

GEOLOGICAL SURVEY OF CANADA



COMMISSION GÉOLOGIQUE DU CANADA

DEPARTMENT OF ENERGY, MINES AND RESOURCES
MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES

**AIRBORNE GEOPHYSICAL SURVEY
1986**

**LACORNE BATHOLITH AREA
QUEBEC
(Barraute 32C/5)**

**STACKED PROFILES
accompanies
Gamma Ray Spectrometer Colour Maps**

Geological Survey of Canada Open File 1596



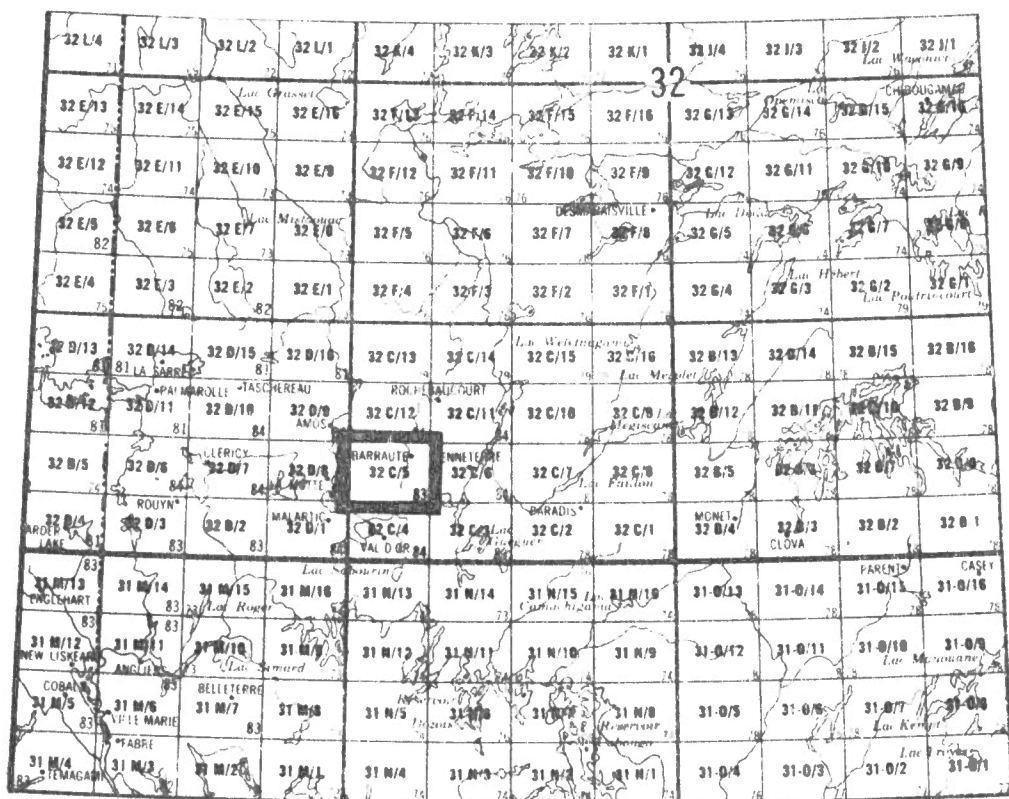
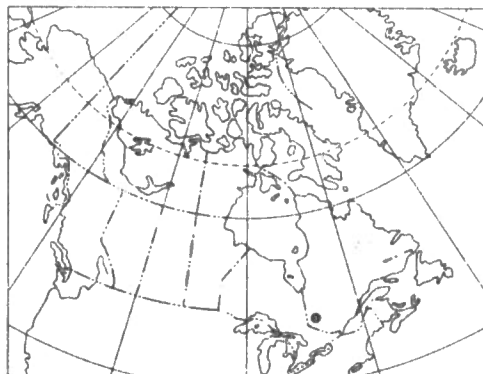
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Canada

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Location map
LACORNE BATHOLITH SURVEY
QUÉBEC
1986

AIRBORNE GAMMA RAY SPECTROMETER SURVEY LACORNE BATHOLITH AREA - QUEBEC

In the September 1986 a multi-parameter geophysical survey was flown in the Val D'Or region of Quebec. The survey location is shown on the index map. The main purpose of the survey was to collect quantitative gamma ray spectrometer data as a mapping technique to identify bedrock units in the area displaying variations in the radioelement distribution. VLF electromagnetic data and total field magnetic data were also recorded and compiled as additional geophysical parameters.

The gamma ray spectrometer data are presented as a set of eight radioelement colour maps, the total count, potassium, equivalent uranium and equivalent thorium concentrations, the eU/eTh, eU/K and eTh/K ratios, and the ternary radioelement map. Accompanying the colour maps are VLF and magnetic profile maps, a flight line map with a superimposed topographic base and a geology map. The map scale is 1:100,000. Stacked profiles at a scale of 1:150,000 are also included under separate cover.

The airborne VLF measurements were obtained using a Herz Totem 1A airborne VLF system. The primary electromagnetic field is generated by VLF station NAA at Cutler, Maine, which transmits at 24.0 kHz. The secondary field is generated by eddy currents flowing in near-surface conductors. The profiles presented are the total field value (vector sum of the horizontal and vertical components) and the quadrature (out-of-phase) component of the vertical field. The total field is expressed in percent of the local primary field and the quadrature in percent of the along-track component. The mean values of the total field and quadrature component were removed along each flight line. The quadrature which depends on the flight line directions, was inverted for lines flown from east to west. A 5 point filter was applied to both total field and quadrature data for final presentation. Anomalies over conductors produce positive peaks on the total field trace and are of the cross-over type (negative to positive) on the quadrature trace. All VLF profiles are plotted on a zero line which represents the true flight path as monitored in-flight on a video screen.

All data were sampled at 1 second intervals. The airborne radiometric measurements were made using a 256 channel spectrometer, with twelve 102x102x406 mm NaI (Tl) detectors, flown at a mean terrain clearance of 125 m at 190 km/h. East-west flight lines were at 500 metre line spacing.

Potassium is measured directly from the 1.46 MeV gamma ray photons emitted by ⁴⁰K, whereas uranium and thorium are measured indirectly from gamma ray photons emitted by daughter products in their decay chains. Uranium is monitored by means of gamma ray photons at approximately 1.76 MeV from ²¹⁴Bi, and thorium, from 2.62 MeV photons emitted by ²⁰⁸Tl. The energy windows used are as follows:

Total Count		0.41-2.81 MeV
Potassium	⁴⁰ K	1.36-1.56 MeV
Uranium	²¹⁴ Bi	1.66-1.86 MeV
Thorium	²⁰⁸ Tl	2.41-2.81 MeV

Total count, uranium, thorium and potassium counts have been corrected for dead time, ambient temperature changes, background radiation, spectral scattering and deviations of terrain clearance from the planned survey altitude. In areas of extreme topographic variations accurate terrain corrections are difficult. Thus, estimates of radioelement concentrations may be inaccurate in these areas. The computer programs used to produce the contour maps and profiles are modified from Geological Survey of Canada Open File 109 "Airborne Gamma Spectrometry Data Processing Manual".

The values for the radioelement concentrations shown on the contour maps are "average surface concentrations", that is, an average for the area on the ground viewed by the spectrometer, an area which may contain varying amounts of outcrop, overburden and surface waters. As a result the concentrations as shown on the contoured maps are usually considerably lower than the concentrations in the bedrock. However, the radioelement distribution shown by the contour maps reflects the relative distribution of the elements in the bedrock.

Factors for converting airborne measurements to element concentration were determined by relating the corrected airborne count rates over a test strip in the Ottawa area to the known ground radioelement concentrations (R.L. Grasty and B.W. Charbonneau, 1974, Gamma-Ray Spectrometry Calibration Facilities, G.S.C. Paper 74-1B, pp. 69-71).

The conversion factors used are those listed below.

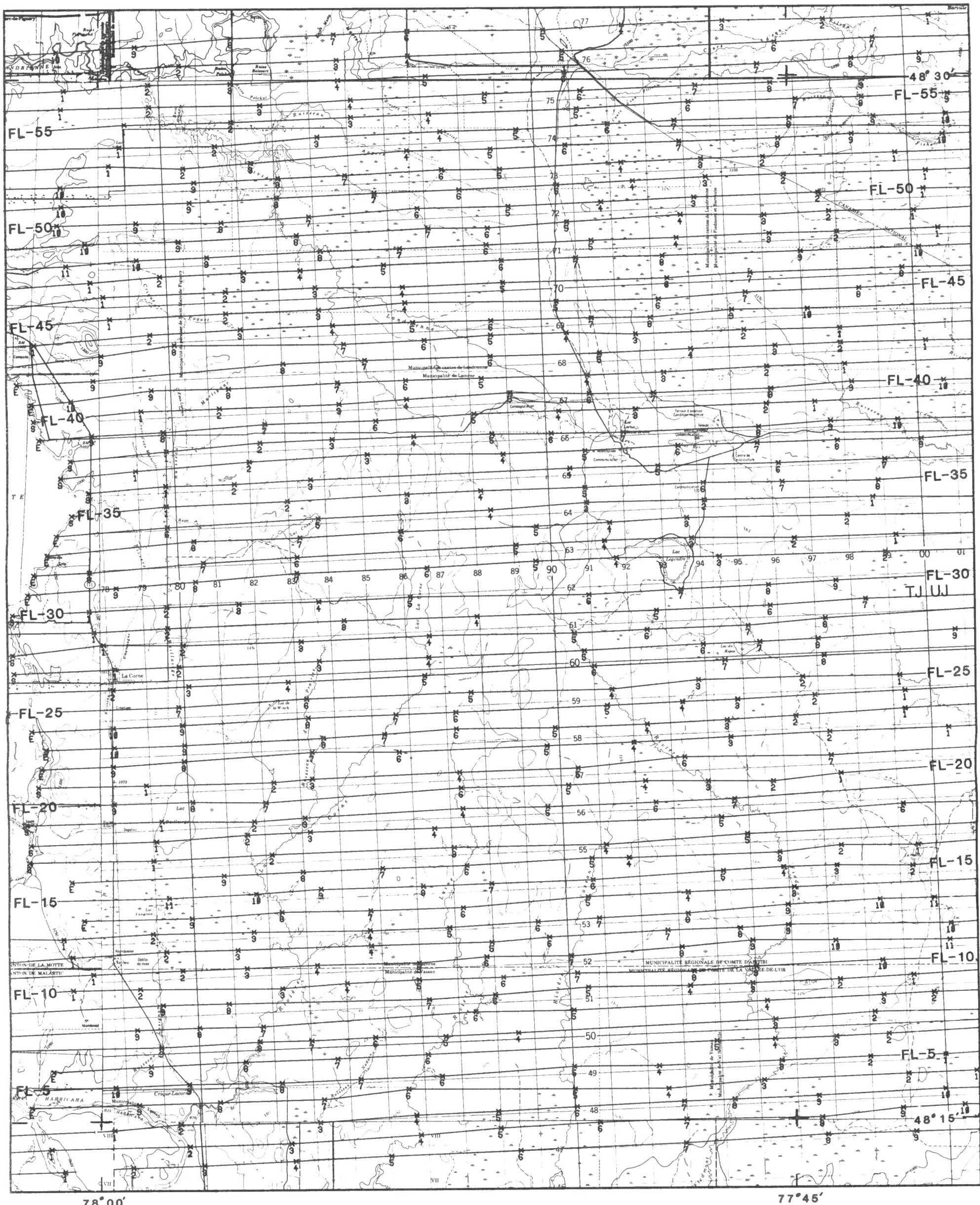
1 Ur Total Count	161	cps
1% K	91.0	cps
1 ppm eU	9.1	cps
1 ppm eTh	7.0	cps

Total count measurements are presented as units of radioelement concentration (Ur), as defined in International Atomic Energy Agency Technical Report Series No. 174, 1976.

Information regarding the availability of this Open File release may be obtained from: Geological Survey of Canada, 601 Booth St., Ottawa, Ontario, K1A 0E8 Telephone (613) 995-4342.

Base map material supplied by Surveys and Mapping Branch

Airborne gamma ray spectrometer, VLF and magnetic survey
flown, compiled and funded by Geological Survey of Canada



LACORNE BATHOLITH SURVEY
VAL-D'OR AREA, QUÉBEC
BARRAUTE
32 C/5

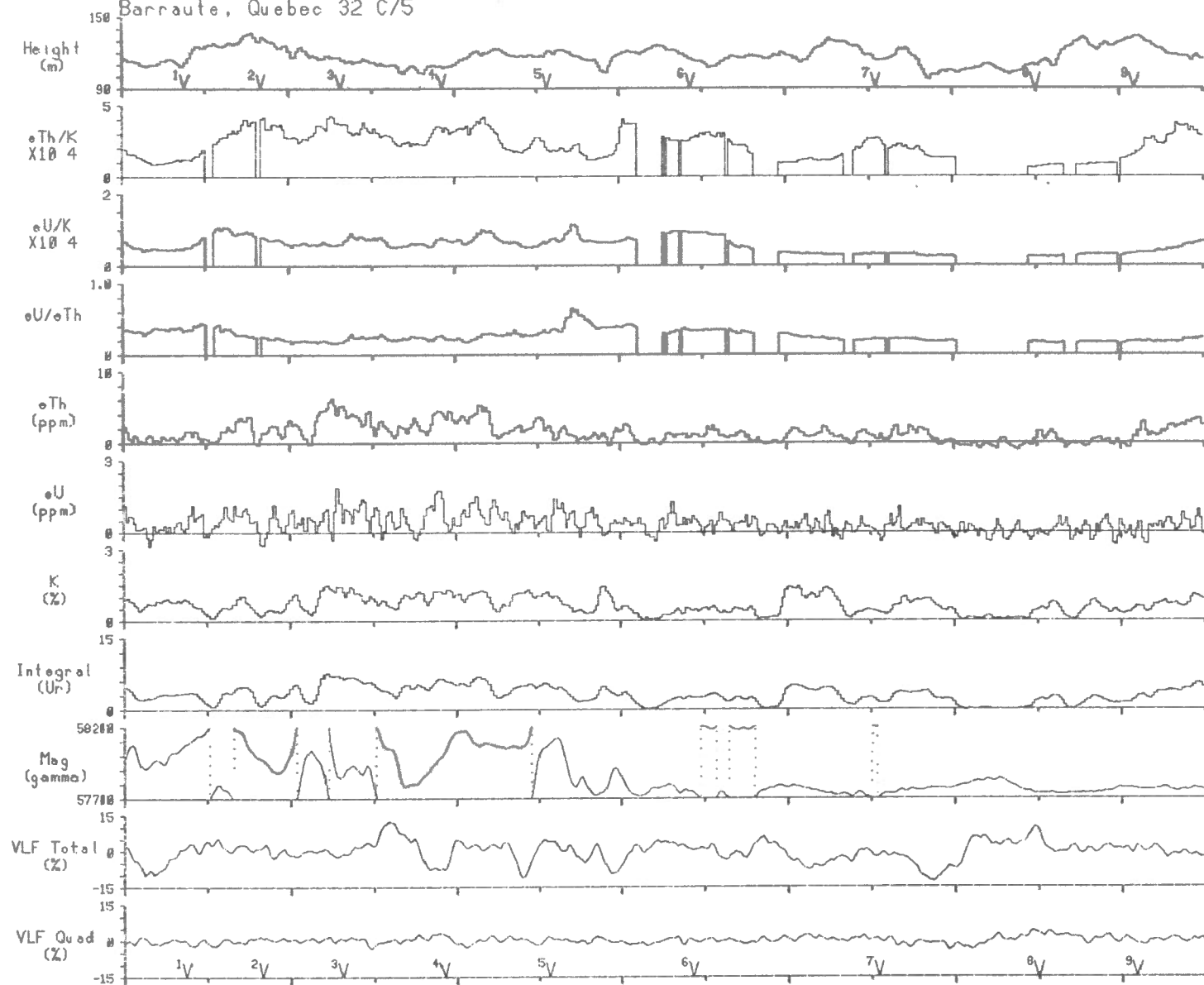
0 km 2

Base map scale 1:100 000

FLIGHT LINE MAP AND TOPOGRAPHIC BASE

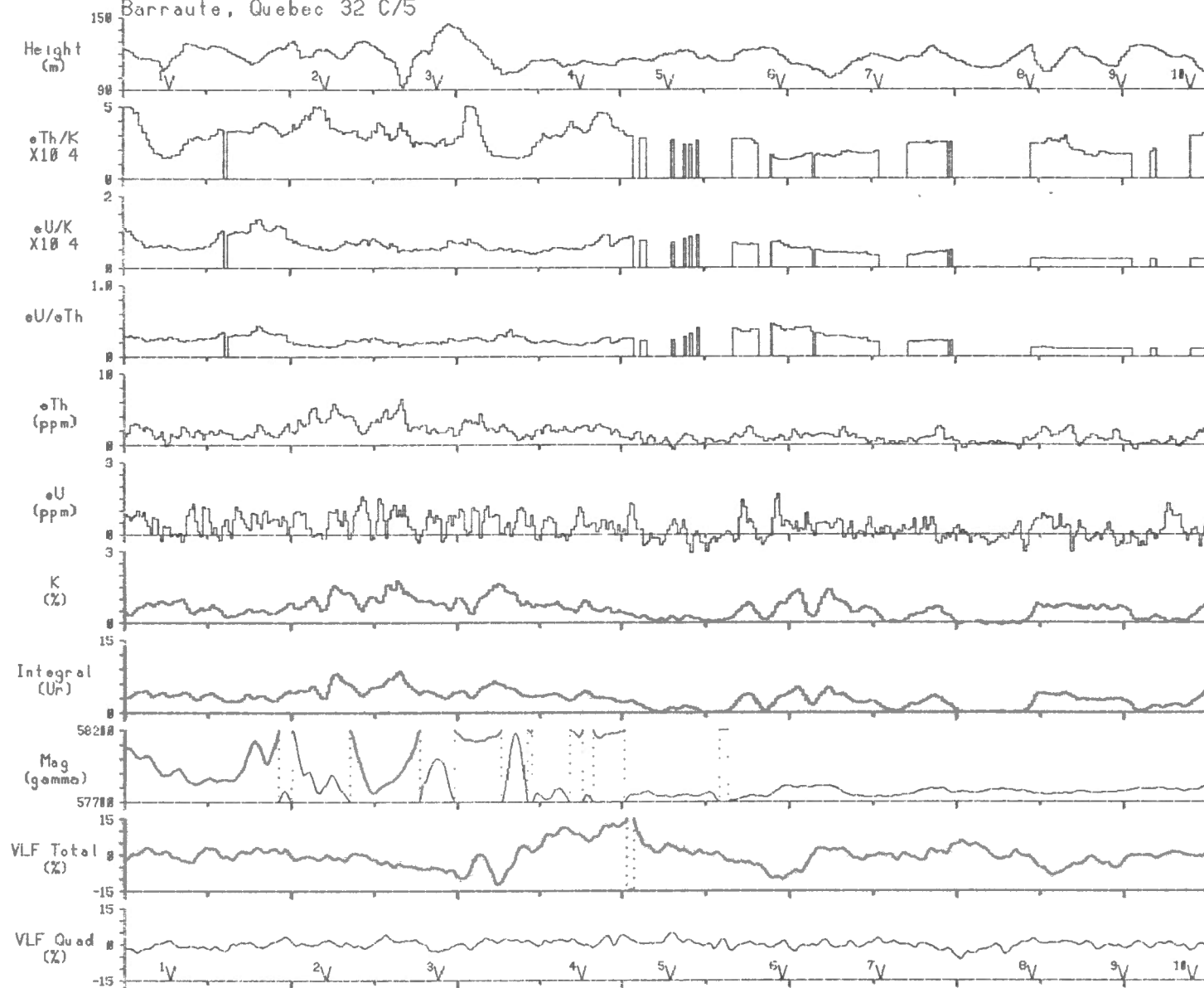
Flight line and fiducial . . . FL-15 — x —

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 Barraute, Quebec 32 C/5



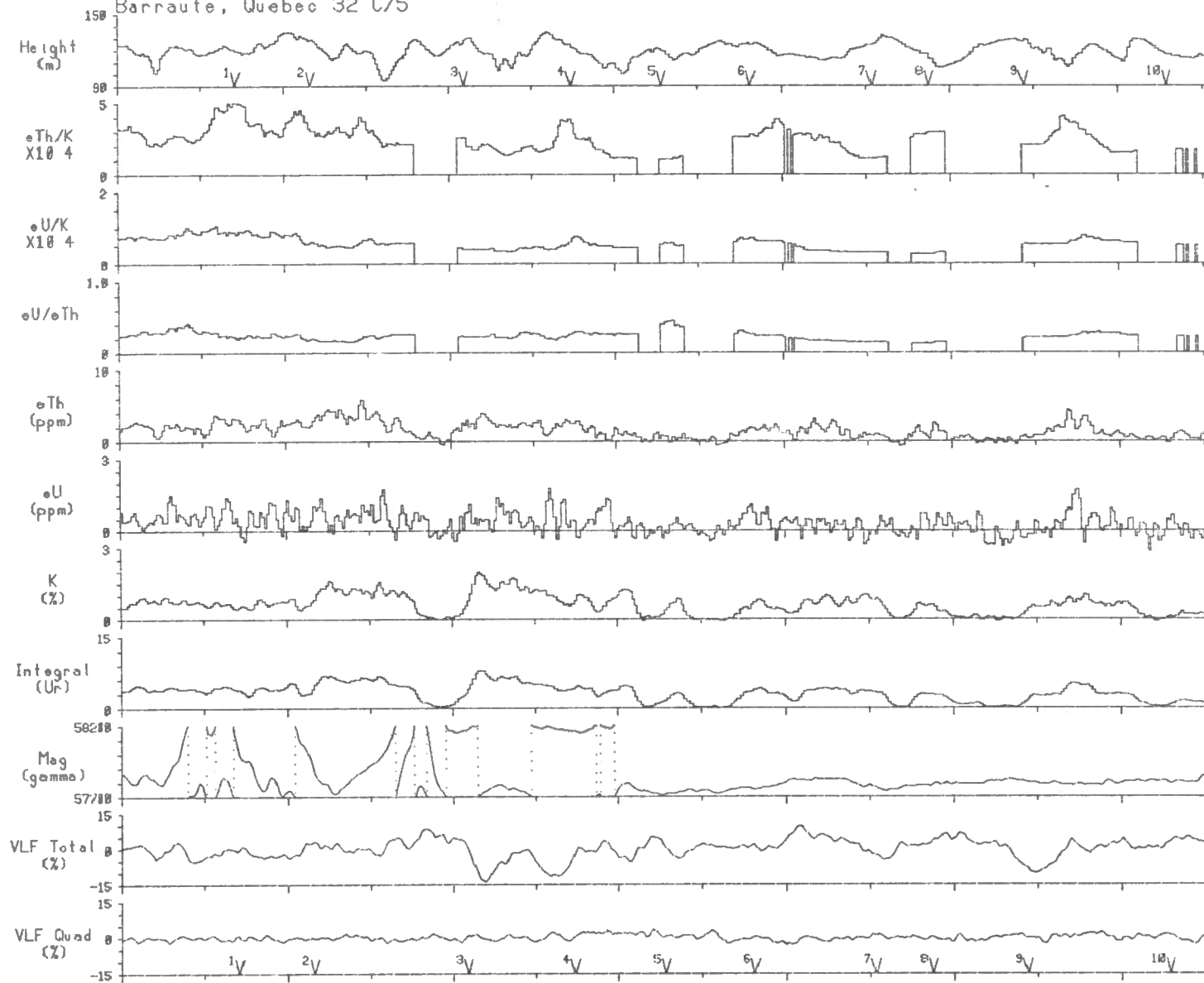
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Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5



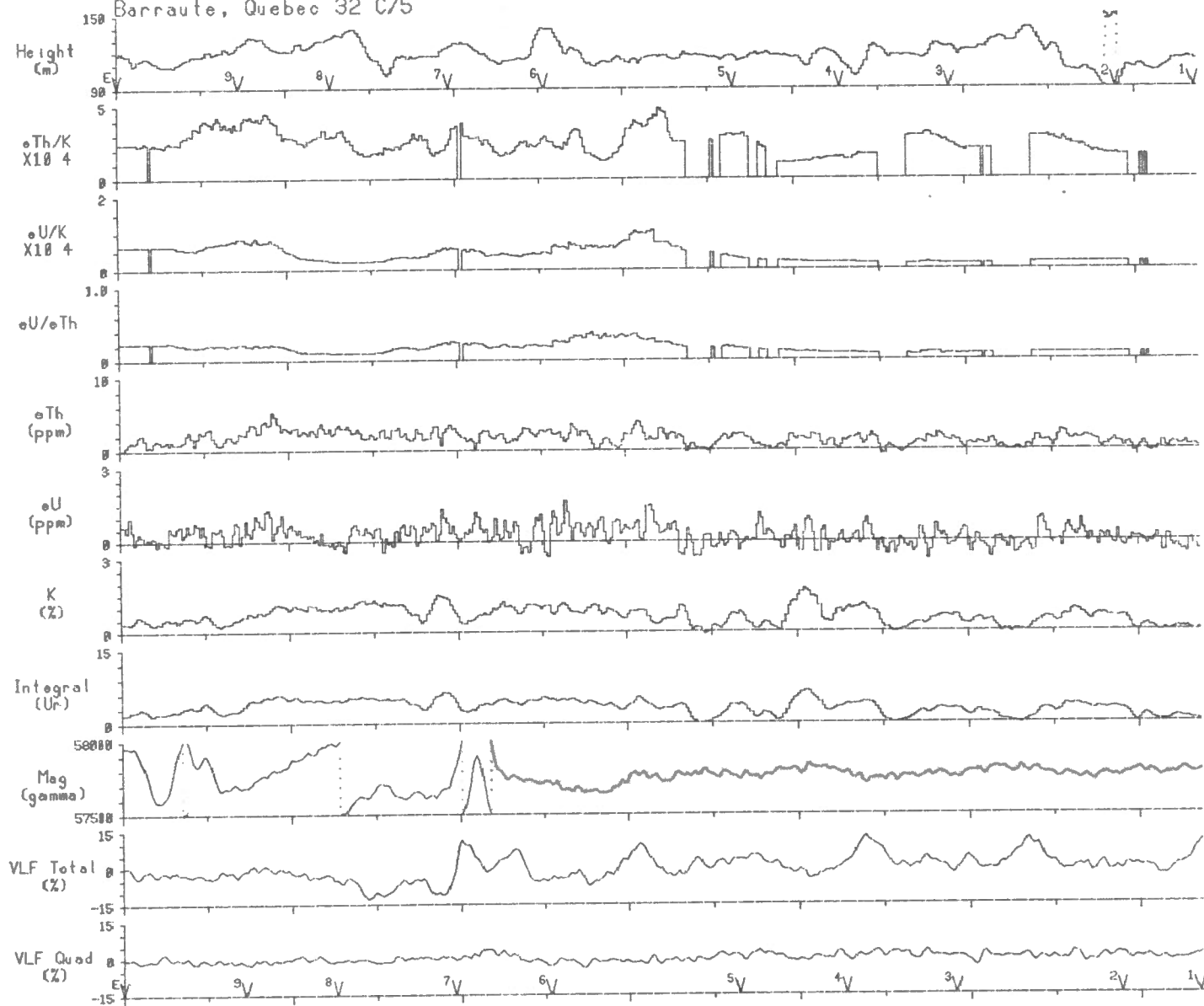
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 Barraute, Quebec 32 C/5



Line 3  Scale 1:150000

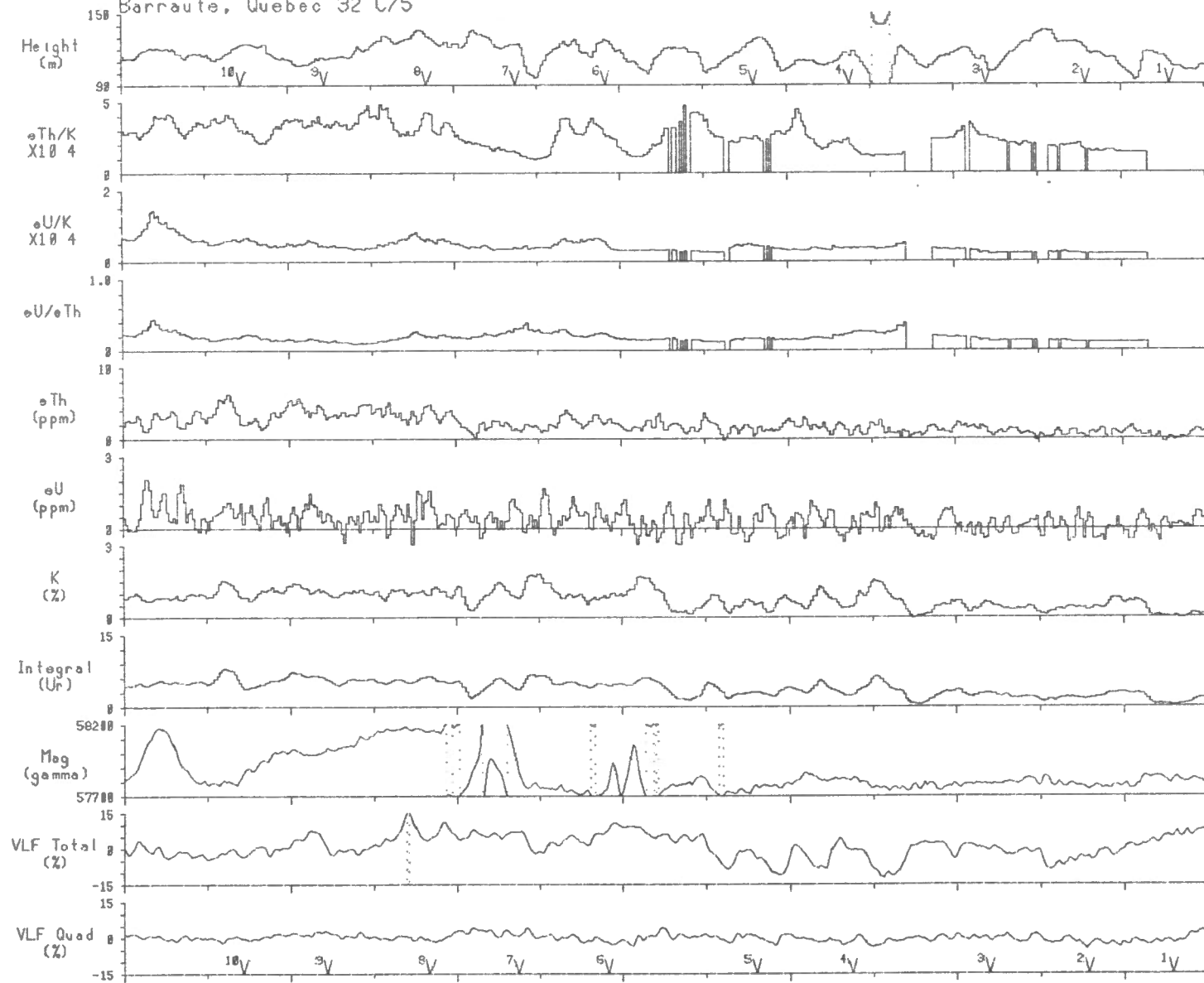
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 Barraute, Quebec 32 C/5



Line 4 | 2 km | Scale 1:150000

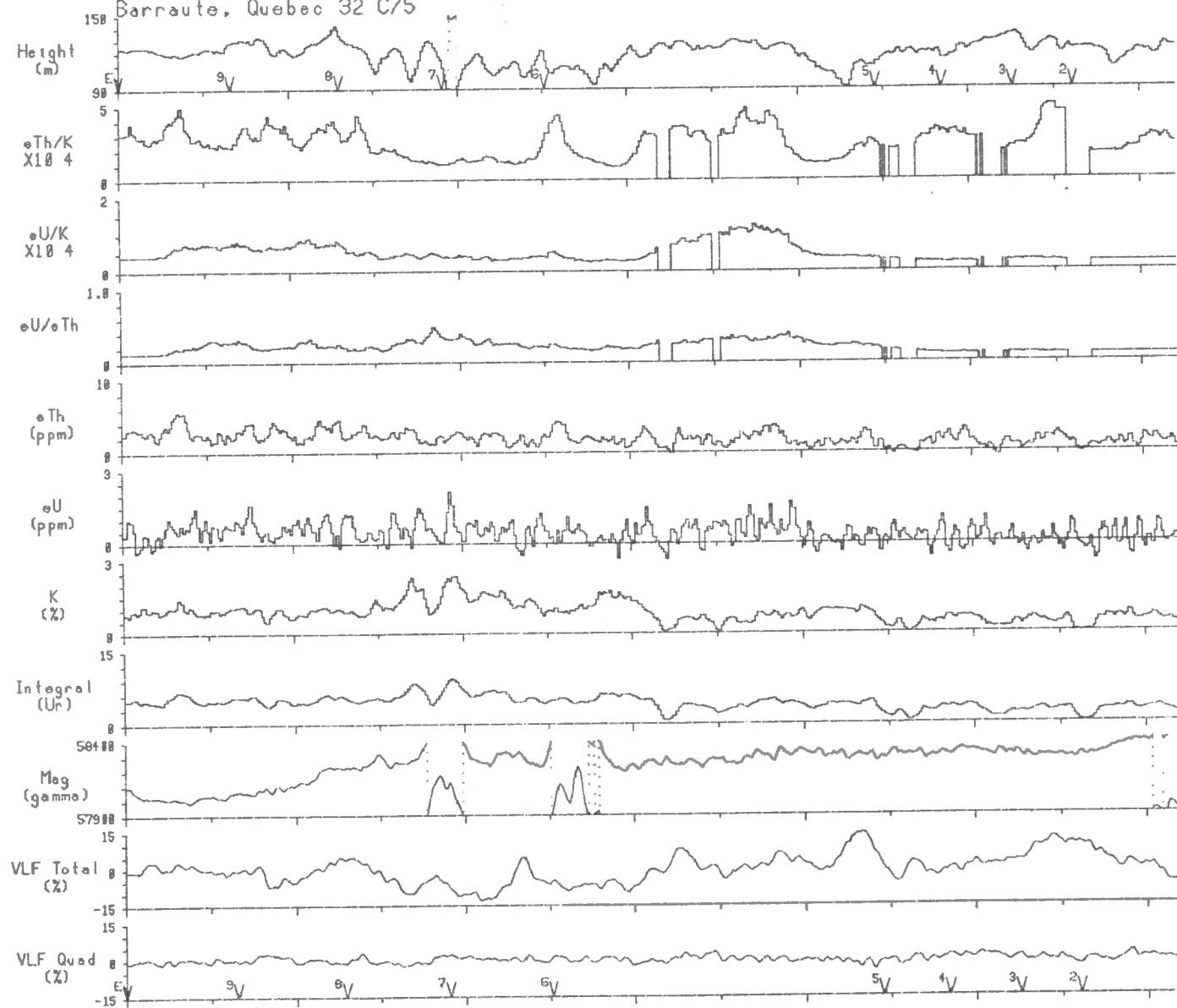
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Barraute, Quebec 32 C/5



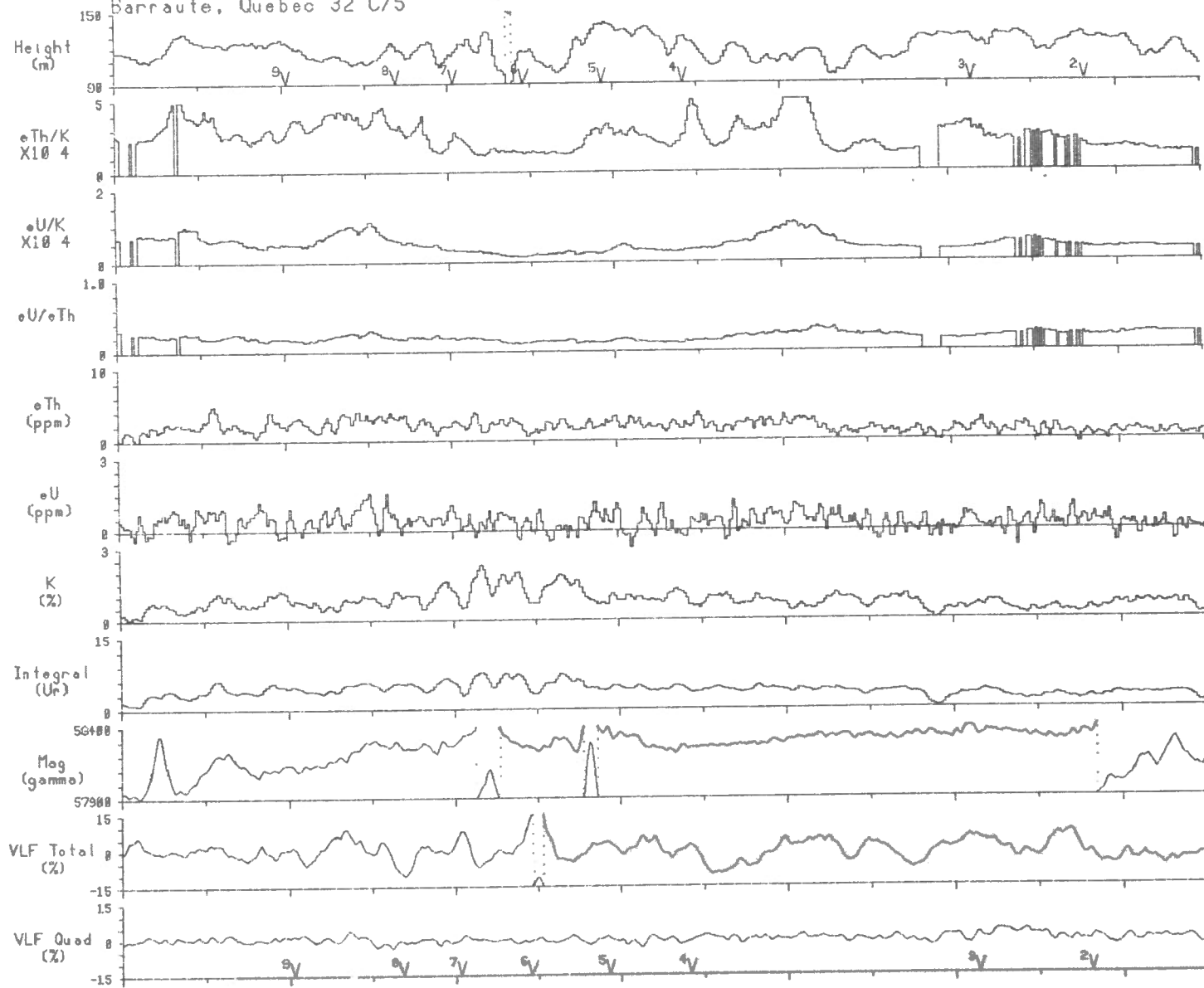
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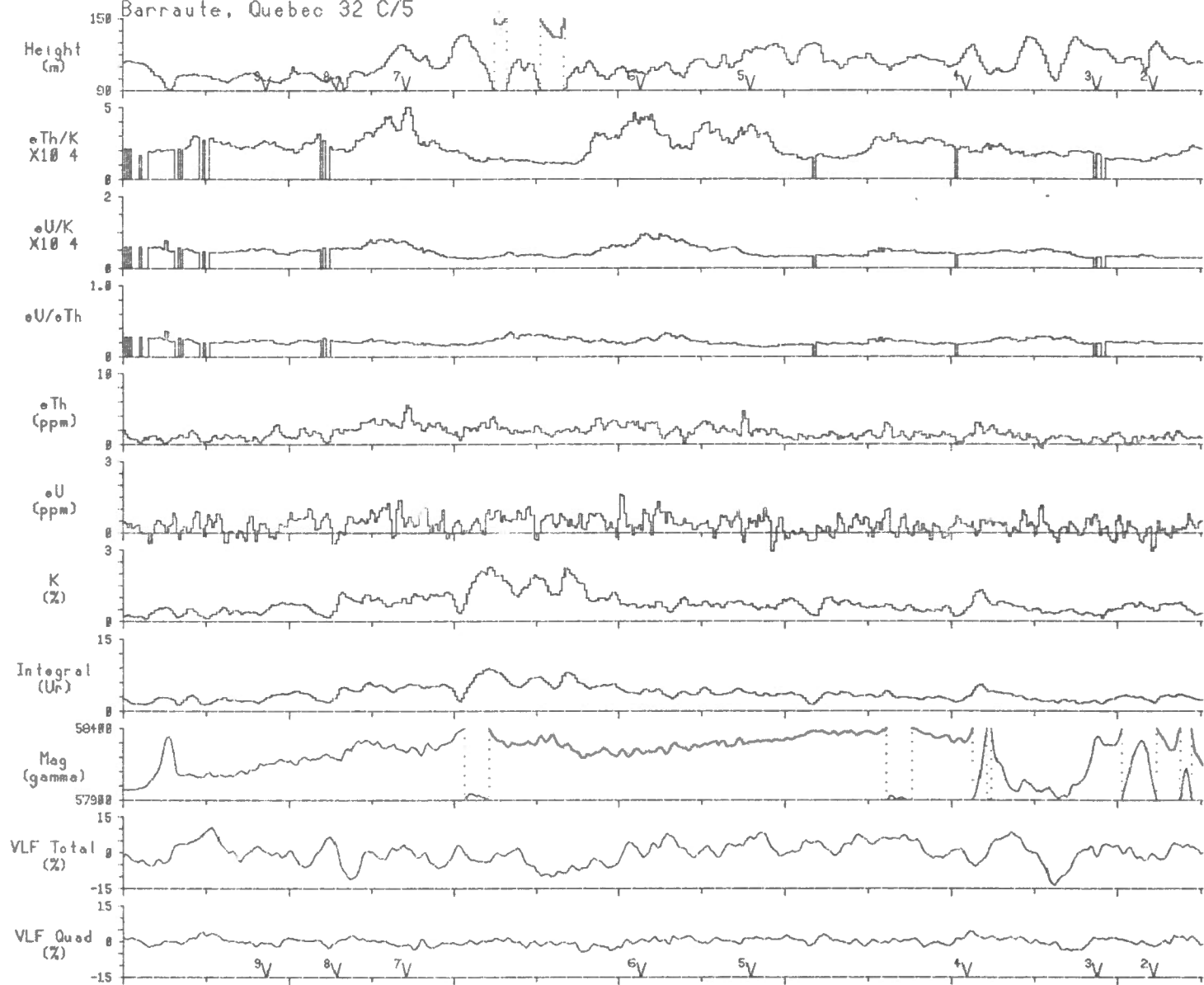
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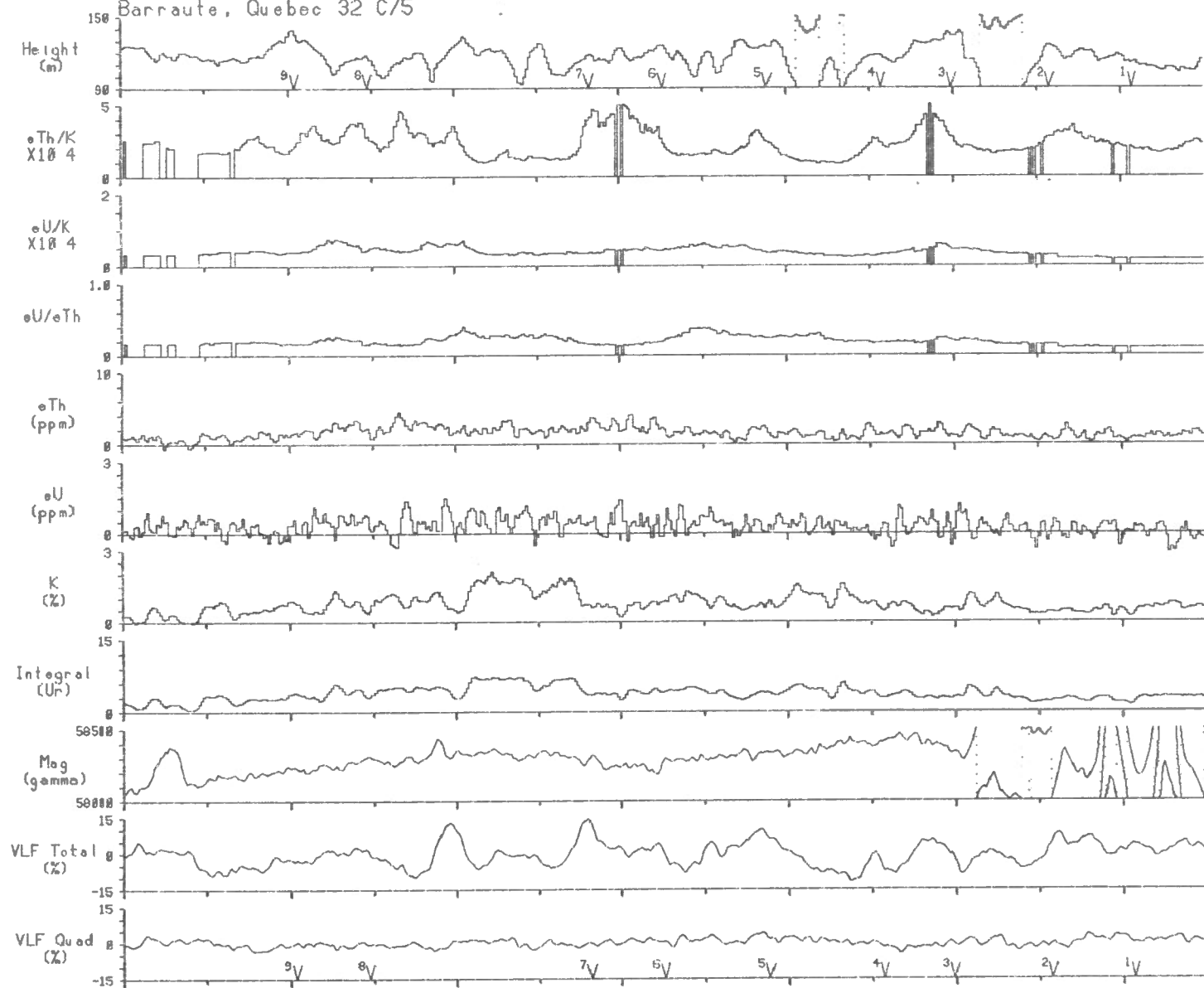
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 Barraute, Quebec 32 C/5



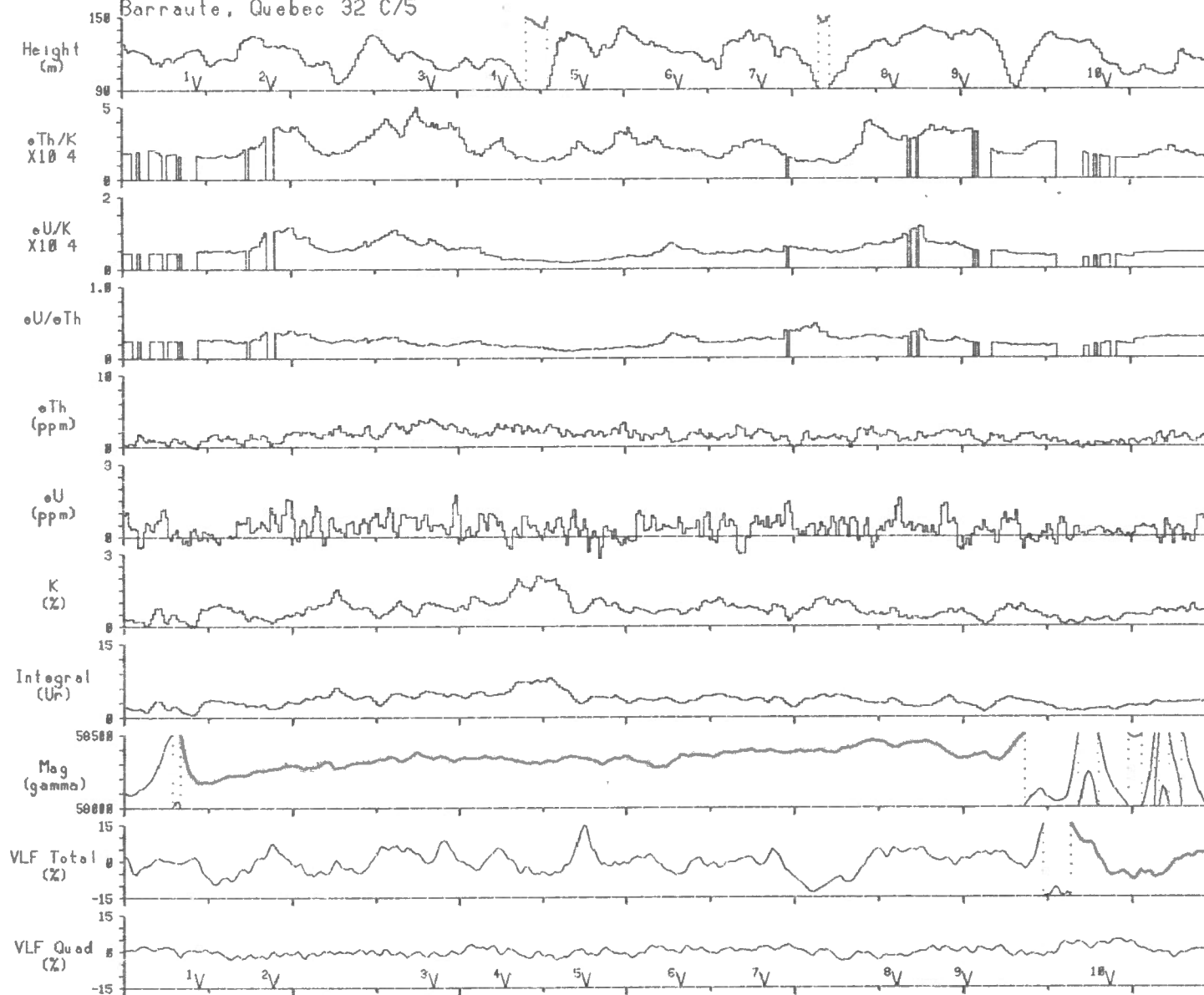
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Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5



Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986

Barraute, Quebec 32 C/5

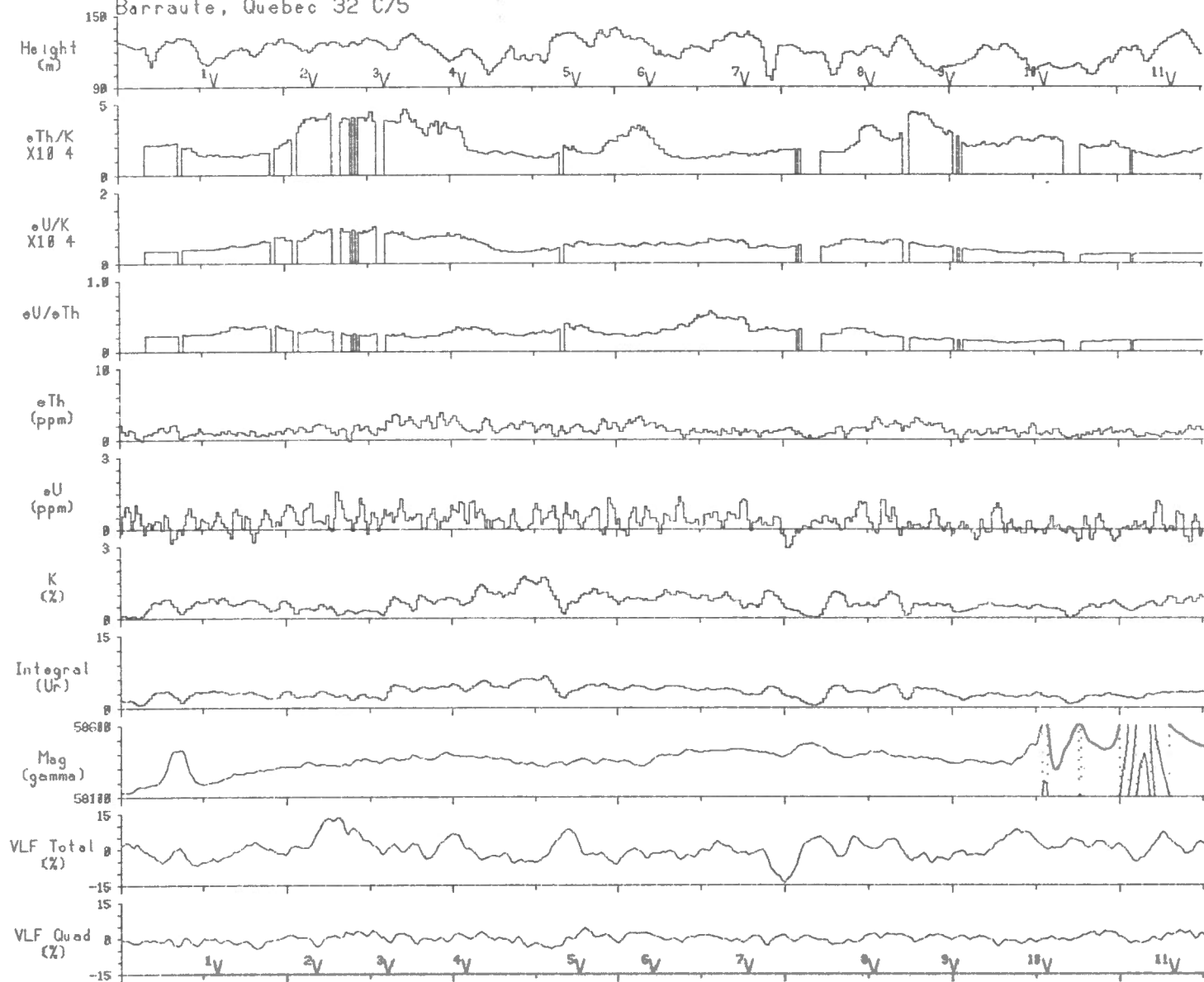


Line 10

2 km

Scale 1:150000

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 Barraute, Quebec 32 C/5

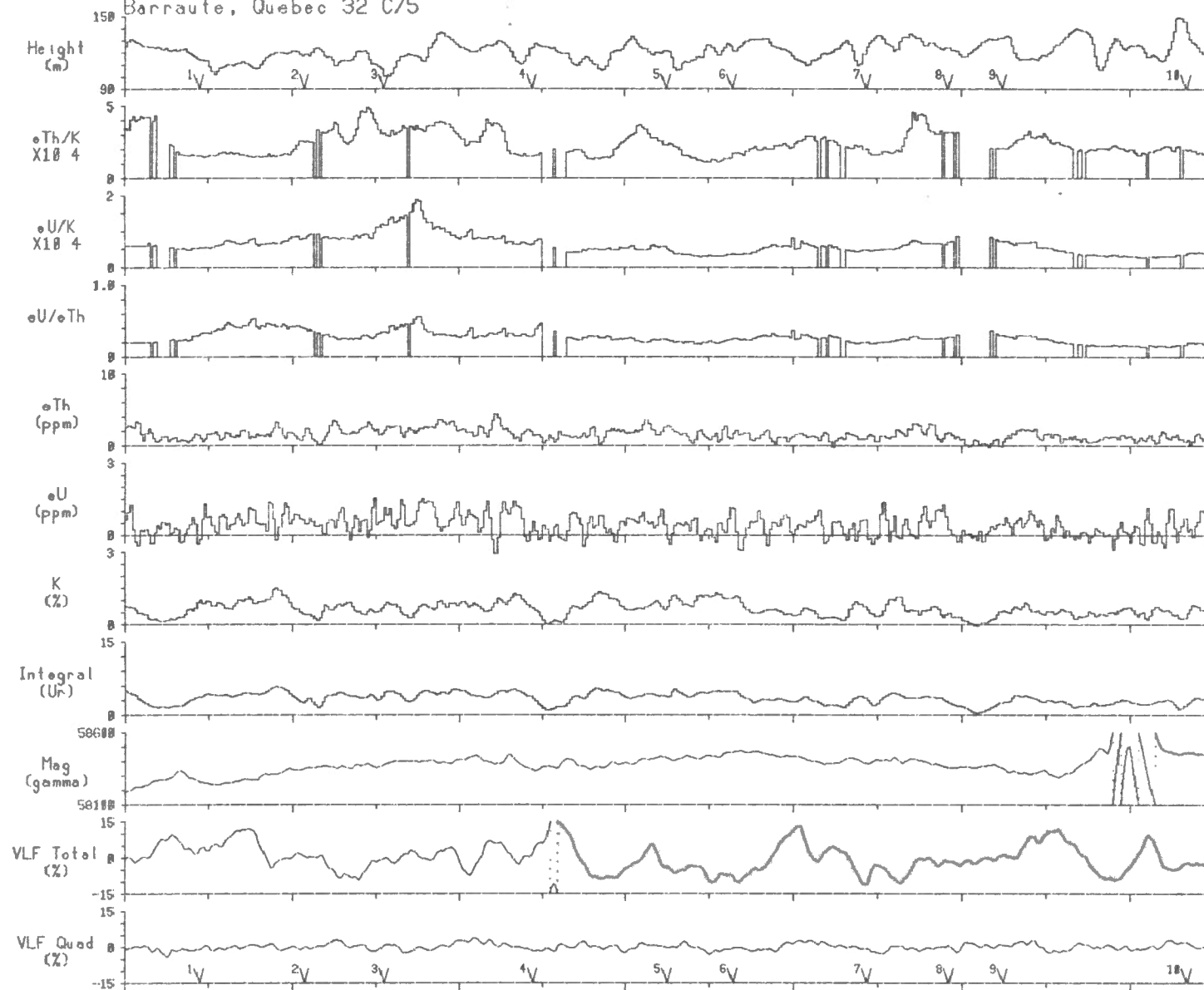


Line 11

2 km

Scale 1:150000

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 Barraute, Quebec 32 C/5



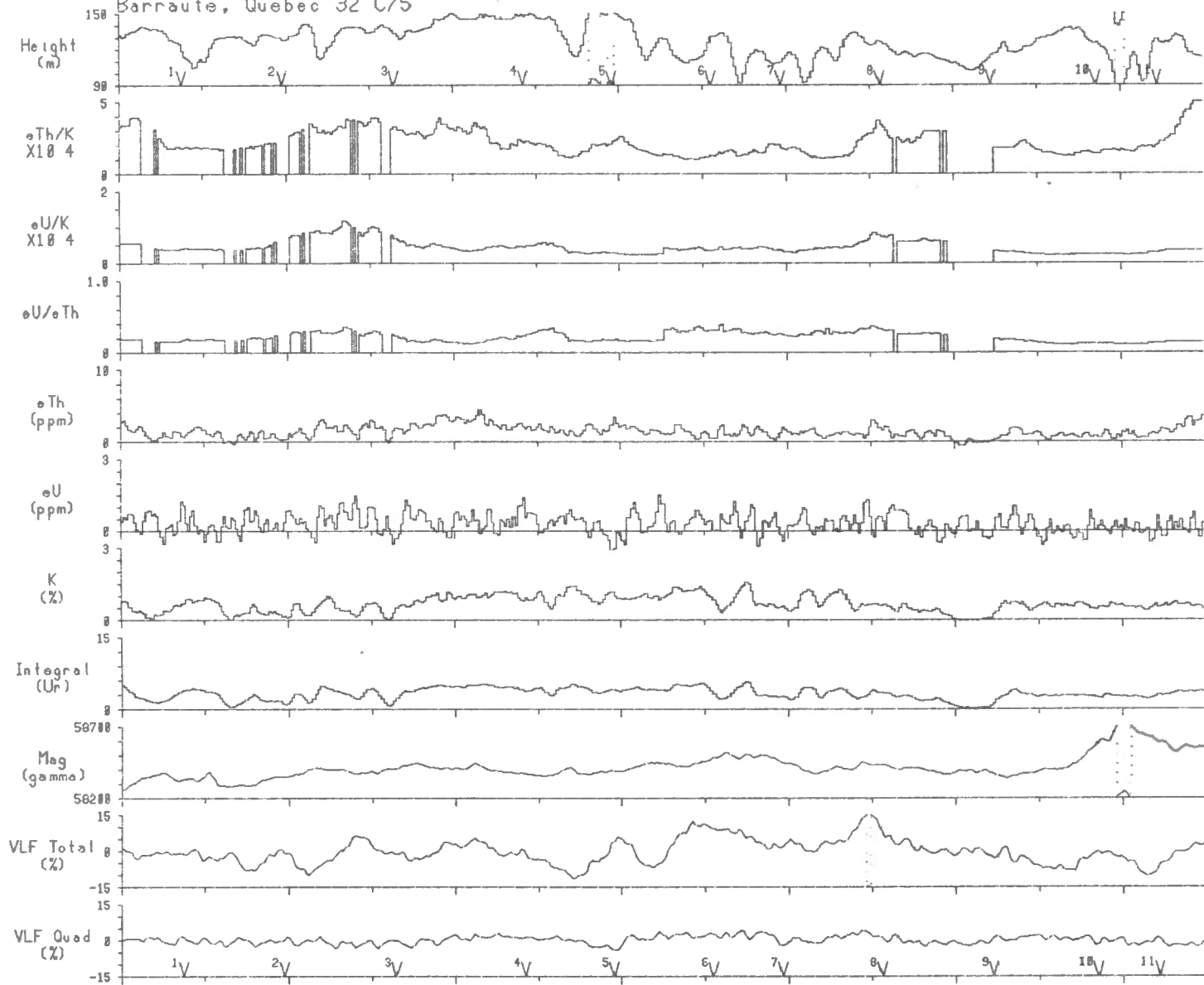
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2 km

Scale 1:150000

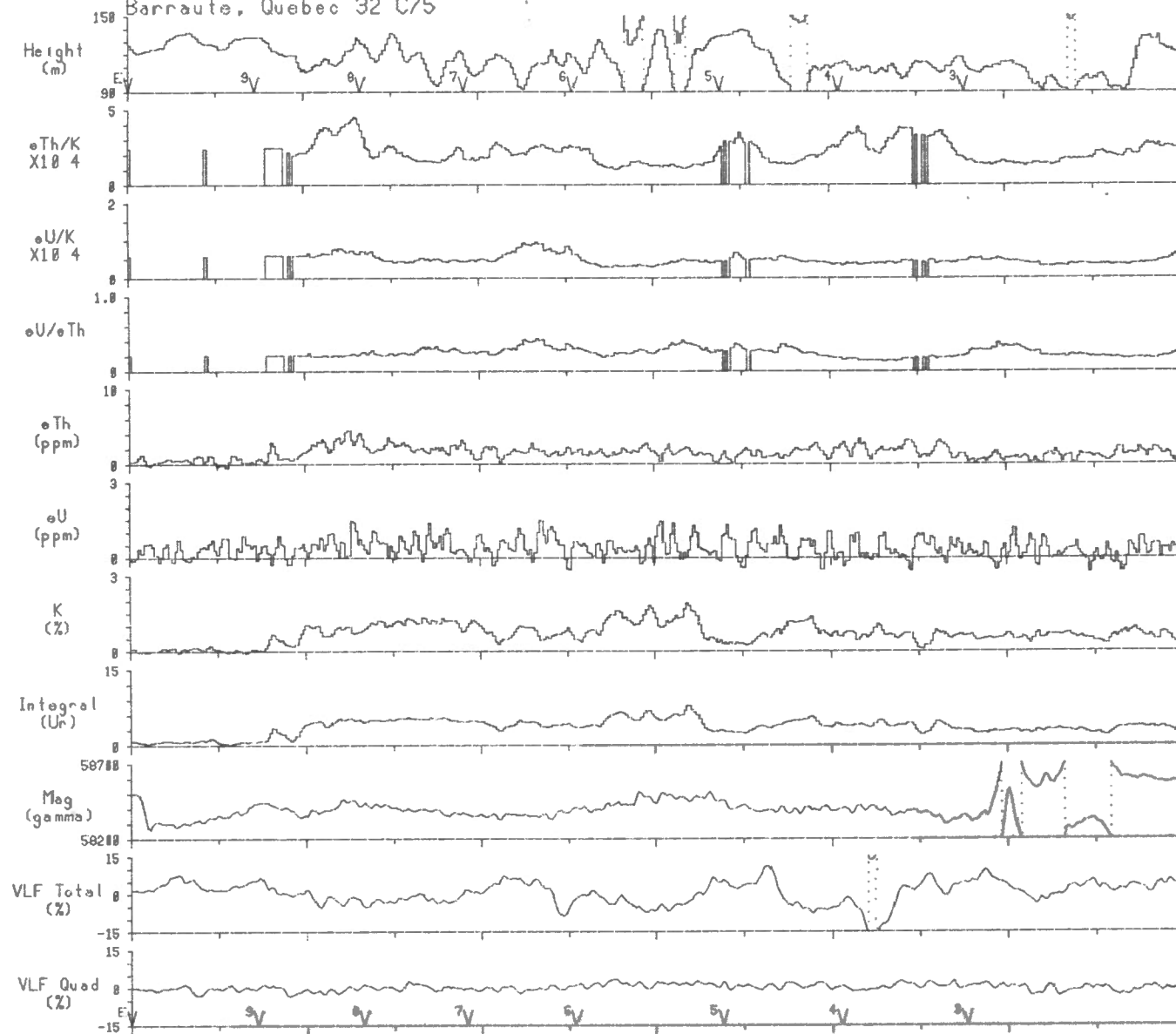
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Barraute, Quebec 32 C/5



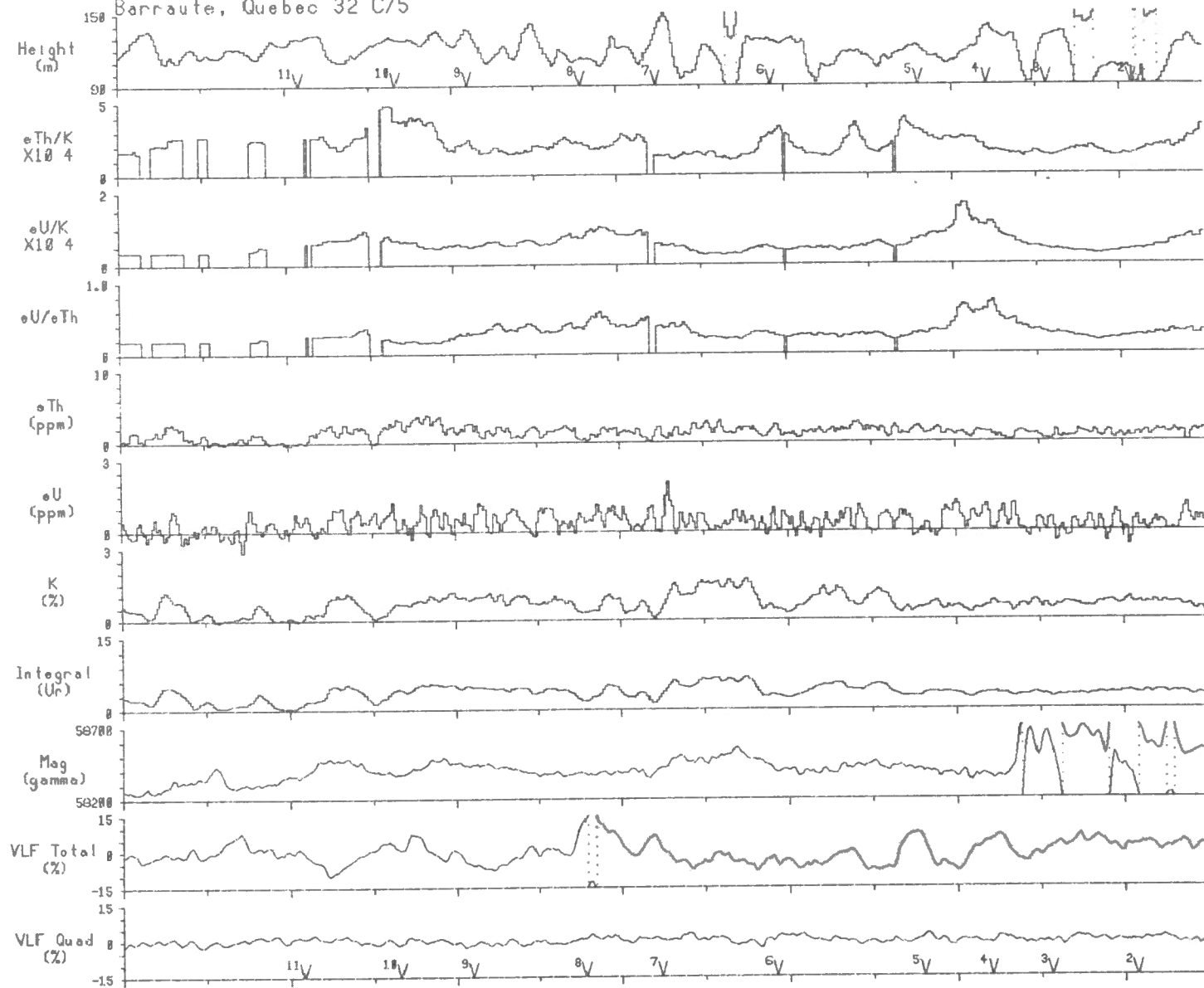
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 Barraute, Quebec 32 C/5



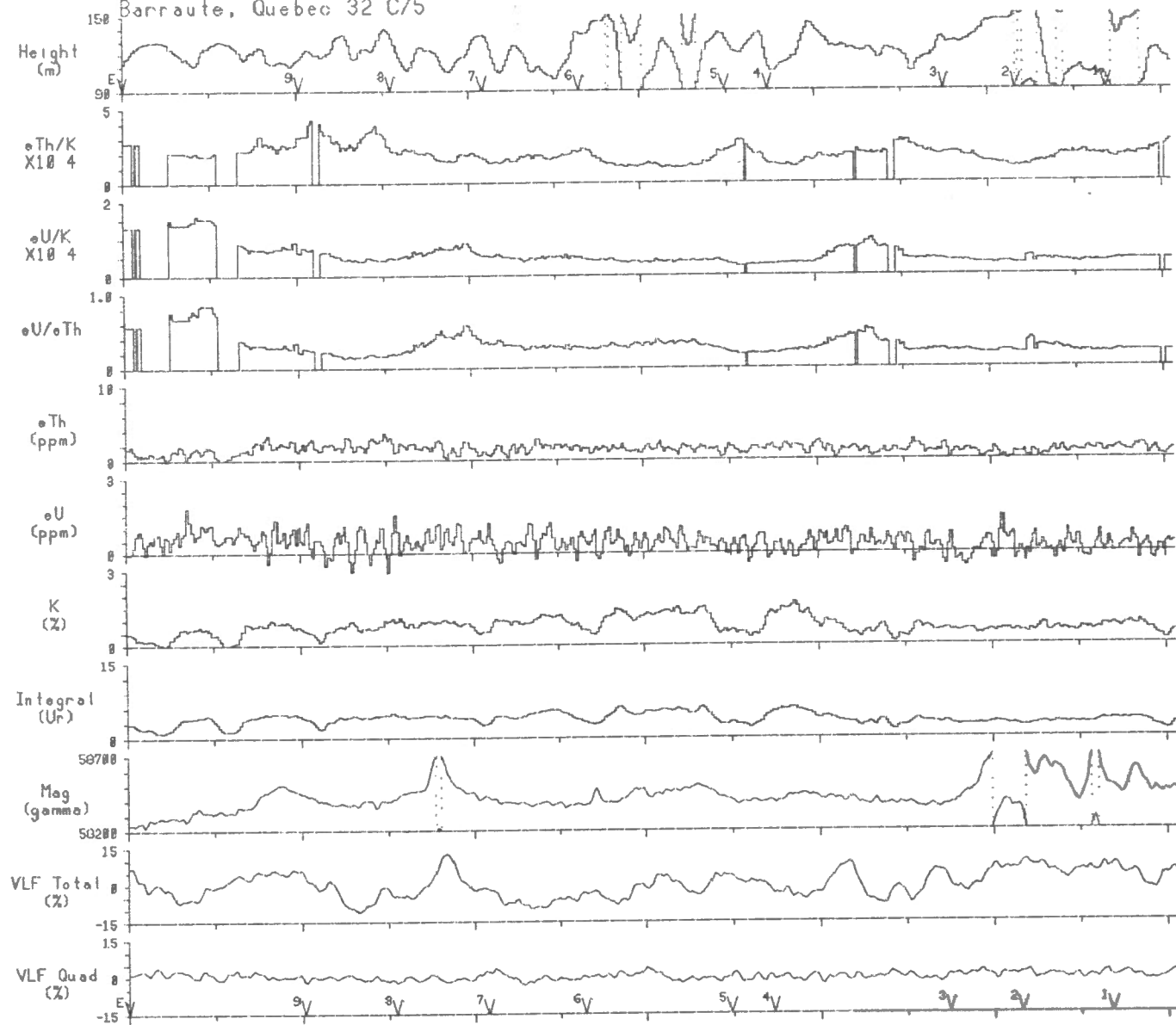
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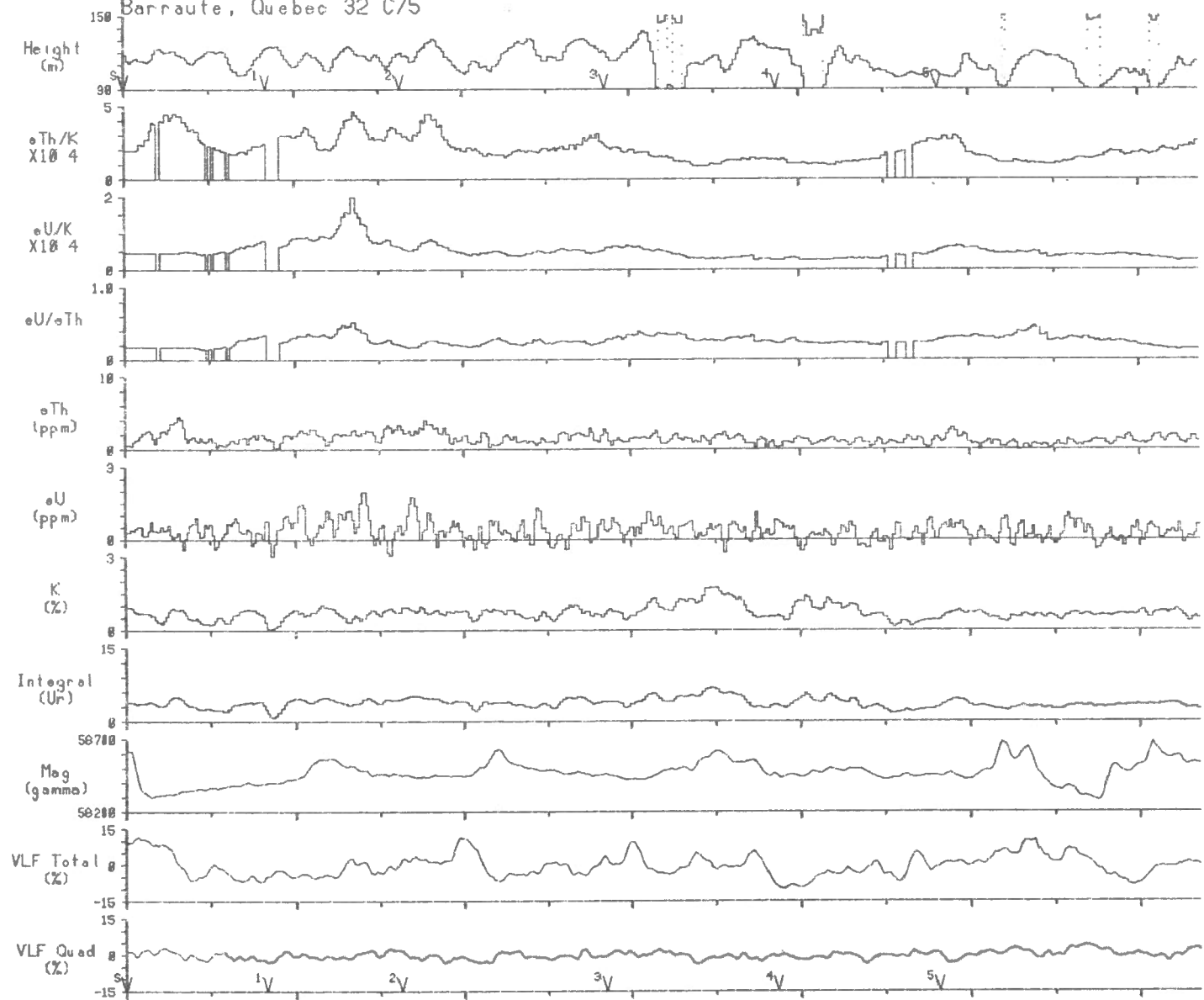
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 Barraute, Quebec 32 C/5



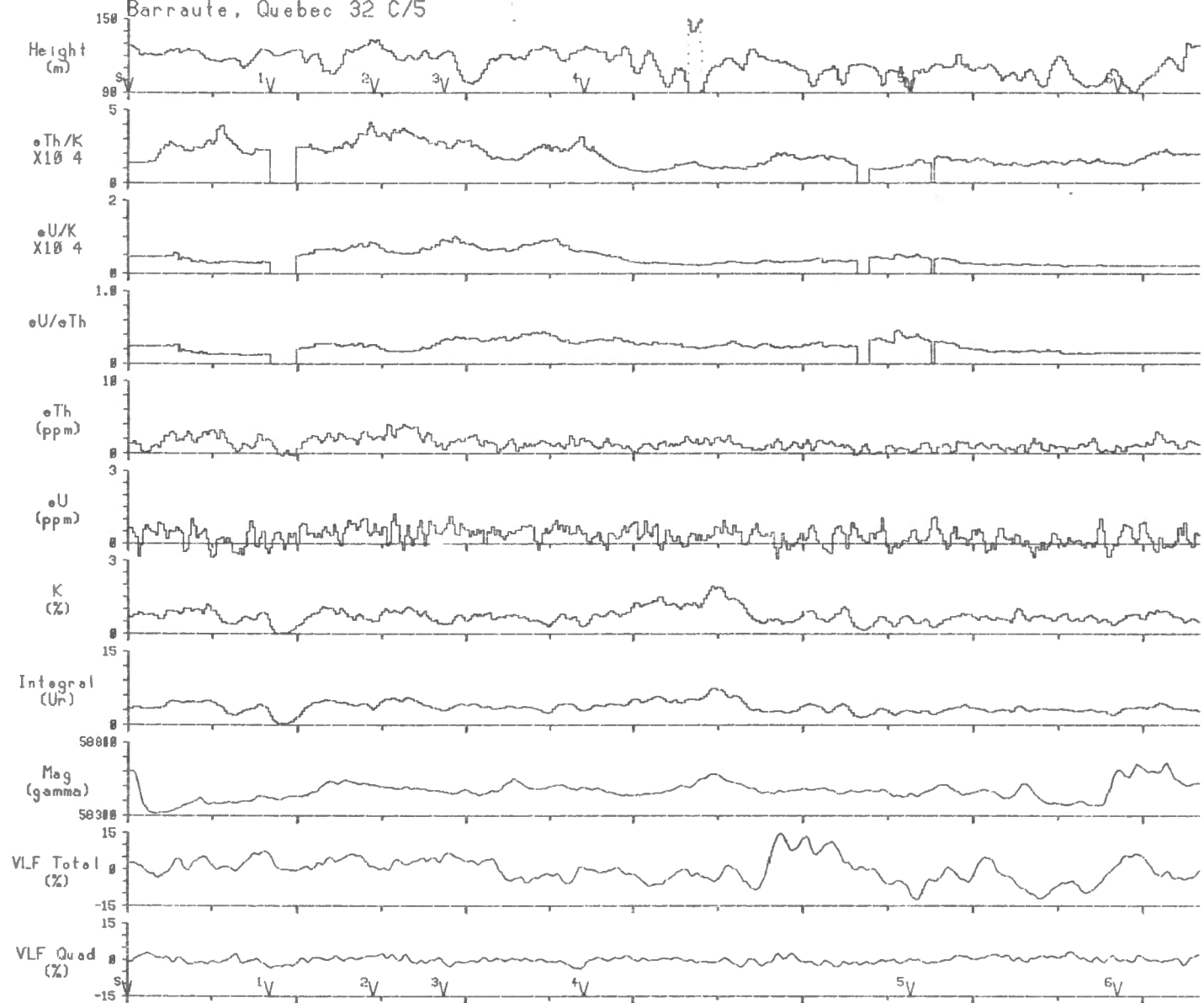
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 Barraute, Quebec 32 C/5



Line 17  Scale 1:150000

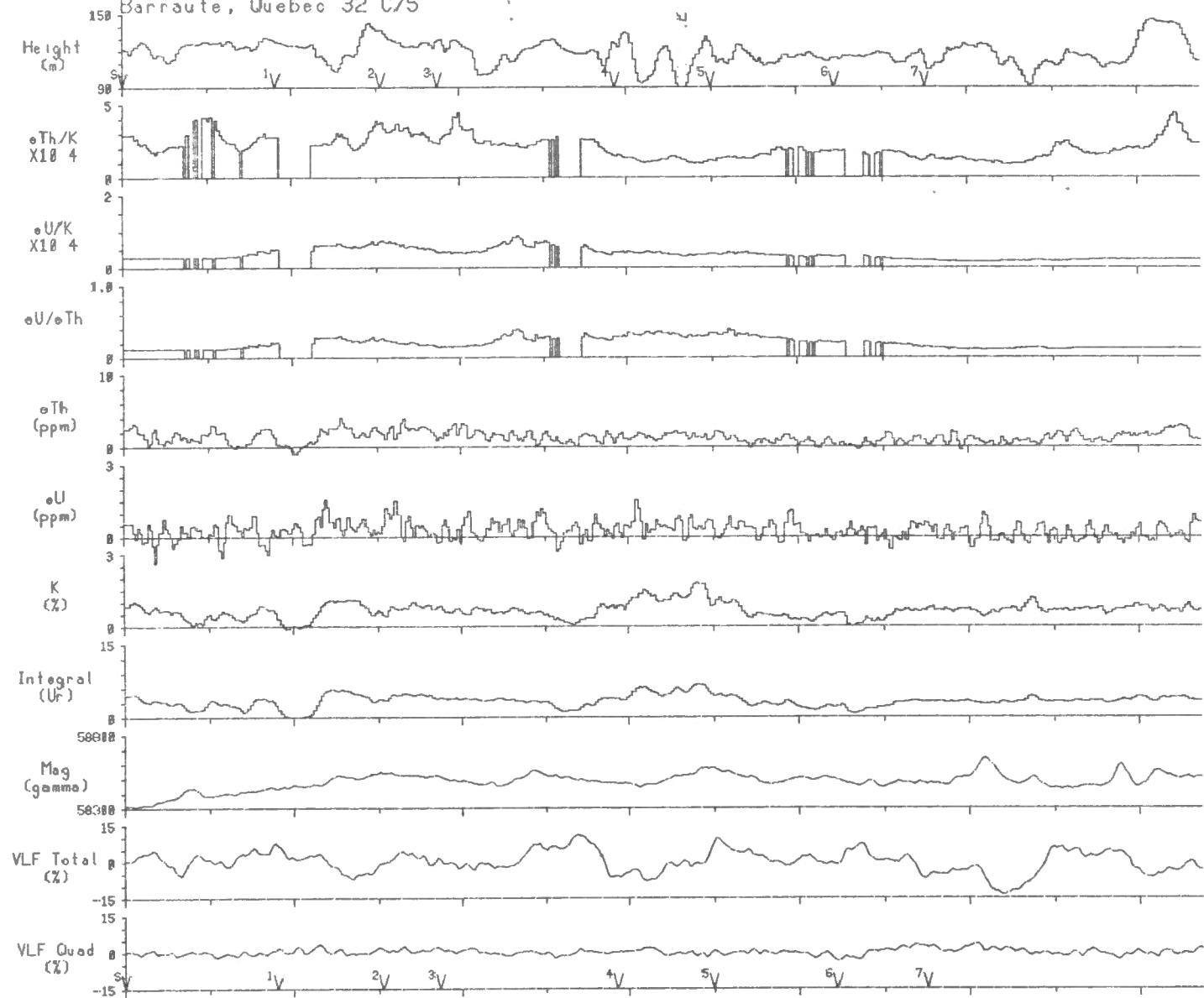
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 Barraute, Quebec 32 C/5



Line 18  2 km

Scale 1:150000

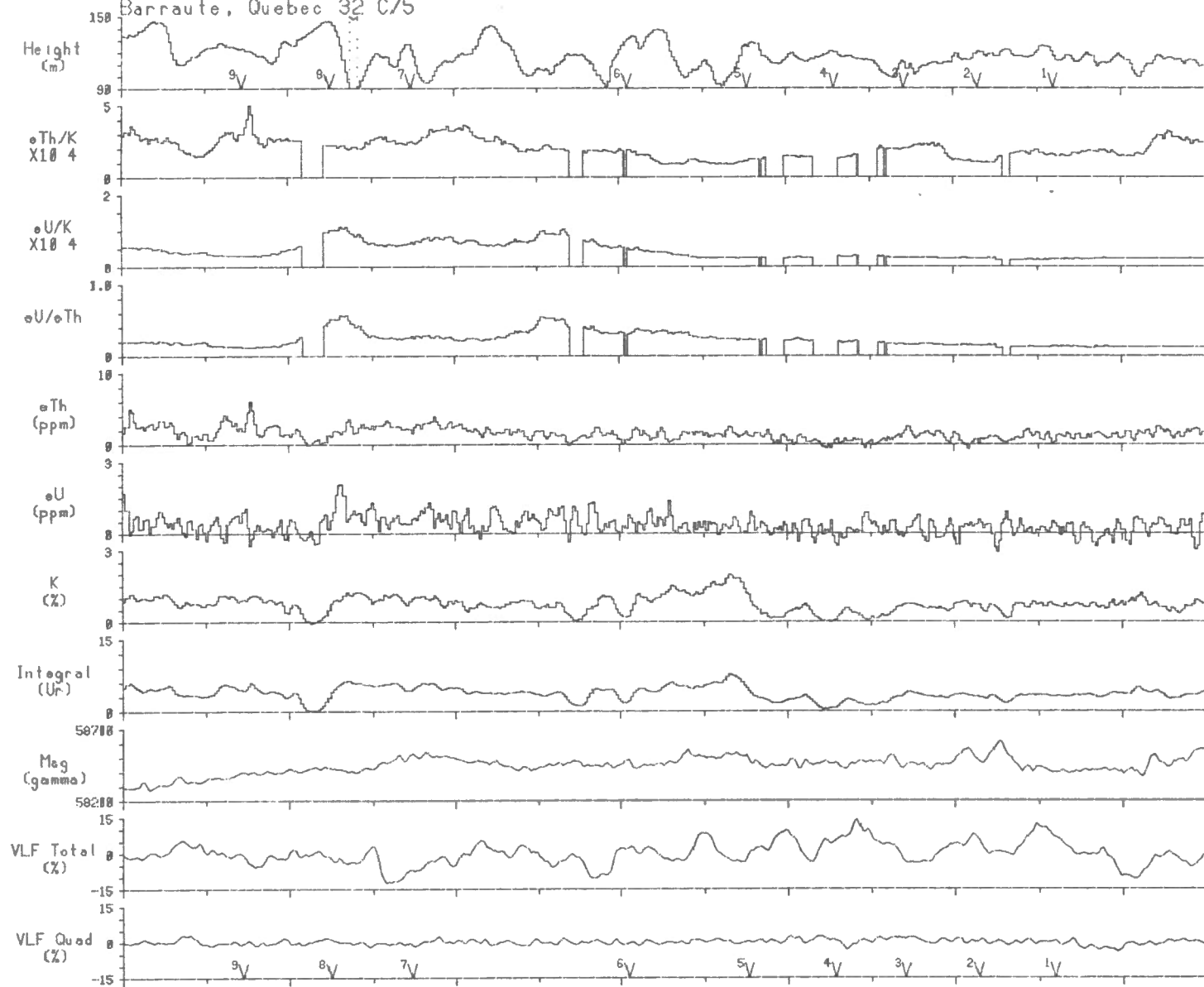
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 Barraute, Quebec 32 C/5



Line 19  Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986

Barraute, Quebec 32 C/5



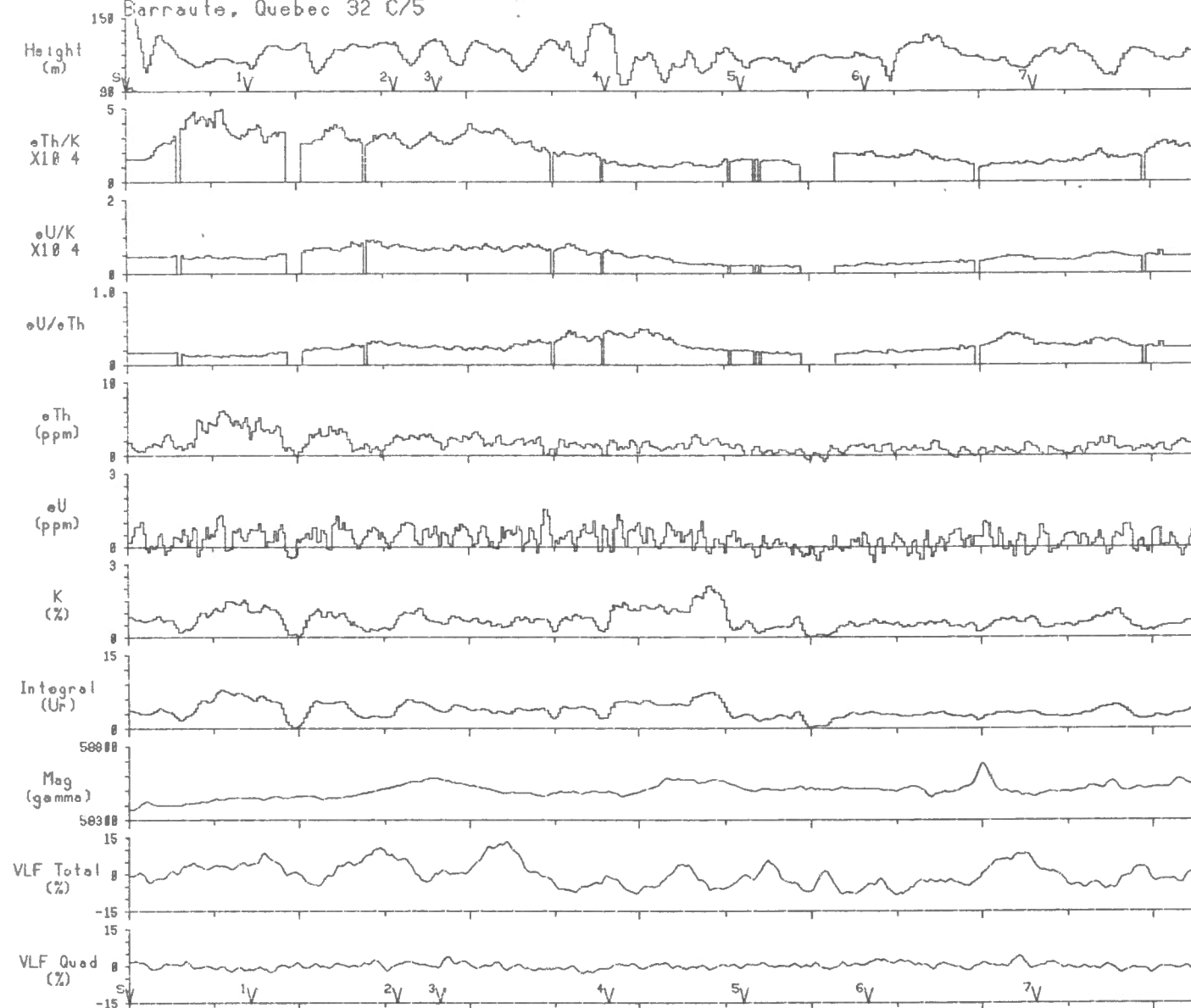
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Scale 1:150000

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Barraute, Quebec 32 C/5

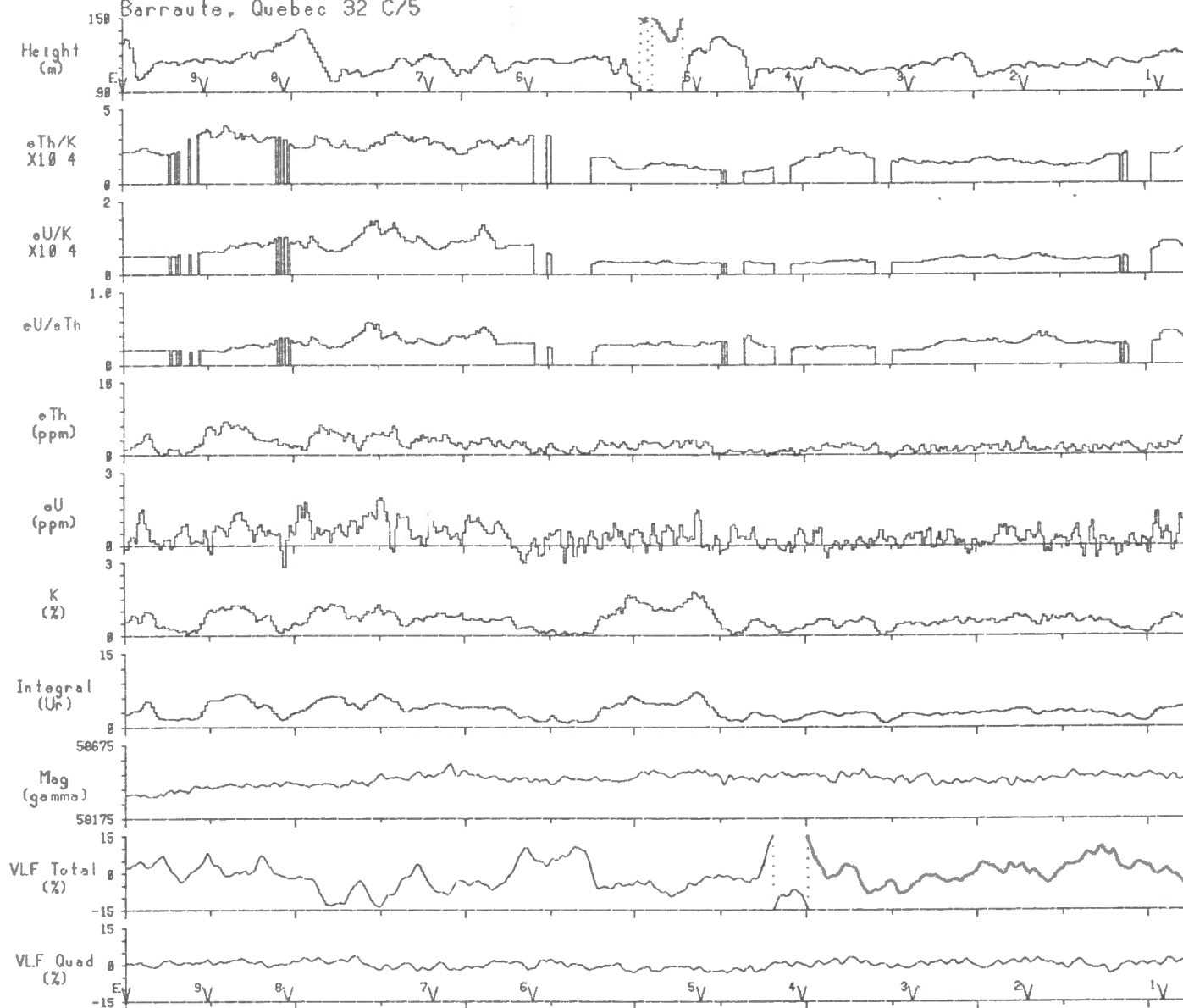


Line 21

2 km

Scale 1:150000

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 Barraute, Quebec 32 C/5

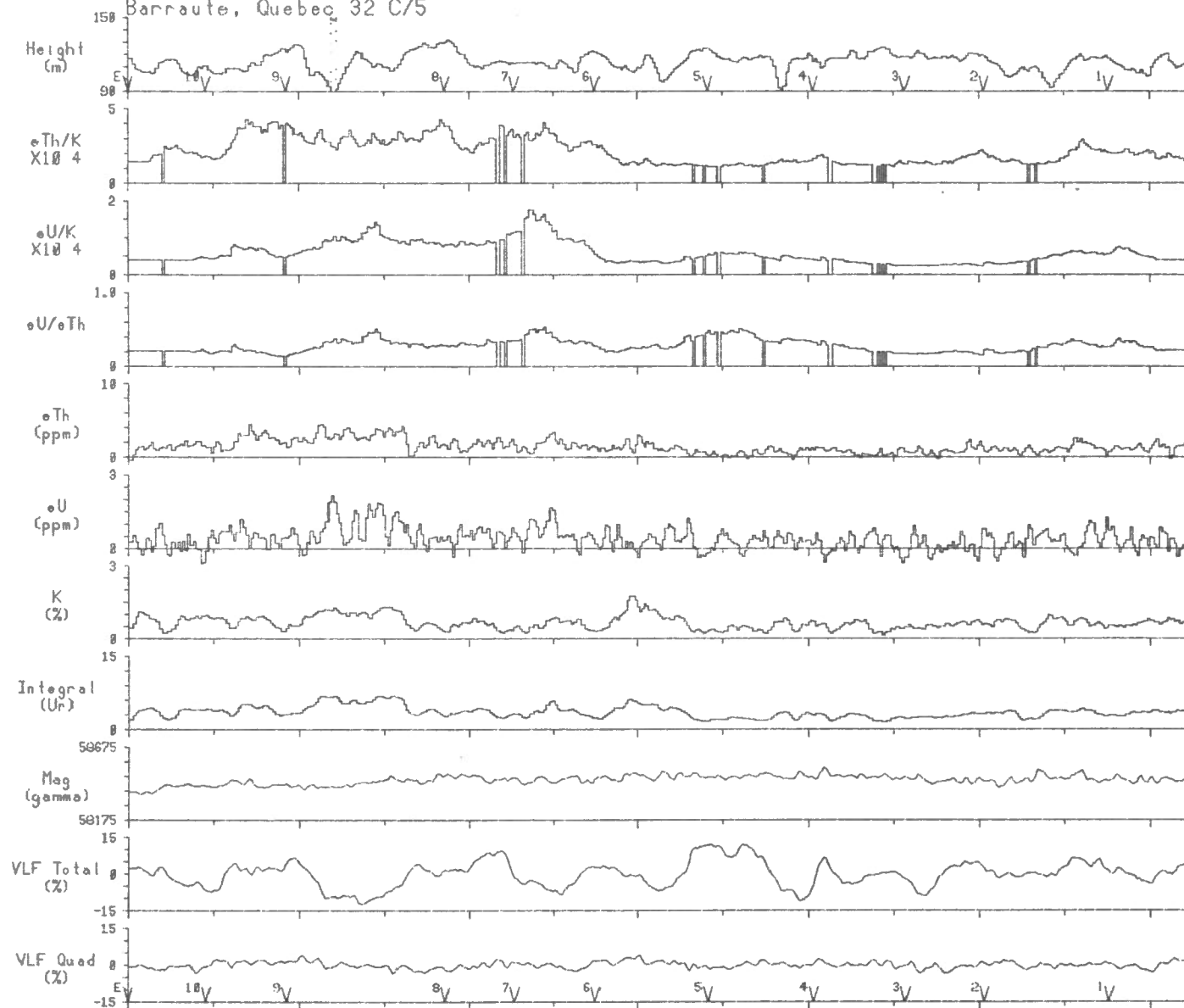



Line 22

2 km

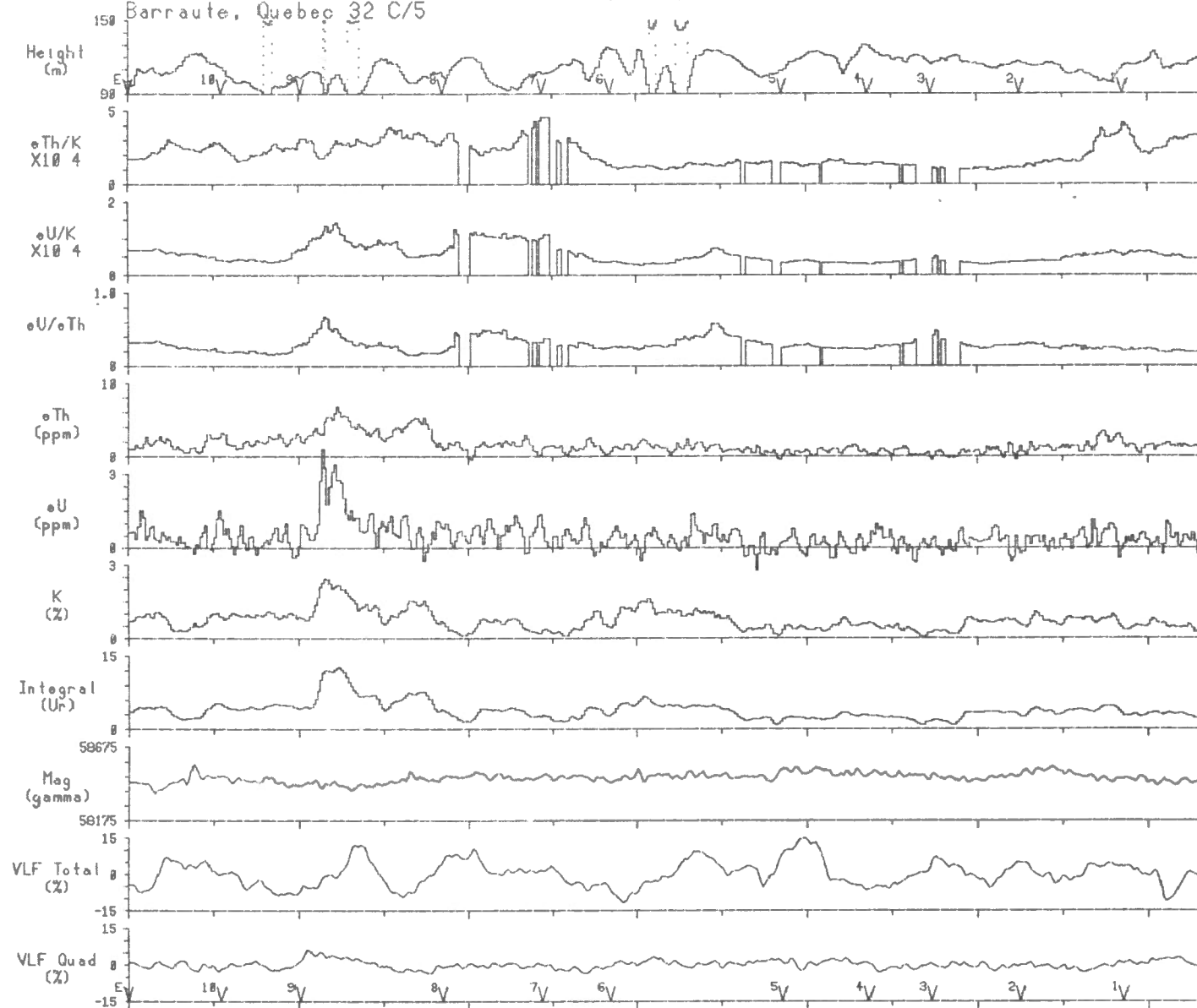
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 Barraute, Quebec 32 C/5



Line 23  Scale 1:150000

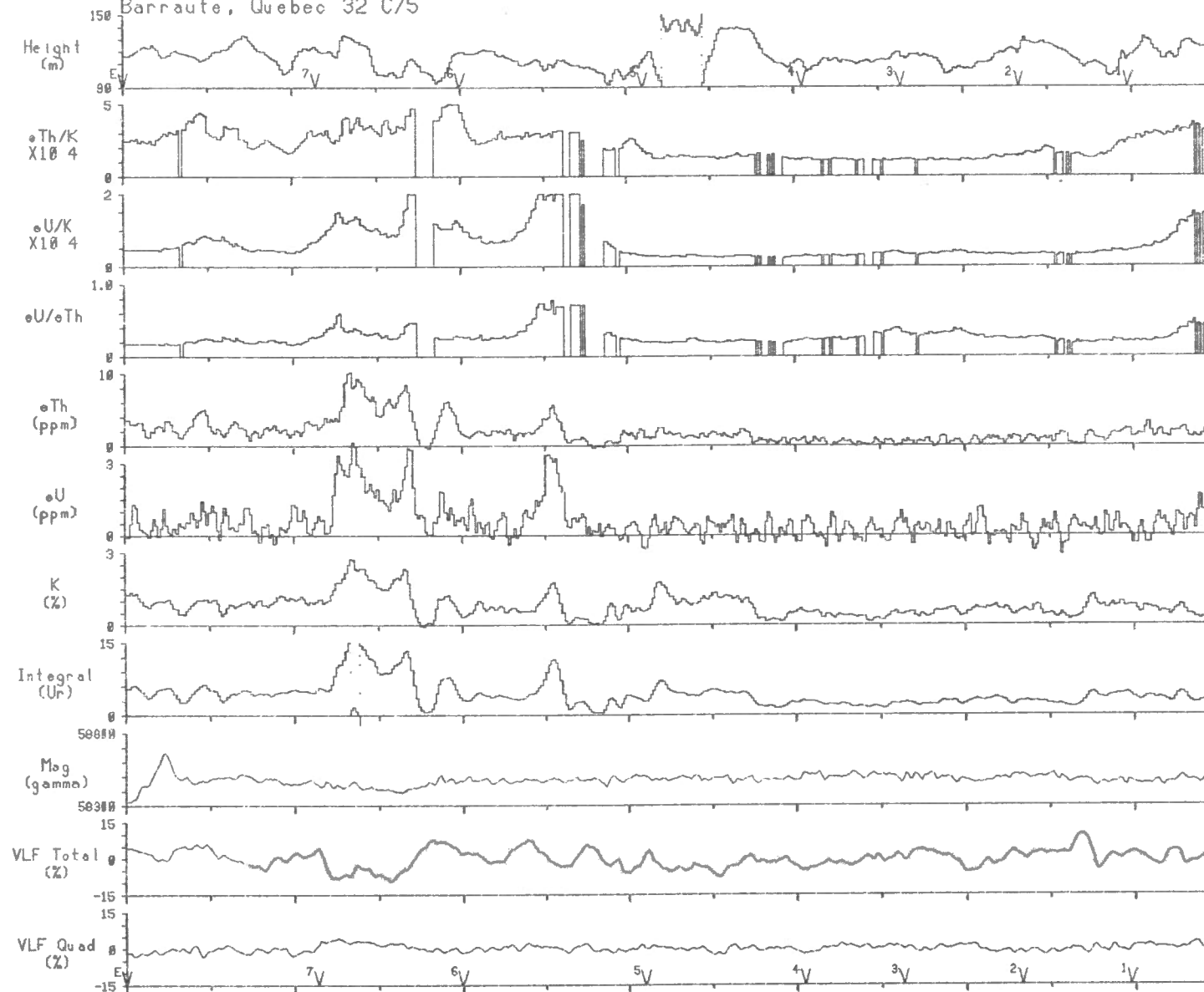
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 Barraute, Quebec 32 C/5



Line 24 2 km Scale 1:150000

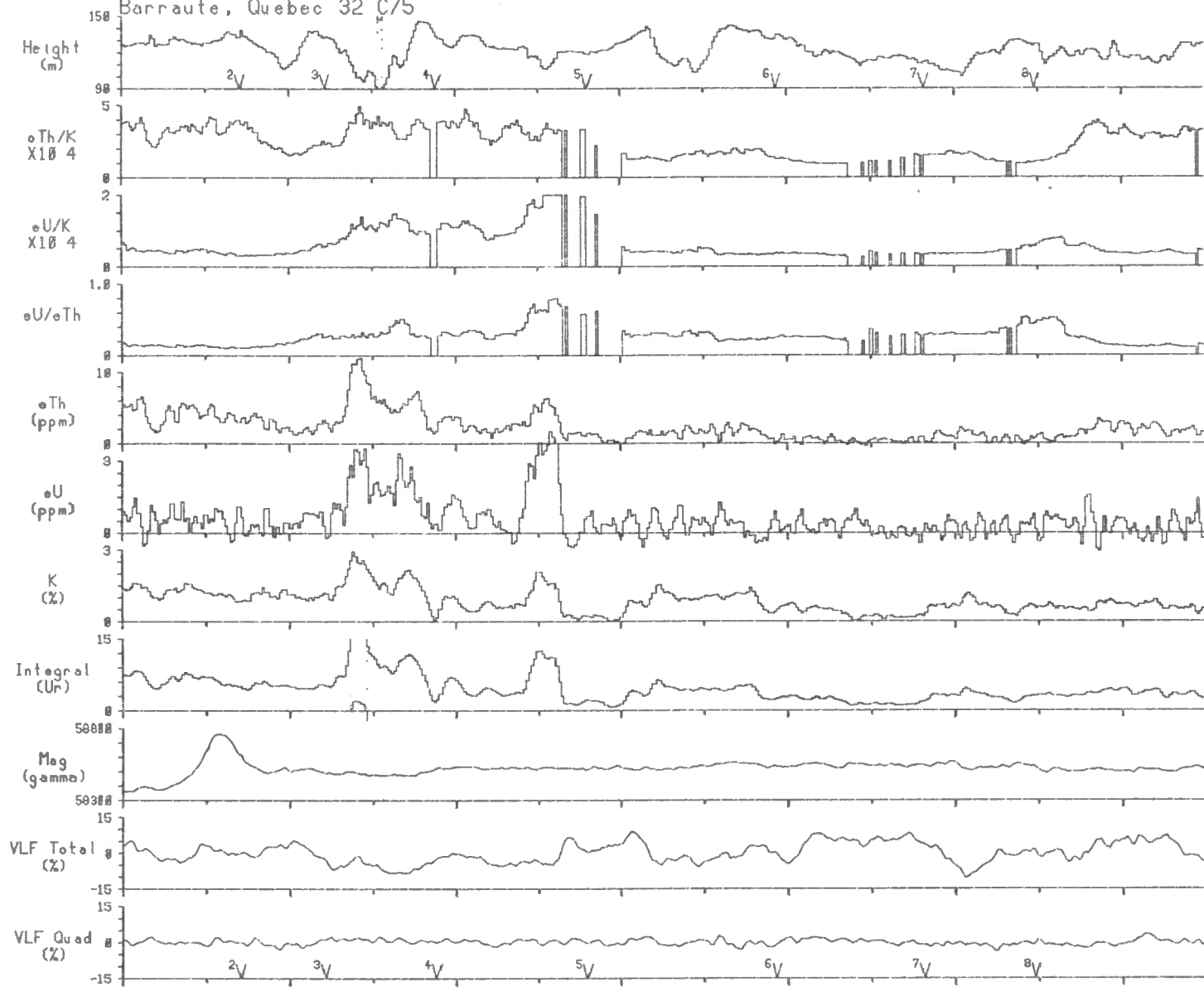
Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986

Barrabute, Quebec 32 C/5



Line 25 2 km Scale 1:150000

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 Barraute, Quebec 32 C/5

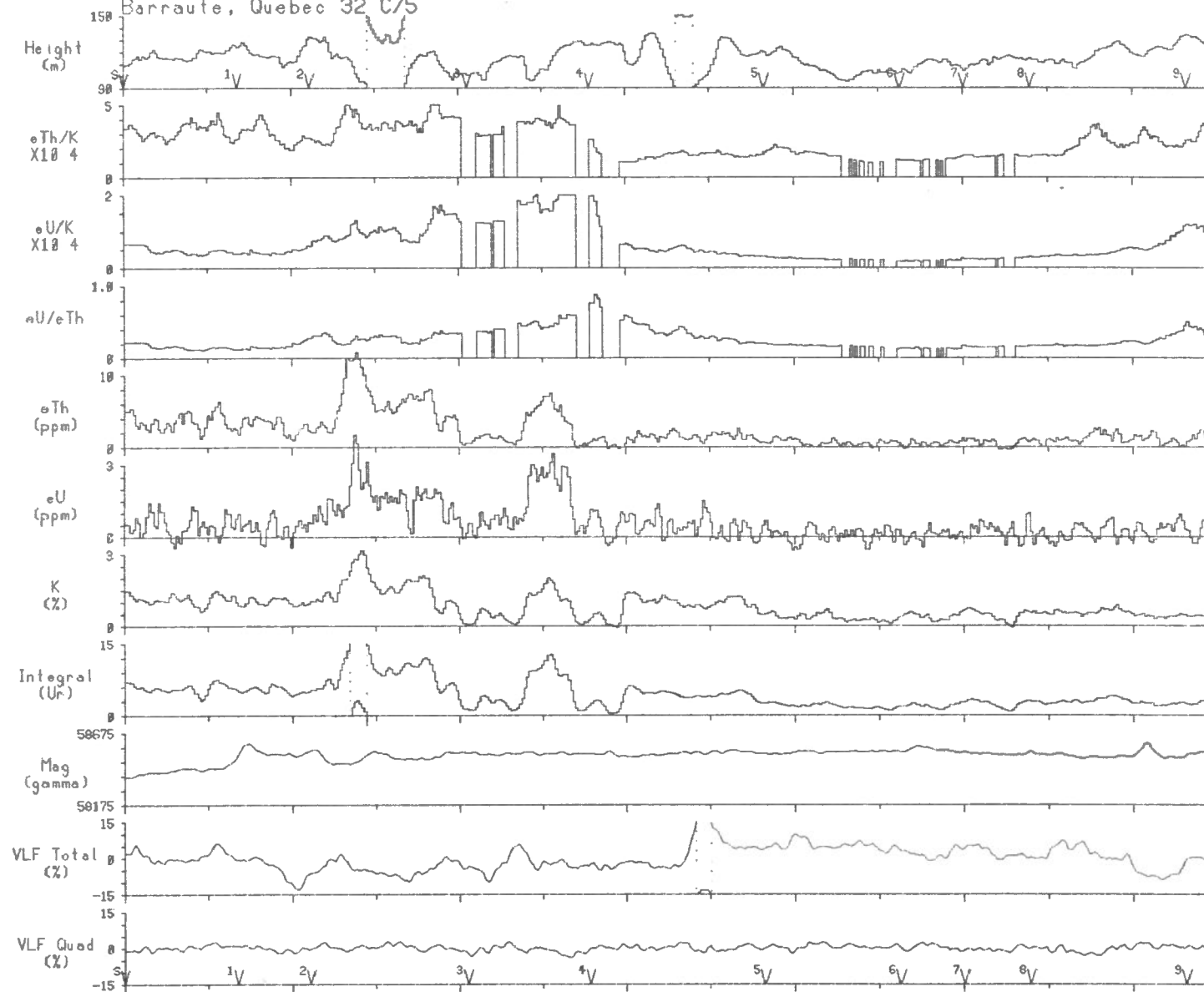


Line 26

2 km

Scale 1:150000

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 Barraute, Quebec 32 C/5



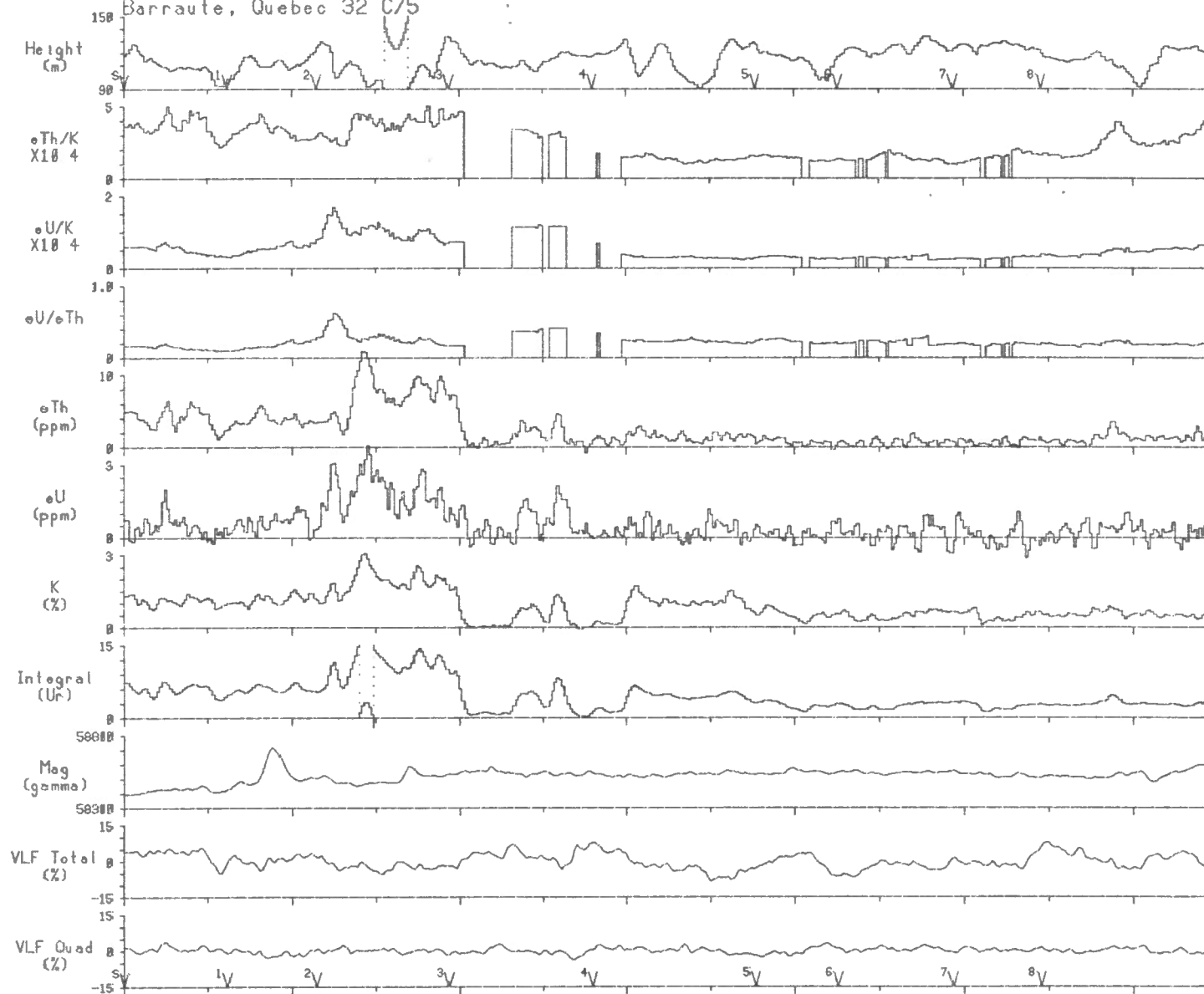
Line 27

2 km

Scale 1:150000

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Barrabute, Quebec 32 C/5

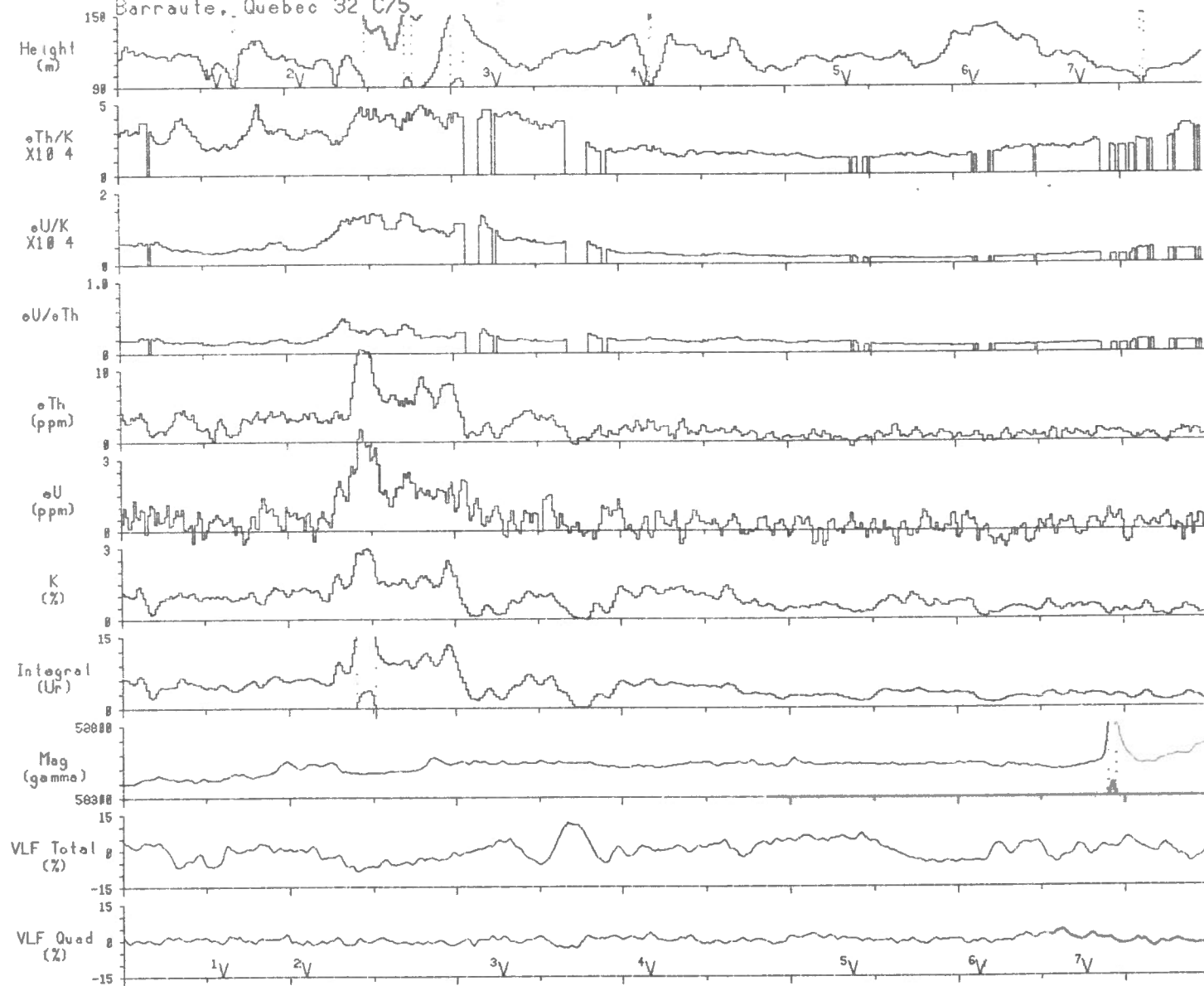


Line 28

2 km

Scale 1:150000

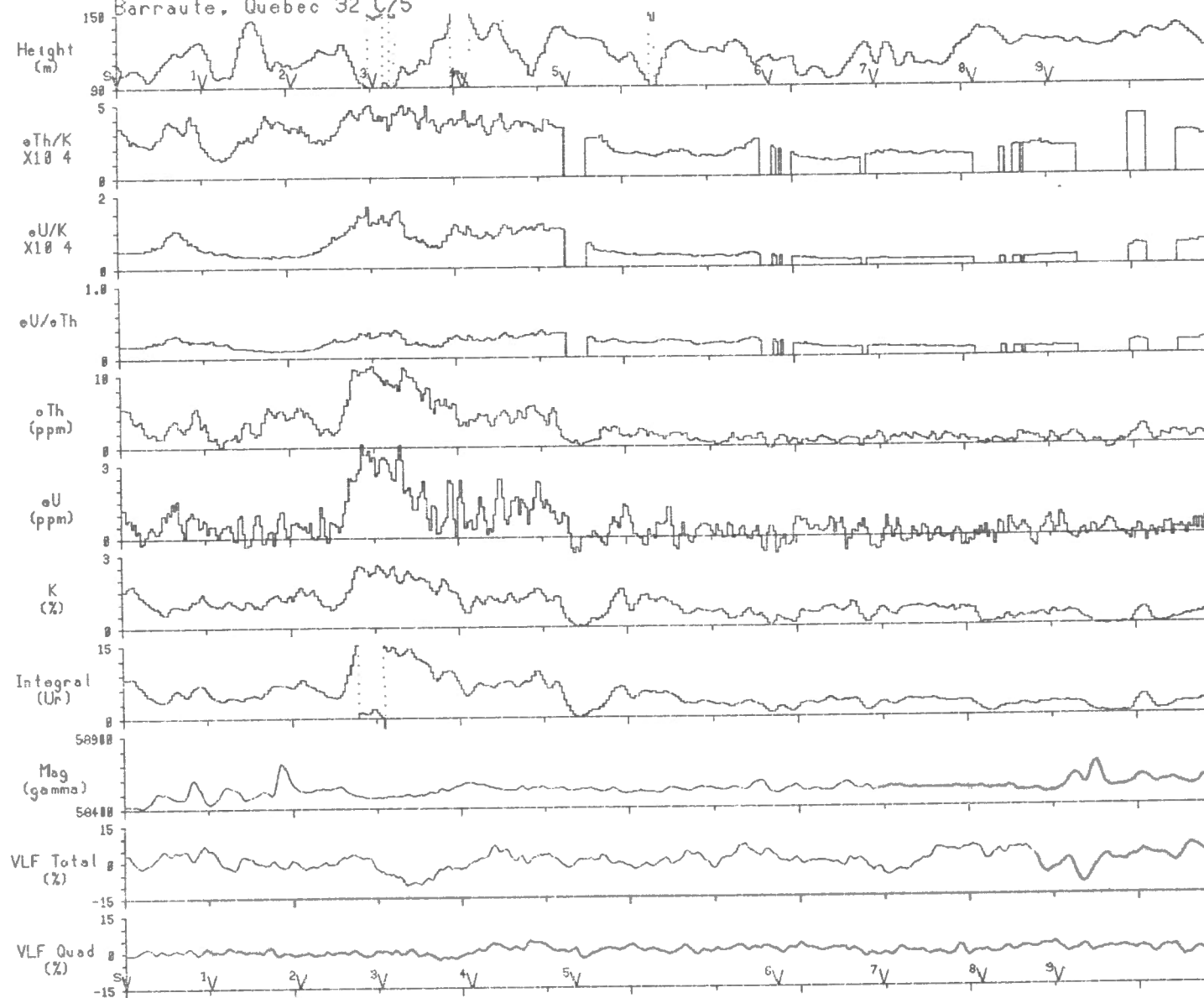
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 Barraute, Quebec 32 C/5



Line 29  Scale 1:150000

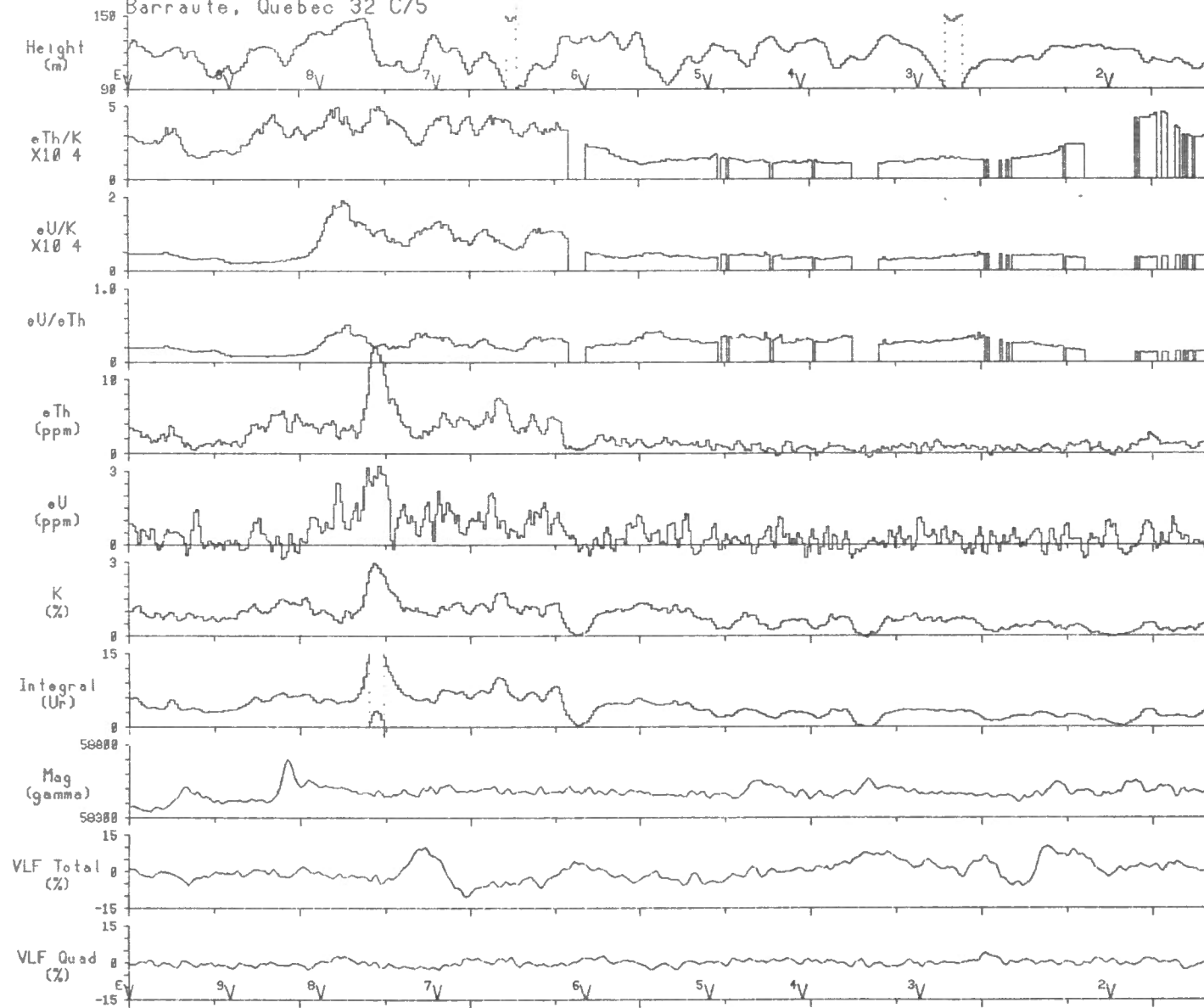
Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986

Barrabute, Quebec 32 C/5



Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986

Barraute, Quebec 32 C/5



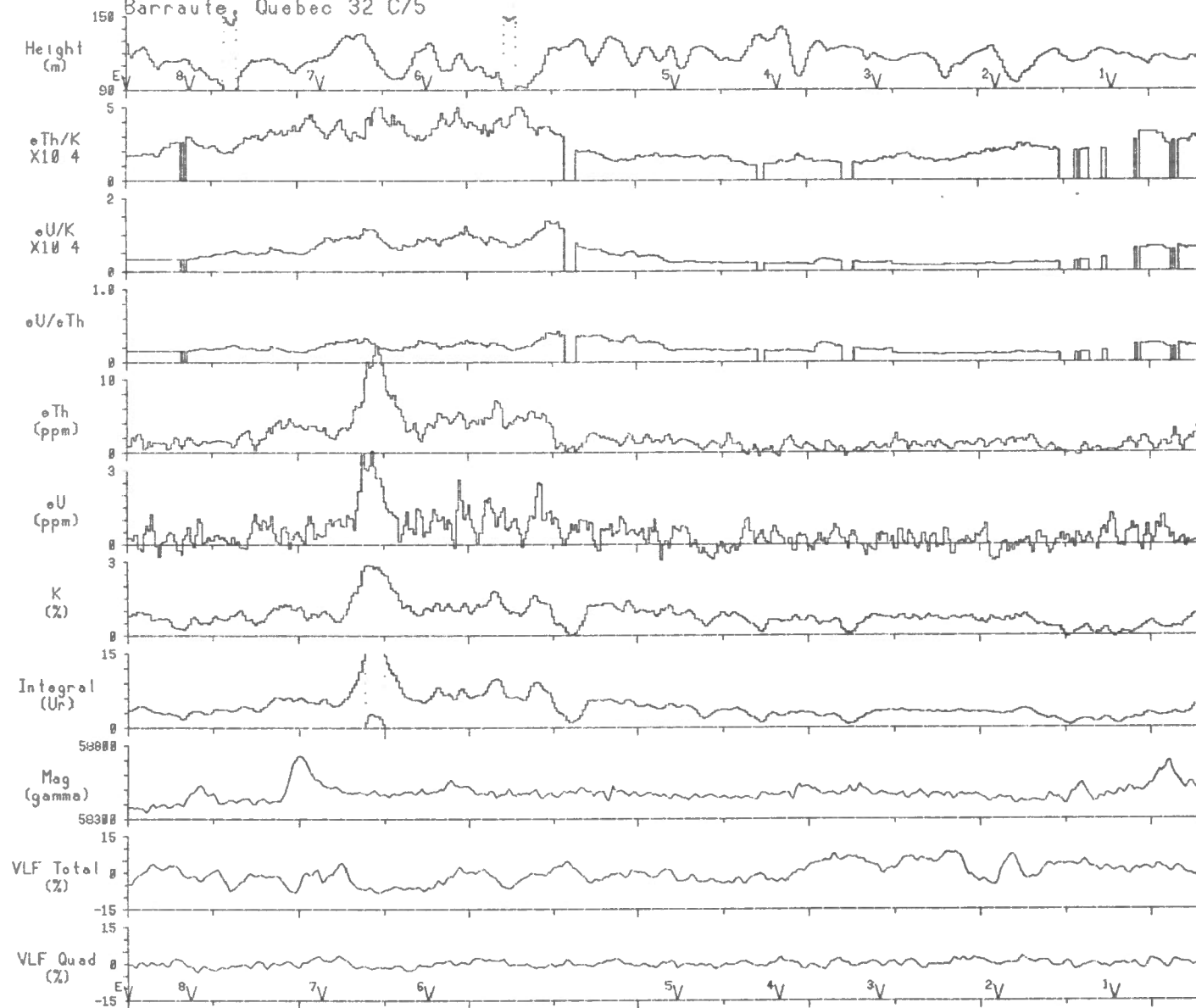
Line 31

2 km

Scale 1:150000

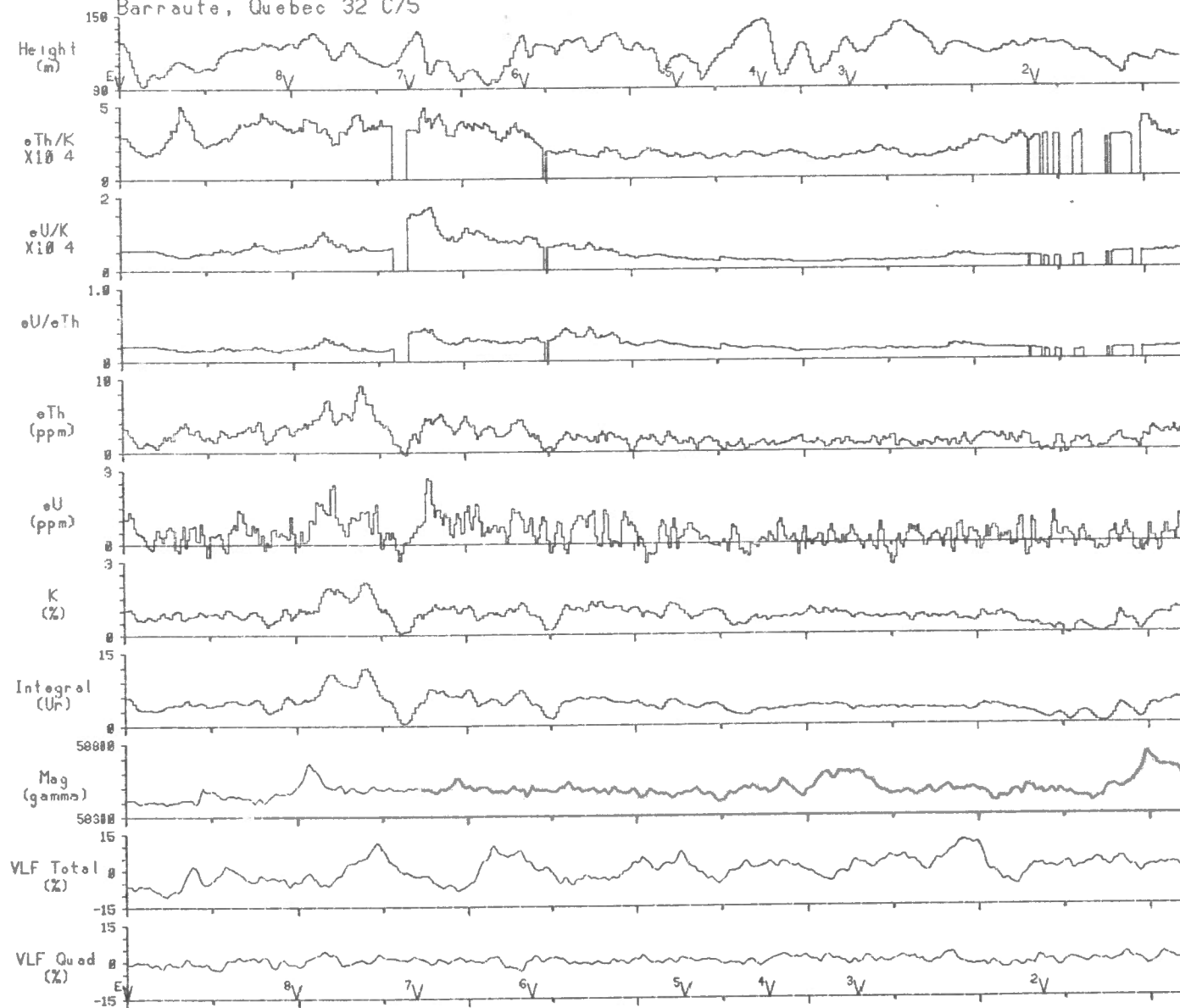
Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986

Barraute, Quebec 32 C/5



Line 32 2 km Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5



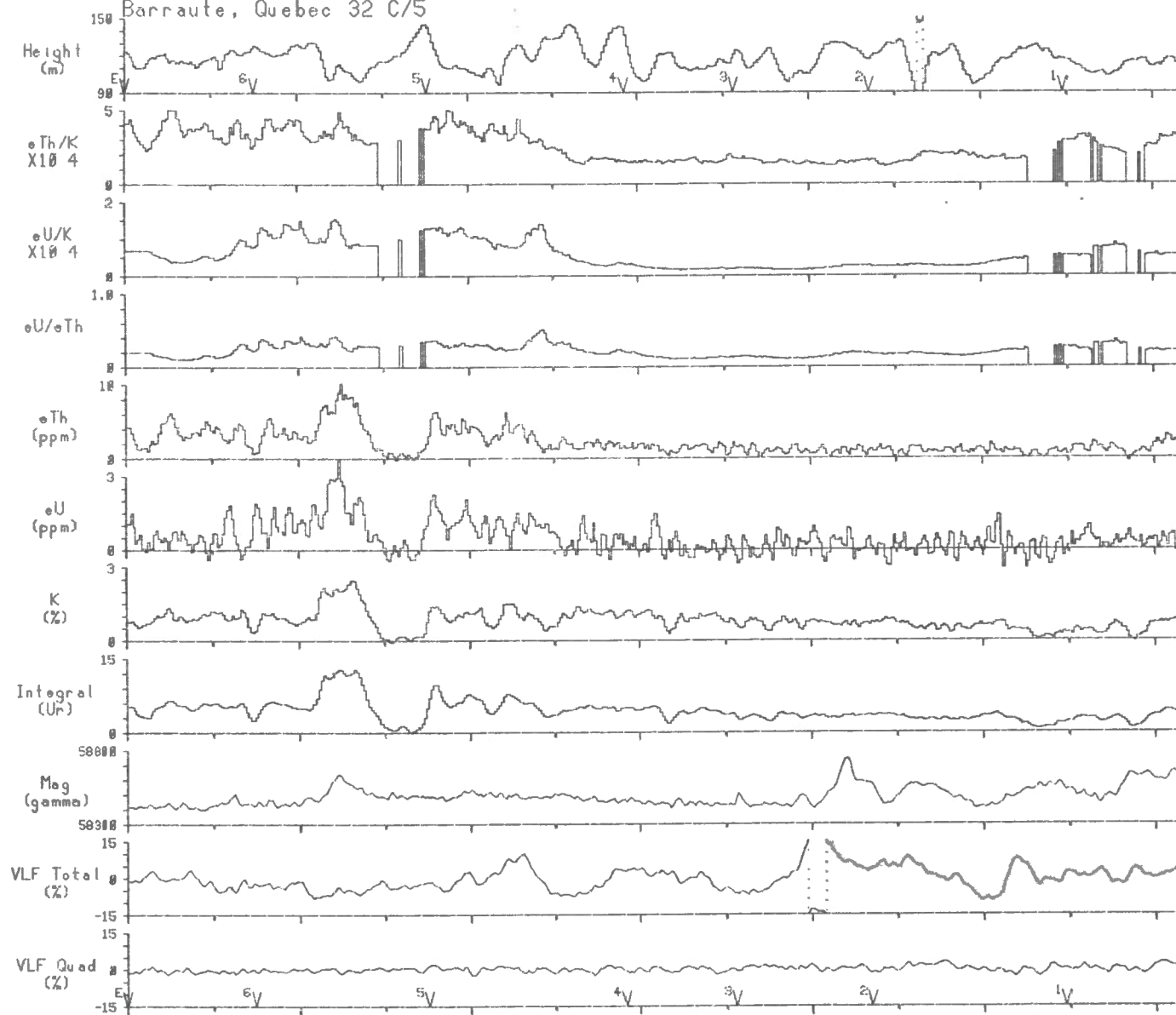
Line 33

2 km

Scale 1:150000

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Barrabute, Quebec 32 C/5



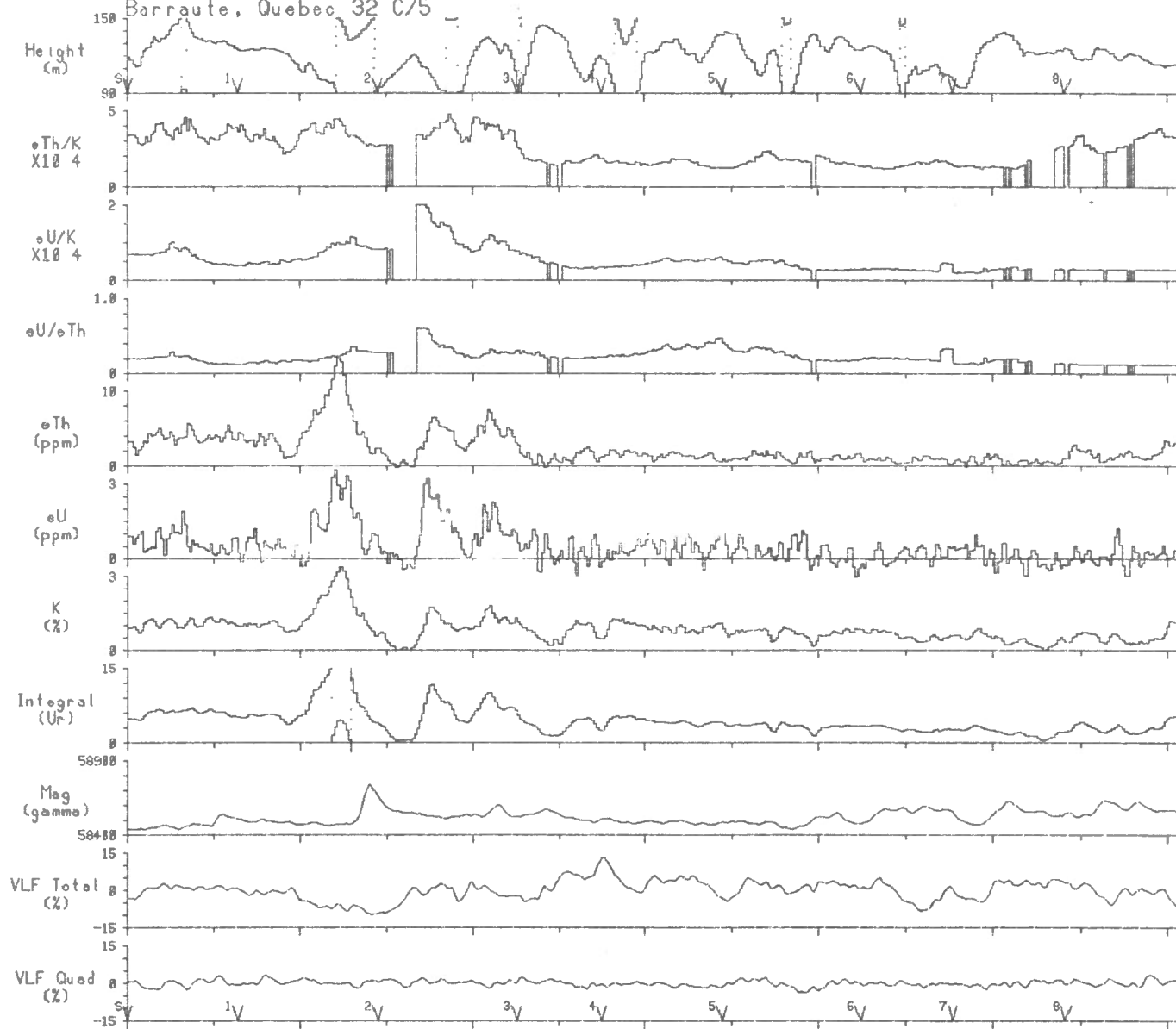
Line 34

2 km

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Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986

Barraute, Quebec 32 C/5



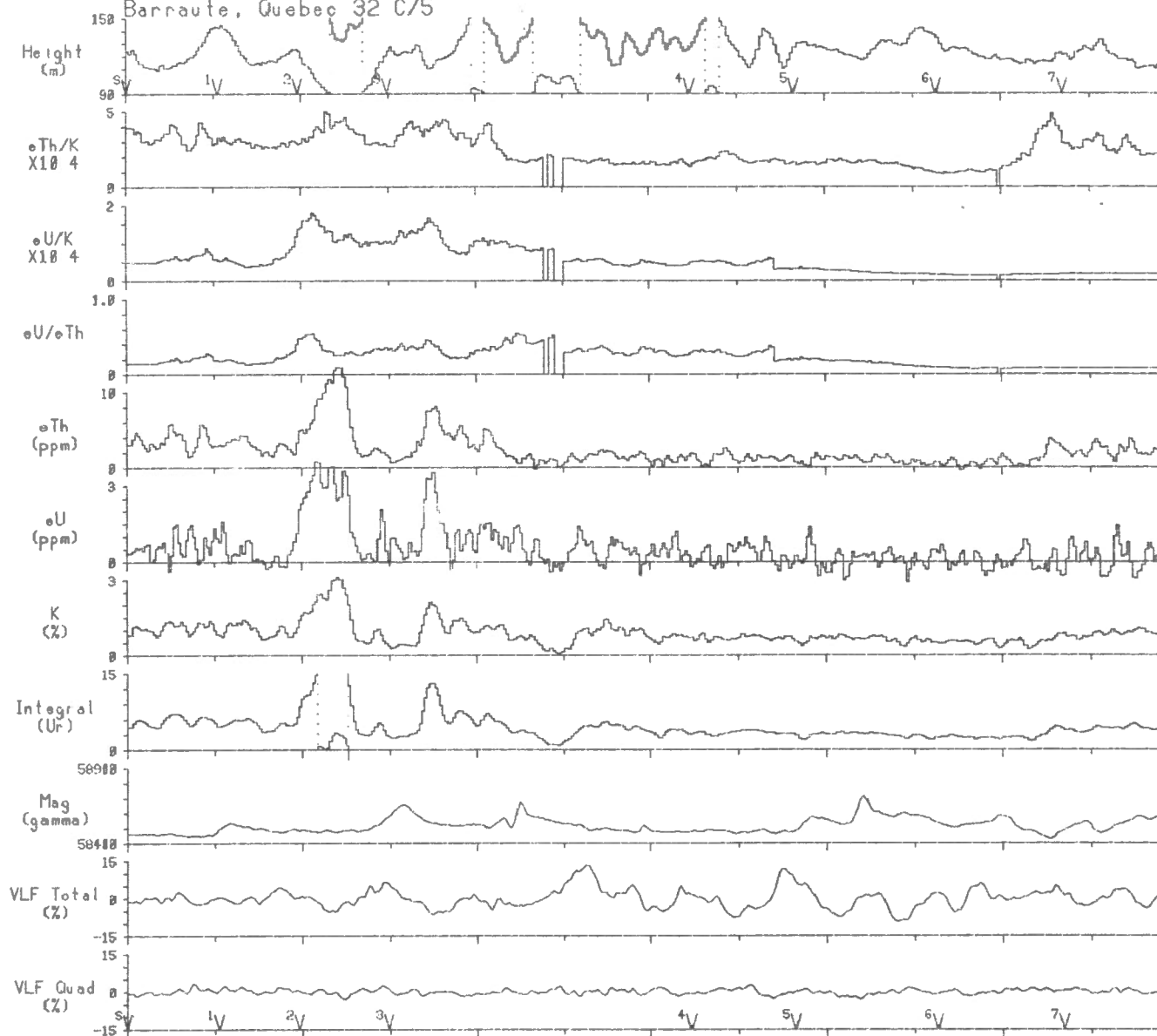
Line 35

2 km

Scale 1:150000

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Barraute, Quebec 32 C/5

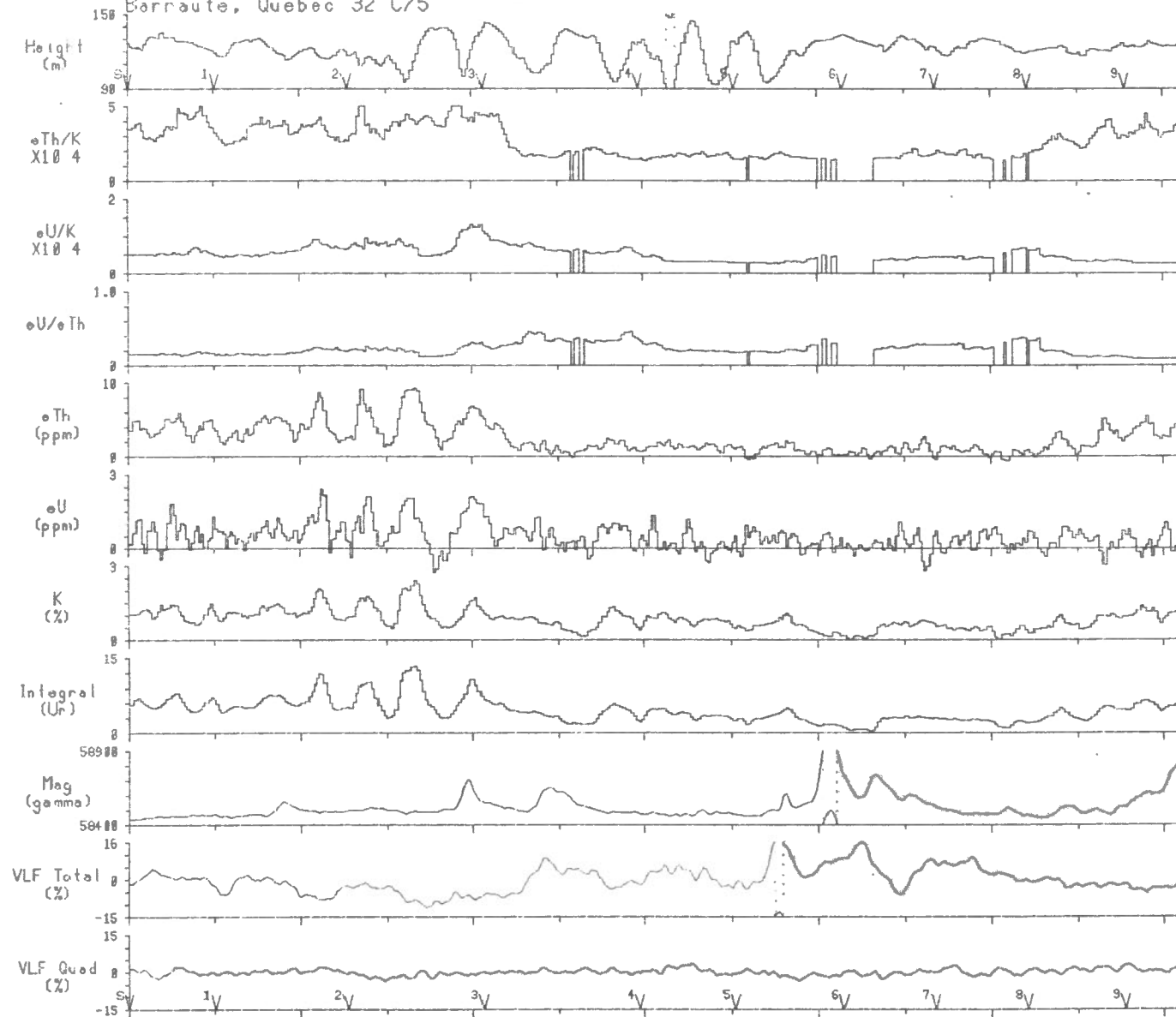


Line 36

2 km

Scale 1:150000

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 Barraute, Quebec 32 C/5

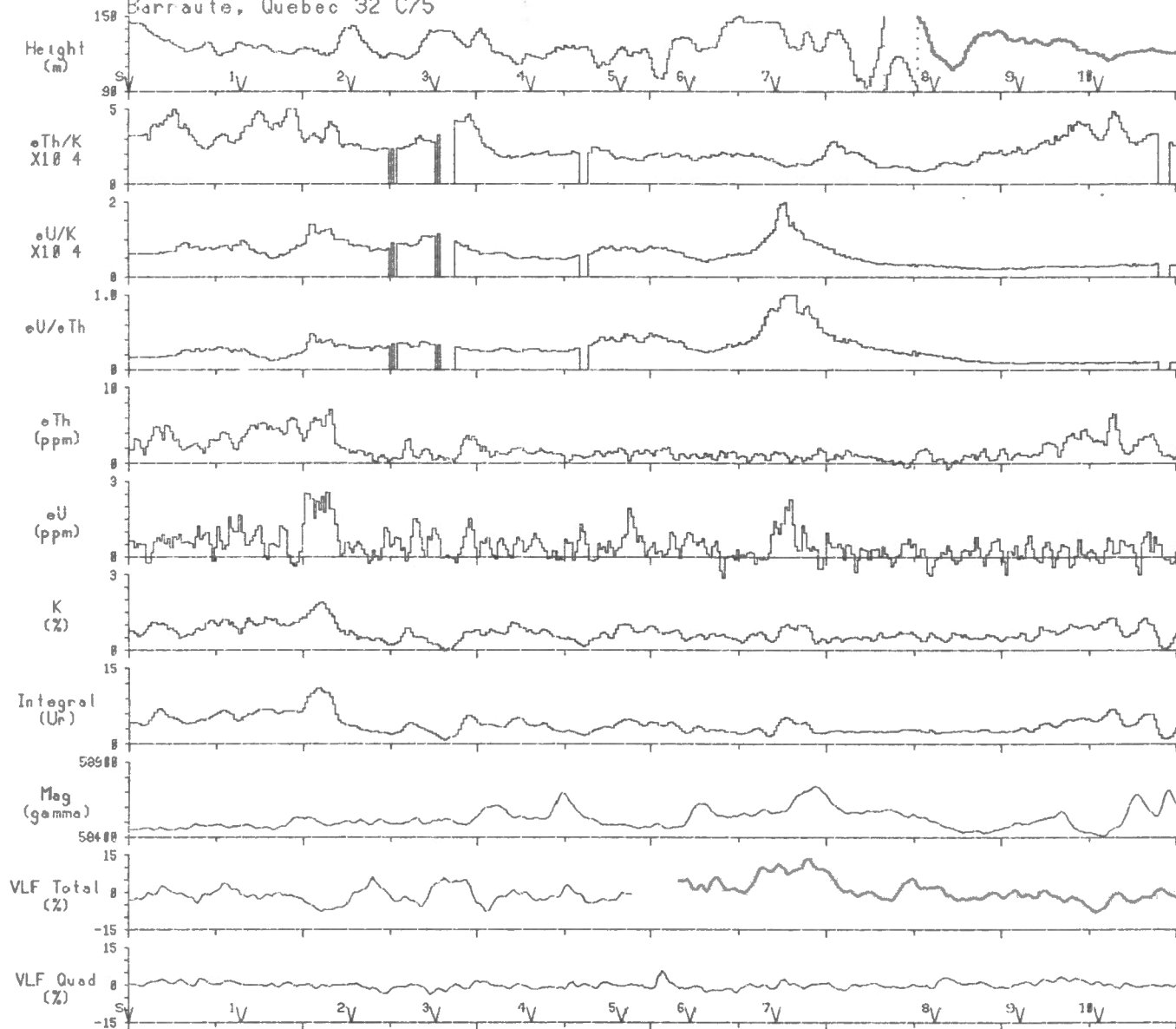


Line 37

2 km

Scale 1:150000

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 Barraute, Quebec 32 C/5



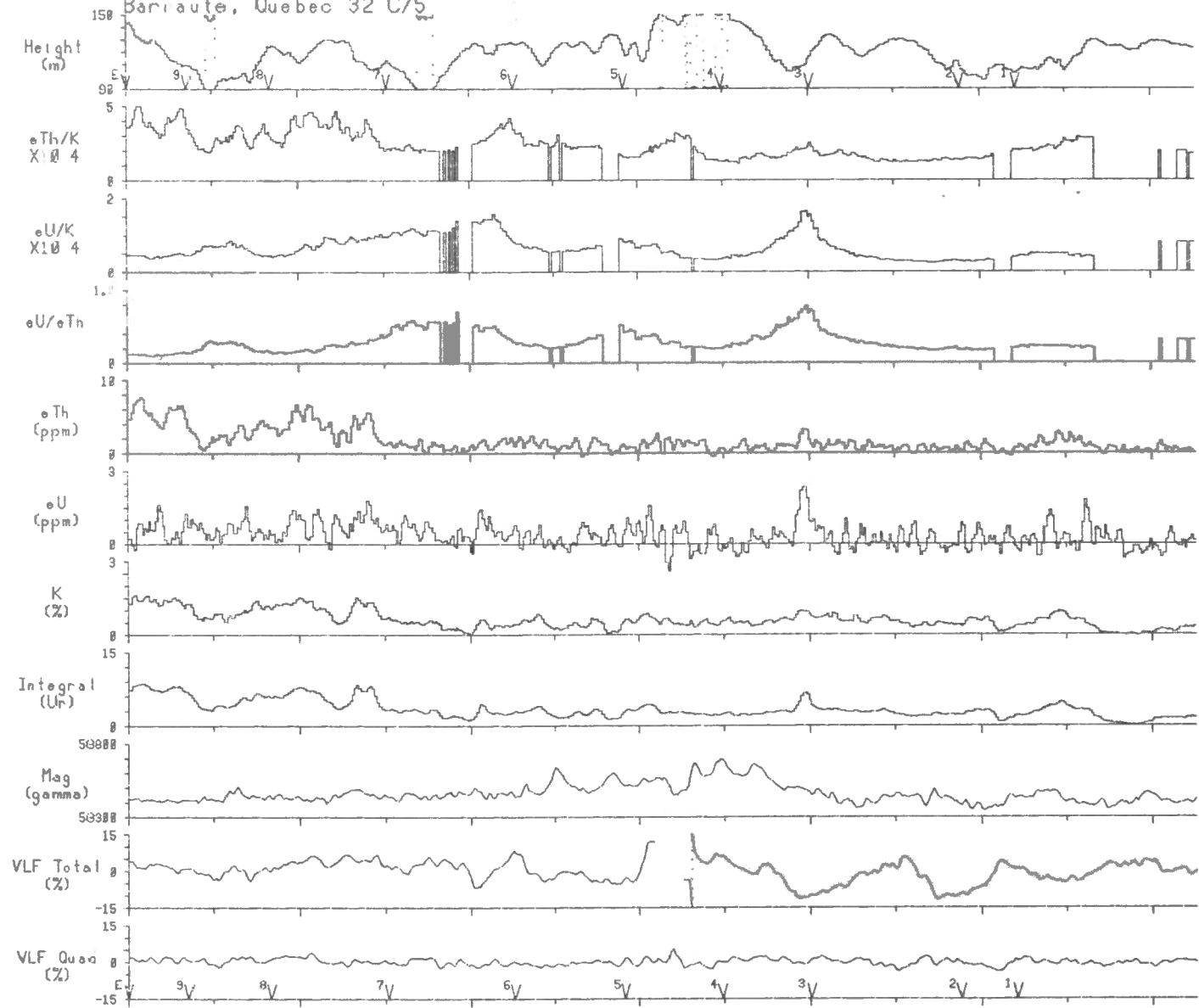
Line 38

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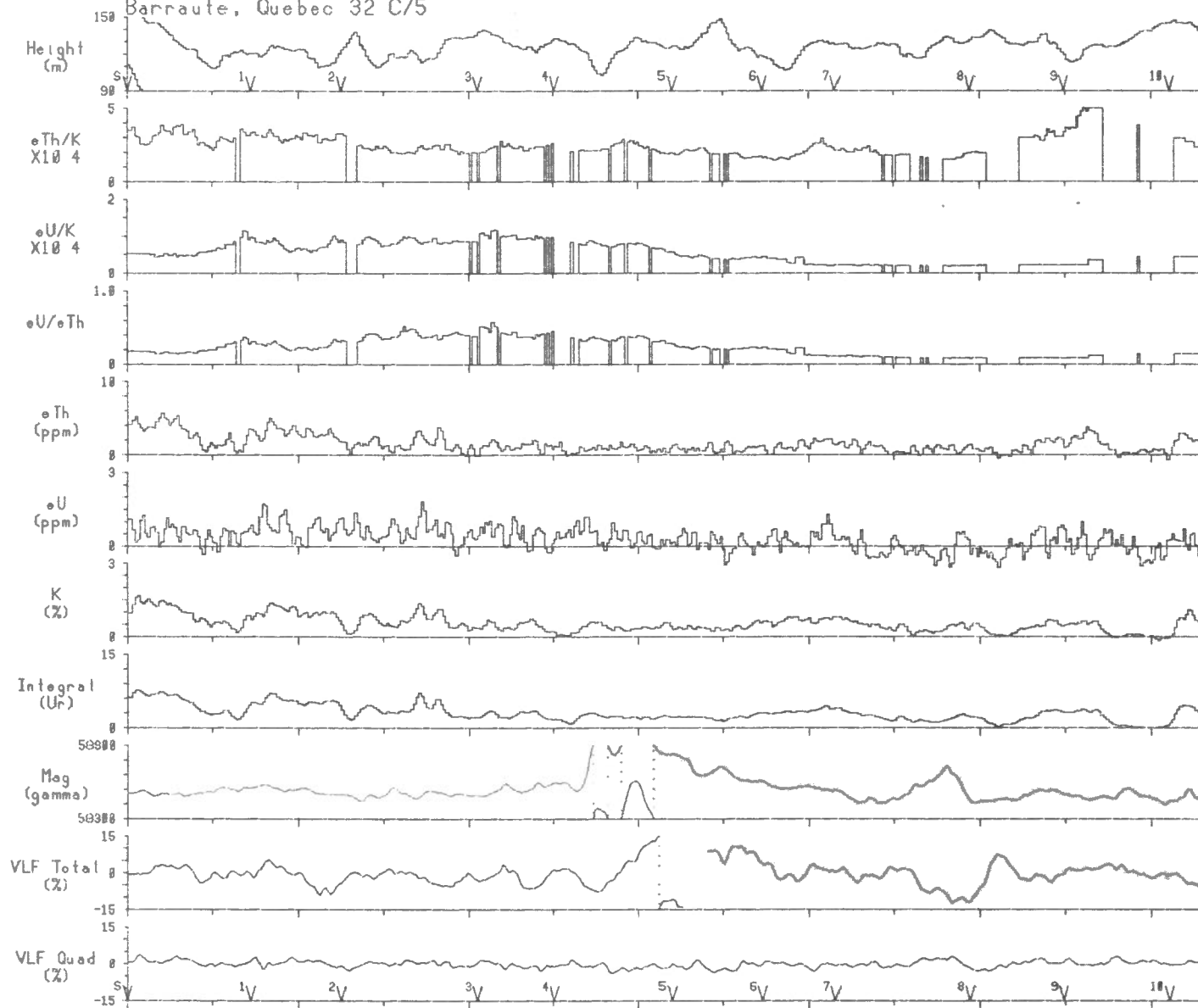
Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986

Barraute, Quebec 32 C/5



Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986

Barraute, Quebec 32 C/5

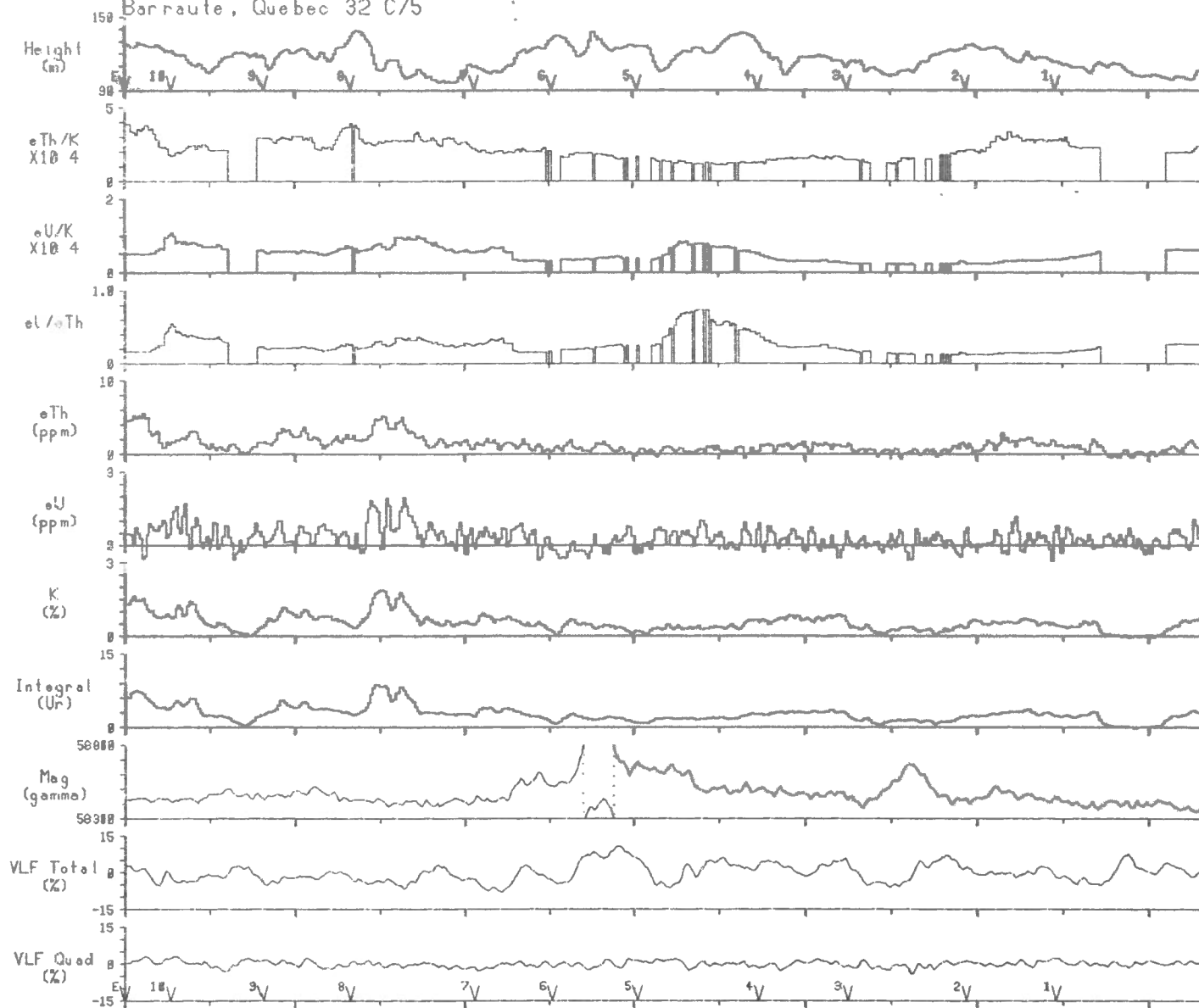


Line 40

2 km

Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5

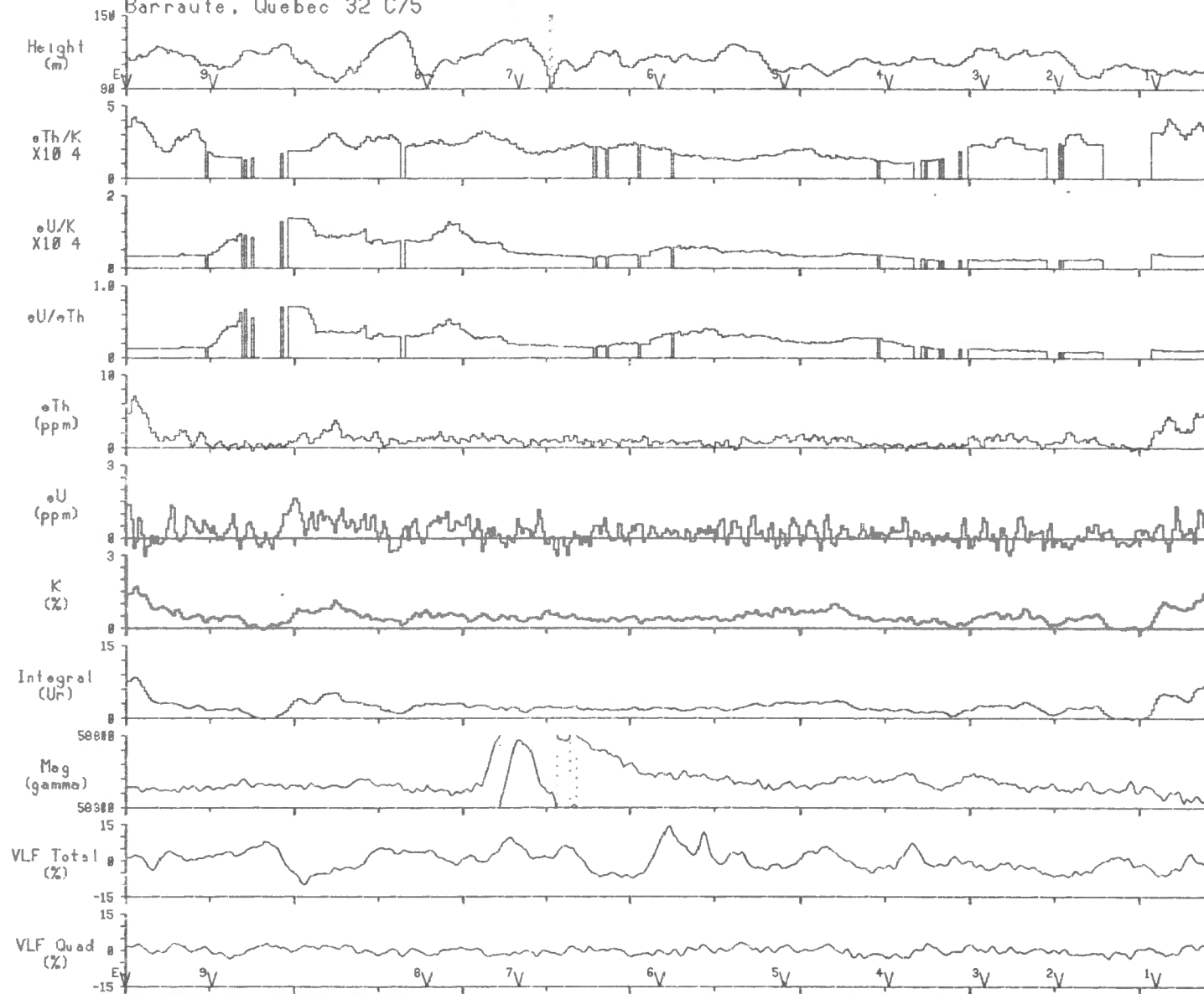


Line 41

2 km

Scale 1:150000

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 Barraute, Quebec 32 C/5



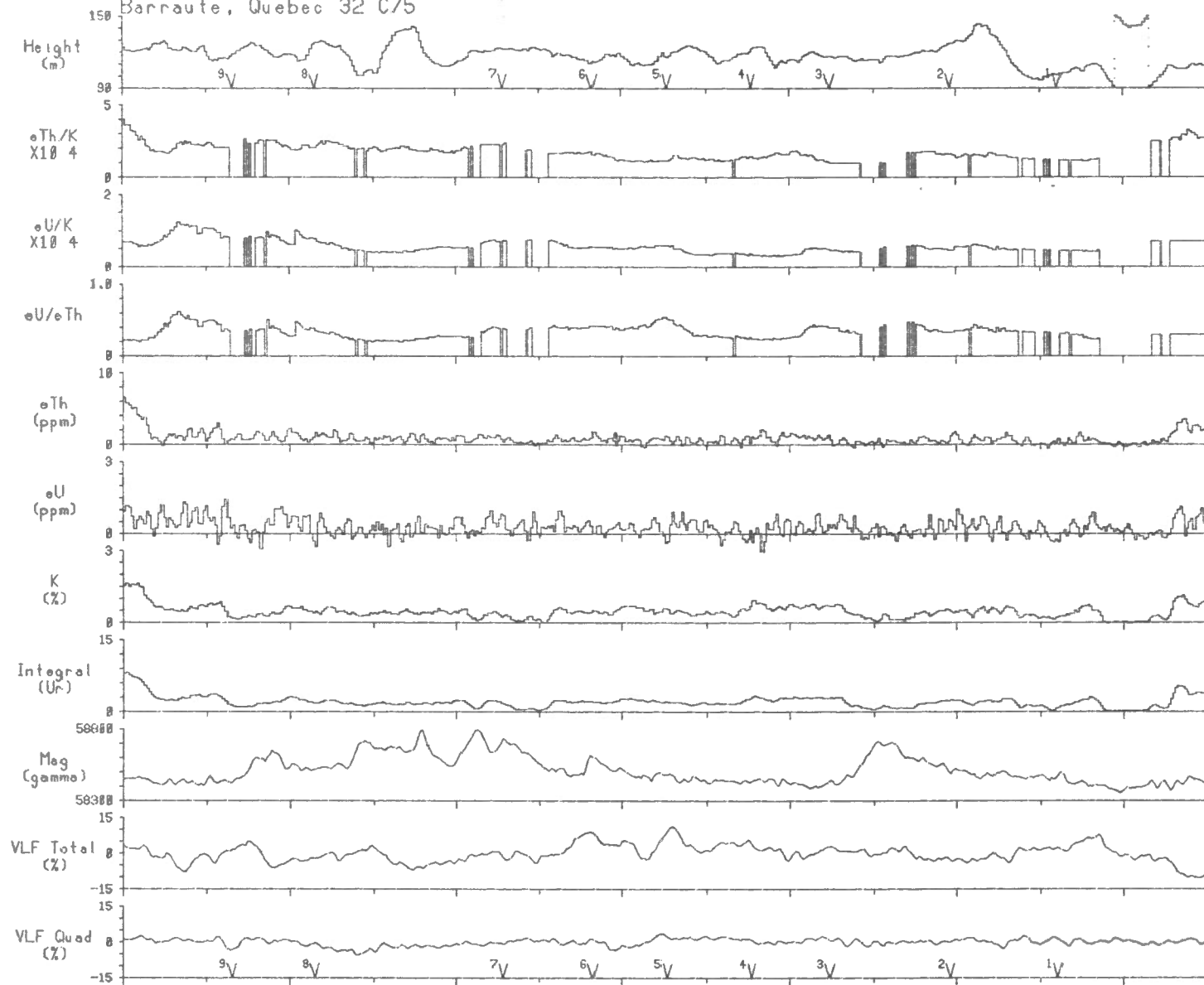
Line 42

2 km

Scale 1:150000

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Barrabute, Quebec 32 C/5

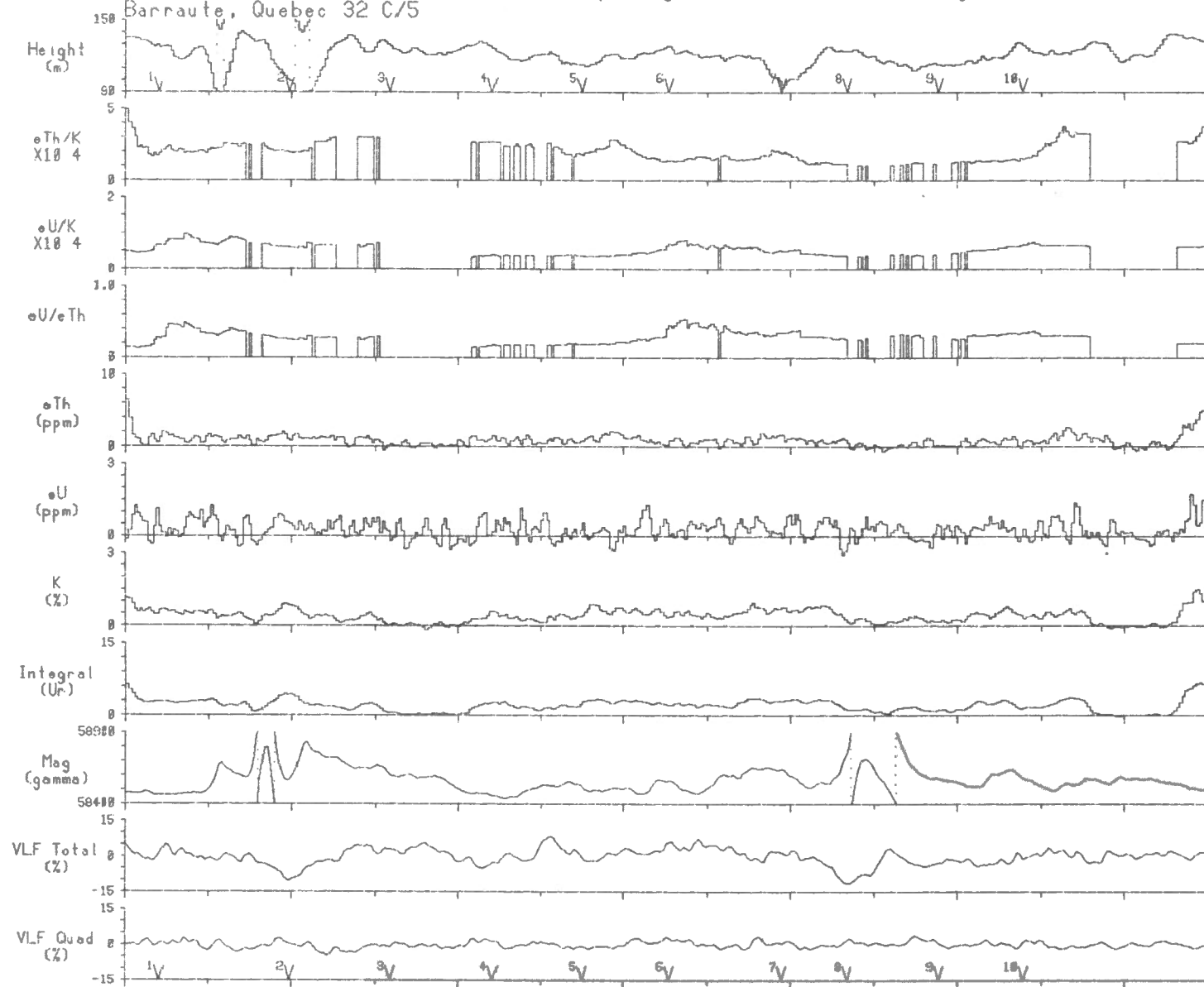


Line 43 | 2 km

Scale 1:150000

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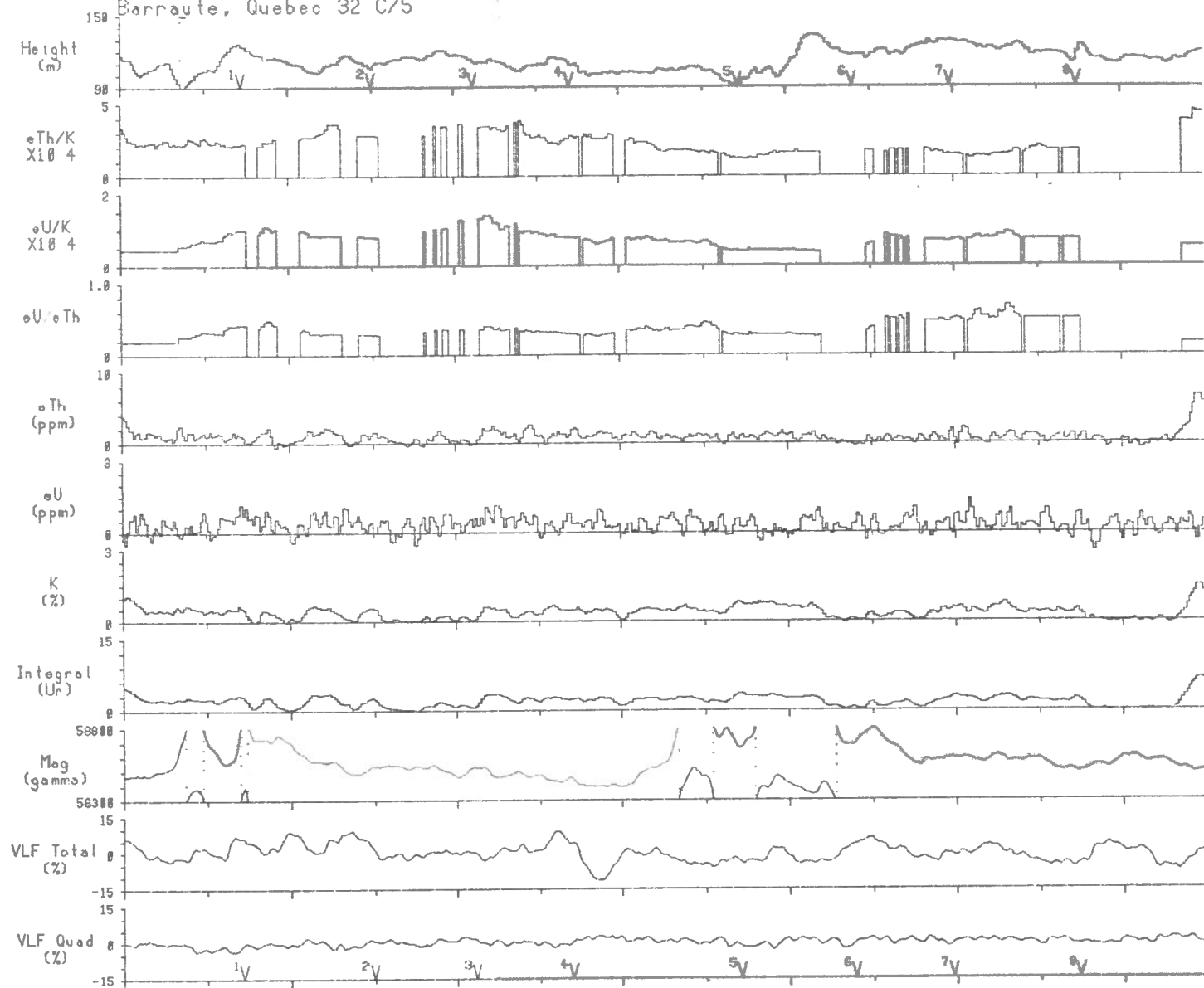
Barrabute, Quebec 32 C/5



Line 44 | 2 km

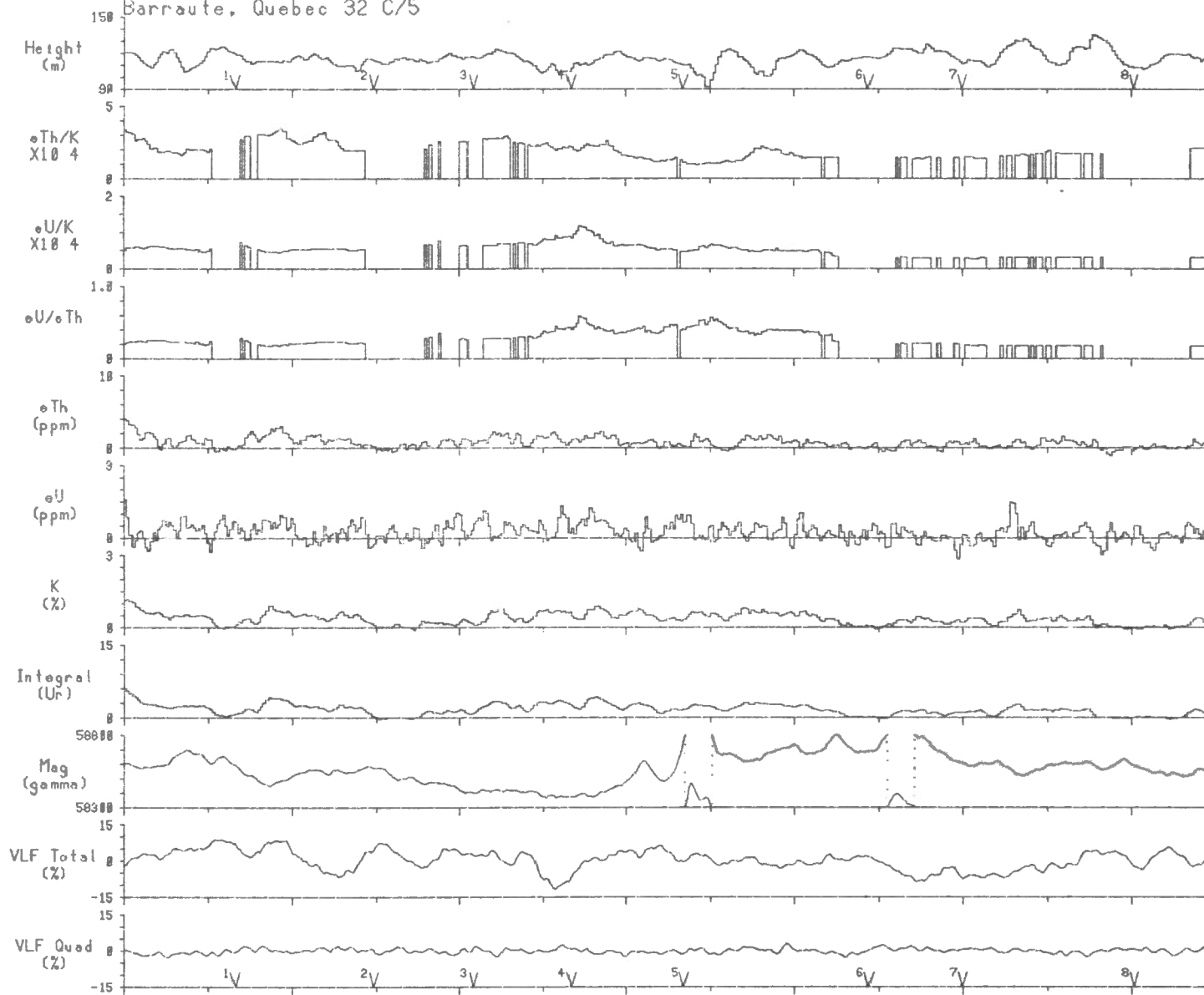
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Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5



Line 45 $\overline{2 \text{ km}}$ Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5

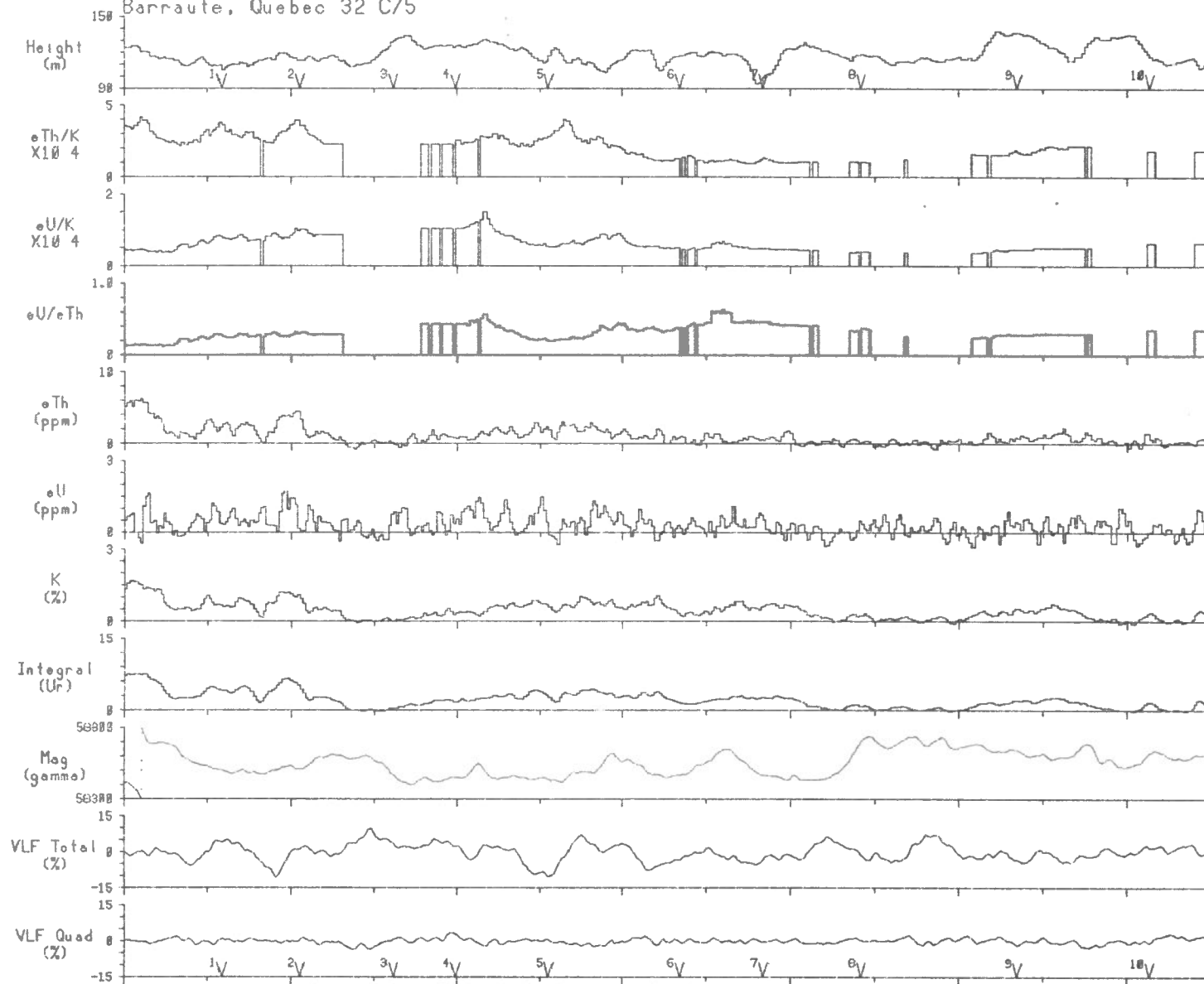


Line 46

2 km

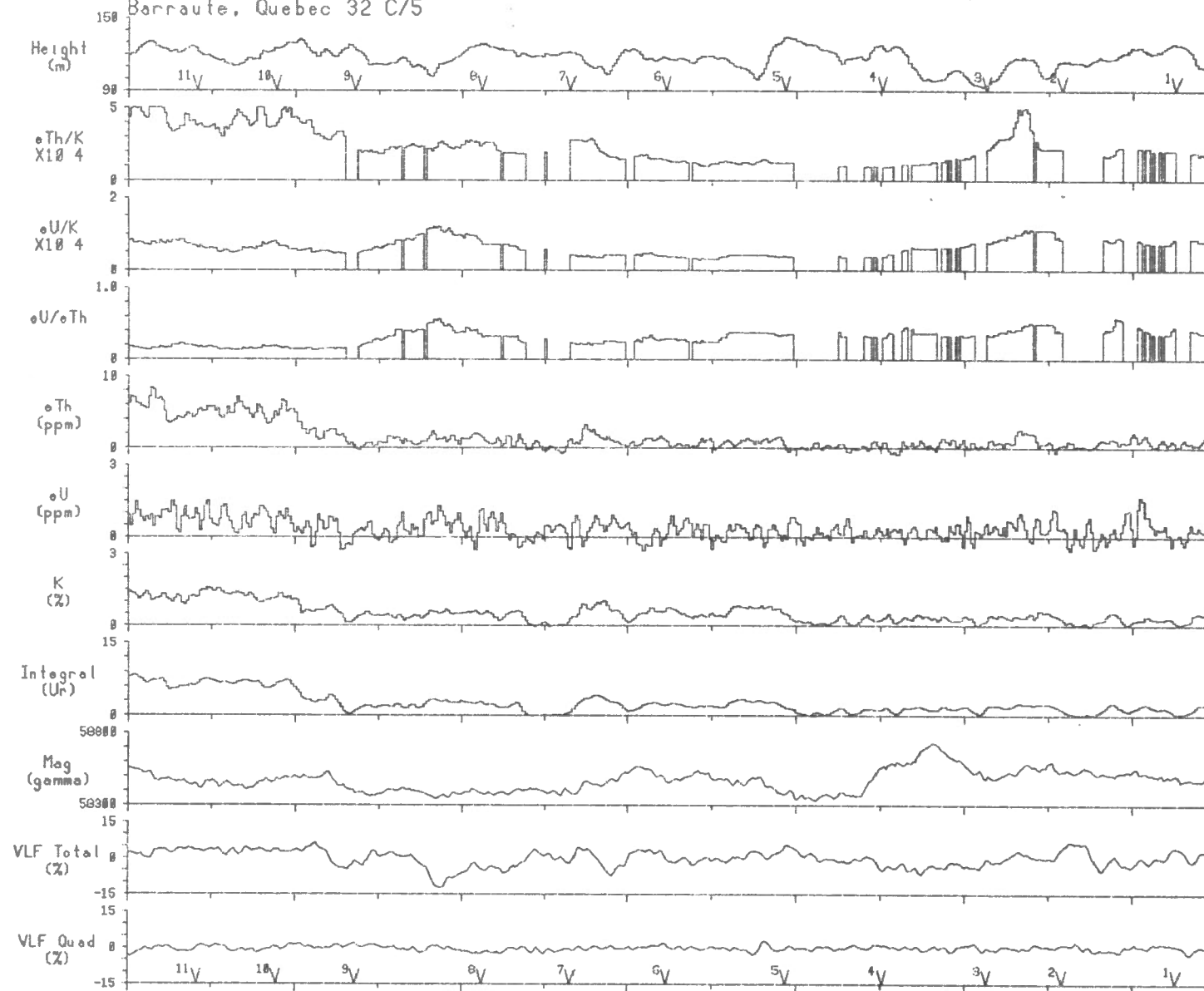
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 Barraute, Quebec 32 C/5



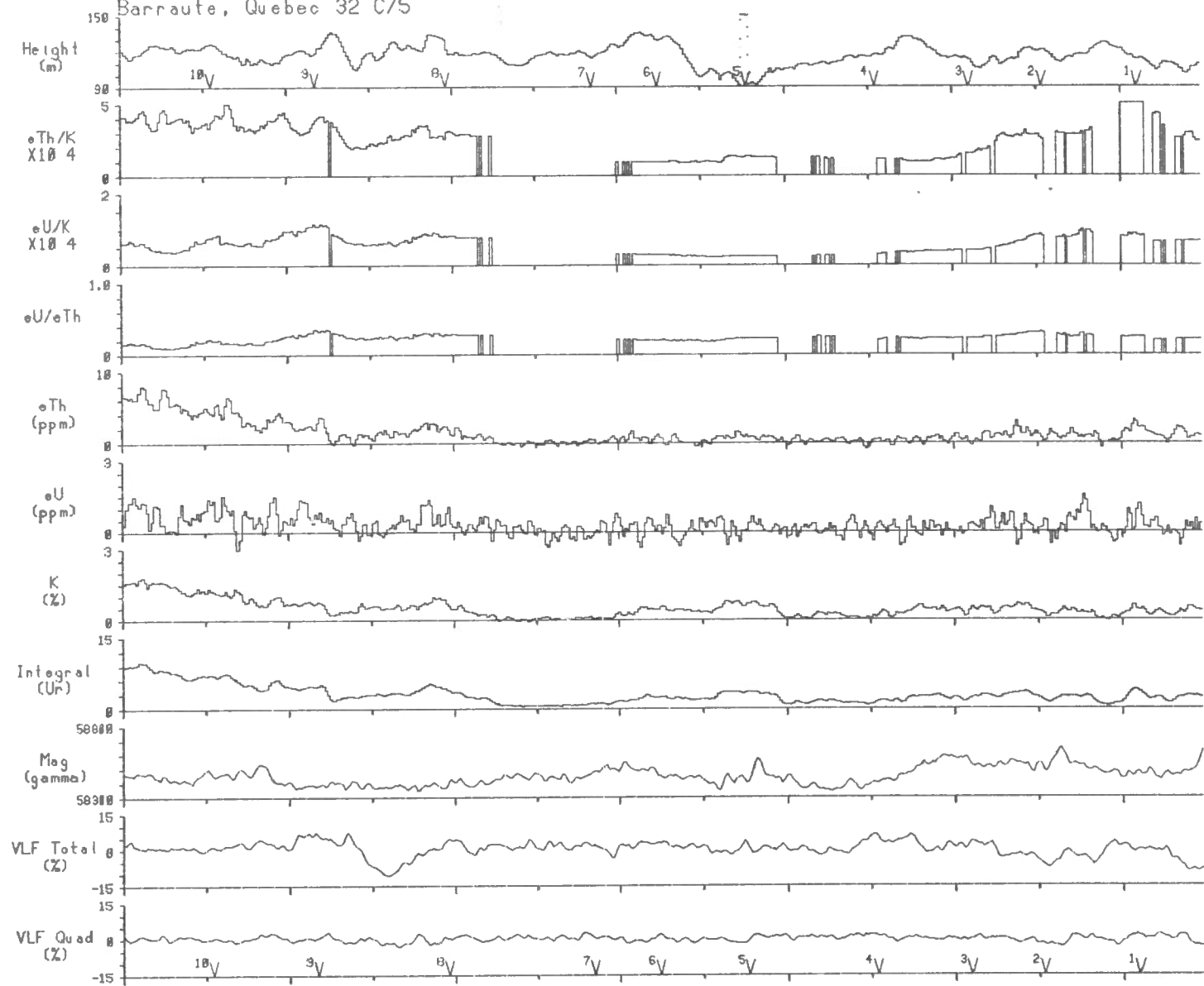
Line 47 2 km Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5



Line 48 2 km Scale 1:150000

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 Barraute, Quebec 32 C/5

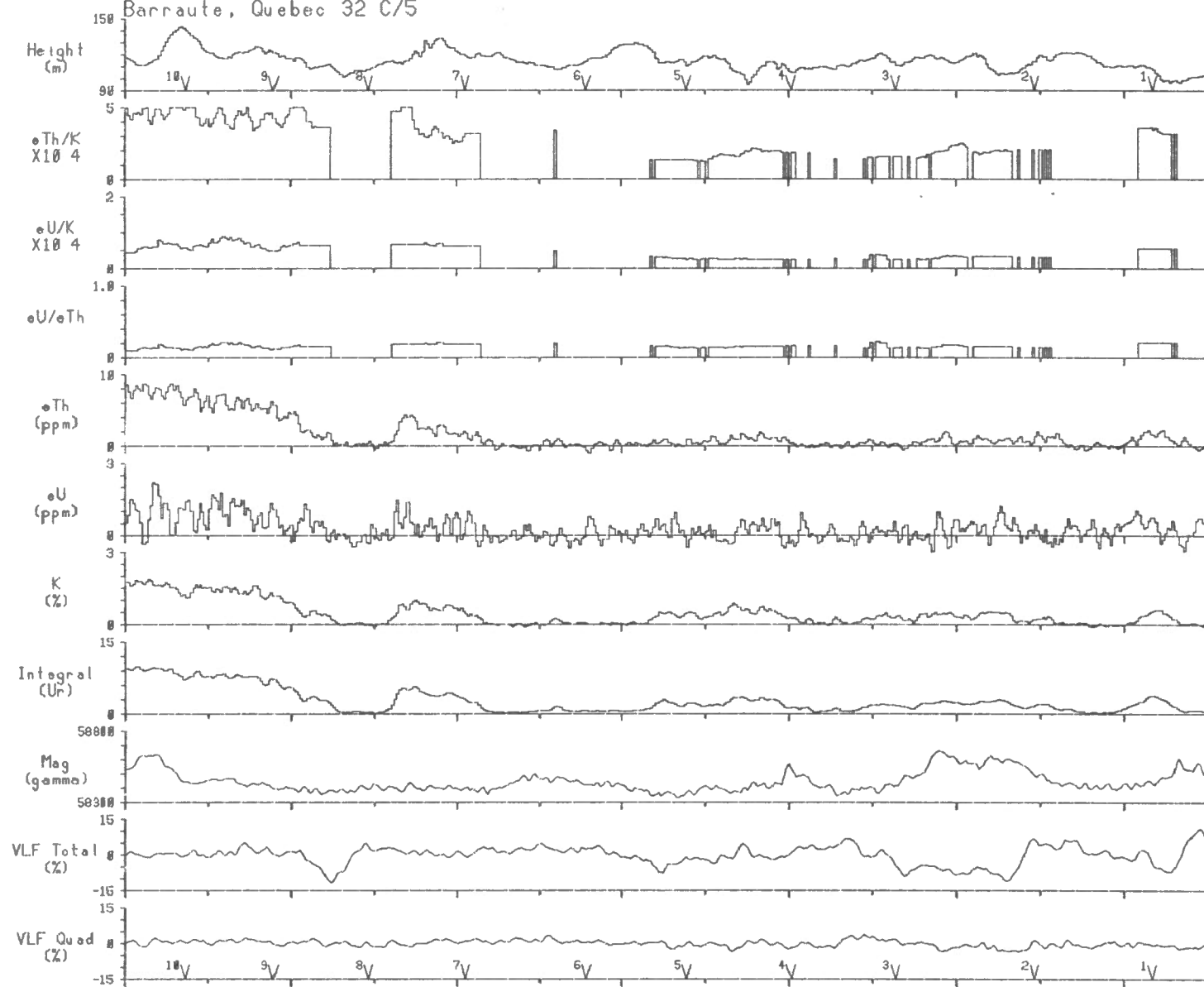


Line 49

2 km

Scale 1:150000

Lacorne Batholith Québec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Québec 32 C/5

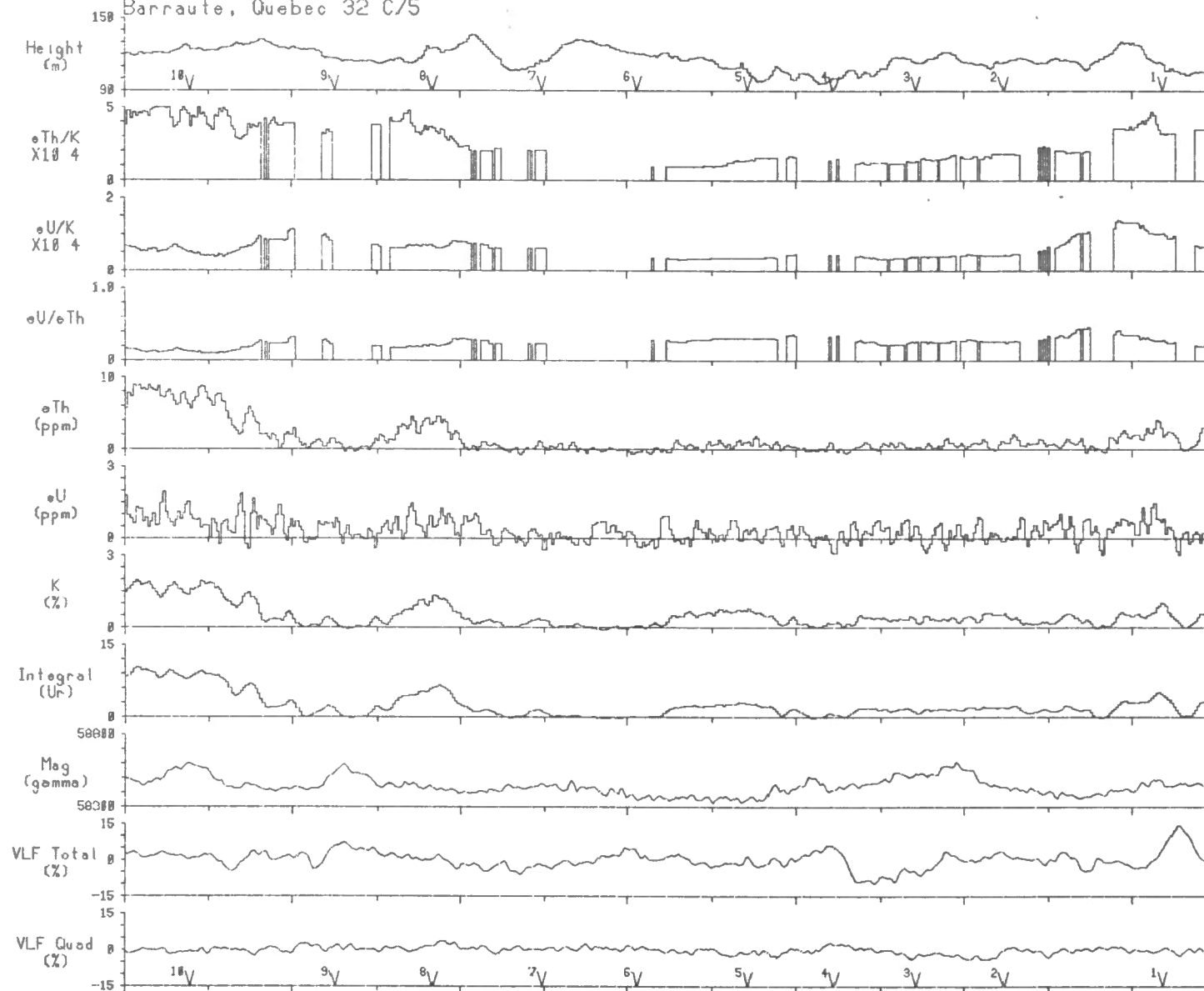


Line 50

2 km

Scale 1:150000

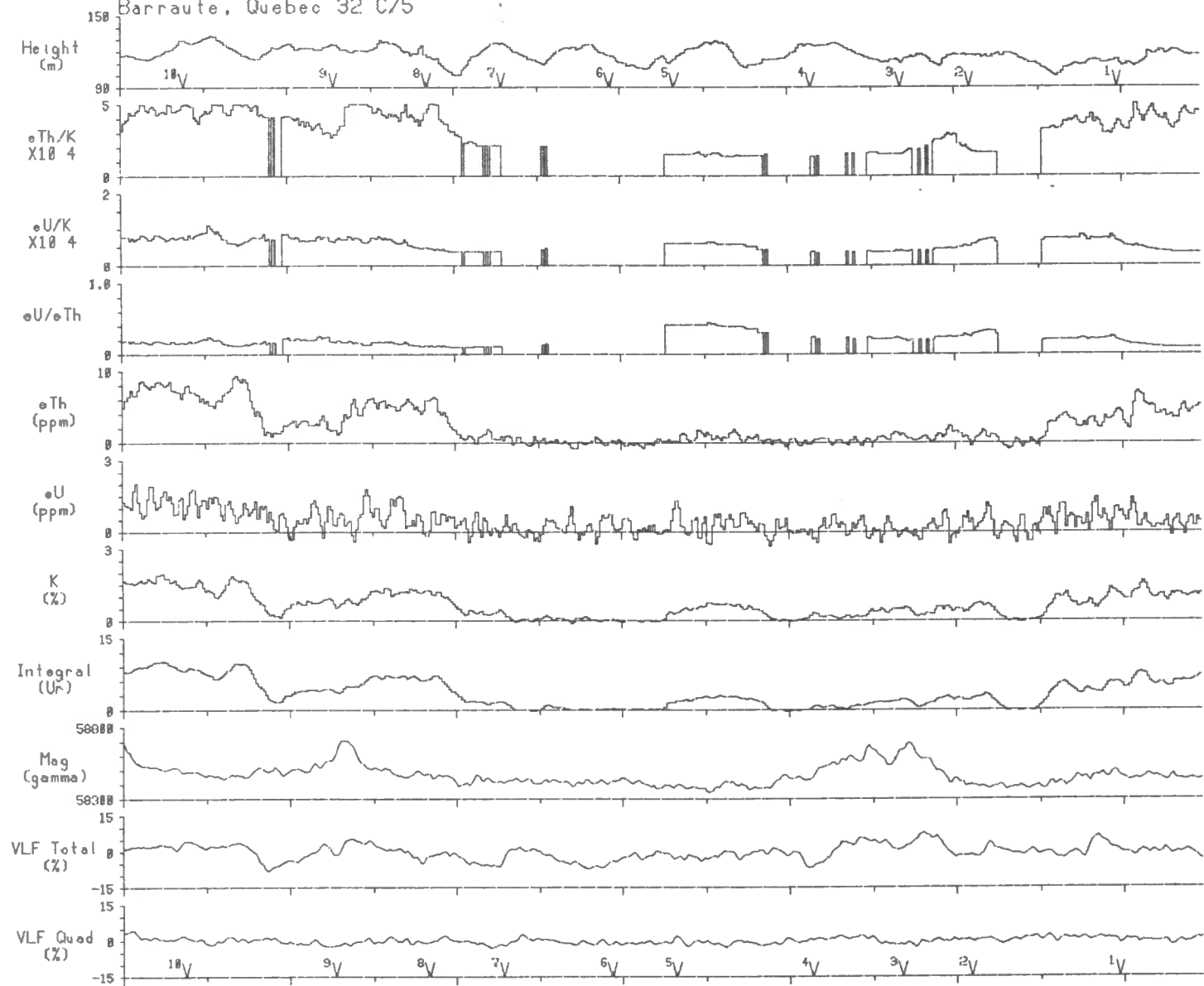
Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
Barraute, Quebec 32 C/5



Line 51 | 2 km

Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5

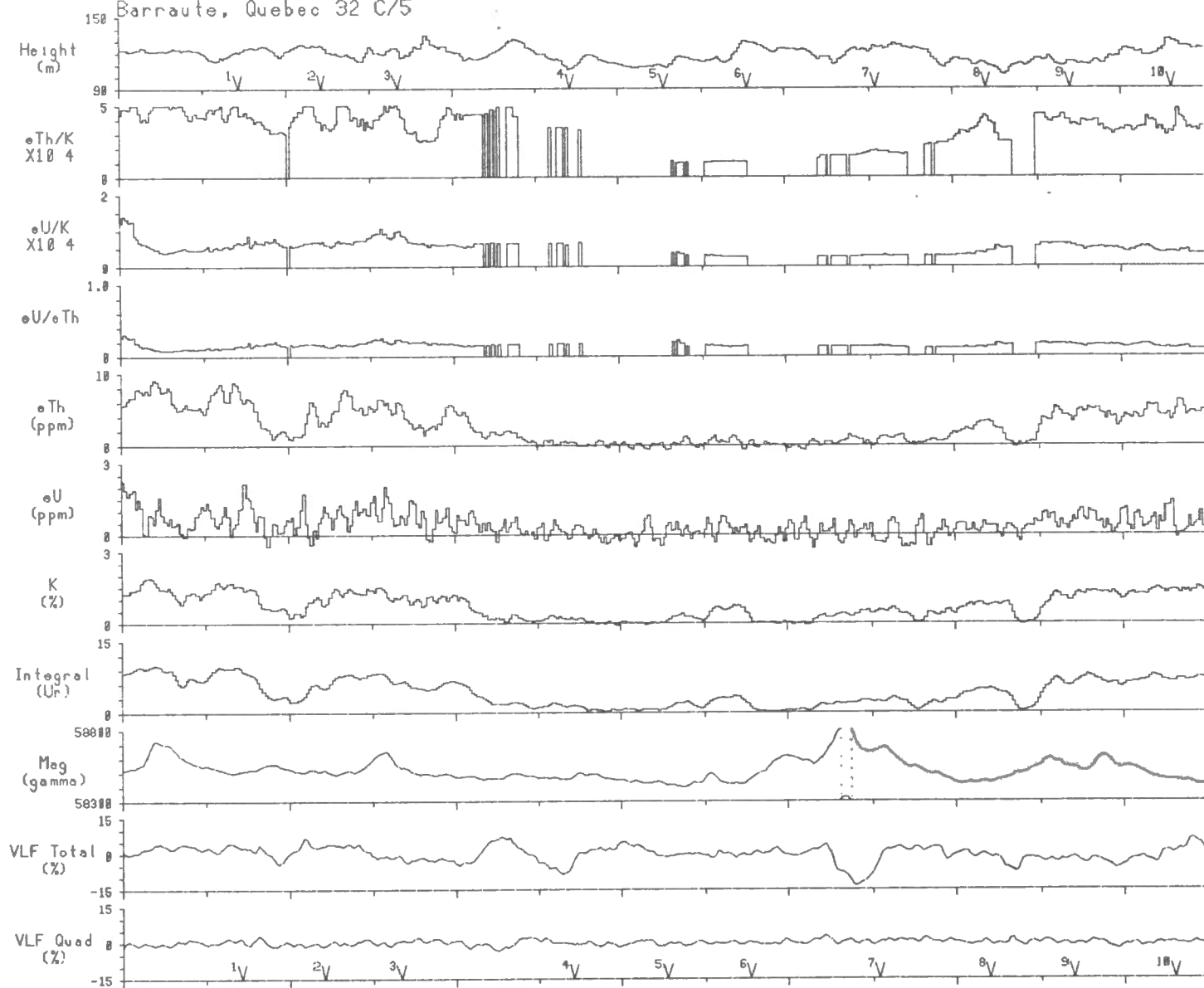


Line 52

2 km

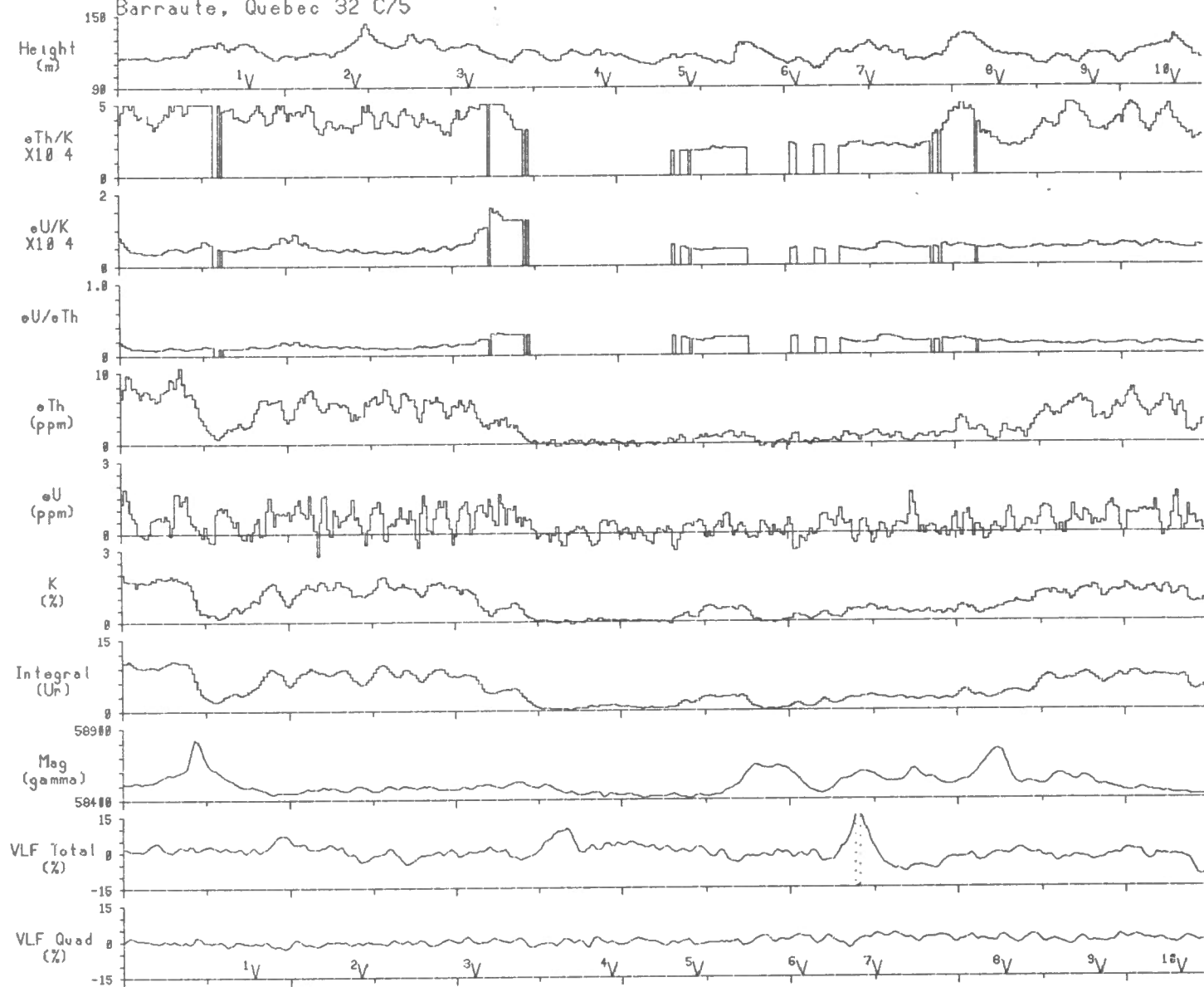
Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5



Line 53 2 km Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5

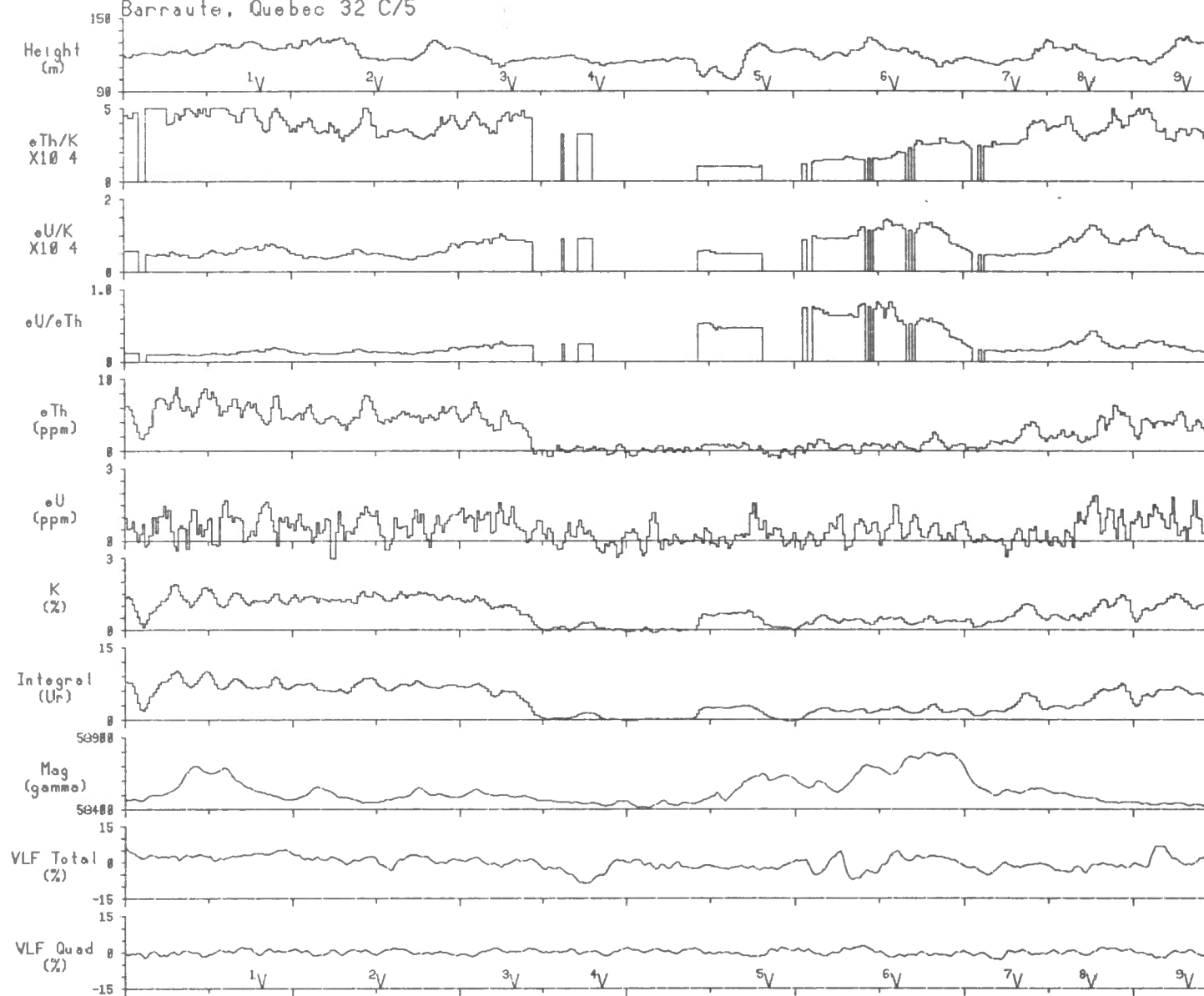


Line 54

2 km

Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5

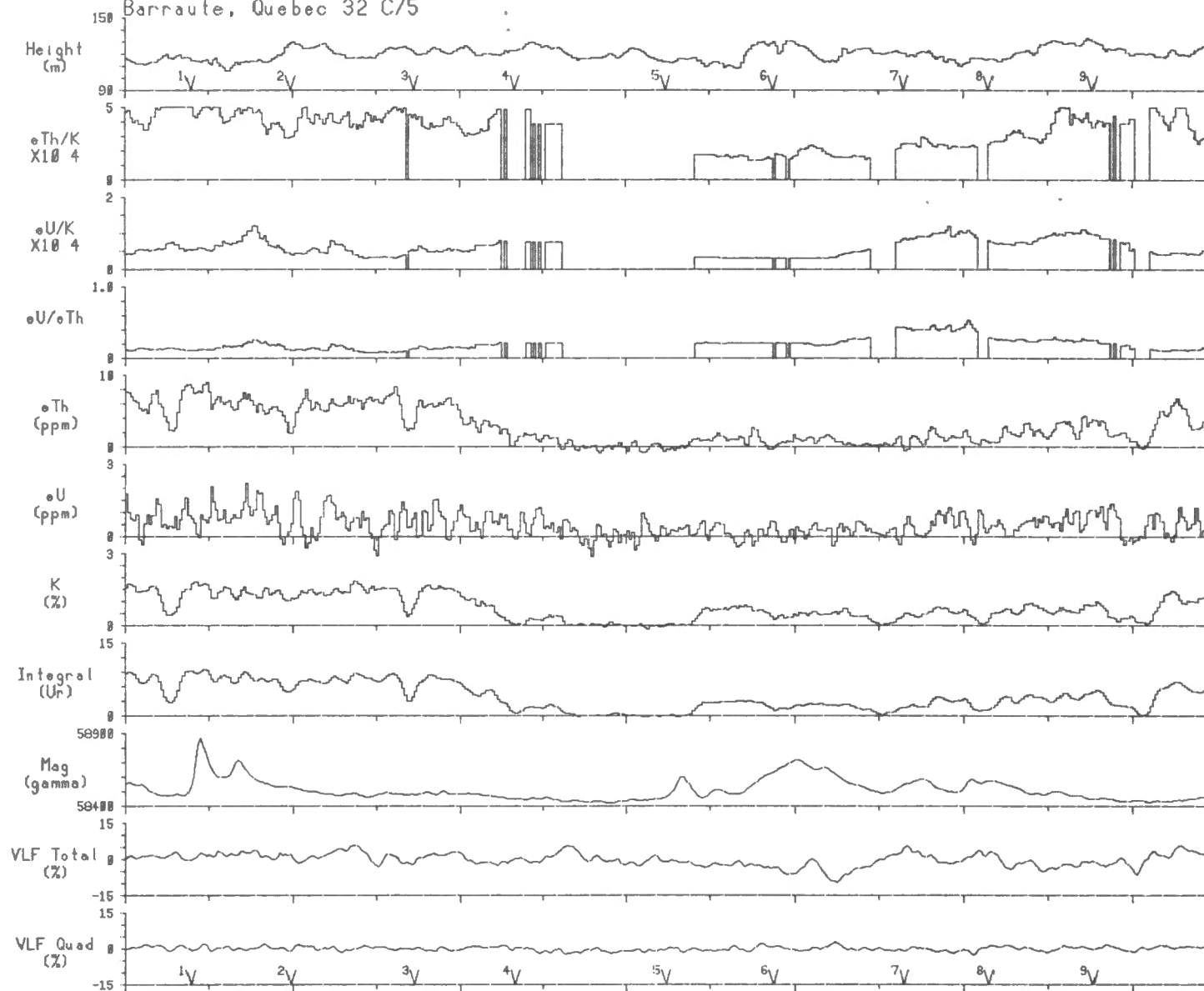


Line 55

2 km

Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5

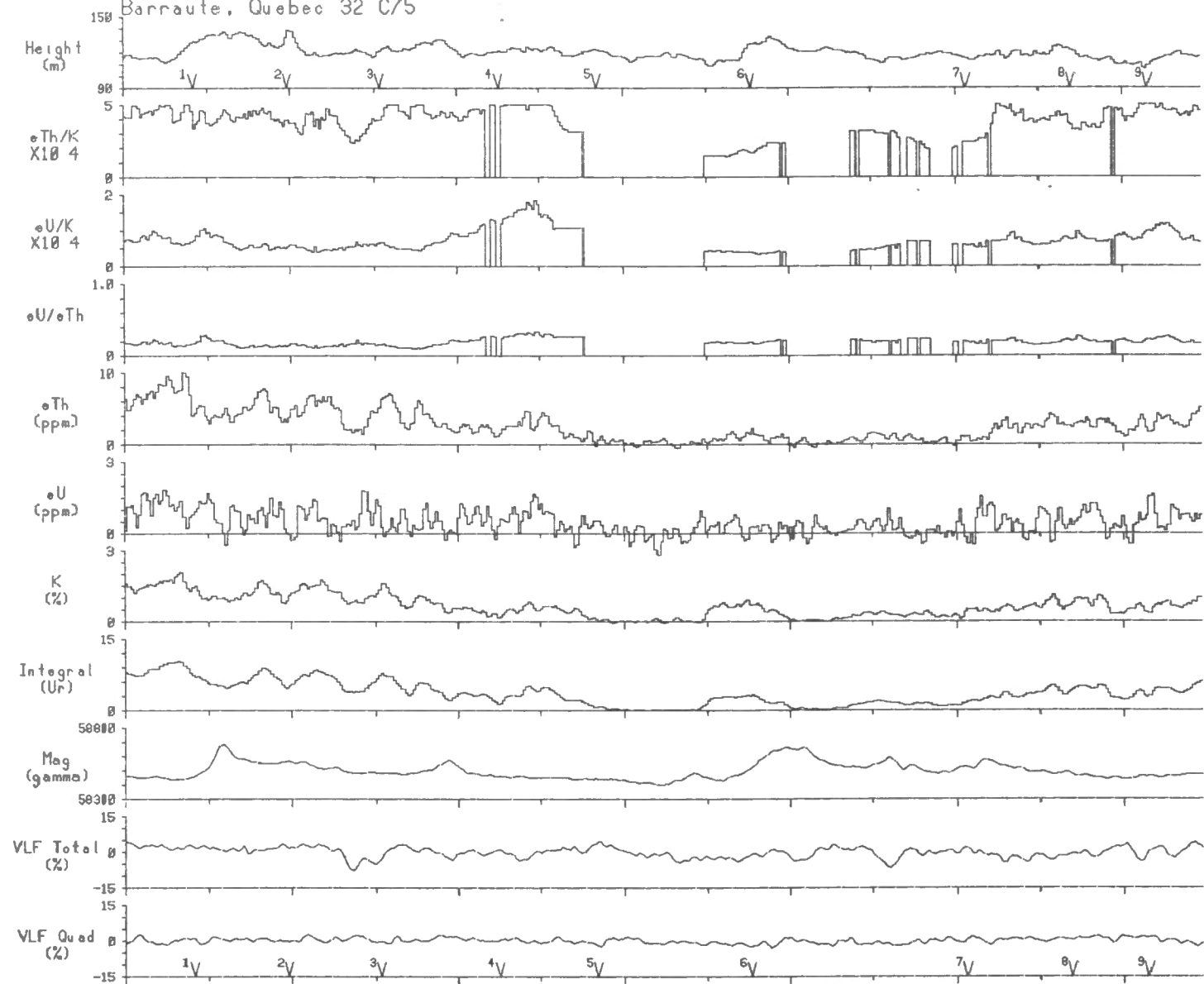


Line 56

2 km

Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5

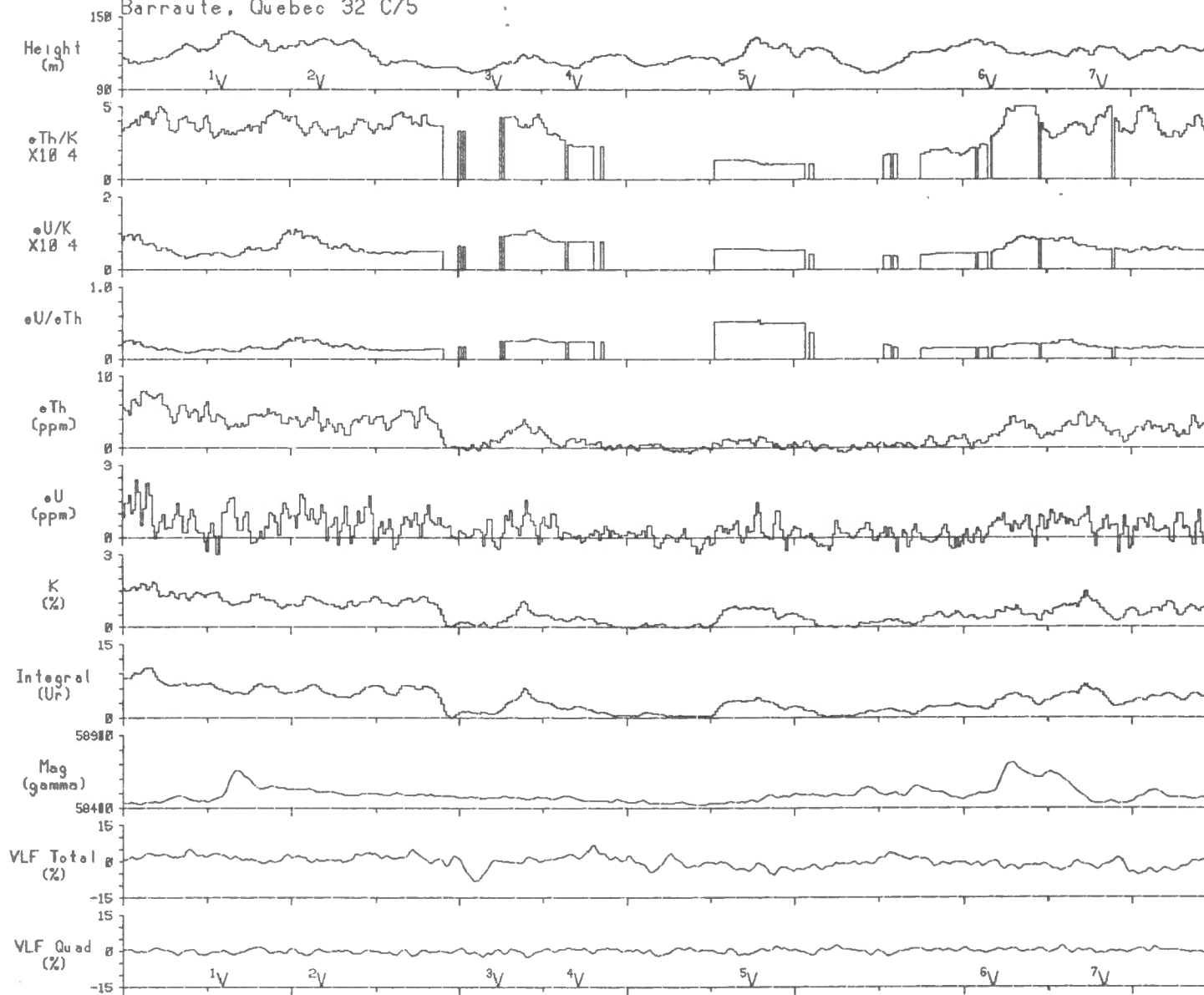


Line 57

2 km

Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5

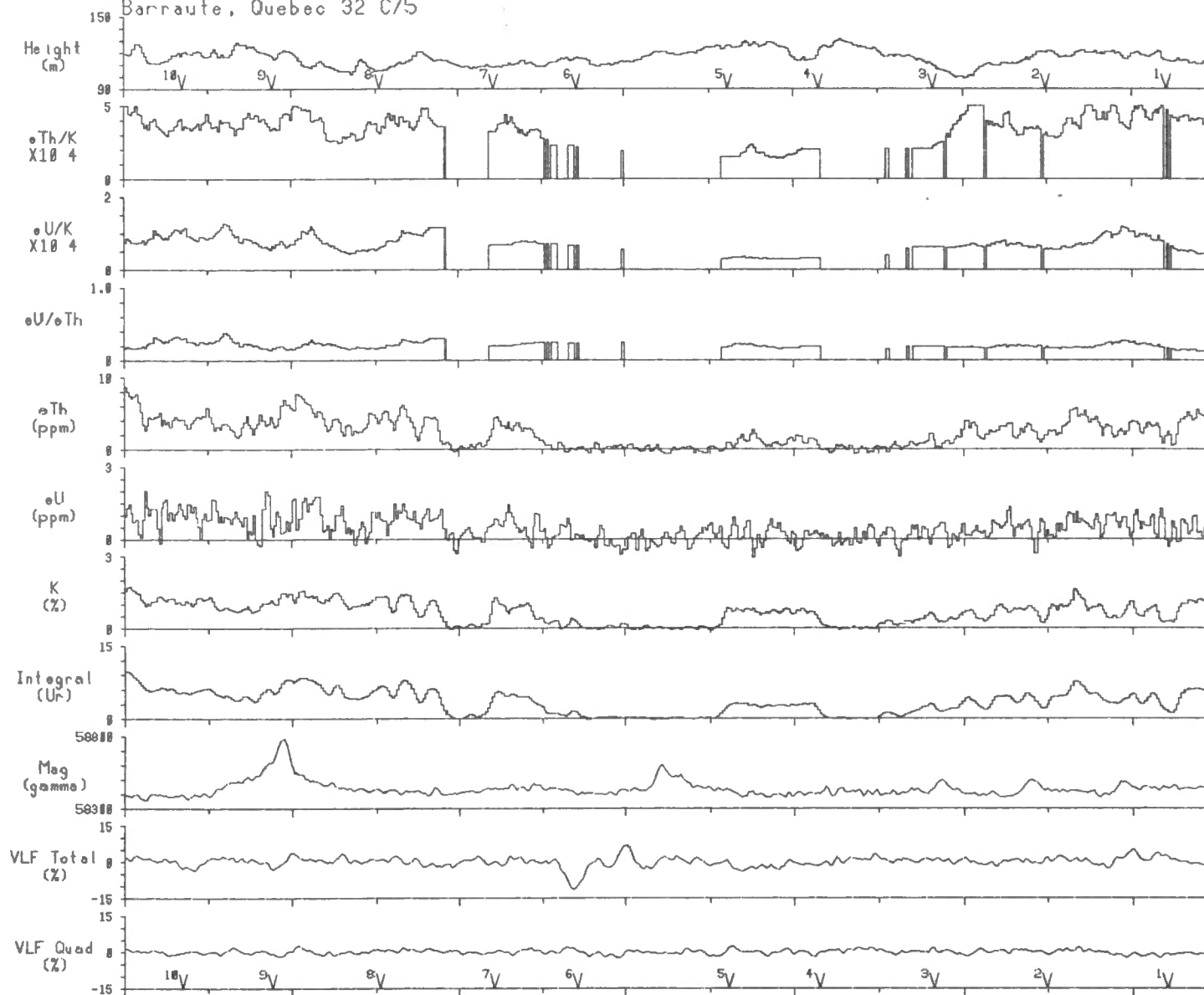


Line 58

2 km

Scale 1:150000

Lacorne Batholith Quebec 1986 (Line Spacing 500 metres) Flown-July, 1986
 Barraute, Quebec 32 C/5



Line 59

2 km

Scale 1:150000