be seen on the Visible imagery that transverse shear lines are evident at location A on the tops of the emerging comma clouds. This indicates a strong low level jet in that area.

Examination of the hodographs for Port Hardy and Quillayutte (Figure 3) for 0000Z of February 9. indicate that indeed there is a wind maxima at about the 9000 ft. level of 60 to 65 knots.

Examination of the tephigrams for Port Hardy and Quillayutte (Figure 4) for 0000Z of February 9. indicate clearly that Quillayutte is dry in the low levels and moist in the high levels, while at Port Hardy the reverse is the case. This would indicate that the comma low clouds have as yet not reached Quillayutte.

More important, however, is the fact that when these transverse shear lines are evident, surface winds at light houses in excess of 50 knots have been reported as this line of transverse shear passes overhead. Similar conditions were observed on March 10, 1977; February 20, 1977 and October 26, 1977. In all these cases transverse shear lines were observed on the Visible imagery. Needless to say this area will also be a region of moderate to severe turbulence in the lower troposhere and a region where convective clouds should be expected.

Due to the higher resolution of the Goes Visible imagery it appears that these lines may only be detectable during day-light hours. However, the Ir imagery will still indicate the emergence of the lower comma clouds and thus alert one to the possibility of transverse shear lines in the lower cloud deck and the implied possibility of storm force surface winds.

FIGURE 1

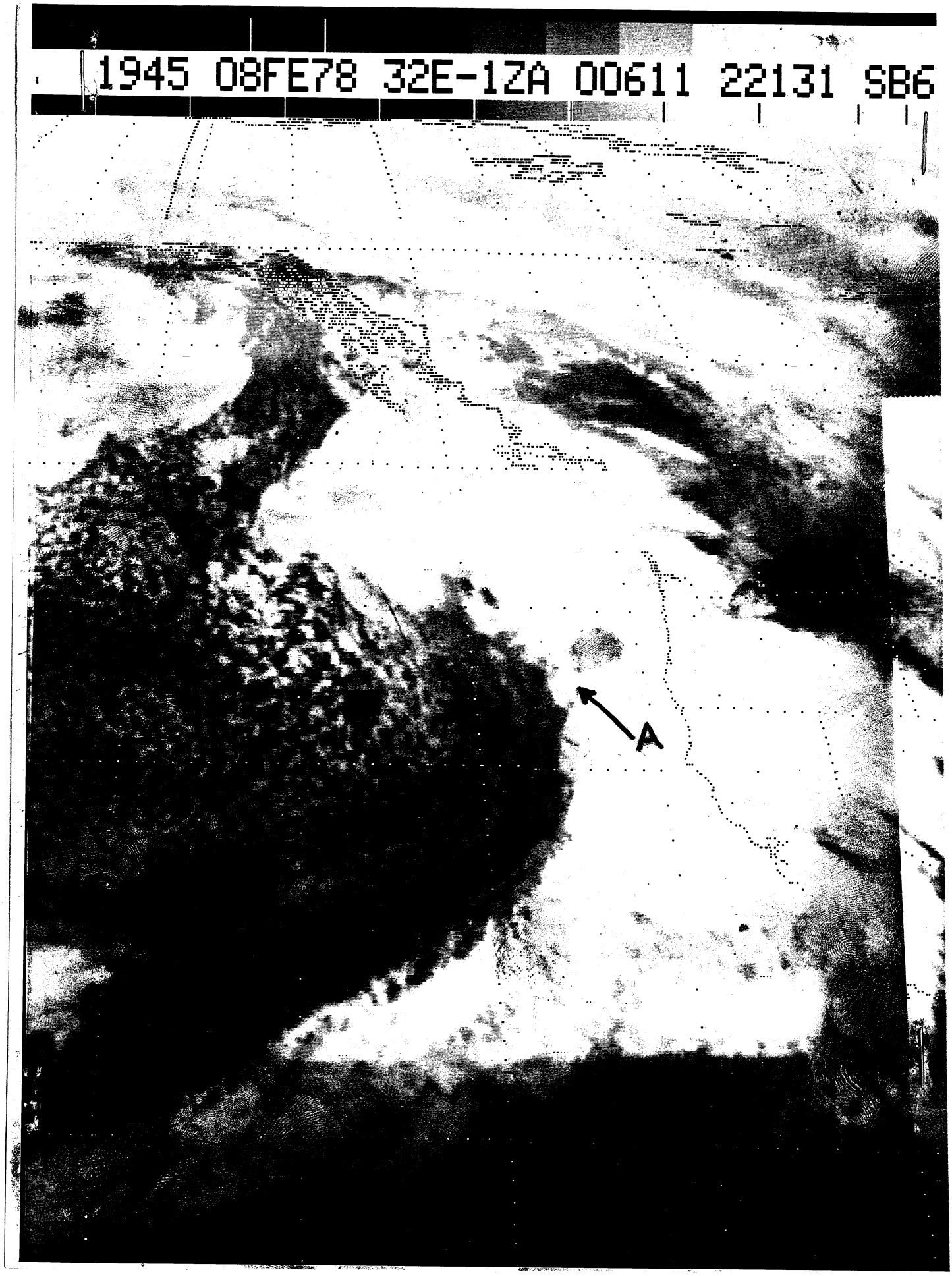


FIGURE 2

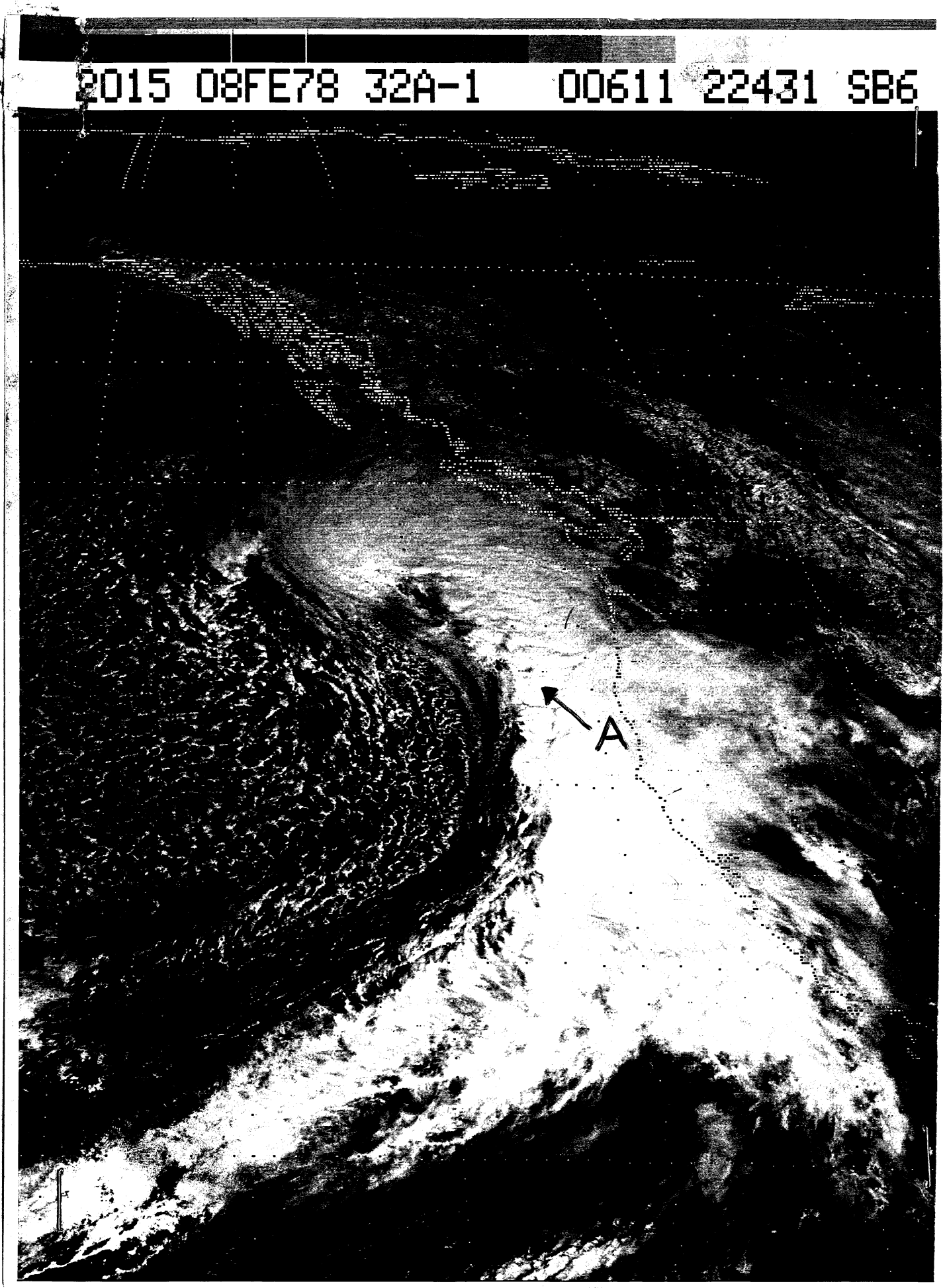
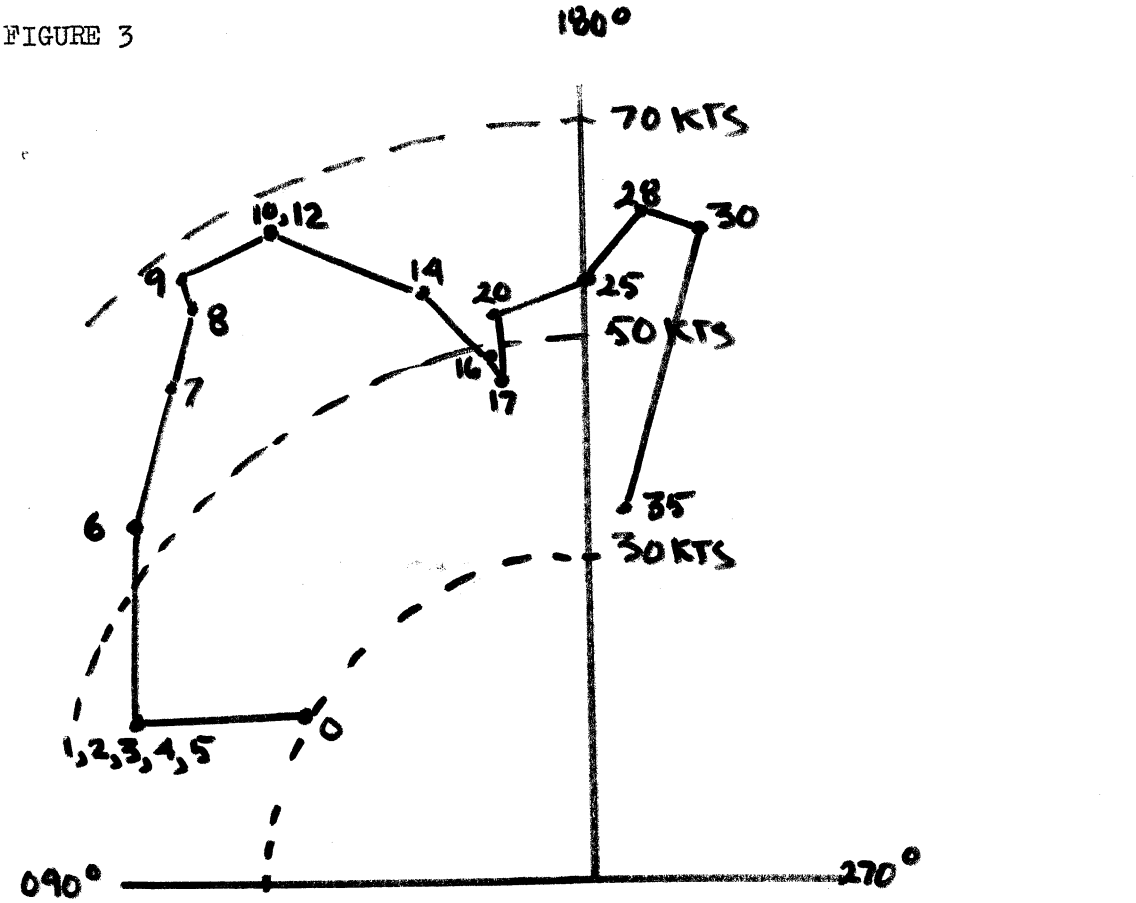
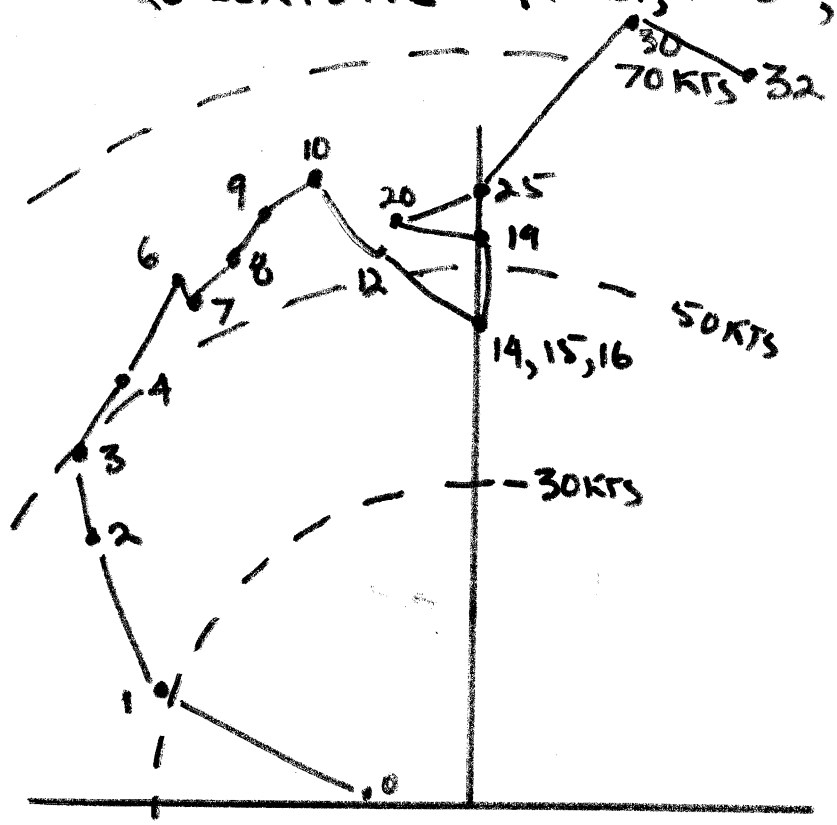


FIGURE 3

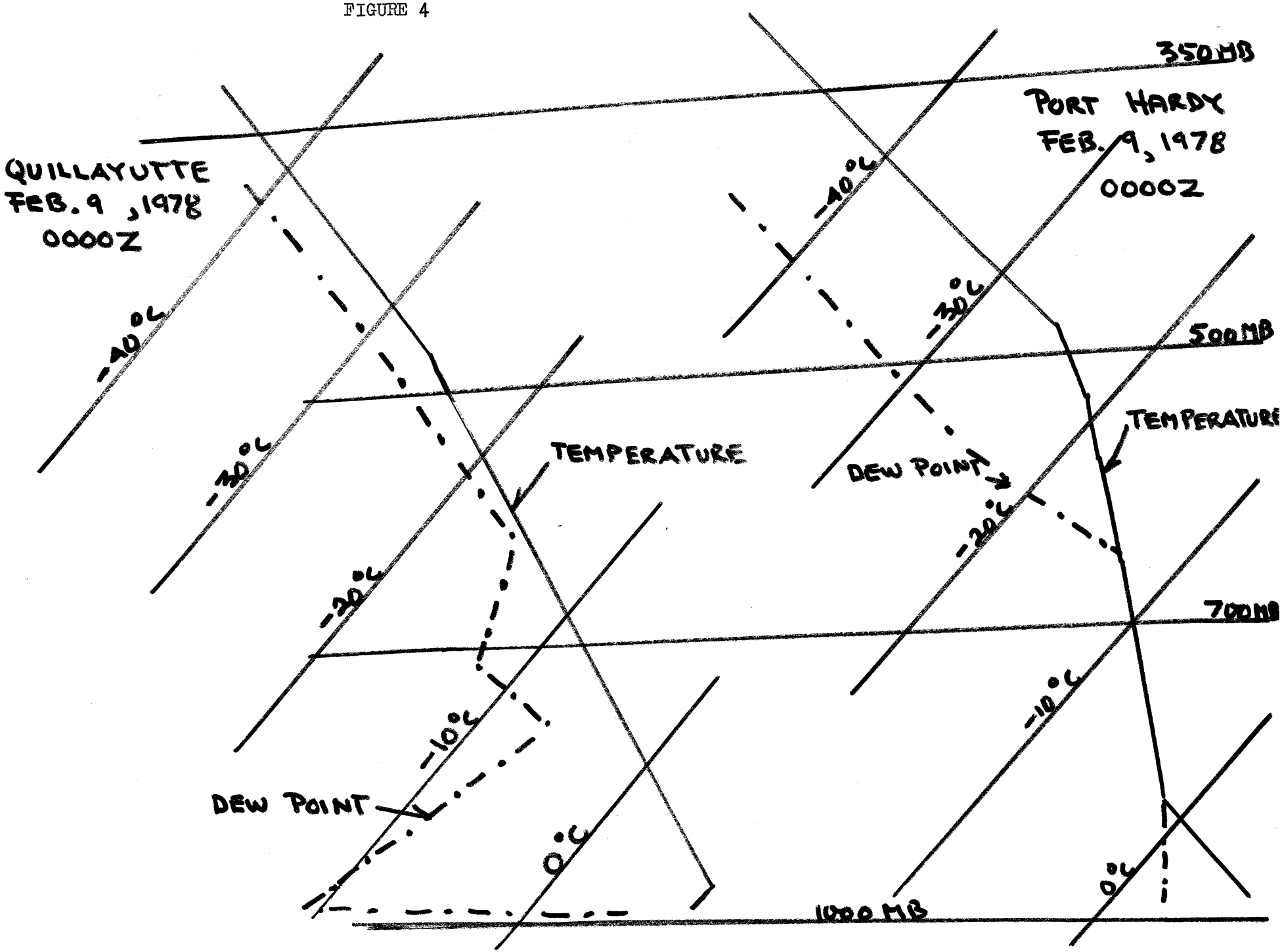


QUILLAYUTTE 9 FEB., 1978, 0000Z



PORT HARDY 9 FEB. 1978, 0000Z

FIGURE 4


QUILLAYUTTE
FEB. 9, 1978
0000Z
PORT HARDY
FEB. 9, 1978
0000Z
350 MB
500 MB
700 MB
1000 MB
-40°C
-30°C
-20°C
-10°C
0°C
TEMPERATURE
DEW POINT