PACIFIC REGION TECHNICAL NOTES

80-006
February 28, 1980

PWC Satellite Analysis Chart

John Thomas, Satellite Meteorologist
Pacific Weather Centre, Vancouver

INTRODUCTION

For some time now the satellite group of the Pacific Weather Centre has been issuing a real-time cloud analysis chart using GOES satellite images. An example of this chart and the table of symbols used are shown in figure 1. A descriptive upper air analysis is being composed in conjunction with the cloud analysis and is currently being transmitted to users in the form of a teletype message under the heading FXCN4 CWVR. This analysis is done three times per day and is concerned with the location and motion of the jet stream and midtropospheric features of the atmosphere which will influence the weather over and upstream from B.C. In order to enhance the information contained in this upper air analysis, and to make it more readily useable by all user groups in the field, a pictoral depiction of the FXCN4 could be transmitted as a facsimile chart on a regular basis.

SATELLITE ANALYSIS CHART

This new analysis chart will be issued in addition to the cloud analysis and will be done on the grid of the smaller scale UC2 images which extend westwards to the dateline (figure 2). The cloud analysis is normally done on the larger scale SB6 sector which extends only to about 145W although this sector is not yet available at the P.W.C. on a regular basis. This new chart will depict the jet stream and the major features discussed in the FXCN4. It will not replace the message but is to be used with the message. The FXCN4 will add detail to the analysis chart and will discuss how the systems depicted will influence the weather over and upstream from B.C.

The satellite analysis chart will show the jet stream axis, vorticity, maxima, vorticity lobes, upper ridges and upper low centres. It will also indicate the cloud boundaries of the most significant synoptic scale systems in order to show their relationship to the upper air features. A standard set of symbols has been adopted for use with the satellite depiction charts and is consistent with traditional analysis symbolism. An example of the Satellite Analysis Chart is shown in figure 3.

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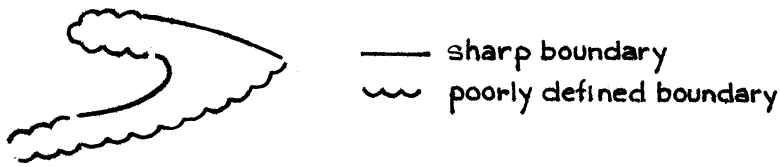
DEPICTION SYMBOLS

1. Cloud System Boundary -



- a continuous solid line delineating the extent of a cohesive cloud system.
- identical to depiction in cloud analysis chart.

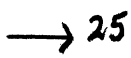
2. Jet Stream -

- continuous solid line with arrowhead
- indicates axis of maximum winds speed at or near the tropopause level
- the relative maximum wind speed along the axis indicated as shown with the wind speed in knots
- wind speeds determined from airplane reports and from cloud motions.

e.g.,

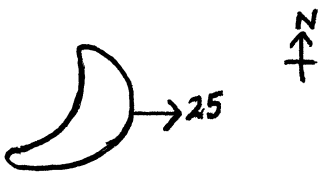
- indicates a wind maxima of 150 knots.

3. System Motion -



- an arrow extending from any feature gives its instantaneous direction of motion
- its instantaneous speed is given in knots by the number at the head of the arrow.

e.g.,



- cloud system moving east at 25 knots.

4. Vorticity Centre - *

- centre of maximum vorticity indicated by *

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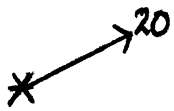
Since vorticity maxima are of primary importance in the analysis and prognosis they are depicted as shown to make them readily differentiable from all other upper air features. A vorticity maxima is normally associated with an upper low centre but may not be co-located with it.

e.g., 



- vorticity maxima moving NE at 20 knots.

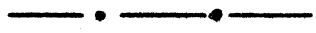
5. Vorticity Lobes - 

- a broken line extending from a vorticity centre
- areas of positive vorticity advection (PVA) are located ahead of the vorticity lobe.

A vorticity lobe may or may not be coincidental with a short wave trough. However, a short wave trough is by definition coincident with a vorticity lobe, therefore, only vorticity lobes will be indicated on the analysis.

6. Upper Low Centre - 

- depicted by the traditional symbol
- centre of closed circulation at 500 mb or higher.

7. Long-Wave trough - 

- axis of the trough (minimum contour heights) indicated by a dash-dot-dashed line

8. Upper Ridge Line - 

- both long and short-wave ridges indicated by a jagged line
- the amplitude of the ridge will be indicated by the length of the line.

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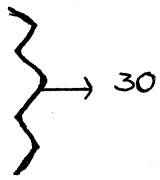
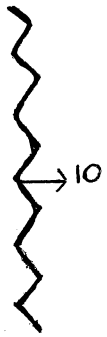
e.g.,



- shortwave ridge moving east at 30 knots.



- longwave ridge moving east 10 knots.

REMARKS

The Satellite Analysis Chart is being implemented to assist in the dissemination of data by the PWC and is to be used in conjunction with other PWC products. This chart can be readily used to evaluate computer generated prognosis and analysis charts and should assist users in understanding the forecasts based on this analysis. This new chart is expressly for the benefit of users in the field and can be modified to increase its usefulness. This analysis chart will be scheduled to be transmitted once a day at 21:00Z (1 p.m. PST) on a real-time basis. Unfortunately at this time, PWC has no control over the images received. There will be no chart issued when a UC2 sector is unavailable.

Comments and/or criticisms from the field will be greatly appreciated as this is a new and experimental chart.

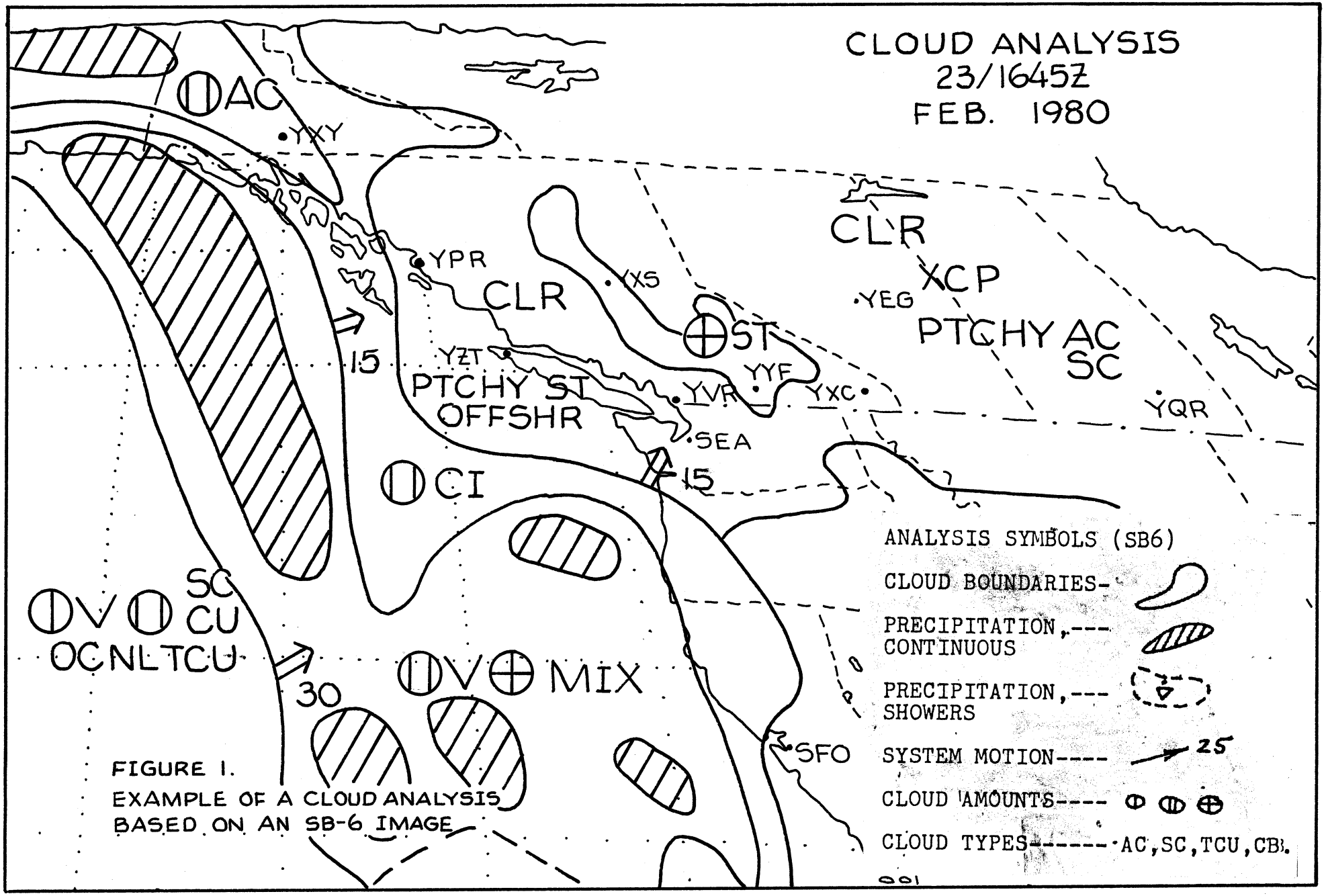


FIGURE 1.
EXAMPLE OF A CLOUD ANALYSIS BASED ON AN SB-6 IMAGE

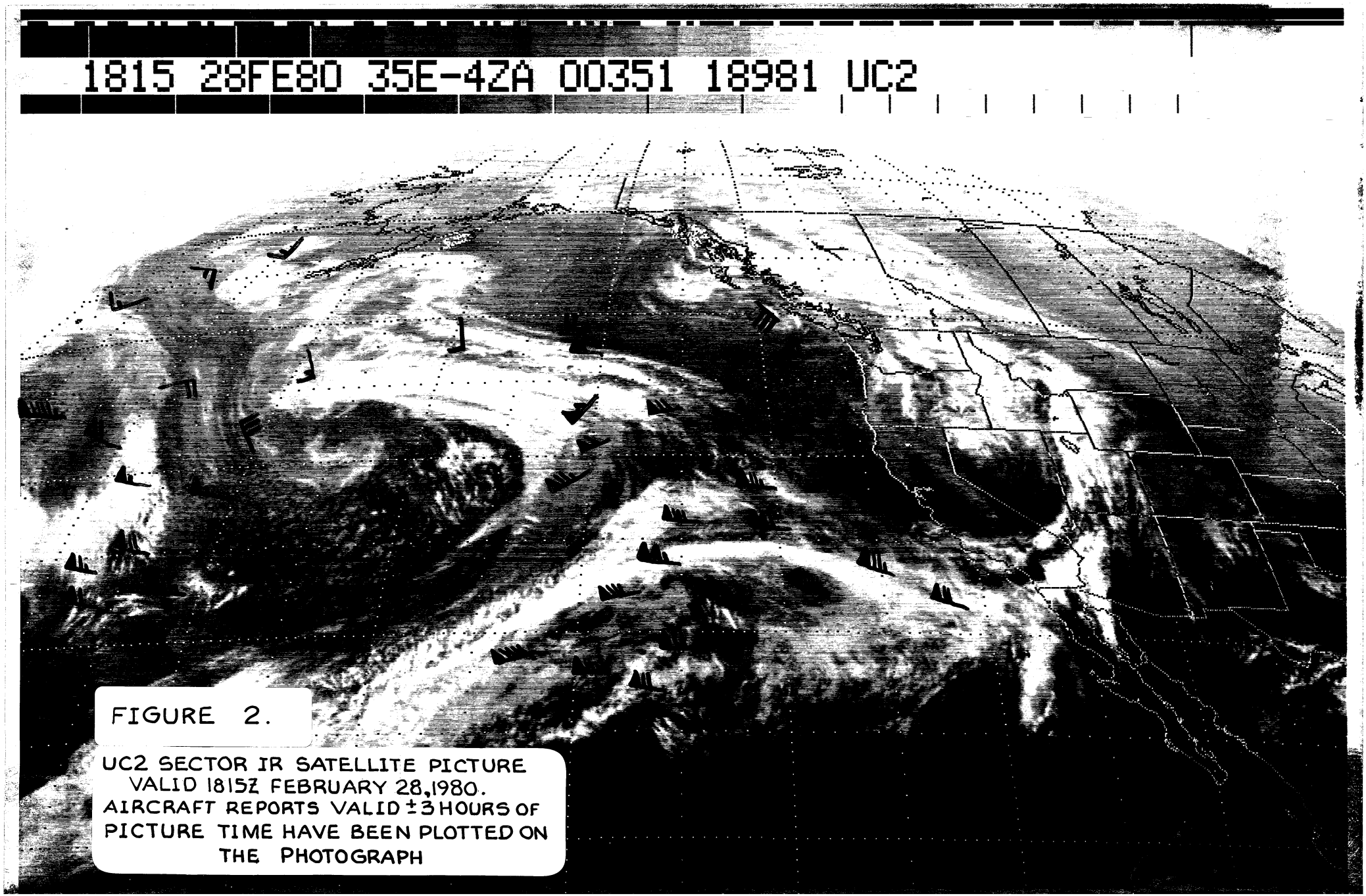


FIGURE 2.

UC2 SECTOR IR SATELLITE PICTURE VALID 1815Z FEBRUARY 28, 1980. AIRCRAFT REPORTS VALID ±3 HOURS OF PICTURE TIME HAVE BEEN PLOTTED ON THE PHOTOGRAPH

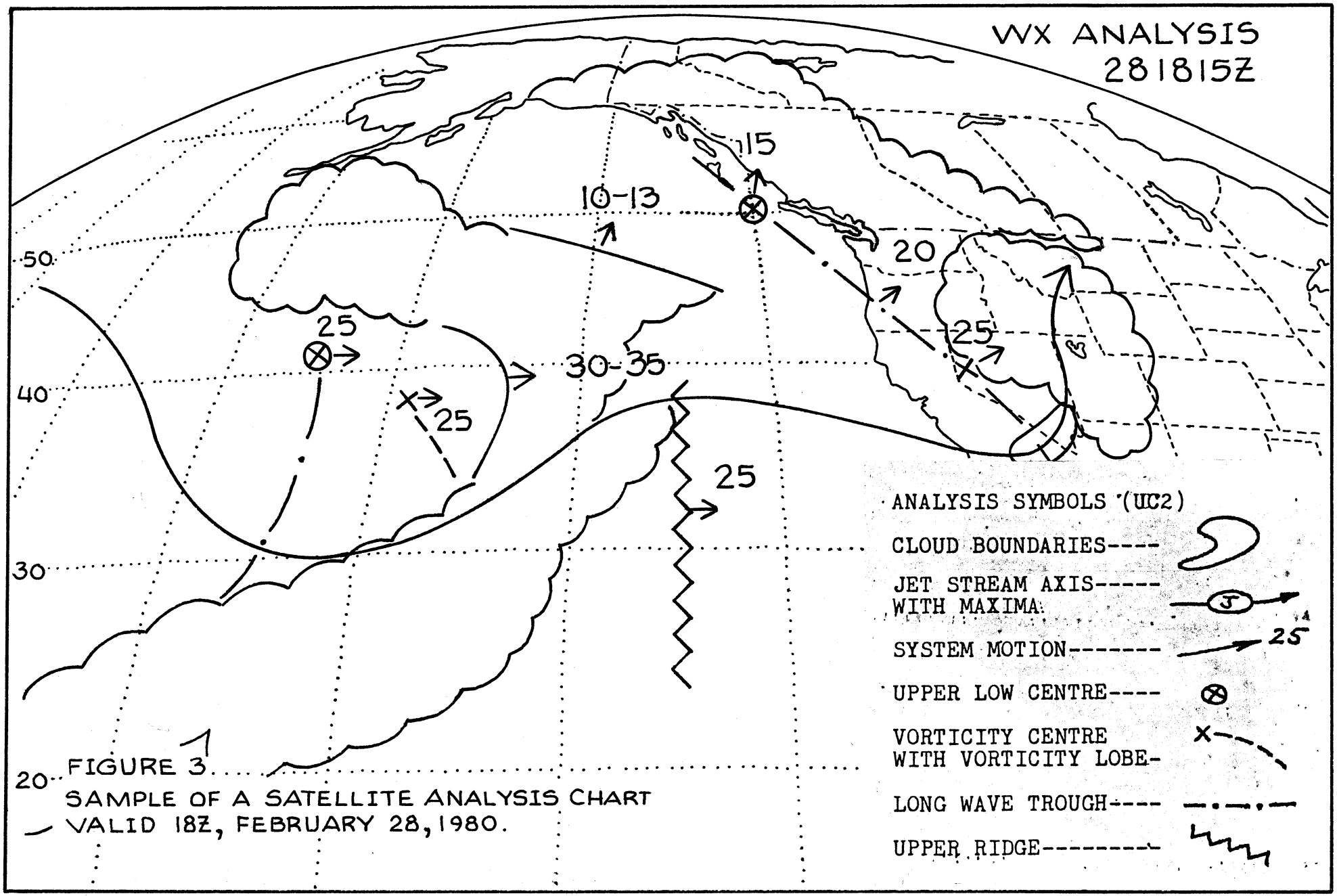


FIGURE 3.
SAMPLE OF A SATELLITE ANALYSIS CHART
VALID 18Z, FEBRUARY 28, 1980.