

83-#266-#11361

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

NTS: 104-K/11, 12

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**11,361**

HORIZONTAL LOOP EM, VLF-EM, AND MAGNETICS  
SURVEYS ON THE BIG BULL, BIG BULL EXTENSION,  
BULL 2, 3, 4, 8 AND 9 CLAIMS  
ATLIN MINING DIVISION, B.C.

(ASSESSMENT REPORT)

Latitude : 58°40'N  
Longitude : 134°32'30"W

Claim Owner and Operator : COMINCO LTD.

JUNE 1983

JULES J. LAJOIE



COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

NTS: 104-K/11, 12

HORIZONTAL LOOP EM, VLF-EM, AND MAGNETICS  
SURVEYS ON THE BIG BULL, BIG BULL EXTENSION,  
BULL 2, 3, 4, 8 AND 9 CLAIMS  
ATLIN MINING DIVISION, B.C.

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INTRODUCTION

The Big Bull and Bull claims are located about 4 kilometres north of Tulsequah, B.C., as shown in the location map, Plate 246-83-1. Access in February was by fixed wing ski-equipped aircraft from Atlin to a camp on the Taku River.

The objective of the survey described herein was to explore for extensions of the Big Bull mineralization under sediments of the Taku River flood plain. The grid is shown in Plate 246-83-2, along with the claim outlines.

The geophysical work was completed between February 8th to 18th, 1983 by Cominco geophysicist, Boris Lum; Cominco geologist, Paul Sorbara; and two assistants, Len Parisienne who resides on the site and Al McGregor, Cominco technician. 10.4 kilometres of horizontal loop EM (HLEM) (APEX MaxMin II), 10.7 kilometres of VLF (CRONE Radem), and 9.2 kilometres of total field magnetics (SCINTREX MP-2) were completed. The work was done on the following claims shown in Plate 246-83-2:- Big Bull, Big Bull Extension, Bull Nos. 2, 3, 4, 8 and 9.

DATA PRESENTATION

The results of the survey are presented in two location maps, four computer plots of geophysical data and one geophysical compilation map:-

Plate 246-83-1 (in text)	Location Map Scale 1:250,000
Plate 246-83-2	Big Bull Claim and Grid Map Scale 1:5,000
Plate 246-83-3	Big Bull Horizontal Loop EM Coil Separation = 150 m Scales 1:5,000 1 cm = 20%

Plate 246-83-5	Big Bull Horizontal Loop EM Coil Separation = 200 m Scales 1:5,000 1 cm = 20%
Plate 246-83-5	Big Bull VLF-EM Scales 1:5,000 1 cm = 10% 1 cm = 200 field strength units
Plate 246-83-6	Big Bull Total Field Magnetics Scales 1:5,000 1 cm = 500 gammas
Plate 246-83-7	Big Bull Geophysical Compilation Scale 1:5,000

INTERPRETATION

a) HLEM

The whole grid shown in Plate 246-83-2 was covered with 150 metre coil separation HLEM and the results are shown in Plate 246-83-3. Lines 75S (slough line), 200S, 300S and 400S were covered with a 200 m coil separation HLEM, and these results are shown in Plate 246-83-4. Four frequencies were used: 222 Hz, 444 Hz, 1777 Hz and 3555 Hz. Included in Plates 246-83-3 and 246-83-4 are plots of 1777 Hz data with the 222 Hz in-phase data subtracted out, in order to quantify some of the chainage errors.

On Line 0S, there is a 5 to 10 metre wide conductive zone centered at 512W. The anomaly can be seen on the 1777 Hz and 3555 Hz plots at both coil separations. It is a poor conductor of about 0.5 mhos, and is at a shallow depth of less than about 10 metres, probably at subcrop.

A similar response is observed on Line 75S, which was surveyed along the frozen slough (Snye River). The conductor is at 575W, has an estimated poor conductance of about 1 mho, and a depth of about 10 metres. Since the line is near the edge of the conductive valley fill, part of the response may be due to the latter.

On Line 200S, the response from 0W to 500W is that of a conductive layer, the sediments of the Taku River. West of 500W, there is a transition from the response of the conductive sediments to that of the resistive outcrop, producing an anomaly. Superimposed on this "edge" anomaly there is possibly a poor conductor response located between 600W and 625W on Line 200S, which lines up well with the responses on Lines 75S and 0S.

Lines 300S to 700S in the 150 metre coil separation data and Lines 300S to 400S in the 200 metre coil separation data display HLEM results typical of a conductive layer. Many of the noisy station to station variations in the in-phase data disappear in the 1777 Hz - 222 Hz plots (Plates 246-83-3 and 4), thereby confirming that they are due to poor chainage.

No bedrock conductor is observed on Lines 300S to 700S. The depth of exploration for the 150 metre coil separation is about 75 m and for the 200 metre coil separation, it is about 100 m.

b) VLF-EM

The VLF data acquired on the Big Bull grid are shown in Plate 246-83-5. The E-W lines were surveyed using the Seattle, Washington VLF transmitter. The two baselines at 500W and 0W were surveyed using the Hawaii transmitter. The Crone Radem unit used in this survey measures the dip and relative field strength of the VLF field.

The strongest dip angle and field strength anomaly occurs at 512W on Line 0, directly coincident with the HLEM conductor on this line. Other positive crossovers on this line with much weaker or absent field strength responses occur at 420W, 310W, and 80W. The latter are not substantiated by the HLEM data.

On Line 75S (slough line), a broad dip angle anomaly occurs at 575W, coincident with the HLEM anomaly on this line.

On Line 200S, a strong anomaly occurs at 910W beyond the limit of the HLEM survey. There is no VLF anomaly corresponding with the postulated HLEM conductor at 615W on this line.

The remainder of the survey area including the two baselines is relatively flat.

c) Magnetics

The total field magnetic data is shown in Plate 246-83-6. The main characteristic is high variability of up to 1,000 gammas in areas of shallow overburden north of the Snye River. There is no magnetic anomaly directly coincident with the HLEM conductor at 512W on Line 0N. The magnetic data is relatively flat over the sediments of the Taku River.

CONCLUSIONS

The compilation of geophysical data is shown in Plate 246-83-7.

A poor conductor (0.5 - 1 mho) was located at 512W on Line 0S, and it appears to extend to about 610W on Line 200S. No HLEM conductors were found on the grid from 300S to 700S within the depth of exploration (75 to 100 metres) of the HLEM system.

Report by:



Jules J. Lajoie  
Ph.D., P.Eng.

Approved for  
Release by:



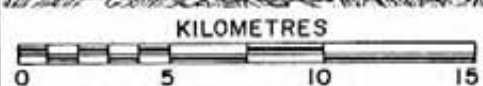
G. Harden  
Manager, Exploration  
Western District


JJL/jel

DISTRIBUTION:

Mining Recorder	(2)
Western District Files	(1)
Geophysics	(1)





 NTS  
104 K

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

**BIG BULL PROPERTY**  
**BIG BULL LOCATION MAP**  
**ATLIN M.D., B.C.**

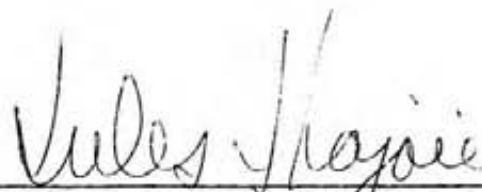
Scale: 1: 250000      Date: JUNE 1983      Plate: 246-83-1

IN THE MATTER OF THE B.C. MINERAL ACT  
AND IN THE MATTER OF A GEOPHYSICAL PROGRAMME  
CARRIED OUT ON THE BIG BULL AND BULL CLAIMS  
LOCATED 4 KM NORTH OF TULSEQUAH, B.C.  
IN THE ATLIN MINING DIVISION OF THE  
PROVINCE OF BRITISH COLUMBIA, MORE PARTICULARLY  
N.T.S. 104-K/11, 12

S T A T E M E N T

I, Jules J. Lajoie of the City of West Vancouver in the Province of British Columbia, make oath and say:

1. THAT I am employed as a geophysicist by Cominco Ltd. and, as such have a personal knowledge of the facts to which I hereinafter depose;
2. THAT annexed hereto and marked as "Exhibit A", to this statement is a true copy of expenditures incurred on geophysical survey on the BIG BULL and BULL mineral claims;
3. THAT the said expenditures were incurred between February 8th and 18th, 1983, for the purpose of mineral exploration of the above-noted claims.



Jules J. Lajoie, Ph.D., P.Eng.  
Geophysicist, Cominco Ltd.



EXHIBIT "A"

STATEMENT OF GEOPHYSICAL EXPENDITURES (1983)

BIG BULL AND BULL CLAIMS

1. SALARIES

B. Lum, Geophysicist			
Feb. 8 - 18 : 11 days @ \$175/day	\$ 1,925.00		
P. Sorbara, Geologist			
11 days @ \$173/day	1,903.00		
Len Parisienne, Assistant			
7 days @ \$100/day	700.00		
Al McGregor, Assistant			
10 days @ \$161/day	1,610.00		6,138.00
			<hr/>

2. EQUIPMENT RENTAL

Feb. 4 to 21 : 18 days

MaxMin II	18 days @ \$45/day	810.00	
MP-2	18 days @ \$15/day	270.00	
Radem	18 days @ \$15/day	270.00	1,350.00
			<hr/>

3. OPERATING DAY CHARGE (1)

Feb. 10 - 15 : 6 days @ \$250/day 1,500.00

4. EXPENSE ACCOUNTS

B. Lum	767.04		
P. Sorbara	788.00		1,555.04
			<hr/>

Balance Forward 10,543.04

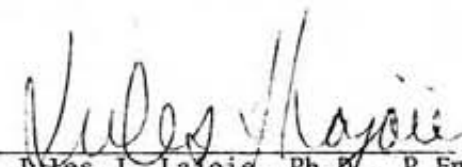
Balance Forward 10,543.04

5. MISCELLANEOUS

Camp Rent	8 days @ \$50/day	400.00	
Field Transport	(Mob and Demob - TAKU AIR)	2,843.50	
Linecutting		6,500.00	
Domicile (Food)	8 days @ \$50/day	400.00	10,143.50

TOTAL EXPENDITURES \$ 20,686.54

I certify this to be a true statement of expenditures for the geophysical survey on the BIG BULL and BULL claims in 1983.


  
Jules J. Lajoie, Ph.D., P.Eng.  
Geophysicist, Cominco Ltd.

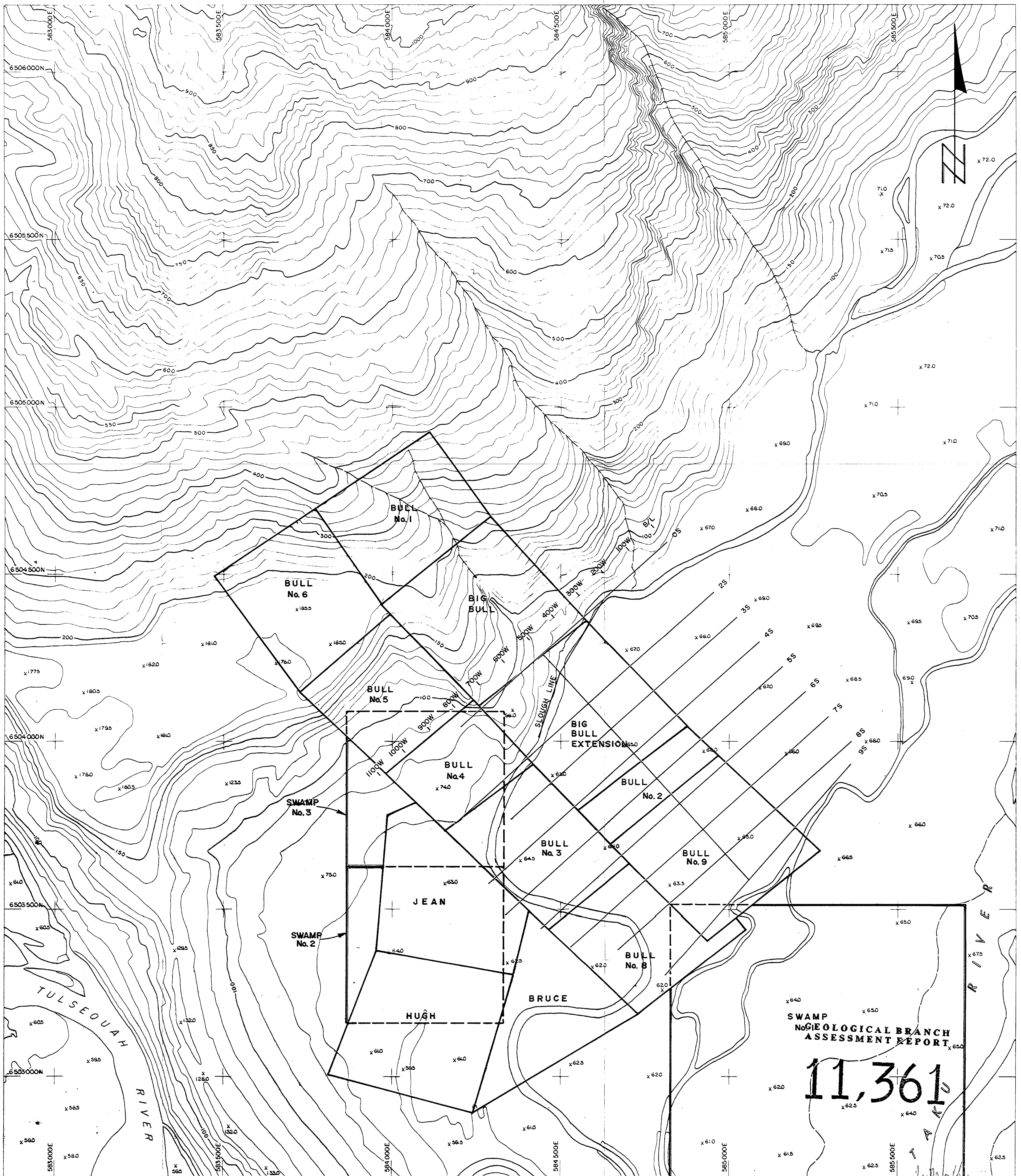
- (1) Operating Day Charge : for those field days on which useful data is acquired to cover costs of drafting, interpretation and report writing.

C E R T I F I C A T I O N

I, Jules J. Lajoie, of 5655 Keith Road, in the City of West Vancouver, in the Province of British Columbia, do hereby certify that:-

1. I graduated from the University of Ottawa in 1968 with an Honours B.Sc. in Physics, from the University of British Columbia in 1970 with a M.Sc. in Geophysics, and from the University of Toronto in 1973 with a Ph.D. in Geophysics.
2. I am a registered member of the Association of Professional Engineers of the Province of British Columbia, the Society of Exploration Geophysicists, and the British Columbia Geophysical Society.
3. I have been practicing my profession for the past ten years.

  
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Jules J. Lajoie, Ph.D., P.Eng.  
Research Geophysicist



SWAMP  
GEOLOGICAL BRANCH  
ASSESSMENT REPORT

11,361

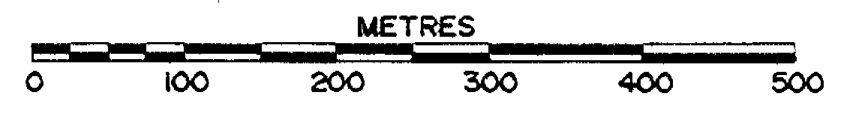
TO ACCOMPANY A REPORT BY JULES J. LAJOIE, Ph.D., P.Eng.

**BIG BULL PROPERTY**

**BIG BULL CLAIM and GRID MAP**

**ATLIN M.D., B.C.**

Scale: 1:5000 Date: JUNE 1983 Plate: 246-83-2



SHEET INDEX

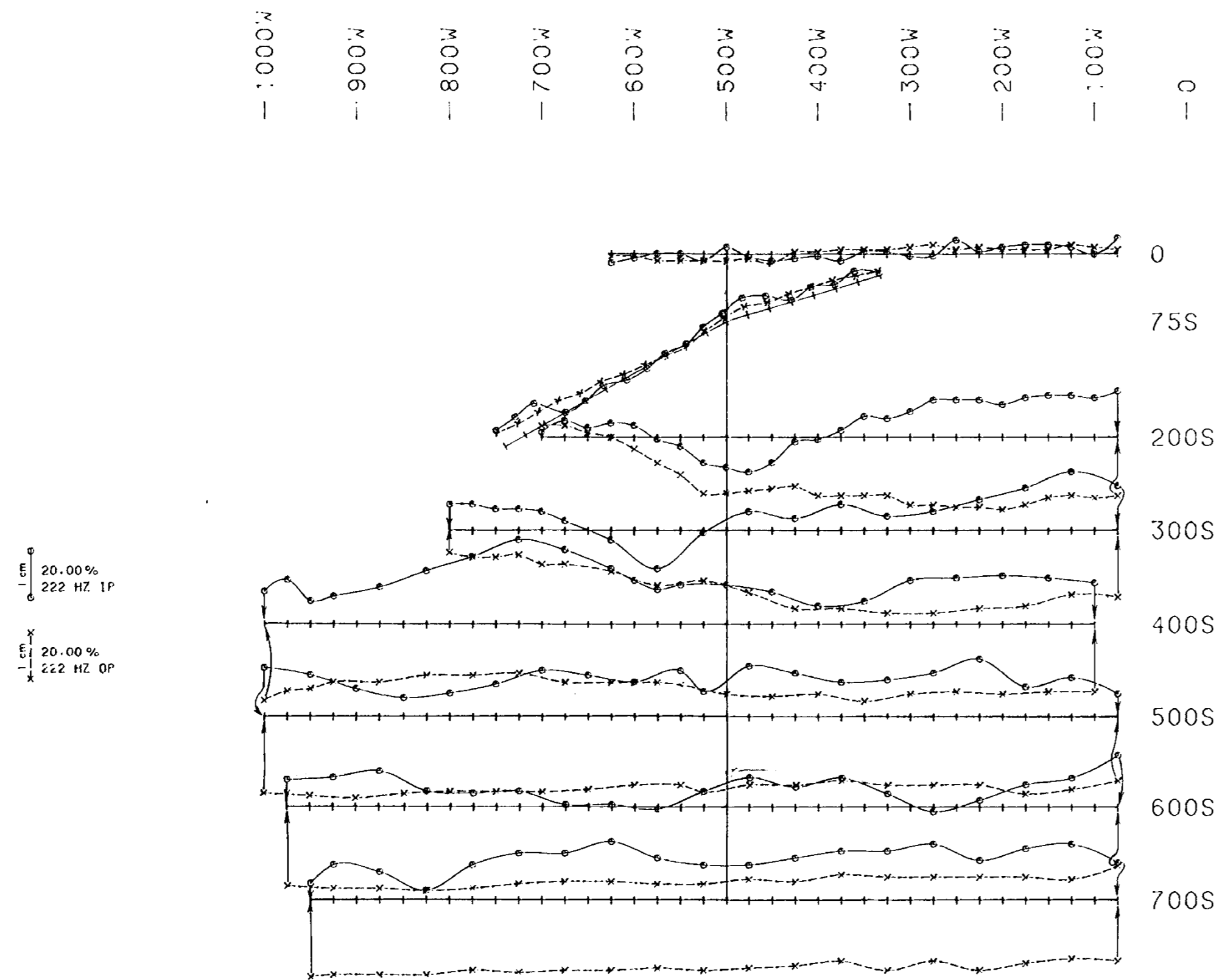


McElvanney Surveying & Engineering Ltd.  
1166 Alberni Street, Vancouver, B.C. Canada

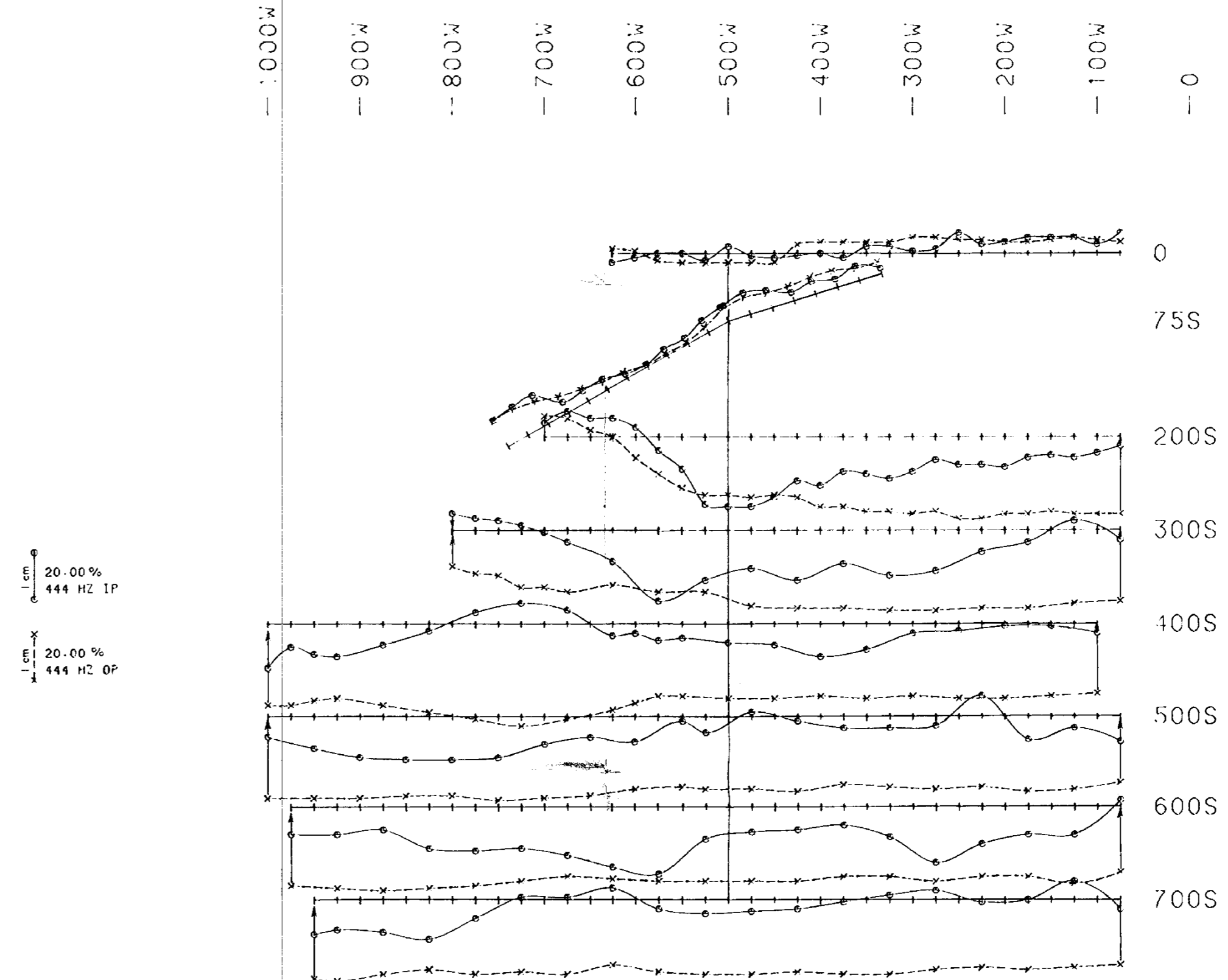
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NTS 104 K

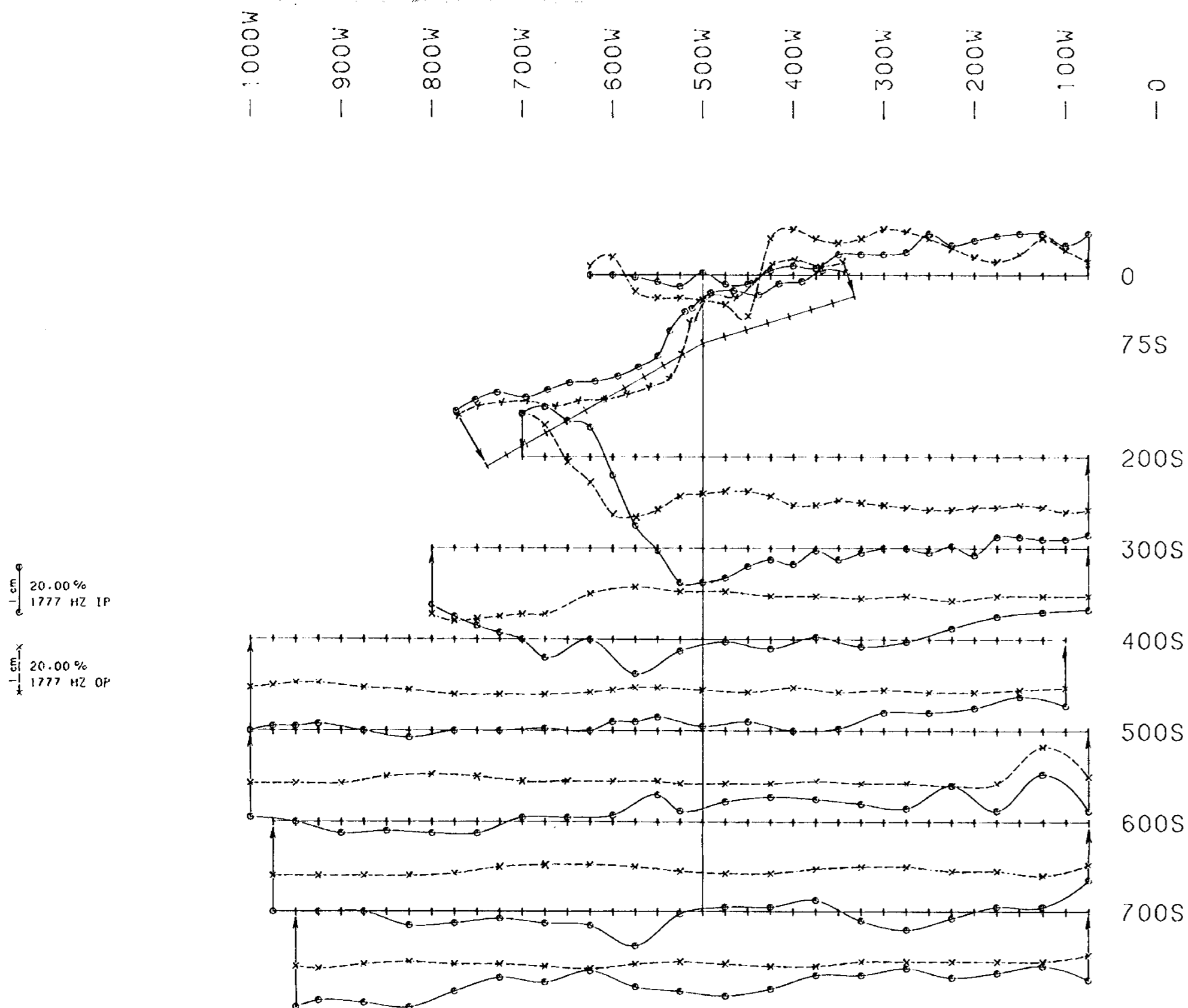
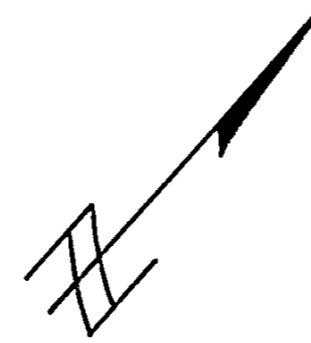




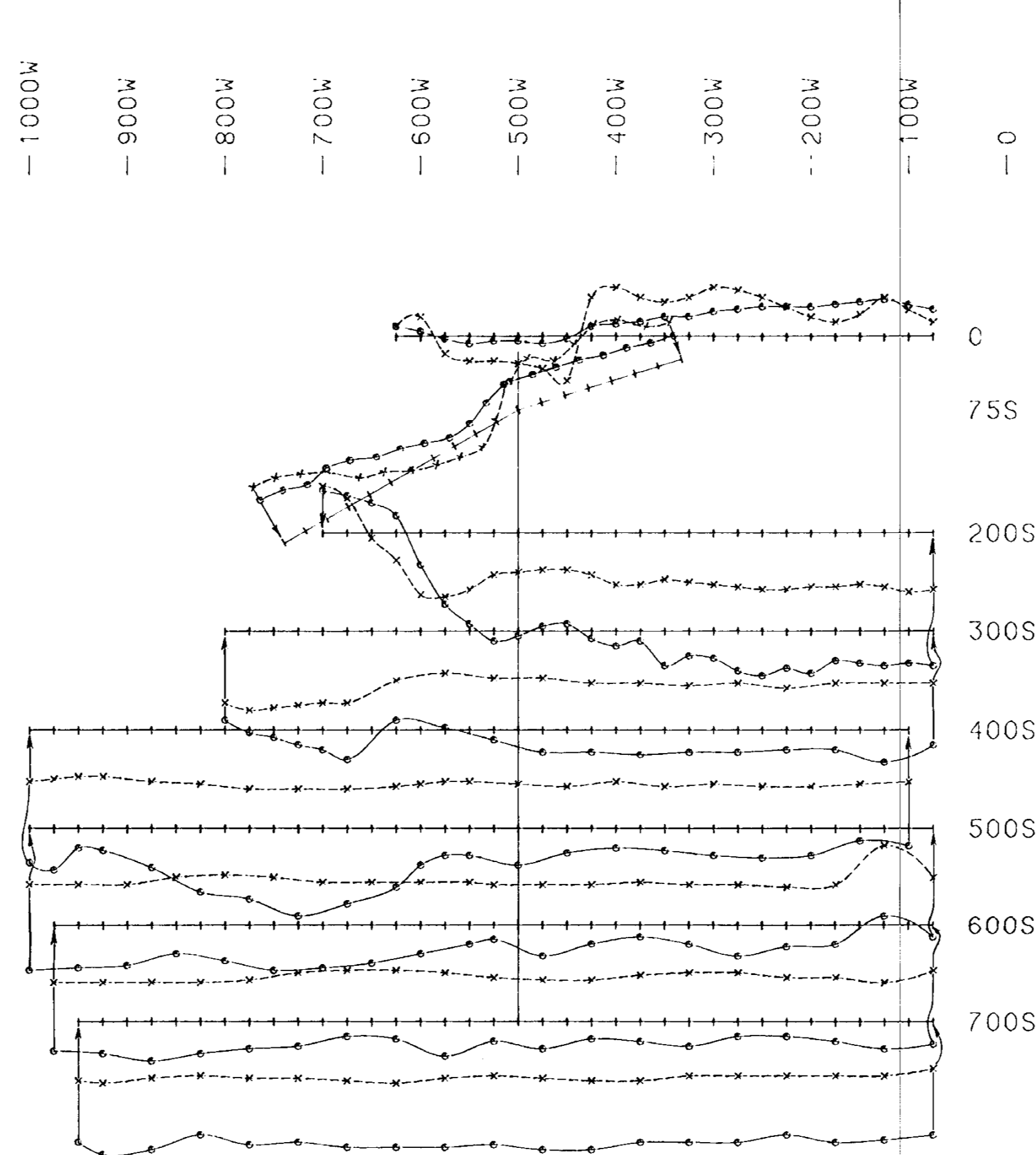
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222 HZ OP



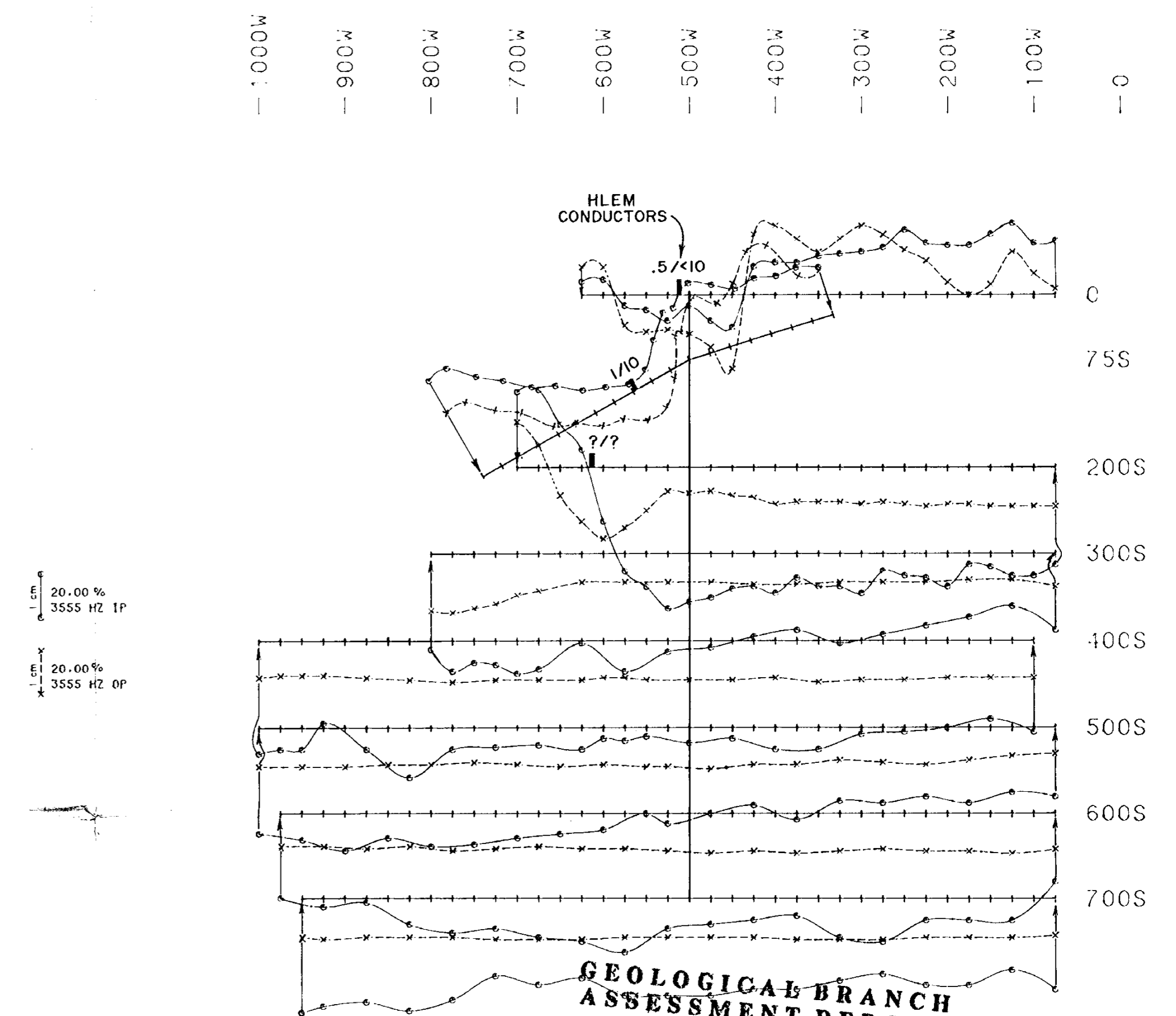
BIG BULL CS = 150M HLEM - 444 HZ IP  
444 HZ OP



BIG BULL CS = 150M HLEM - 1777 HZ IP  
1777 HZ OP



BIG BULL CS = 150M HLEM - 1777 - 222 HZ IP  
1777 HZ OP



BIG BULL CS = 150M HLEM - 3555 HZ IP  
3555 HZ OP

GEOLOGICAL BRANCH  
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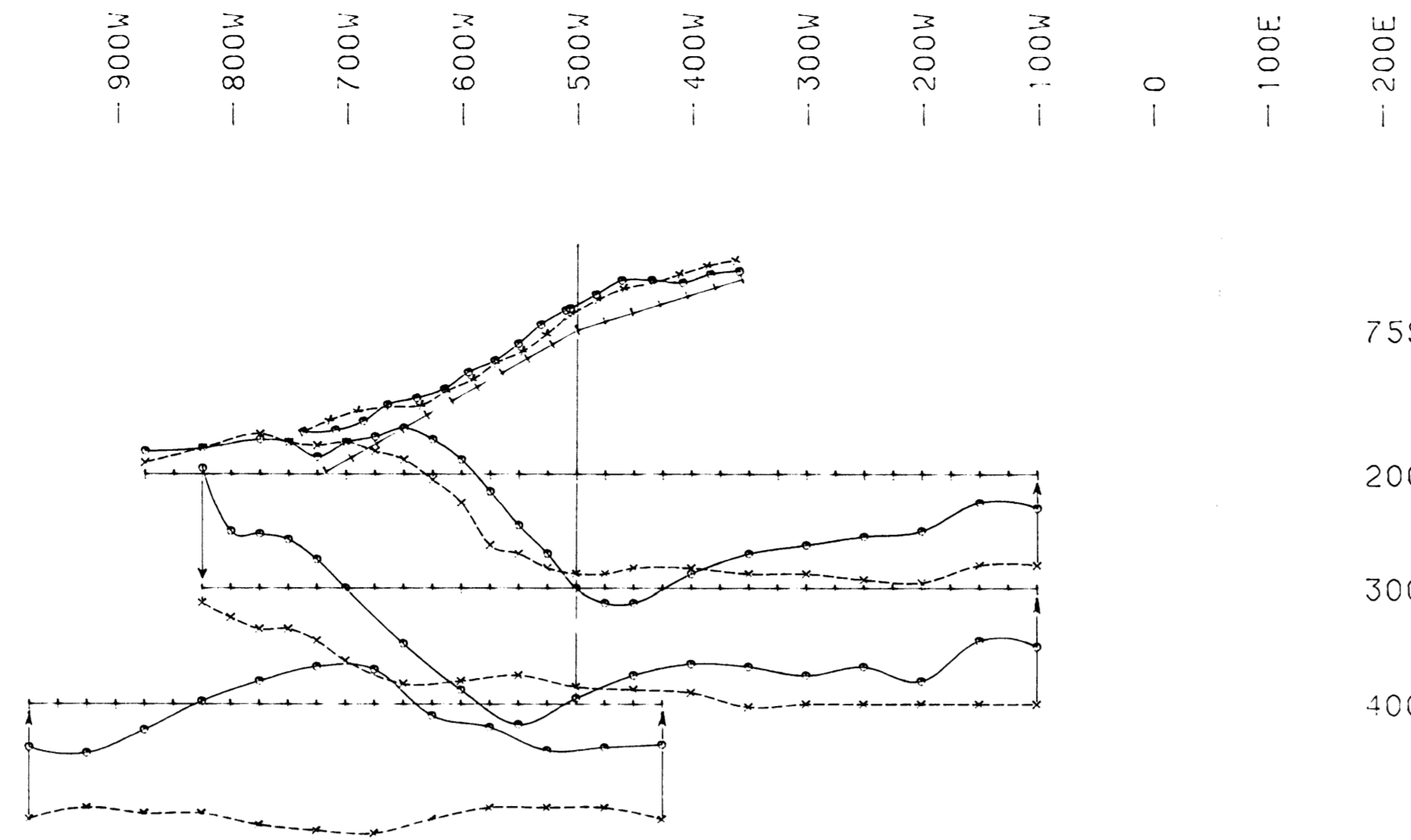
CONDUCTANCE / DEPTH  
IN MHOS / IN METRES  
ELECTROMAGNETIC  
CONDUCTOR

INSTRUMENT: APEX PARAMETRICS  
MAX-MIN II

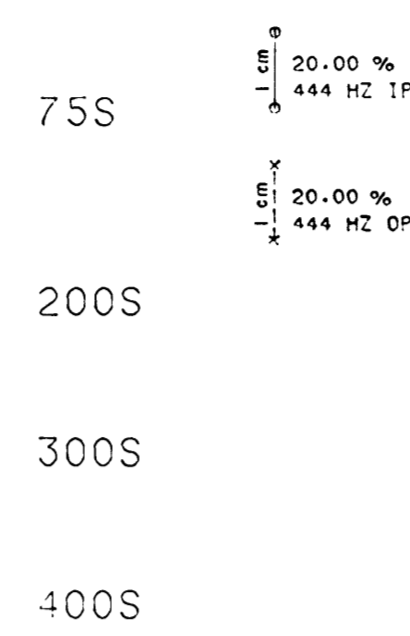


TO ACCOMPANY A REPORT BY JULES J. LAJOIE Ph.D., P.Eng.

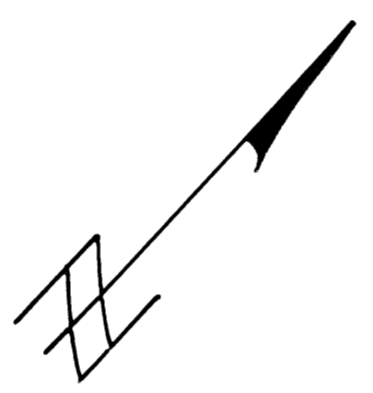
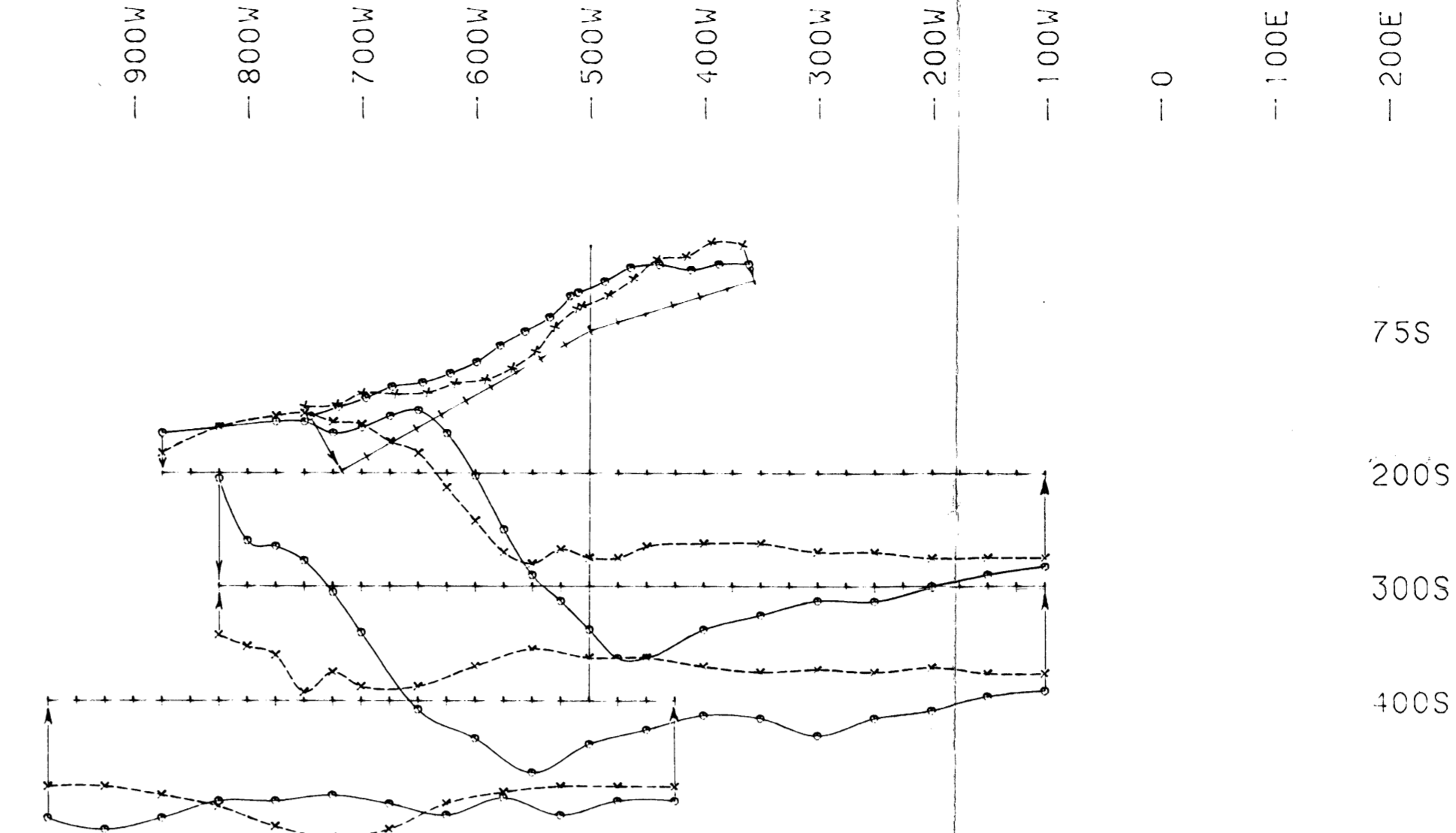
BIG BULL PROPERTY			
Drawn by:	Traced by:	BIG BULL HLEM	
Revised by:	Scale:	COIL SEPARATION = 150m.	
Scale: 1:5000		Date: JUNE 1988	
ATLIN M.D., B.C.		Plate: 246-83-2	



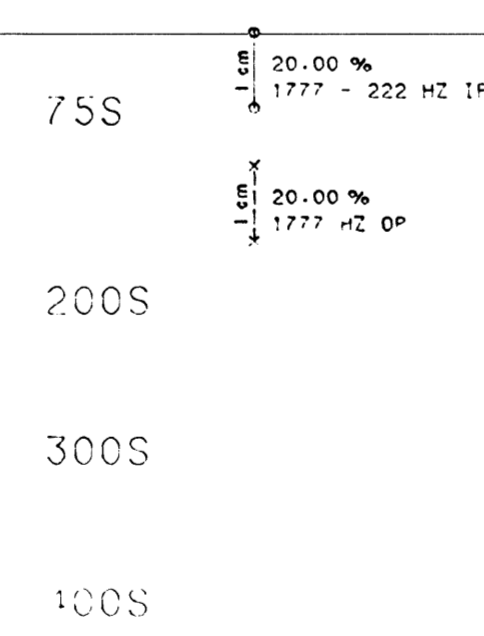
BIG BULL CS = 200M HLEM - 222 HZ IP  
222 HZ OP



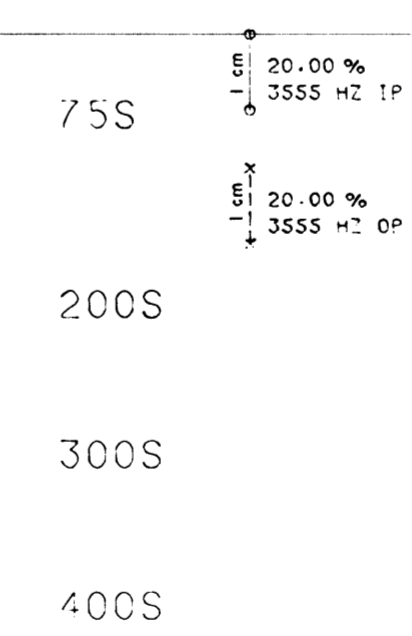
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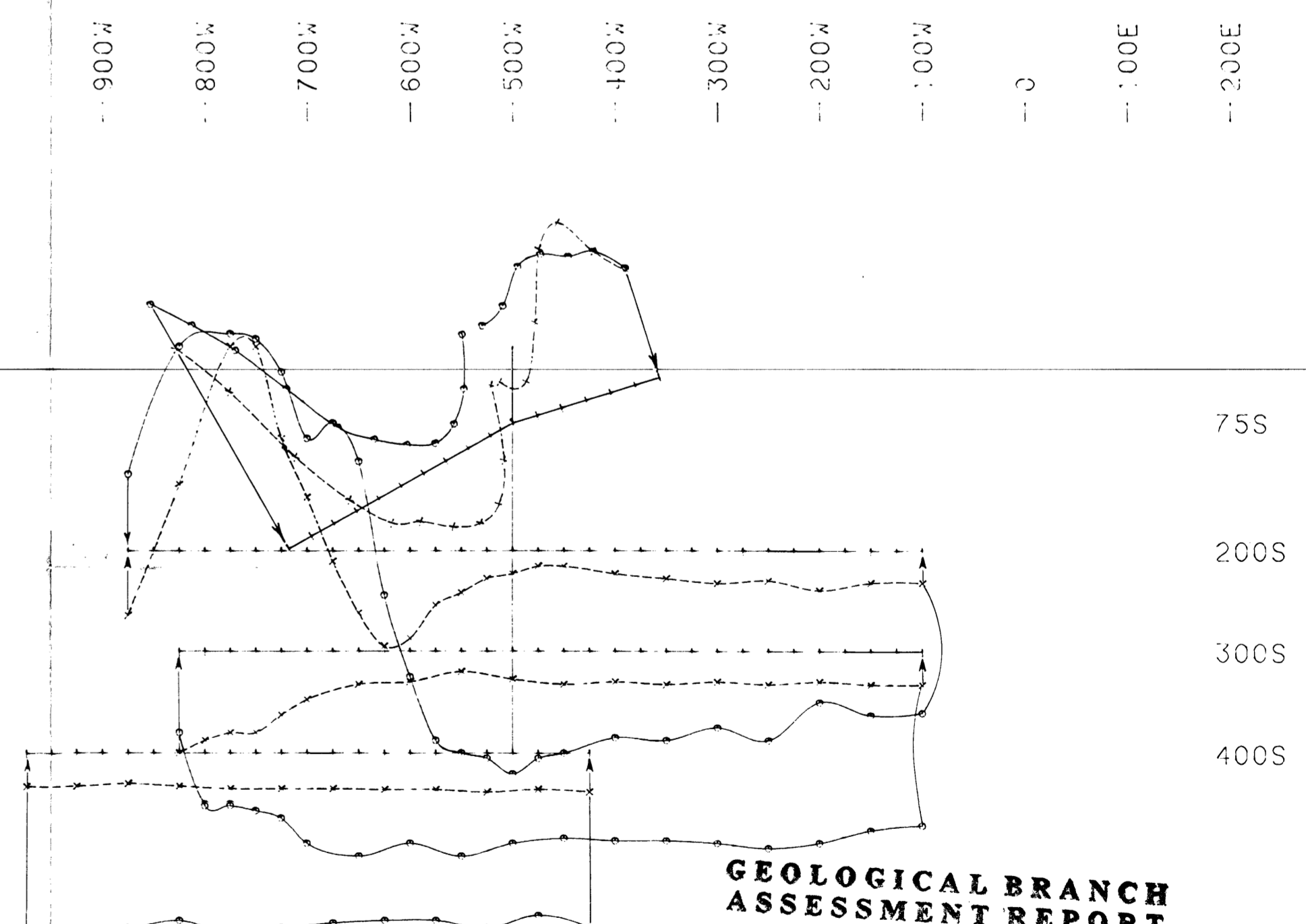
BIG BULL CS = 200M HLEM - 1777 HZ IP  
1777 HZ OP



BIG BULL CS = 200M HLEM - 1777 - 222 HZ IP  
1777 HZ OP



BIG BULL CS = 200M HLEM - 3555 HZ IP  
3555 HZ OP



**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**11,361**

*Jules Lajoie*

INSTRUMENT: APEX PARAMETRICS  
MAX-MIN II



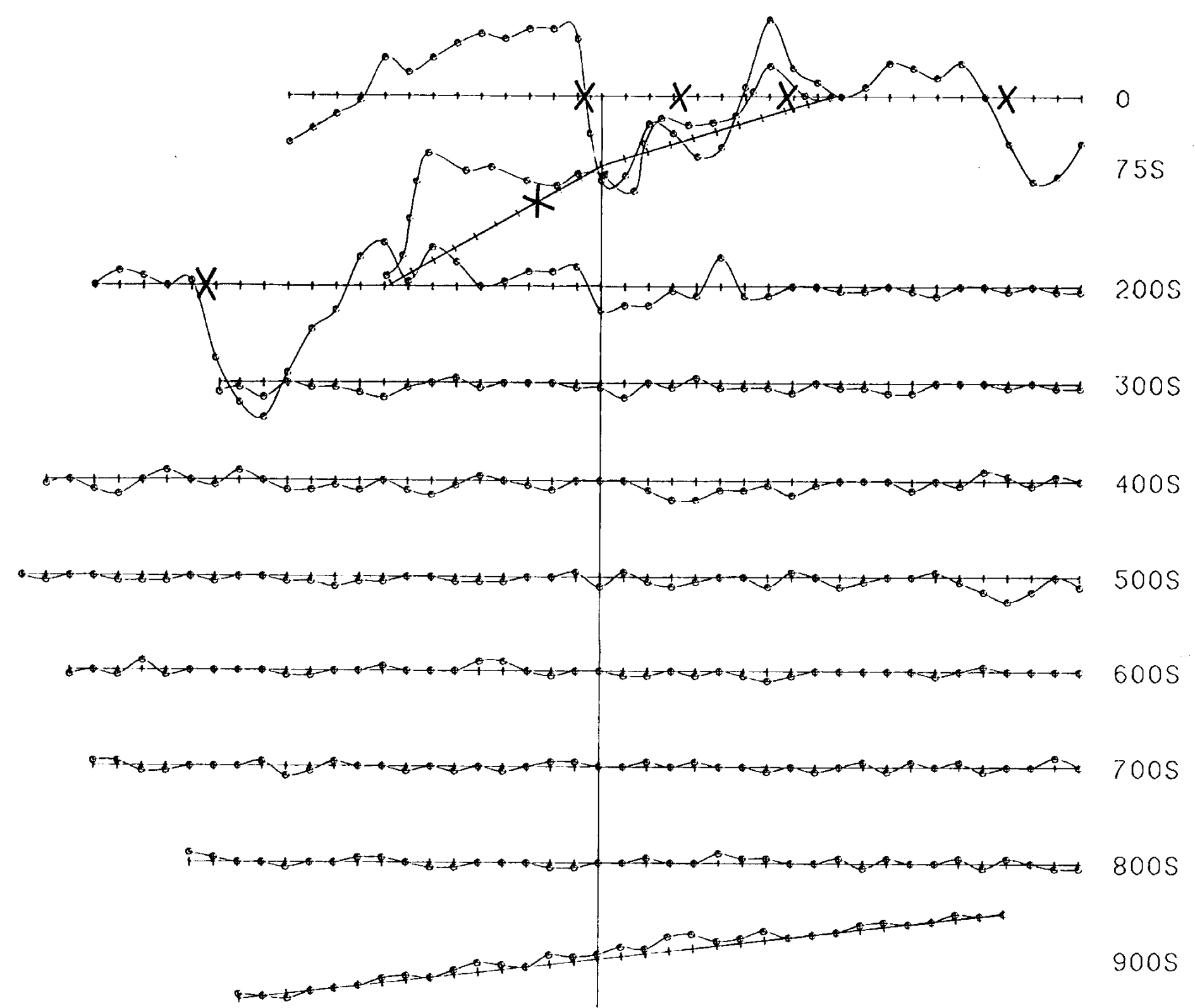
TO ACCOMPANY A REPORT BY JULES J. LAJOIE Ph.D., P.Eng.

BIG BULL PROPERTY	
Drawn by:	Traced by:
Checked by:	Reviewed by:
BIG BULL HLEM COIL SEPARATION = 200m.	
ATLIN M.D.B.C.	
Scale: 1:5000	Date: JUNE 1983

NTS 104-K  
246-83-4

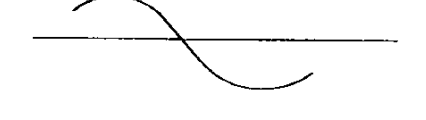


— 1200W  
— 1100W  
— 1000W  
— 900W  
— 800W  
— 700W  
— 600W  
— 500W  
— 400W  
— 300W  
— 200W  
— 100W  
— 0  
— 100E

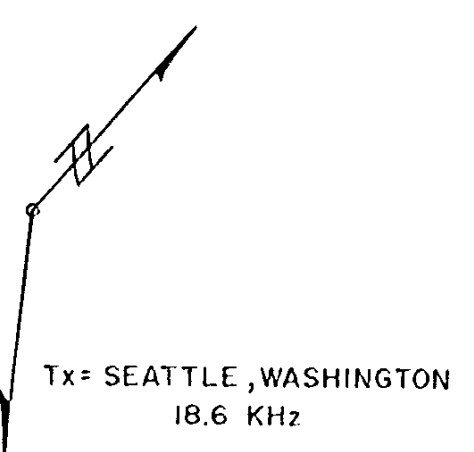


BIG BULL VLF - DIP ANGLE

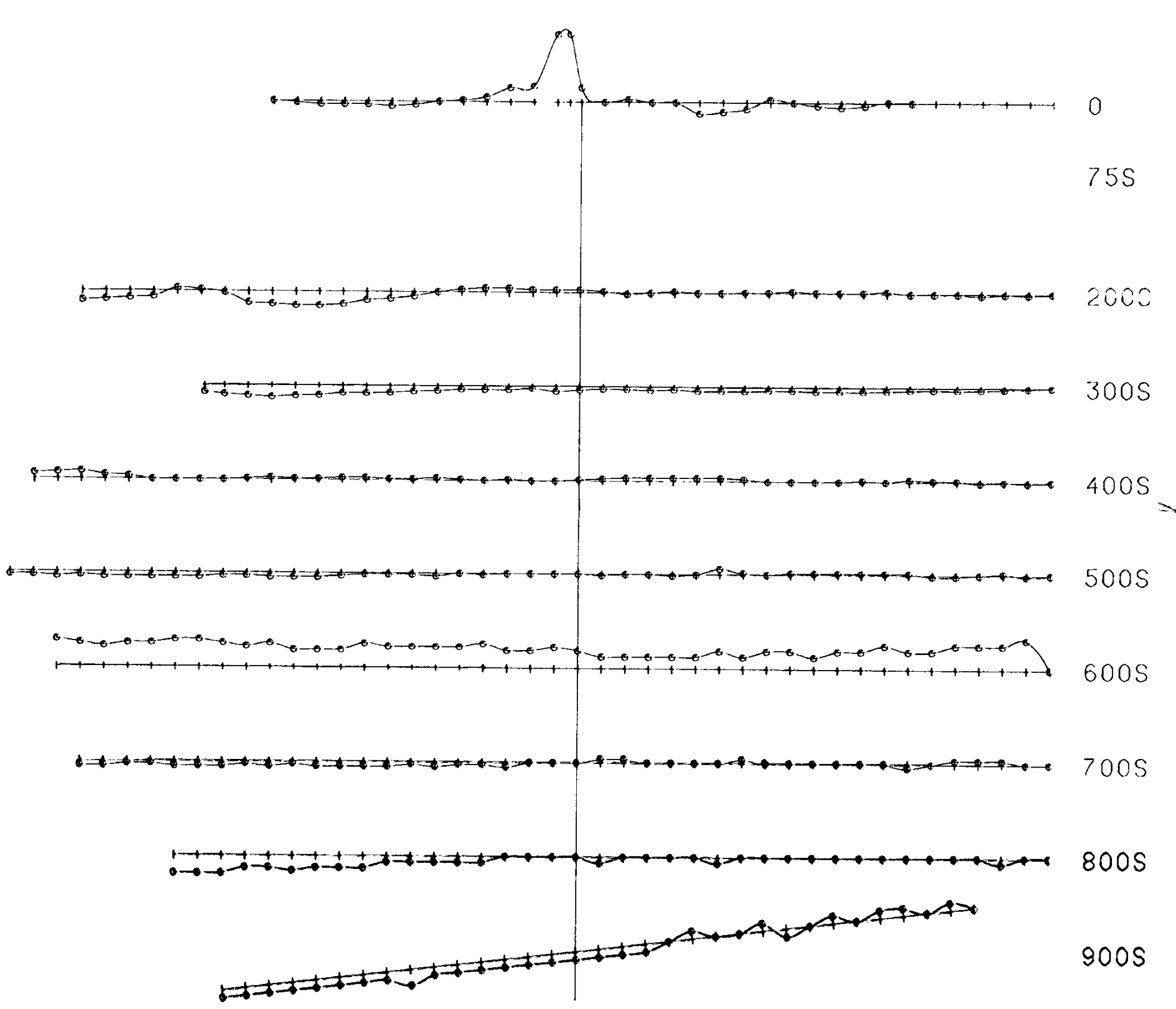
POSITIVE CROSSOVER



10.00 DEGREES  
DIP ANGLE



— 1200W  
— 1100W  
— 1000W  
— 900W  
— 800W  
— 700W  
— 600W  
— 500W  
— 400W  
— 300W  
— 200W  
— 100W  
— 0  
— 100E

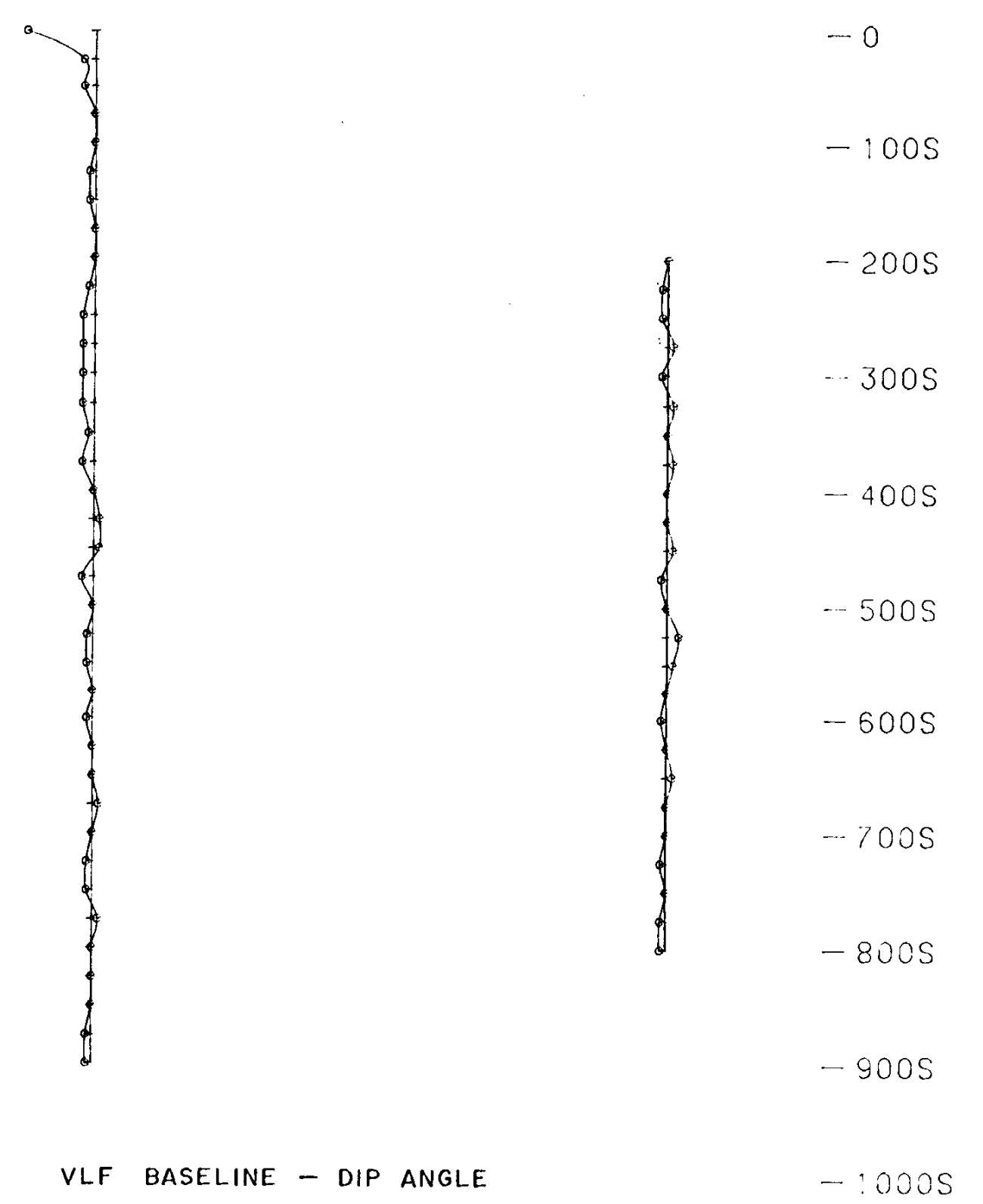


BIG BULL VLF - FIELD STRENGTH

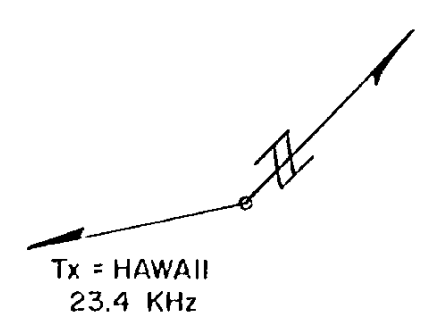
THE BASE VALUE  
OF EACH LINE IS  
100 units

200.00 UNITS  
FIELD STRENGTH

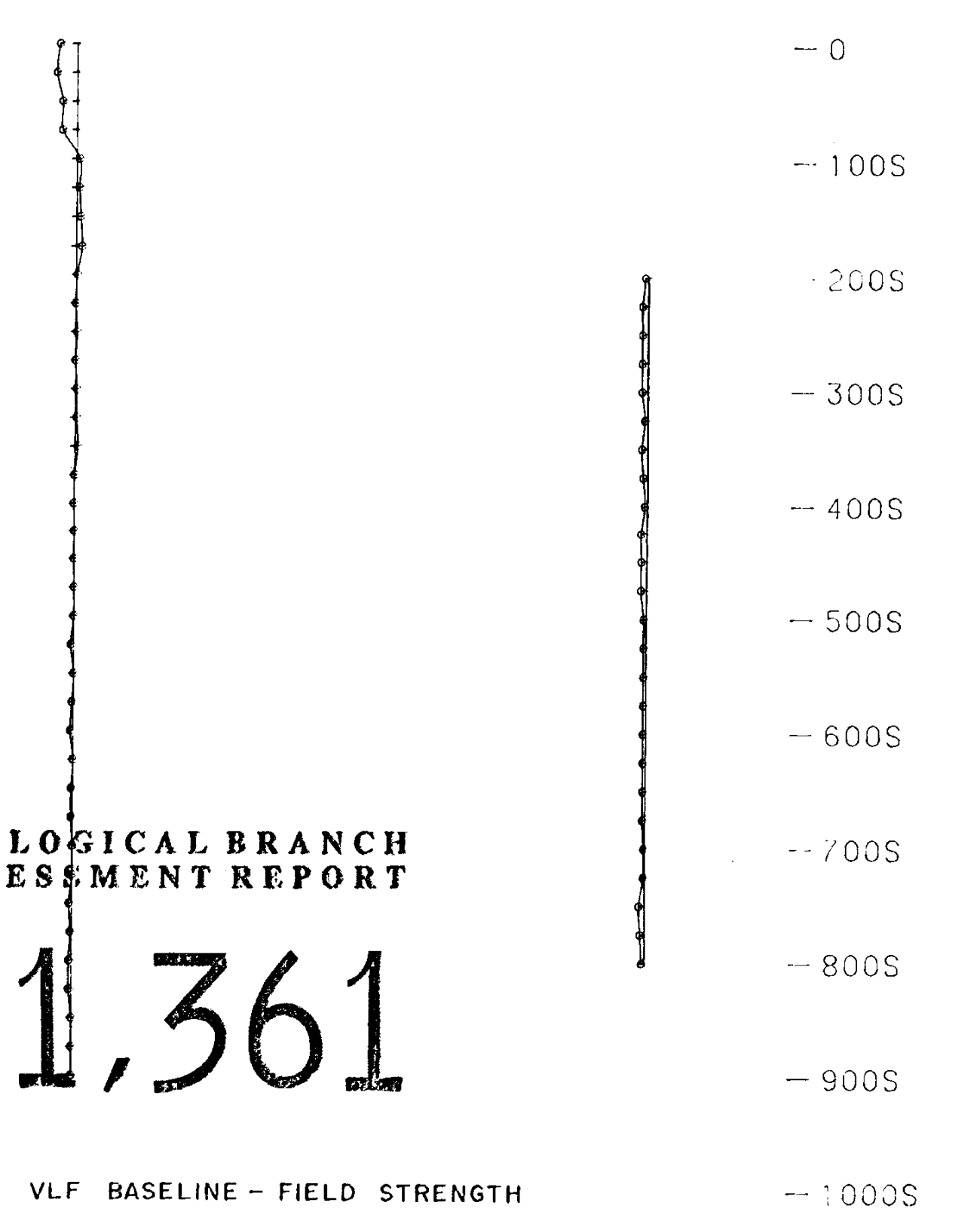
— 500W  
— 0



VLF BASELINE - DIP ANGLE



— 500W  
— 0



VLF BASELINE - FIELD STRENGTH

GEOLOGICAL BRANCH  
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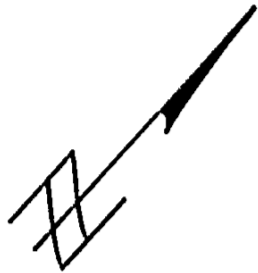
INSTRUMENT: CRONE RADEM

X VLF CROSSOVER ANOMALY

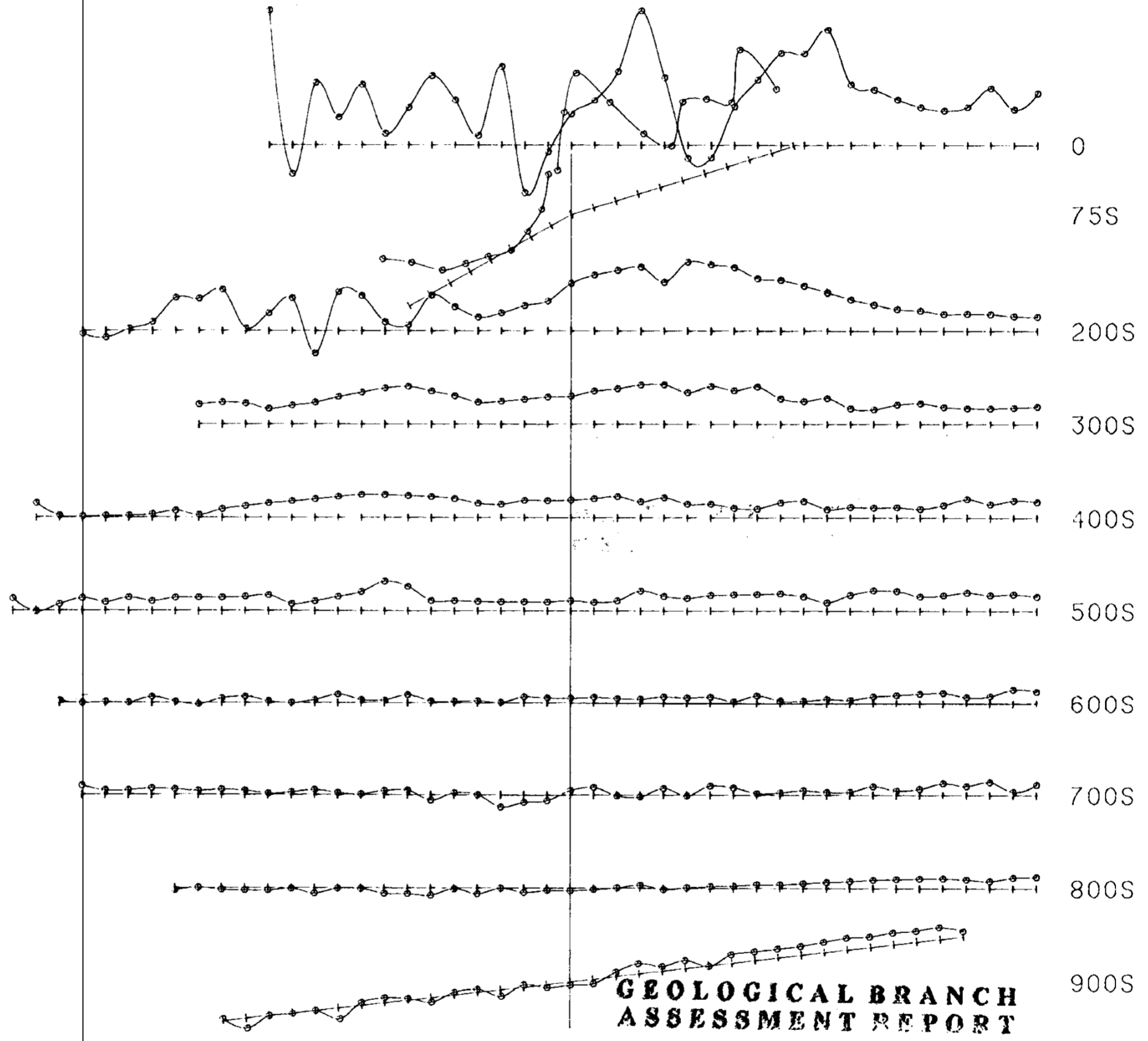


TO ACCOMPANY A REPORT BY JULES J. LAJOIE P.H.D., P.Eng. *Jules Lajoie*

<b>BIG BULL PROPERTY</b>				NTS 104-K
Drawn by:	Traced by:			BIG BULL VLF EM
Revised by:	Date:	Revised by:	Date:	
ATLIN M.D., B.C.				Plate: 246-B3-5 FORM #10 0670
Scale: 1:5000		Date: JUNE 1983		



— 1100W — 1000W — 900W — 800W — 700W — 600W — 500W — 400W — 300W — 200W — 100W — 0 — 100E



THE BASE VALUE OF THE LINES IS 58,200 GAMMAS

500.00 GAMMAS

**GEOLOGICAL BRANCH  
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TO ACCOMPANY A REPORT BY JULES J. LAJOIE Ph.D., PEng.

*Jules Lajoie*

INSTRUMENT: SCINTREX MF-2  
PROTON PRESSION  
MAGNETOMETER

## BIG BULL PROPERTY

NTS  
104-K

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

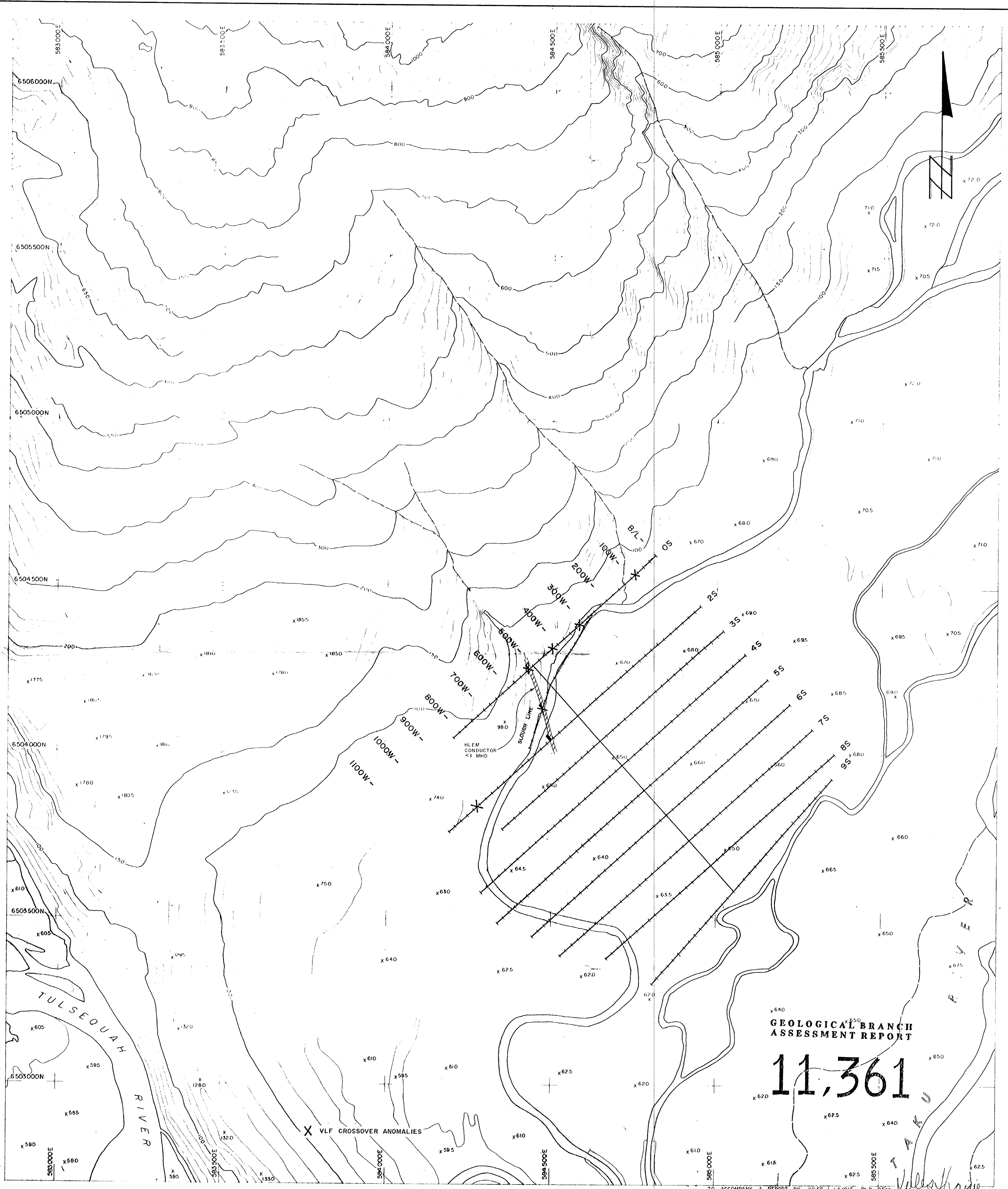
BIG BULL MAGNETICS

ATLIN M.D., B.C.

Scale: 1:5000

Date: JUNE 1983

Plate: 246-83-6



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

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TAKU

NOTE: Contour Interval is 10 Metres where the General Slope of the Ground is less than 50%, and 20 Metres where the General Slope is more than 50%.

0 100 200 300 400 500 METRES

SHEET INDEX

McElhenny  
McElhenny Surveying & Engineering Ltd  
1166 Alberni Street, Vancouver, B.C. Canada

TO ACCOMPANY A REPORT BY JULES J. LAJOIE Ph.D., P.Eng.

**BIG BULL PROPERTY**

NTS 104 K

**BIG BULL GEOPHYSICAL  
COMPILATION MAP**

ATLIN M.D., B.C.

Scale: 1: 5000 Date: JUNE 1983 Plate: 246-83-7

FORM 210 0676