PACIFIC REGION TECHNICAL NOTES

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A Preliminary Investigation into the Breakdown of Blocking Ridges Off the West Coast

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INTRODUCTION

During the late summer and fall of 1979, there were several instances of "Blocking Highs" off the west coast. These patterns resulted in several weeks without any recorded precipitation over the Vancouver area. The change in weather after such a dry spell usually happens fairly quickly and is often difficult to forecast.

An attempt was made to discover a general pattern preceeding the imminent breakdown of such a block. Several similar breakdowns were examined using satellite imagery.

DISCUSSION OF FINDINGS

Figures A1 to A5 and figures B1 to B5 show two cases of a ridge breakdown illustrating the most common sequence of events. The 250 mb charts for the initial and final set of satellite pictures are included for comparison.

Pictures A1 and B1 are the GOES satellite pictures for Sept. 25 and Oct. 12. They show the initial stages in both cases of a blocking ridge breakdown. The jet positions are superimposed on the imagery to illustrate the upper air flow. In both cases, a westerly flow has begun to develop in an area (180-160W) where a southwest flow was previously observed. Diagrams A2 and B2 are the 250mb analysis corresponding to figures A1 and B2. They indicate a broad strong westerly flow across the north Pacific west of longitude 160W. Diagrams A3 and B3 show the further development of the westerly flow across the north Pacific. There is an indication of the jet attempting to break through the block at points A. It is important to notice that there is no evidence of a significant ridge rebuilding to the west.

Diagrams A4 and B4 show the final stages of the breakdown where precipitation occurs at Vancouver. A westerly flow is evident across the entire north Pacific from diagrams A5 and B5. A series of weather systems are tracking eastward towards the B.C. coast.

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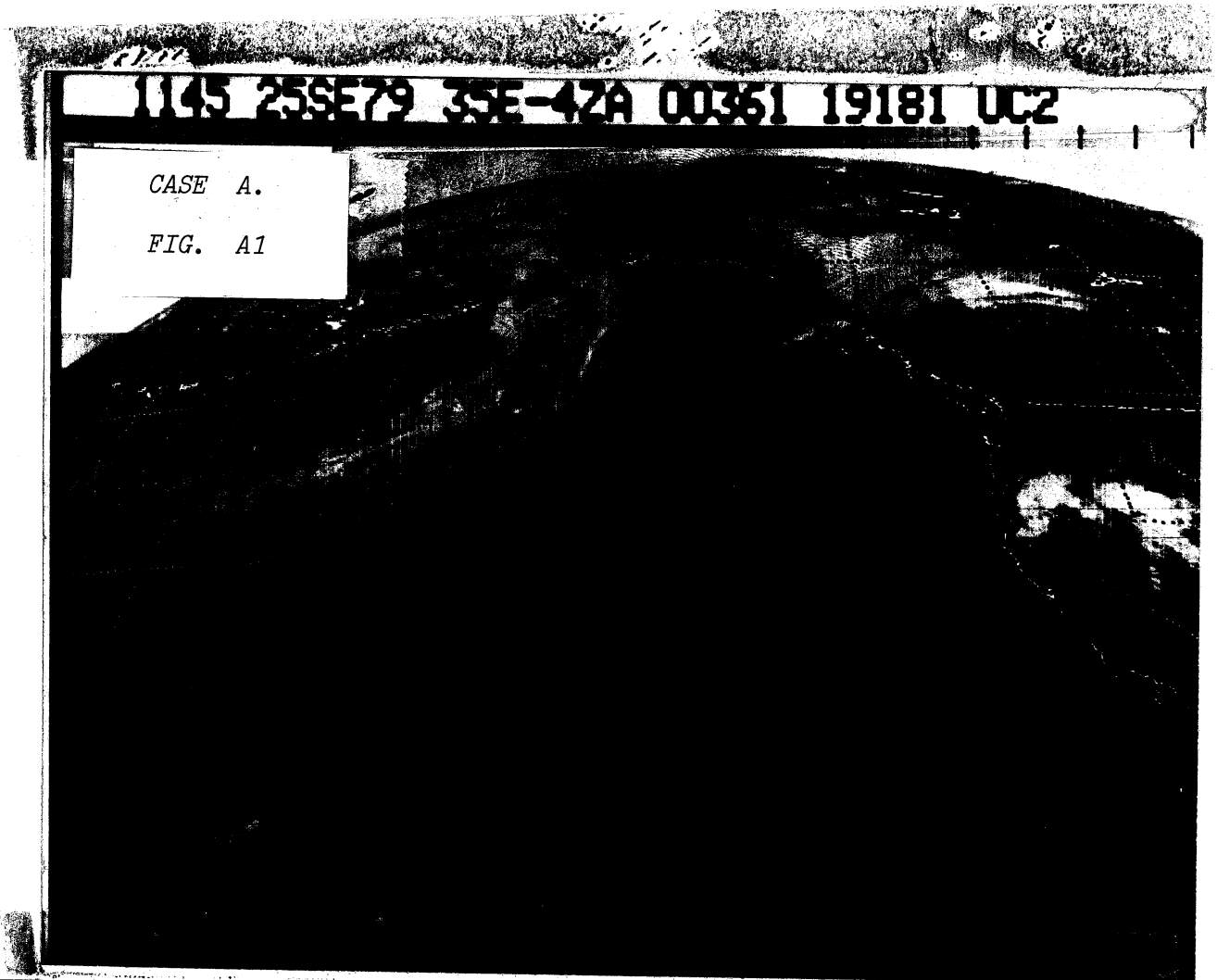
SUMMARY OF RESULTS

Some "rules of thumb" in predetermining the breakdown of a blocking ridge are evident from the imagery.

(1) The westerly stream is usually confined to the latitudes 35^{o}N to 50^{o}N.

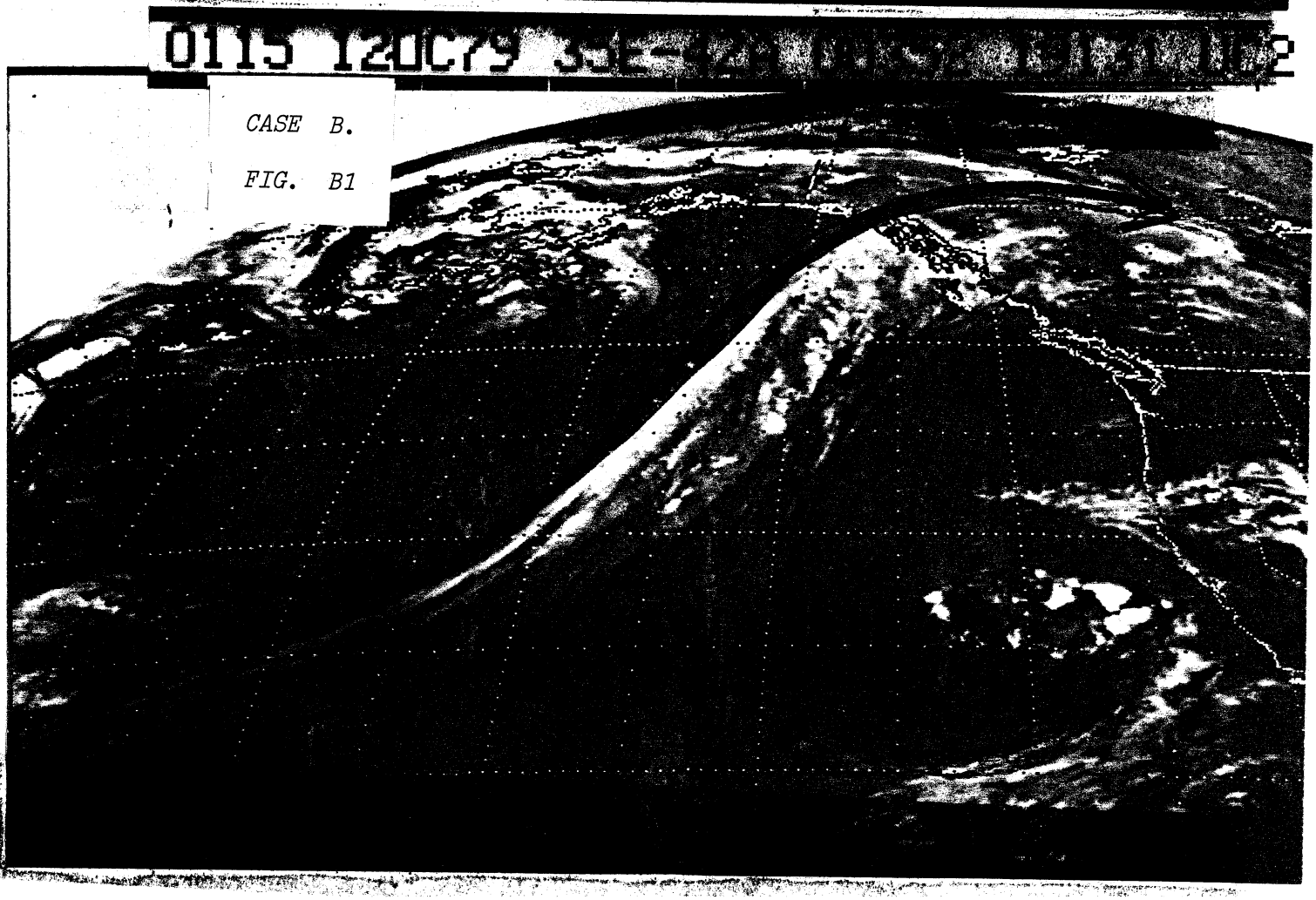
(2) When the westerly stream reaches 160 to 170^{o}W the precipitation area will reach Vancouver in 1½ to 2 days.

(3) There is no evidence of meridional flow occuring to the west. This would indicate a major ridge rebuilding.



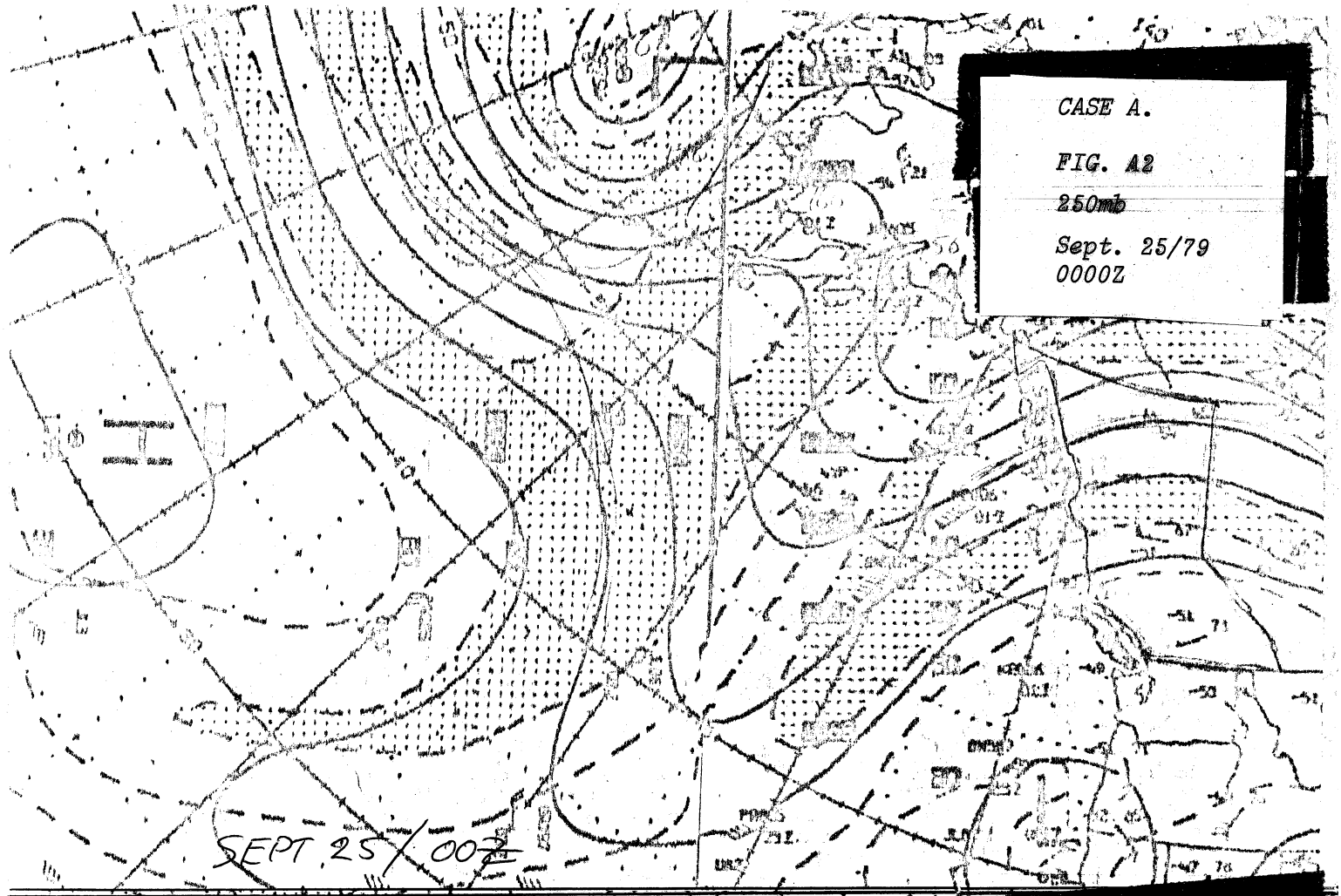
CASE A.

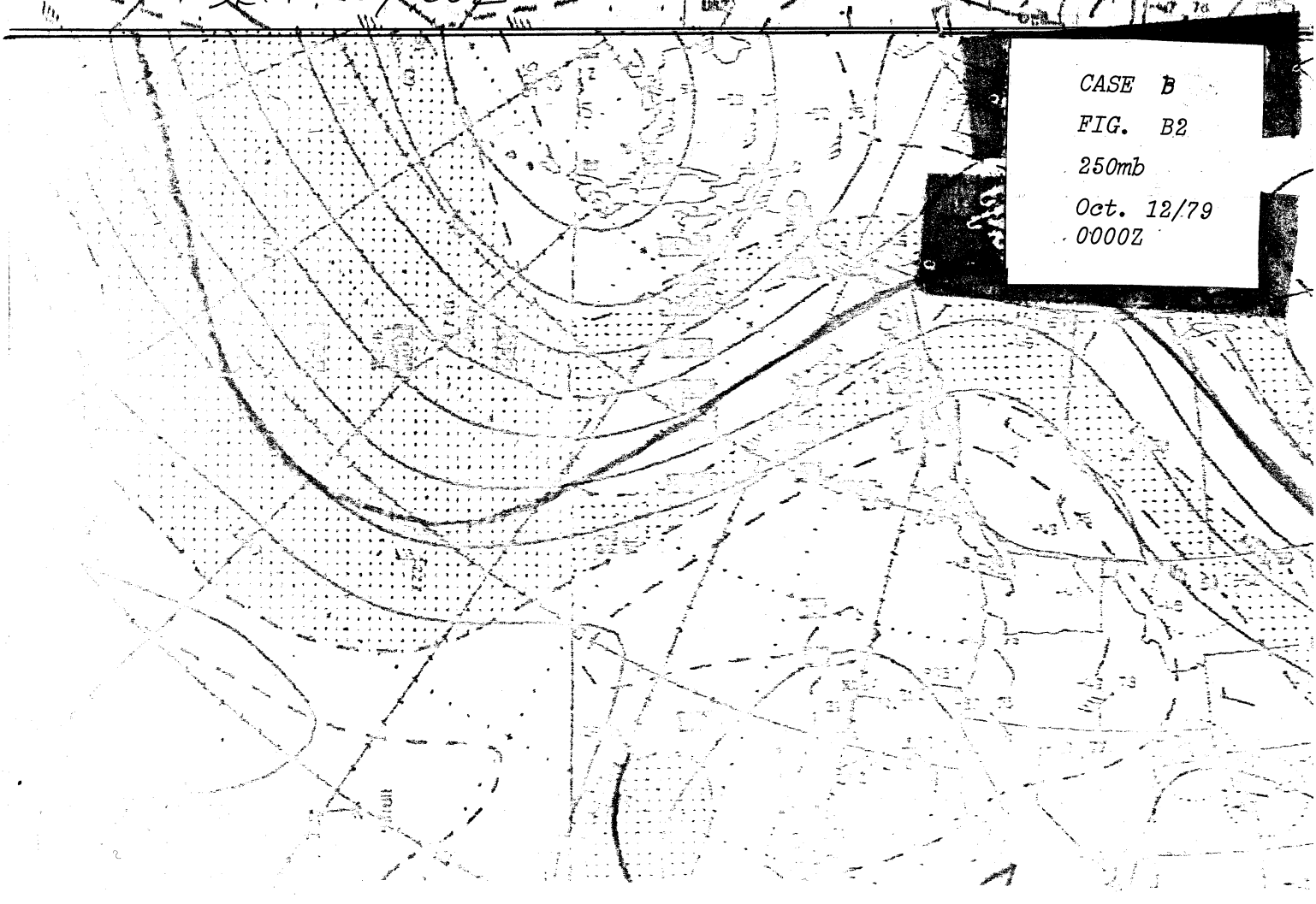
FIG. A1



CASE B.

FIG. B1

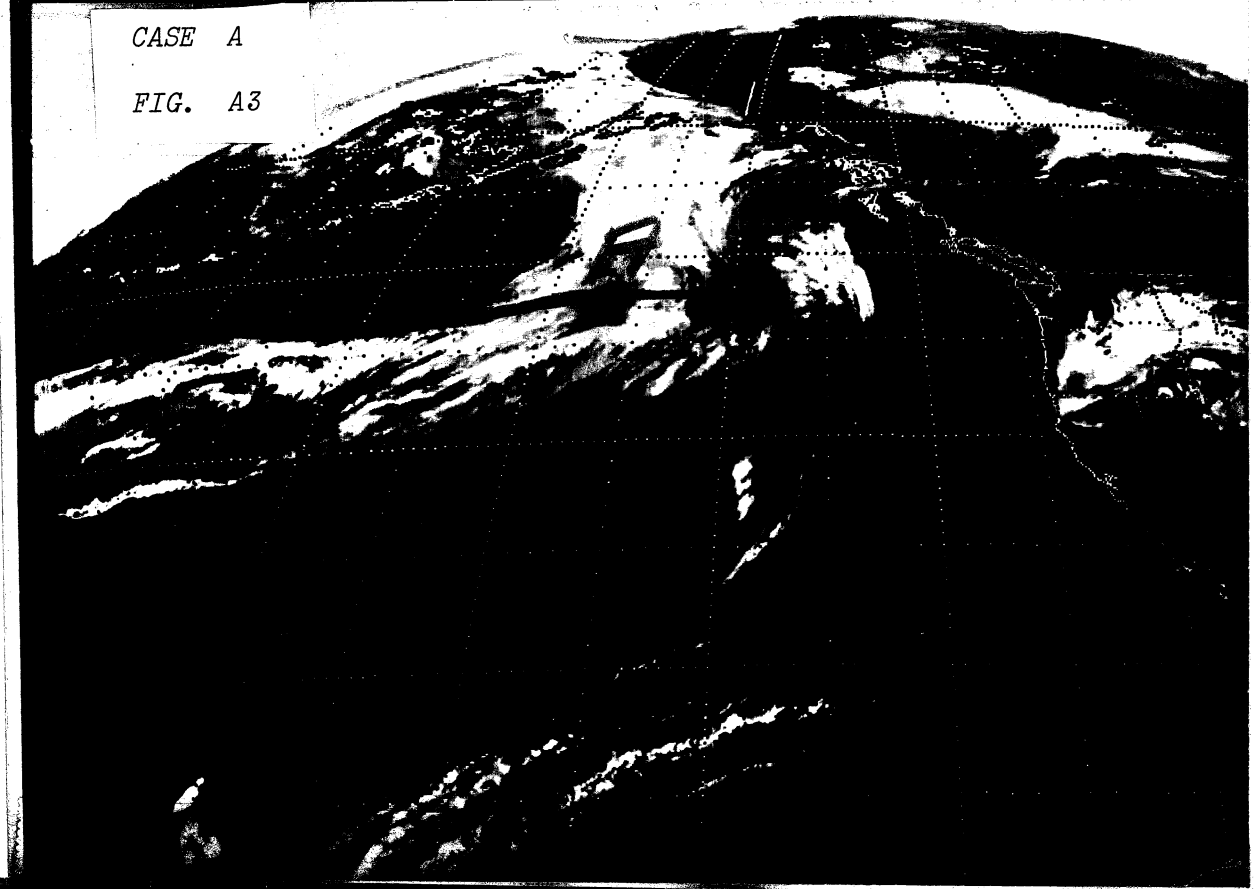

CASE A.
FIG. A2
250mb
Sept. 25/79
0000Z
SEPT 25/00Z


CASE B
FIG. B2
250mb
Oct. 12/79
0000Z

2015 25SE79 35E-4ZA 00331 19201 UC2

CASE A

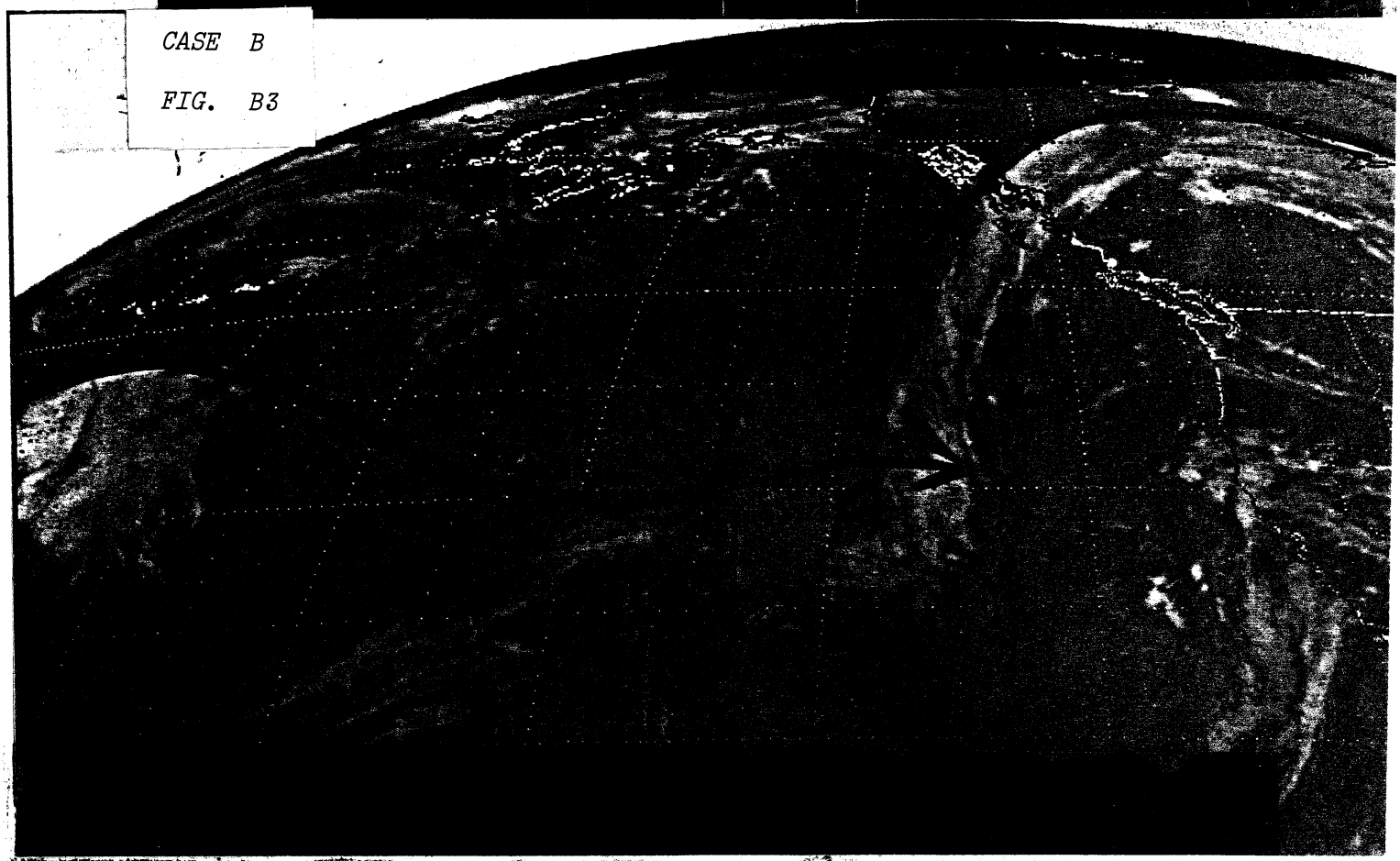
FIG. A3

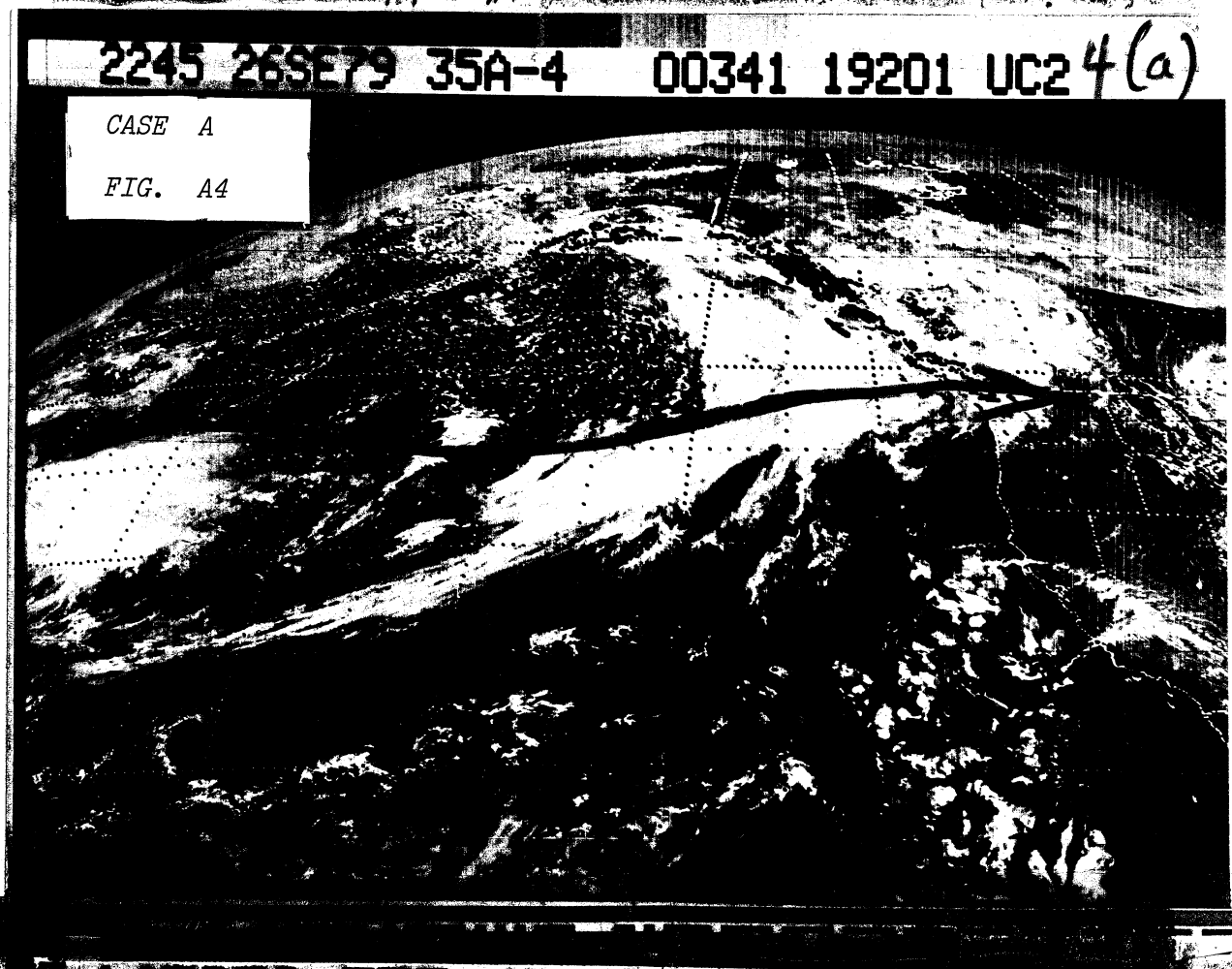


0115 130C79 35E-4ZA 00351 19121 UC2

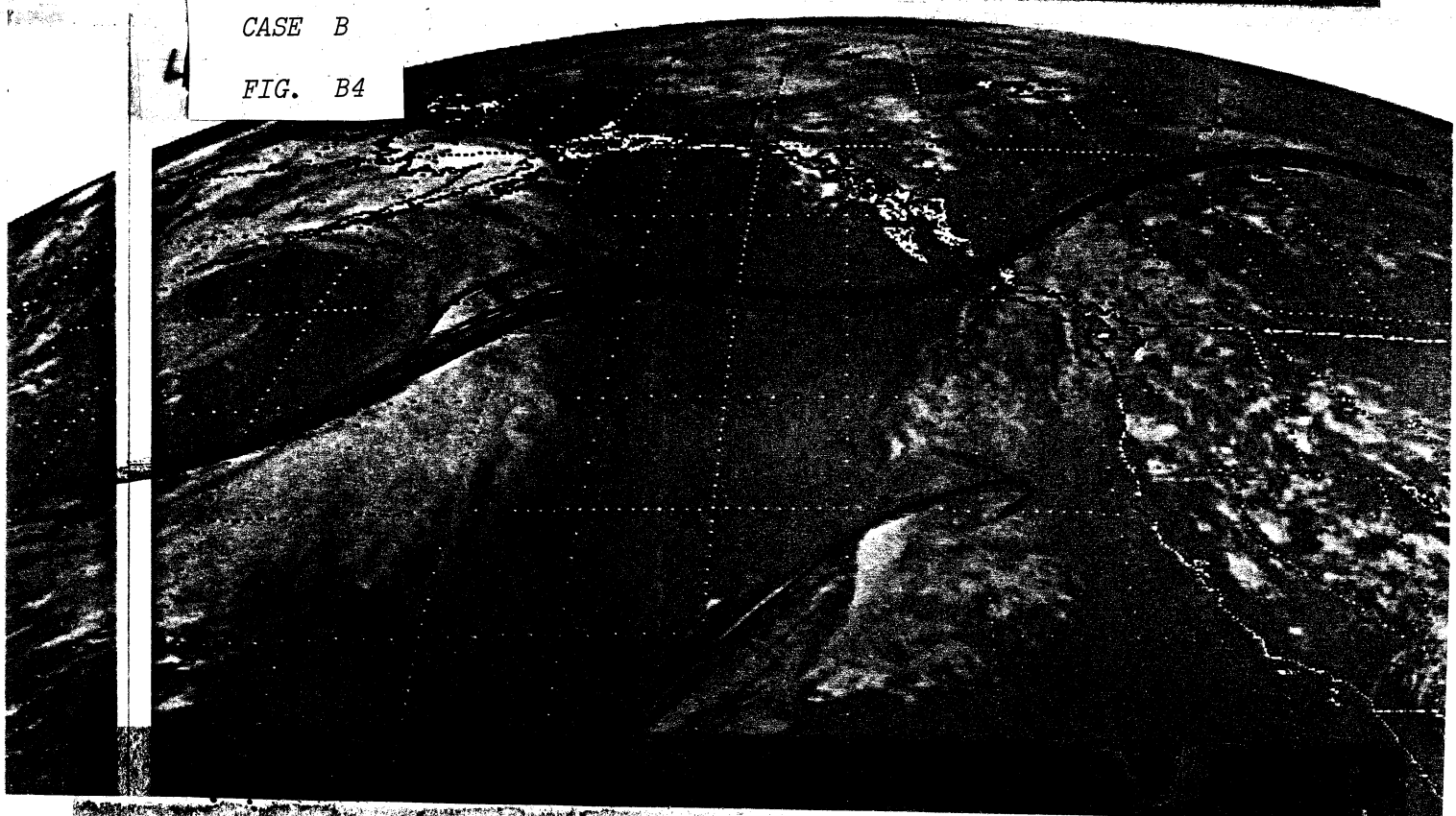
CASE B

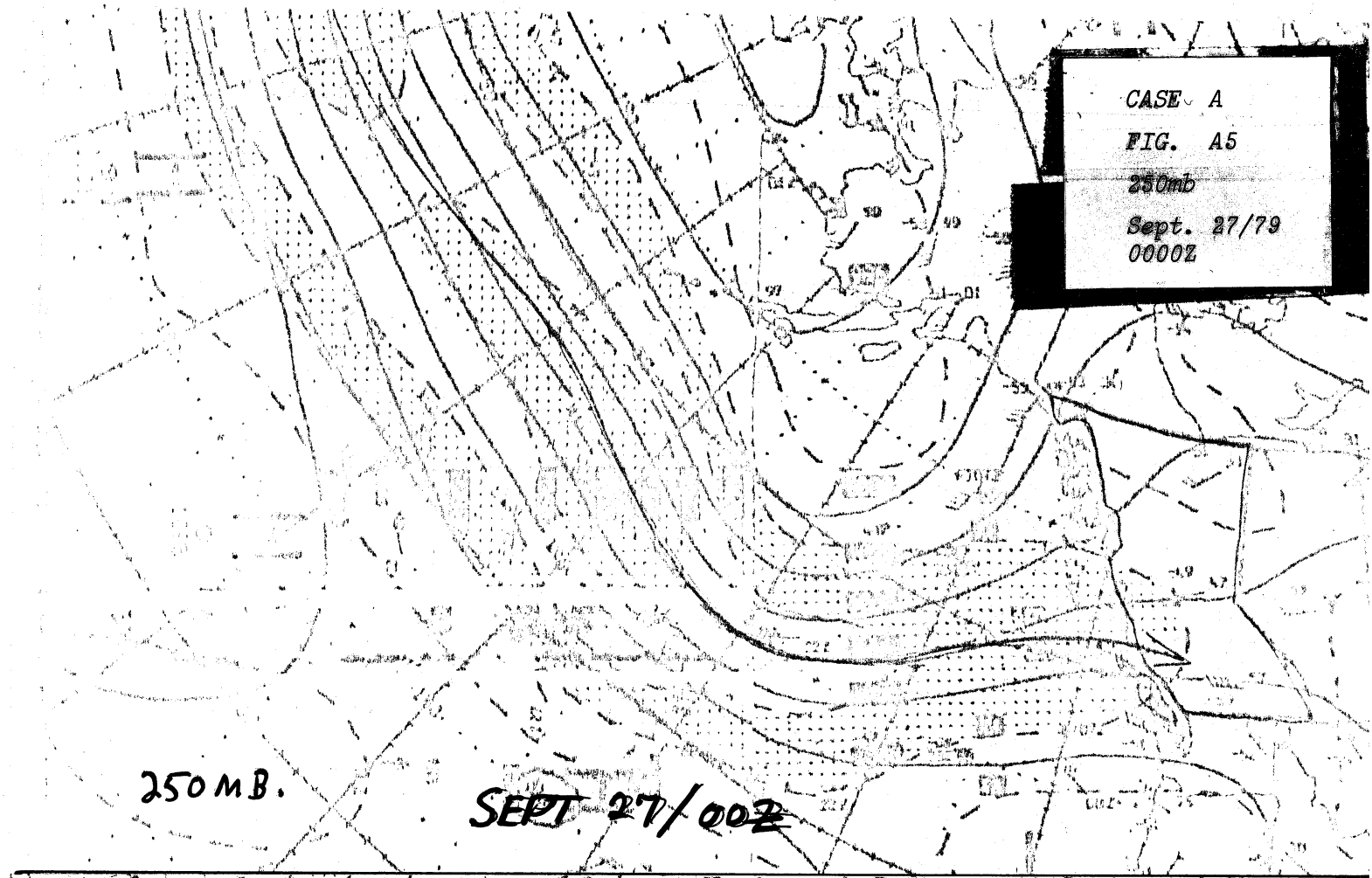
FIG. B3

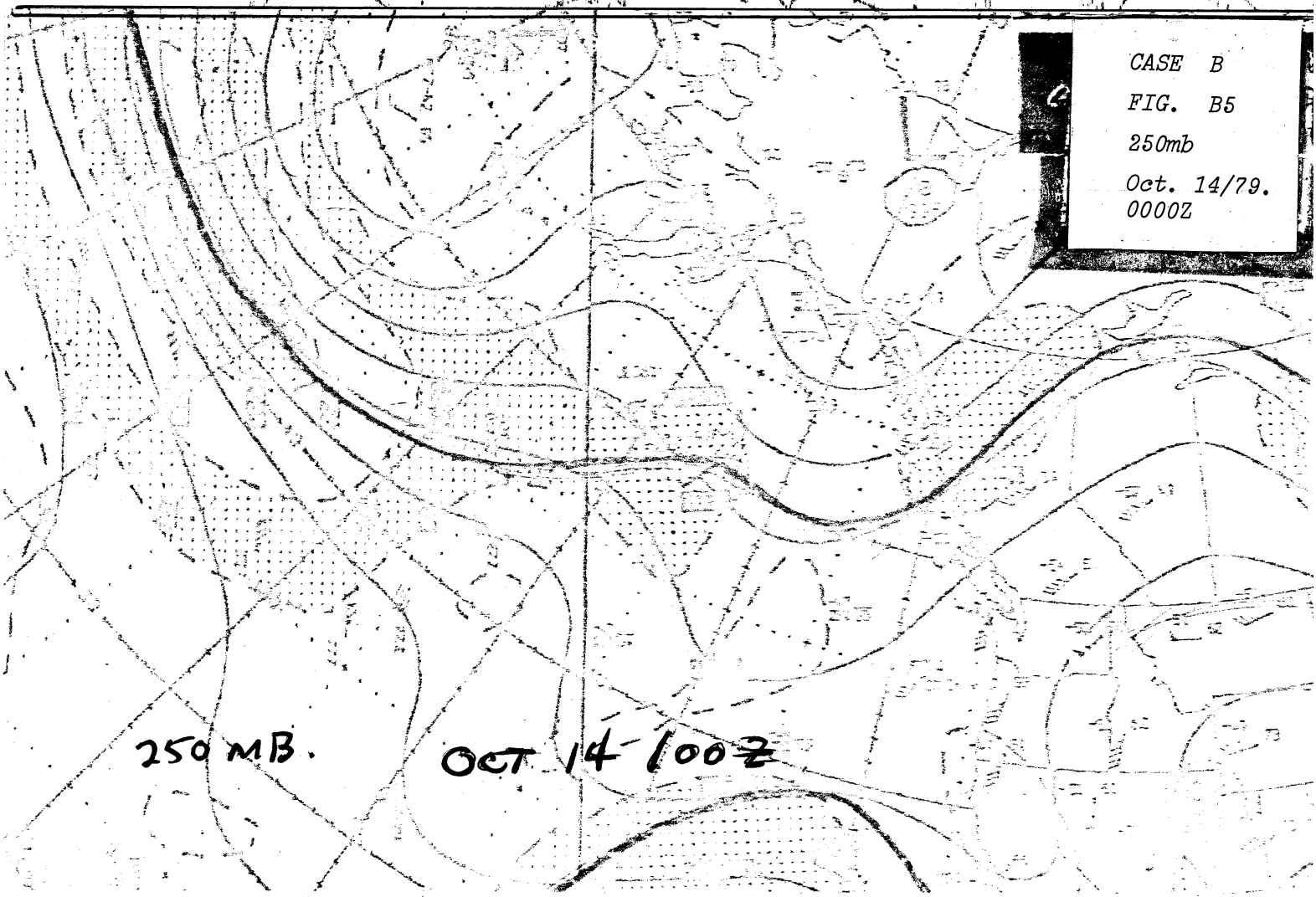



2245 26SE79 35A-4 00341 19201 UC2
CASE A
FIG. A4

4(a)


03Y5 14DC79 35E-4ZA 00362 19101 UC2
CASE B
FIG. B4


CASE A
FIG. A5
250mb
Sept. 27/79
0000Z
250 MB.
SEPT 27/00Z


CASE B
FIG. B5
250mb
Oct. 14/79.
0000Z
250 MB.
OCT 14/00Z