Assessment Report

Wernecke 1-12,21-32,41-52,72,74,76,78,80
and 82 cls.

Mayo Mining District
NTS 106E/1

A.R. Archer, P. Eng. July 15, 1978



This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

$ 4200.00

D.B. Craig

President Geologist or
~~Resident Mining Engineer~~

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

B.R. BAXTER
Supervising Mining Recorder

~~Commissioner~~ of Yukon Territory



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ARCHER, CATHRO
AND ASSOCIATES LTD.
CONSULTING GEOLOGICAL ENGINEERS

Whitehorse, Yukon (403) 667-4415 1016 - 510 West Hastings Street Vancouver, B.C. V6B 1L8 (604) 688-2568

Post Office Box 4127
Whitehorse, Yukon
Y1A 3S9

# Report on

# Detailed Radiometric Grid Survey

# and

# Airborne Radiometric Survey

Wernecke 1-12, 21-32, 41-52, 72, 74, 76, 78, 80, 82 Claims

Mayo Mining District

Claim Sheet 106E/1

Latitude 65°07'N Longitude 134°23'W

July 15, 1978

Alan R. Archer, P. Eng. Consulting Engineer

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## INTRODUCTION

The Wernecke claims cover a uranium occurrence found by Wernecke Joint Venture (Standard Oil Company of B.C. Ltd., Aquitaine Company of Canada Ltd., and Messrs. L. and H. Clay) in July 1975 and explored by preliminary geological mapping and radiometric surveys. In 1976, the property was optioned to Eldorado Nuclear Limited and more detailed geological surveys of the central claims and detailed radiometric surveys of the main uranium showing were carried out. In early 1978 an orthophoto map was prepared to aid ground work and to provide better control for airborne surveys. The airborne survey was conducted on June 4, 5 and 26 by geologist C.A. Main and ground radiometrics, mapping and prospecting was conducted over an anomalous area during the period June 18 to 29 by geologist J. Chapman assisted by prospectors G. Matthews, A. Halleran and S. Veerman. The program was supervised by geologist U. Schmidt and managed by Archer, Cathro & Associates Ltd.

## PROPERTY, LOCATION AND ACCESS

The property consists of 42 contiguous mineral claims recorded in the Mayo Mining District as follows:

| Claim Name | Grant Numbers | Expiry Date |
|---|---|---|
| Wernecke 1-12 | Y97944-Y97955 | 21 April, 1979 |
| Wernecke 21-32 | Y97964-Y97975 | 21 April, 1979 |
| Wernecke 43-52 | YA1353-YA1362 | 30 March, 1979 |
| Wernecke 72 | YA1382 | 30 March, 1979 |
| Wernecke 74 | YA1384 | 30 March, 1979 |
| Wernecke 76 | YA1386 | 30 March, 1979 |
| Wernecke 78 | YA1388 | 30 March, 1979 |
| Wernecke 80 | YA1390 | 30 March, 1979 |
| Wernecke 82 | YA1392 | 30 March, 1979 |

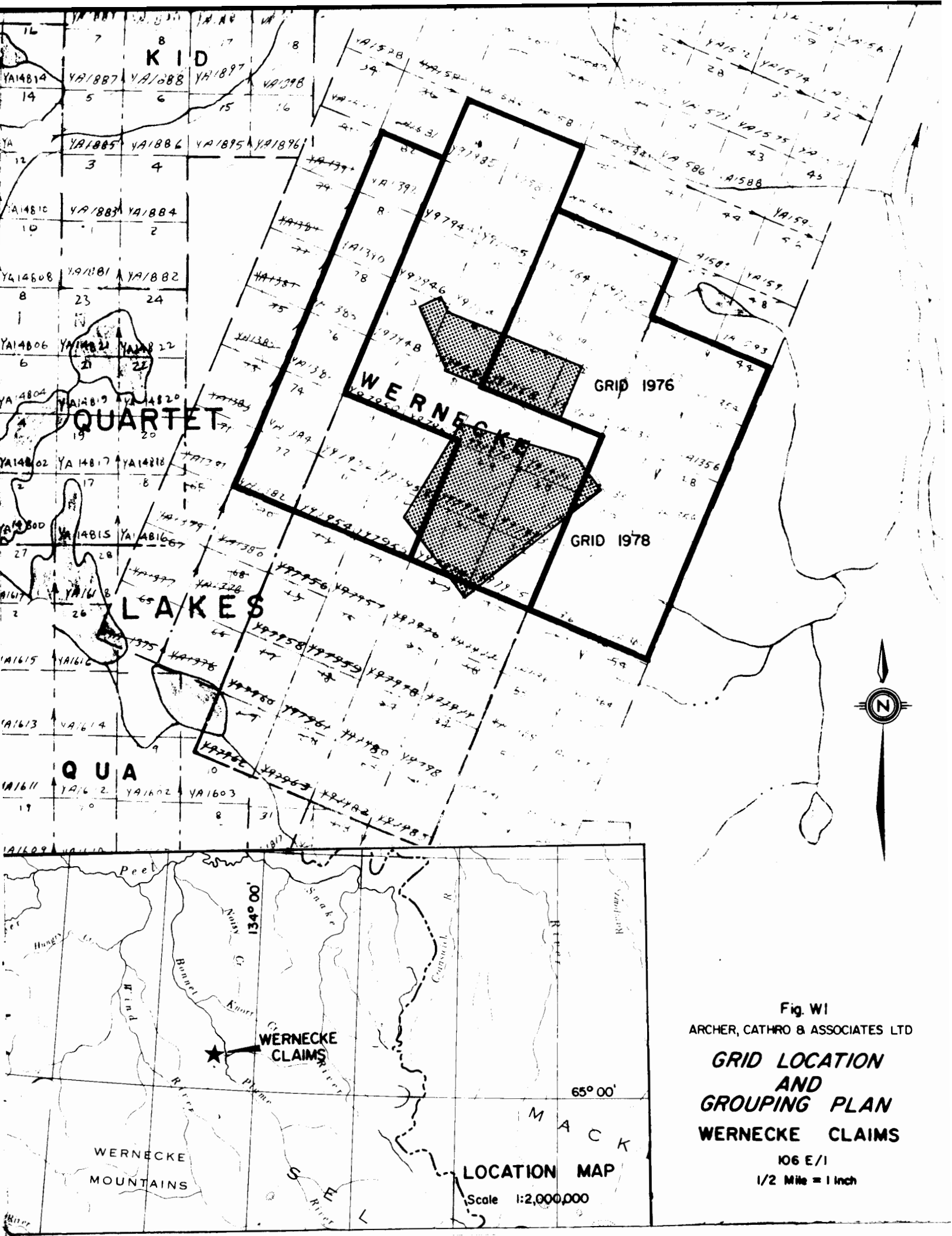


Fig. W1

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# GRID LOCATION AND GROUPING PLAN

## WERNECKE CLAIMS

106 E/1

1/2 Mile = 1 Inch

The property is located at latitude 65°07'N and longitude 134°23'W on NTS claim sheet 106E/1, 110 airmiles northeast of Mayo. Access was by helicopter from the base camp at Kiwi Lake, ten miles to the northwest. Kiwi Lake may be reached by float equipped fixed wing aircraft from a charter base at Mayo.

## AIRBORNE RADIOMETRIC SURVEY

### Instrumentation

The claims were surveyed by an airborne differential spectrometer, an instrument capable of separately distinguishing uranium, thorium and potassium rich areas. The airborne system consisted of a Gould (Brush) 222 two-channel and a Hewlett-Packard 7155A single-channel strip-chart recorder, both driven by signals from a Scintrex GAD-4 spectrometer-analyser using a Scintrex GSA-61 1853 cc thallium-activated, sodium iodide crystal as sensor. The crystal was mounted in a removable plywood box that was tied to the outside cargo rack of the helicopter. The analyser and recorders were placed inside the cabin and were connected to the sensor by cable. An auxiliary power outlet in the helicopter supplied ships power (28v) to all instruments.

The three graphs recorded continuous, one-second integration counts for total radioactivity, uranium and thorium. Some flight lines were reflown recording total count, uranium and potassium. The total count and uranium count were recorded simultaneously on the Gould instrument while the thorium count was charted on the Hewlett-Packard recorder. Both instruments produced graphs at a linear speed of 10 cm/min. The charts were usually set for widths of 0 to 2500 counts per second (cps) for total count, 0 to 50 cps for uranium and 0 to 40 cps for thorium.

Each chart was calibrated daily using specimens of thorium and uranium so that the graph value exactly matched the absolute value as shown on the spectrometer dial. The

spectrometer was calibrated for maximum sensitivity on the designated thorium peak.

Flight Procedure

The survey was flown at a nominal height of 50 m but varied from 25 to 75 m depending upon terrain irregularity. Survey lines were flown at constant altitude (contours) at 250 foot contour intervals. Helicopter speed is not considered critical and no attempt was made to correlate chart speed with traverse length. Generally, 50 to 90 km/hour was a practical and safe survey speed. Topographical and geological maps (1:250,000 scale) were used for both detialed and reconnaissance navigation and plotting.

Data Organization

The operator plotted flight paths on the orthophoto map as the traverse progressed, noting pertinent navigational, geographical and surface exposure data on the strip charts. Correlation between mapped flight lines and the chart was achieved by numbered fiducials and handwritten notes on the charts.

## RESULTS

Appendix I is a complete copy of the strip chart records. Sequential numbers (fiducials) along these charts refer to positions along the flight lines plotted on Figures W3 and W6 in the pockets. Chart anomalies are defined as where there are values 20% higher than the local background. These anomalies are shown on the charts in Appendix I and on Figures W3 to W6.

Both total count and uranium surveys show good correlation to each other and with two areas of known mineralization (ground surveyed in 1976 and 1978 as shown on Figure W1 following page 1). The remaining anomalies require ground examination.

Thorium has no specific pattern and is not apparently useful for uranium search in this area. Potassium shows anomalous response in areas of potassic alteration in and

around the diatreme breccias and may have limited use in prospecting for areas of unmapped breccias.

## GROUND RADIOMETRIC SURVEY AND PROSPECTING

The airborne survey indicated an area of uranium interest along the east side of the mountain summit (see Figure W4). Mineralized float had been found here during a previous prospecting traverse. A control grid was laid out by establishing a picketed baseline with 50 m centers and running crosslines with hipchain and compass with slope correction. Radiometric readings were taken every 50 m and the intervening ground was prospected. Each station was picketed (see Figure W2). All readings were taken with Scintrex BGS-1S broadband scintillometers, equipped with 12.75 cc NaI (Tl) crystals. The readings from each instrument were found to be roughly correlative.

A number of radioactive zones were found and mapped. These were mainly caused by erratic occurrences of brannerite mineralization within unit Hspa, an altered chloritic metasediment within the thermal aureole of nearby diatreme breccia zones. At three occurrences, 2+00S/9+00E; 2+00N/4+50E; and approximately 1+00N/0+50E, radiation was found within specific horizons of the altered metasediments. These may represent a primary uranium source and deserve more detailed study.

The claim block is underlain by Helikian (?) argillic sediments with minor carbonate members. These rocks are altered and metamorphosed to varying degrees due to emplacement of an extensive diatreme-like breccia. The breccia zones lie around the perimeters of a central core of metasediments.

## CONCLUSIONS

Airborne radiometric anomalies lying off the 1976 and 1978 grids were not inspected and require prospecting and sampling.

Apparently stratabound mineralization requires more examination, particularly the occurrence at 1+00N/0+50E which lies off the 1978 grid and which may extend to the west and north.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES LTD.,

Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL
ENGINEER

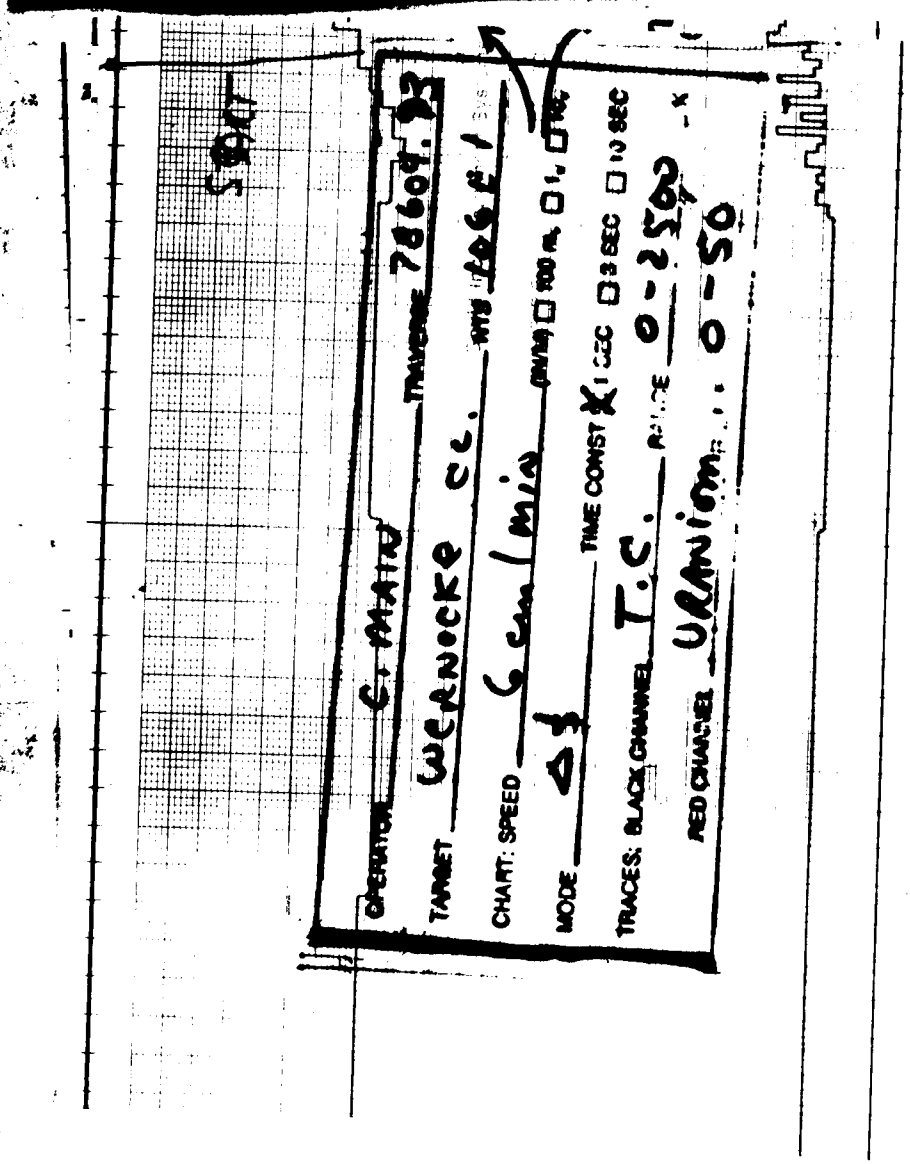
A.R. Archer, B.A.Sc., P.Eng.

ARA:jm

# APPENDIX ONE

| | Recorder | Date | Element | Range (cps) |
|---|---|---|---|---|
| Tape One | Brush 222 | June 4 | Total Count<br>Uranium | 0-2500<br>0-50 |
| Tape Two | Hewlett-Packard | June 4 | Thorium | 0-40 |
| Tape Three | Brush 222 | June 5 | Total Count<br>Uranium | 0-2500<br>0-50 |
| Tape Four | Hewlett-Packard | June 5 | Thorium | 0-40 |
| Tape Five | Brush 222 | June 26 | Total Count<br>Potassium | 0-2500<br>0-100 |
| Tape Six | Hewlett-Packard | June 26 | Uranium | 0-40 |

These photocopies are consecutive portions of continuous strip charts. Fiducial numbers along the chart correspond to locations noted on Figures W3 to W6. Each traverse has a unique number corresponding to a flight line plotted on the figures. At the beginning of each traverse the instrument setting, the traverse number and the radioactive element are noted.

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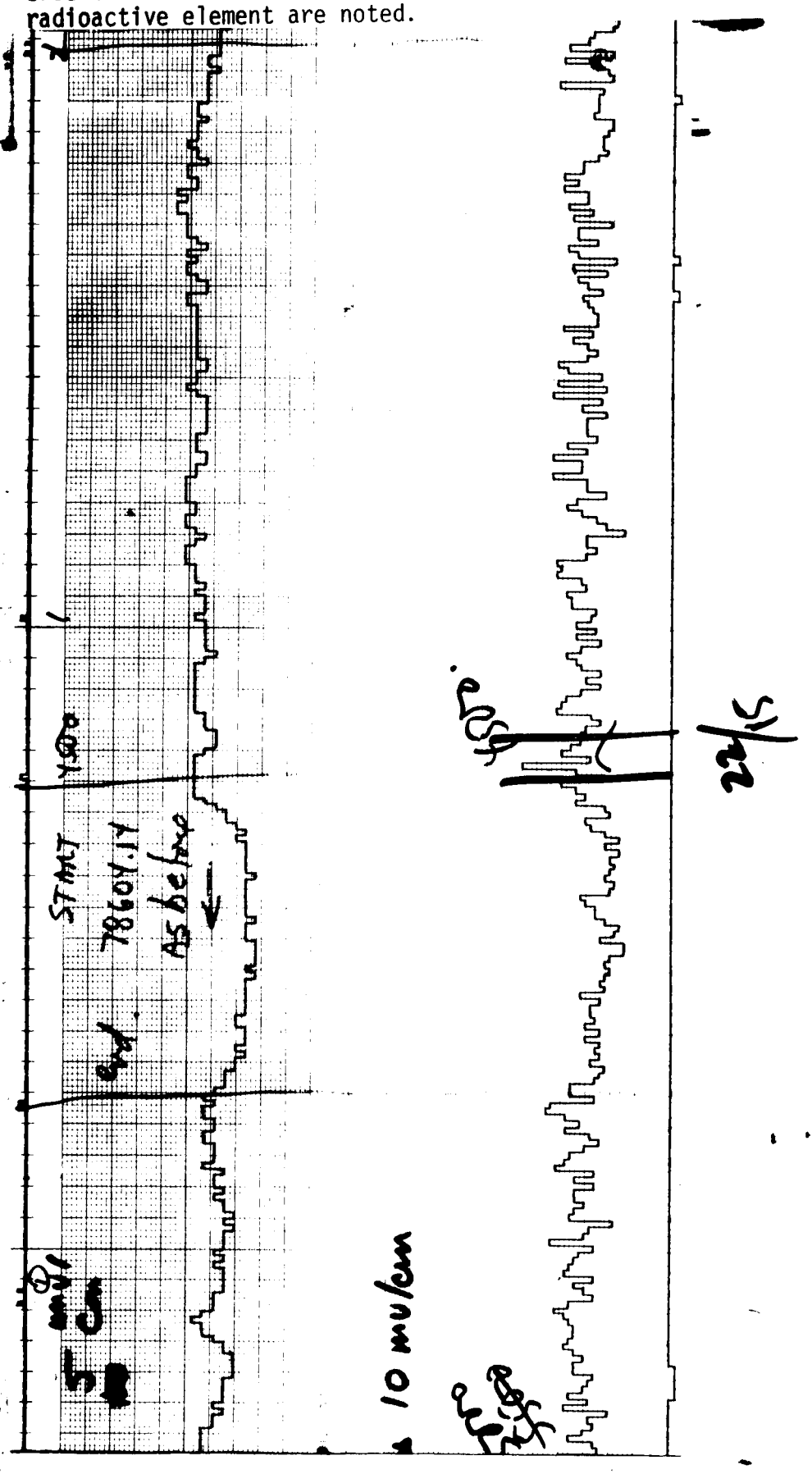

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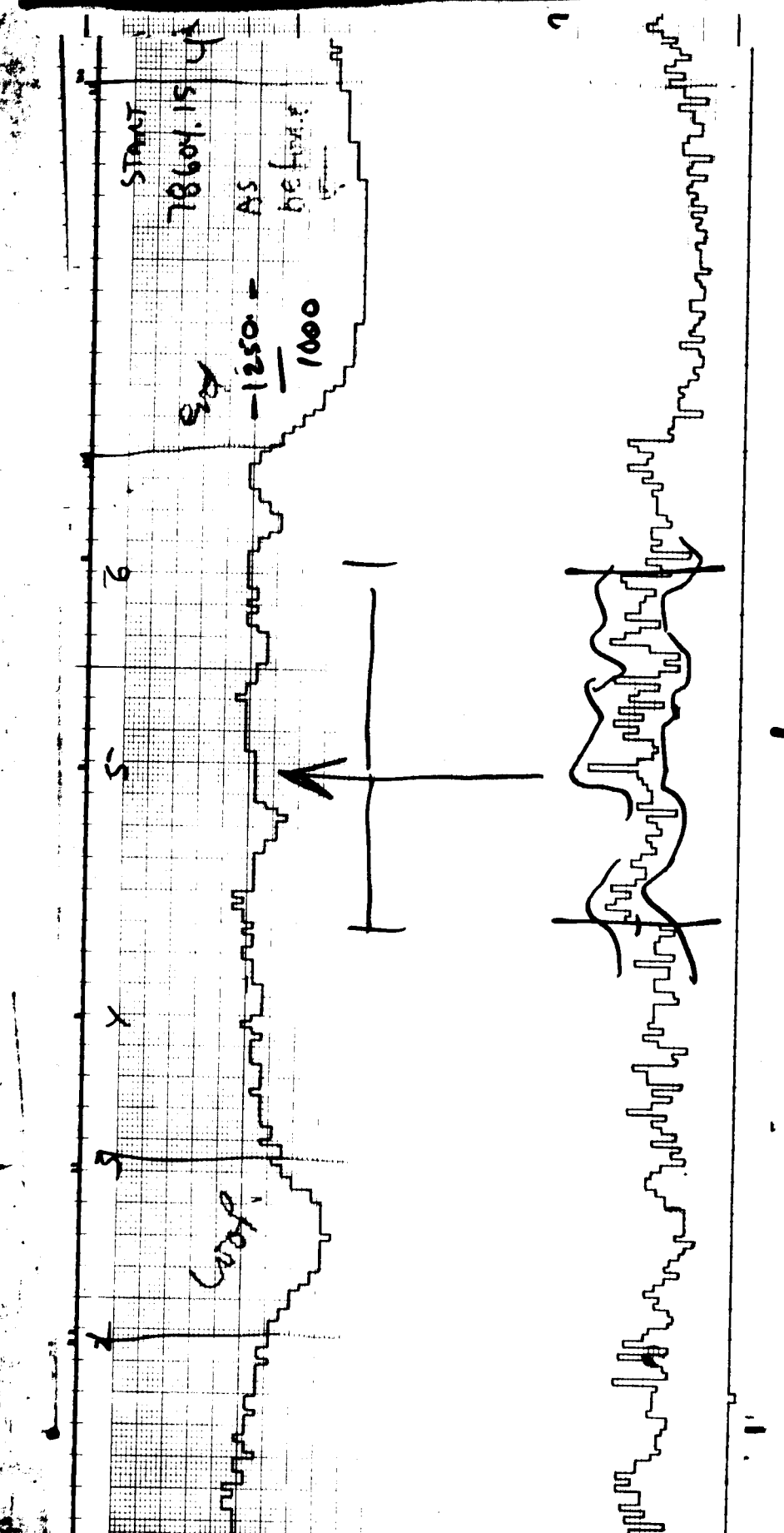

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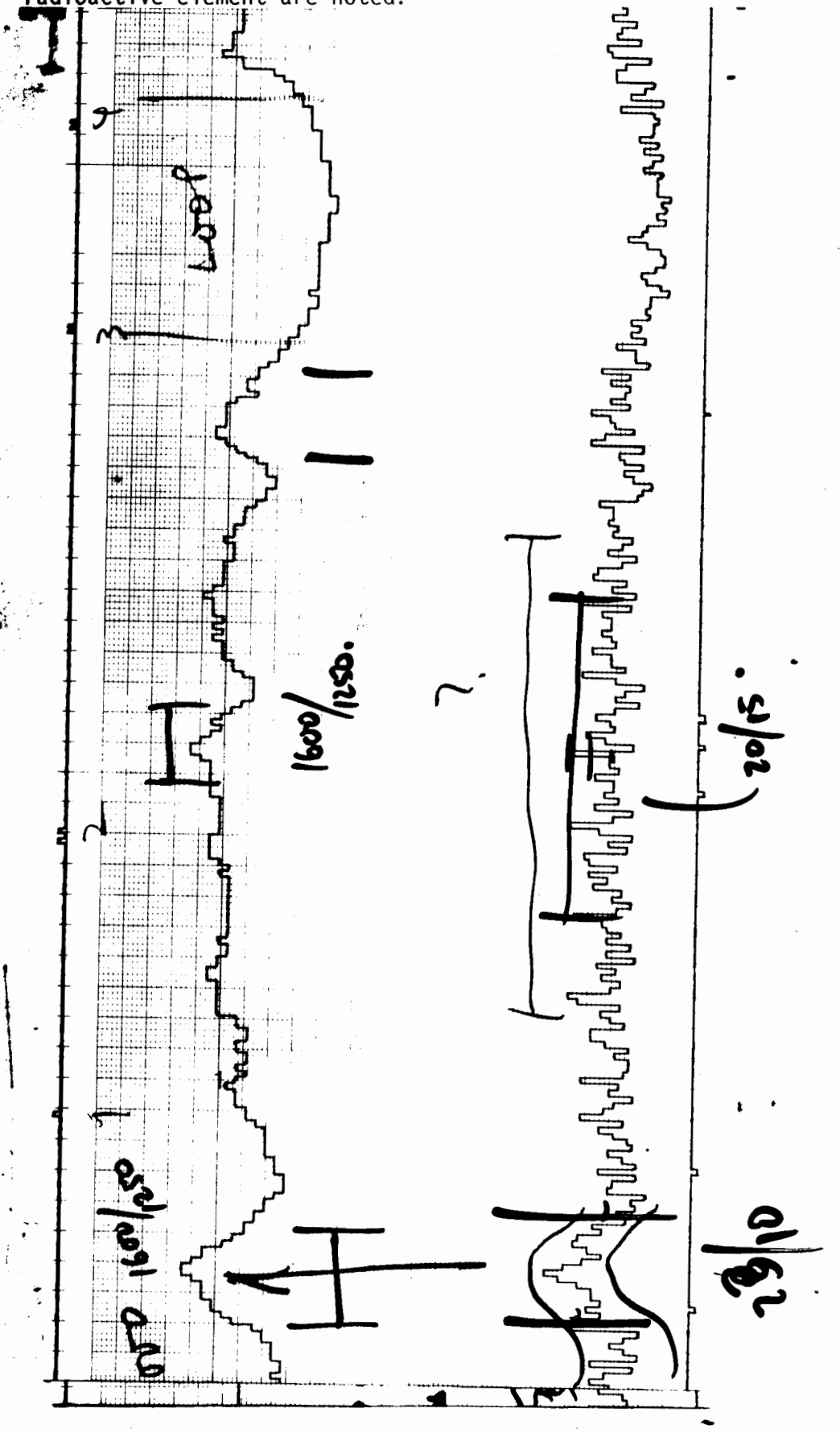

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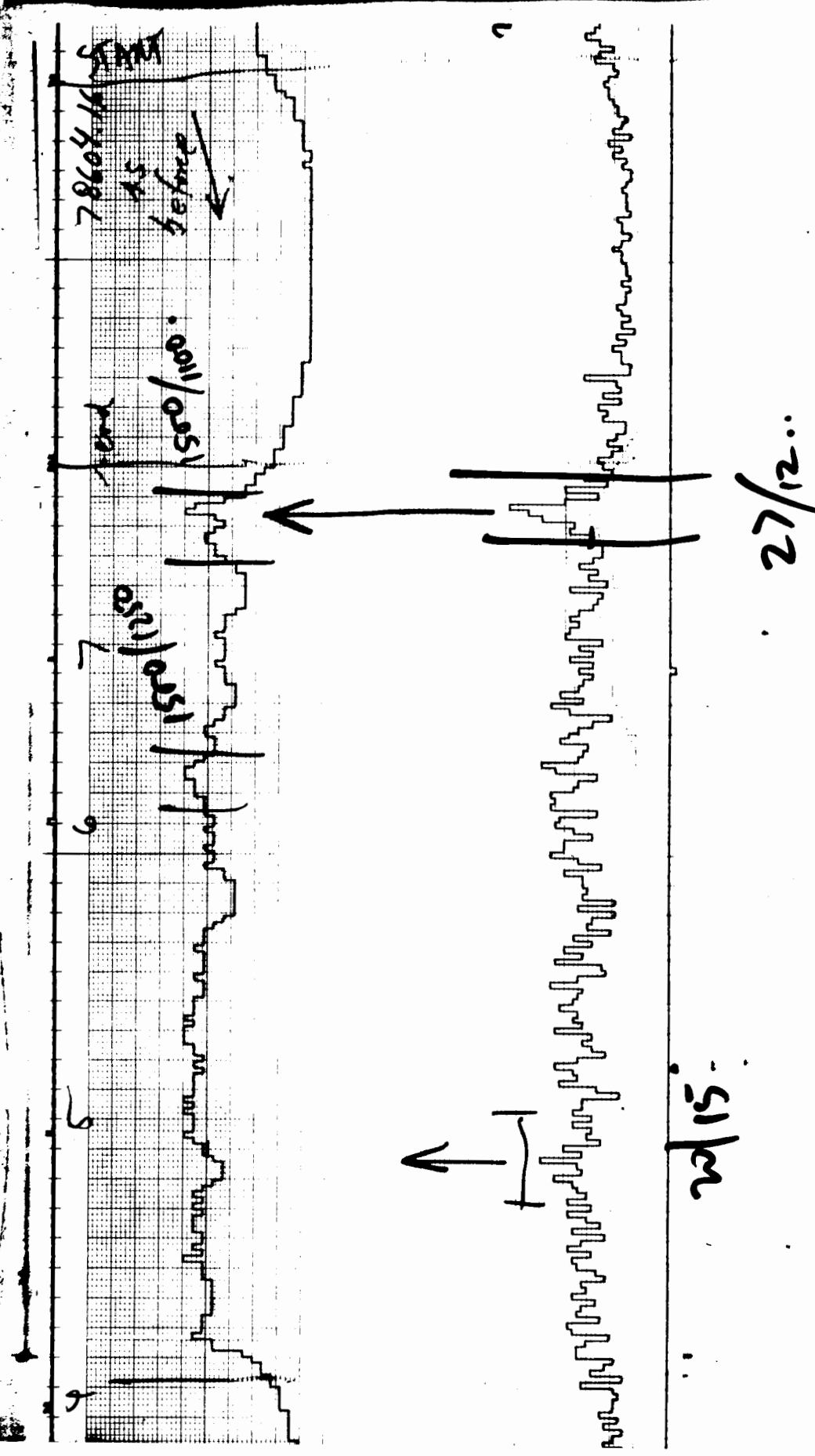

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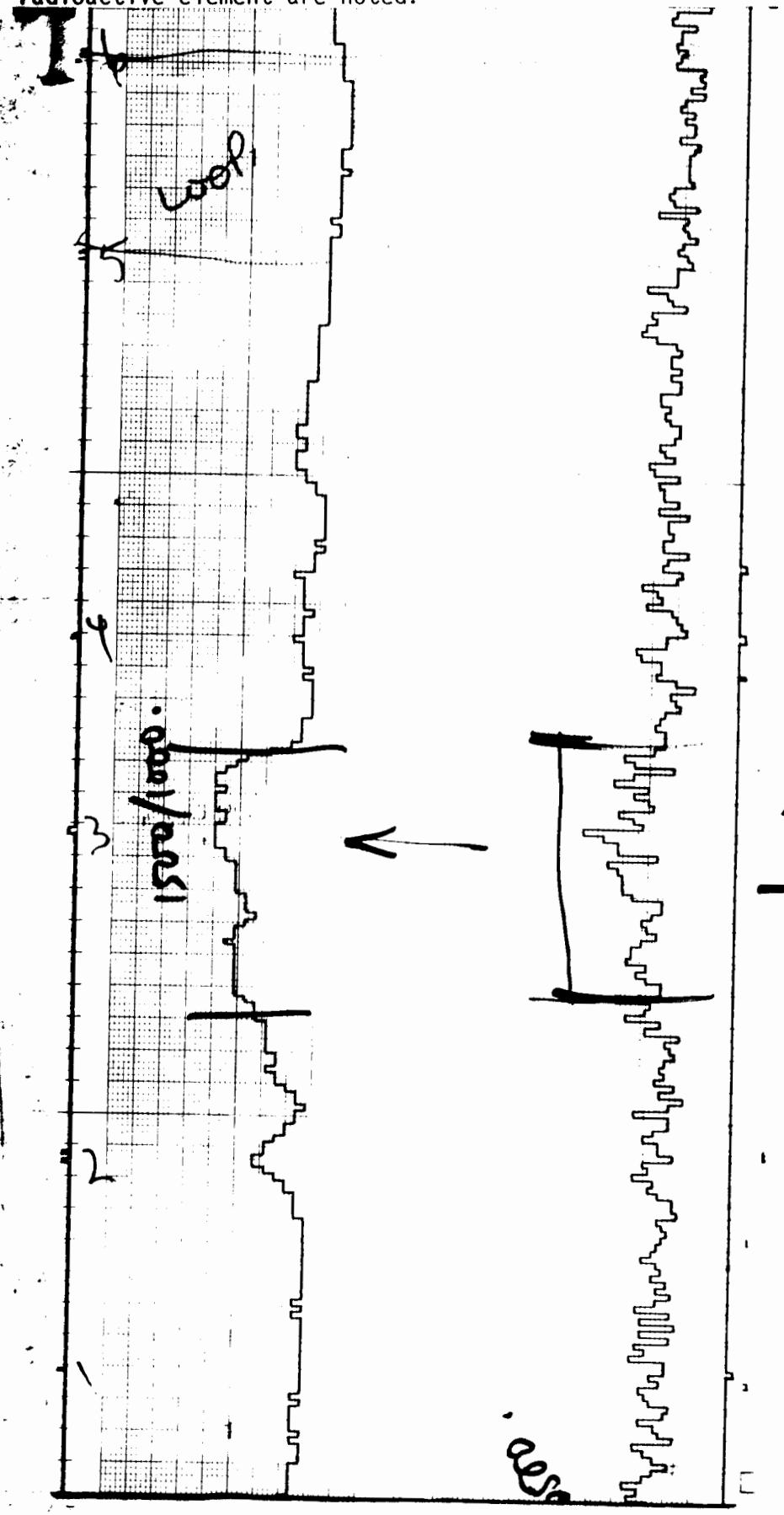

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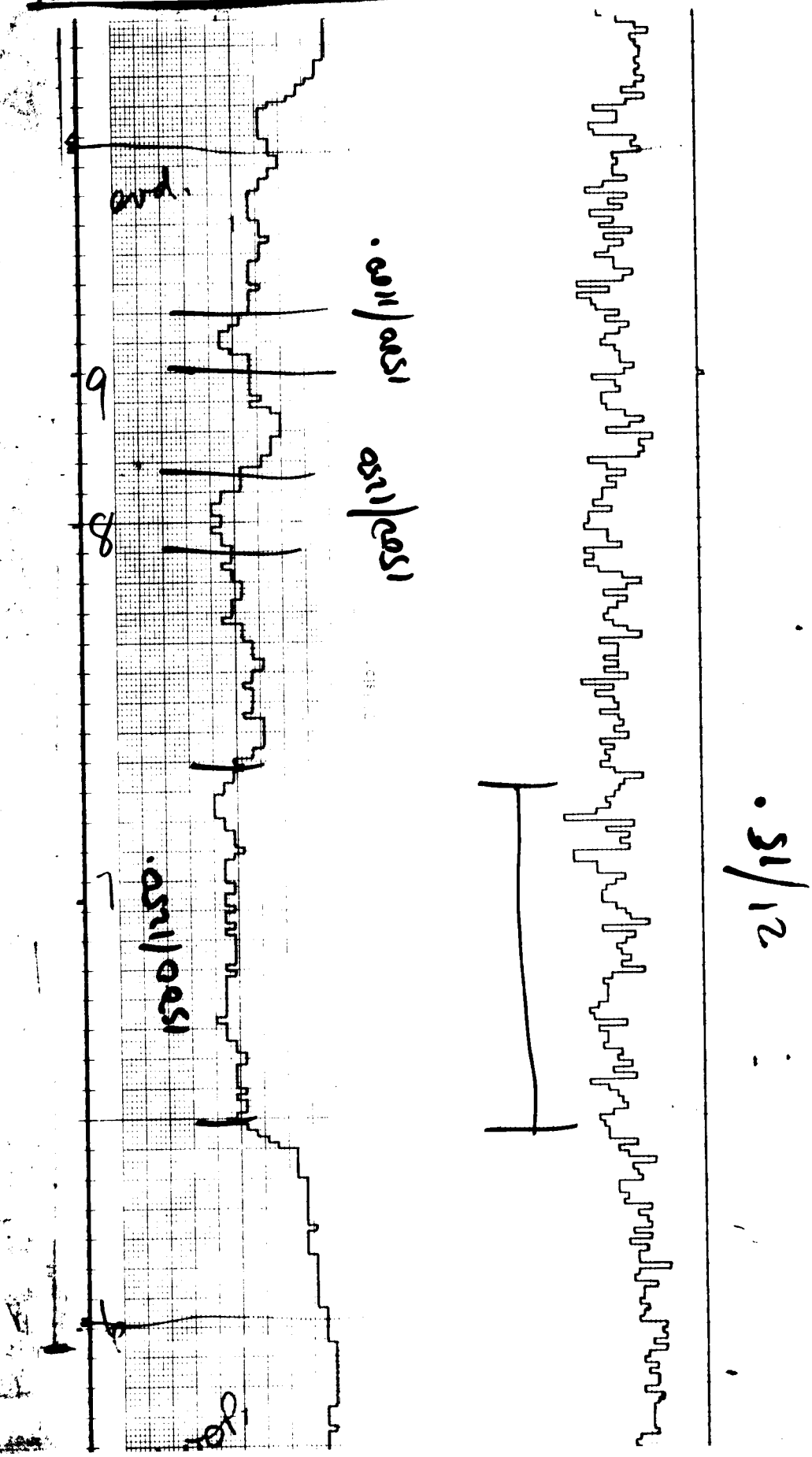

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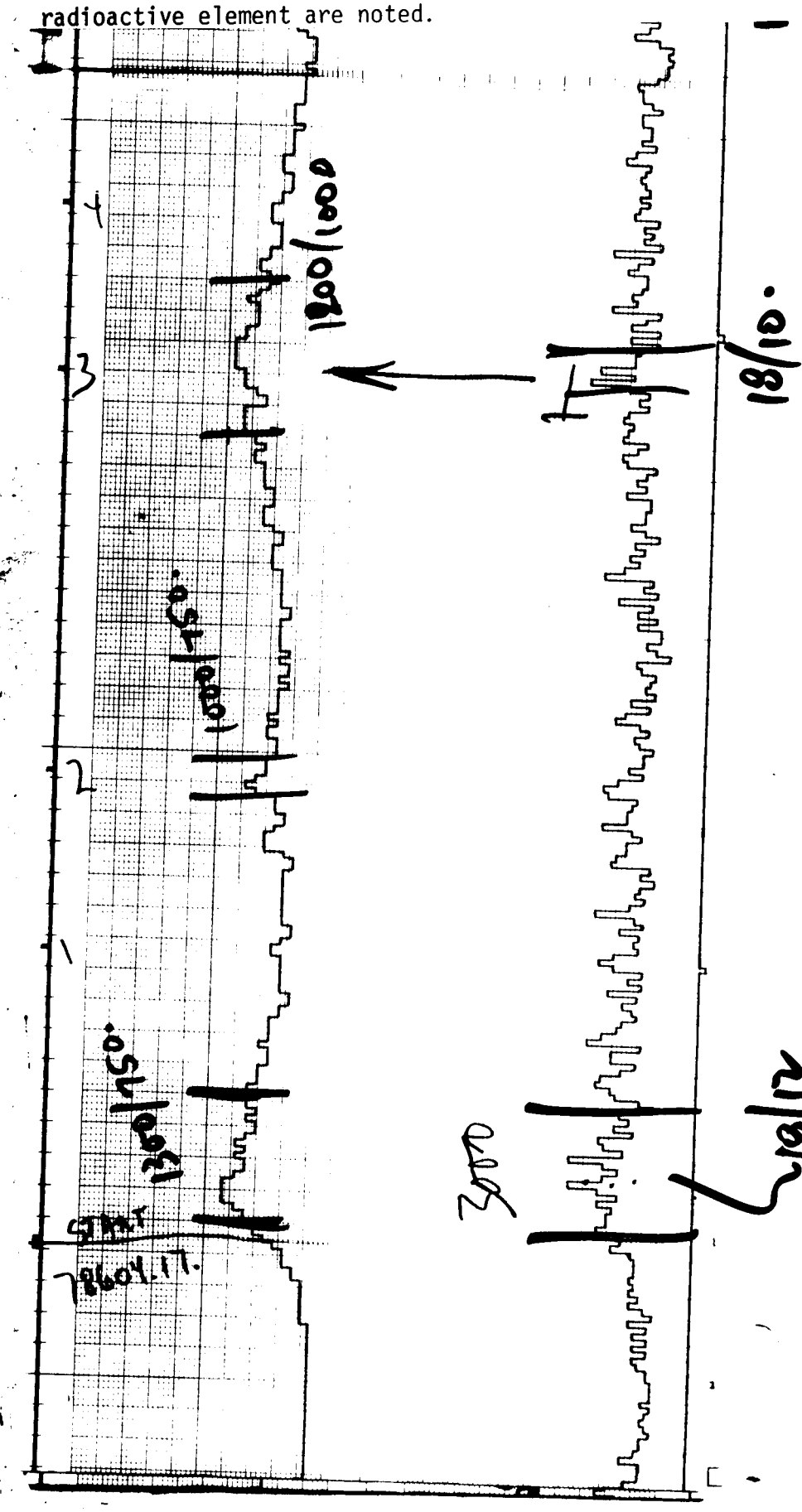

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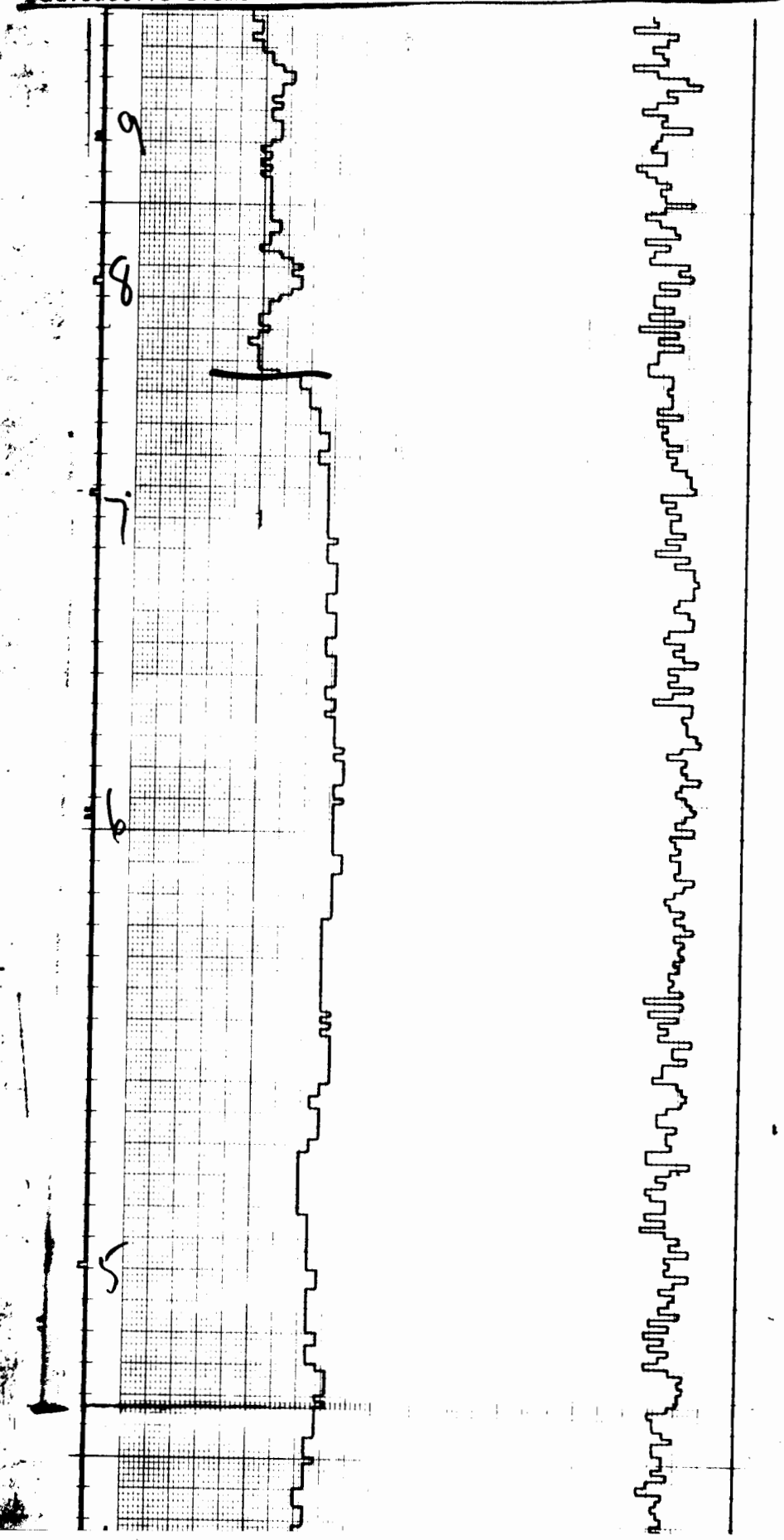

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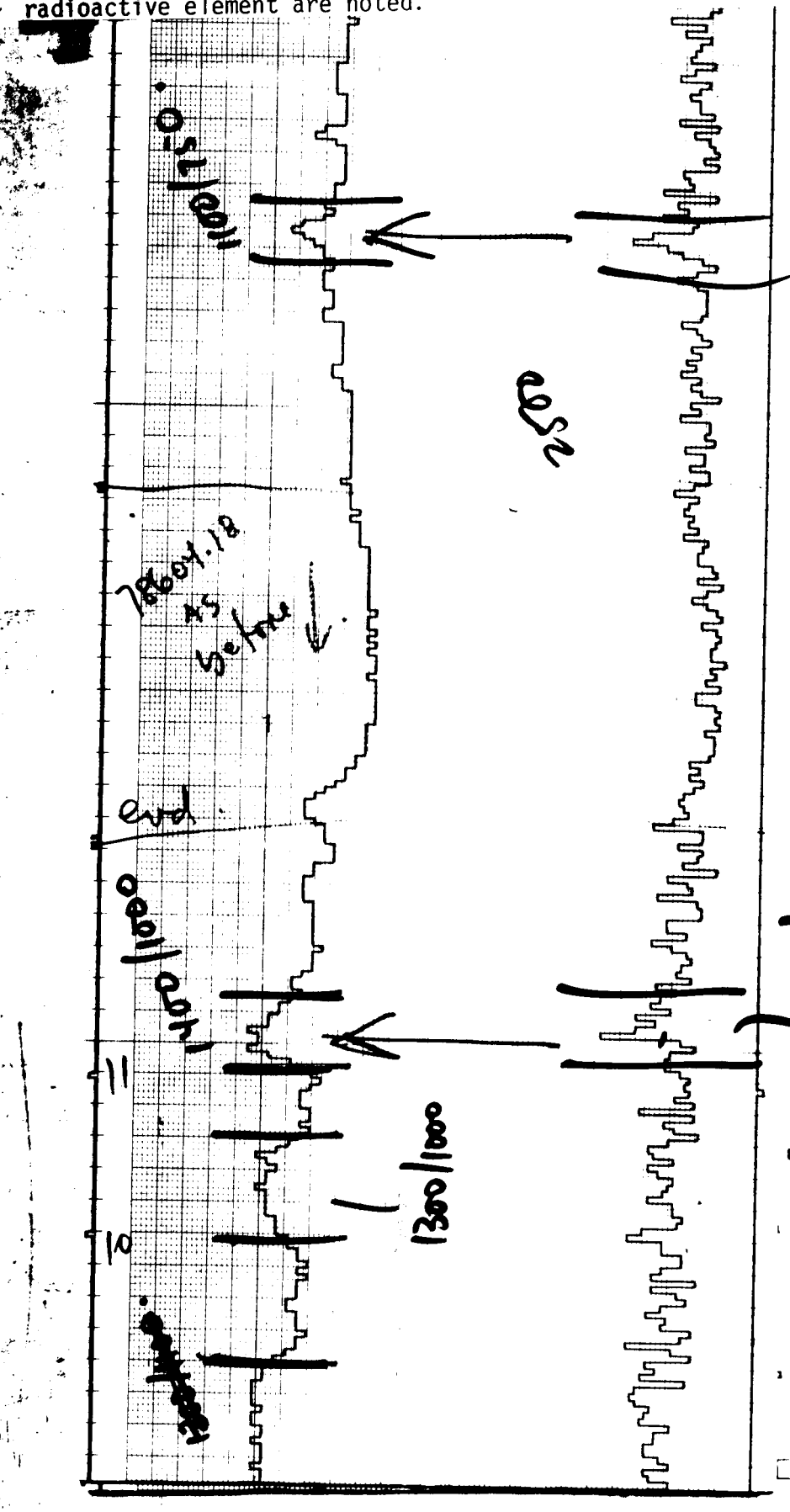

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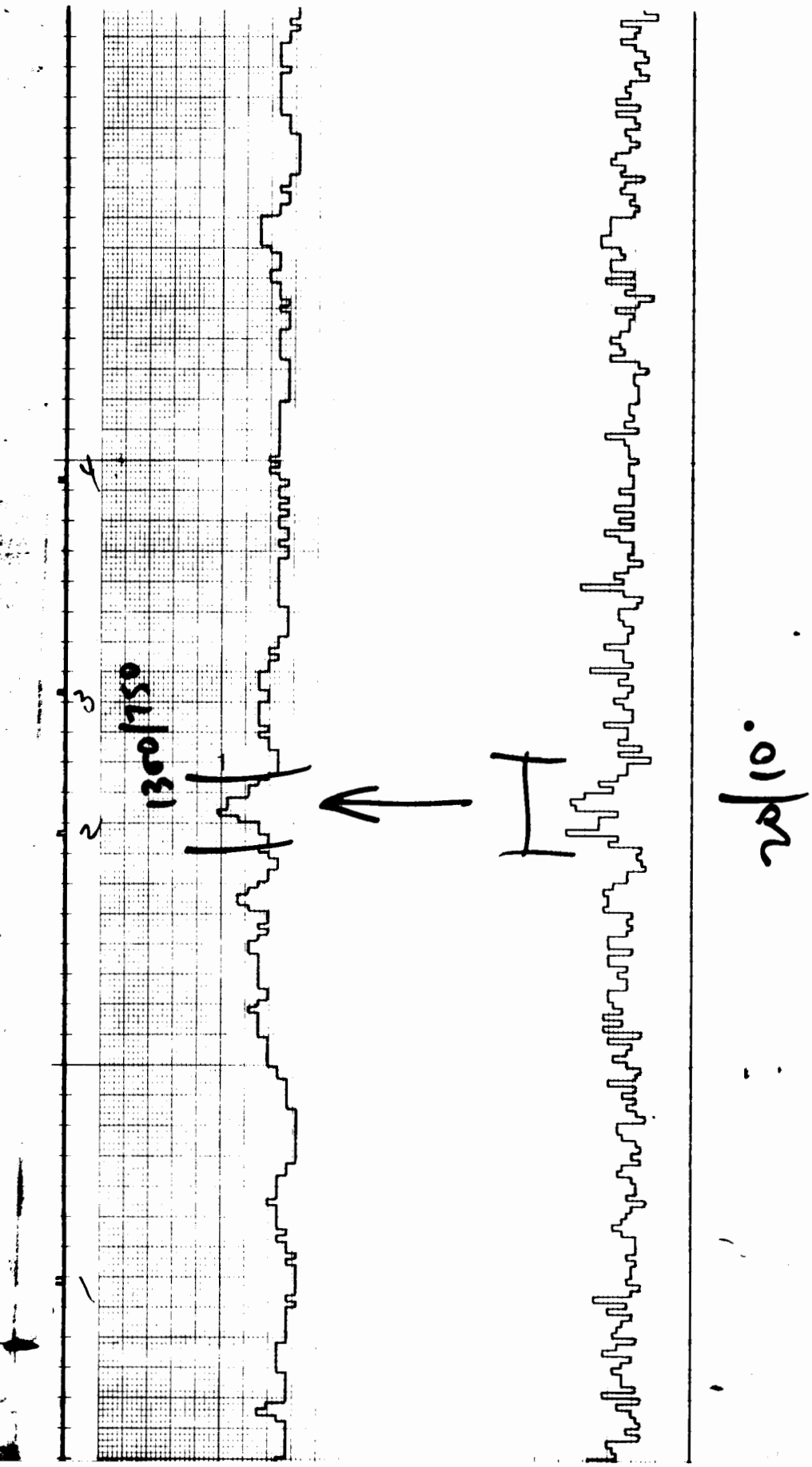

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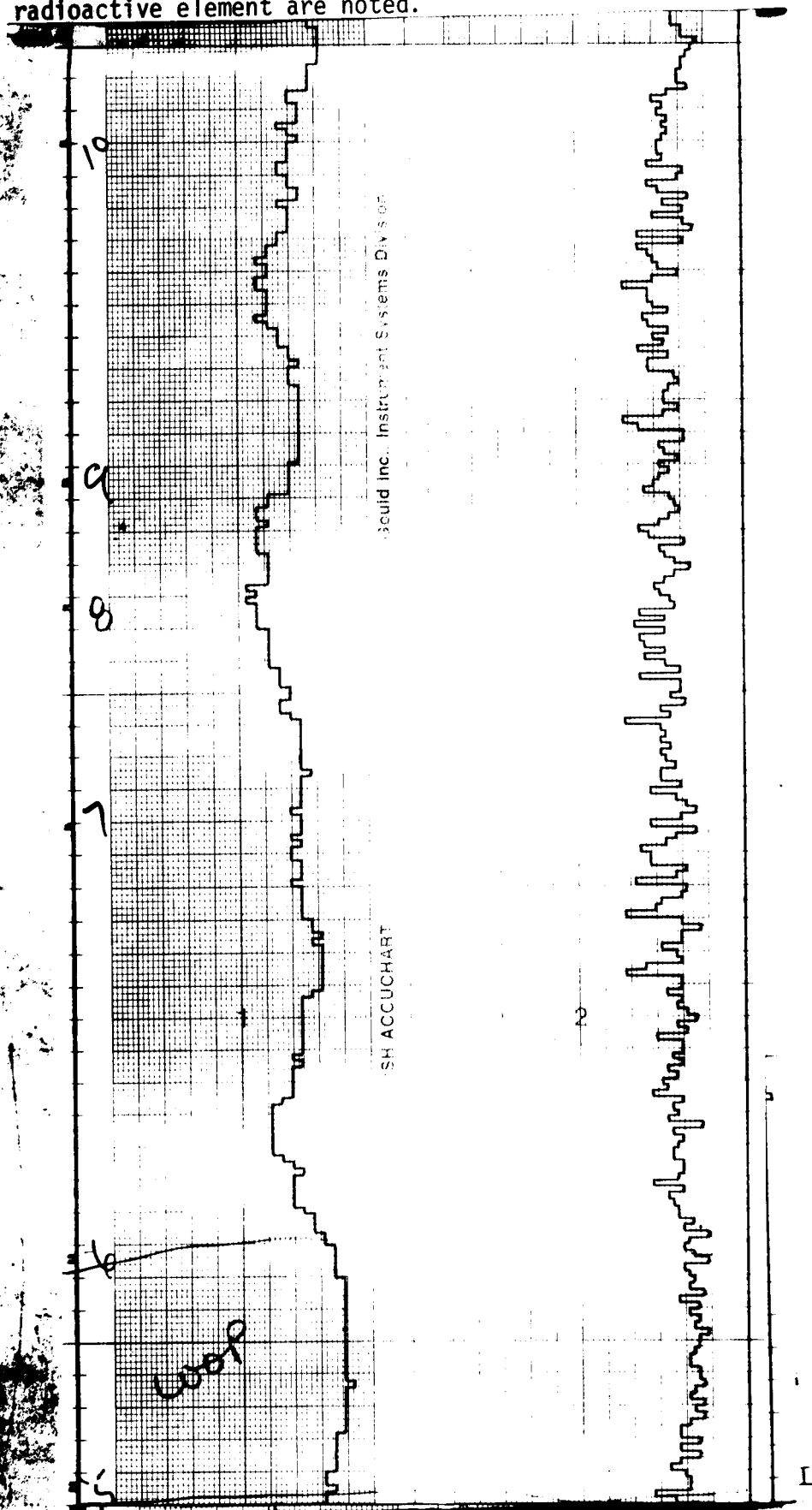

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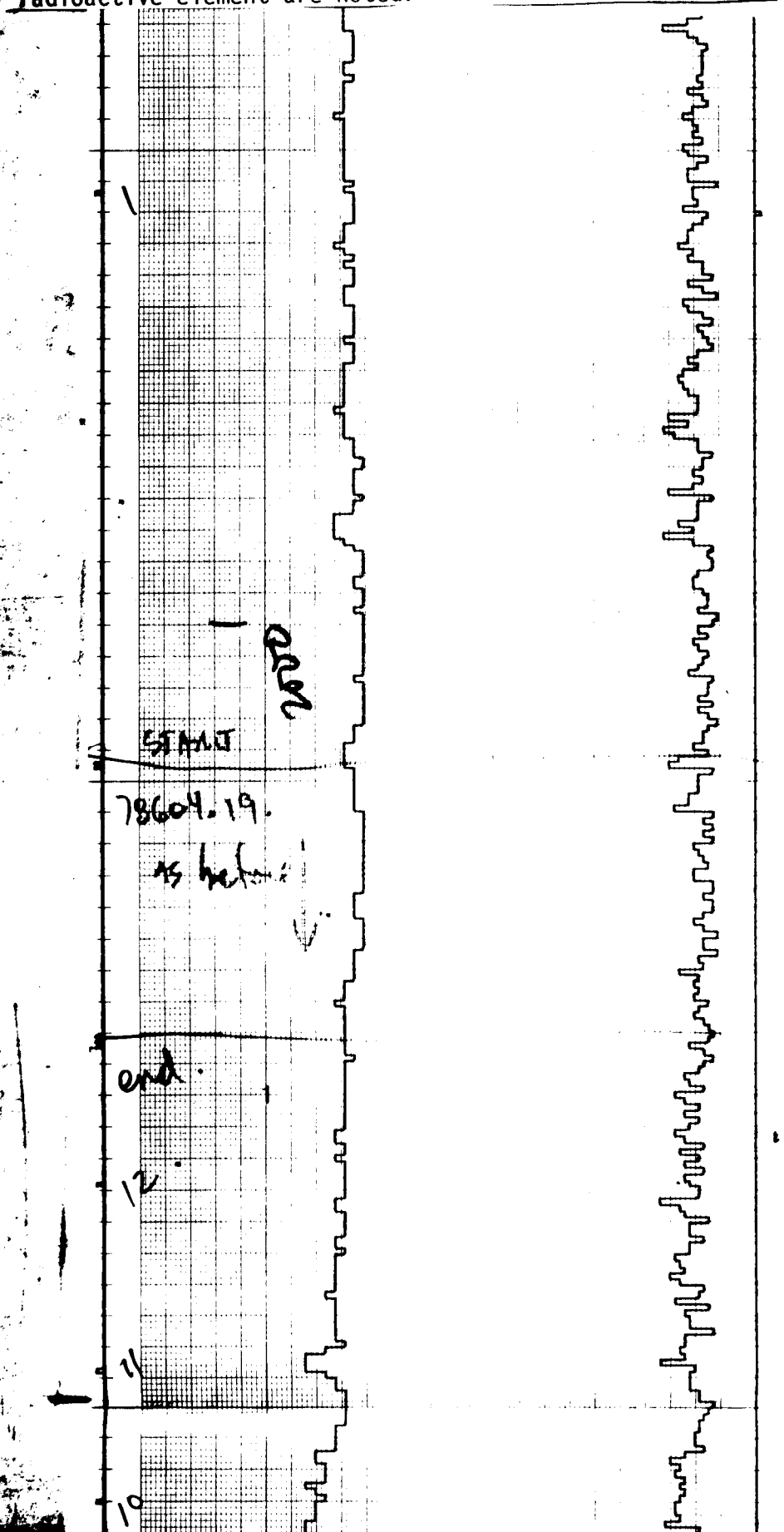

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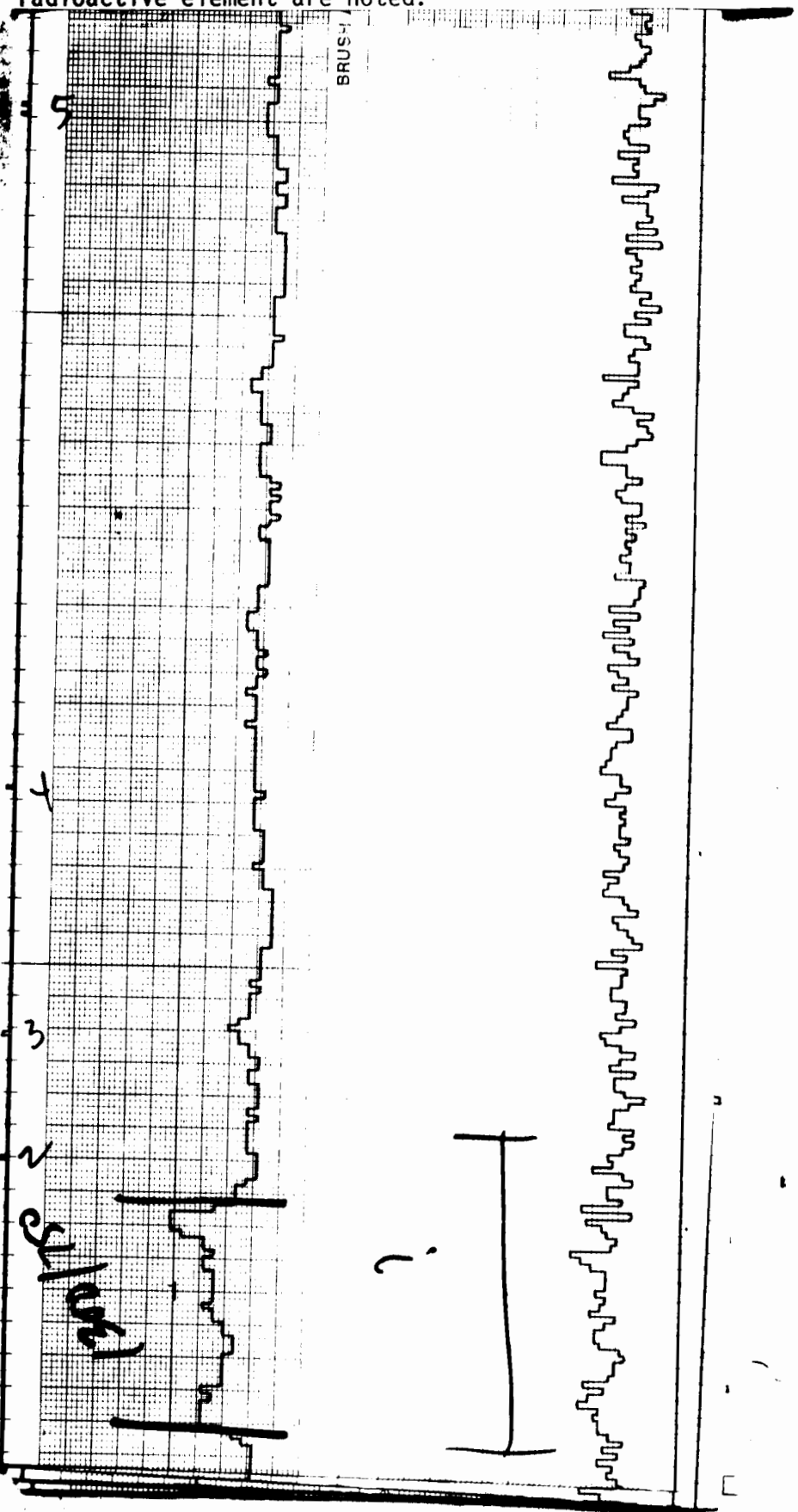

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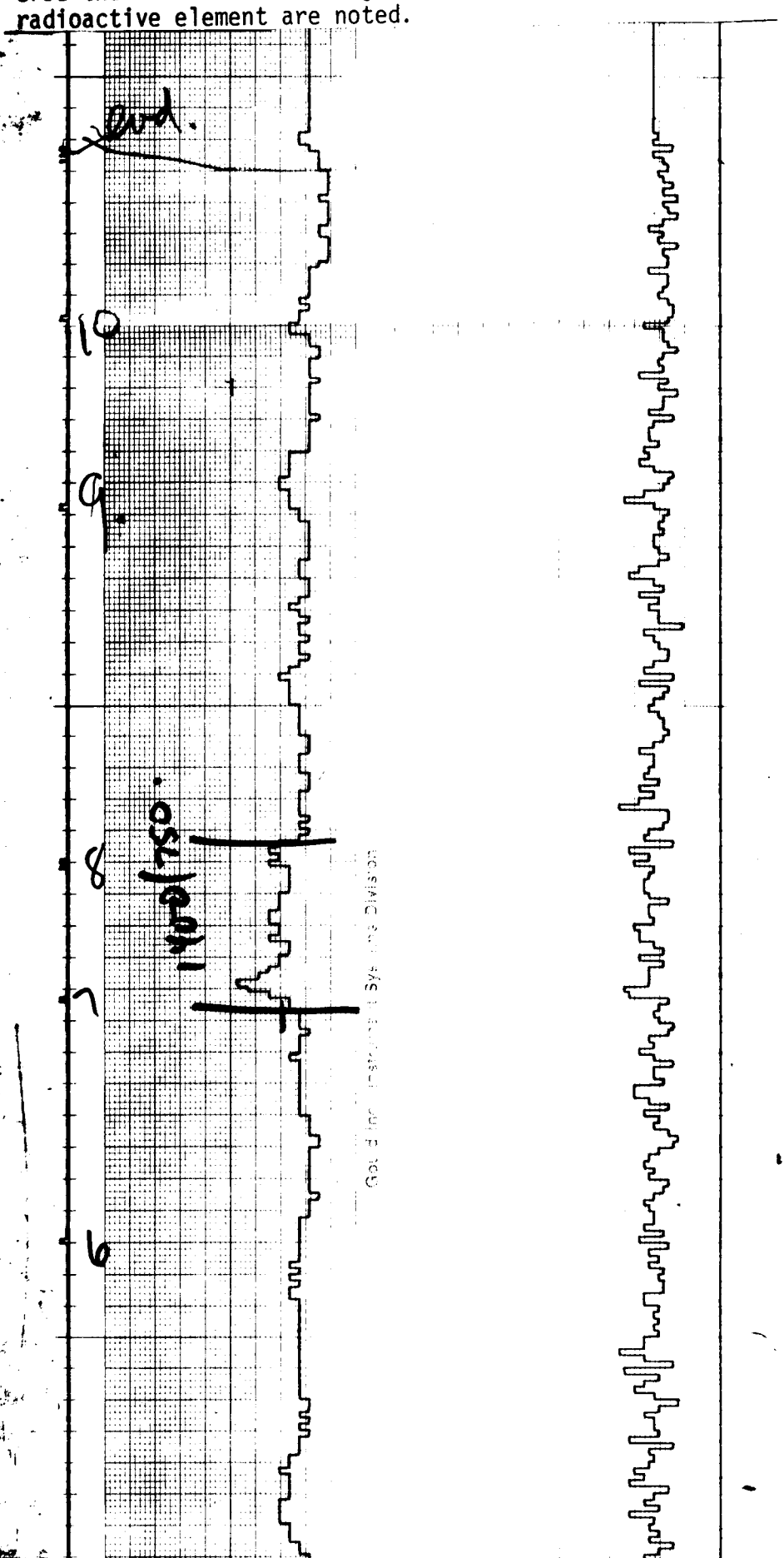

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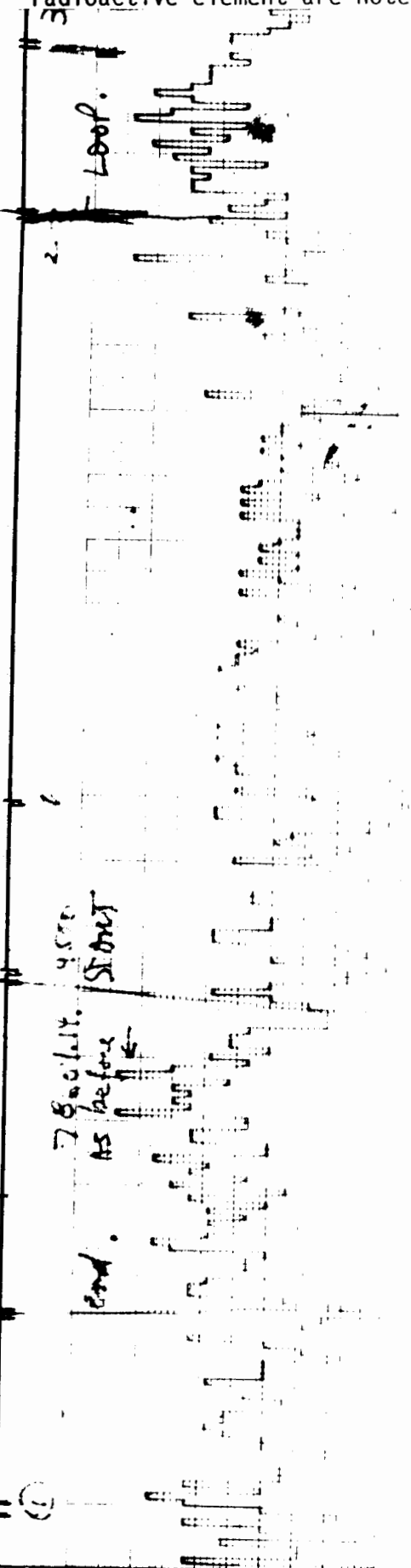

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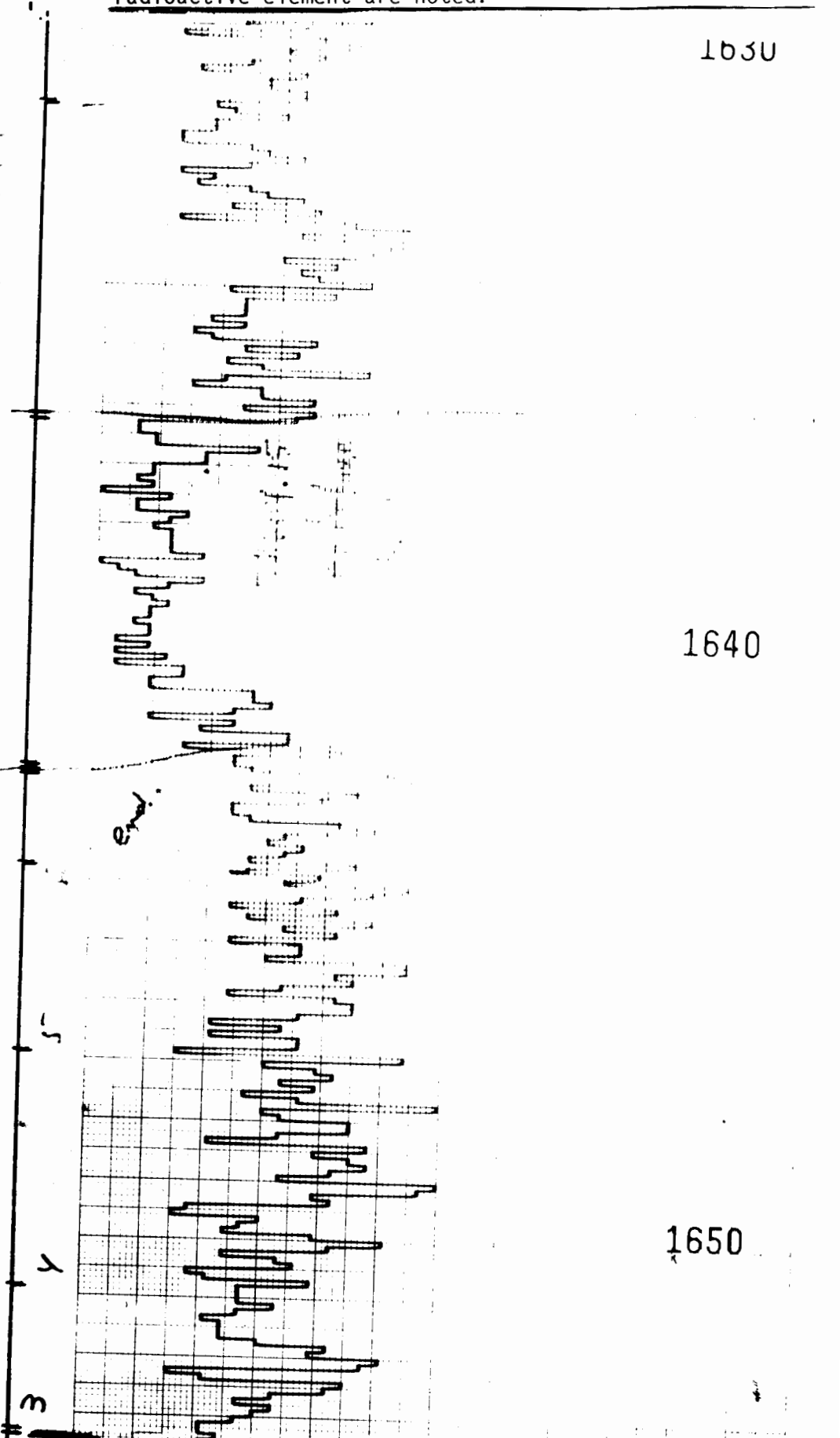

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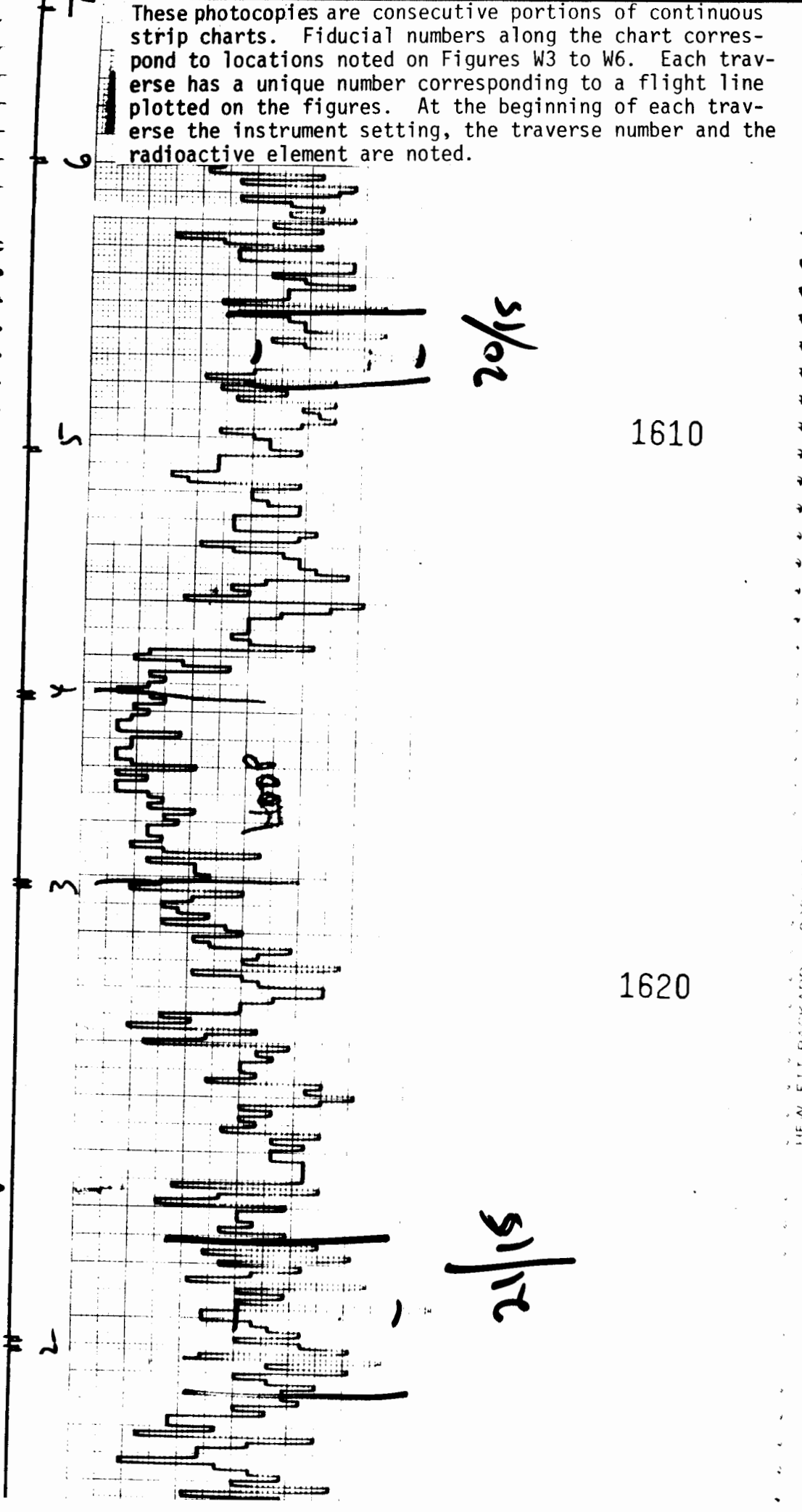

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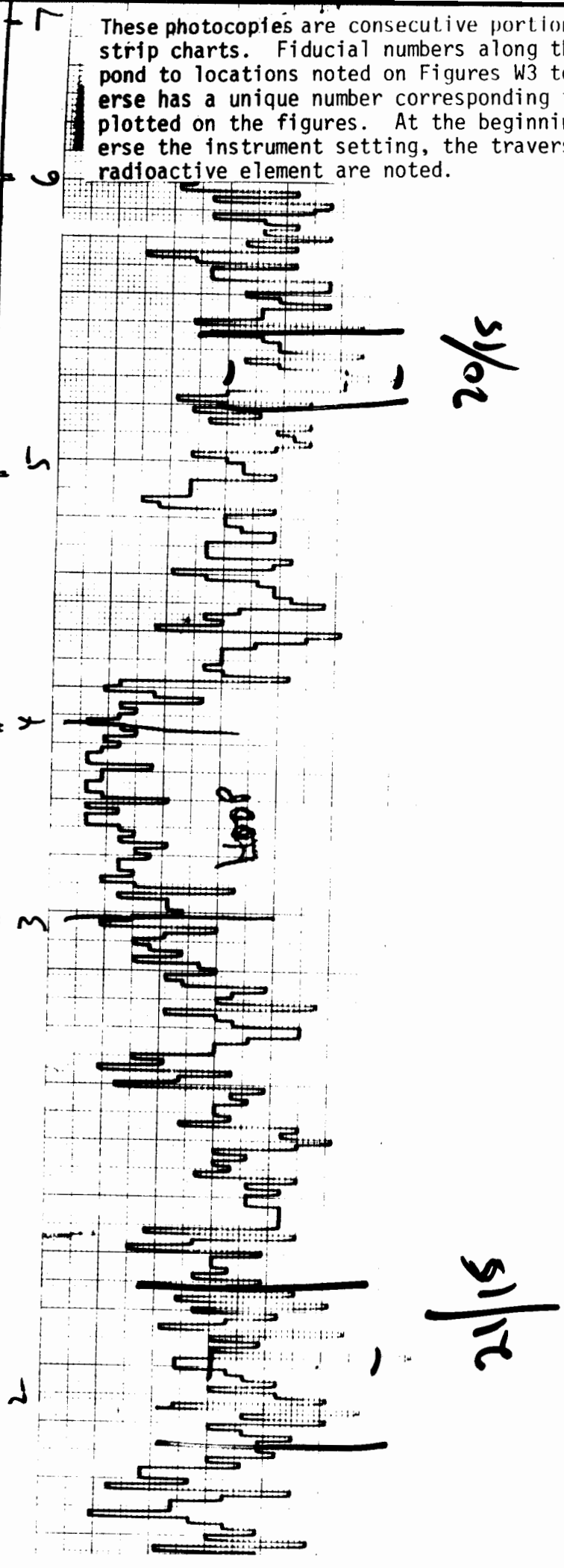

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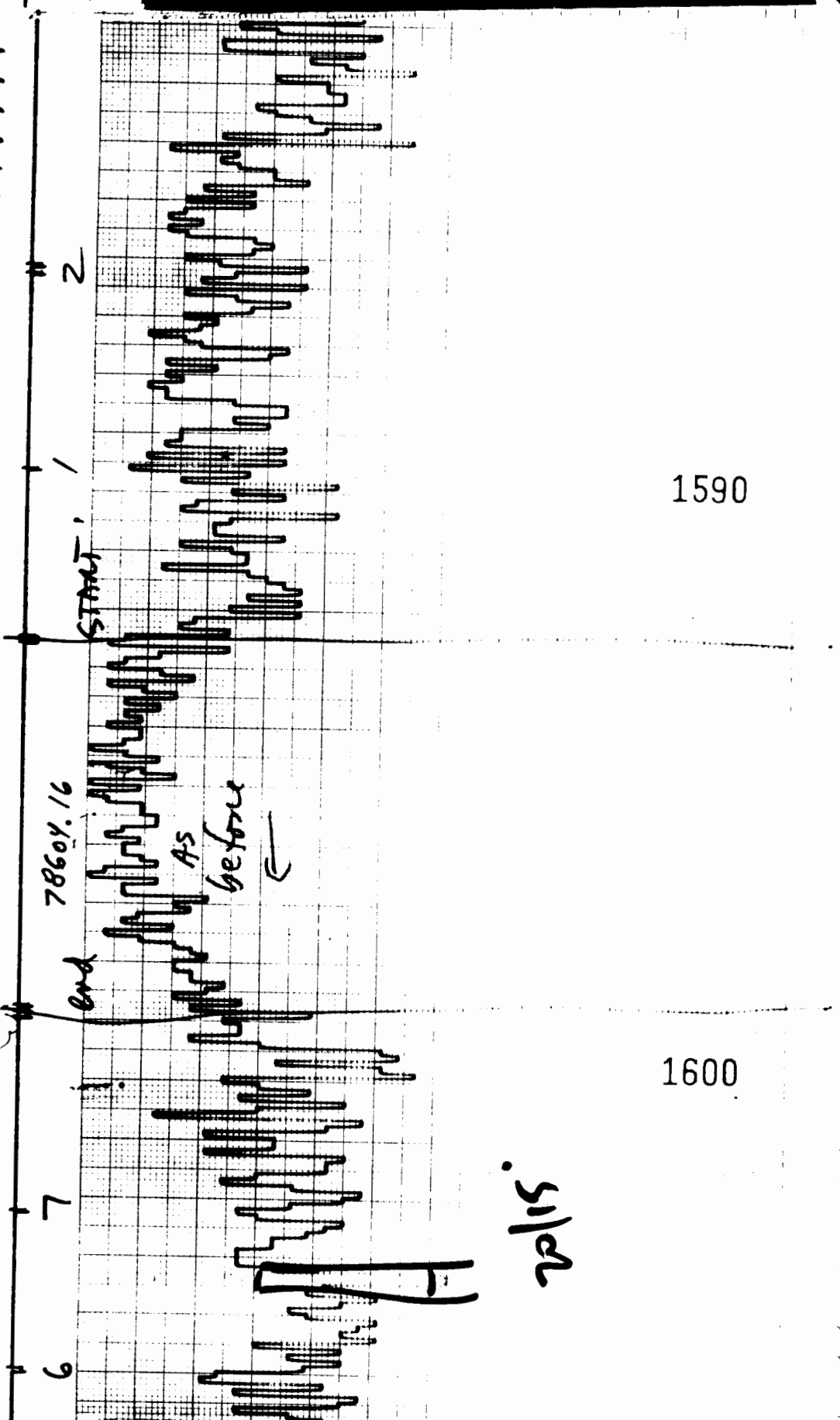

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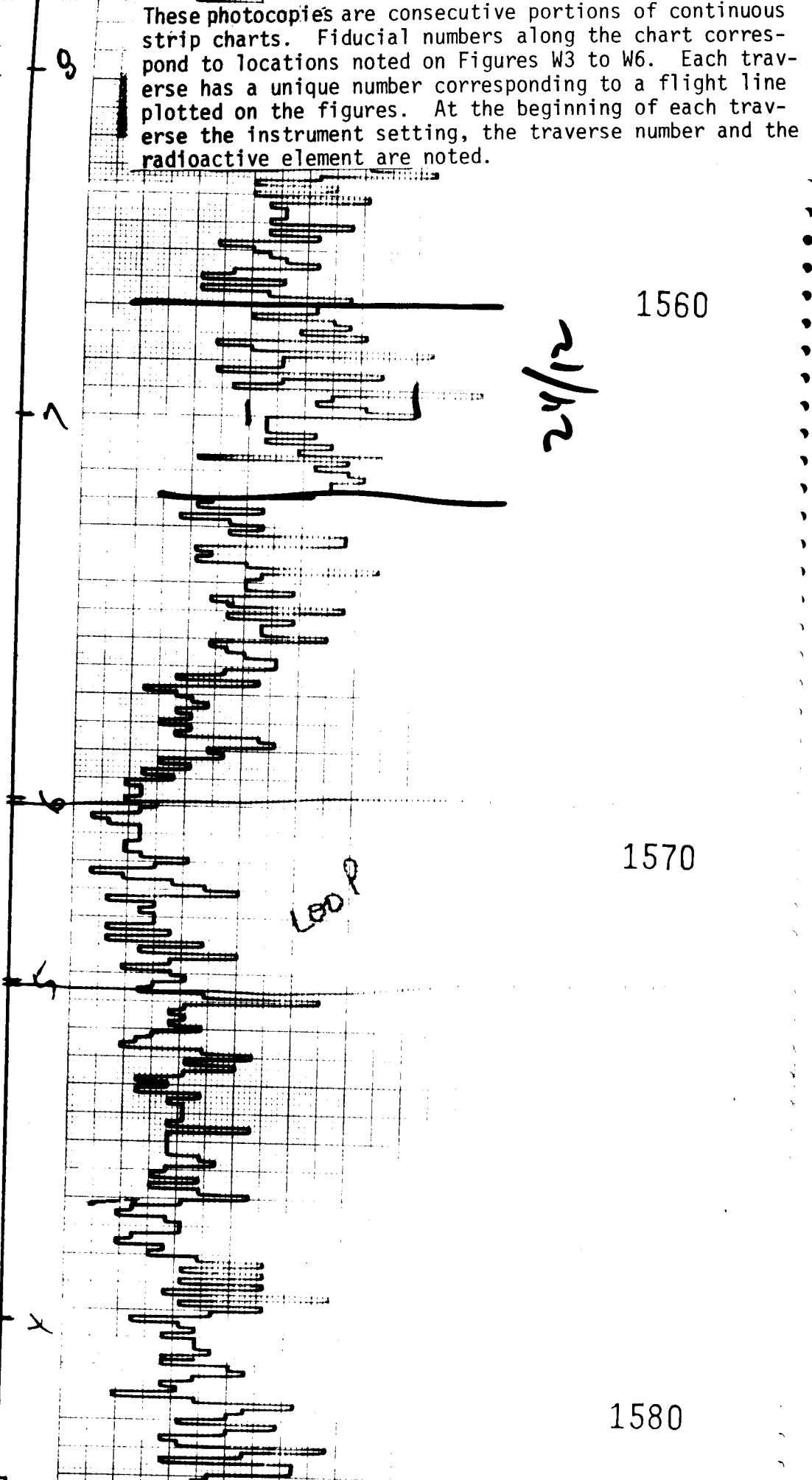

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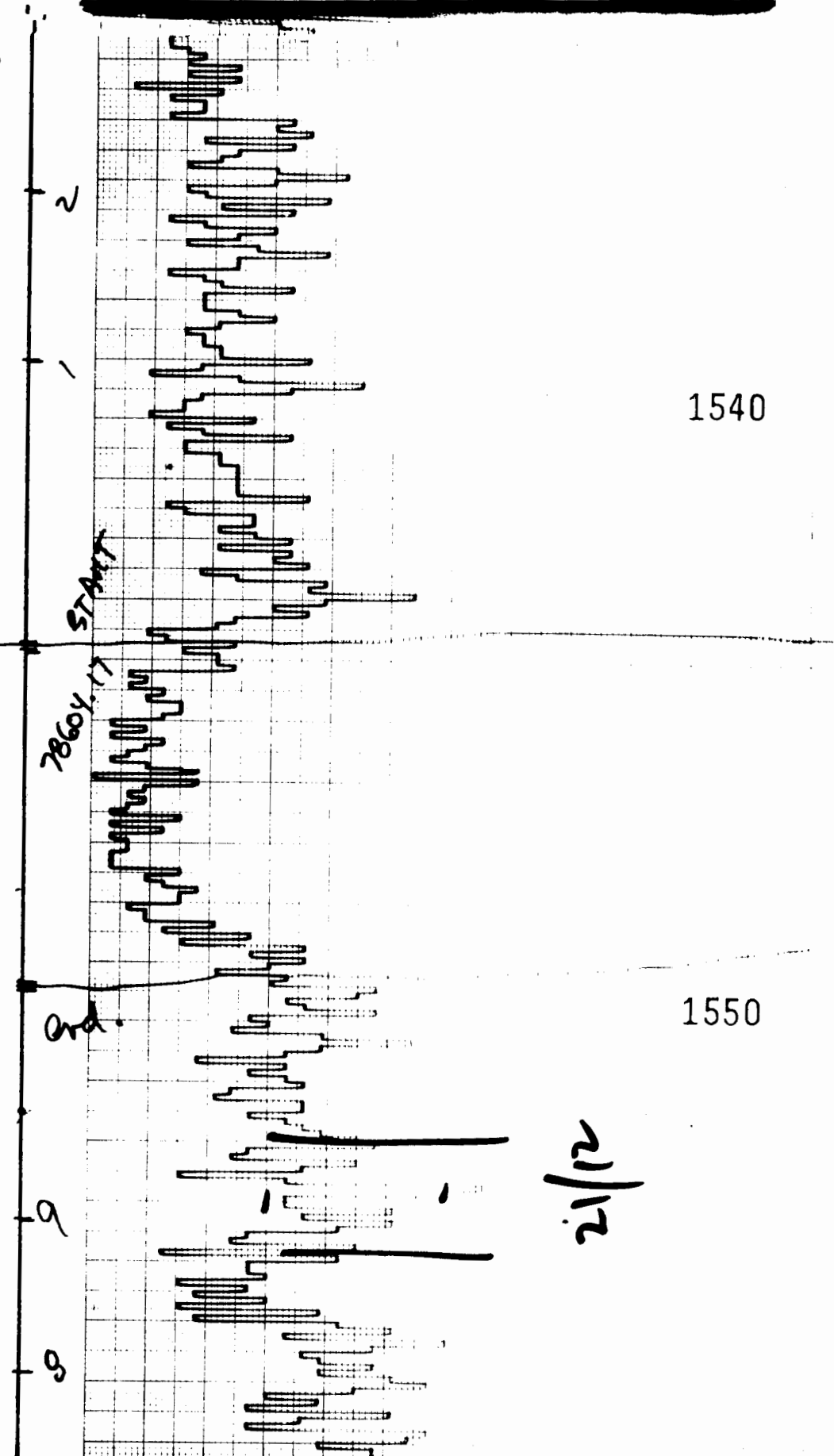

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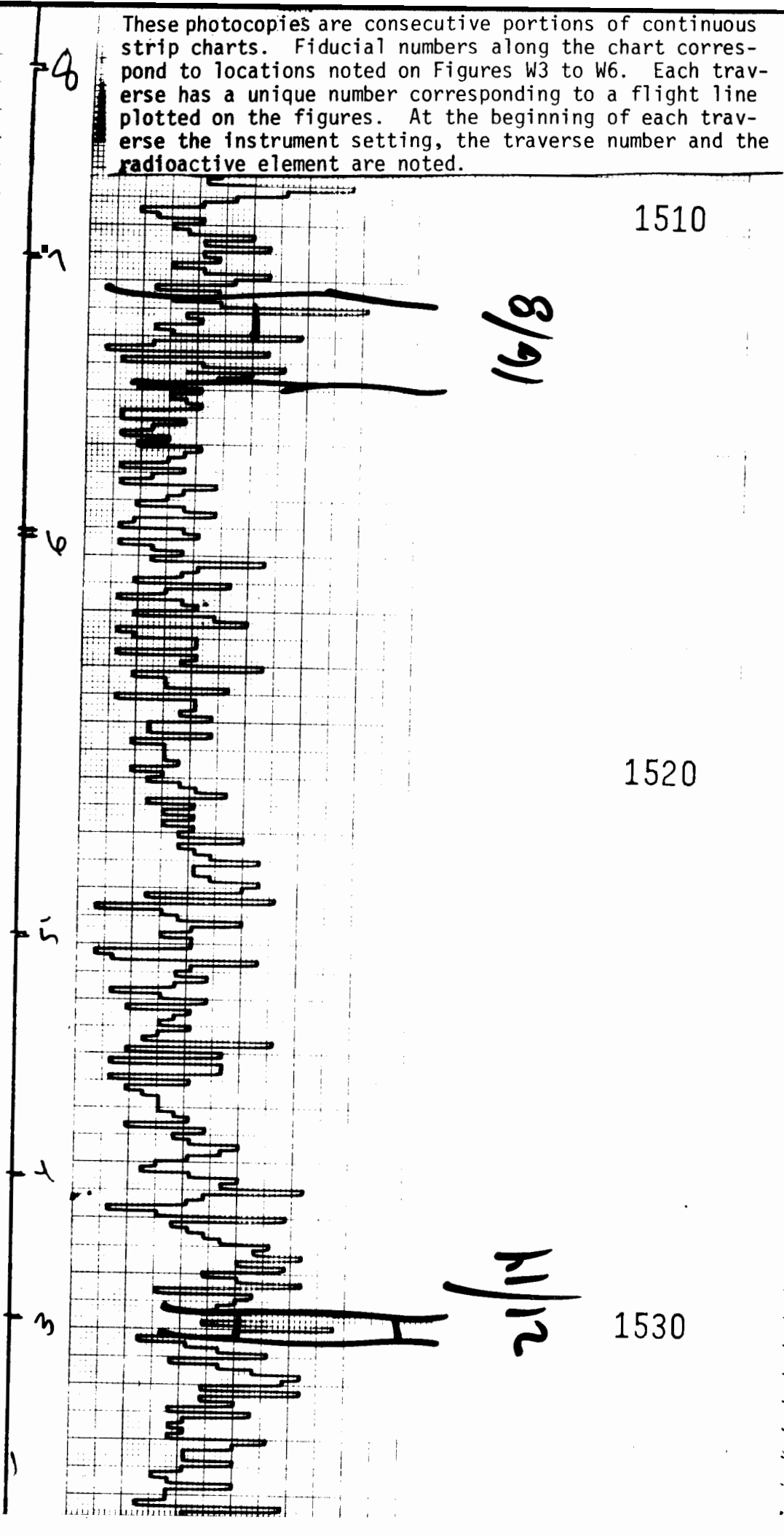

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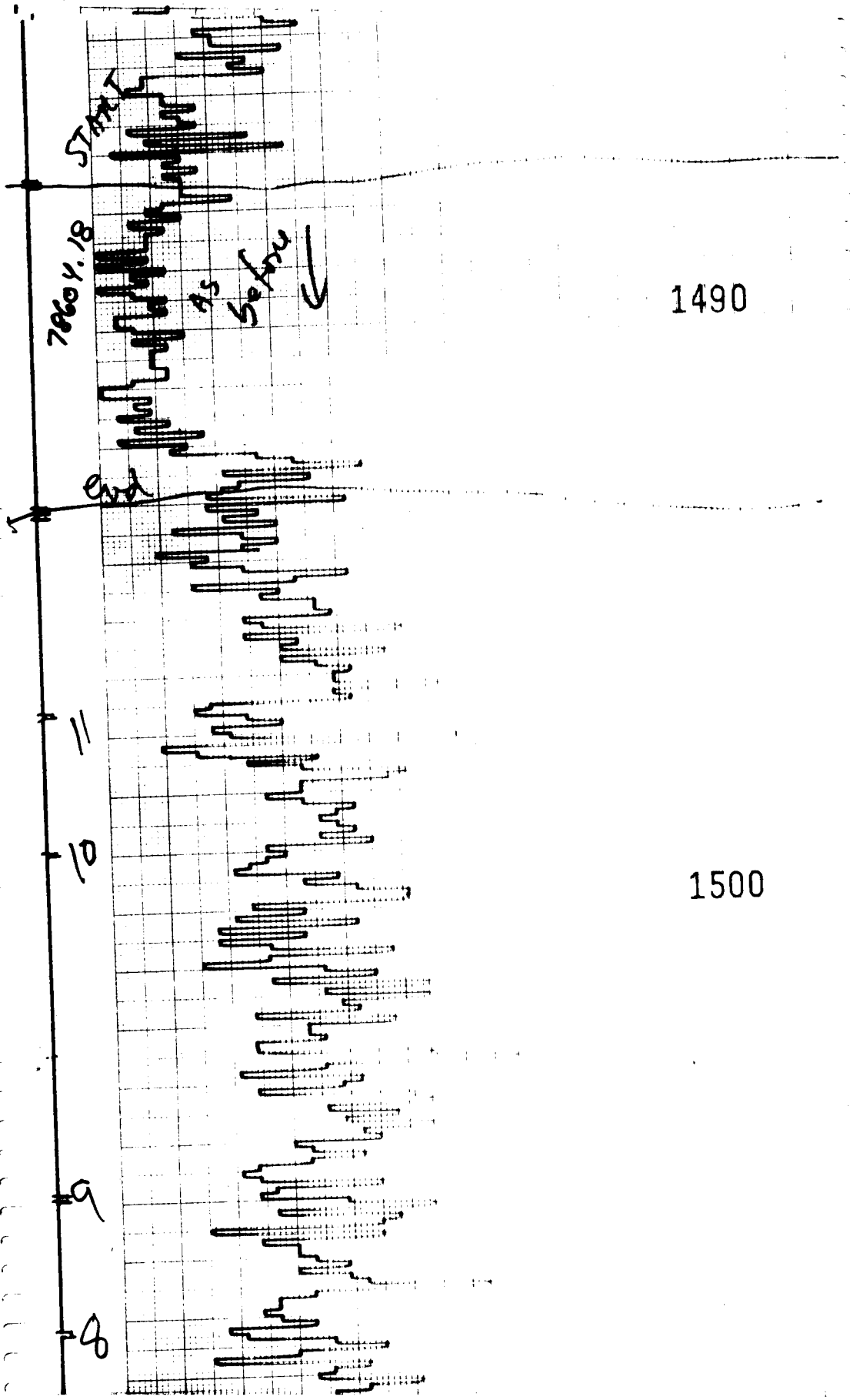

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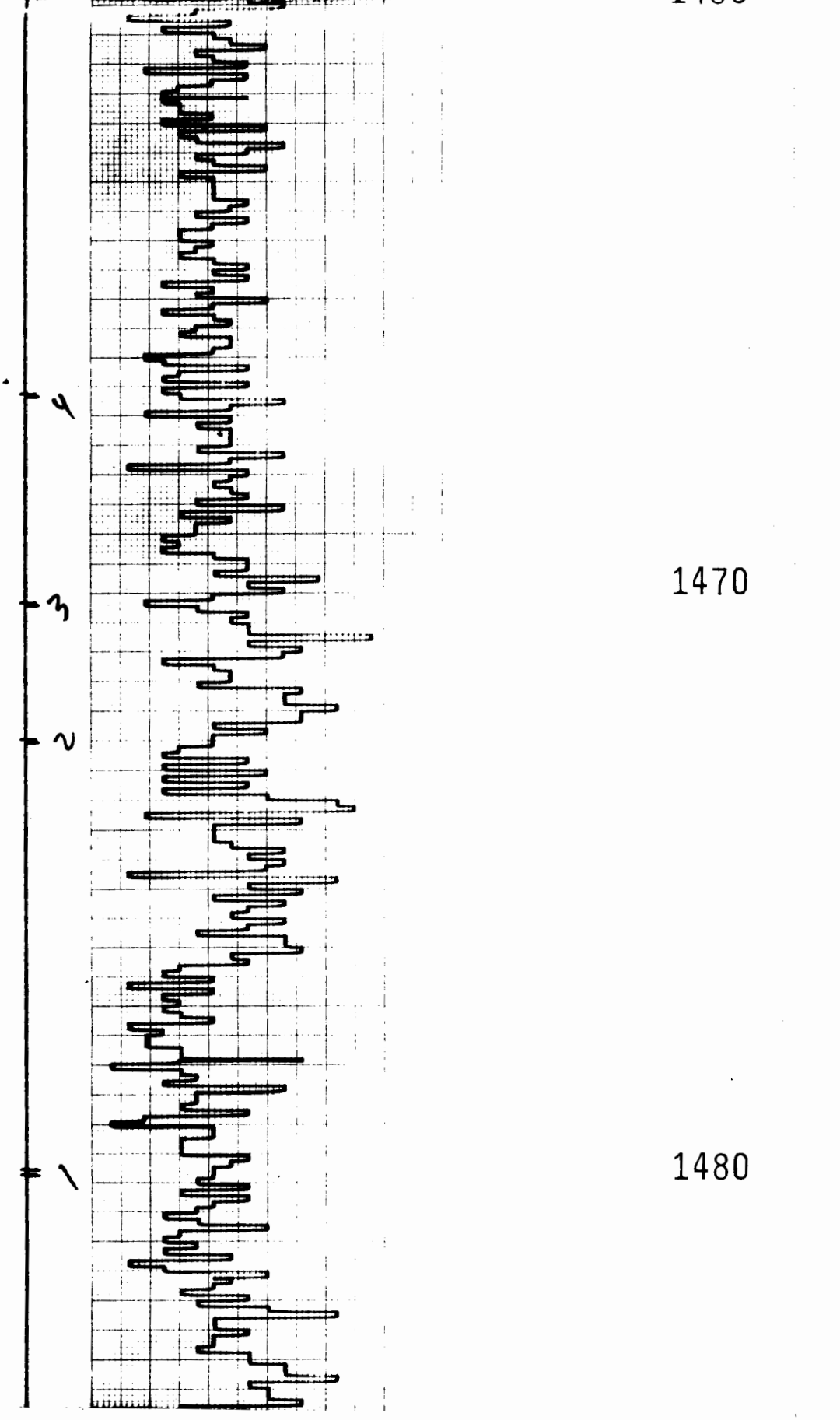

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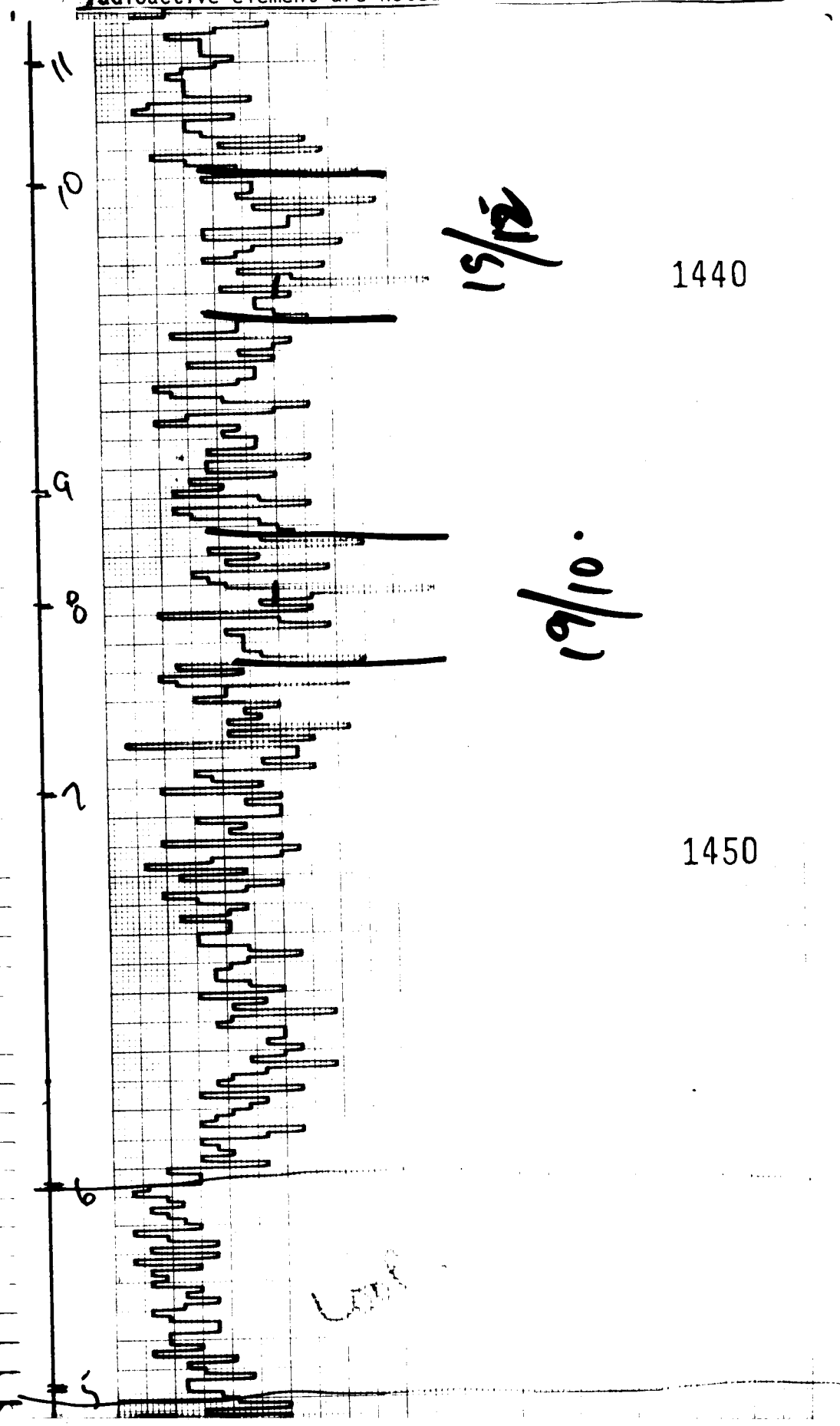

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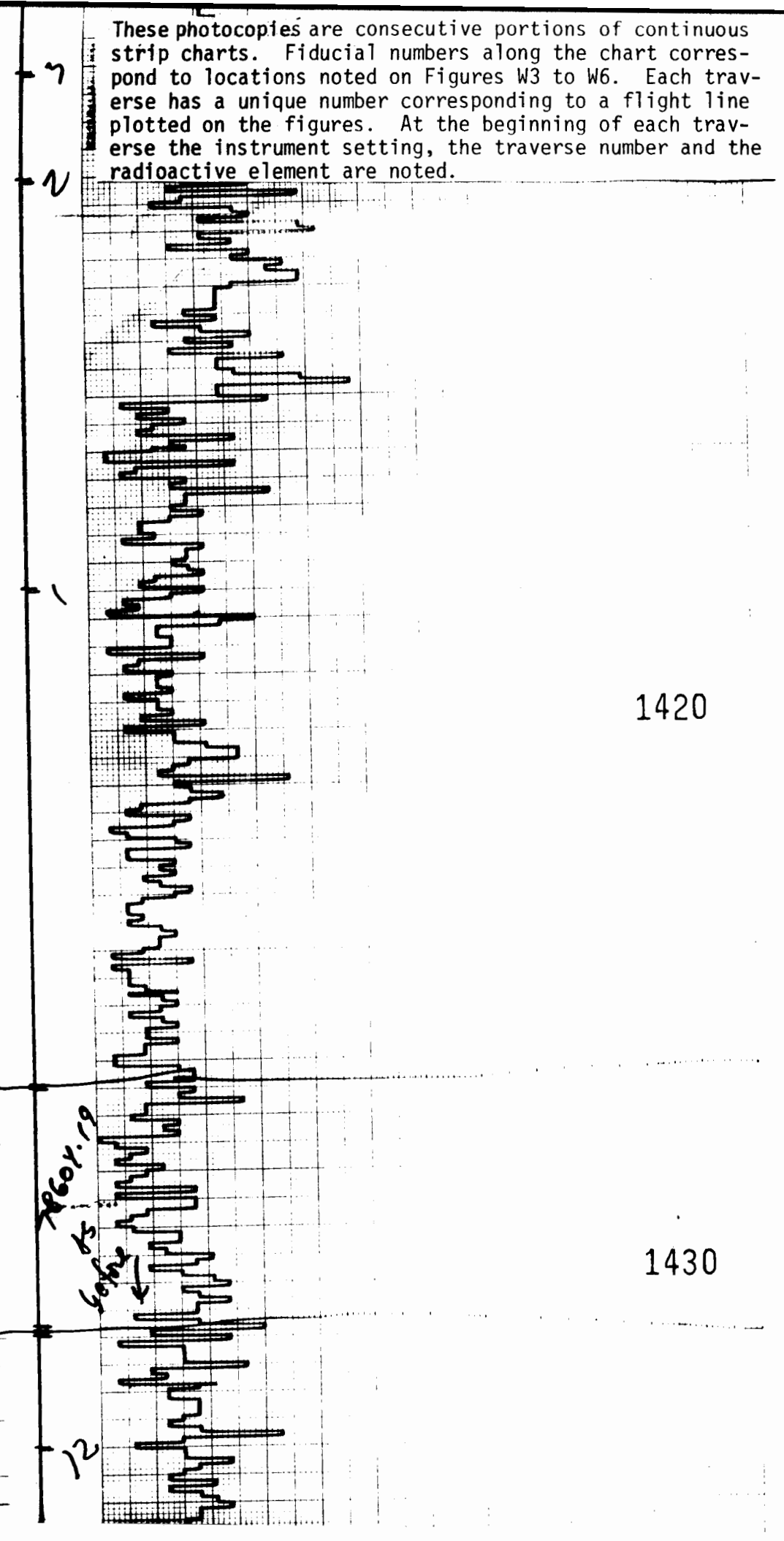

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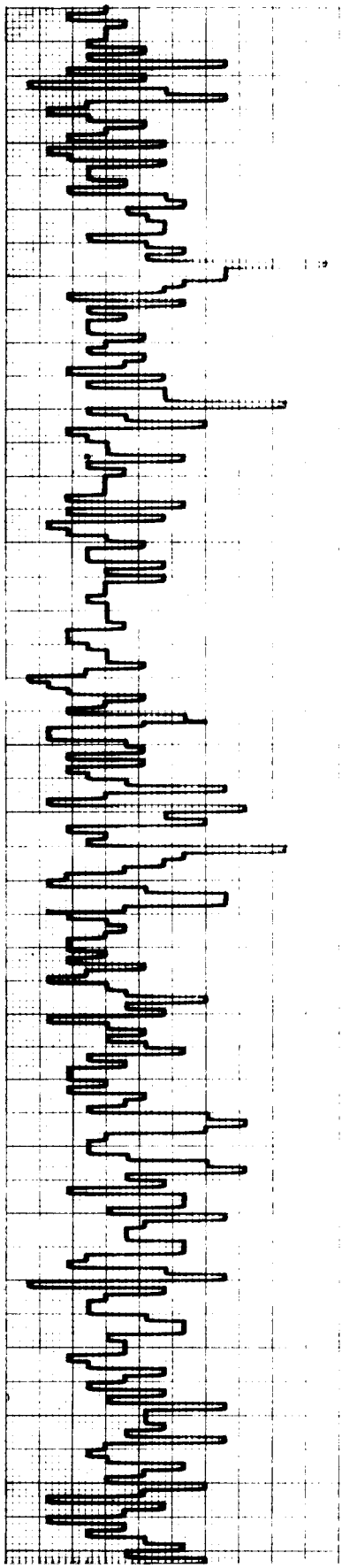

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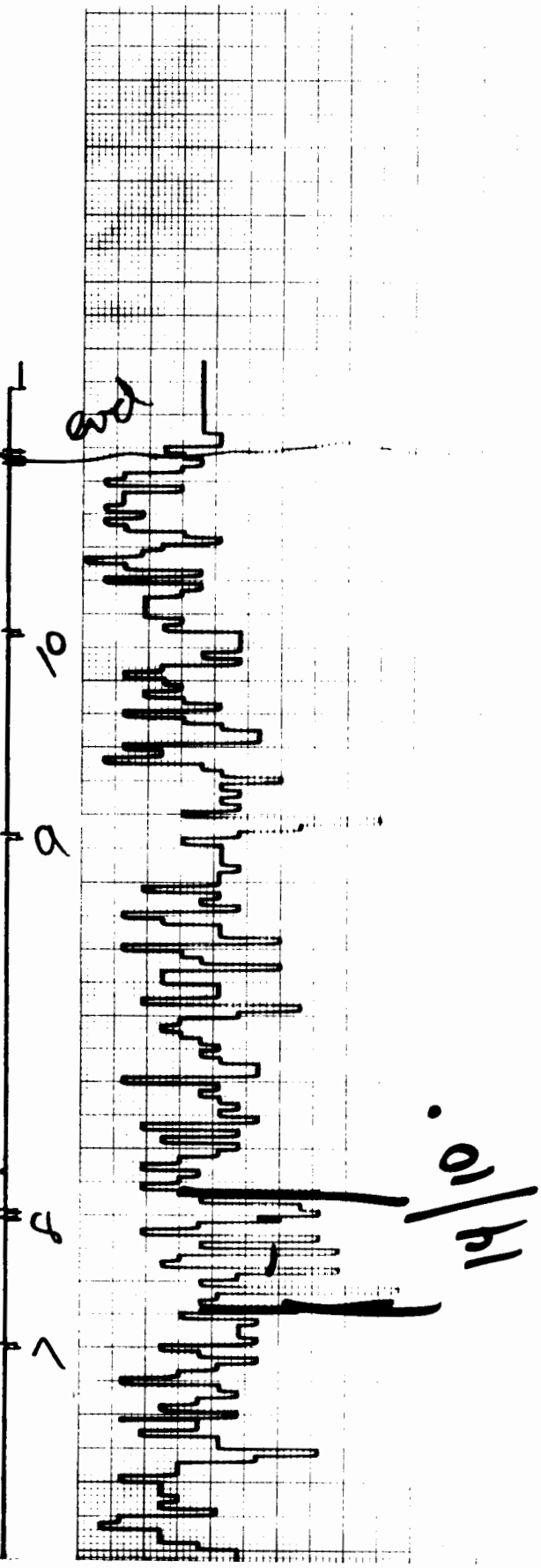

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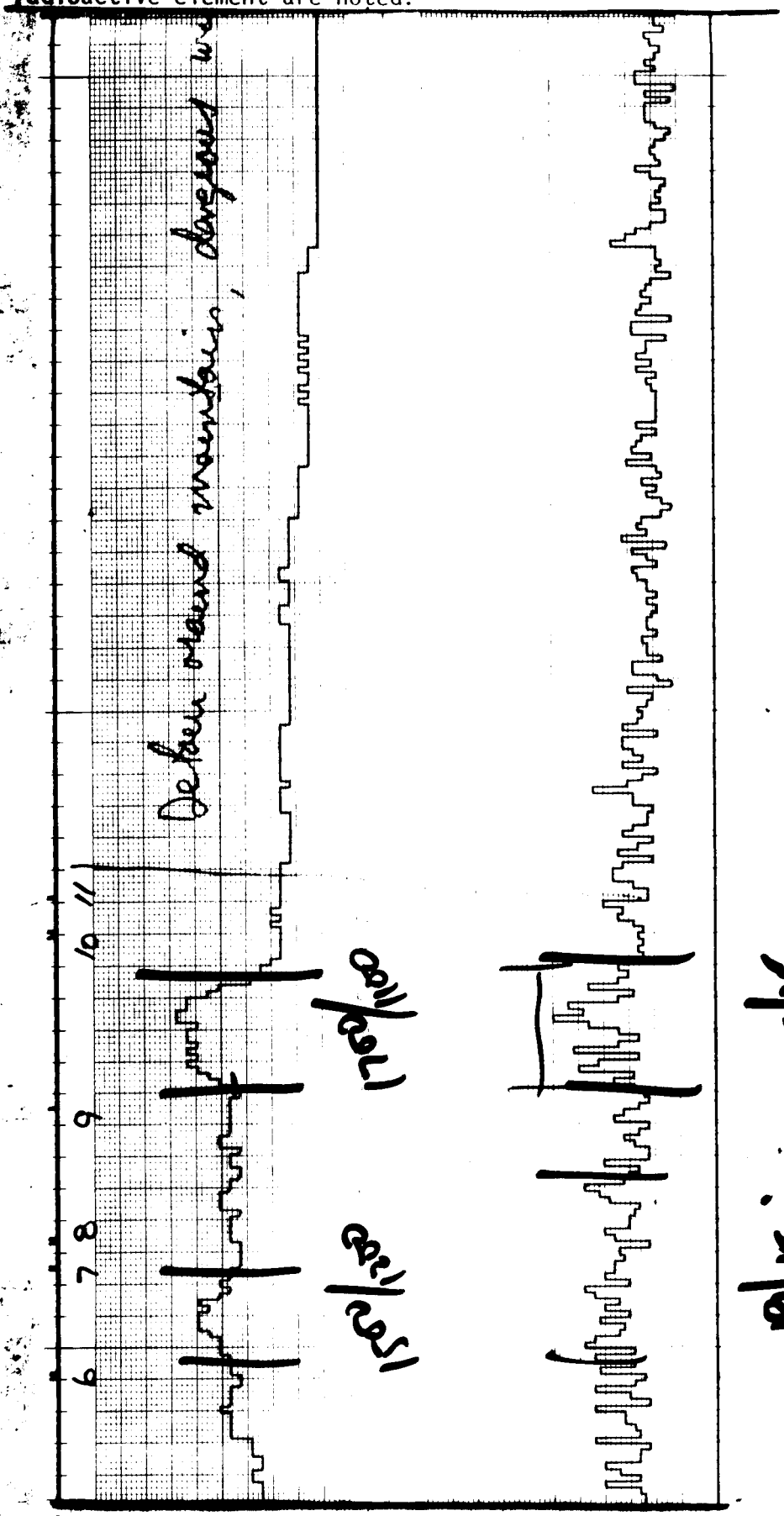

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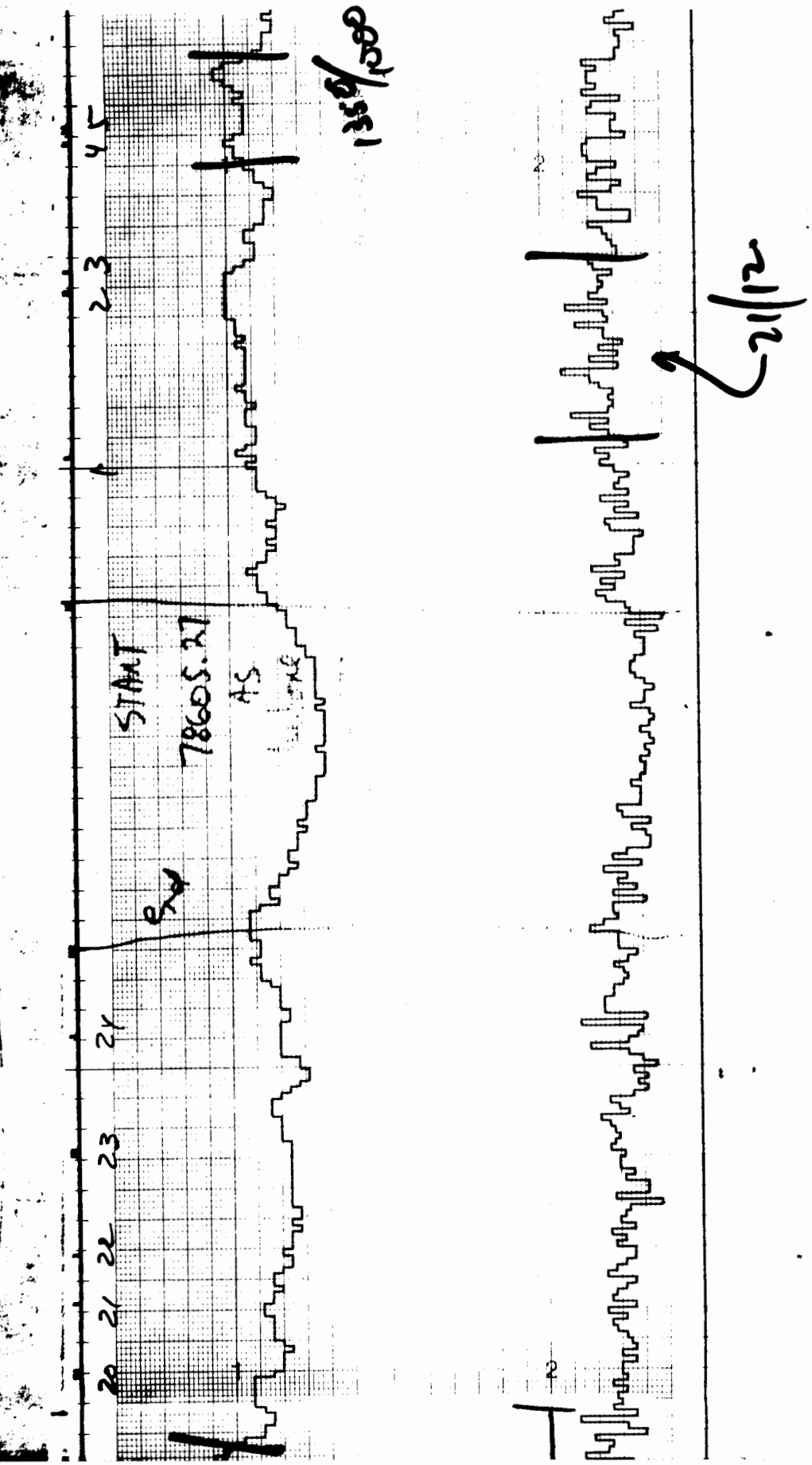

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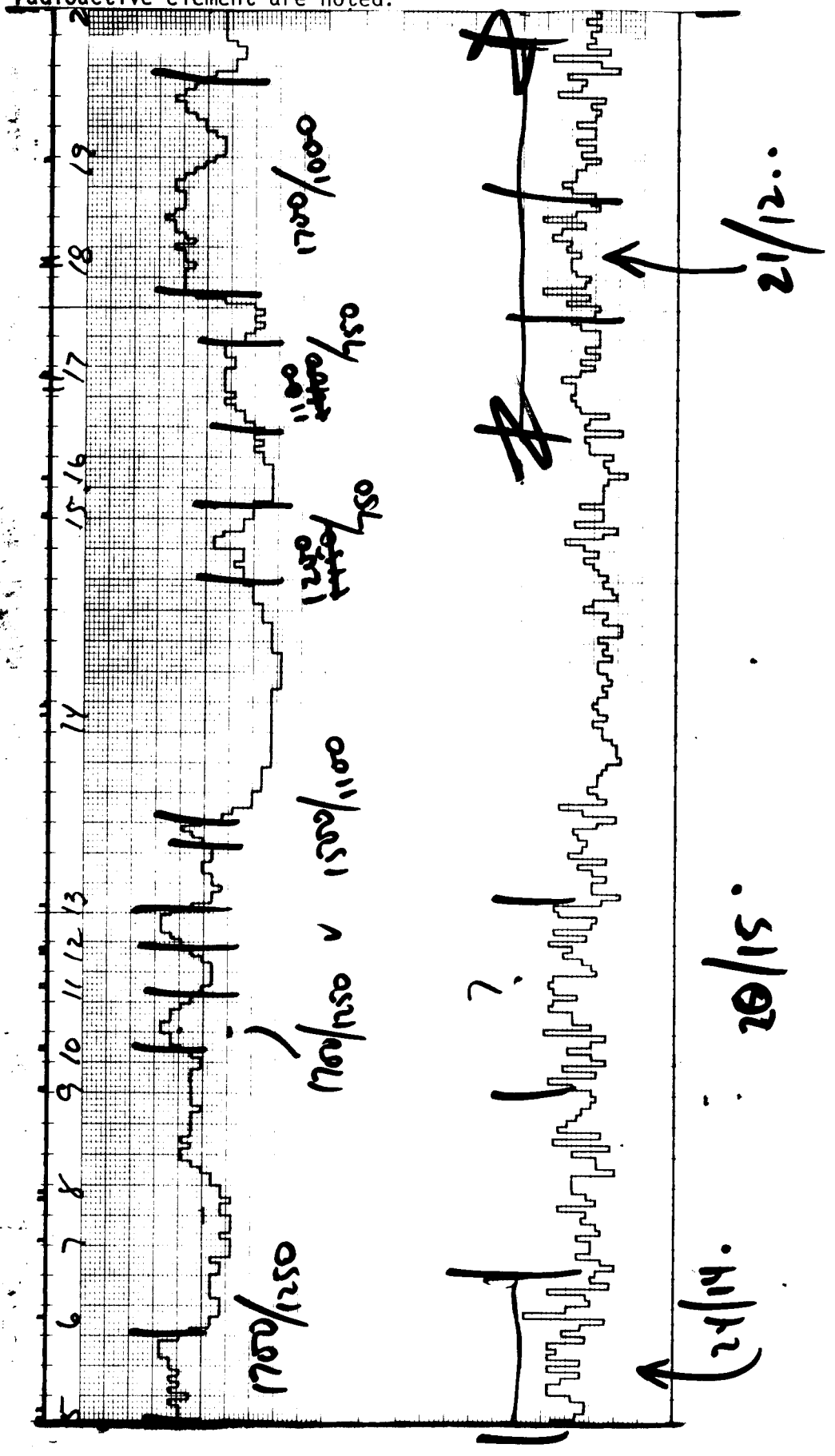
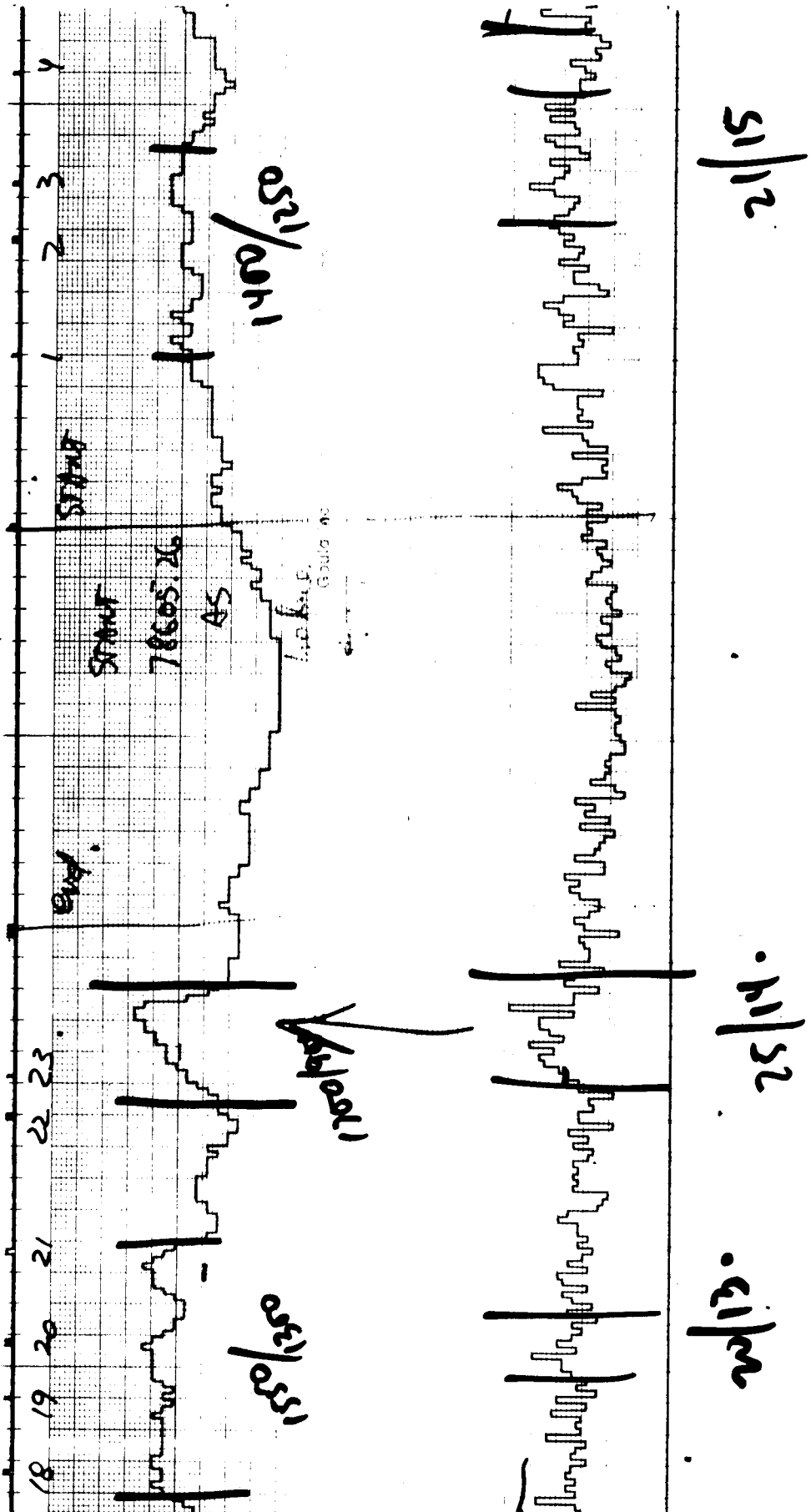


Strip charts. Fiducial numbers along the chart correspond to locations noted on Figures W3 to W6. Each traverse has a unique number corresponding to a flight line plotted on the figures. At the beginning of each traverse the instrument setting, the traverse number and the radioactive element are noted.



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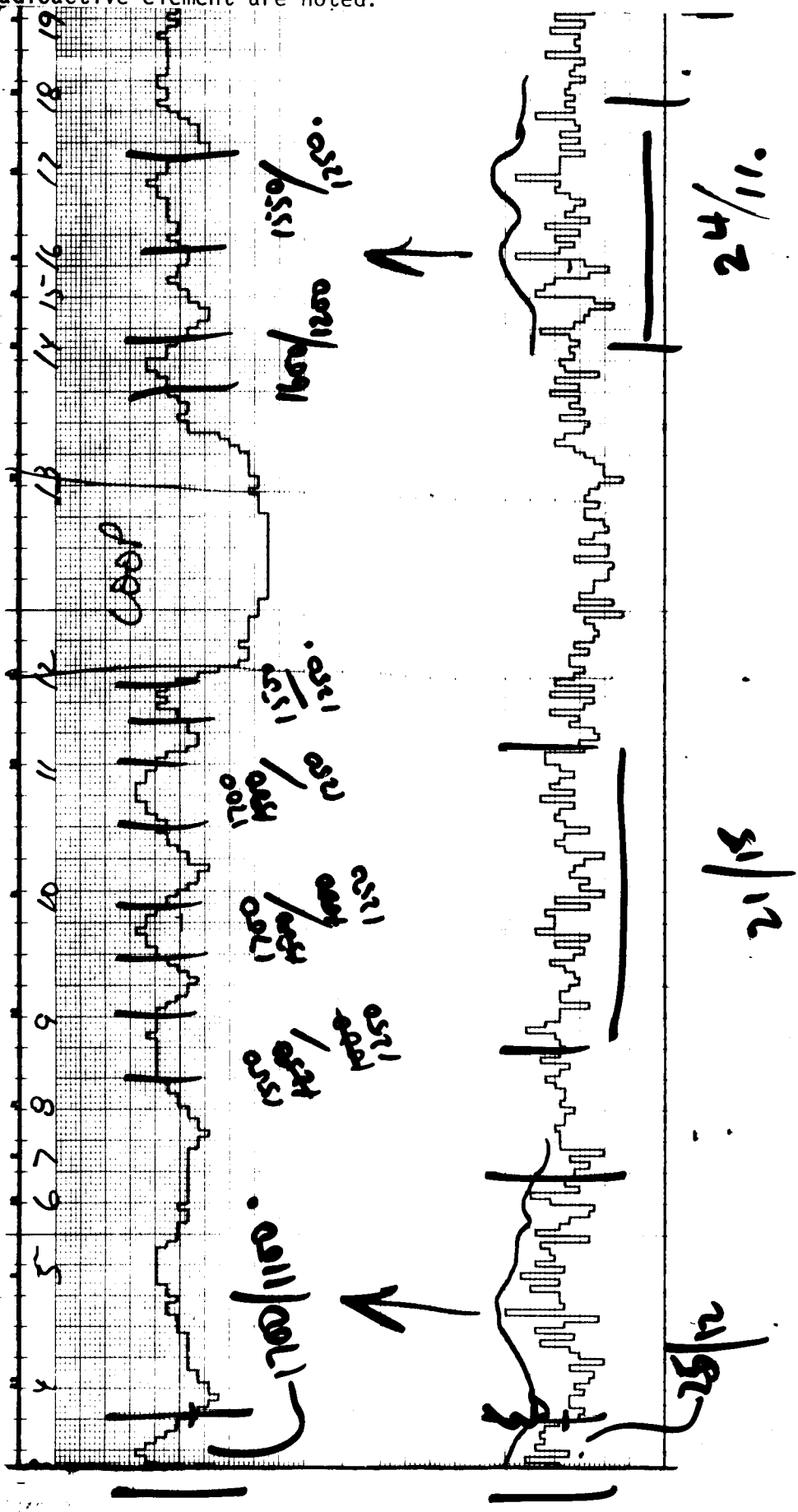

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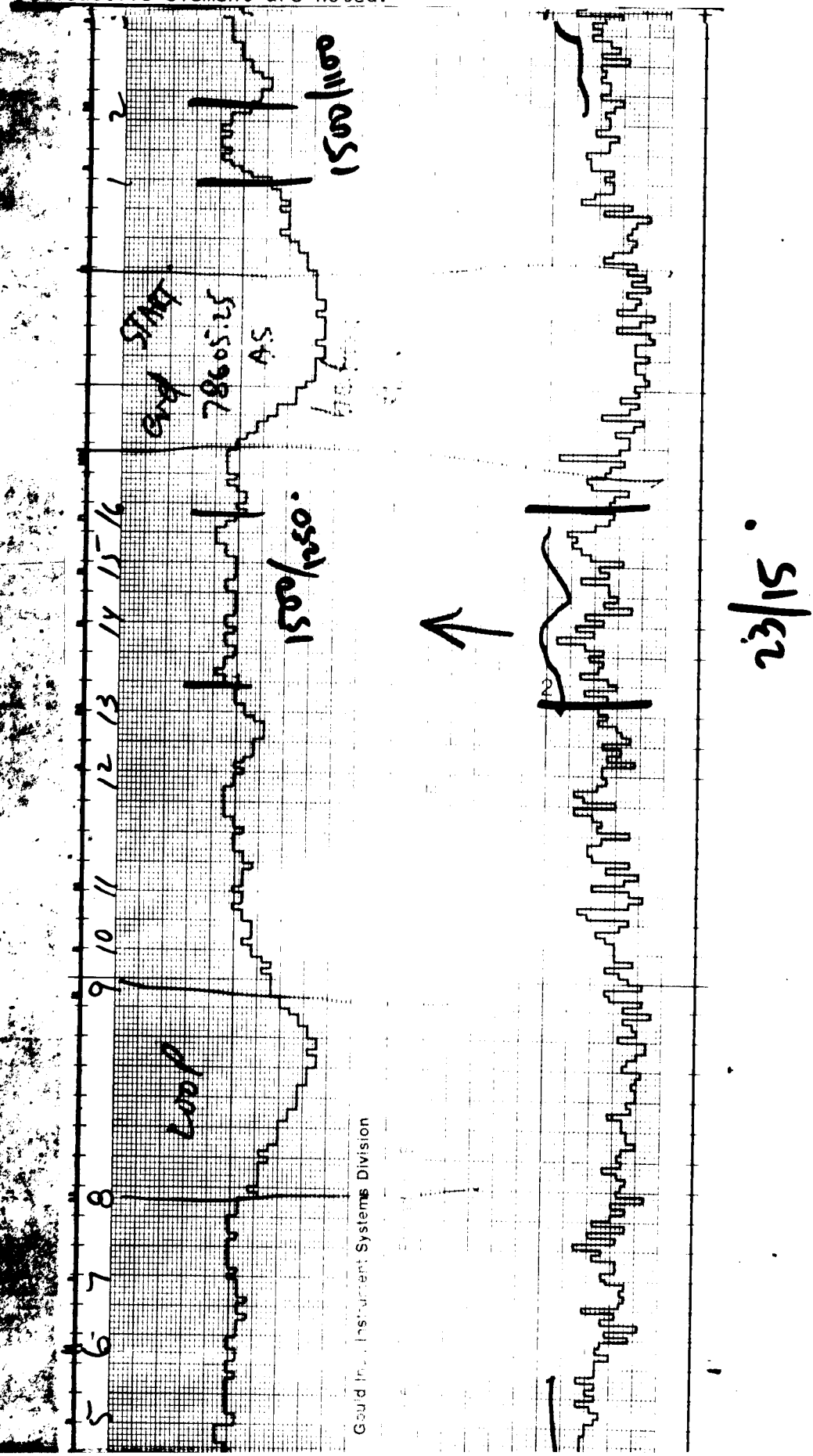

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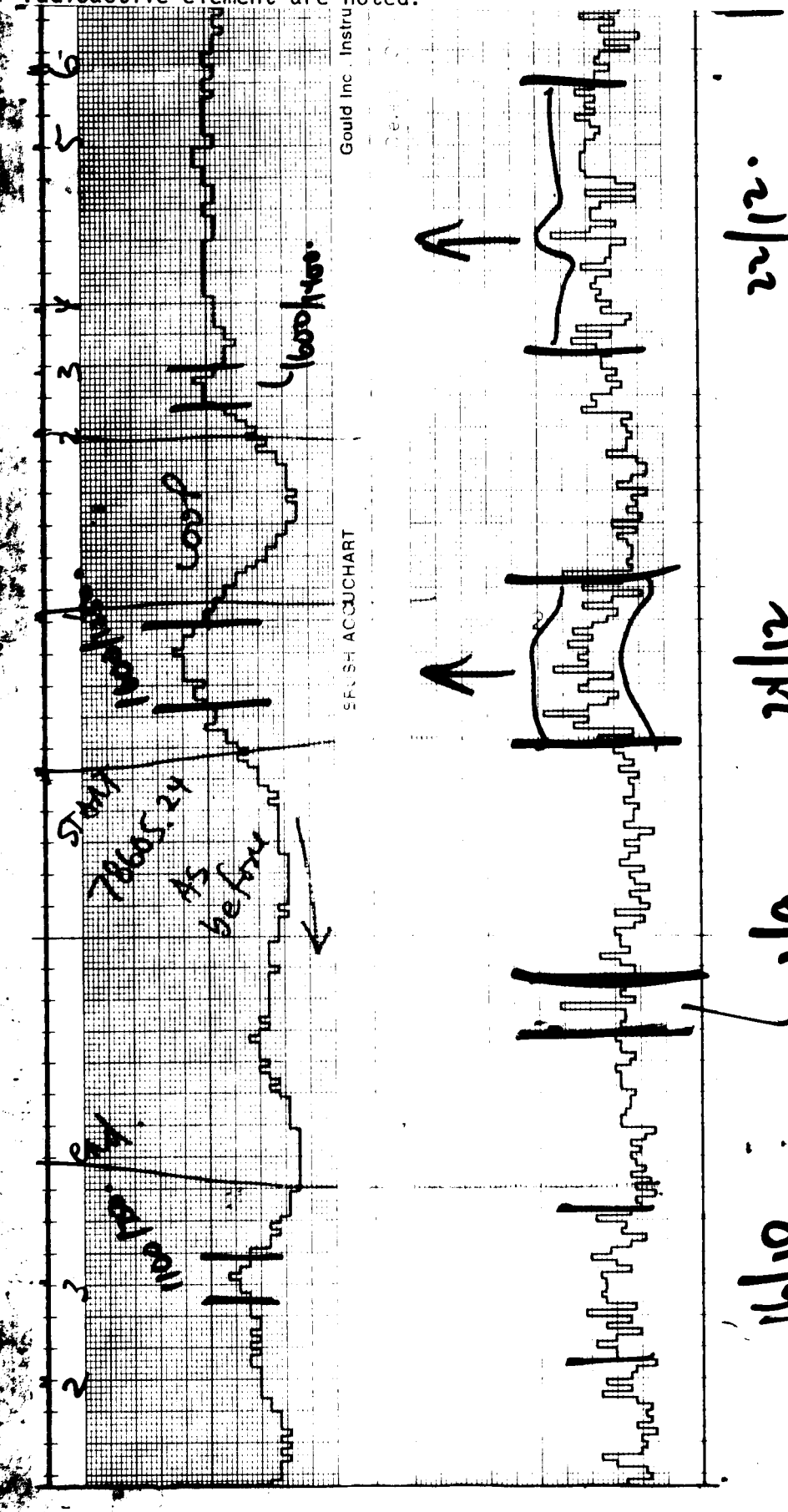

TAPE THREE

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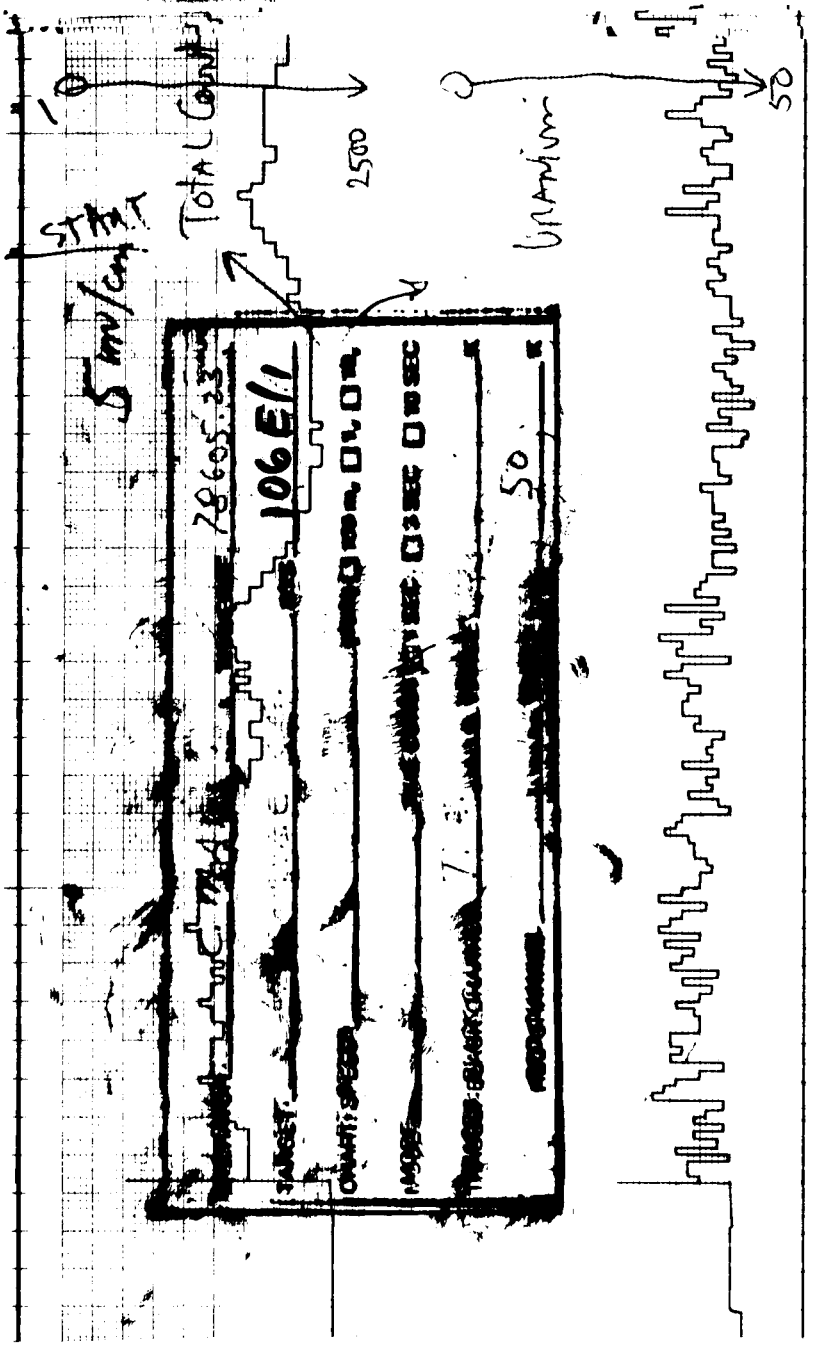

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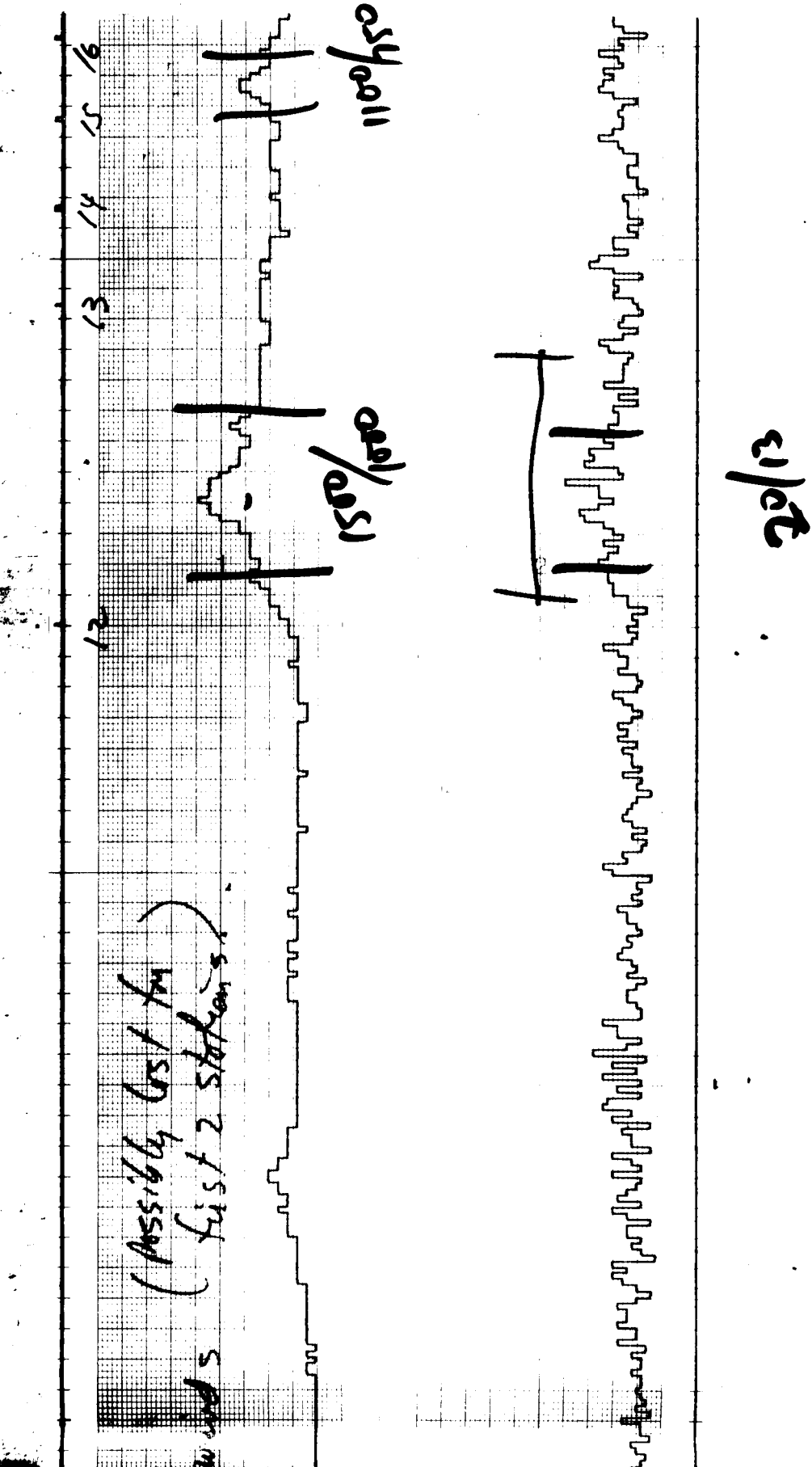

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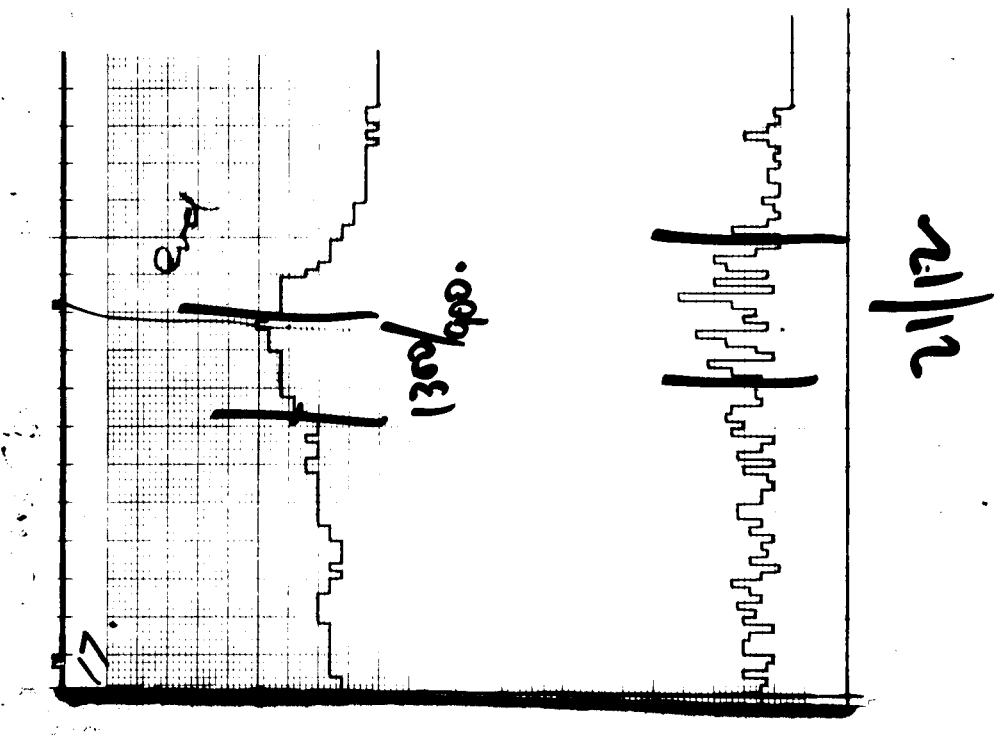

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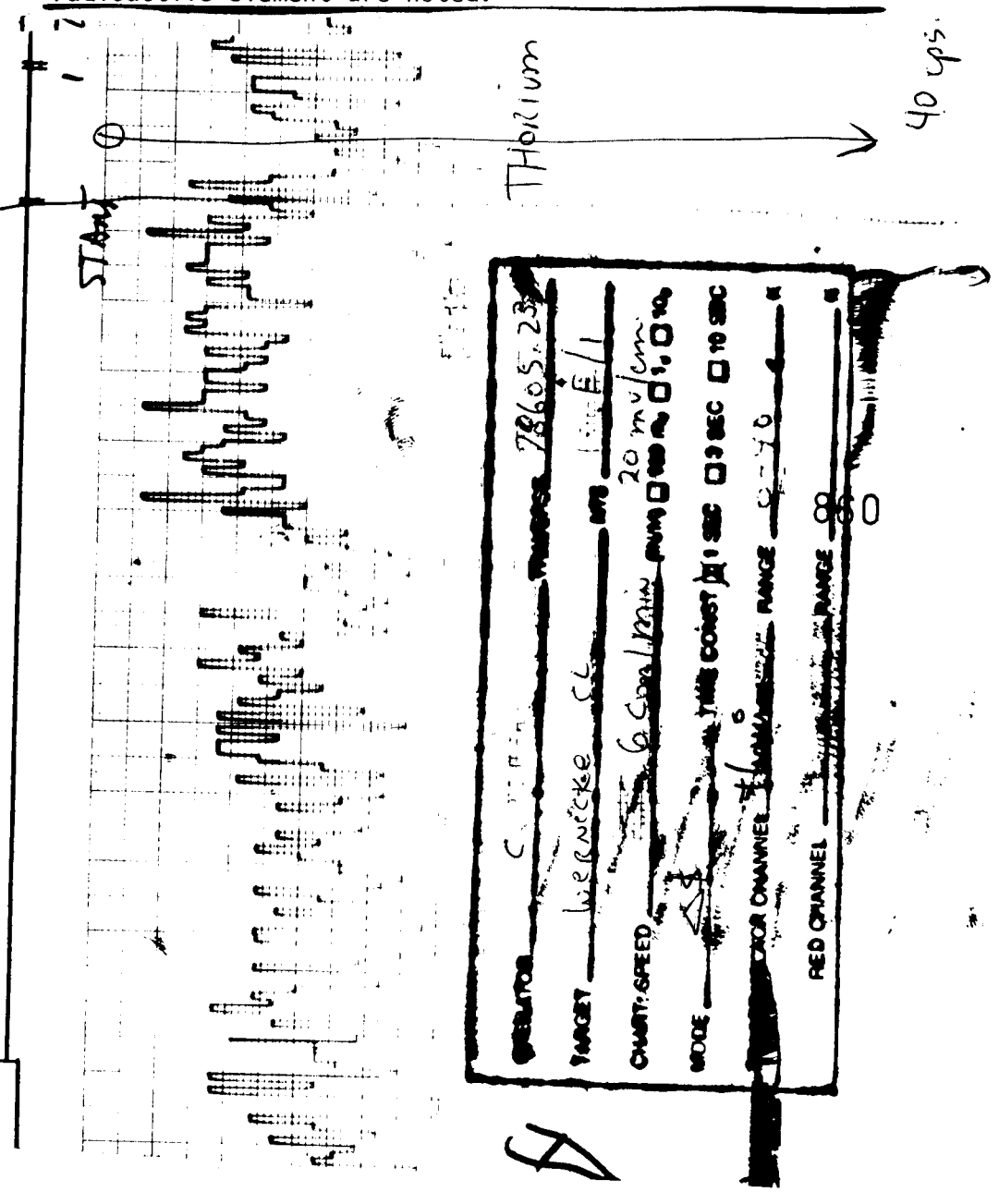


TAPE FOUR

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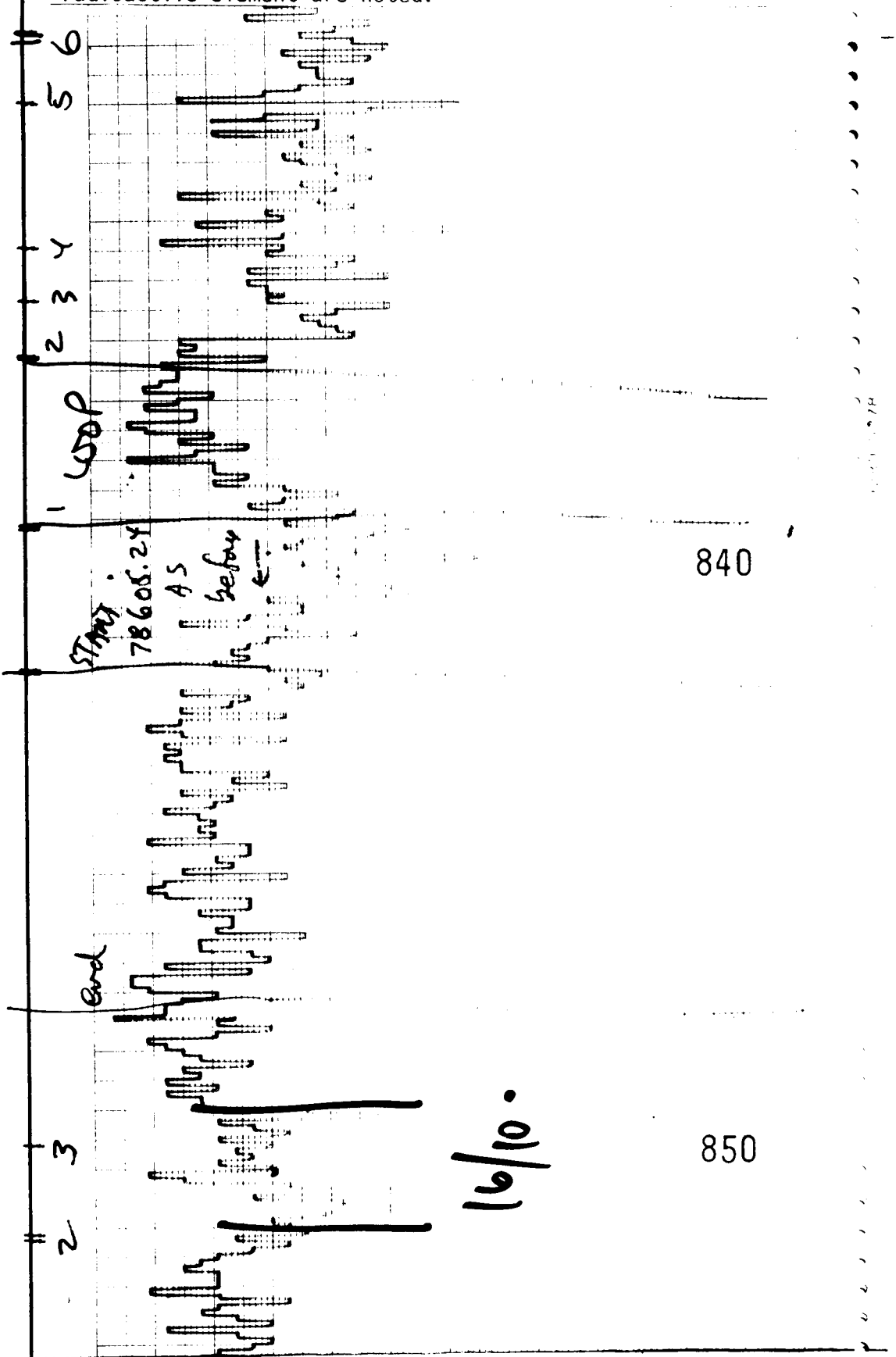

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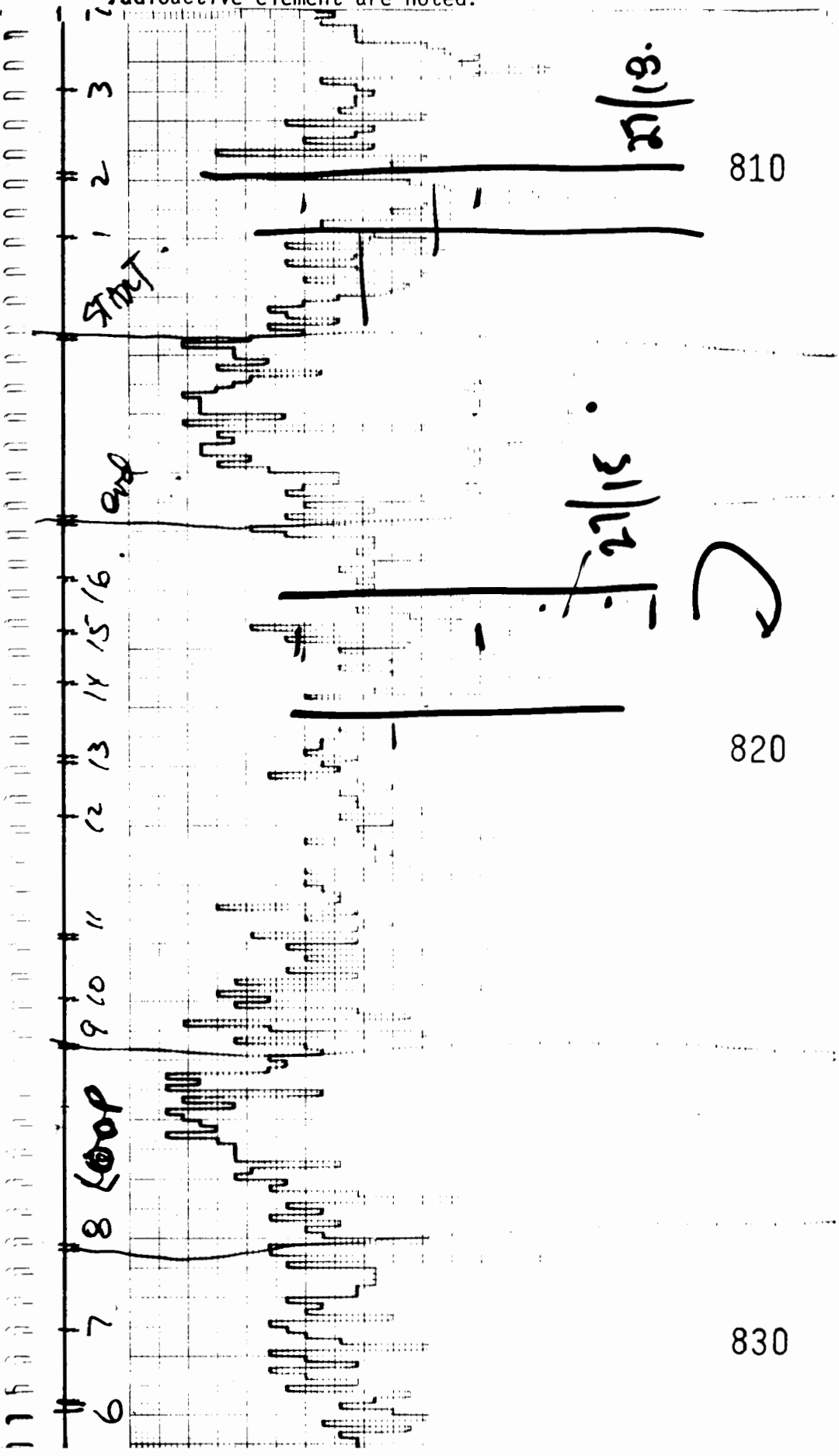

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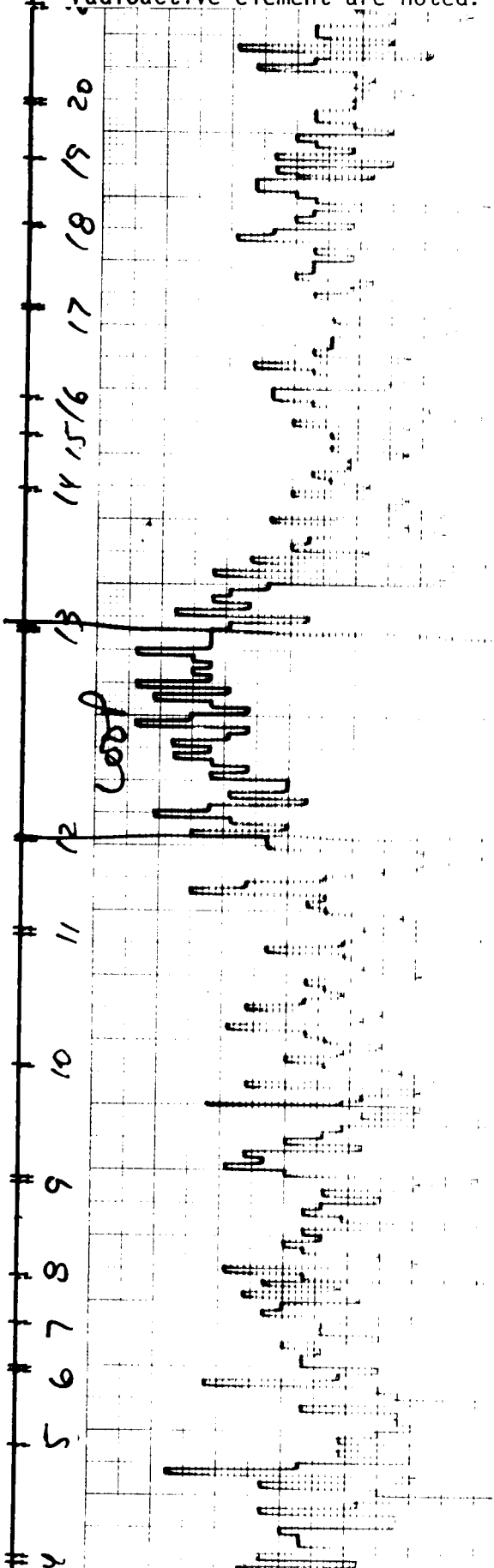

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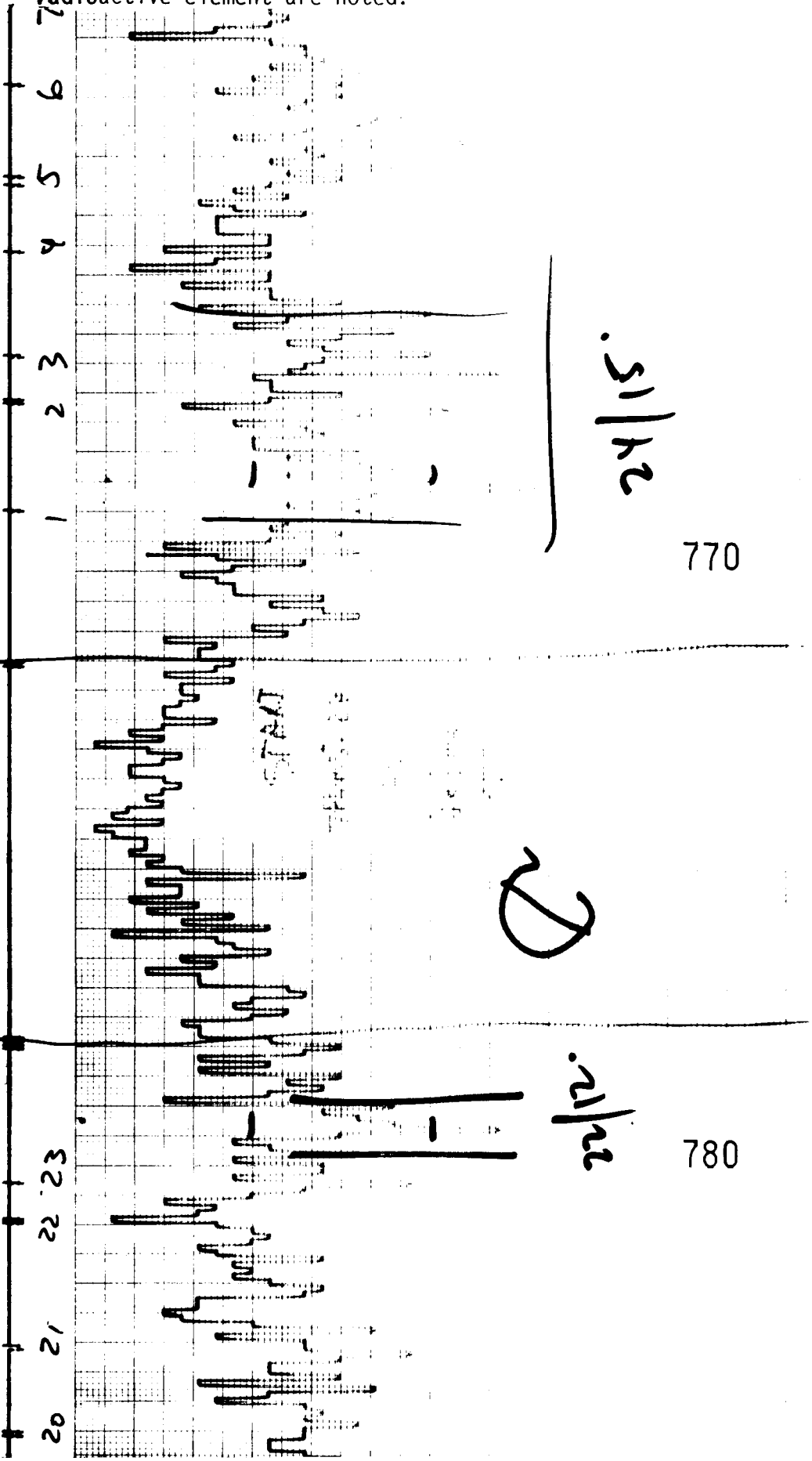

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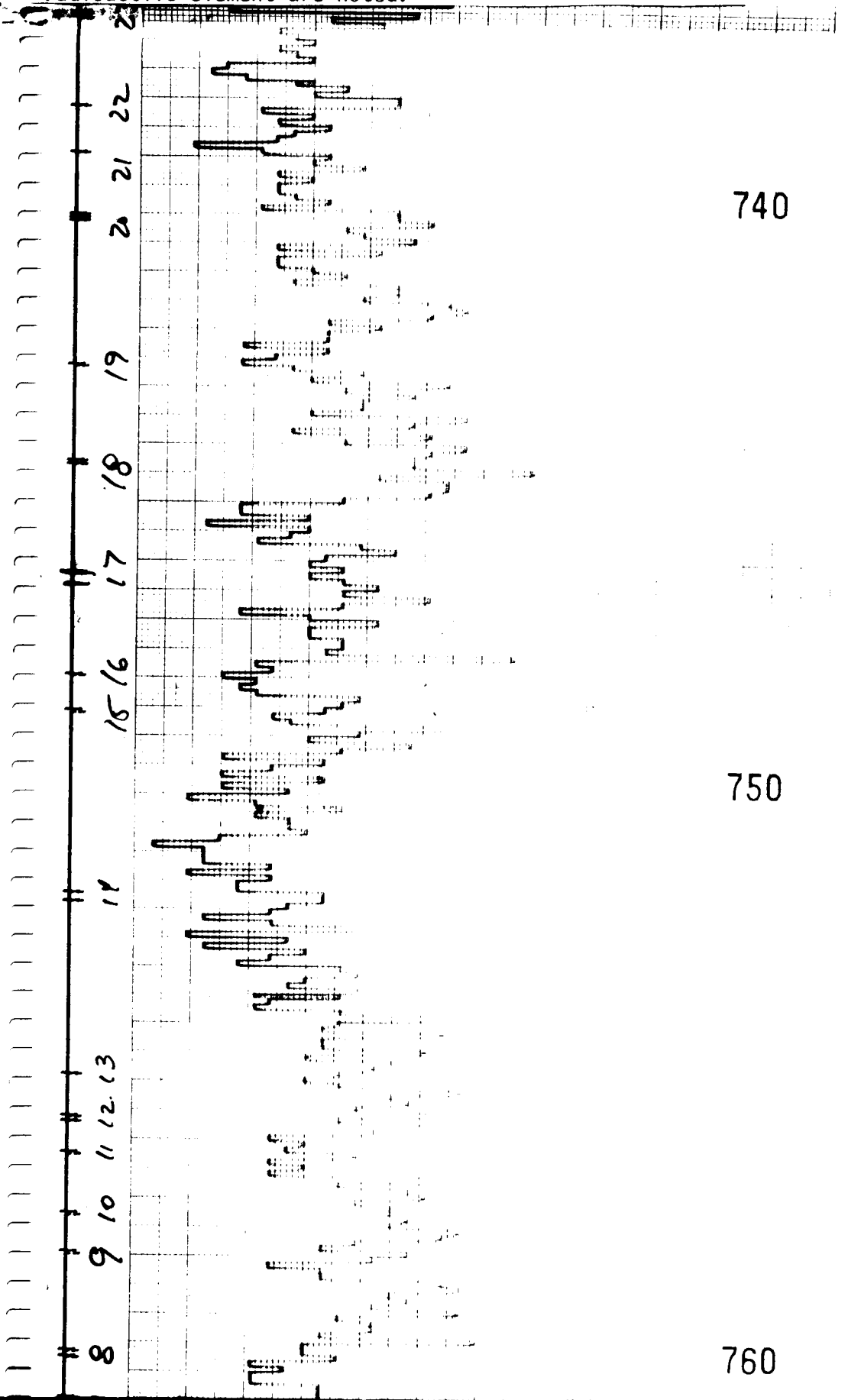

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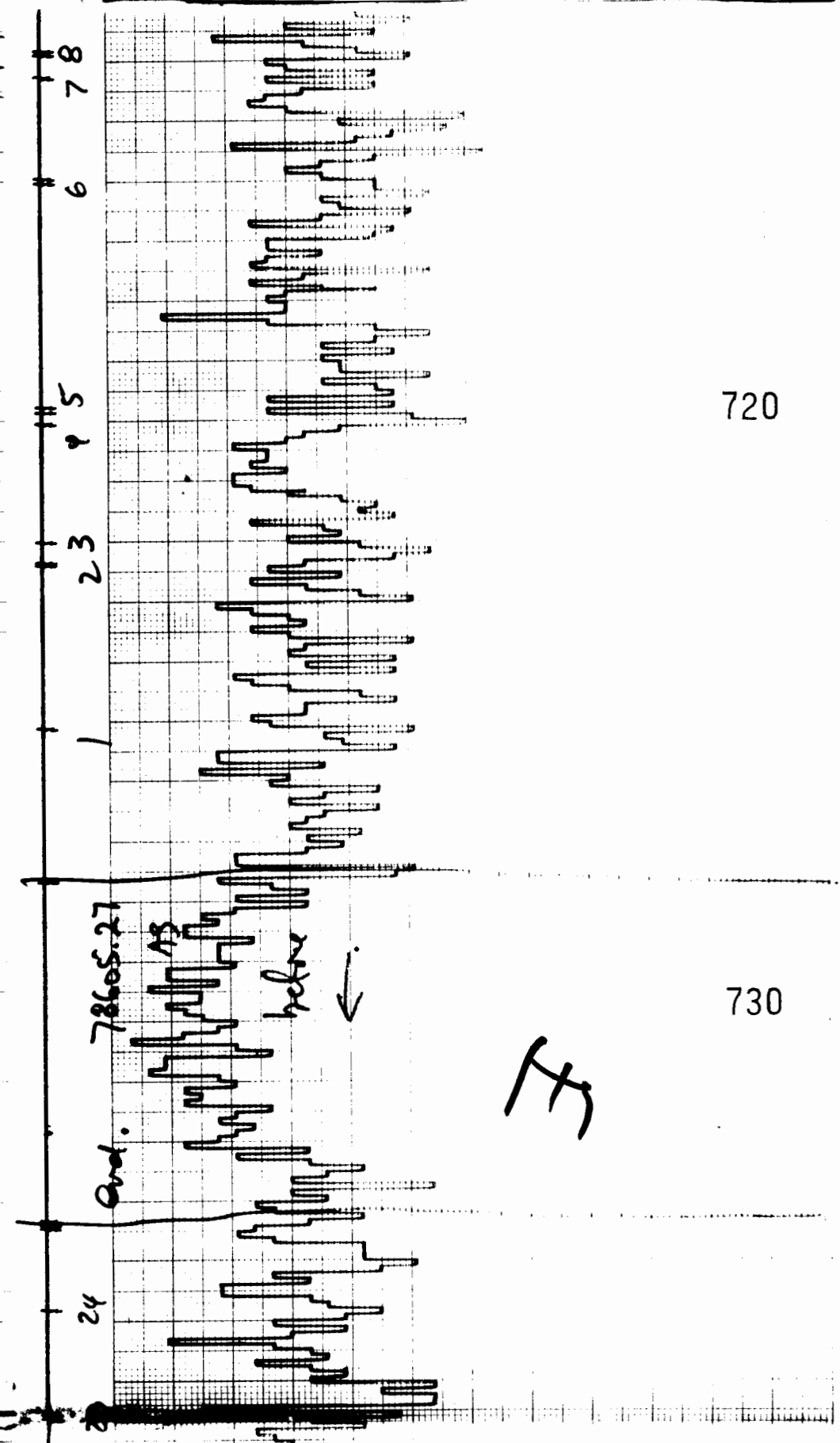

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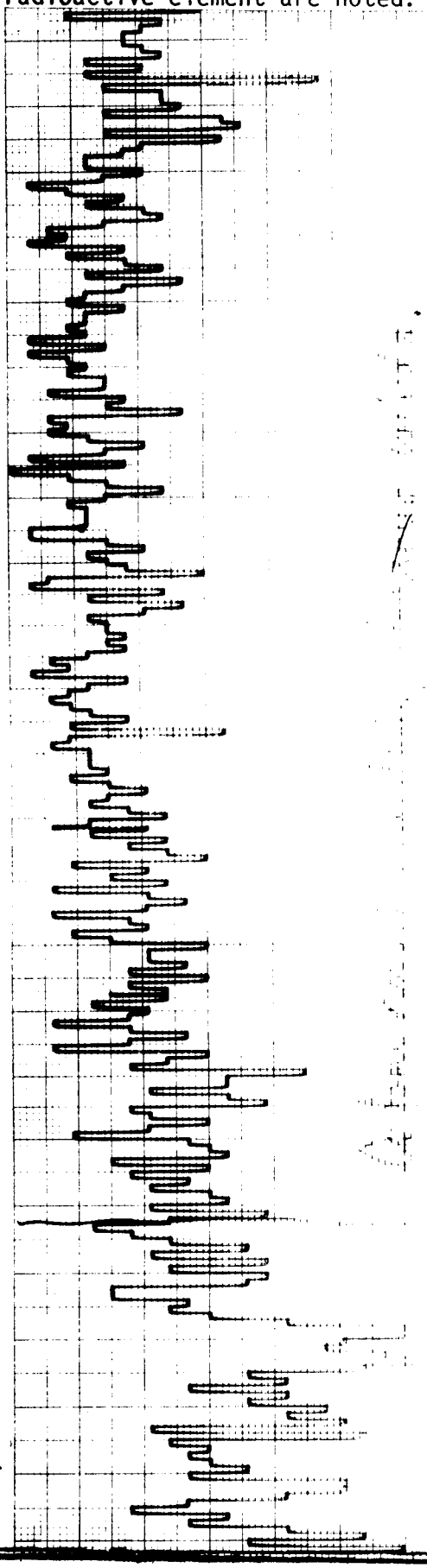

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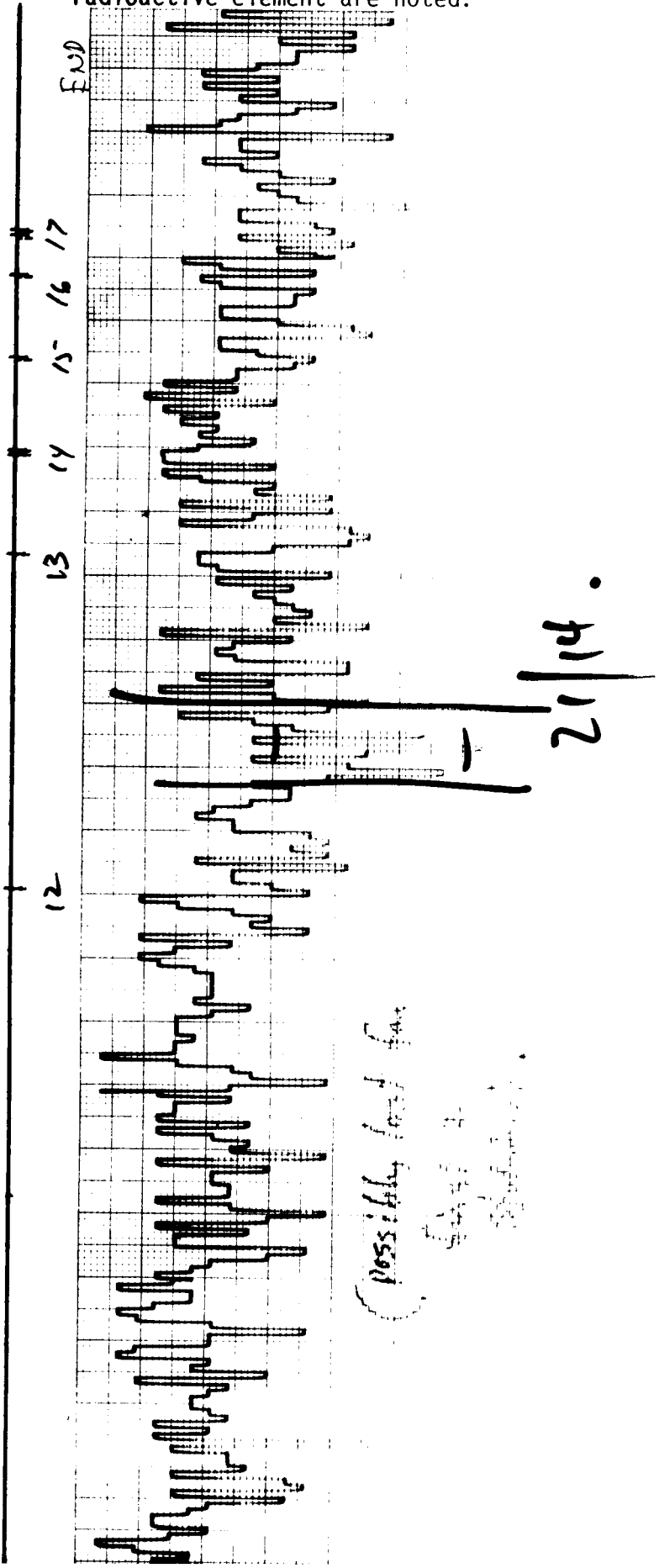

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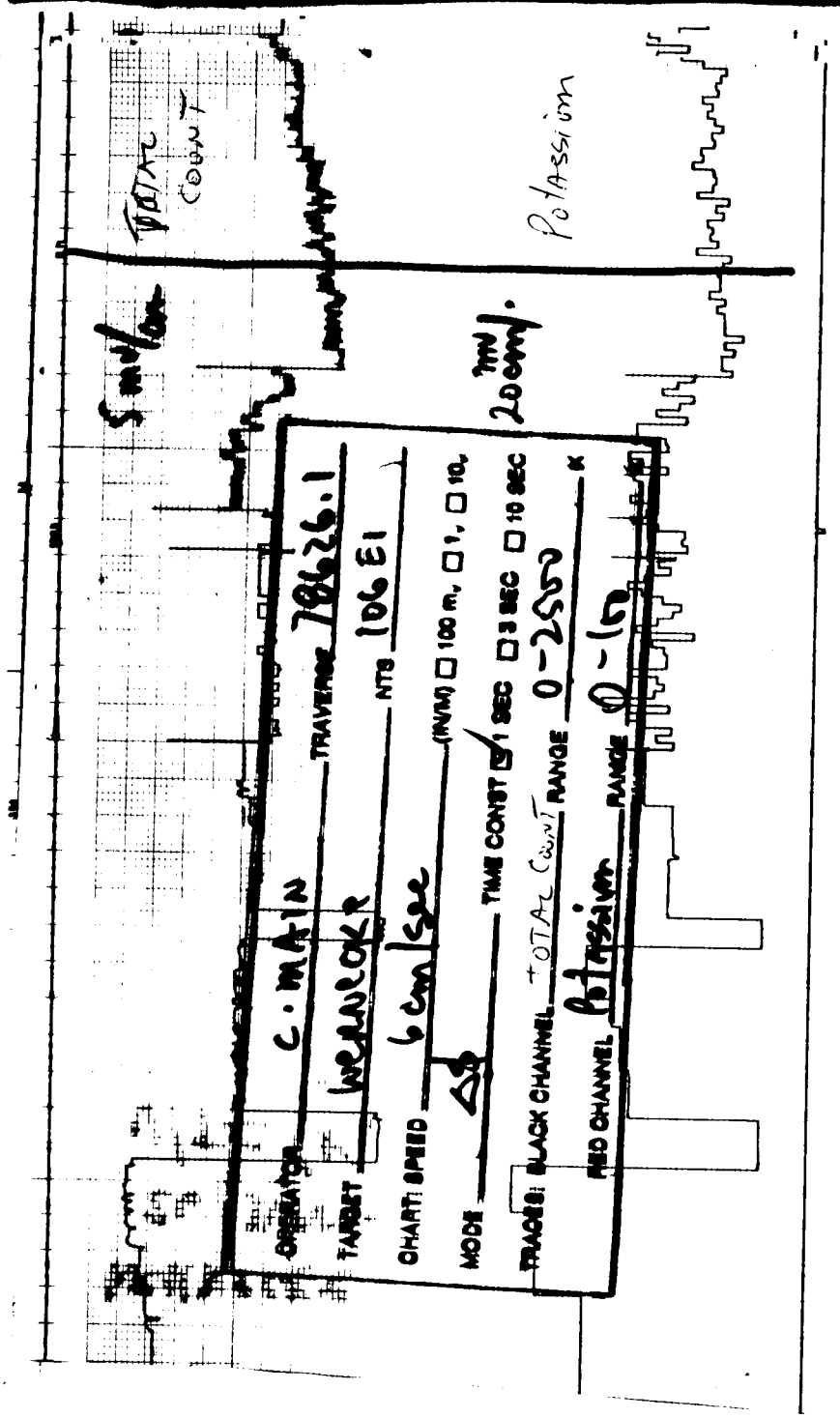


TAPE FIVE

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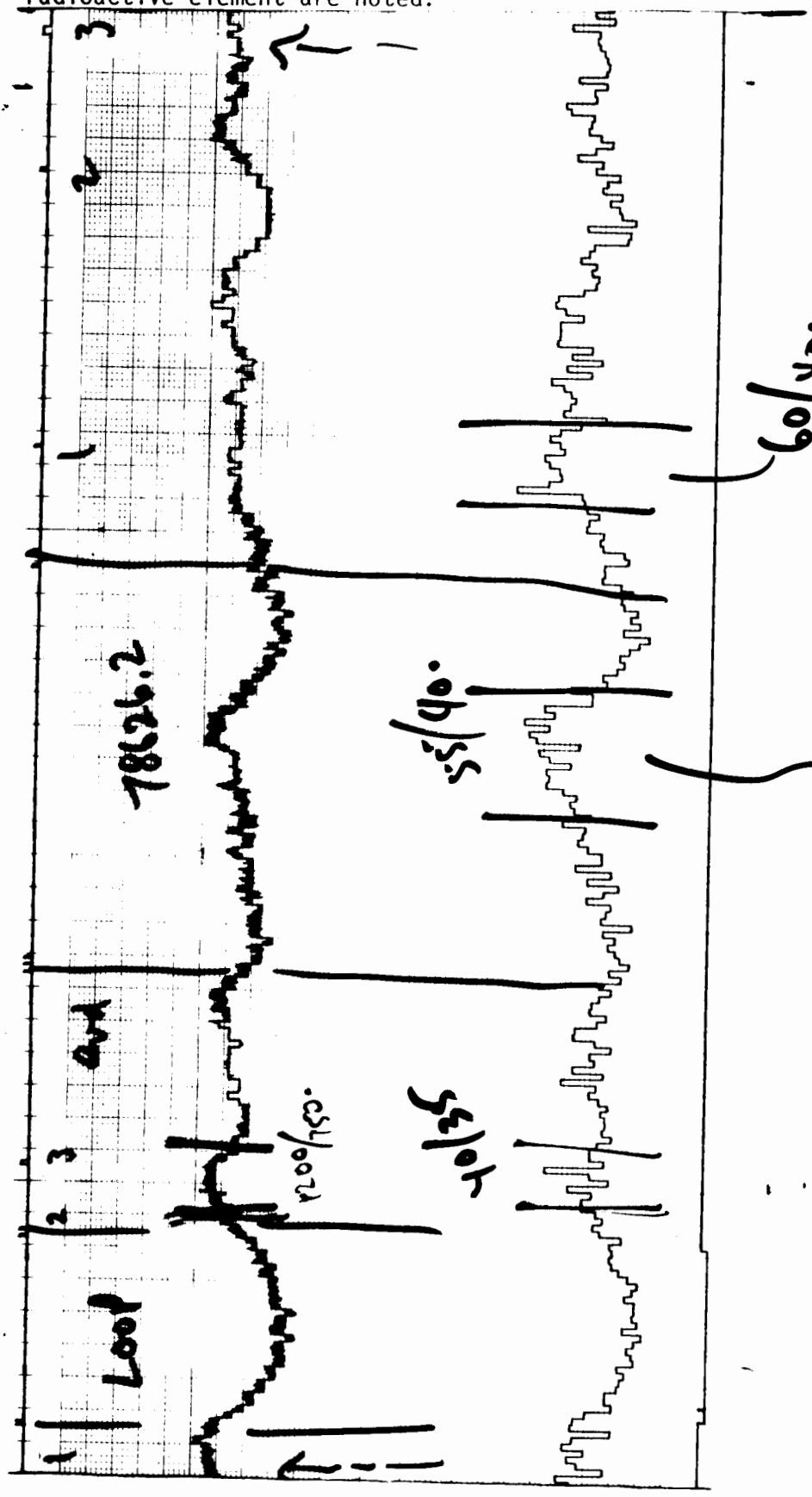

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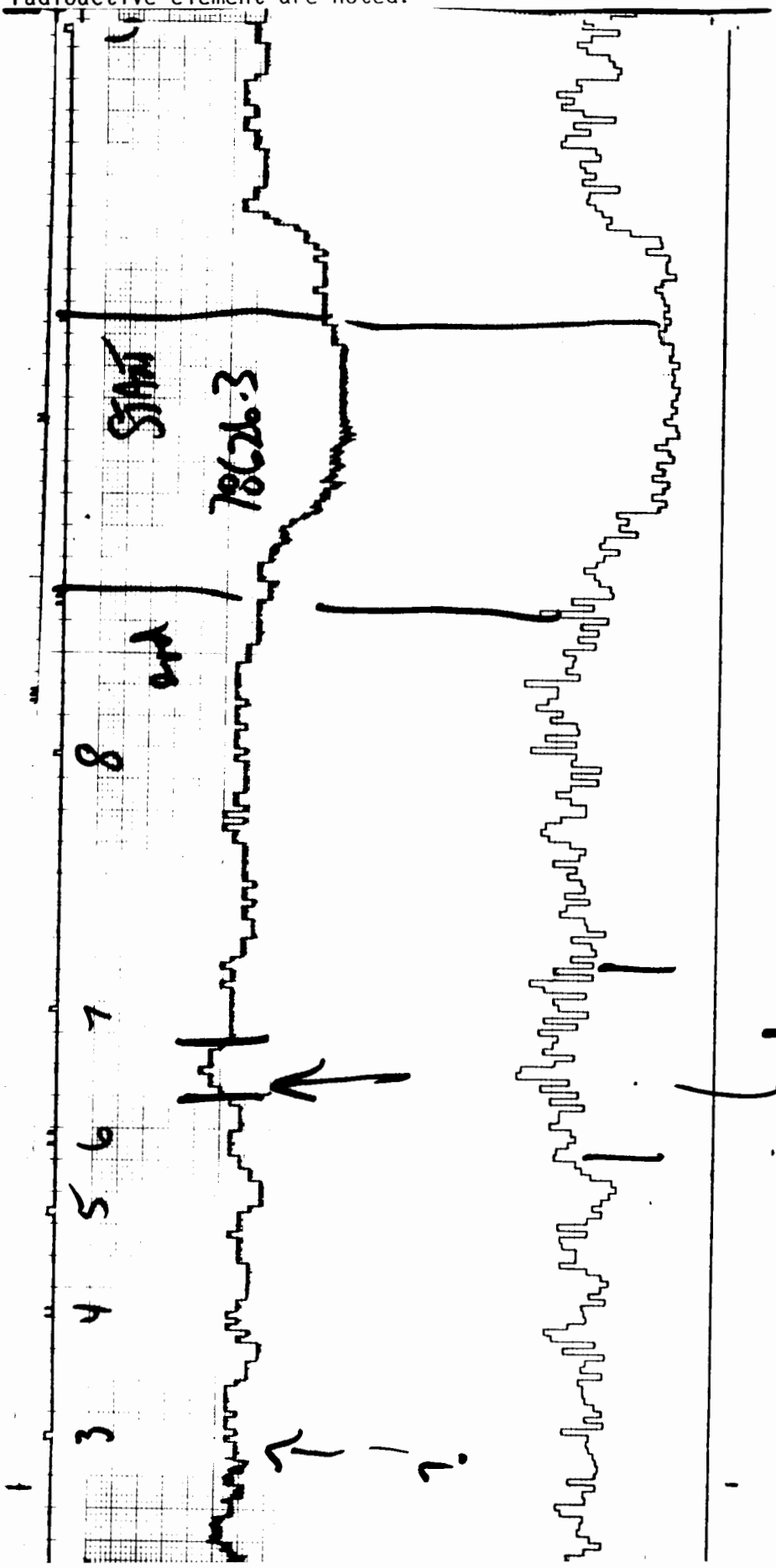

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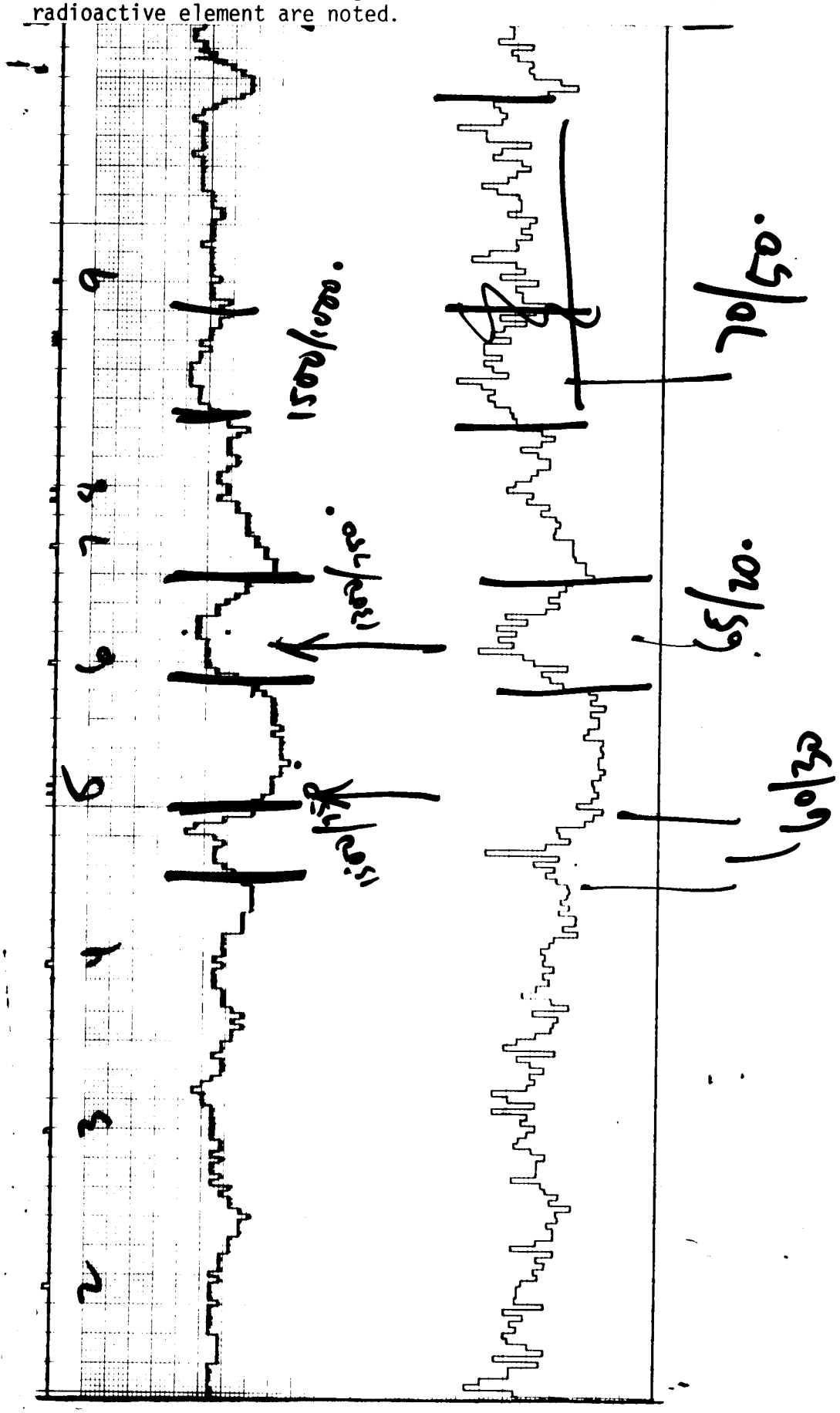

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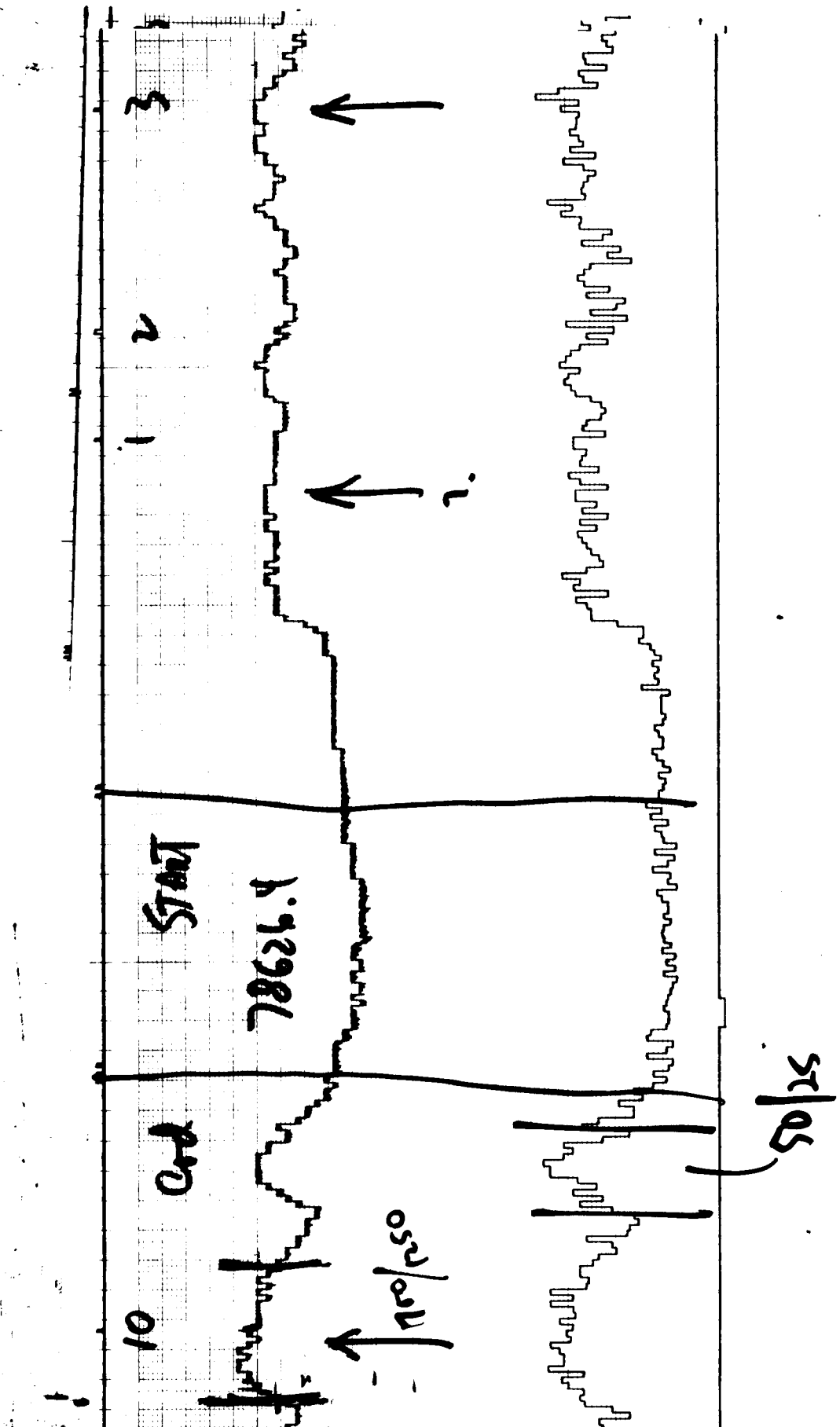

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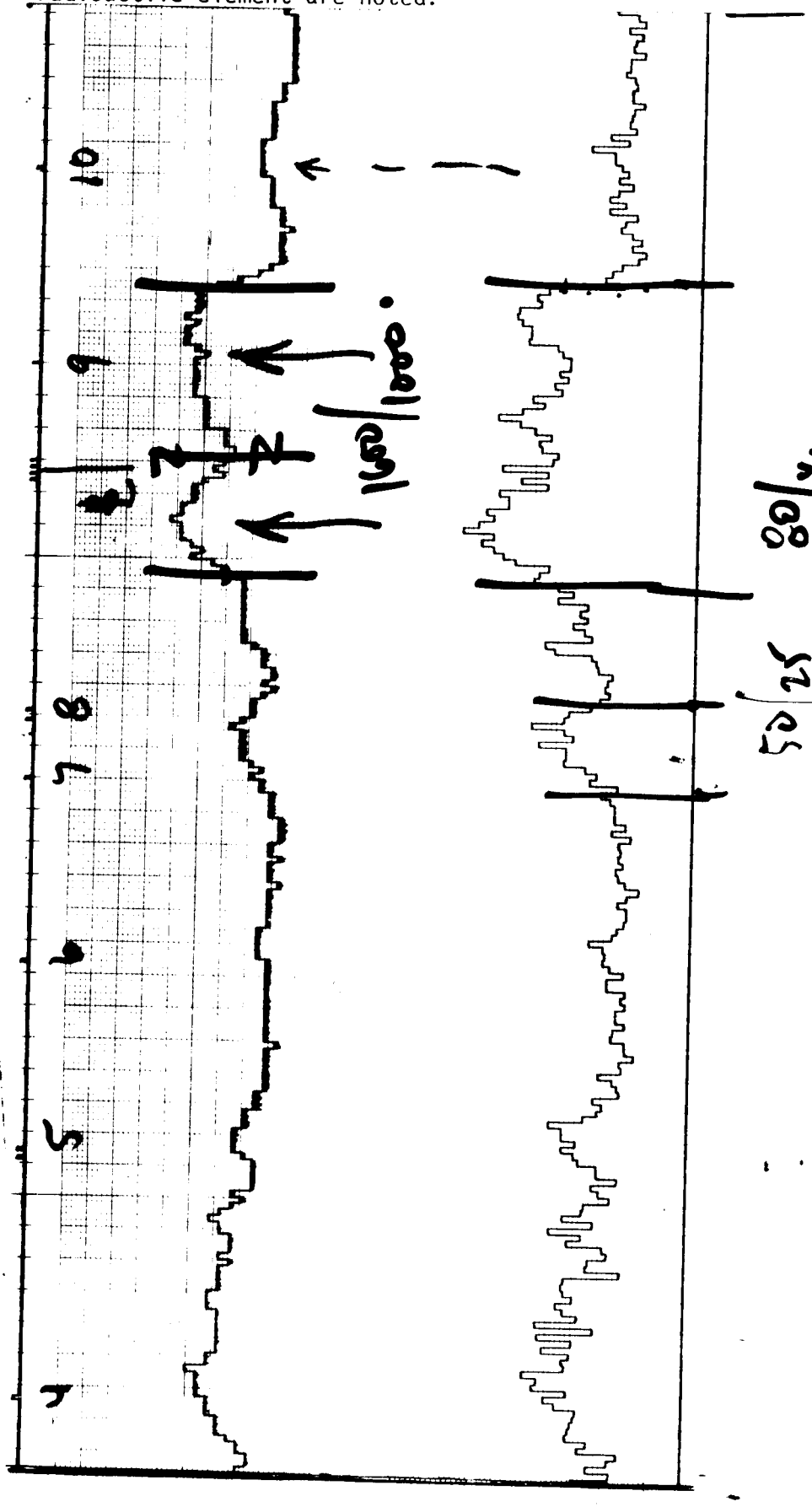

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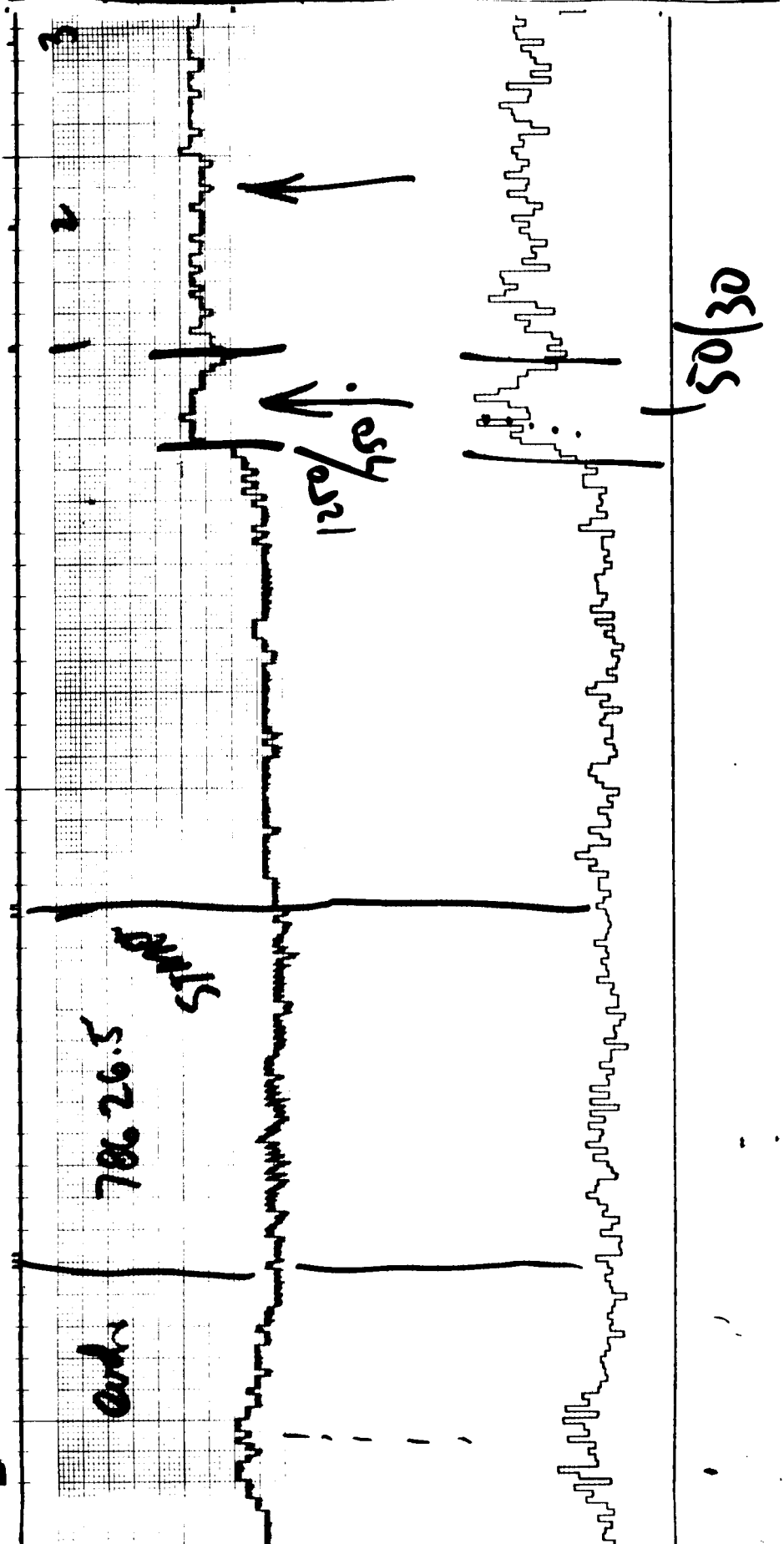

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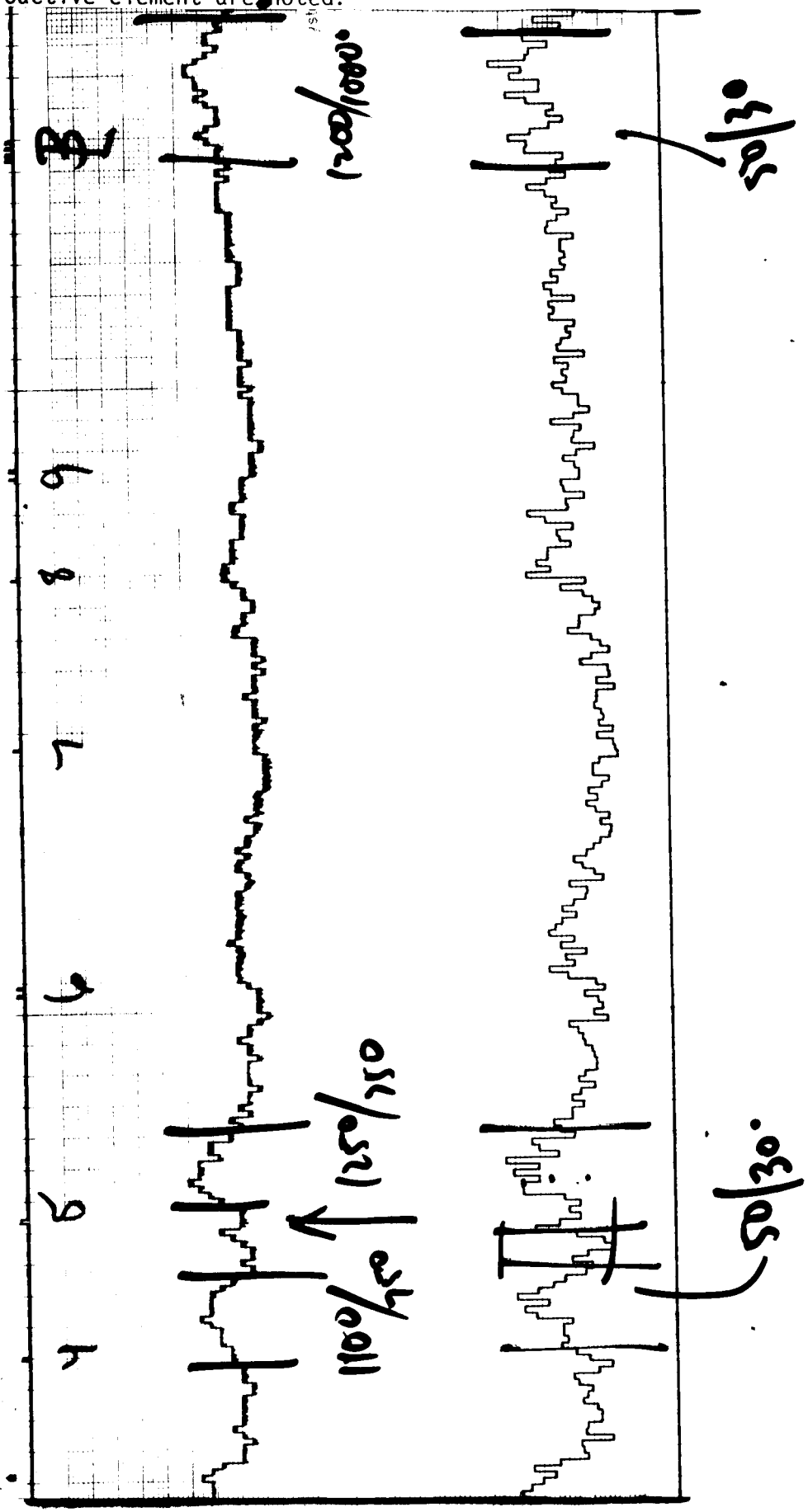

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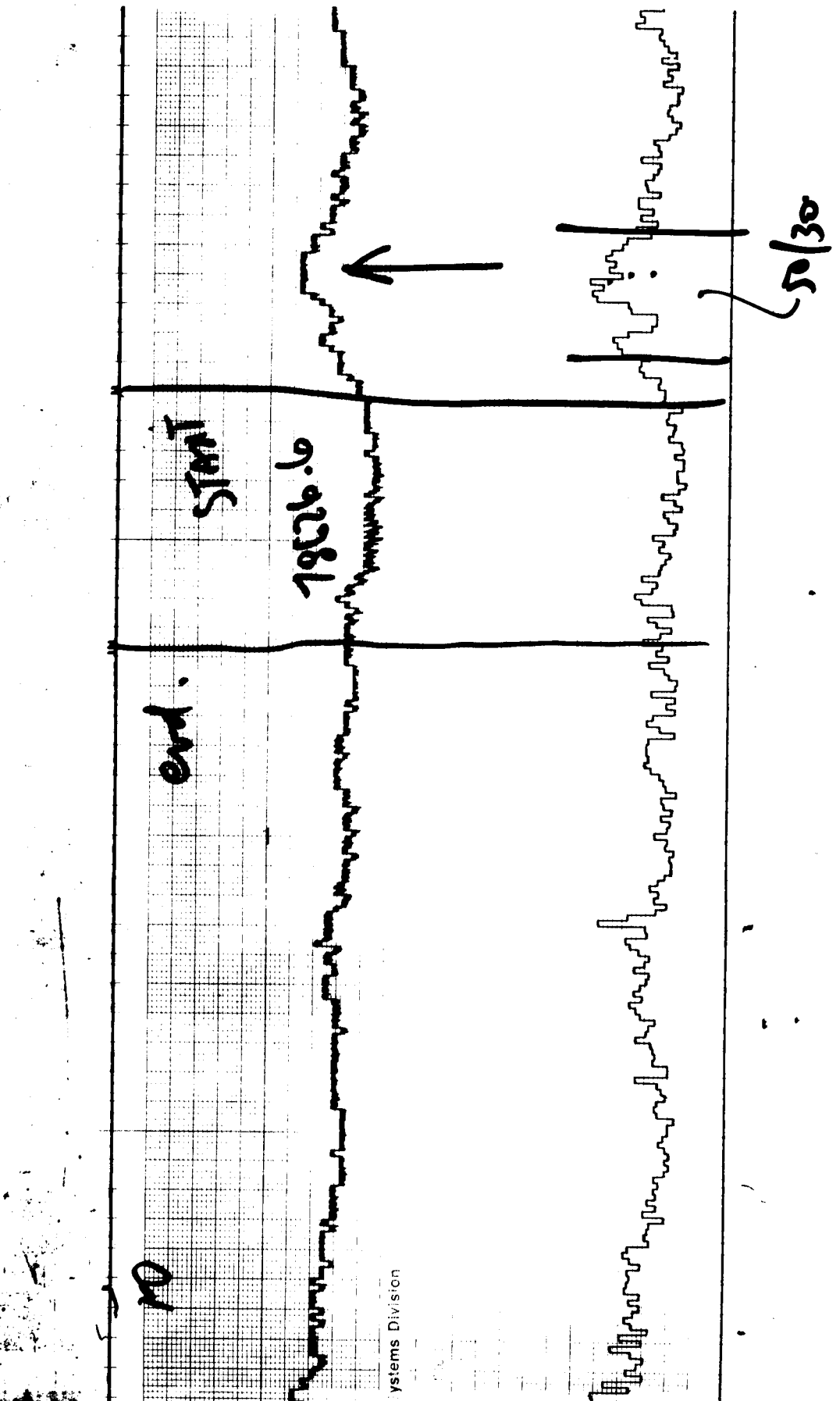

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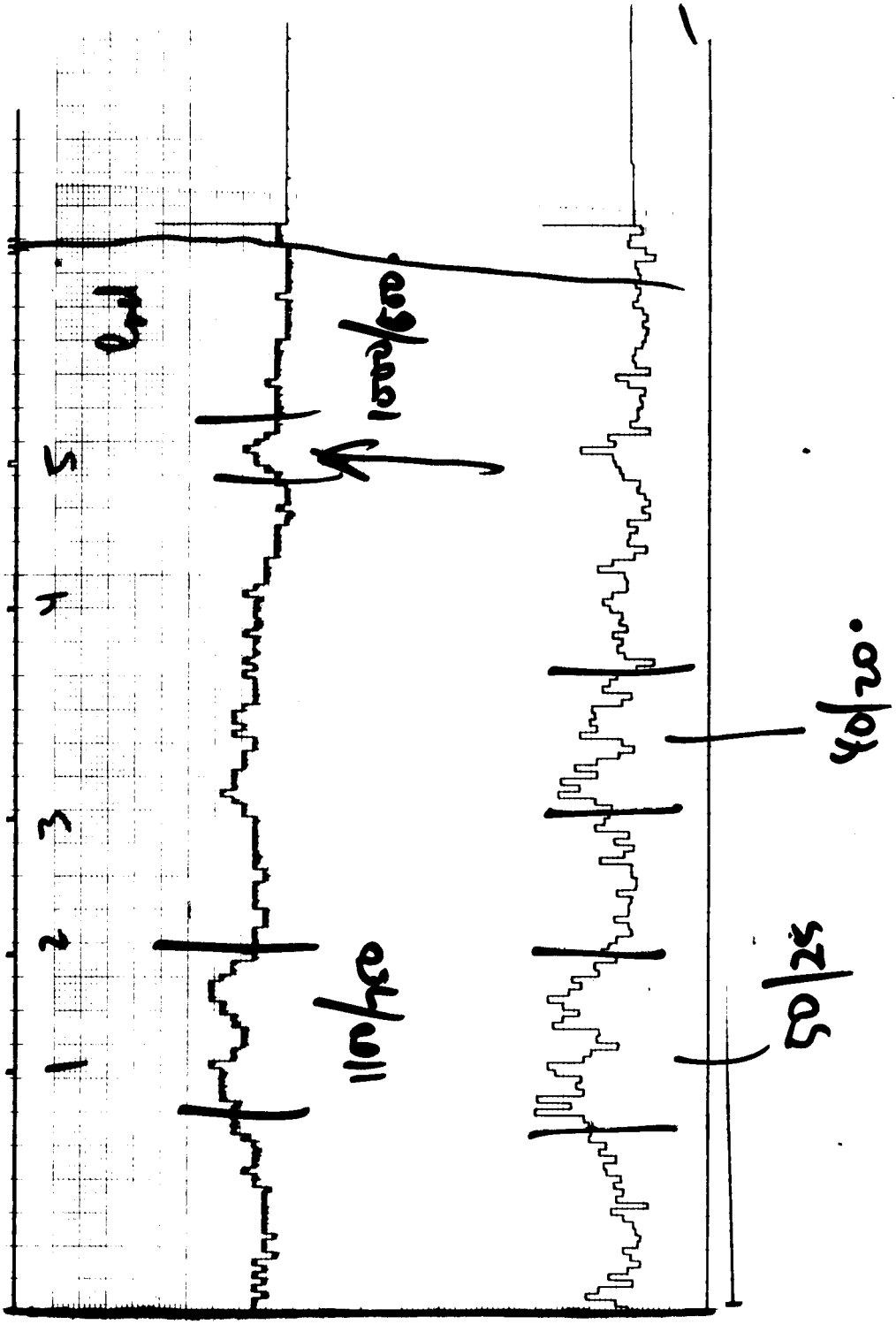

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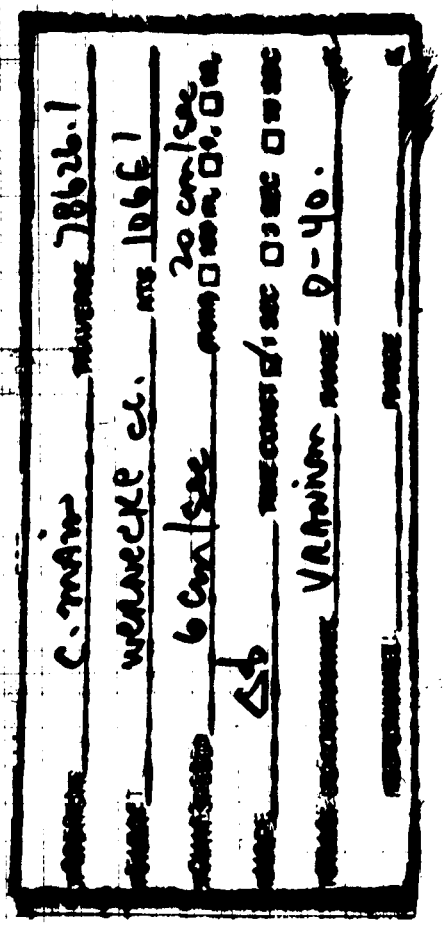
TAPE SIX



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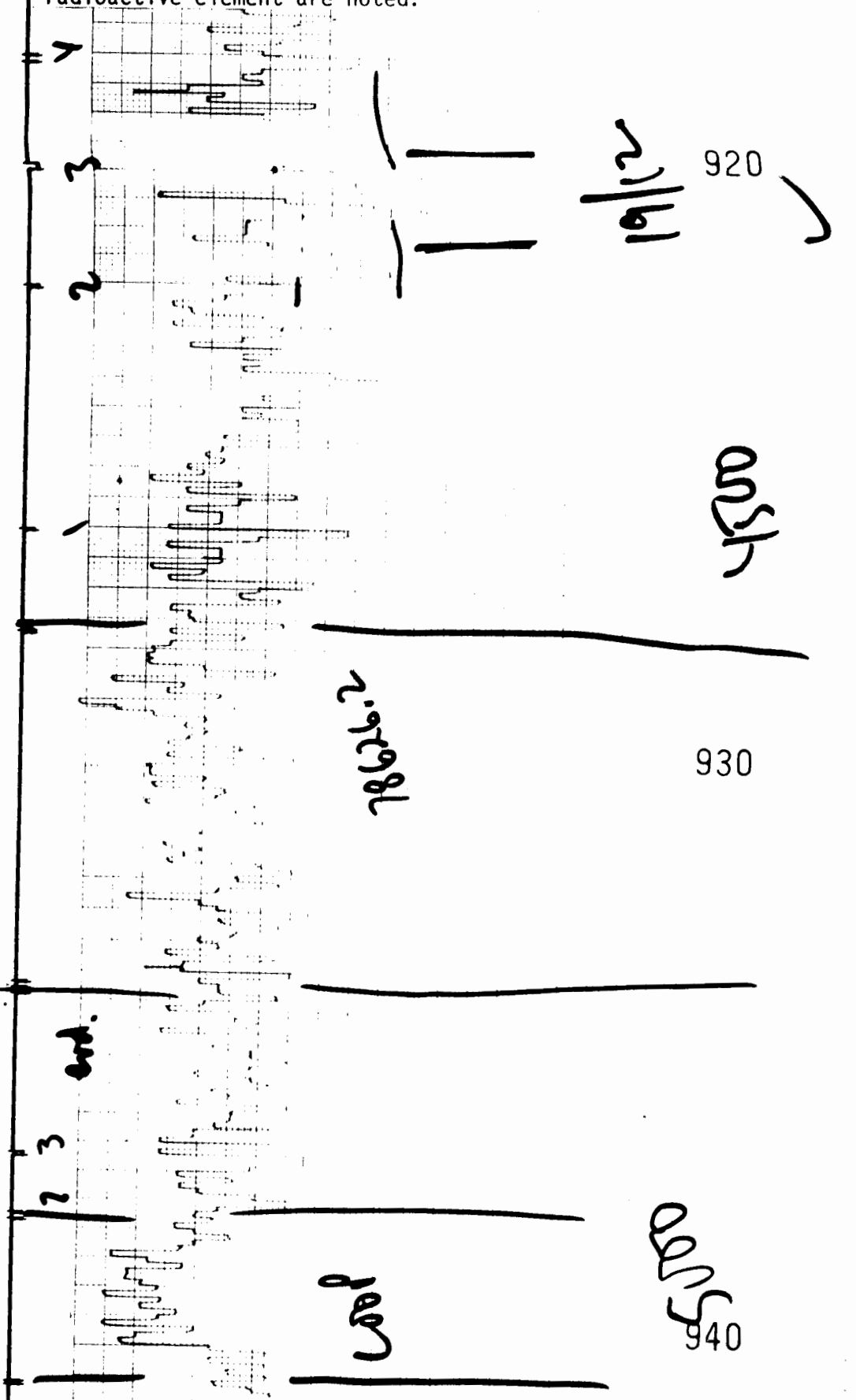

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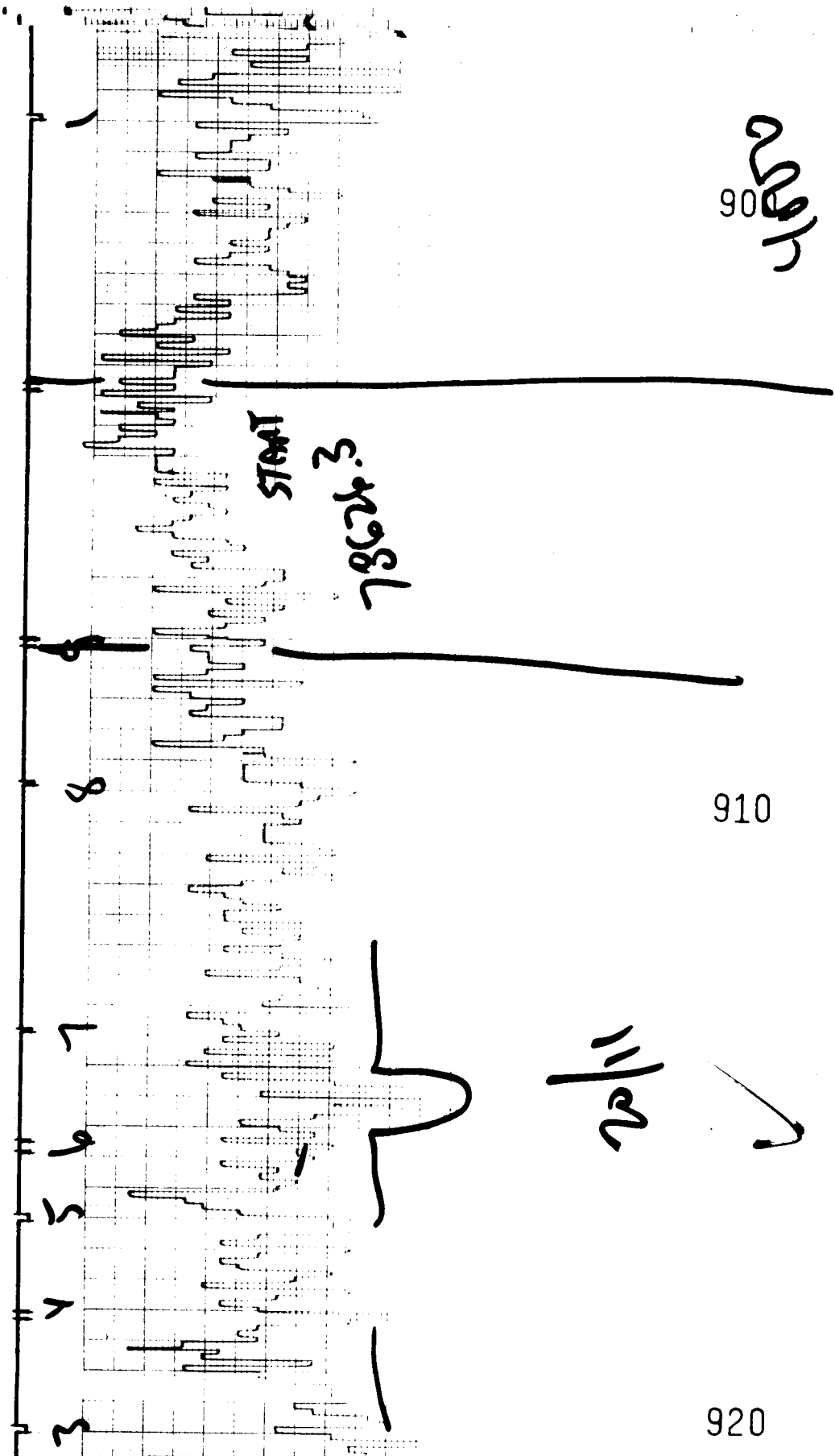

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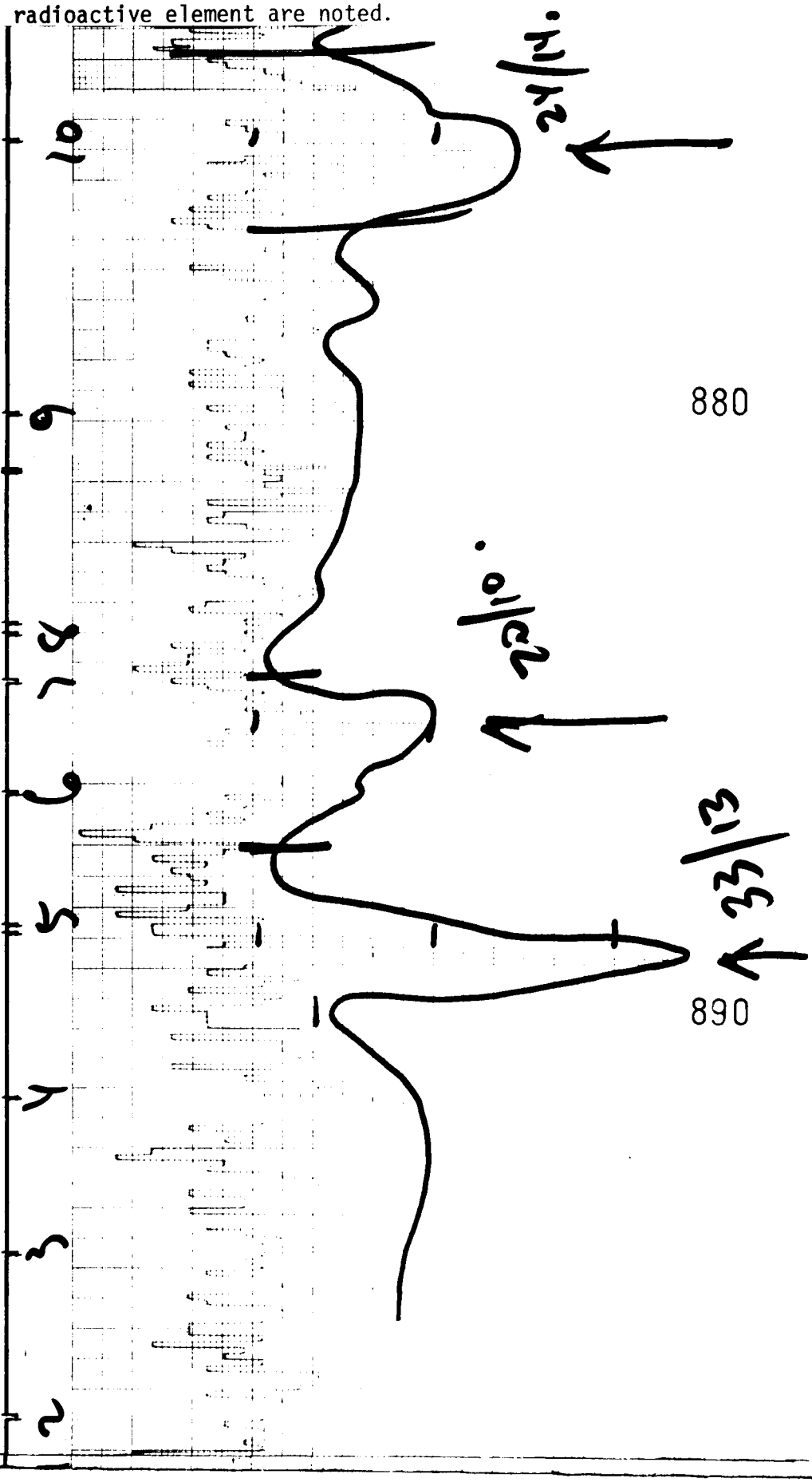

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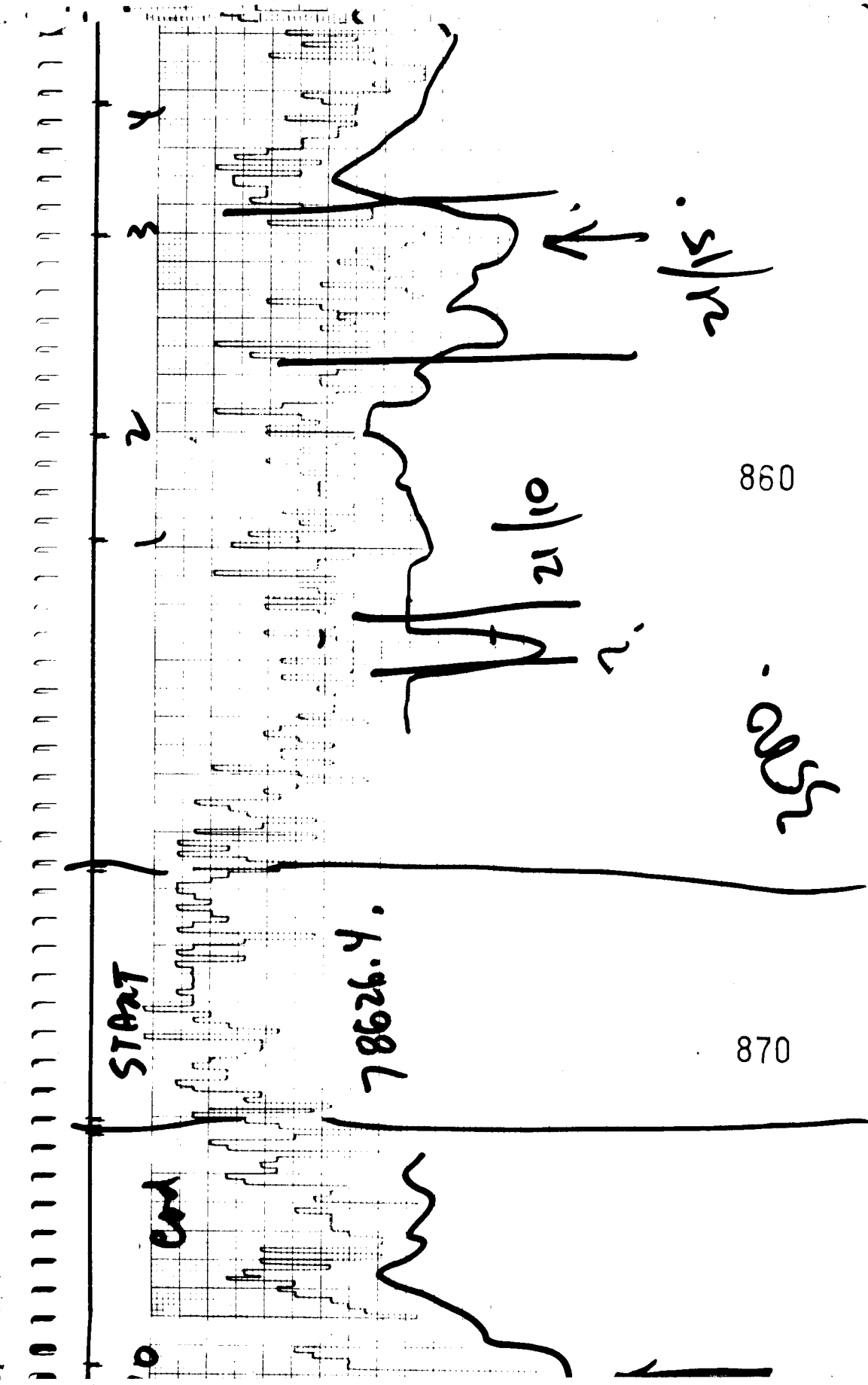

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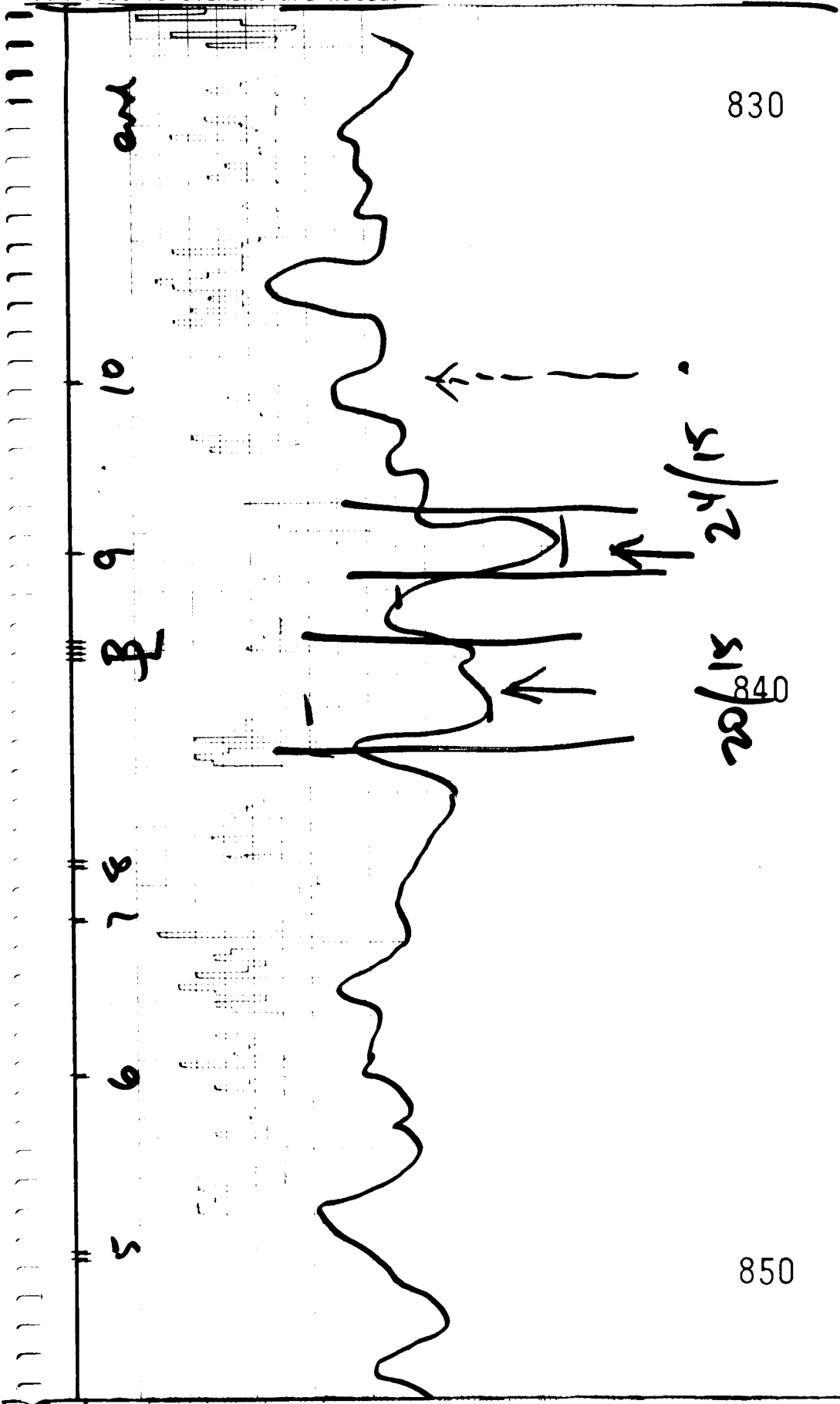

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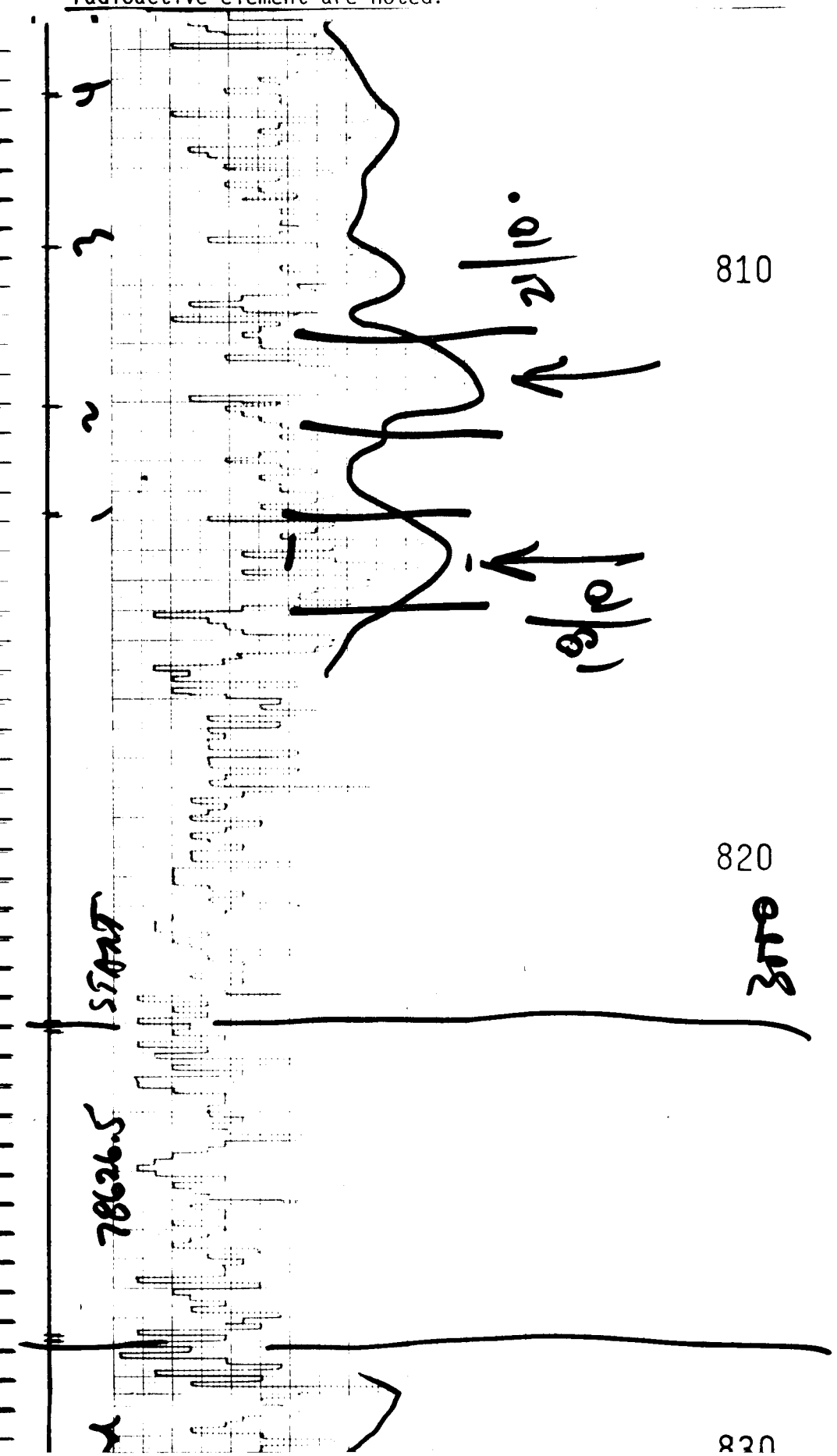

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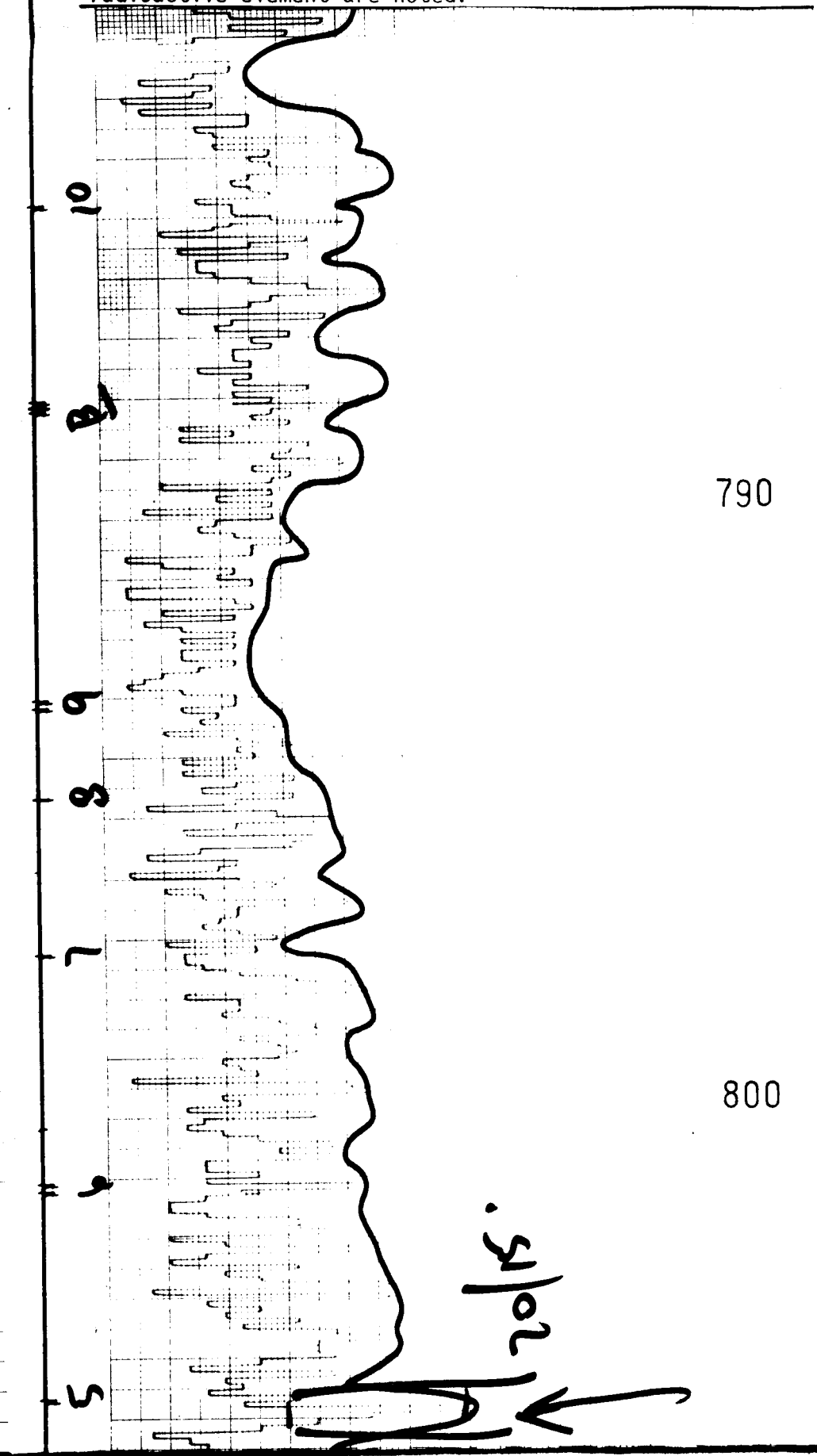
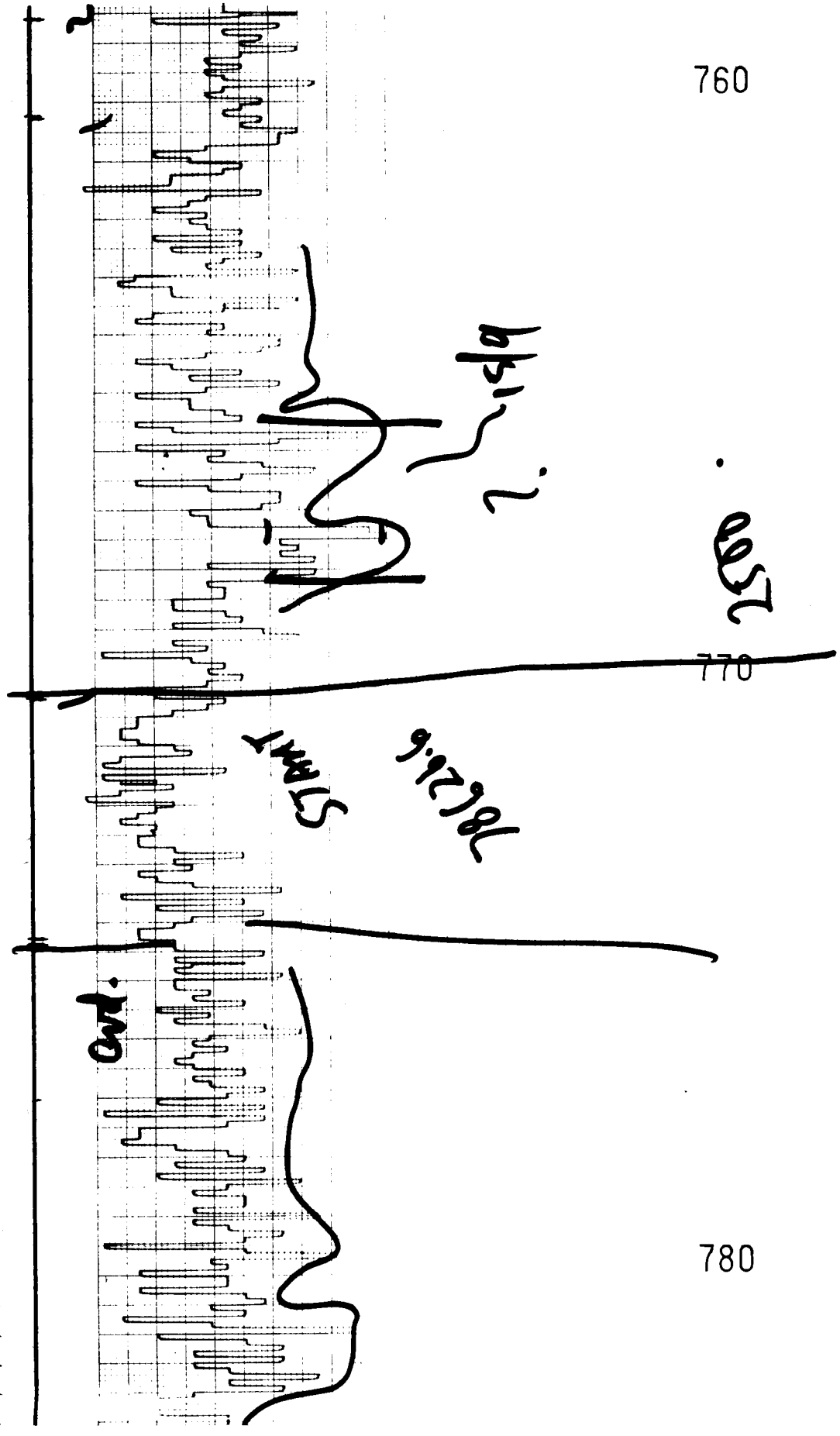
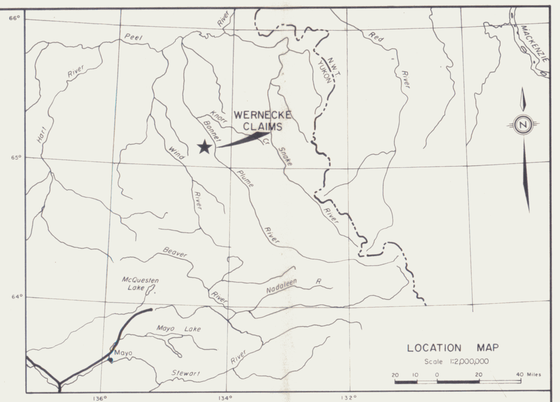


These photocopies are consecutive portions of continuous strip charts. Fiducial numbers along the chart correspond to locations noted on Figures W3 to W6. Each traverse has a unique number corresponding to a flight line plotted on the figures. At the beginning of each traverse the instrument setting, the traverse number and the radioactive element are noted.



These photocopies are consecutive portions of continuous strip charts. Fiducial numbers along the chart correspond to locations noted on Figures W3 to W6. Each traverse has a unique number corresponding to a flight line plotted on the figures. At the beginning of each traverse the instrument setting, the traverse number and the radioactive element are noted.




SUMMIT

BASELINE

0+00E 1+00E 2+00E 3+00E 4+00E 5+00E 6+00E 7+00E 8+00E 9+00E 10+00E

0+00N 1+00N 2+00N 3+00N 4+00N

0+00S 1+00S 2+00S 3+00S 4+00S 5+00S 6+00S 7+00S 8+00S

Hsp Hspa Hsh Hsc Hb

POSTS WERNECKE 27,28,29,30

POSTS WERNECKE 29,30,31,32

5000 4800 4600 4400 4200 4000 3800 3600 3400 3200

## LEGEND

- Hsp — Dark green, banded, chloritic argillite and phyllite, locally schistose. Minor basic dikes
- Hspa — Alternating beds of black slate and green phyllite partly spotted and bleached. Cut with many quartz-carbonate veins with rare brantnerite.
- Hsh — Tightly kinked grey green – grey blue chlorite schist
- Hb — Diatreme breccia composed of host rock frags in limy matrix. Specular hematite common with red staining
- Hsc — Dark brown weathering creamy dolomite with shaly layers

• 98 Scintillometer reading in counts per second

All readings were taken with Scintrex BGS-1S broadband Scintillometers, equipped with 12.75 cc Na I (Tl) crystals

FIG. W2

ARCHER, CATHRO & ASSOCIATES LTD

# GROUND RADIOMETRIC SURVEY AND GEOLOGY

## 1978 GRID

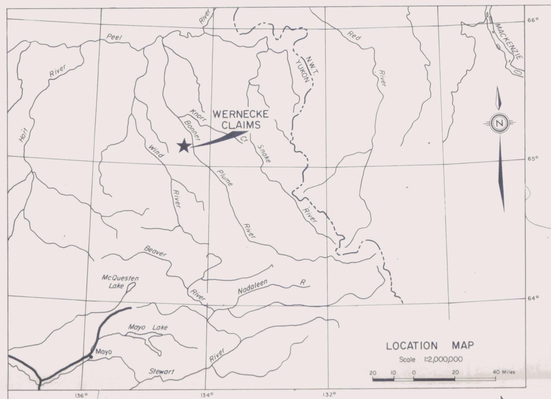
WERNECKE CLAIMS

WERNECKE JOINT VENTURE

SCALE 1:2000

50 25 0 25 50 100 Metres

Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL ENGINEER




PROPERTY OUTLINE — WERNECKE CLAIMS

1978 BASELINE

Quartet Lakes

## LEGEND

Traverse: start, fiducial 2, end

78604.13 — Traverse number and direction

1600/1000 — Anomalous interval; Local background (cps); Maximum anomalous value (cps)

Traverses 78604.13 to .18 were reflown as 78626.1 to .6 (see Appendix One, Tape 5, for data and FIG. W6 for fiducial(s))

FIG. W3

ARCHER, CATHRO & ASSOCIATES LTD

# AIRBORNE RADIOMETRIC SURVEY TOTAL COUNT

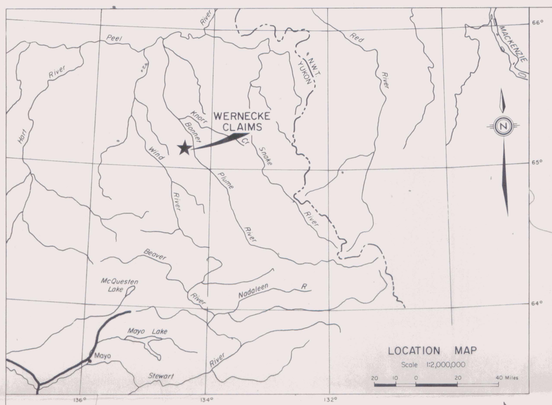
WERNECKE CLAIMS

WERNECKE JOINT VENTURE

SCALE 1:5000

METRES 100 50 0 100 200 300 400 500 METRES

Association of Professional Engineers of the Yukon Territory — A. R. ARCHER — GEOLOGICAL ENGINEER




PROPERTY OUTLINE — WERNECKE CLAIMS

1976 BASELINE

78604.19 → 78604.18 → 78604.17 → 78604.16 → 78604.15 → 78604.14 → 78604.13 →

78605.27 → 78605.26 → 78605.25 → 78605.24 → 78605.23 →

Quartet Lakes

78604.19 (cont.) 78604.16 (cont.) 78604.17 78604.16 (cont.) 78604.15 (cont.) 78605.26 (cont.) 78605.27 (cont.)

## LEGEND

start 2 fiducial end — Traverse

78604.13 → — Traverse number and direction

24/15 — Anomalous interval; Local background (c/cps); Maximum anomalous x value (cps)

Traverses 78604.13 to .18 were reflown as 78626.1 to .6
(see Appendix One, Tape 5, for data and FIG W6 for fiducials)

FIG. W4

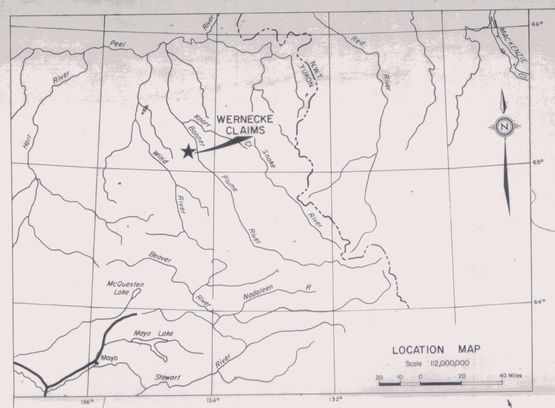
ARCHER, CATHRO & ASSOCIATES LTD

# AIRBORNE RADIOMETRIC SURVEY
# URANIUM
## WERNECKE CLAIMS
## WERNECKE JOINT VENTURE

SCALE 1:5000

METRES 100 50 0 100 200 300 400 500 NEWTON

Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL ENGINEER




78604.19
78604.18
78604.17
78605.27
78604.16
78605.26
78604.15
78605.25
78604.14
78605.24
78604.13
78605.23
PROPERTY OUTLINE — WERNECKE CLAIMS
1976 BASELINE
Quartet Lakes

## LEGEND

- Traverse (start, fiducial, end)
- 78604.13 → Traverse number and direction
- Anomalous interval
- 27/15 — Local background (cps) / Maximum anomalous value (cps)

Traverses 78604.13 to .18 were reflown as 78626.1 to .6
(see Appendix One, Tape 5, for data and FIG W6 for fiducials)

FIG W5

ARCHER, CATHRO & ASSOCIATES LTD

# AIRBORNE RADIOMETRIC SURVEY
# THORIUM

WERNECKE CLAIMS
WERNECKE JOINT VENTURE

SCALE 1:5000

METRES 100 50 0 100 200 300 400 500 METRES

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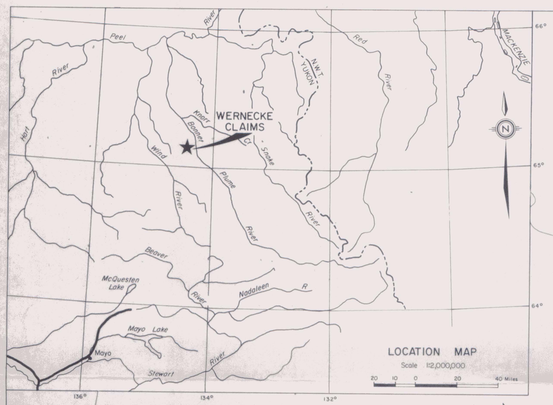
GEOLOGICAL ENGINEER




PROPERTY OUTLINE — WERNECKE CLAIMS

1976 BASE-LINE

78626.1

60/30

50/30

65/20

40/35

50/25

65/50

70/50

80/40

50/30

55/40

40/20

60/40

50/25

78626.2

78626.3

78626.4

78626.5

78626.6

Quartet Lakes

LEGEND

Traverse

start, 2 fiducial, end

78626.2 — Traverse number and direction

50/25 — Anomalous interval

Local background (cps)

Maximum anomalous value (cps)

FIG. W6

ARCHER, CATHRO & ASSOCIATES LTD

# AIRBORNE RADIOMETRIC SURVEY
# POTASSIUM

WERNECKE CLAIMS

WERNECKE JOINT VENTURE

SCALE 1:5000

METRES 100 50 0 100 200 300 400 500 METRES

Association of Professional Engineers of the Yukon Territory
A. R. ARCHER
GEOLOGICAL ENGINEER