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MOINA EL 7/74

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REPORT ON EXPLORATION FOR 12 MONTHS  
TO 18 JUNE 1986

Author: S J Caithness

Date: 4 June 1986

Submitted to: T W Dickson

Accepted by:



Copies:

CRAE Hobart  
CRAE Canberra  
Department of Mines  
Tasmania  
Billiton Australia

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## 1. SUMMARY

A regional stream sediment survey has been carried out over EL 7/74 (Moina). The survey was designed to search for fine gold both as a primary target and as a pathfinder for volcanogenic massive sulphides. Areas highlighted include the Winterbrook Inlier, Tin Spur and Moina.

UTEM geophysical surveys have been completed over two grids within the Winterbrook Inlier. Initial interpretation has outlined a number of anomalies for further investigation.

The future programme will involve soil geochemical and drill testing of UTEM responses plus evaluation of the Au potential at Tin Spur and Moina.

## 2. INTRODUCTION

This report covers all work carried out over Exploration Licence 7/74 (Moina) for the year ending 18th June 1986.

EL 7/74 is the subject of a joint venture between Comalco Limited, Billiton Australia and CRA Exploration Pty Limited. CRAE commenced management of exploration activities within the EL in conjunction with neighbouring licences EL 8/77 (Riana) and EL 36/79 (Loongana) in March 1985.

The Licence consists of two separate areas located approximately 35 km south of Ulverstone. The southernmost area is located immediately to the south and east of Lake Cethana while the other portion includes the Moina-Smiths Plains area (see plans TASH 2973 & 2998).

The Licence area is dominantly used for farming and forest management.

### 3. CONCLUSIONS

The regional stream sediment survey has outlined three areas for follow-up, i.e. the Winterbrook Inlier, Tin Spur and Moina.

An evaluation of previous work within the Winterbrook Inlier has indicated that considerable potential exists to host volcanogenic massive sulphides. The area contains a prospective acid to intermediate volcanosedimentary sequence with a number of galena and sphalerite occurrences.

Initial interpretation of the large UTEM survey completed within the Inlier has outlined a number of anomalies worthy of follow-up. If follow-up results are encouraging, other prospective zones may be surveyed.

The Tin Spur and Moina areas contain old workings which are the likely sources of geochemical anomalies. Some gold work has been carried out at Tin Spur however little attention has been paid to gold at the Moina workings.

### 4. RECOMMENDATIONS

- (1) Follow-up of UTEM anomalies within the Winterbrook Inlier. This work will involve soil geochemistry over near surface features and drill testing of the deeper responses.
- (2) Compilation of existing data to assess the Au potential of the Moina workings.
- (3) Compilation of existing data to assess the Au potential of the Tin Spur workings.

### 5. GEOLOGY

The geology of EL 7/74 is shown on plan TASH 3002. PreCambrian metamorphosed sediments of the Tyennan Block occur in the southernmost portion of area 2. These sediments have been intruded by the Cambrian Dove Granite.

Further north, Cambrian rocks of the Mount Read Group outcrop in a narrow east-west trending belt. These rocks consist of acid to intermediate volcanics, tuffaceous units and sediments. They are overlain unconformably by the Ordovician Roland Conglomerate. Highly altered schistose zones are commonly developed within the Cambrian along this contact.

The Roland Conglomerate underlies the Moina Sandstone which is in turn overlain by the Ordovician Gordon Limestone. This limestone is particularly well developed in the northern portion of area 1.

Devonian granite has intruded both Cambrian and Ordovician lithologies at Cethana Dam.

Tertiary basalt and Quaternary cover masks the underlying geology over portions of the licence area.

A number of historical workings occur within the licence area. At Moina, Sn-W-Bi-Mo was mined from a skarn deposit. The area immediately south of Cethana also contains Sn-W-Bi deposits but was dominantly prospected for Ag-Pb-Au. Most of these workings lie within Ordovician sediments or within the Cambrian-Ordovician contact zone.

## 6. GEOCHEMISTRY

A regional stream sediment sampling programme has been carried out. The emphasis of the programme was to search for fine gold either as a primary target or as a pathfinder for volcanogenic massive sulphides. Thirty-two large (5 kg) -4 mesh samples were collected at a density of approximately 1 per 4 km<sup>2</sup>. These were assayed for gold using the cyanide leach technique. A standard -80 mesh sample was also collected at each site and assayed for base metals and indicator elements. All results are contained in Appendix 1 and sample sites are shown on plan TASH 2949.

The sampling detected nine anomalies worthy of initial follow-up. These highlighted three areas:-

- 1) The Winterbrook Inlier of Cambrian volcanics and sediments
- 2) The Moina historical mining area
- 3) The Tin Spur-Olivers Hill area south of Cethana

Anomaly levels have been arbitrarily chosen at (ppm) 40 Pb, 50 Cu, 0.1 Au and 1000 ppt Au in the cyanide leach samples. Zn, and to a lesser extent Cu, are regarded as poor discriminators due to their strong correlation with basalt occurrences. Statistical evaluation of the results will be carried out in the future to determine more subtle anomalies and any significant correlations between elements.

Compilation of previous explorers' stream sediment geochemistry has been completed. The results are presented on plans TASH 2999-3001.

Follow-up sampling to date has concentrated on the Winterbrook Inlier.

## 7. WINTERBROOK INLIER

Work by CRAE within EL 7/74 has largely concentrated within this area. The area is considered prospective on a geological basis and due to its geochemical response. Previous work carried out by Comalco and Billiton (nee Shell Metals) has not adequately tested the Inlier.

### 7.1 Geology

The Winterbrook Inlier has been mapped at 1:10 000 scale by Comalco. The geology consists of a Cambrian acid to intermediate volcanosedimentary sequence with overlying Tertiary basalt and Pleistocene sediments. The Cambrian appears to represent a domal structure rimmed by Ordovician sandstones and conglomerates.

Detailed grid mapping, also by Comalco, was completed over prospects in the north (Winterbrook grids) and south east (Mt Jacob grid) of the inlier. Mapping over the Winterbrook grids outlined a strongly sericitised rhyolite dome within a sequence of acid and intermediate lithic and crystal tuffs. The units surrounding the rhyolite are commonly sericitised and sheared. The mapped area is further enhanced by the presence of a shale unit and galena and sphalerite occurrences.

The Mt Jacob grid is again an area of bimodal volcanism with acid rhyolites and intermediate andesites occurring in association with acid to intermediate tuffs and shales. Sericitic alteration and sulphide occurrences (galena and sphalerite) were noted in this area also.

Other zones of mapped bimodal volcanics occur throughout the inlier however no follow-up work has been carried out in these areas.

The geology of the inlier is shown on plan TASH 2821.

## 7.2 Previous Exploration

Previous exploration within the Winterbrook Inlier was largely carried out by Comalco and Billiton. The area was originally targeted by Comalco on the basis that the geology had similarities to that of known deposits at Rosebery and Mount Lyell. Work carried out included gridding, stream sediment, soil (C and Ao horizons) and rock chip geochemistry, geological mapping and IP geophysical surveys. The work concentrated on the Mount Jacob and Winterbrook grids.

Two diamond holes were drilled by Comalco at the Mt Jacob prospect. The first hole was sited to test a coincident IP and Pb geochemistry anomaly and intersected 16m of 2% combined Pb-Zn. The second hole was sited further west, again to test an IP response. This hole failed to intersect significant base metal sulphides and downhole IP indicated that pyrite at the top of the Cambrian caused the surface anomaly. No further significant tests were carried out on this prospect by Comalco.

Work by Billiton over the Winterbrook and Mt Jacob grids again largely revolved around soil and rock chip geochemistry. Ground magnetics, VLF-EM, Max-Min and UTEM geophysical surveys were also conducted. This work failed to further upgrade the prospect areas.

### 7.3 Geochemistry

Geochemical work carried out by CRAE has involved collation of previous explorers' stream sediment samples and follow-up sampling of untested anomalies. These results are presented on plans TASH 2966 & 2968.

A total of 9 follow-up samples have been collected to test two anomalies (sample no. 1231545 - 0.4 ppm Au and sample no. 123150 - 44 ppm Pb, 74 ppm Zn). In both cases the follow-up has failed to enhance the initial anomaly. Results are included in Appendix 2.

### 7.4 Geophysics

The main emphasis of work carried out during the past year has been UTEM geophysical surveys over two grids within the Inlier. A total of 54 line km of UTEM was surveyed at a line spacing of 200m.

A major grid was cut over the previously explored Winterbrook Grids, and a second smaller grid (7 km) was cut over an area of unexplored bimodal volcanics to the west of the Mt Jacob prospect. A number of significant responses were obtained from the surveys. Survey details and interpretation of results are contained in a memo by T von Strokirch and included in Appendix 3. Location of grids and contouring of results is shown on plan TASH 2958.

Ground magnetics was completed over the gridded areas and is shown on plan TASH 2959.

Reinterpretation of the Billiton UTEM survey at Mt Jacob prospect led to the identification of a subtle anomaly not previously detected. A gravity survey was carried out to determine whether the anomaly was due to massive sulphides. Soil geochemistry was not used because of Ordovician scree cover. Interpretation of the gravity has indicated that a lithological unit caused the UTEM response. Details of the survey are contained in Appendix 5 and on plans TASH 2929 & 3005.

#### 8. MOINA AREA

Stream sediment geochemistry highlighted the Moina area with anomalies in Pb and Zn plus both fine and coarse Au. The maximum values obtained from sampling are (ppm) 60 Pb, 245 Zn, 0.27 Au and 1800 ppt Au.

Extensive exploration work for Sn-W and F was carried out over this area by Comalco. The work concentrated around the historical "Shepherd and Murphy" workings. Three major styles of mineralisation were sought - skarn, stockwork or sheeted development of feldspar veins and stockwork or griesan development at or near the granite contact.

A thorough evaluation of the area for Au needs to be completed. Selective gold assays were carried out on drill core by Comalco, however they were often bulked samples over large intervals.

#### 9. TIN SPUR

This area is also highlighted by stream sediment geochemistry with strongly anomalous fine Au (5250 ppt) and low order Pb-Zn results. The area includes old workings at Tin Spur and Devonian prospects.

Both prospects lie within Ordovician sediments and have been previously explored for Sn-Au and Pb-Ag-Au. Compilation of the previous work should be carried out to determine whether any potential exists to host large tonnage-low grade Au or thin layer Au mineralisation.

#### 10. FUTURE PROGRAMME

The future programme within EL 7/74 will concentrate on the Winterbrook Inlier, Moina and Tin Spur areas.

Data compilation and evaluation of Au potential should be carried out on the Moina and Tin Spur areas before any fieldwork is undertaken. This work should assess whether these areas have potential for large tonnage-low grade Au deposits or thin layer Au.

The future programme over the Winterbrook Inlier will depend largely on interpretation of the UTEM geophysical survey. Near surface anomalies will be tested with C-horizon soil sampling while deeper responses will be drill tested. If encouraging results are obtained from follow-up work, further UTEM coverage will be undertaken.

11. REFERENCES

- Smyth W D 1981 EL 7/74 MOINA; Progress Report on Exploration during the period 1.1.80 - 31.7.81. Unpublished Shell Report No. 08.1062
- Smyth W D 1982 EL 7/74 MOINA; Progress Report on Exploration during the period 31.7.81 - 30.6.82. Unpublished Shell Report No. 08.1066

12. LOCATION

Burnie 1:250 000 Sheet SK55-3

13. KEYWORDS

Cambrian, Acid, Intermediate, Shale, Dome, Geochem-drainage, Geophys-EM

14. LIST OF PLANS

<u>Plan No</u>		<u>Scale</u>
TASh 2973 /	MOINA EL 7/74 Location Plan	1:1 000 000
TASh 2998 /	MOINA EL 7/74 EL and Prospect Location Plan	1:100 000
TASh 2999 /	MOINA EL 7/74 Previous Explorers Stream Geochemistry - Cu	1:25 000

TASh 3000 ✓	MOINA EL 7/74 Previous Explorers Stream Geochemistry - Pb	1:25 000
TASh 3001 ✓	MOINA EL 7/74 Previous Explorers Stream Geochemistry - Zn	1:25 000
TASh 2949 ✓	MOINA EL 7/74 CRAE Regional Stream Sediment Sample Locations 1985/86	1:25 000
TASh 3002 ✓	MOINA EL 7/74 Regional Geology	1:25 000
TASh 2821 ✓	MOINA EL 7/74 Mt Jacob and Winterbrook Area Sketch Geology	1:25 000
TASh 2966 ✓	MOINA EL 7/74 Winterbrook Dome Stream Sediment Geochem - Copper	1:10 000
TASh 2967 ✓	MOINA EL 7/74 Winterbrook Dome Stream Sediment Geochem - Lead	1:10 000
TASh 2968 ✓	MOINA EL 7/74 Winterbrook Dome Stream Sediment Geochem - Zinc	1:10 000
TASh 2958 ✓	MOINA EL 7/74 Mt Jacob and Winterbrook Area Utem Grids	1:10 000
TASh 2959 ✓	MOINA EL 7/74 Mt Jacob and Winterbrook Area Ground Mag Contours	1:10 000
TASh 2929 ✓	MOINA EL 7/74 Mt Jacob Prospect Shell UTEM Survey Channel 7 Data	1:2 500
TASh 3003 ✓	MOINA EL 7/74 Winterbrook Grid UTEM Channel 5 Contours	1:10 000

013

TASH 3004 ✓	MOINA EL 7/74 Winterbrook Grid UTEM Anomaly Locations	1:10 000
TASH 3005 ✓	MOINA EL 7/74 Mt Jacob Grid Geophysical Interpretation Plan	1:10 000
TASH 3072 ✓	MOINA EL 7/74 Mt Jacob Grid Gravity Survey Bouguer Anomaly	1:2 500
TASH 2924 ✓	MOINA EL 7/74 Mt Jacob Grid 9700E Section EM Coupling of Shell UTEM Survey	1:5 000
TASH 3006 ✓	MOINA EL 7/74 Winterbrook Grid UTEM Profile Loop 0001 Line 8600E	As Shown
TASH 3007 ✓	MOINA EL 7/74 Winterbrook Grid UTEM Profile Loop 0001 Line 8800E	As Shown
TASH 3008 ✓	MOINA EL 7/74 Winterbrook Grid UTEM Profile Loop 0001 Line 9000E	As Shown
TASH 3009 ✓	MOINA EL 7/74 Winterbrook Grid UTEM Profile Loop 0001 Line 9200E	As Shown
TASH 3010 ✓	MOINA EL 7/74 Winterbrook Grid UTEM Profile Loop 0001 Line 9400E	As Shown
TASH 3011 ✓	MOINA EL 7/74 Winterbrook Grid UTEM Profile Loop 0001 Line 9600E	As Shown
TASH 3012 ✓	MOINA EL 7/74 Winterbrook Grid UTEM Profile Loop 0001 Line 9800E	As Shown
TASH 3013 ✓	MOINA EL 7/74 Winterbrook Grid UTEM Profile Loop 0002 Line 10000E	As Shown

TASh 3014 ✓	MOINA EL 7/74	Winterbrook Grid		
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	UTEM Profile	Loop 0002	Line 11000E	As Shown
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	UTEM Profile	Loop 0002	Line 11200E	As Shown
TASh 3024 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	(Point) Loop 0003		
		Line 11400E		As Shown
TASh 3025 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	(Continuous) Loop 0003		
		Line 11400E		As Shown
TASh 3026 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	Loop 0003	Line 11600E	As Shown
TASh 3027 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	(Continuous) Loop 0003		
		Line 11800E		As Shown
TASh 3028 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	(Point) Loop 0003		
		Line 11800E		As Shown

TASH 3029 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	(Continuous) Loop 0003		
	Line 12000E			As Shown
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	UTEM Profile	Loop 0003 Line 12200E		As Shown
TASH 3032 ✓	MOINA EL 7/74	Winterbrook Grid		
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TASH 3033 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	Loop 0004 Line 8600E		As Shown
TASH 3034 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	Loop 0004 Line 8800E		As Shown
TASH 3035 ✓	MOINA EL 7/74	Winterbrook Grid		
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TASh 3041 ✓	MOINA EL 7/74	Winterbrook Grid	UTEM Profile Loop 0005 Line 10200E	As Shown
TASh 3042 ✓	MOINA EL 7/74	Winterbrook Grid	UTEM Profile Loop 0005 Line 10400E	As Shown
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TASh 3045 ✓	MOINA EL 7/74	Winterbrook Grid	UTEM Profile Loop 0005 Line 11000E	As Shown
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TASh 3049 ✓	MOINA EL 7/74	Winterbrook Grid	UTEM Profile Loop 0006 Line 11800E	As Shown
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TASh 3067 ✓	MOINA EL 7/74	Winterbrook Grid		
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TASh 3069 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	Loop 0009	Line 11000E	As Shown
TASh 3070 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	Loop 0009	Line 11200E	As Shown
TASh 3071 ✓	MOINA EL 7/74	Winterbrook Grid		
	UTEM Profile	Loop 0009	Line 11400E	As Shown

#### 15. LIST OF APPENDICES

Appendix 1	Regional Stream Sediment Geochemistry Logs and Results
Appendix 2	Follow-up Geochemistry Sample Locations and Results
Appendix 3	Winterbrook Grid, UTEM Geophysical Survey; Memo by T von Strokirch

Appendix 4 Winterbrook Grid, Ground Magnetics Geophysical  
Survey; Memo by T von Strokirch

Appendix 5 Mt Jacob Grid, Summary of Geophysical Surveys;  
Memo by T von Strokirch

APPENDIX 1

REGIONAL STREAM SEDIMENT GEOCHEMISTRY

LOGS AND RESULTS

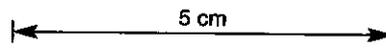
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SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations	
	Easting	Northing		Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Am (ppm)	Au (ppt)		
1153357	430800	5404600	-4#										50	Weakly incised; slow flow - marsh land; alluvial banks; 10% gravel, 50% sand, 40% silt; mod-high organics; 3m wide	
			-80#	18	35	72	<1	10	230	3.15	45	0.80		Dominant quartzite + ss + float; vein quartz.	
1153358	428000	5399400	-4#										200	Moderately incised; mod flow; eucalypt + blackberry; alluvial banks; 4m wide; 50% gravel, 50% sand, 2% silt; low organics	
			-80#	46	20	80	<1	4	1320	6.35	220	0.005		Dominant quartzite + ss; vein quartz; Mn staining.	
1153931	428200	5406600	-80#	15	84	60	<1	48	350	1.83	60	0.04		Steeply incised; mod. flow; steep gradient; 4m wide; alluvial banks; eucalypt forest; 50% gravel, 40% sand, 20% silt, 10% clay + organics	
			-4#										5250	Siliceous, mg. quartzite containing fine disseminated pyrite %; sericitic alteration; sp veining	
DETECTION LIMIT															
ANALYTICAL METHOD															

Project : SHEFFIELD - MOINA	1:250 000 Sheet : BURNIE	AMG Zone :	Sheet No. : 1/1
Tenement : MOINA EL 7/74	DPO's :		Laboratory : AMDEL
Area / Prospect : REGIONAL STREAM SEDIMENTS			Collected By : A. EDWARDS Date : JANUARY 1986



B. FITZPATRICK



SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)	
1153136 137	420500	5413250	-4# -80#	5	34	54	<1	3	880	2.69	320	<0.005	<50	Moderate flow; weakly incised; alluvial benches - swampy area; pine plantation - contamination; 50% gravel, 40% sand, 10% silt; moderate organics; Rounded cobbles + boulders of quartz, quartzite, sandstone, siltstone + acid volcanic
1153138 139	420700	5413100	-4# -80#	11	32	105	<1	12	4300	4.64	330	<0.005	<50	Moderate flow; weakly incised; alluvial benches - swampy area; pine plantation - contamination; 40% gravel, 40% sand, 20% silt; Rounded cobbles + boulders of coarse acid/intermediate lithic volcanic, sandstone, quartzite, quartz, quartz porphyry
1153140 141	427800	5402400	-4# -80#	24	40	175	<1	5	1900	2.77	470	<0.005	100	Moderate flow; well incised; steep gradient; reworked front; 60% gravel, 30% sand, 10% silt; moderate organics; Medium grained lithic tuff of acid/intermediate composition with fragments up to 5mm; fine sst + shale; vein qz; chlorite alteration of tuff - banding + orbiculae
DETECTION LIMIT														
ANALYTICAL METHOD														

Project : SHEFFIELD - MOINA  
 Tenement : MOINA EL 7/74  
 Area / Prospect : REGIONAL STREAM SEDIMENTS

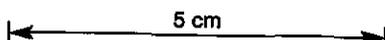
1 250 000 Sheet :

AMG Zone :

Sheet No. : 1/2

DPO's :

Laboratory : AMDI



Collected By : S. CAUTNESS Date : 12/11/85



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## CRA EXPLORATION PTY. LTD.

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SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations	
	Easting	Northing		Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)		
1142791 792	414800	5412000	-80# -4#		16	24	<1	8	345	2.34	270	0.02	100	Moderate flow; weakly incised; 4m wide; eucalypt forest; 50% gravel, 40% sand, 10% silt; low organics. Dominant mg. acid porphyry float; quartz phenocrysts in fine feldspar-rich matrix. Minor conglomerate and pale grey shale float.	
1142793 794	415500	541600	-80# -4#	<2	16	23	<1	2	215	1.69	310	<0.005	150	Mod. flow; moderately incised; 4m wide; eucalypt forest; 60% gravel, 35% sand, 5% silt; low organics. Dominant mg. quartz-feldspar porphyry; euhedral-subhedral chloritic feldspar phenocrysts; Minor conglomerate.	
1142795 796	415200	541600	-80# -4#	7	16	30	<1	2	380	3.66	330	<0.005	100	Mod-strong flow; moderately incised; 5m wide; eucalypt forest; 40% gravel, 50% sand, 10% silt; low organics. Dark green qz-feldspar porphyry; dominant mg. euhedral-subhedral pink feldspar + quartz phenocrysts; Minor conglomerate float.	
1142797 798	413600	5415200	-80# -4#	17	8	180	<1	<2	790	6.28	140	<0.005	50	Mod-strong flow; moderately incised; 4m wide; eucalypt forest; 60% gravel, 30% sand, 10% silt; low organics. Basalt; minor quartz.	
DETECTION LIMIT															
ANALYTICAL METHOD															
Project: SHEFFIELD - MOINA				1: 250 000 Sheet: BURNIE				AMG Zone:				Sheet No.:			
Tenement: MOINA EL 7/74				DPO's:								Laboratory:			
Area / Prospect: REGIONAL STREAM SEDIMENT SURVEY								← 5 cm →				Collected By: S. CAITHNESS Date: 24-10-85			

026

## CRA EXPLORATION PTY. LTD.

025027

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations	
	Easting	Northing		Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)		
990589 590	413600	5413700	-80 <sup>#</sup> s/s -4 <sup>#</sup> s/s	<2	10	14	<1	7	52	0.97	50	0.005	100	1m wide. Moderate flow. Boulder bar site. Banks alluvium of qz. Minor Fe staining, very gravel rich. Float: 80% conglomerate (siliceous), qzites and gritty qzites; 15% grey green shales; 5% fine grained tuff. No vis. sulphides.	
990591 592	414500	5414400	-80 <sup>#</sup> s/s -4 <sup>#</sup> s/s	9	42	92	<1	8	860	2.46	170	0.005	100	1m wide. Moderate flow. Gravel bar. Very silt rich. Banks probably all alluvial & probably significant contribution from Levee River but impossible to sample further upstream as creek flows underground. Ab. Fe stain. Float 90% qzite; 10% lat. 0% - lat.	
998995 996	412600	5415300	-80 <sup>#</sup> ss -4 <sup>#</sup> ss	11	14	84	<1	2	640	4.69	110	<0.005	50	1m wide. Moderate flow. Boulder bank site. Silt deficient. Abundant Mn/Fe stain. Banks alluv. & colluv. Float 95% basalt; 5% qz; 5% qzite & siliceous conglomerate.	
DETECTION LIMIT															
ANALYTICAL METHOD															
Project : SHEFFIELD - MOINA				1 : 250 000 Sheet : BURNIE				AMG Zone : 55				Sheet No. :			
Tenement : MOINA EL 7-74				DPO's :								Laboratory :			
Area / Prospect : REGIONAL DRAINAGE								← 5 cm →				Collected By : I. M. CLEMENTSON Date : 24 Oct 1985			

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)	
1231463 464	418700	5415650	-80# -4#	24	25	105	<1	2	620	5.24	260	<0.005 <50	Weakly incised; moderate flow; colluvial br. b.; agricultural land; 45% gravel, 50% sand, 5% silt Basalt float dominant - Fe + Mn staining; quartz gravel	
1231465 466	417800	5415100	-80# -4#	8	26	50	<1	<2	365	2.73	300	<0.005 <50	Moderate flow; 3.5m wide; colluvial br. b.; open farm land; boulder top; 60% gravel, 35% sand, 5% silt. Basal siltstone; black shale; quartz; conglomerate	
1231467 468	419800	5414600	-80# -4#	26	21	54	<1	3	1260	4.74	190	<0.005 <50	Moderate flow; 0.5m wide; colluvial br. b.; agricultural land; boulder top; 55% gravel, 35% sand, 5% silt, 5% organics Dominant basalt float; minor quartz; Manganese staining	
1231469 470	420200	5414500	-80# -4#	54	11	145	<1	<2	1900	12.90	250	<0.005 <50	Slow flow; 0.5m wide; agricultural land; colluvial br. b.; pond trap site; 70% gravel, 20% sand, 10% silt. Dominant basalt boulders	
1231471 472	419500	5411700	-80# -4#	13	25	45	<1	4	305	2.80	370	<0.005 <50	Moderate flow; weakly incised; 2.0m wide; colluvial br. b.; pine forest; 60% gravel, 35% sand, 5% silt Quartz; conglomerate; green + purple volcanic	
1231501 502	419550	5411400	-80# -4#	7	44	74	<1	4	430	3.36	390	<0.005 50	Moderate flow; colluvial br. b.; 2.0m wide; weakly incised; logged rainforest; boulder top; 40% gravel, 50% sand, 10% silt; contains fine logging Conglomerate; quartz; red + green volcanic	
DETECTION LIMIT														
ANALYTICAL METHOD														

Project : SHEFFIELD - MOINIA

1 : 250 000 Sheet :

AMG Zone :

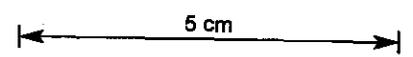
Sheet No. :

Tenement : MOINIA EL 7/74

DPO's :

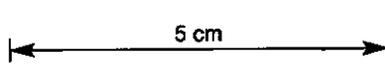
Laboratory : ALS  
AMDEL

Area / Prospect : REGIONAL STREAM SEDIMENT SURVEY



Collected By : A. CRICK  
I. ROGERS

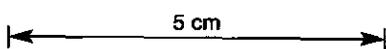
Date : MAY 1985

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations	
	Easting	Northing		Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)		
1231503 504	419600	5411300	-80# -4#	23	25	74	<1	5	610	5.38	300	<0.005 <50	Moderate flow; well incised; 2.0m wide; alluvial banks; pine forest; 60% gravel, 35% sand, 5% silt; gravel bar Conglomerate; quartz; basalt; red rock; green rock		
1231519 520	423200	5408250	-80# -4#	36	19	140	<1	3	1040	7.38	160	0.005 100	Moderate flow; well incised; 1m wide; alluvial banks; eucalypt forest; 60% gravel, 35% sand, 10% silt Basalt; sandstone; quartz; conglomerate; mudstone		
1231521 522	422400	5407100	-80# -4#	24	31	150	<1	<2	620	6.10	160	0.005 100	Moderate flow; moderately incised; alluvial banks; 1m wide; agricultural land; 70% gravel, 25% sand, 5% silt; gravel bar Quartz pebbles; basalt; sandstone		
1231523 524	422750	5407500	-80# -4#	10	60	245	<1	<2	1480	8.12	75	0.270 1800	Moderate flow; well incised; 1m wide; alluvial banks; agricultural + eucalypt forest; 5% gravel, 45% sand, 5% silt; gravel bar Basalt; altered sandstone; quartz pebbles		
1231533 534	421250	5406500	-80# -4#	31	27	185	<1	<2	830	6.26	230	0.160 100	Moderate flow; alluvial banks; weakly incised; 1m wide; wattle and myrtle forest; 55% gravel, 35% sand, 10% silt Basalt; siltstone + mudstone; conglomerate		
1231535 536	421400	5406450	-80# -4#	26	42	135	<1	7	1200	4.87	310	0.010 300	Strong flow; moderately incised; alluvial banks; 3.0m wide; wattle + myrtle forest; 65% gravel, 30% sand, 5% silt Dominant basalt float; siltstone + mudstone; quartzite		
DETECTION LIMIT															
ANALYTICAL METHOD															
Project : SHEFFIELD - MOINA				1 : 250 000 Sheet :				AMG Zone :				Sheet No. :			
Tenement : MOINA EL 7/74				DPO's :								Laboratory : AMDEL			
Area / Prospect : REGIONAL STREAM SEDIMENT SURVEY												Collected By : A. CRICK I. ROGERS			

029

## CRA EXPLORATION PTY. LTD.

025030

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations	
	Easting	Northing		Cu	Pb	Zn	Ag	As	Mn	Fe (%)	Ba	Au (ppm)	Au (ppt)		
1231543 544	423400	5413000	-80# -4#	13	13	78	<1	4	720	5.08	160	0.005	Moderate flow; weakly incised; alluvial banks; rain forest; 70% gravel, 25% sand, 5% silt; gravel bar Quartzite; siltstone; mudstone; Mn staining in quartz		
1231545 546	417350	5413300	-80# -4#	<2	19	18	<1	2	190	2.18	330	0.400	Moderate flow; moderately incised; alluvial banks; 1.5m wide; logged eucalypt forest; 60% gravel, 35% sand, 5% silt; gravel bar Conglomerate; siltstone; mudstone; Mn staining in siltstone		
1231547 548	417500	5413250	-80# -4#	<2	13	15	<1	2	125	1.85	320	0.005	Slow flow; moderately incised; 2.0m wide; logged eucalypt forest; 65% gravel, 30% sand, 5% silt; rock bar. Conglomerate; siltstone; quartzite		
1231565 566	409150	5415400	-80# -4#	3	3	25	<1	4	170	1.82	95	0.005	Moderate flow; weakly incised; alluvial banks; 5.0m wide; myrtle rain forest; 45% gravel, 50% sand, 5% silt. Basalt; conglomerate; quartzite; qz veins = basalt		
DETECTION LIMIT															
ANALYTICAL METHOD															
Project : SHEFFIELD - MOINA				1 : 250 000 Sheet :				AMG Zone :				Sheet No. :			
Tenement : MOINA EL 7/74				DPO's :								Laboratory : AMDEL			
Area / Prospect : REGIONAL STREAM SEDIMENT SURVEY												Collected By : A. CRICK T. ROGERS			
												Date : MAY 1985			

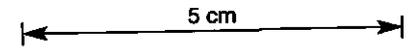
APPENDIX 2

FOLLOW-UP GEOCHEMISTRY SAMPLE LOCATIONS

AND RESULTS

031

CRA EXPLORATION PTY. LTD.



SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES								Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe %	Mn	Au (ppb)	
1231688	418700	5410070	-80#	<2	15	5	<1	<1	0.60	60	15	Moderate flow; weakly incised; terrace forest; colluvial/alluvial to be; 60% gravel, 35% sand, 5% silt; low organics Green chloritic andesite float, tuffaceous volcanic; quartz
1231689	418975	5410880	-80#	<2	15	10	1	<1	0.75	50	<3	Moderate flow; weakly incised; logged eucalypt forest; colluvial/alluvial to be; 60% gravel, 30% sand, 10% silt; low organics Dominant quartzite float with lesser andesitic tuffs and vitric crystal tuffs (acid); minor vein quartz
1231690	418160	5409910	-80#	<2	20	10	<1	<1	0.64	60	<3	Moderate flow; weakly incised; colluvial to be; button grass + eucalypt forest; 70% gravel, 25% sand, 5% silt; low organics; trap site Dominant andesitic volcanic + tuffaceous float (pyritic); common pink sandstone; veins; conglomerate; quartz porphyry

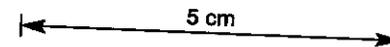
DETECTION LIMIT	2	5	2	1	1	0.01	5	3
ANALYTICAL METHOD	K580			A1205				

Project : SHEPHERD - MOINKA	1 : 250 000 Sheet : BURNIE	AMG Zone :	Sheet No. : 1
Tenement : MOINKA EL 7/74	DPO's : 32023		Laboratory : ALS
Area / Prospect : ANOMALY FOLLOW-UP - WINTERBROOK INLIER			Collected By : S. CAITHNESS Date : MAY 1986

025032

032

CRA EXPLORATION PTY. LTD.



SAMPLE NUMBER	LOCATION			ANALYSES										Geological Observations	
	Easting	Northing	Sample Type	Cu	Pb	Zn	Ag	As	Fe %	Mn	Ba	Au (ppm)	Au (ppt)		
231545 546	417350	5413300	-80# -4#	<2	19	18	<1	2	2.18	190	330	0.40	<50	First pass anomalous sample	
231682	417300	5413350	-80#	<2	15	30	<1	<1	1.86	230		<0.005		Moderate flow; moderately incised; eucalypt forest; 80% gravel, 15% sand, 5% silt; low organics; trap site % of foliated + chloritic intermediate tuff with thin interbeds of chert; Float of intermediate and acid tuffs, laminated shales and hematized tuffs	
231683	416900	5412950	-80#	<2	20	25	<1	<1	2.03	470		<0.005		Moderate flow; steeply incised; eucalypt forest; alluvial bars; 70% gravel, 25% sand, 5% silt; low organics; trap site % of green tuffaceous sediment which contains red chert clasts; Float of quartz-feldspar porphyry containing trace pyrite; flow breccia rhyolite; conglomerate; tuffaceous sediments	
DETECTION LIMIT				2	5	2	1	1	0.01	5		0.005			
ANALYTICAL METHOD				IC580								PT205			

Project : SHEFFIELD - MOINA.	1 : 250 000 Sheet : BURNIE	AMG Zone :	Sheet No. : 1
Tenement : MOINA EL 7/74 - WINTERBROOK INLET	DPO's : 32023		Laboratory : ALS BURNIE
Area / Prospect : STREAM SEDIMENT ANOMALY FOLLOWUP			Collected By : SJC. Date : APRIL 1986

025033

033

## CRA EXPLORATION PTY. LTD.

5 cm

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES									Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe. %	Mn	Ba	Au (ppm)	
1231684	417025	5412950	-80#	5	35	40	<1	<1	2.87	690		50.003	Moderate flow; steeply incised; eucalypt forest; colluvial b. ls; 50% gravel, 40% sand, 10% silt; low organics % of dark green crystal lithic tuff (almost a quartz-felsic porphyry with chert cherts); D. i. t. crystal, lithic tuff with lesser silicified black shale
	11400	50725	colluvial										
1231685	417050	5412650	-80#	2	25	40	<1	<1	3.04	530		50.003	Moderate flow; steeply incised; eucalypt forest; colluvial b. ls; 50% gravel, 30% sand, 10% silt; low organics % of lithic crystal tuff containing chert cherts; minor quartz porphyry and conglomerate float
1231686	417250	5412060	-80#	<2	15	15	1	<1	1.08	120		50.003	Moderate flow; weakly incised; logged eucalypt + pine forest; colluvial b. ls; 50% gravel, 30% sand, 20% silt; mod organics D. i. t. coarse grit/conglomerate float; lesser intermediate volcanic which is strongly magnetic and contains trace pyrite
DETECTION LIMIT				2	5	2	1	1	0.01	5		0.003	
ANALYTICAL METHOD													
Project : SHEFFIELD - MOINA			1 : 250 000 Sheet : BUONIE			AMG Zone :			Sheet No. : 2				
Tenement : MOINA EL 7/74 - WINTERBROOK INLET			DPO's : 32023			Laboratory : ALS BRISBANE							
Area / Prospect : STREAM SEDIMENT ANOMALY FOLLOW-UP			Collected By : SIC			Date : APRIL 1985							

025034



APPENDIX 3

WINTERBROOK GRID, UTEM GEOPHYSICAL SURVEY

MEMO BY T VON STROKIRCH



C.R.A EXPLORATION PTY. LIMITED

(INC. IN N.S.W.)

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TELEX: AA57144  
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AREA CODE: (002)

IN REPLY PLEASE QUOTE

11 June 1986

Memorandum to: T W DICKSON  
Copy to: S J CAITHNESS  
From: T VON STROKIRCH

RESULTS OF A UTEM SURVEY  
OVER THE WINTERBROOK GRID EL 7/74

AIMS

The Winterbrook grid lies in an area of Cambrian volcanics surrounded by younger rocks of Ordovician age. It has been prospected for base metals in the past but much of the work has been of a somewhat cursory nature. The area gridded was selected on the basis of stream sediment geochemistry and a number of geological reasons. In order to locate any base metal deposits that might be present, a deep seeking transient EM technique was chosen as the best method of exploration.

PROGRAM

Fifty-three and a half kilometres of line were cut through variable bush ranging from open fairly mature myrtle forest to dense bauera regrowth after logging. Parts of the area were being logged during the line cutting and survey stages of the program and it was necessary to forfeit one of the EM loops because of the danger from logging. The UTEM technique was selected because of its capacity for extremely large loops in rugged terrain and because of its proven record in similar conditions in Tasmania.

A spacing between the lines of 200 metres was chosen as it was believed that this spacing should locate any anomaly due to a body large enough to be of interest to CRAE.

### SURVEY PARAMETERS

The UTEM III system of Lamontagne Geophysics was used to record the vertical component of the magnetic field. No other components were measured. Readings were taken at twenty five metre spacings up to 1000 metres from the loops. Nine loops were surveyed all told. A frequency of 26.23 Hz was used.

### DATA PRESENTATION

All the data was presented by the contractor as continuously normalised profiles along the lines. A few selected anomalies were further plotted as point normalised plots normalised against channel 1 at a point chosen near an anomaly. Print-outs of continuously normalised data were also recieved.

On receiving the data the continuously normalised values for channel 5 were entered into a computer for further processing. For each loop an average curve of best fit was computed and subtracted from the profiles after which the values were Fraser filtered and contoured. This contour map shows up some of the more subtle longer decay anomalies which are not immediately evident on the profiles and also is a useful geological mapping aid.

### INTERPRETATION

At the time of writing this memo the quantitative interpretation of the data was not completed and this is simply a preliminary inspection of the obvious anomalies. Further information on which to base follow-up work will doubtless be gained from detailed interpretation.

The data were generally found to be of good quality containing a suprising number of anomalies of good amplitude. Past surveys in similar geologic conditions have been lucky to produce any anomalies at all. Cultural and geologic noise were minimal and at no stage did any work have to be repeated by the contractor though a coil problem was present that did decrease the raw data values at some points by approximately 80%. This problem did not have a significant effect on the continuously normalised data. It was therefore possible to determine to a reasonable level of accuracy whether any anomalies were present and the decision was made to accept the data. In fact it is generally not possible to see the effect of the coil fault on the continuously normalised channel 5 contours.

As well as the plan showing fraser filtered contours of channel 5 data there is also an anomaly plan accompanying this report. This plan shows the position of the major anomalies that were found on the survey grid regardless of whether they are due to contacts or conductors. The depths and positions may not be correct if the anomalies are due to contacts as all anomalies other than those specified as being due to contacts have been interpreted assuming discrete conductors.

A description of the major anomalous trench follows:-

#### Anomaly A

This anomaly occurs on three lines and thus has a strike length of at least 400 metres. The anomaly is well developed with a high amplitude response extending to channel 4. It is probably produced by a near vertical body dipping steeply to the south. There is a disrupting response in the early channels especially on line 13800E so it would appear that there is likely to be two bodies involved. A depth of 55-75 metres is interpreted. The decay rate appears fairly poor with a time constant of .6ms being derived.

#### Anomaly B

This is a very well defined anomaly when illuminated by a loop to the north but placing a loop to the south shows a very different signature. This shows that the anomaly is primarily due to a contact south of which the rocks are more conductive. The anomaly is broken by a fault between lines 12200E and 12400E. It is possible that there is a separate conductor present along parts of the contact but it does not appear continuous. Further interpretation is required on this anomaly. The extension to the north west may or may not be part of the same feature but this is definitely a contact.

#### Anomaly C

This anomaly, like the previous, is a strongly developed feature associated with a contact. In this case it seems likely that there is some sort of metal body associated with it as there is a magnetitic anomaly which closely correlates with it. This body would therefore be expected to contain a considerable percentage of magnetite with pyrite or pyrrhotite in order to generate both bodies. Careful quantitative modelling and interpretation will be required before drilling would be recommended on this anomaly.

Anomaly D

This anomaly has a strike extent of at least 400 metres. It is discrete from any other features and appears to have good line to line correlation of depth. There is a bit of migration in early times but later the crossover stabilises giving good positioning on the anomaly. The best response is on the middle line where a good high can be seen on the channel 5 contour plan. The anomaly in early times on lines 13000E and 13200E is disrupted in early times by a small conductor closer to the logs. The position of this is not clear on line 13000E so it has not been plotted. The anomaly looks interesting and is definitely worthy of further work especially in light of its geological position in a sericitically altered rhyolite.

Anomaly E

This anomaly occurs only on one line but as it is the last line of the grid and as the anomaly is of relatively long decay it is included in the discussion. This anomaly has a maximum depth of 80 metres. The source of the anomaly has a near vertical dip and a reasonable depth extent though it is of less than 20 metres width. It is best evident in later times which is promising. Some follow-up will have to be done over this feature and hopefully to the east to find any continuation of it.

Anomaly F

This is likely to be a contact as the anomaly on line 10,600E appears to be due to a contact and the interpreted depths are widely varying. If there is a discrete conductor associated with the contact then it is likely to be at the shallower depths and should be detected by a certain amount of soil geochemistry. Anomaly F may be an extension of anomaly B and for that matter of anomalies I and J.

Anomalies G and H

These are likely to be part of the same trend representing an outcropping contact. The anomaly is consistent only in early times and is typically of high gradient with strong migration. The more conductive rocks are probably to the south.

Anomaly I

The anomaly on 9200E has the appearance of a discrete conductor though its conductivity is poor. Further to the east the anomaly develops stronger migration patterns and gets shallower. It is probable that a programme of soil geochemistry would outline whether the anomaly has any base metal source.

Anomaly J

This anomaly is along strike from anomaly I but its apparent greater depth and slower decay make it worthy of separate consideration. The depth estimates given on the plan are probably reasonable however the response is affected by anomaly N and the depths may be substantially shallower. The source is likely to be steeply dipping to the south and narrow. It appears worthy of follow-up.

Anomaly K

This is mostly an early time anomaly. The interpreted depths are very variable so the anomaly is unlikely to be due to a good discrete conductor. This is probably the least promising of the anomalies recorded.

Anomaly L

This is a well developed contact anomaly which may be the edge of the magnetic body visible on the magnetic contour plan. There is no sign of any conductor visible on the contact as the anomaly at no stage is later in time than channel 7.

Anomaly M

This anomaly is predominantly in early times. The cross overs have a steep gradient and tend to be of a step form rather than the positive and negative troughs typical of a conductor. There is poor correlation between the depth estimated for the anomaly on adjacent lines. Taken together these points once again indicate that the anomaly is likely to be due to a contact.

Anomaly N

On line 10000E this anomaly has a poorly developed trough but the trough is better defined on line 10200E. The shape of the anomaly is somewhat distorted by the presence of anomaly J making

accurate depth or dip interpretations difficult but the indications are that the source is a discrete source at some depth though the poor decay points to a source other than sulphides.

#### Anomaly O

Strong migration in the anomaly on line 13800E points to a contact source though there is some indication that the anomaly may have two components. On line 14000E the anomaly shows a strange response characterised by a very sharply defined trough. The peak and trough of the anomaly appear to be most strongly influenced by different sources. The trough is consistently positioned and is due to the presence of a shallow conductor at less than 50 metres depth. The peak of the positive anomaly exhibits some migration away from the loop and is likely to be due to a contact.

#### CONCLUSIONS

A number of UTEM anomalies are present. Many of these are due to contacts but a number appear to be due to discrete bodies. Completion of the interpretation may decrease this number but it is expected that both shallow and deep anomalies will remain to follow up.

It is suggested that all the anomalies whether contact or conductor be followed up by local soil geochemistry as it is possible that any of the contacts may hide a deeply buried conductor. D may not be amenable to this technique due to depth of burial and these should be carefully evaluated before proceeding to drilling directly if they appear promising. If anomaly E shows any promise in geological or geochemical follow-up, the grid should be extended to the east to close it off. Unfortunately no interesting responses were recorded on the separate southern grid but if we get good results from follow-up to the north it is recommended that the grids be extended to cover further prospective parts of the inlier that were left out for largely logistic reasons.

T VON STROKIRCH  
Project Geophysicist

APPENDIX 4

WINTERBROOK GRID, GROUND MAGNETICS GEOPHYSICAL SURVEY

MEMO BY T VON STROKIRCH



Further interpretation of this data is necessary, incorporating all the geophysical information available in a combined interpretation with special reference being made to the UTEM data before any follow-up work should be planned.

T VON STROKIRCH  
Project Geophysicist

APPENDIX 5

MT JACOB GRID, SUMMARY OF GEOPHYSICAL SURVEYS

MEMO BY T VON STROKIRCH



A copy of the data was obtained and the basalt background was subtracted. The resultant data was Fraser filtered to produce a contour map of channel 7. This channel was selected as one which would be expected to show a perturbation of reasonable amplitude over a significant conductor. Channel 5 was also considered, as a later channel would generally be considered more reliable for detecting conductors of longer time constants, but in this case the data did not appear useful.

In the area of the drill hole there was no anomaly worthy of interest. The only anomalies that stood out were the shale across north eastern end of the grid and a high on line 9300E at around 250mS which has possible connections to lines 9100E and 9500E.

Reinterpretation of the Comalco ground magnetics indicates that the IP anomaly due to the sulphides lies on a magnetic dislocation interpreted as a fault.

The anomaly on line 9300E also lies on this feature which makes it of interest. As can be seen on the coupling diagram the zone of poor coupling gets narrower and one would expect a better amplitude response from a conductor at this position rather than that where the sulphides were intersected. Even so the amplitude of this shallow response is quite high. Quantitative interpretation of this anomaly is not possible due to the close proximity of the basalt contact, however it appears from the gradients within the anomalous portion of the profile, that the response is due to a relatively shallow, less than 50 metres depth, source.

Nothing was located at this point by the soil geochemistry but this is scarcely a surprise as this part of the grid is covered by scree from the Roland conglomerate which is probably of sufficient thickness to inhibit auger sampling.

It was proposed that two lines of gravity be completed over the anomaly on line 9300E and its possible extension on line 9500E.

Gravity readings were taken using CRAE La Coste and Romberg gravity meter number G649 with stations 25 metres apart on both lines and 12.5 metre stations over the anomaly on line 9300E. Line 700W of Comalco corresponds to line 9300E of Shell and Line 500W of Comalco corresponds to line 9500E of Shell. The line numbers were changed for the convenience of the UTEM software. The gravity lines were surveyed by L Mackenzie to the nearest 10mm.

It was hoped that the gravity survey would define whether there was a substantial sulphide body of high density contrast associated with the anomaly. On line 9300E there is a broad gravity high of approximately .8 milligals occurring between 125S and 300S. The sharp gradients at these points and the flat top to the anomaly indicate that it is likely to be due to a lithological unit within 25 metres of the surface at 300S and perhaps somewhat deeper at the northern end of the line. A similar pattern though not as well defined occurs on line 9500E. There is no distinct anomaly centred on 250S on line 9300E so it would appear that the conductor is not due to a massive sulphide body at less than 50 metres depth.

It thus seems that the area has been tested for sulphides except perhaps the southern extension of the drilled IP anomaly. While the UTEM survey was not well positioned to couple with any stratigraphically controlled ore bodies it seems likely that any economic sulphide deposit would be large enough for some part of it to be in a position of reasonable coupling. The only remaining question is therefore the continuation of the IP response which runs too close to the loop edge for an anomaly to necessarily be well defined. This should perhaps be further investigated, at least by close inspection of the core from MtJ D18.

T VON STROKIRCH  
Project Geophysicist

Listing of File : MTJACOB

Title : MT JACOB GRAVITY SURVEY ON LINES 700W AND 500W

LACOSTE AND ROMBERG METER #6649 SURVEY BY T. VON STROKIRCH  
 SURVEY NOT TIED TO NATIONAL NETWORK  
 30/APRIL 1985 WEATHER FINE AND STILL TEMP 19 DEGREES  
 LEVELED BY L. MACKENZIE TO AN ARBITRARY DATUM OF *627.40 m o. load*  
 STAT#,READING,ELEVATION,EASTING,NORTHING,hh:mm,dd:mm:yy

The IGSN 71 gravity formula has been used to compute the latitude correction.  
 Bouguer density used = 3000.00 kg/cubic metre.  
 Meter constant used 1.01580 mGal/div.  
 Free air correction computed from  $2.g(\text{PHI}).h/R(\text{PHI})$   
 where  $g(\text{PHI})$  is the IGSN 71 value for latitude PHI  
 $R(\text{PHI})$  is the earth radius at latitude PHI  
 $h$  is the station elevation above the reference datum.  
 Gravitational constant  $6.672 \text{ E-11 S.I. units.}$

Station Number	Co-ordinates Easting Northing	Elevation	Time	Date	Meter Reading	Bouguer Anomaly
0.0000	421000.0 5409700.0	627.40	09:27	30.04.86	3661.6240	106.10..J
25.0000	421000.0 5409675.0	633.30	09:31	30.04.86	3660.3390	105.8780
50.0000	421000.0 5409650.0	637.99	09:33	30.04.86	3659.4310	105.8155
75.0000	421000.0 5409625.0	640.16	09:36	30.04.86	3659.0270	105.8022
100.0000	421000.0 5409600.0	640.74	09:38	30.04.86	3658.9640	105.8460
125.0000	421000.0 5409575.0	641.01	09:43	30.04.86	3658.8730	105.7996
150.0000	421000.0 5409550.0	641.29	09:45	30.04.86	3658.9010	105.8810
175.0000	421000.0 5409525.0	643.58	09:48	30.04.86	3658.3770	105.7678
187.5000	421000.0 5409512.5	646.85	11:05	30.04.86	3657.9550	105.8074
200.0000	421000.0 5409500.0	649.51	09:54	30.04.86	3657.2020	105.6540
212.5000	421000.0 5409487.5	652.28	11:01	30.04.86	3656.8310	105.6712
225.0000	421000.0 5409475.0	653.94	10:06	30.04.86	3656.2940	105.5267
237.5000	421000.0 5409462.5	656.14	10:58	30.04.86	3655.7450	105.2847
250.0000	421000.0 5409450.0	658.00	10:09	30.04.86	3655.4660	105.4285
267.5000	421000.0 5409437.5	659.44	10:12	30.04.86	3655.0650	105.2821
275.0000	421000.0 5409425.0	662.64	10:15	30.04.86	3654.3880	105.1773
287.5000	421000.0 5409412.5	666.67	10:22	30.04.86	3653.7160	105.2225
300.0000	421000.0 5409400.0	669.69	10:26	30.04.86	3652.8630	104.9043
312.5000	421000.0 5409387.5	672.82	10:29	30.04.86	3652.1760	104.7766
325.0000	421000.0 5409375.0	674.87	10:33	30.04.86	3651.8280	104.7930
350.0000	421000.0 5409350.0	678.95	10:43	30.04.86	3650.7280	104.4109
375.0000	421000.0 5409325.0	687.07	10:50	30.04.86	3649.1390	104.2756
100.0000	421200.0 5409600.0	635.71	11:33	30.04.86	3660.1470	106.0333
125.0000	421200.0 5409575.0	637.76	11:39	30.04.86	3659.2600	105.5282
150.0000	421200.0 5409550.0	639.11	11:43	30.04.86	3659.4700	106.0058
175.0000	421200.0 5409525.0	642.75	11:47	30.04.86	3658.7040	105.9100
200.0000	421200.0 5409500.0	647.67	11:50	30.04.86	3657.7120	105.8160
225.0000	421200.0 5409475.0	651.55	11:54	30.04.86	3657.2120	106.0343
250.0000	421200.0 5409450.0	656.33	11:59	30.04.86	3656.0620	105.7598
275.0000	421200.0 5409425.0	660.21	12:03	30.04.86	3655.2640	105.6754
300.0000	421200.0 5409400.0	663.17	12:05	30.04.86	3654.6590	105.6132
325.0000	421200.0 5409375.0	664.45	12:08	30.04.86	3654.3510	105.5480
350.0000	421200.0 5409350.0	667.23	12:14	30.04.86	3653.4360	105.1491
375.0000	421200.0 5409325.0	668.70	12:20	30.04.86	3653.0550	105.0529
400.0000	421200.0 5409300.0	670.42	12:23	30.04.86	3652.6790	104.9991
425.0000	421200.0 5409275.0	672.50	12:27	30.04.86	3652.0220	104.7286
450.0000	421200.0 5409250.0	677.35	12:21	30.04.86	3650.9010	104.4658

## Base Stations

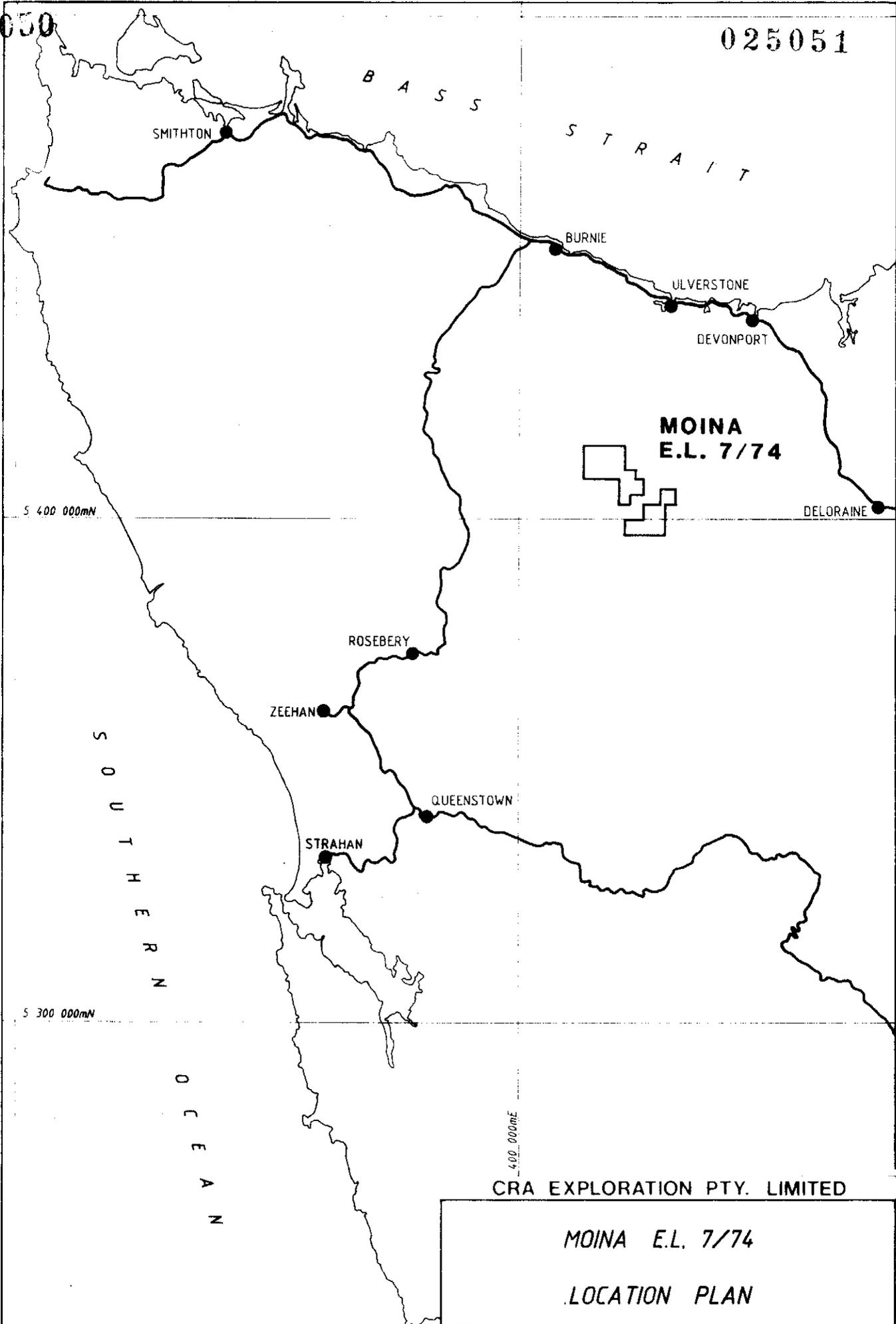
0.0000	421000.0 5409700.0	627.40	09:22	30.04.86	3658.8380
0.0000	421000.0 5409700.0	627.40	11:10	30.04.86	3659.0210
0.0000	421000.0 5409700.0	627.40	12:52	30.04.86	3658.7420

## Conversion Parameters

Nominal Gravity	978106.00000	Meter Constant	1.01580		
Easting/Lonsitude	421070.00000	Northings/Latitude	5409700.00000	AMG Zone	55.00000
Free Air Constant	0.30872				
Bouguer Density	3000.00000				

050

025051



**MOINA  
E.L. 7/74**

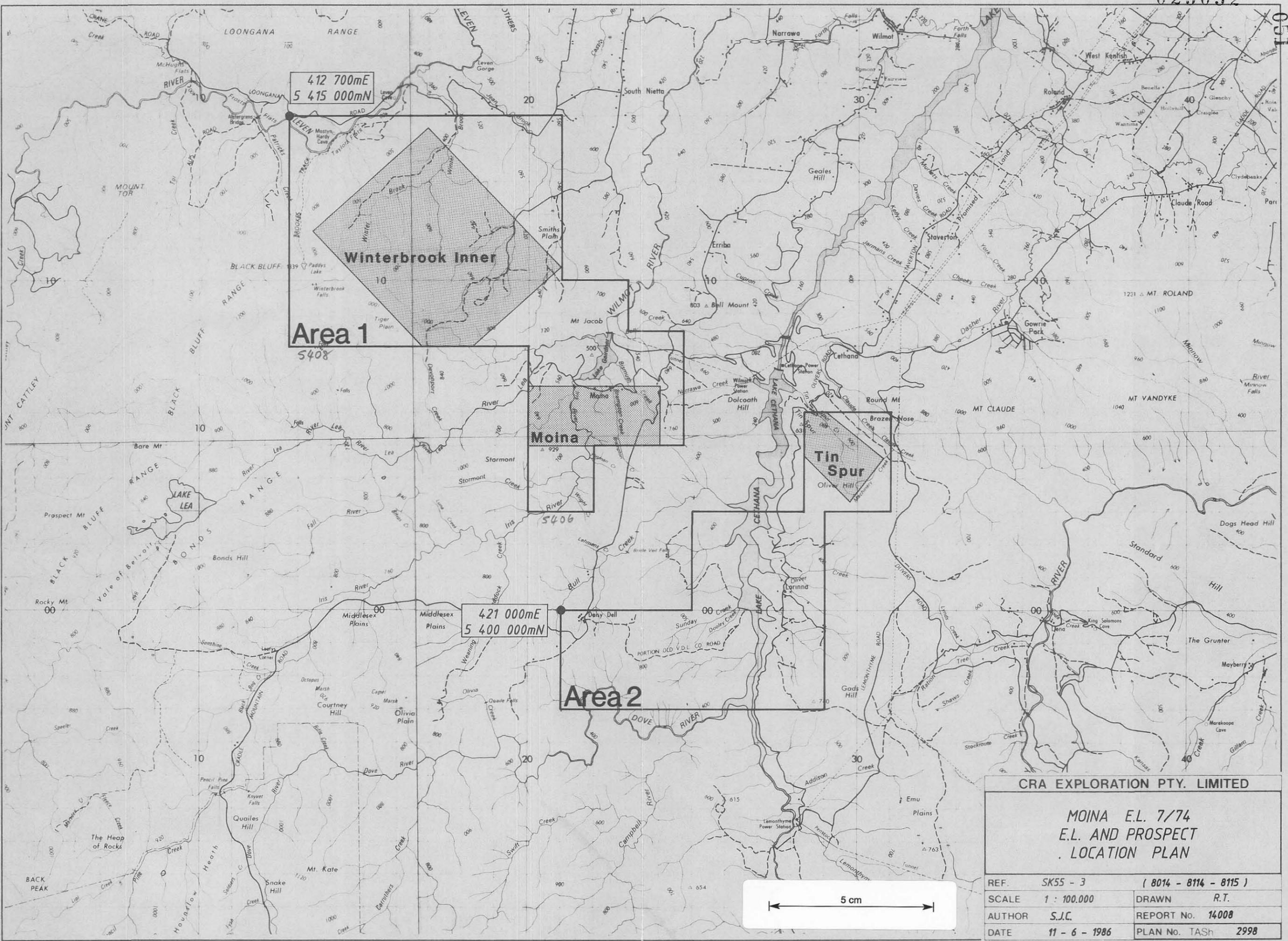
CRA EXPLORATION PTY. LIMITED

**MOINA E.L. 7/74**

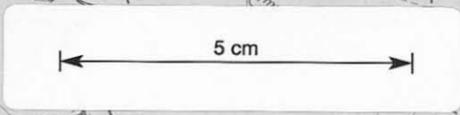
**LOCATION PLAN**

REF	SK55 - 3	( 8104-8114-8115 )
SCALE	1 : 1000 000	DRAWN R.T.
AUTHOR	S.J.C.	REPORT No. 14008
DATE	11 - 6 - 1986	PLAN No. 1A/1 2973

26-2554



<b>CRA EXPLORATION PTY. LIMITED</b>			
<b>MOINA E.L. 7/74 E.L. AND PROSPECT LOCATION PLAN</b>			
REF.	SK55 - 3	( 8014 - 8114 - 8115 )	
SCALE	1 : 100.000	DRAWN	R.T.
AUTHOR	S.J.C.	REPORT No.	14008
DATE	11 - 6 - 1986	PLAN No.	TASH 2998





5 cm

025053

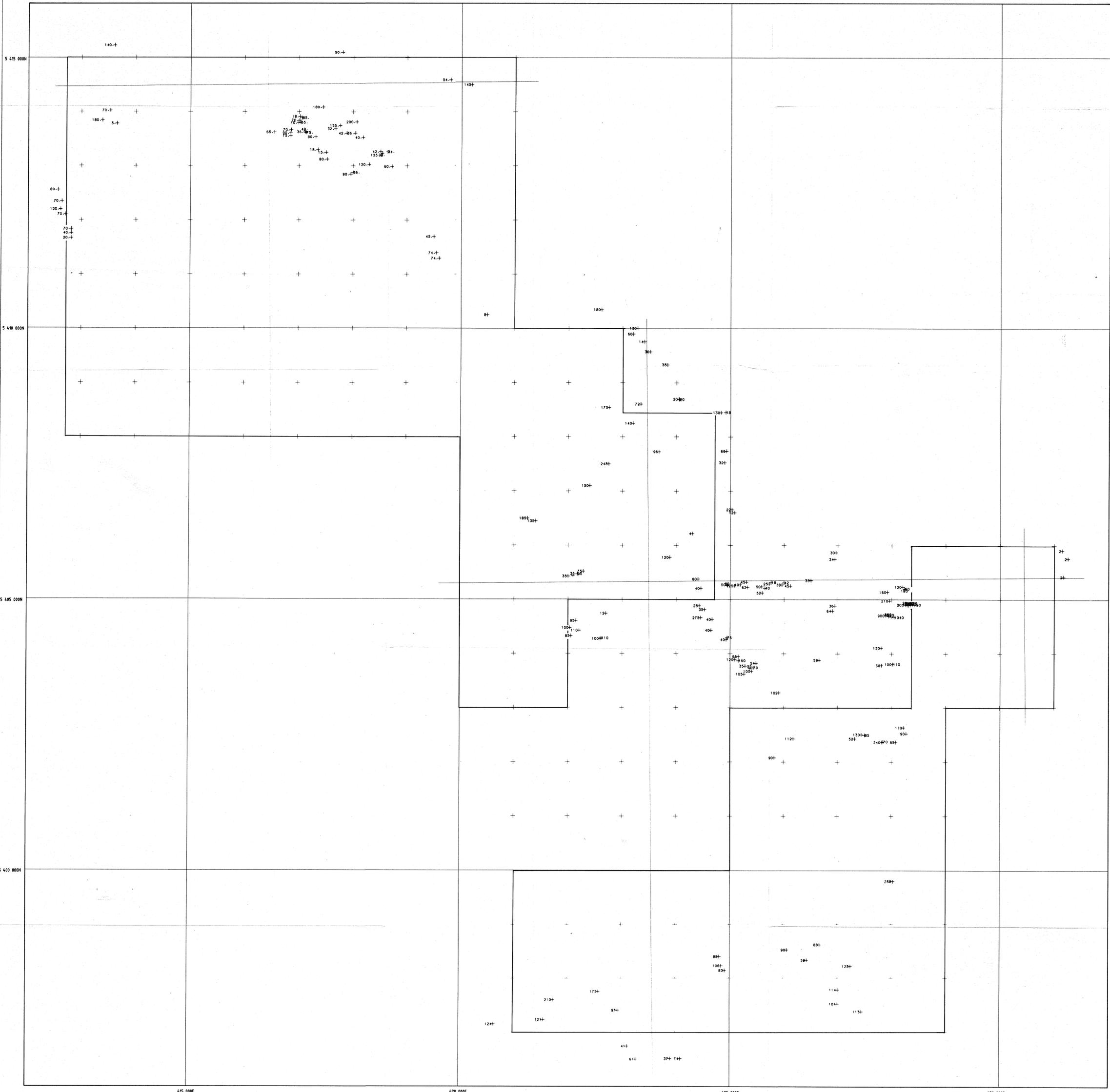
86-2554

CRA EXPLORATION PTY. LIMITED

MOINA E.L. 7/74  
PREVIOUS EXPLORERS  
STREAM GEOCHEMISTRY - Cu

REF.	SKS - 3	( 80% , 81% , 81% )
SCALE	1 : 25000	DRAWN R.T.
AUTHOR	S.J.C.	REPORT NO. 14008
DATE	11 - 6 - 1986	PLAN NO. TASH 2999





025055

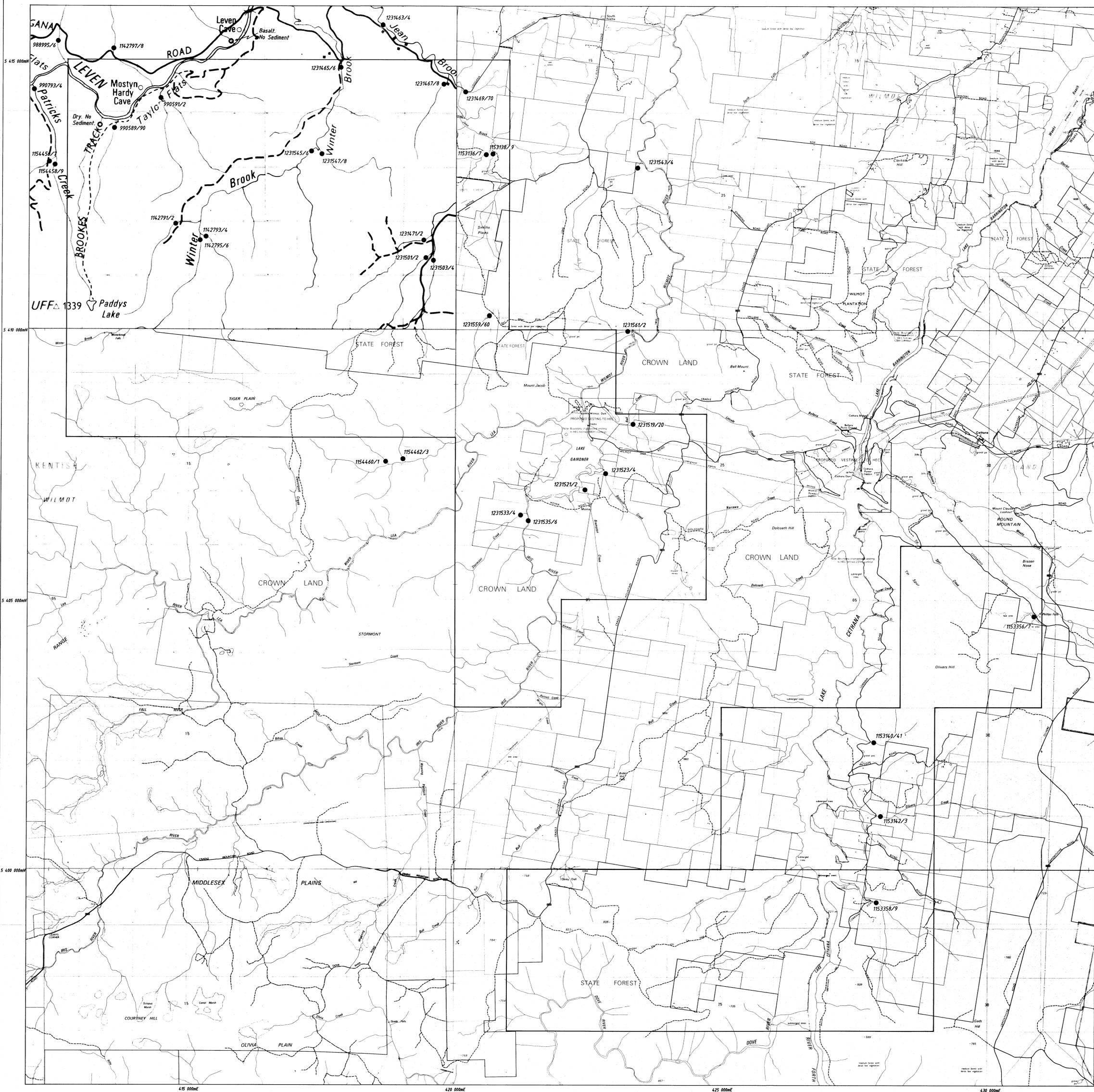
5 cm 7255

CRA EXPLORATION PTY. LIMITED

MOINA E.L. 7/74  
PREVIOUS EXPLORERS  
STREAM GEOCHEMISTRY - Zn

REF:	SK55 - 3	( 80% , 81% , 81% )
SCALE:	1 : 25,000	DRAWN R.T.
AUTHOR:	S.J.C.	REPORT No. 4608
DATE:	11 - 6 - 1986	PLAN No. TASH 3091

86-2554



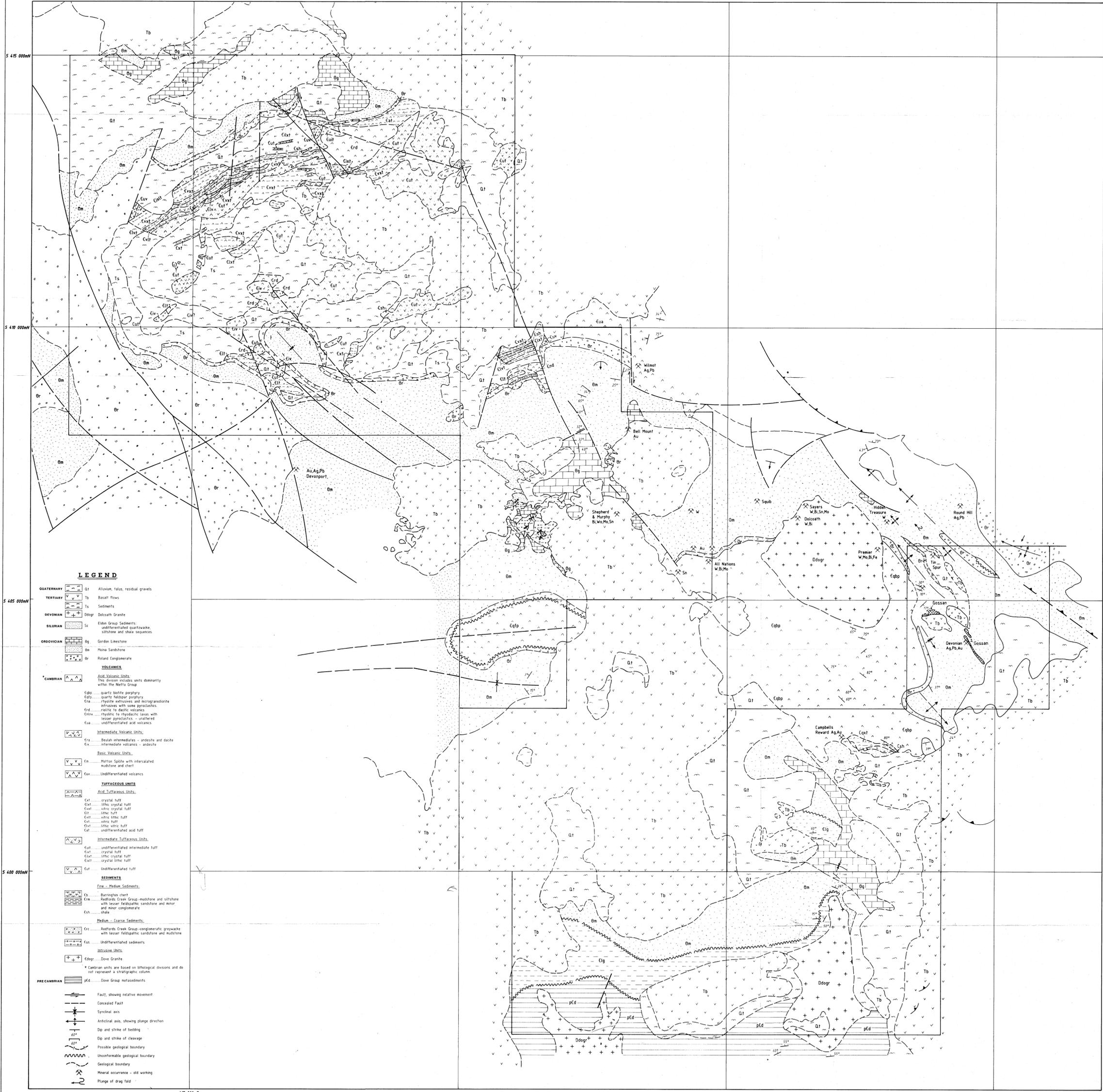
\* N.B. \* EVEN No. ... -4 mesh CYANIDE LEACH SAMPLE.  
 ODD No. ... -80 mesh SAMPLE.

025056 7256

CRA EXPLORATION PTY. LIMITED	
MOINA E.L. 7/74 CRAE REGIONAL STREAM SEDIMENT SAMPLE LOCATIONS 1985 - 86	
REF. SK55 - 3	( 8014-8015-8115 )
SCALE 1 : 25 000	DRAWN R.T.
AUTHOR S.J.C.	REPORT No. 14608
DATE 7 - 3 - 1986	PLAN No. TASH 2949

86-2554





**LEGEND**

- QUATERNARY**
- Qt Alluvium, talus, residual gravels
- TERTIARY**
- Tb Basalt flows
  - Ts Sediments
- DEVONIAN**
- Ddogr Dolcoath Granite
- SILURIAN**
- Sc Eiden Group Sediments, undifferentiated quartzite, siltstone and shale sequences
- ORDOVICIAN**
- Bg Gordon Limestone
  - Bm Home Sandstone
  - Br Roland Conglomerate
- CAMBRIAN**
- Acid Volcanic Units**
- The division includes units dominantly within the Niella Group
- Ebp quartz biotite porphyry
  - Ebpq quartz felspar porphyry
  - Eca rhyolite andesite and microgranodiorite intrusives with some pyroclastics
  - Erd rhyolite to dacite volcanics
  - Entw rhyolite to rhyodacite lavas with lesser pyroclastics - undifferentiated
  - Eua undifferentiated acid volcanics
- Intermediate Volcanic Units**
- Era Beulah intermediates - andesite and dacite
  - Eix intermediate volcanics - andesite
- Basic Volcanic Units**
- En Morton Spite with intercalated mudstone and chert
  - Euv Undifferentiated volcanics
- TUFFACEOUS UNITS**
- Acid Tuffaceous Units**
- Evt crystalline tuff
  - Evtc lithic crystalline tuff
  - Evtv vitric crystalline tuff
  - Evtl lithic tuff
  - Evti vitric lithic tuff
  - Evtv vitric tuff
  - Evtl lithic vitric tuff
  - Eva undifferentiated acid tuff
- Intermediate Tuffaceous Units**
- Euit undifferentiated intermediate tuff
  - Euitc crystalline tuff
  - Euitv lithic crystalline tuff
  - Euitl crystalline lithic tuff
- Sediments**
- Fine - Medium Sediments**
- Es Barrington chert
  - Era Redford Creek Group - mudstone and siltstone with lesser feldspathic sandstone and minor and minor conglomerate
  - Esh shale
- Medium - Coarse Sediments**
- Erc Redford Creek Group - conglomeratic graywacke with lesser feldspathic sandstone and mudstone
  - Eus Undifferentiated sediments
- Intrusive Units**
- Edogr Dove Granite
- \* Cambrian units are based on lithological divisions and do not represent a stratigraphic column
- PRECAMBRIAN**
- pcd Dove Group metasediments
- Structural Features**
- Fault, showing relative movement
  - Concealed Fault
  - Synclinal axis
  - Anticlinal axis, showing plunge direction
  - Dip and strike of bedding
  - Dip and strike of cleavage
  - Possible geological boundary
  - Unconformable geological boundary
  - Geological boundary
  - Mineral occurrence - old working
  - Plunge of drag fold

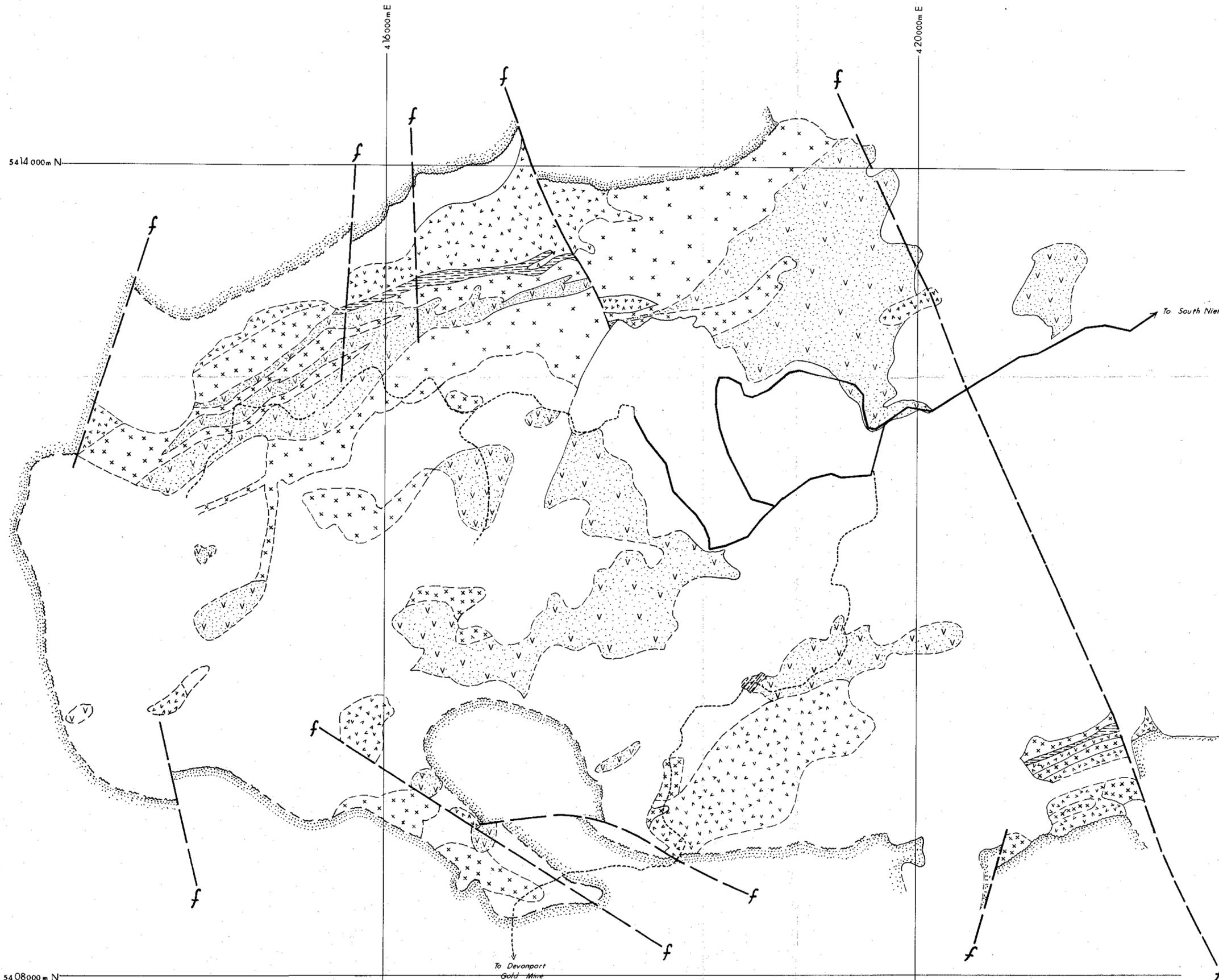
025057

Scale bar: 1 cm

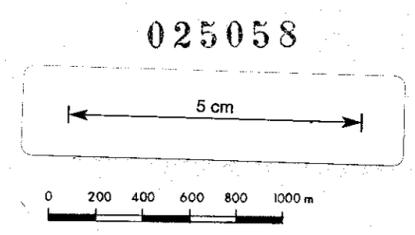
\*\* N.B. \*\*  
 This plan is a compilation of pre-existing mapping  
 Major regional references include: T.M. Porter and  
 Tasmanian Mines Department, with small detailed  
 areas taken from individual grid maps.

86-2554

CRA EXPLORATION PTY. LIMITED	
MOINA E.L. 7/74	
REGIONAL GEOLOGY	
REF. SKS - 3	( 80% - 81% - 81% )
SCALE 1 : 25 000	DRAWN R.T.
AUTHOR S.J.C.	REPORT No. 4498
DATE 10 - 6 - 1986	PLAN No. TASH 3002



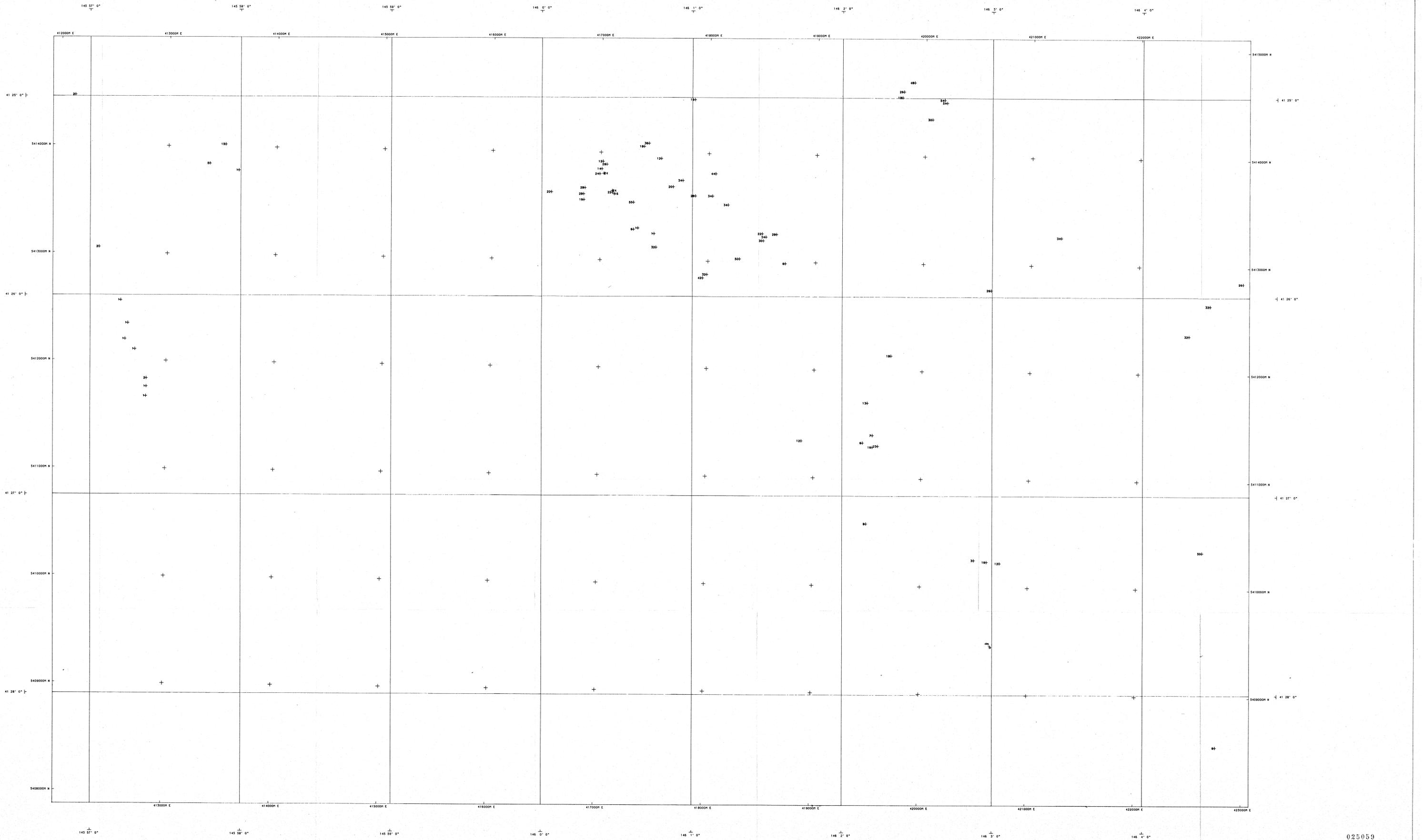
-  Ordovician conglomerate, sandstone & limestone
-  € acid volcanics & volcanoclastics
-  Siltstone, tuff shale
-  Volcaniclastic conglomerate reworked tuffs, minor tuff - shale, sandstone minor lithic & crystal tuffs
-  € intermediate volcanics & volcanoclastics



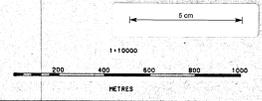
7258

<b>CRA EXPLORATION PTY. LIMITED</b>	
<b>MT JACOB &amp; WINTERBROOK AREA</b>	
<b>SKETCH GEOLOGY</b>	
REF. SK55-3	
SCALE 1: 25 000	DRAWN A.R.
AUTHOR I.M.C.	REPORT No. 14008
DATE 18.10.85	PLAN No. TASH 2821

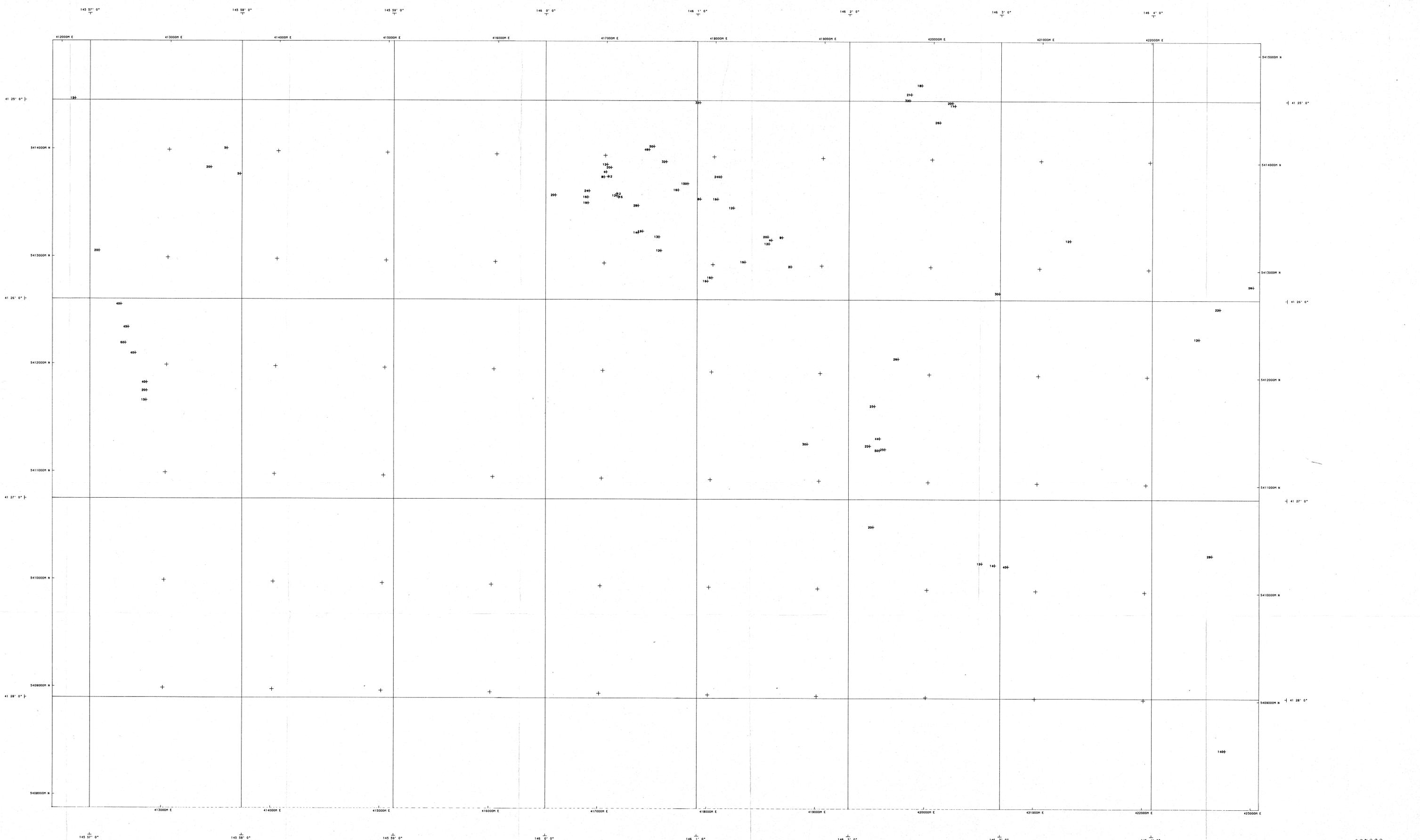
86-2554



CU



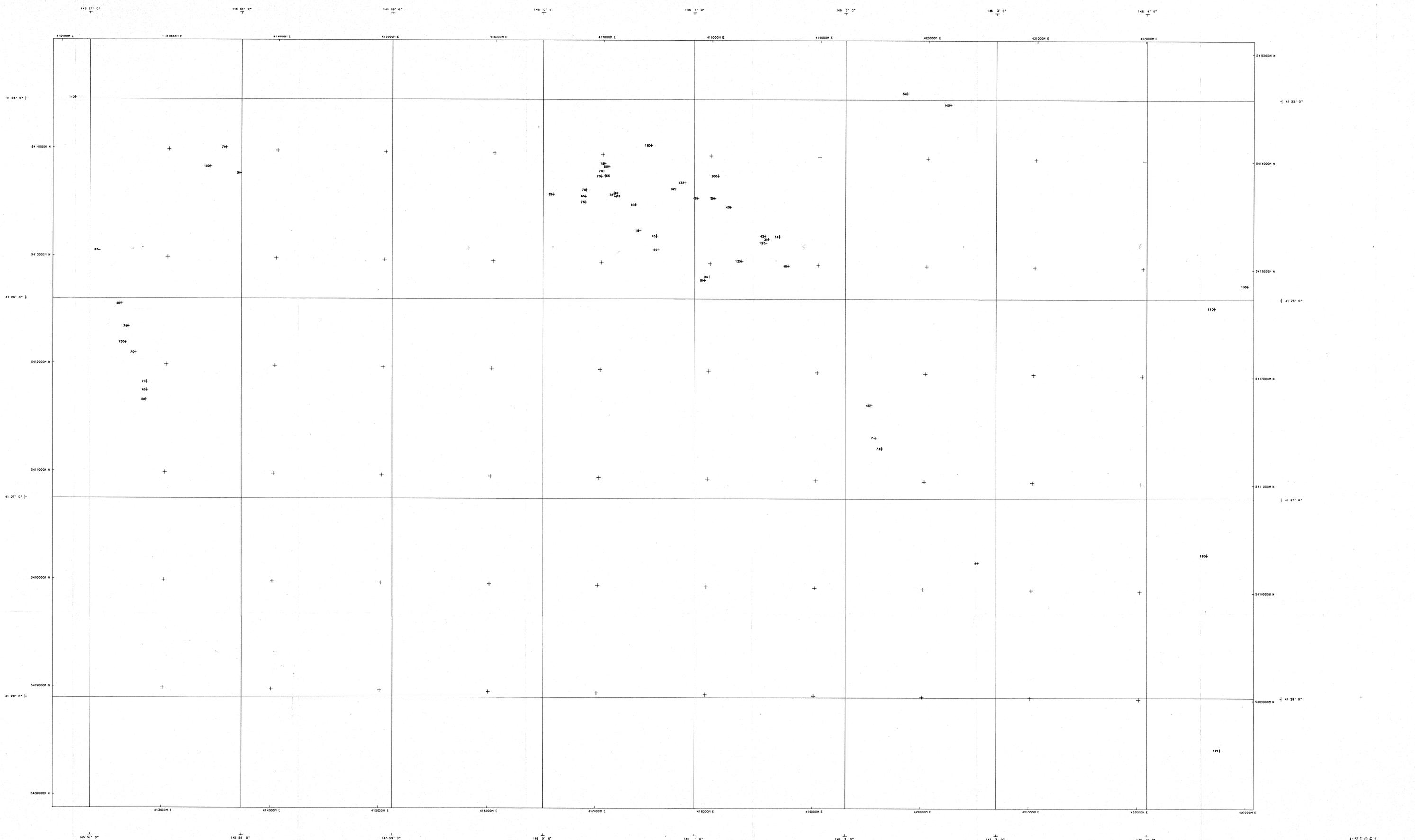
025059  
 86-2554  
 7259  
 CRA EXPLORATION PTY. LTD.  
 WINTERBROOK DOME - TAS.  
 MT READ VOLCANICS  
 STREAM SEDIMENT GEOCHEMISTRY  
 COPPER : ppm  
 MORVA EE 7774  
 GEOL. E.J.C. REPORT NO. 1600  
 DRAWN: CRAE Spt DATE: 14-4-96 PLAN NO. 2064



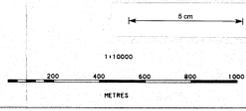
PB

025060  
86-2554  
7260

GRA EXPLORATION PTY. LTD.  
WINTERBROOK DOME - TAS.  
HT. READ VOLCANICS  
STREAM SEDIMENT GEOCHEMISTRY  
LEAD ppm  
MENA EL. 774  
SERIAL SJC REPORT NO. 4208  
DRAWN: CRAE Syd DATE: 16 4 86 PLAN NO. 297



ZN



025061 720E  
**86-2554**  
 GRA EXPLORATION PTY. LTD.  
 WINTERBROOK DOME - TAS  
 MT READ VOLCANICS  
 STREAM SEDIMENT GEOCHEMISTRY  
 ZINC : mg/kg  
 MONA EL 7/76  
 DRAWN: CRAE Syd DATE: 16. 6. 96 PLAN NO: 7663  
 REPORT NO: 16088



7262

7262

5 cm

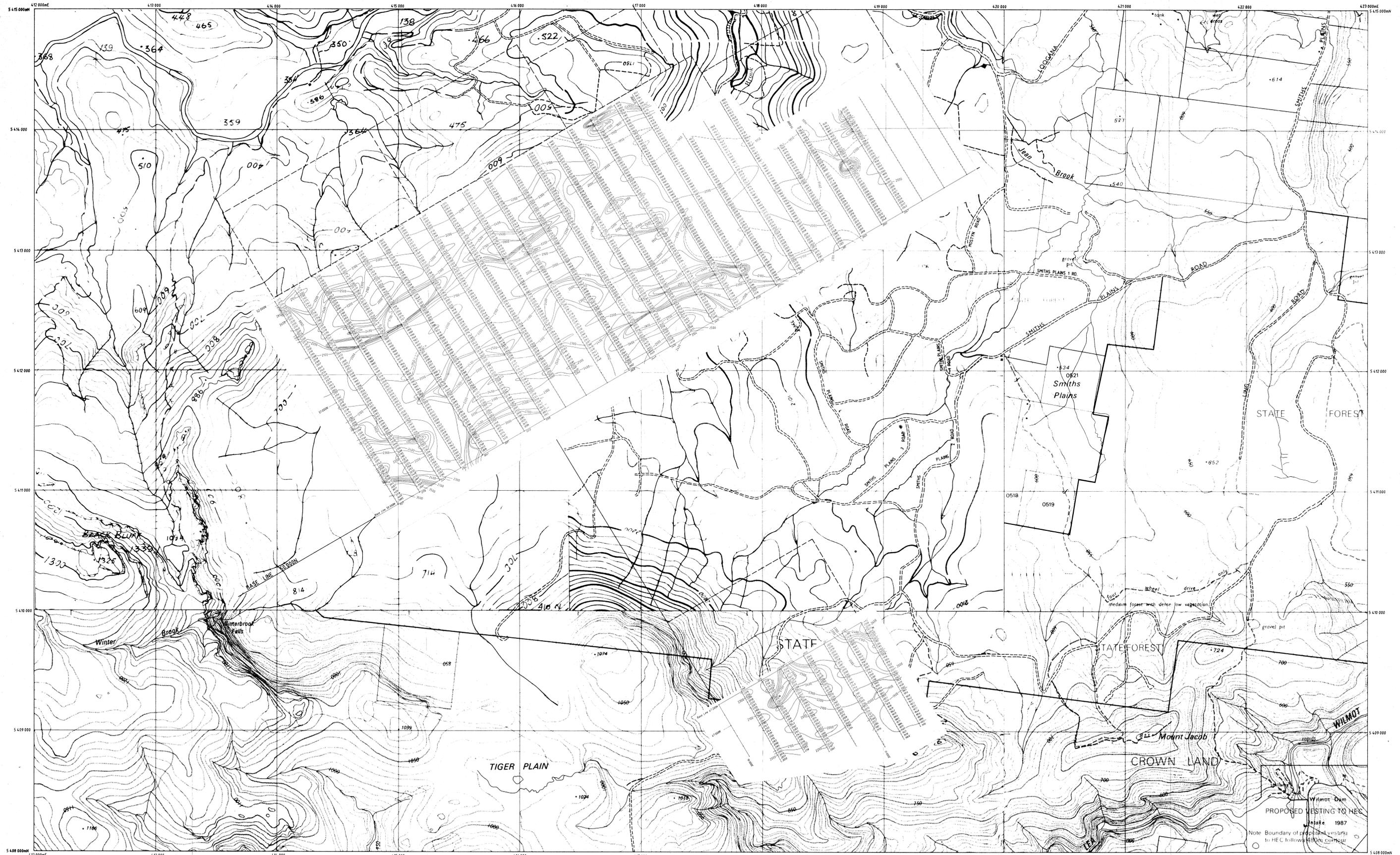
CRA EXPLORATION PTY. LIMITED  
 MOINA E.L. 7/74  
 MT. JACOB & WINTERBROOK AREA  
 U.T.E.M. GRIDS

025062

86-2554

REF. 255 - 3	(REV. - 818.1)
SCALE 1 : 10 000	DRAWN R.T.
AUTHOR T.V.S.	REPORT No. 14518
DATE 8 - 4 - 1986	PLAN No. TAGS 255

PROPOSED VESTING TO HEC  
 1st June 1987  
 Note: Boundary of proposed vesting to HEC follows 480m contour



7263

**\*\* NOTE \*\***  
 Readings recorded with Geometrics Magnetometers models G816 / G856.  
 All readings in nanoTeslas.  
 60 000nT must be added to give Total field.  
 Readings recorded at 12.5 metre intervals and smoothed for plotting  
 to 25 metre intervals using a 3 point triangular filter.



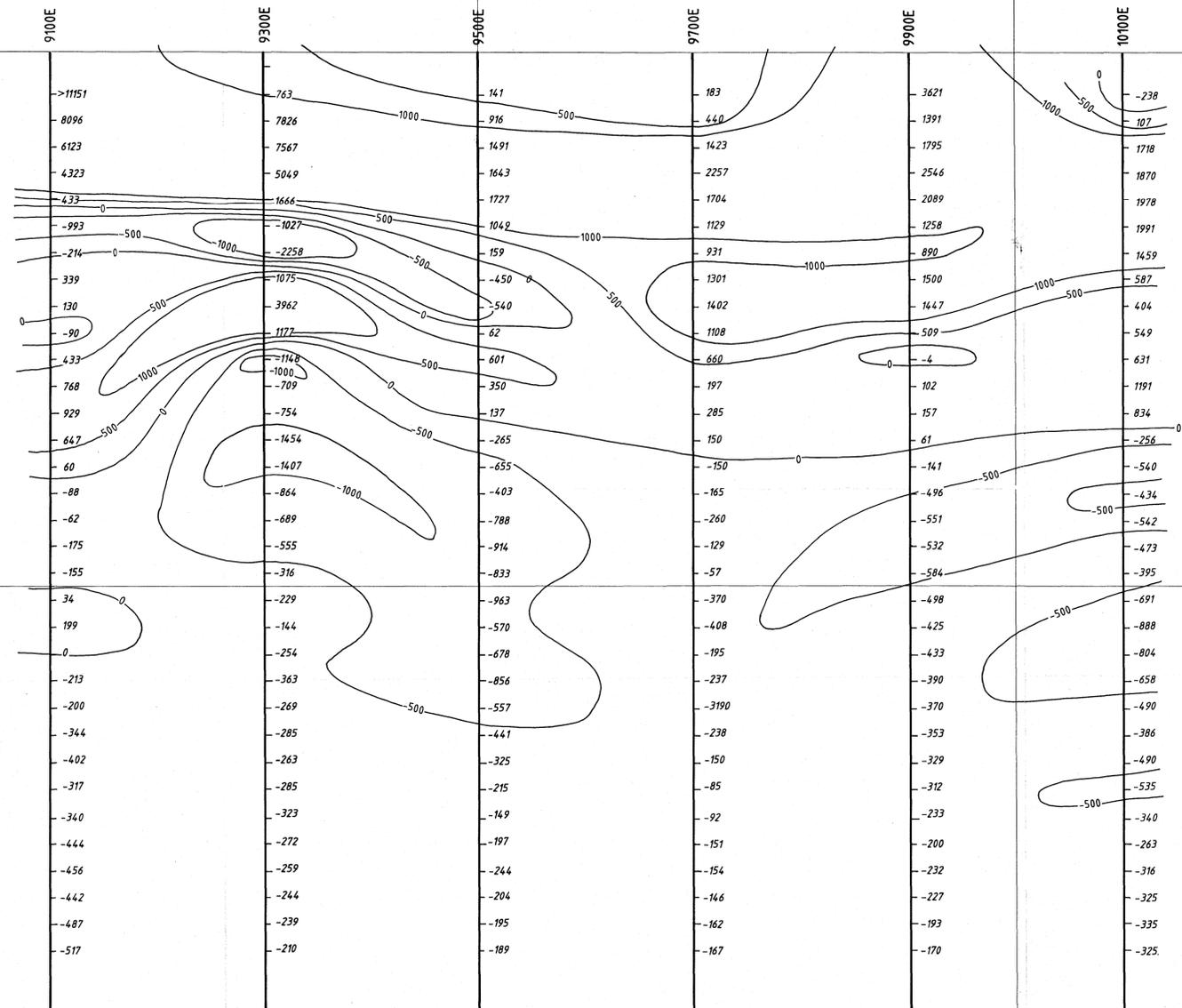
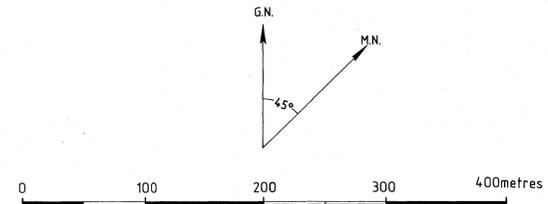
86-2554

025063 7263

CRA EXPLORATION PTY. LIMITED

MOINA EL. 7774  
 MT. JACOB & WINTERBROOK AREA  
 GROUND MAGNETIC CONTOURS

REF. SHEET - 3	(8015 - 8016)
SCALE 1 : 50 000	DRAWN BY
AUTHOR T.S.C.	REPORT NO. 1500A
DATE 8 - 4 - 1986	PLAN NO. TASH 2959



LINE 1000mW

LINE 1000mS

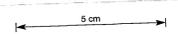
LINE 500mW

LINE 00

LINE 500mS

TRANSMITTER LOOP

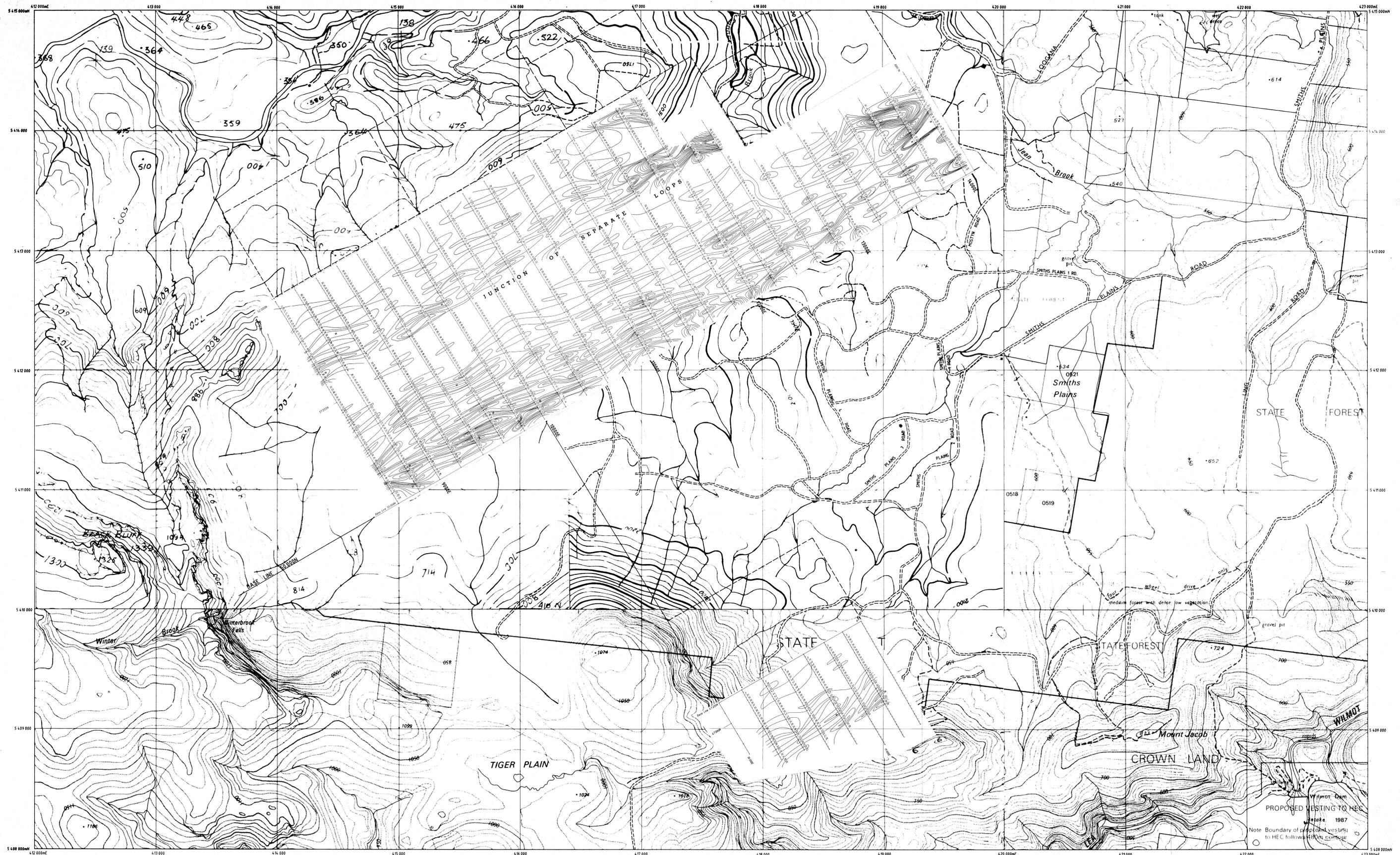
\* N.B. \* DATA CONTINUOUSLY NORMALISED  
LOG / LINEAR CURVE SUBTRACTED  
FRASER FILTER APPLIED.



86-2554

025064 7264

CRA EXPLORATION PTY. LIMITED			
MOINA E.L. 7/74			
MT. JACOB PROSPECT			
SHELL U.T.E.M. SURVEY			
CHANNEL 7 DATA			
REF.	SK55 - 3	( 8014 - 8114 - 8115 )	
SCALE	1 : 2500	DRAWN	R.T.
AUTHOR	T.V.S.	REPORT No.	14008
DATE	17 - 2 - 1986	PLAN No.	TASH 2929



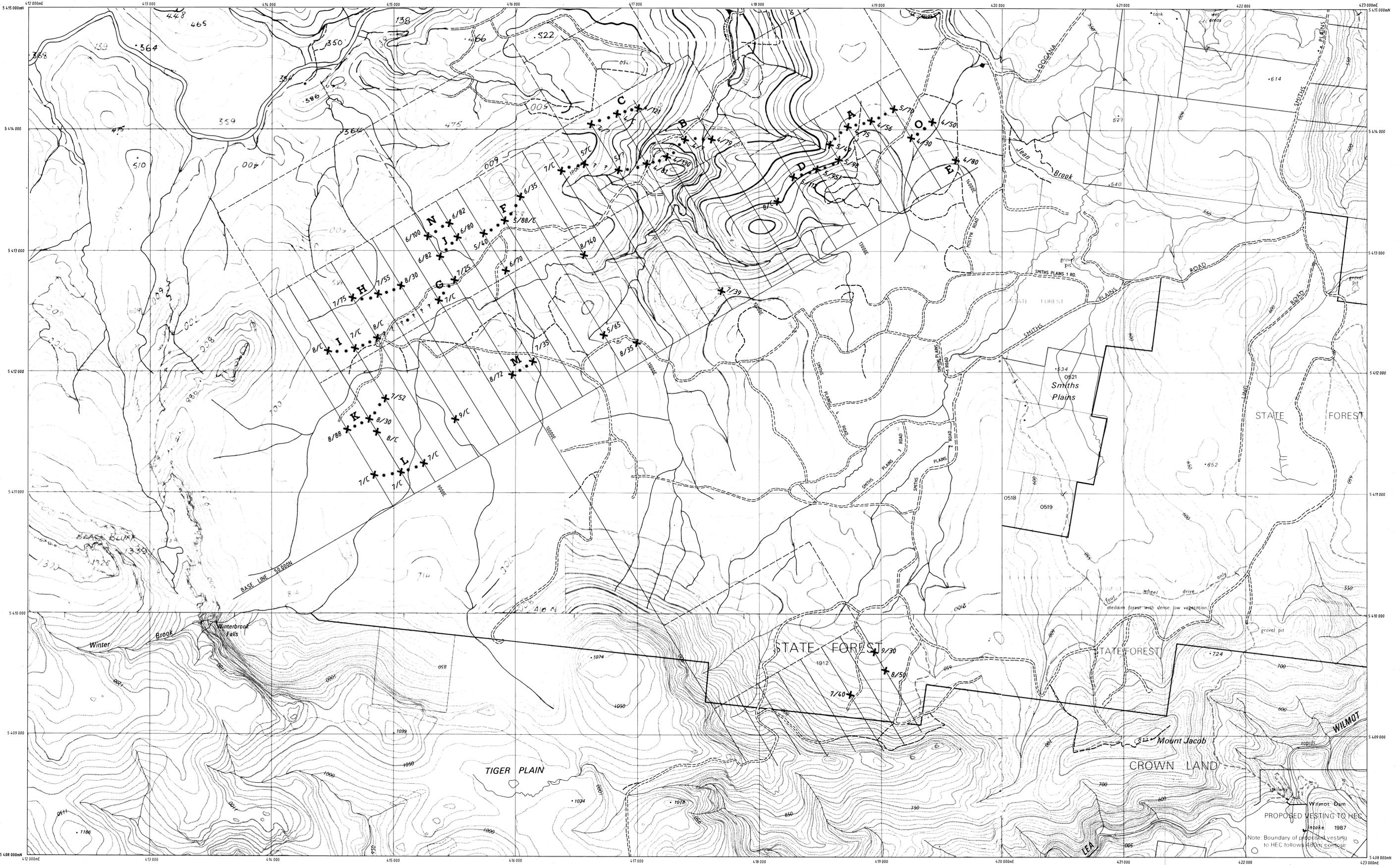
7265

025065 7265  
 8 cm

\*\* N.B. \*\*  
 DATA FRASER FILTERED AFTER  
 SUBTRACTION OF REGIONAL

CRA EXPLORATION PTY. LIMITED	
MOINA E.L. 7/74	
MT. JACOB & WINTERBROOK AREA	
U.T.E.M. CHANNEL 5 CONTOURS	
REF. SHEET 3	(805 - 816)
SCALE 1:20 000	DRAWN R.T.
AUTHOR T.H.S.	REPORT NO. 15,008
DATE 8.4.1986	PLAN NO. TASH 3003

86-2554



\*\*\* INTERPRETED LINE OF ANOMALY  
 x/75 LATEST CHANNEL WITH RESPONSE / INTERPRETED DEPTH  
 /C INTERPRETED AS CONTACT

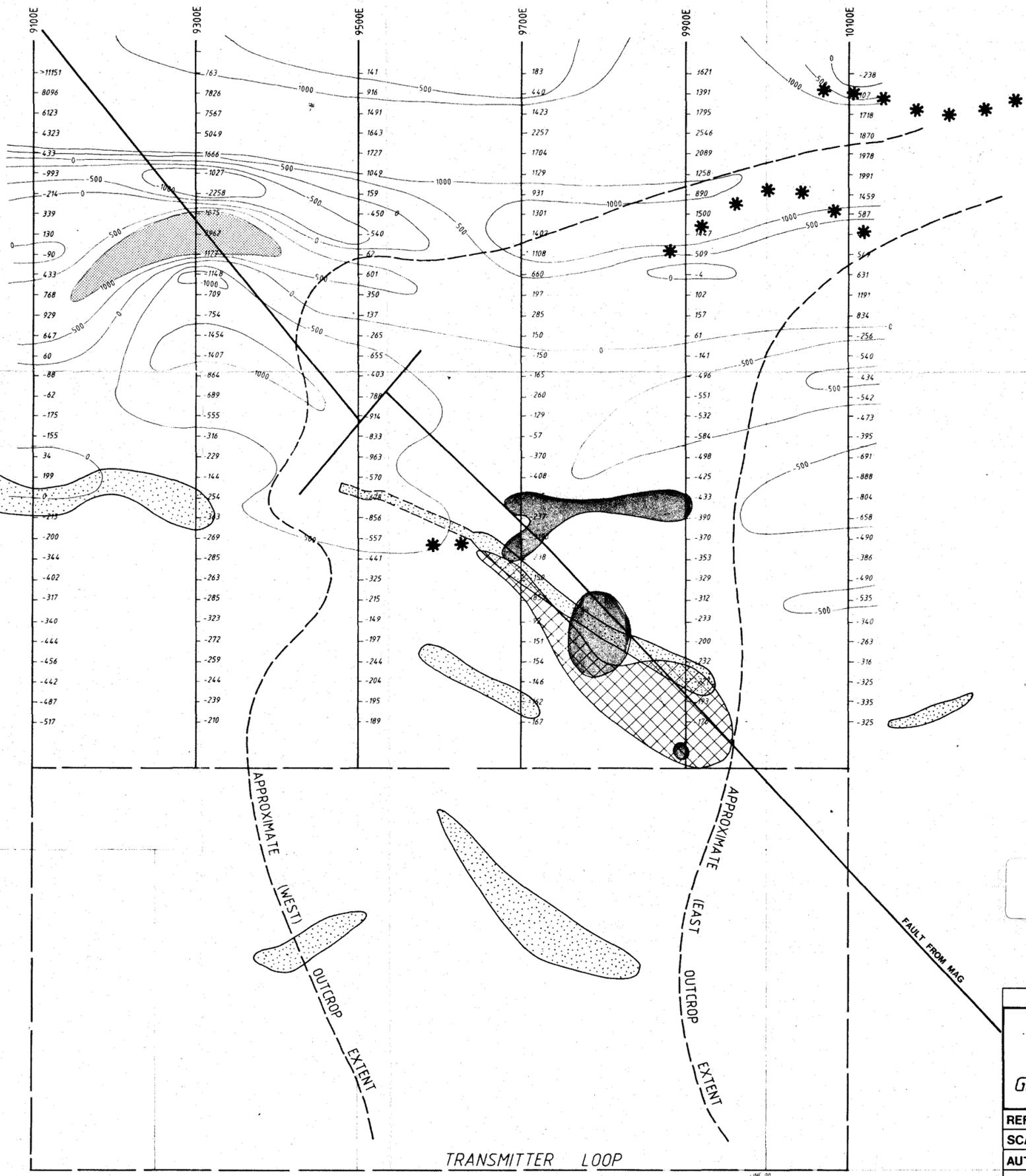
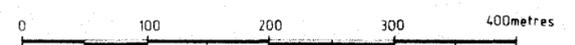
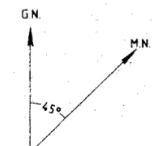
7266

N.B. ANOMALY POSITION DERIVED FROM CONTINUOUSLY NORMALISED PLOTS

86-2554

CRA EXPLORATION PTY. LIMITED  
 MDA E.L. 7774  
 MT. JACOB & WINTERBROOK AREA  
 U.T.M. ANOMALY PLAN  
 REF. SK55 - 3 (805 - 815)  
 SCALE 1 : 50 000 DRAWN R.T.  
 AUTHOR T.V.S. REPORT No. 3488  
 DATE 8 - 4 - 1988 PLAN No. TASH 304

7266  
7265



- >1000 ppm Pb
- CHARGEABILITY HIGH
- RESISTIVITY LOW
- U.T.E.M. CONDUCTOR
- MAGNETIC HIGH

025067

5 cm

7207

86-2554

**CRA EXPLORATION PTY. LIMITED**

MOINA E.L. 7/74  
MT. JACOB GRID  
GEOPHYSICAL INTERPRETATION PLAN

REF. SK55 - 3	( 8014 , 8114 , 8115 )
SCALE 1 : 5000	DRAWN R.T.
AUTHOR T.v.S.	REPORT No. 14008
DATE 12 - 6 - 1986	PLAN No. TASH 3005

052

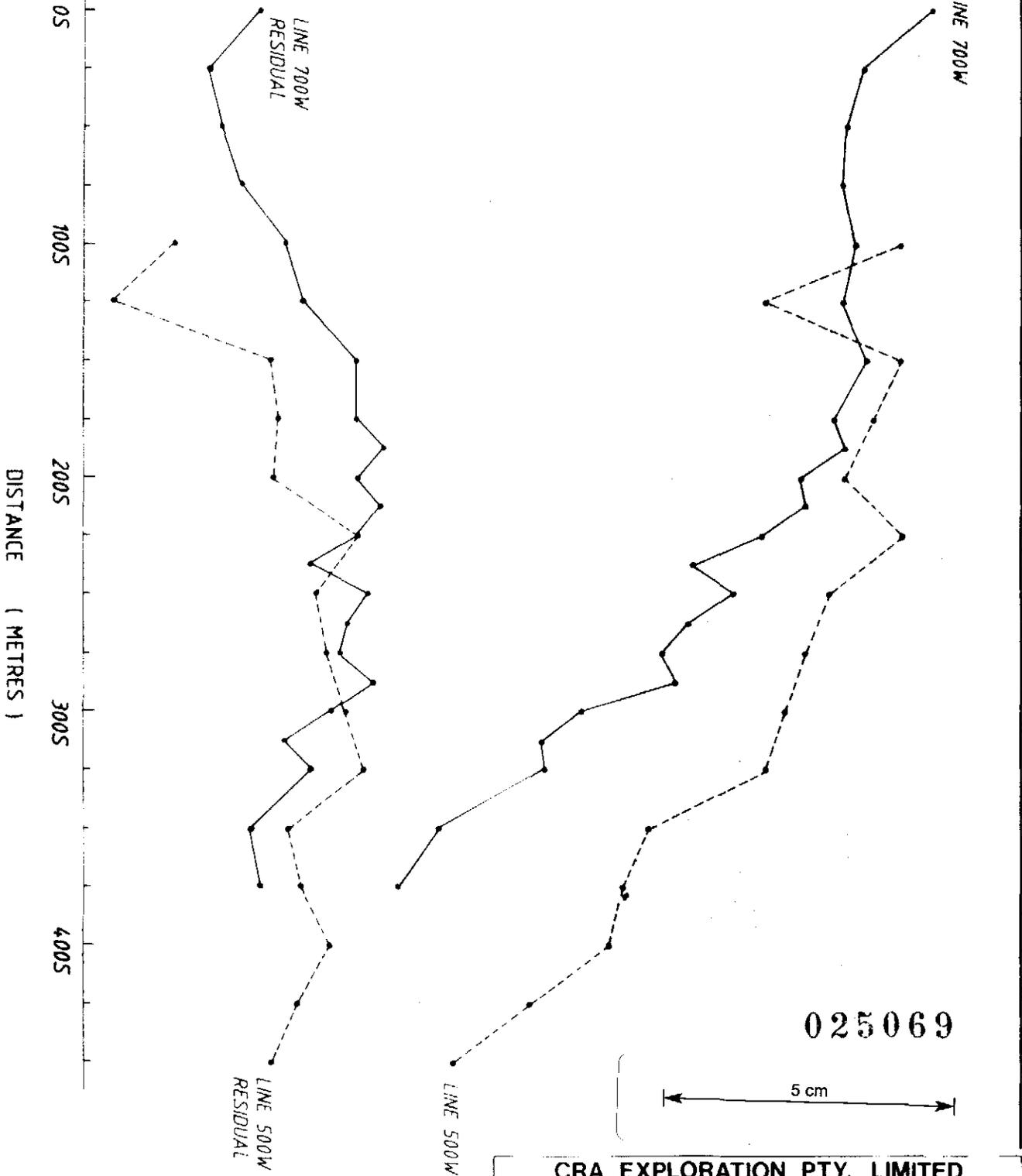
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104

105

106

Residual Gravity ( milligals )

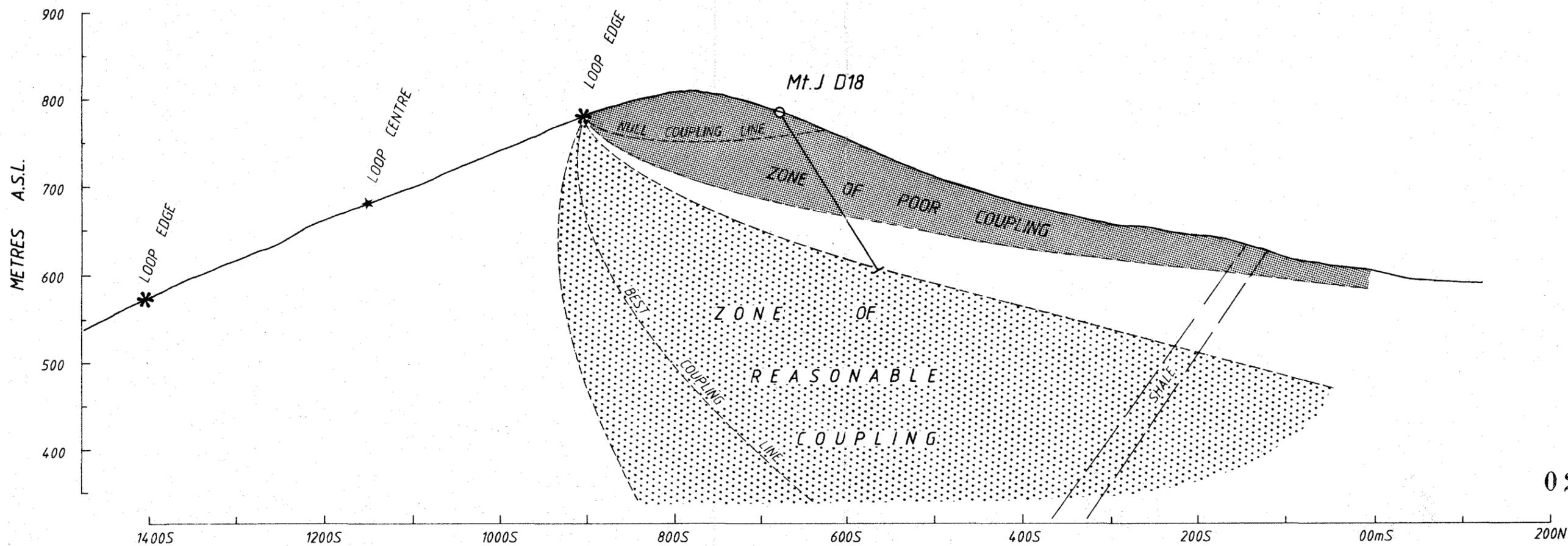


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CRA EXPLORATION PTY. LIMITED

MOINA E.L. 7/74  
MT. JACOB GRID  
GRAVITY SURVEY

REF.	SK55 - 3	( 804 - 814 - 815 )
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AUTHOR	T.v.S.	REPORT No. 14008
DATE	12 - 6 - 1986	PLAN No. TASH 3072

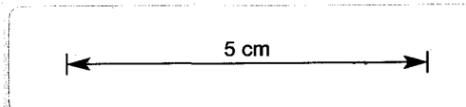


025068

CRA EXPLORATION PTY. LIMITED

MOINA E.L. 7/74  
 MT. JACOB GRID 9700E SECTION  
 E.M. Coupling of Shell U.T.E.M. Survey

REF.	SK55 - 3	( 8014 - 8114 - 8115 )
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AUTHOR	T.v.S.	REPORT No. 14008
DATE	14 - 2 - 1986	PLAN No. TASH 2924

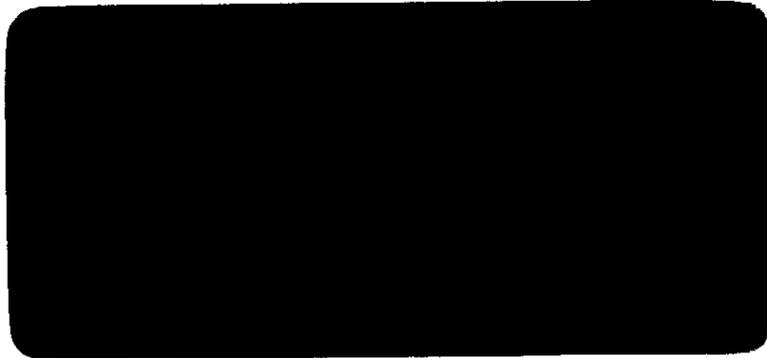


053

86-2554

86-2554<sup>Vol</sup> 2/2

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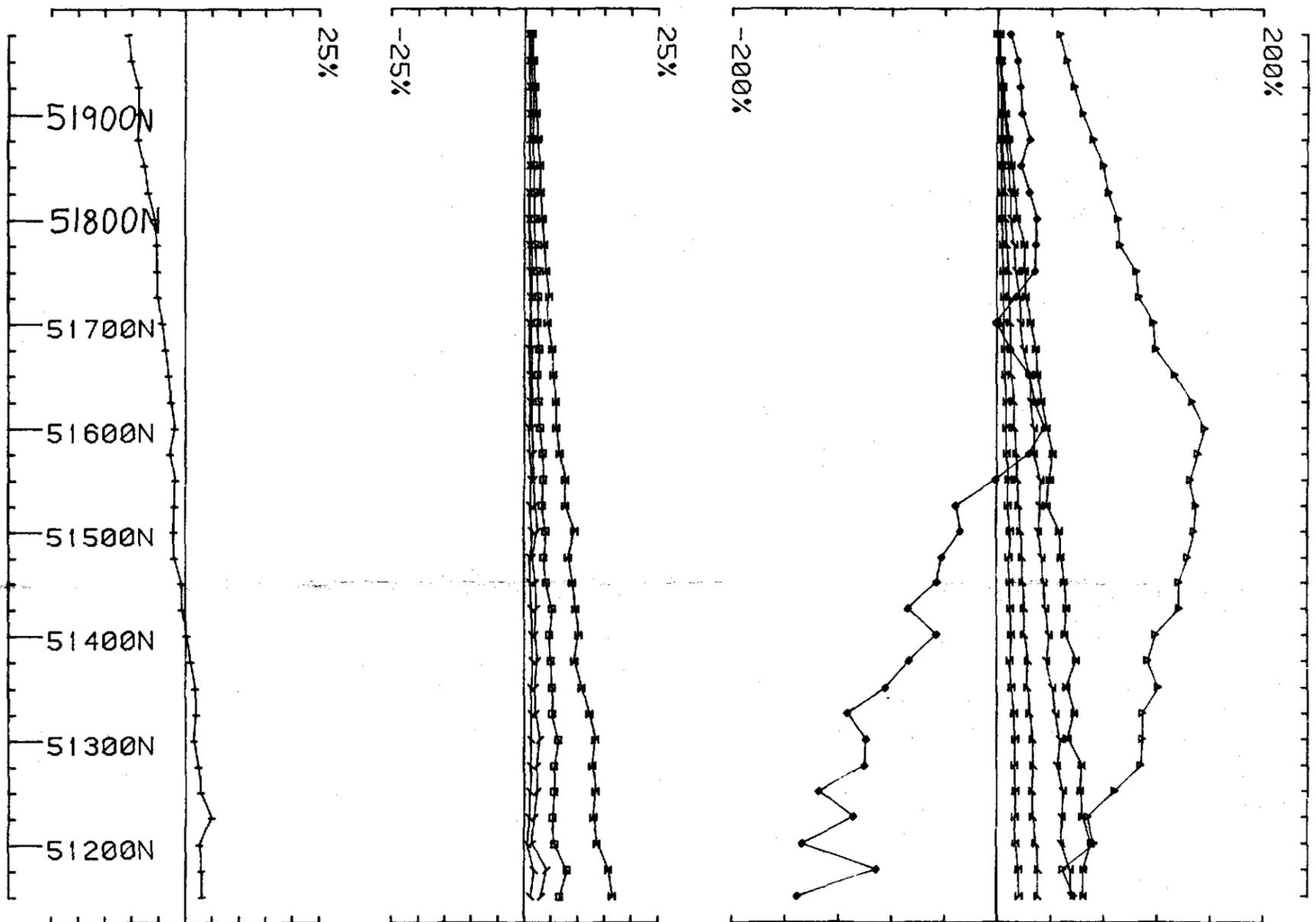


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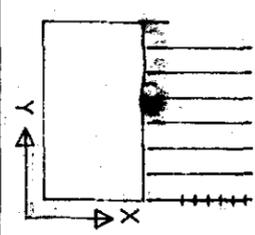
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DOUGLAS McKENNA & PARTNERS <sup>PTY LTD</sup>  
Consulting Exploration & Mining Geologists

025070  
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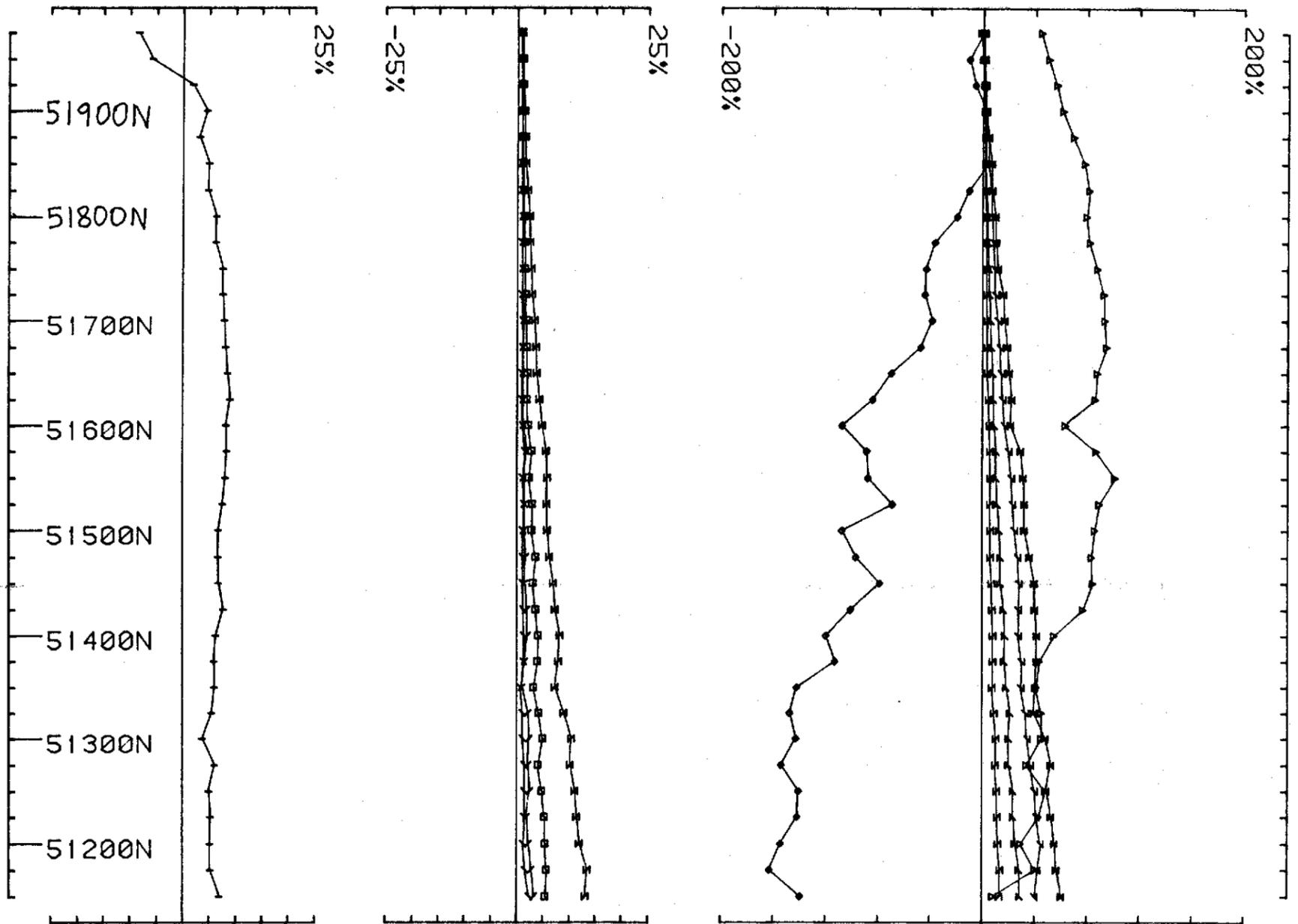


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C. R. A. EXPLORATION CREW :- PMM ML  
 Line 8600E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

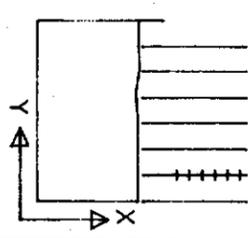


WINTERBROOK  
 LOOP 0001  
 LINE 8600  
 Hz

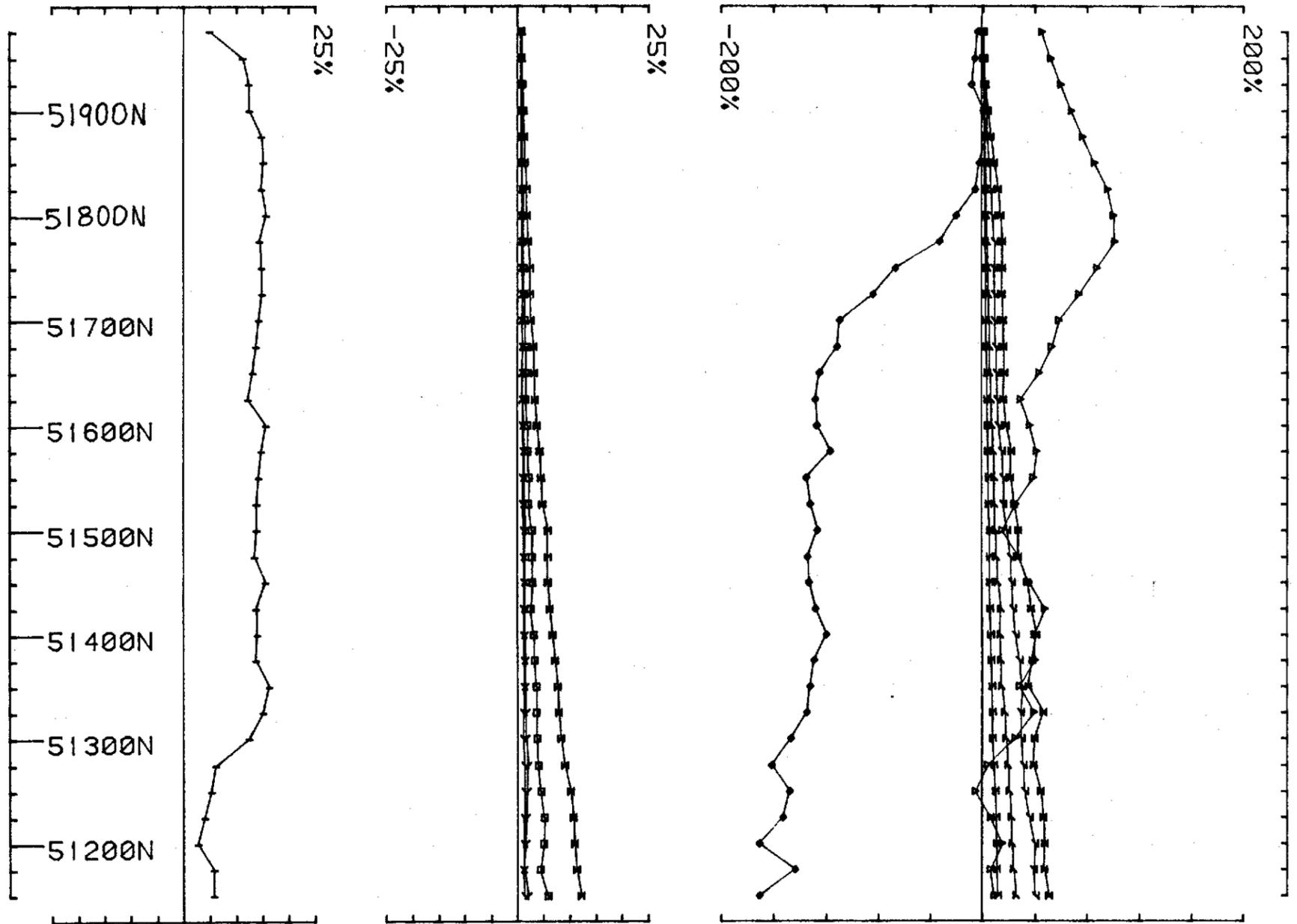
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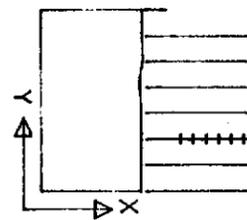
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 AREA :- WINTERBROOK  
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 Line 8800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



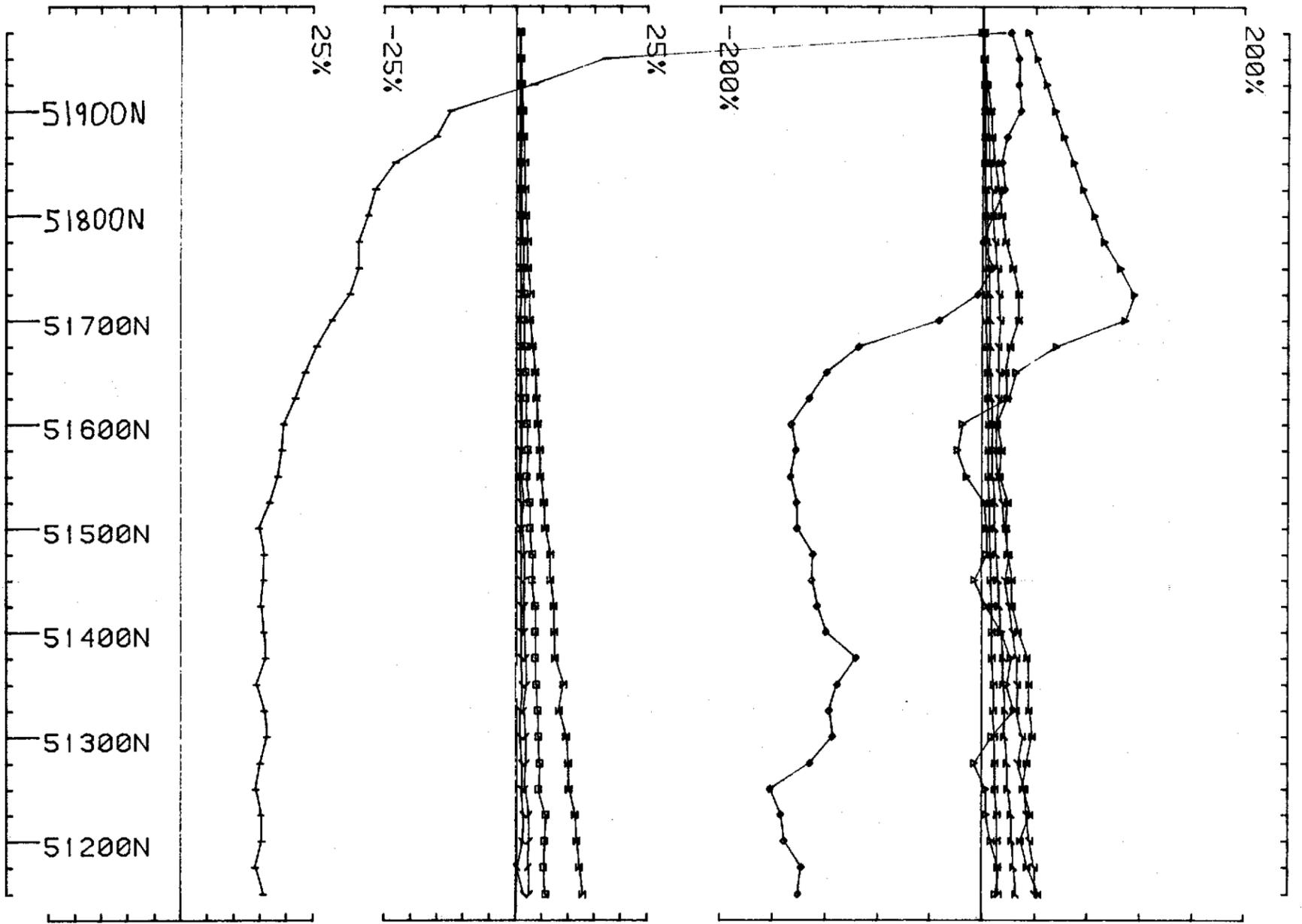
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 LINE 8800  
 Hz



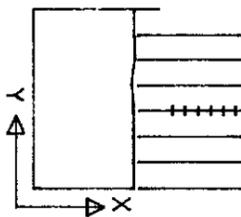
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 9000E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



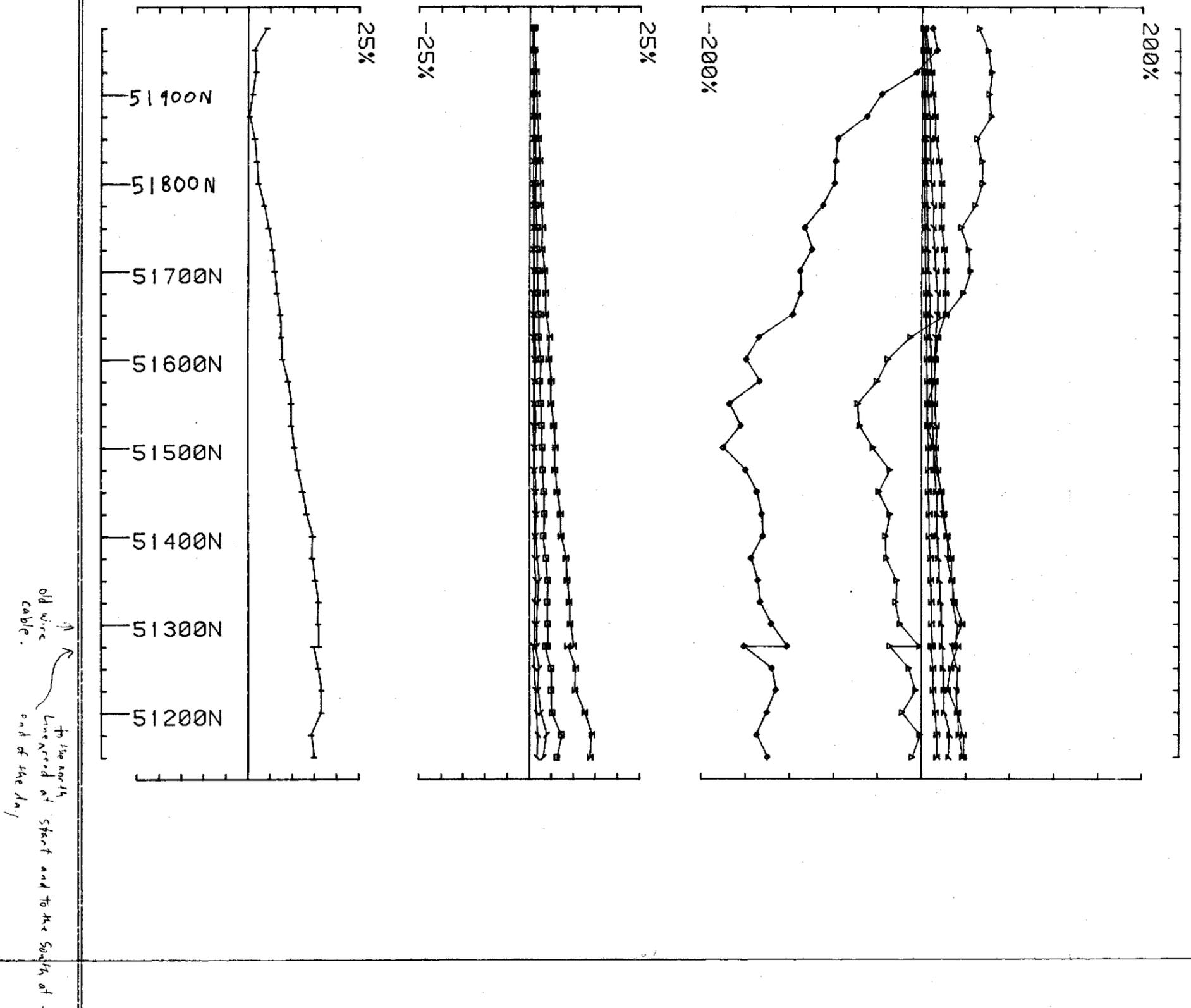
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 LINE 9000  
 Hz



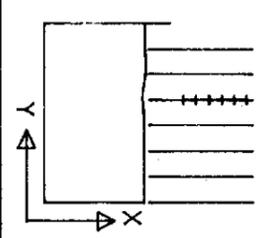
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 AREA :- WINTERBROOK  
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 Line 9200E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



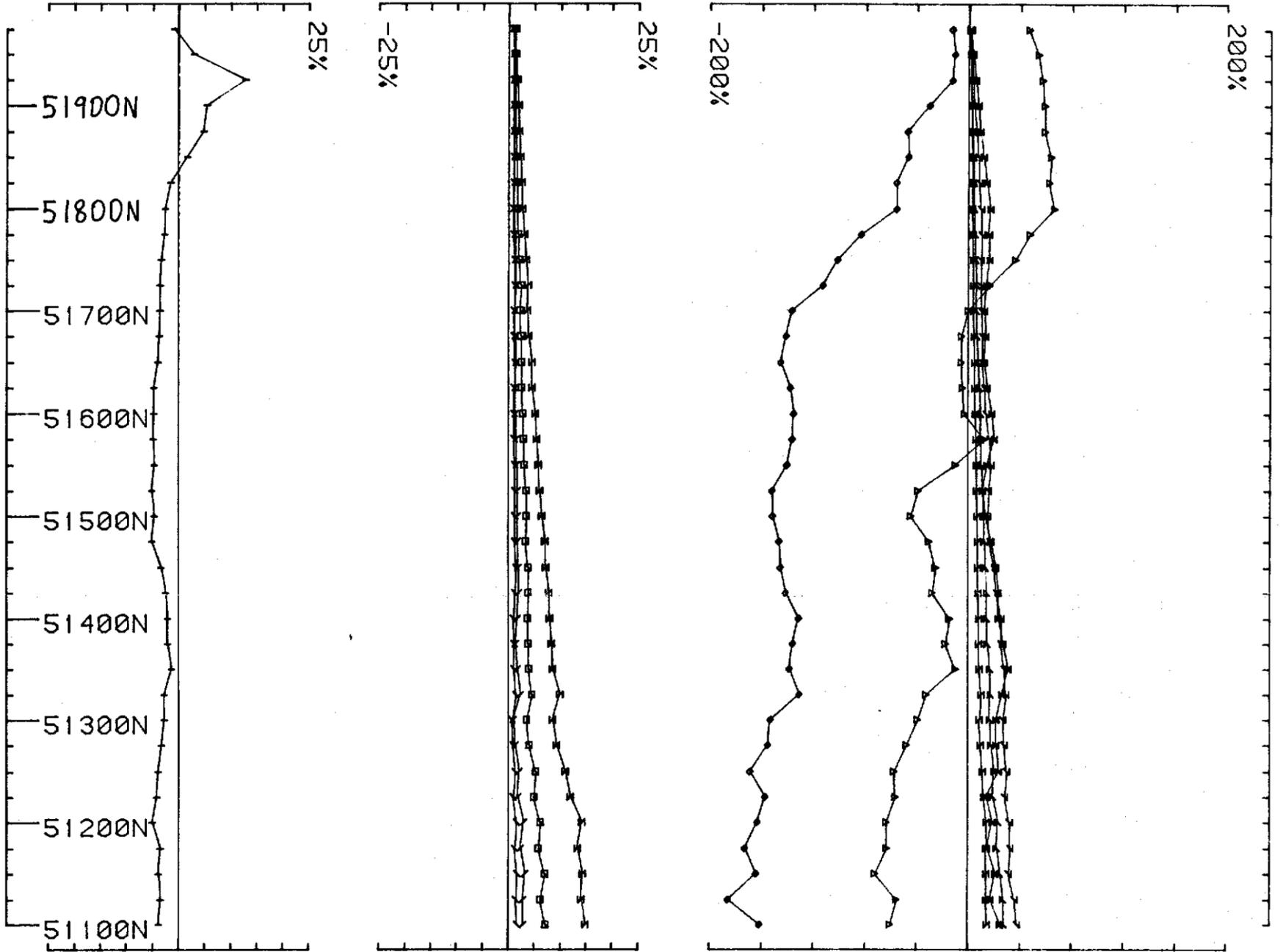
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 LINE 9200  
 Hz



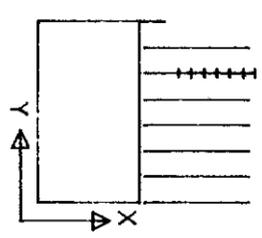
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 AREA :- WINTERBROOK  
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 Line 9400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



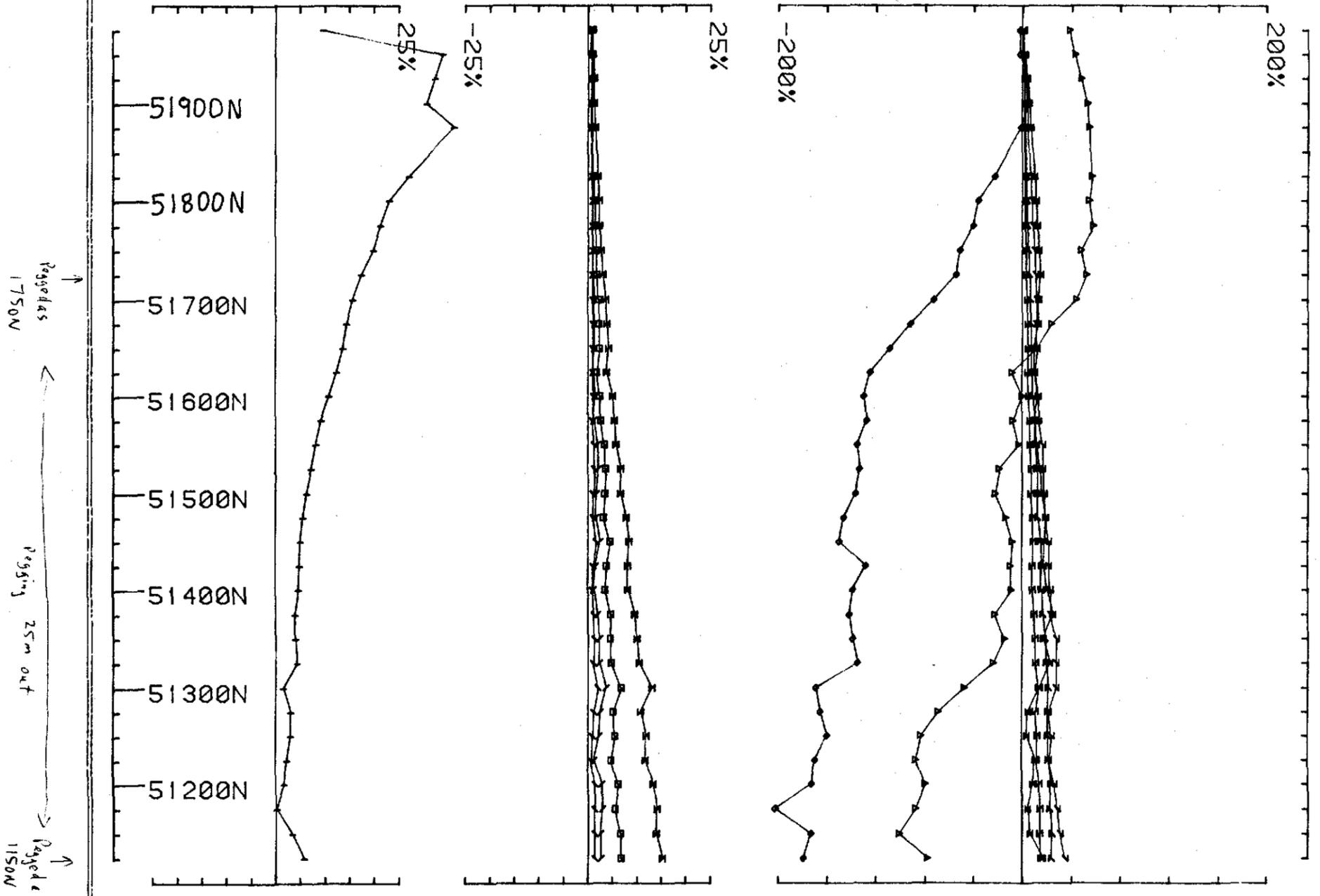
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 LINE 9400  
 Hz



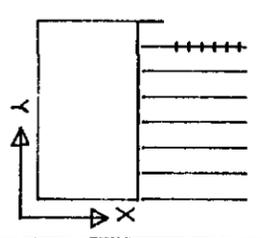
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 AREA :- WINTERBROOK  
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 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



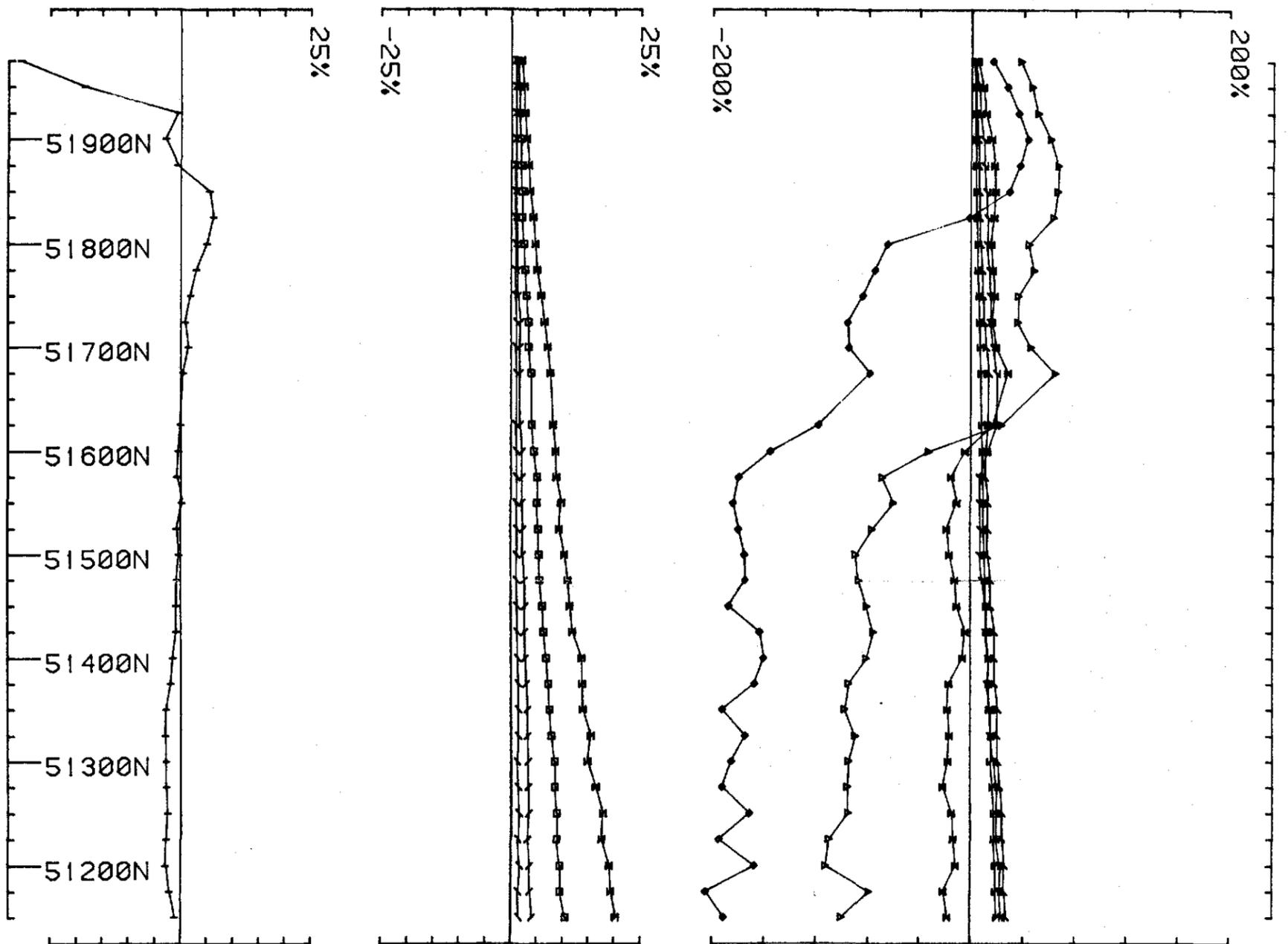
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 LOOP 0001  
 LINE 9600  
 Hz



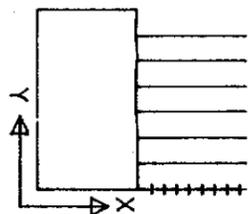
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 AREA :- WINTERBROOK  
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 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



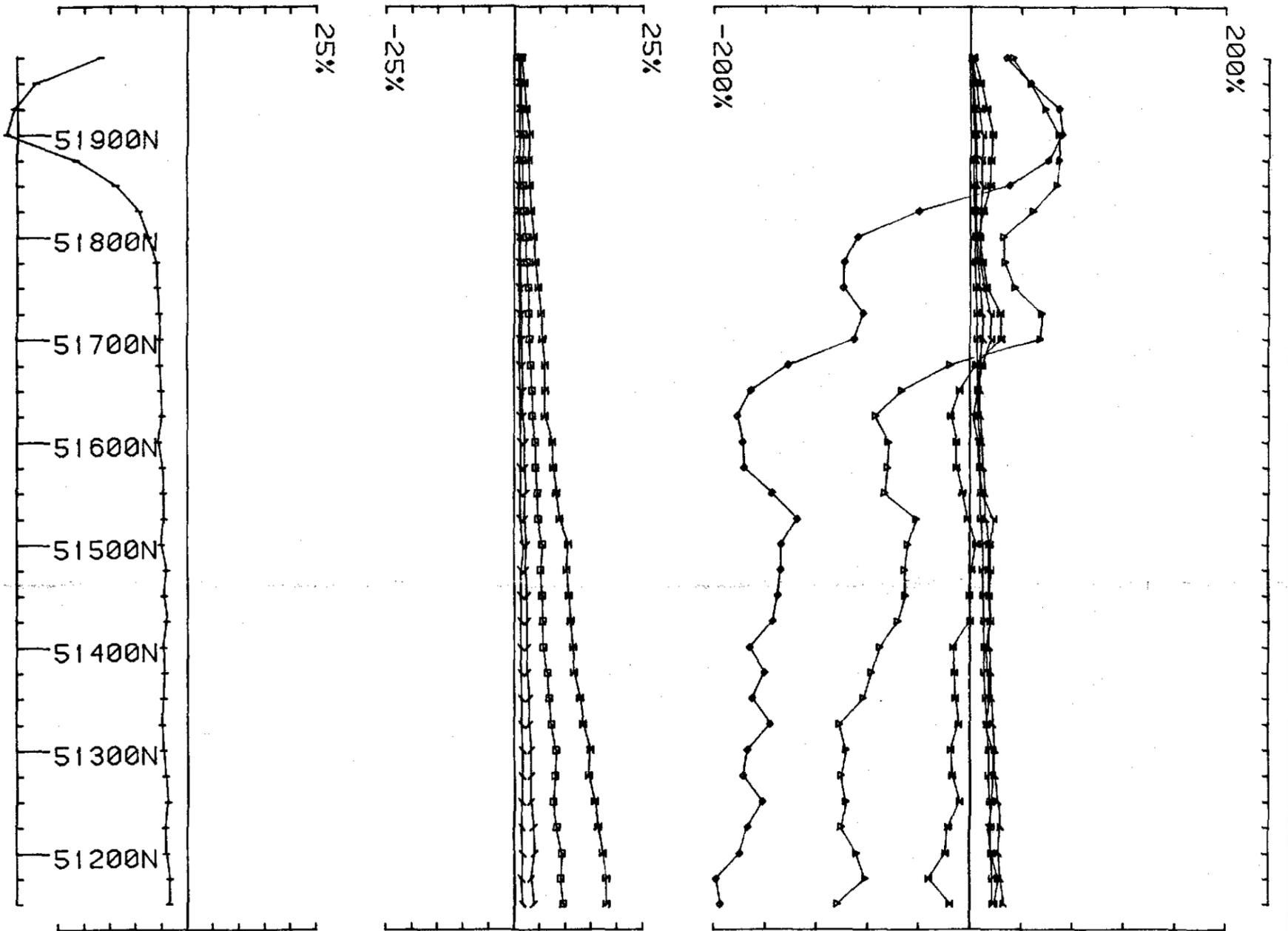
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 LINE 9800  
 Hz



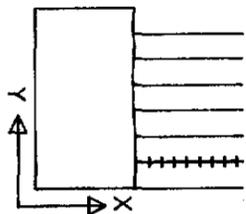
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 AREA :- WINTERBROOK  
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 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



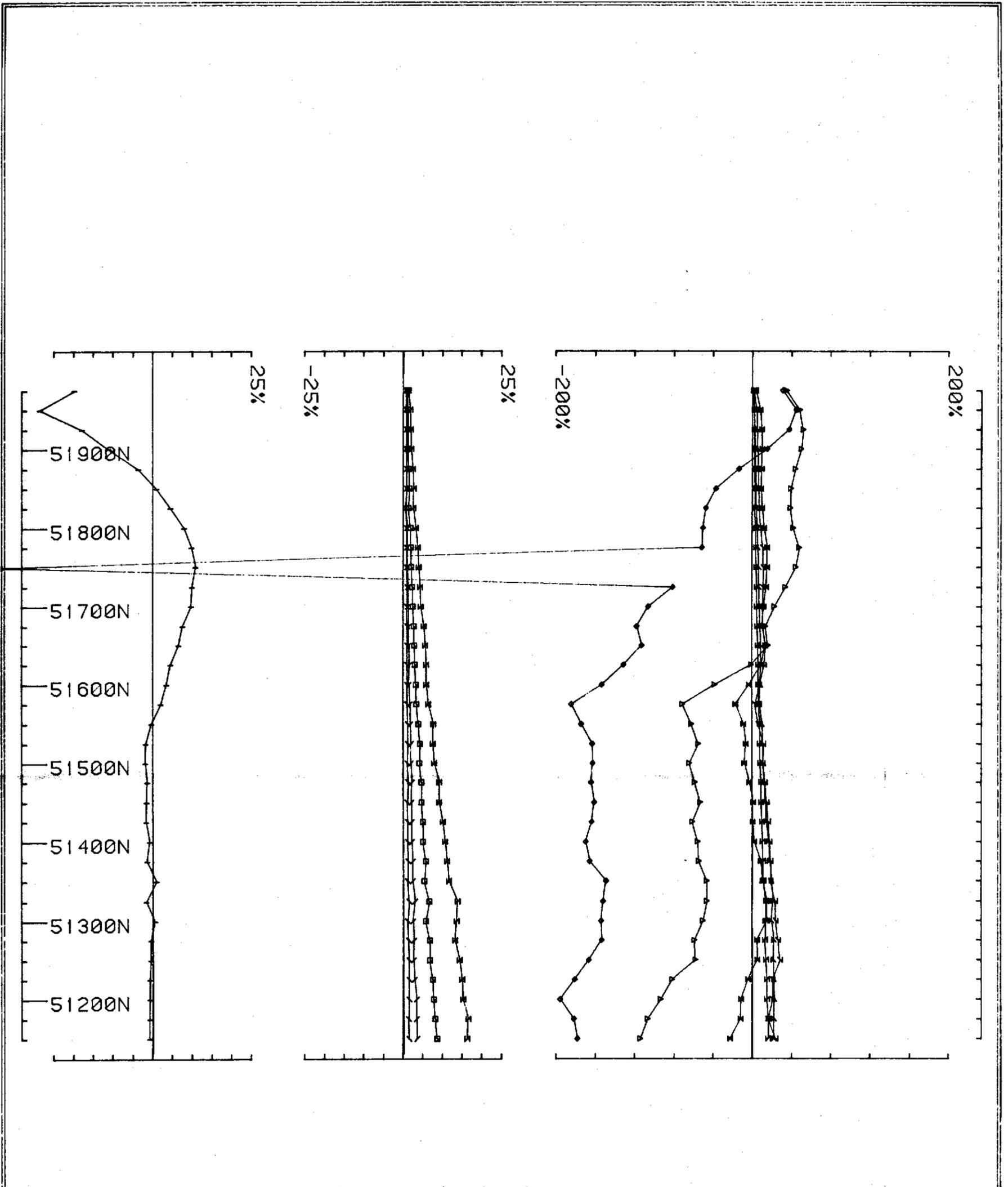
WINTERBROOK  
 LOOP 0002  
 LINE 10000  
 Hz



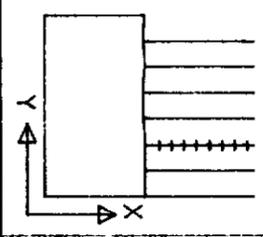
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM DA  
 Line 10200E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



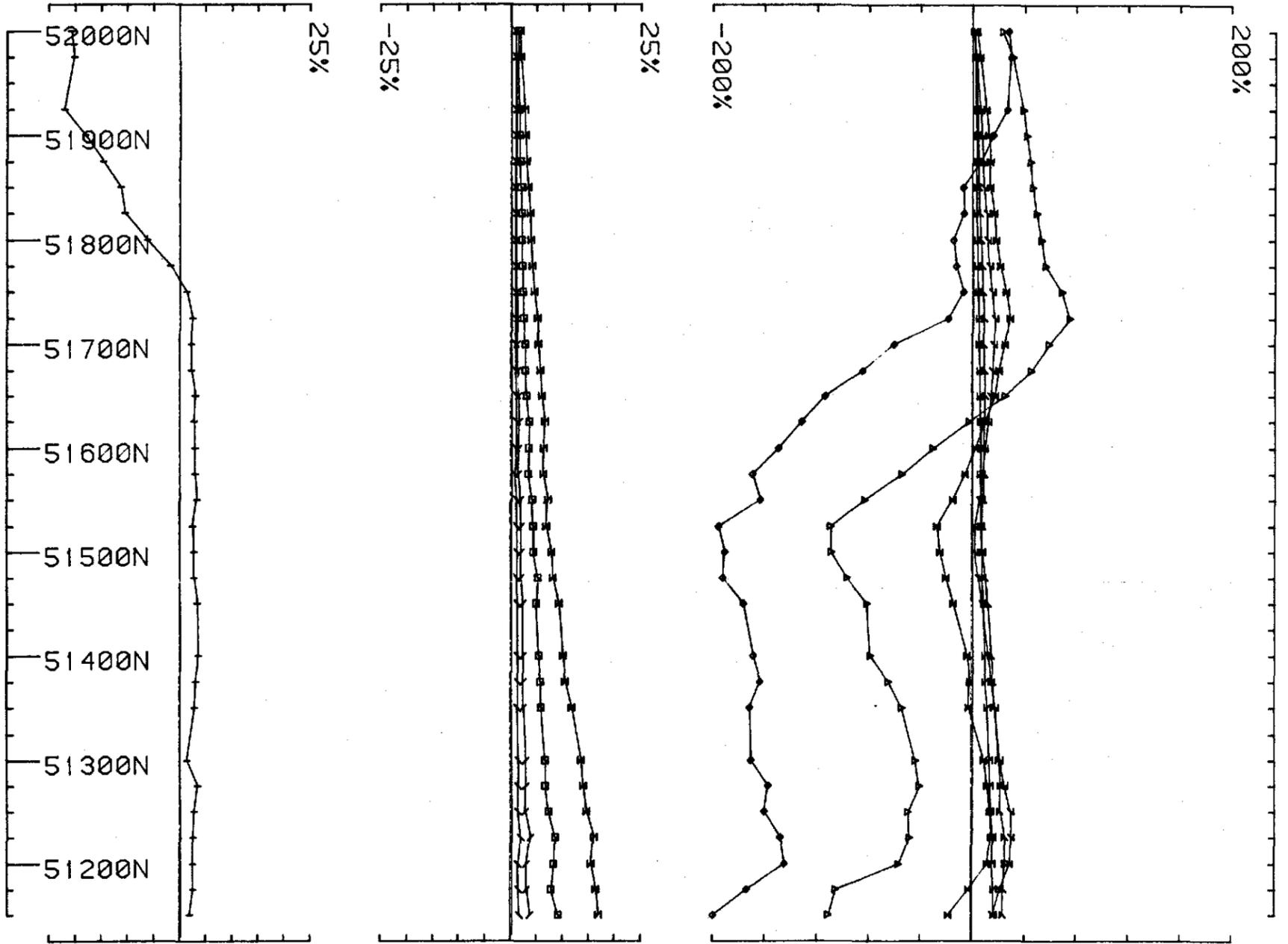
WINTERBROOK  
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 LINE 10200  
 Hz



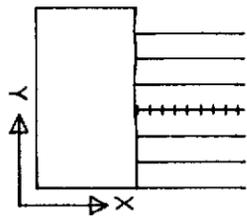
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 Line 10400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



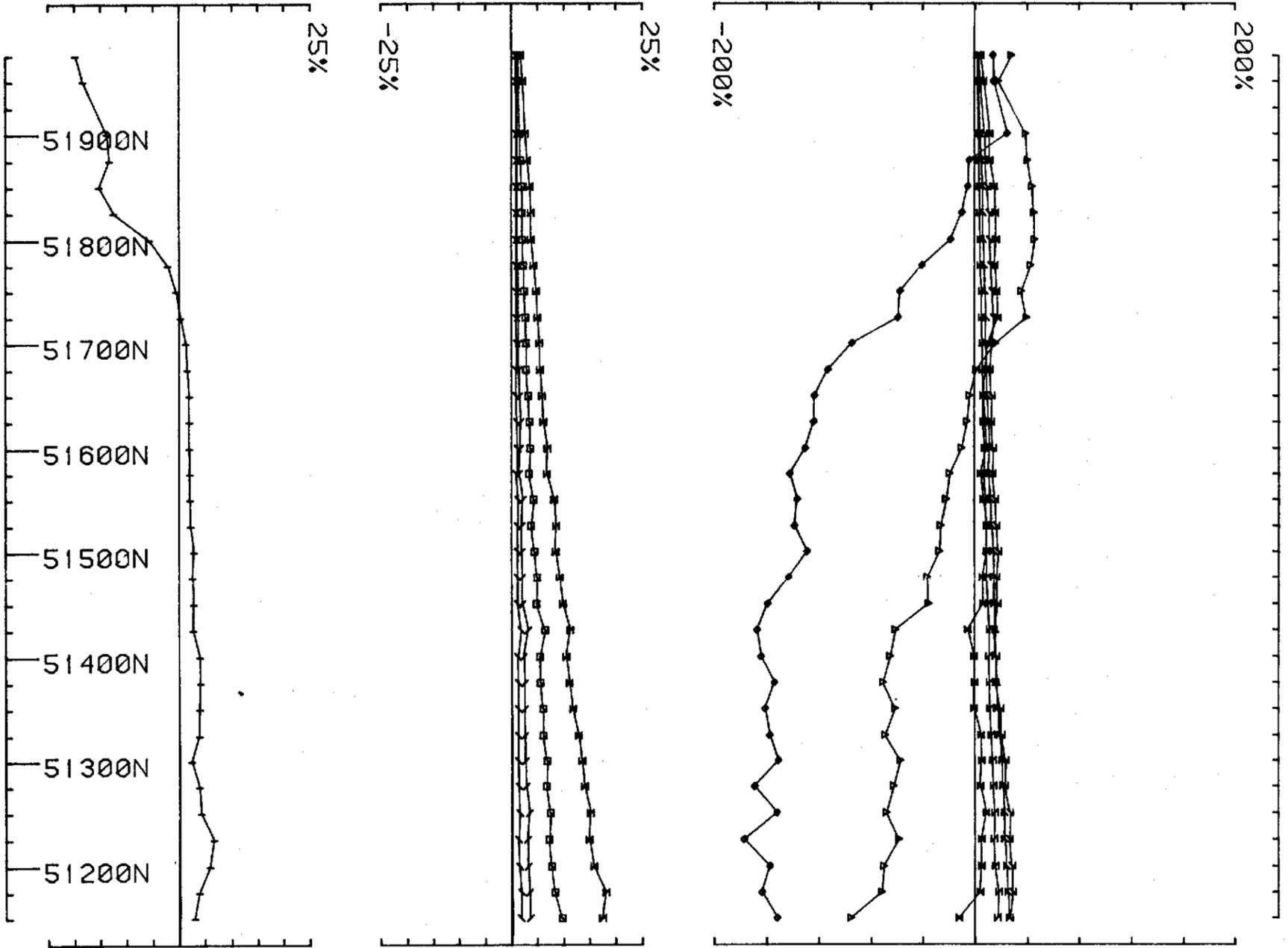
WINTERBROOK  
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 LINE 10400  
 Hz



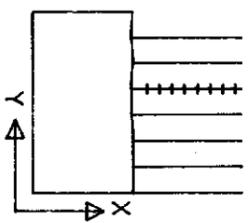
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 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



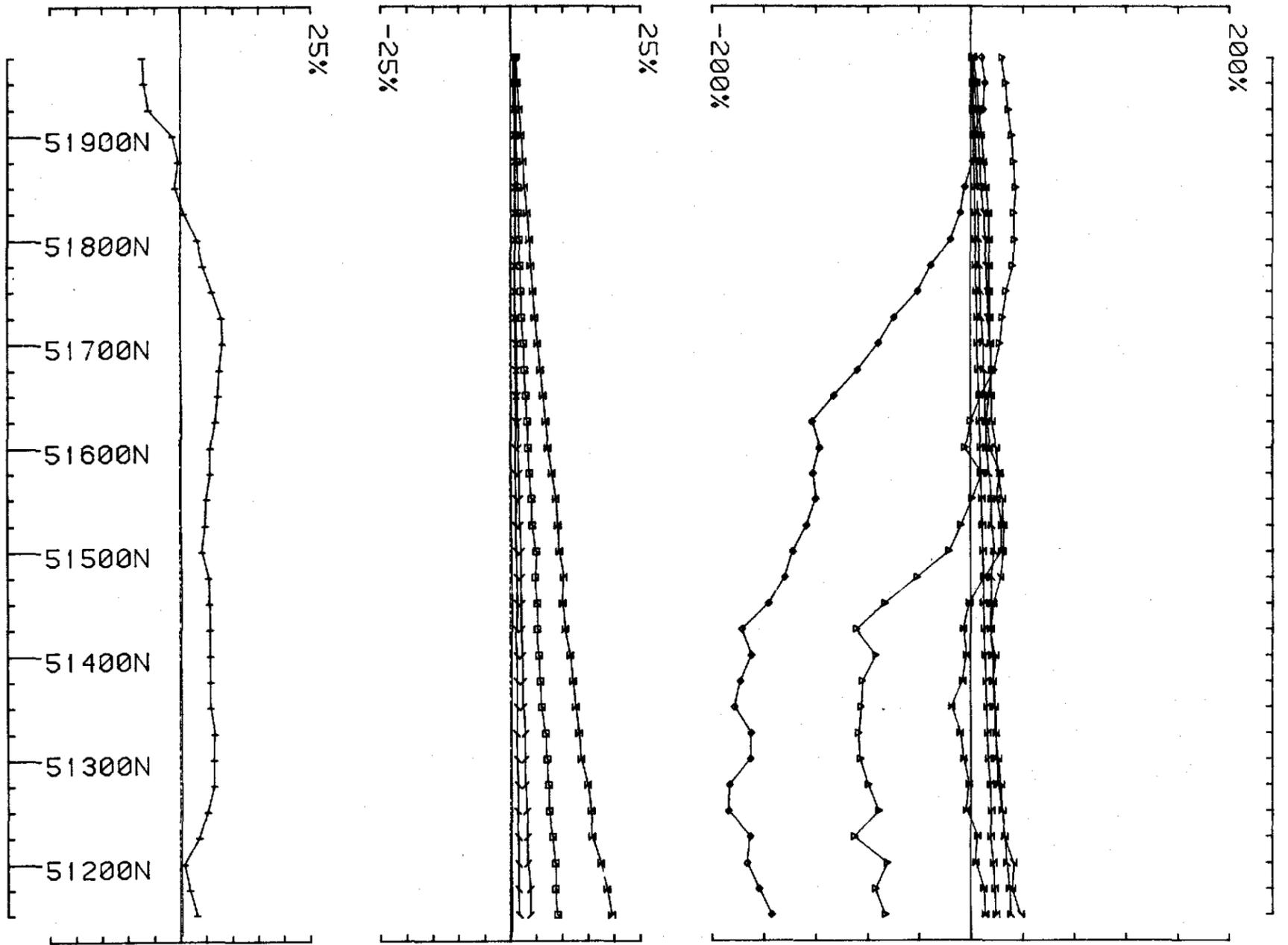
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 LINE 10600  
 Hz



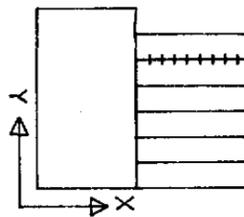
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 Line 10800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



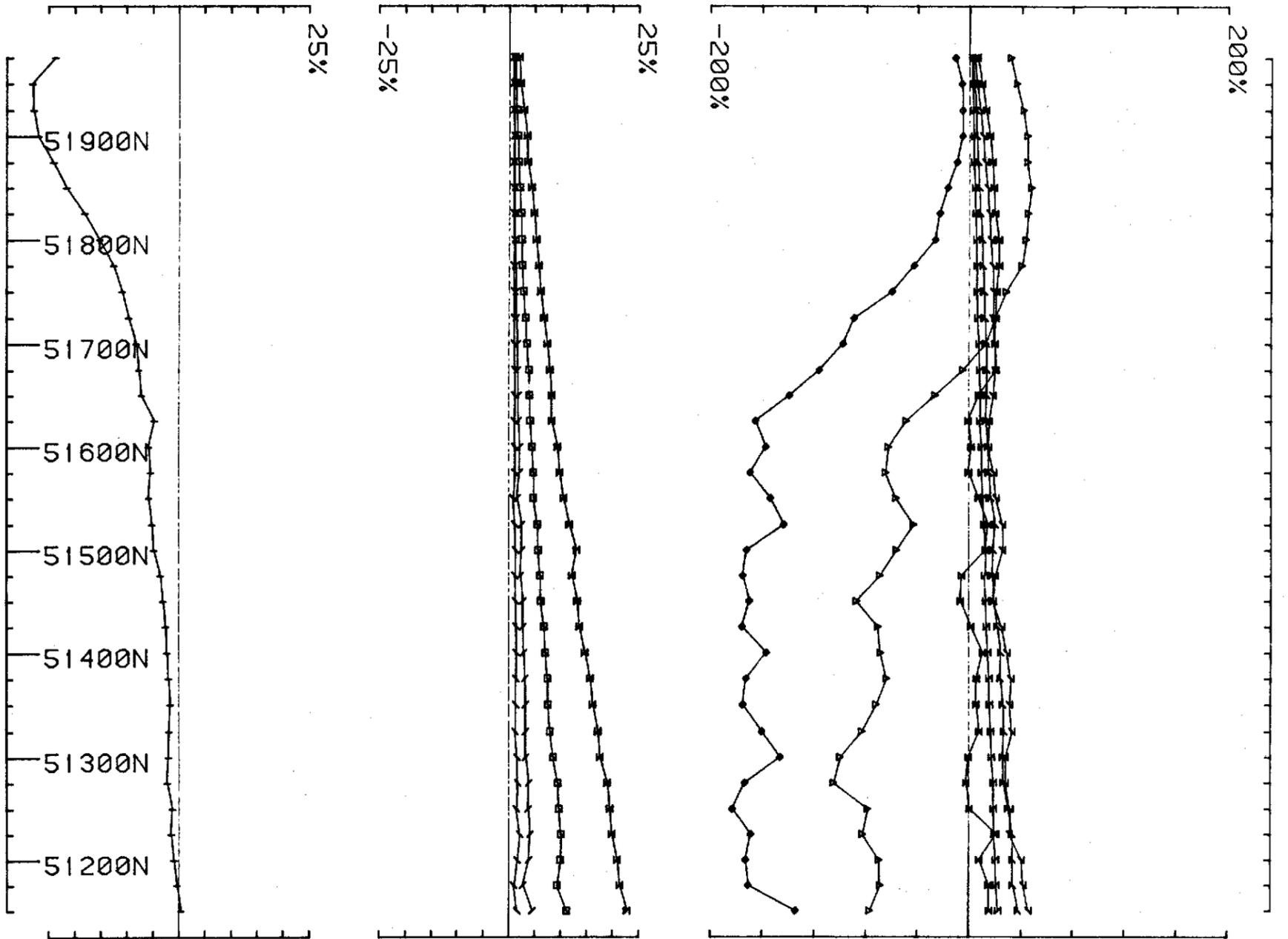
WINTERBROOK  
 LOOP 0002  
 LINE 10800 Hz



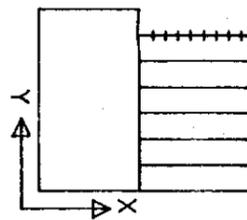
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 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



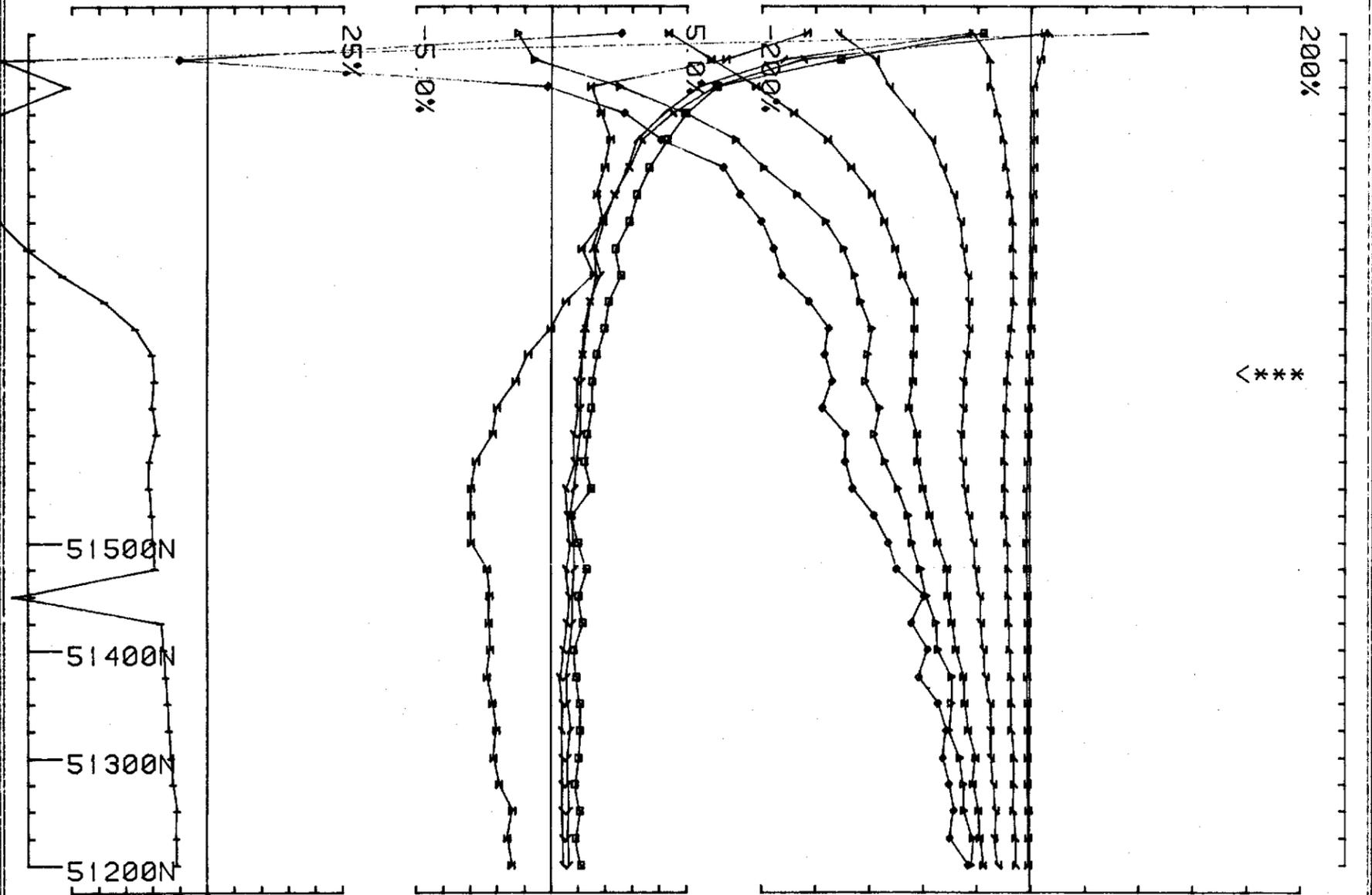
WINTERBROOK  
 LOOP 0002  
 LINE 11000  
 Hz



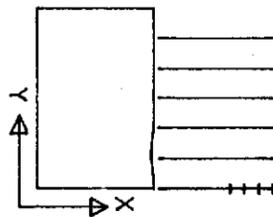
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM DA  
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 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



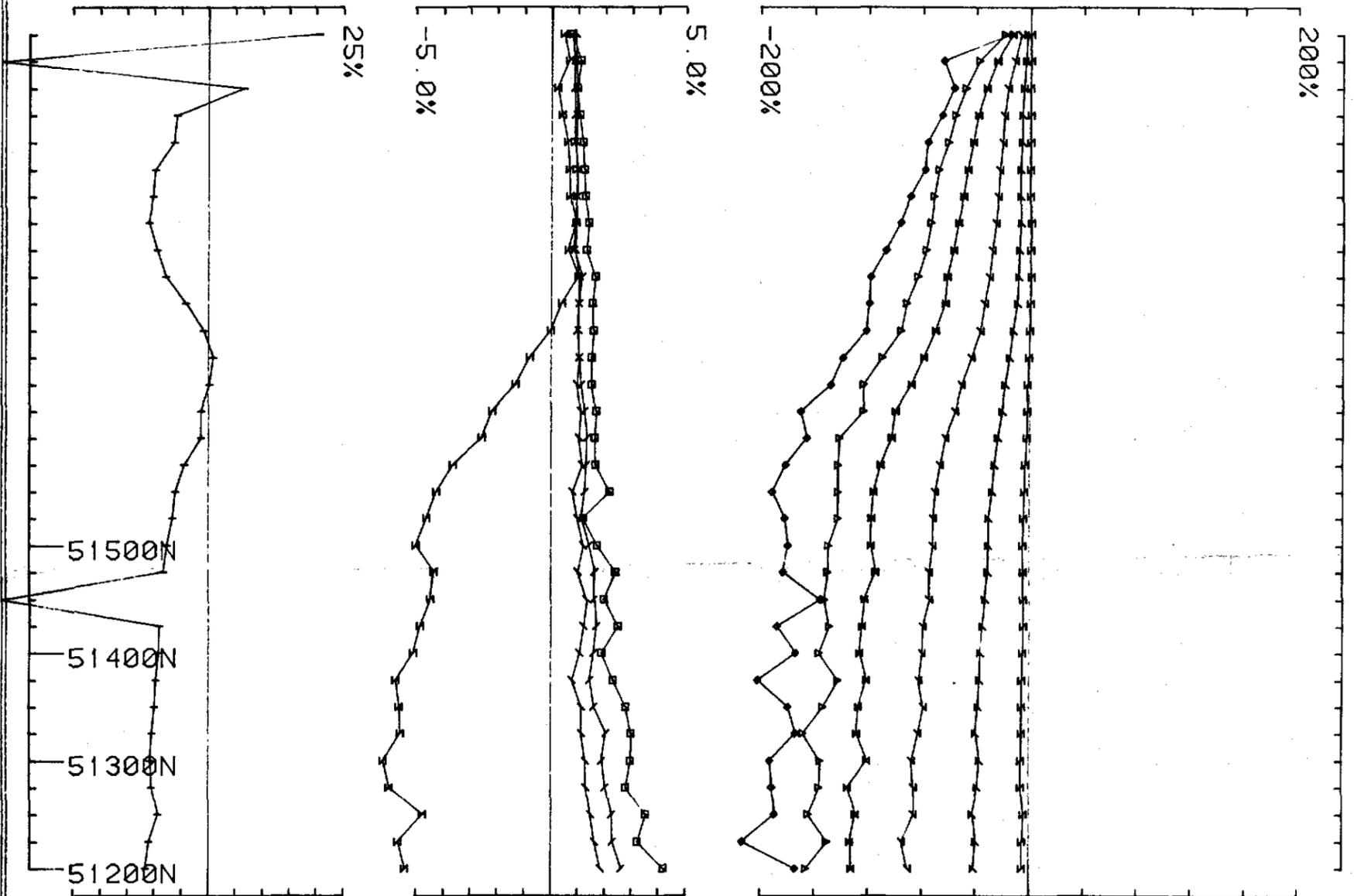
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 LINE 11200  
 Hz



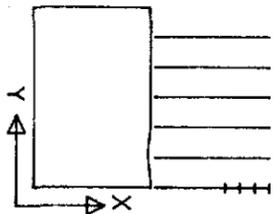
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 Line 11400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD POINT Ch 1 NORMALIZATION



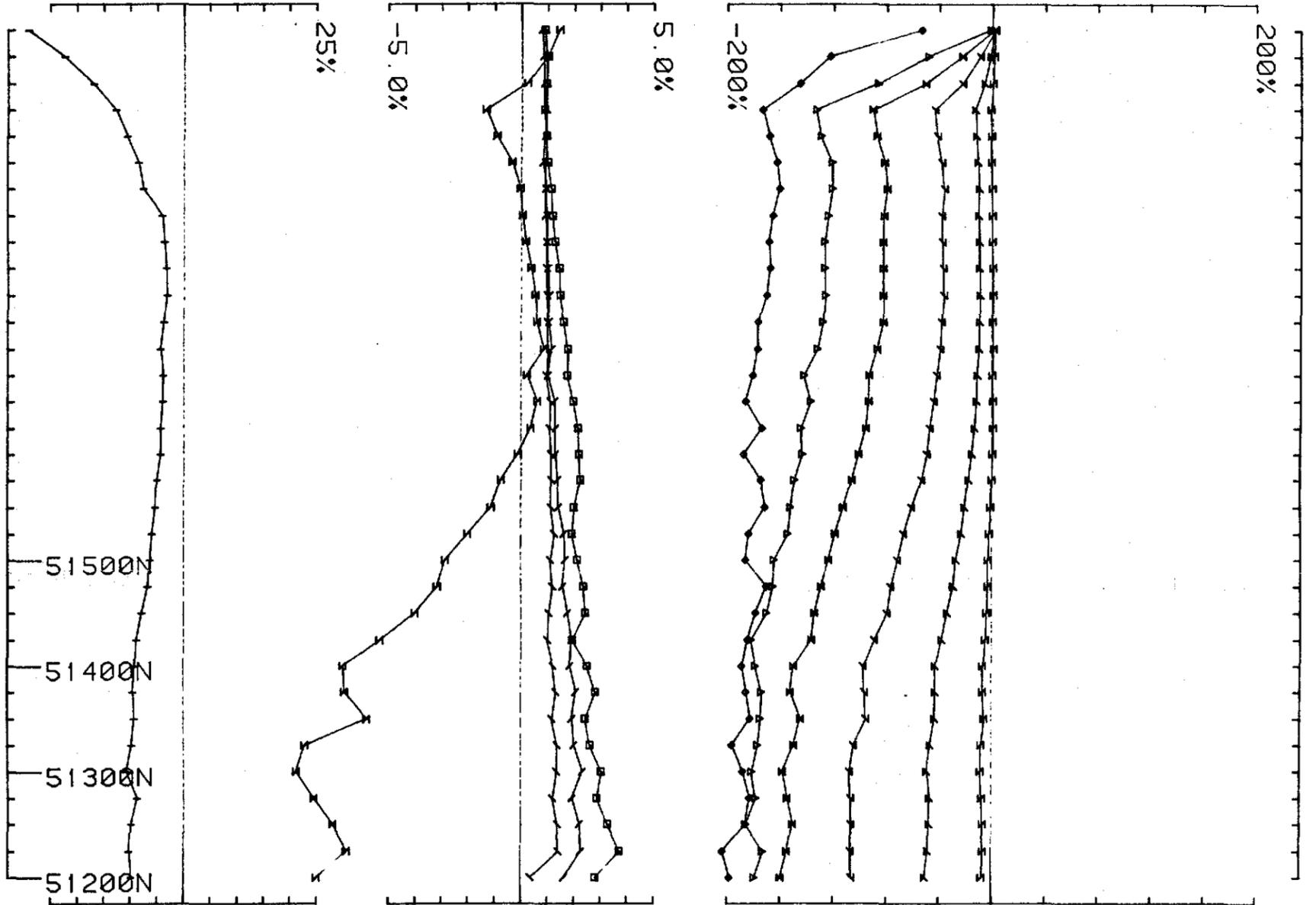
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 LINE 11400  
 Hz



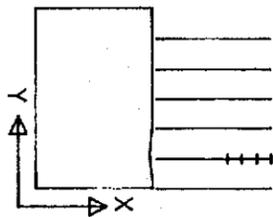
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 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



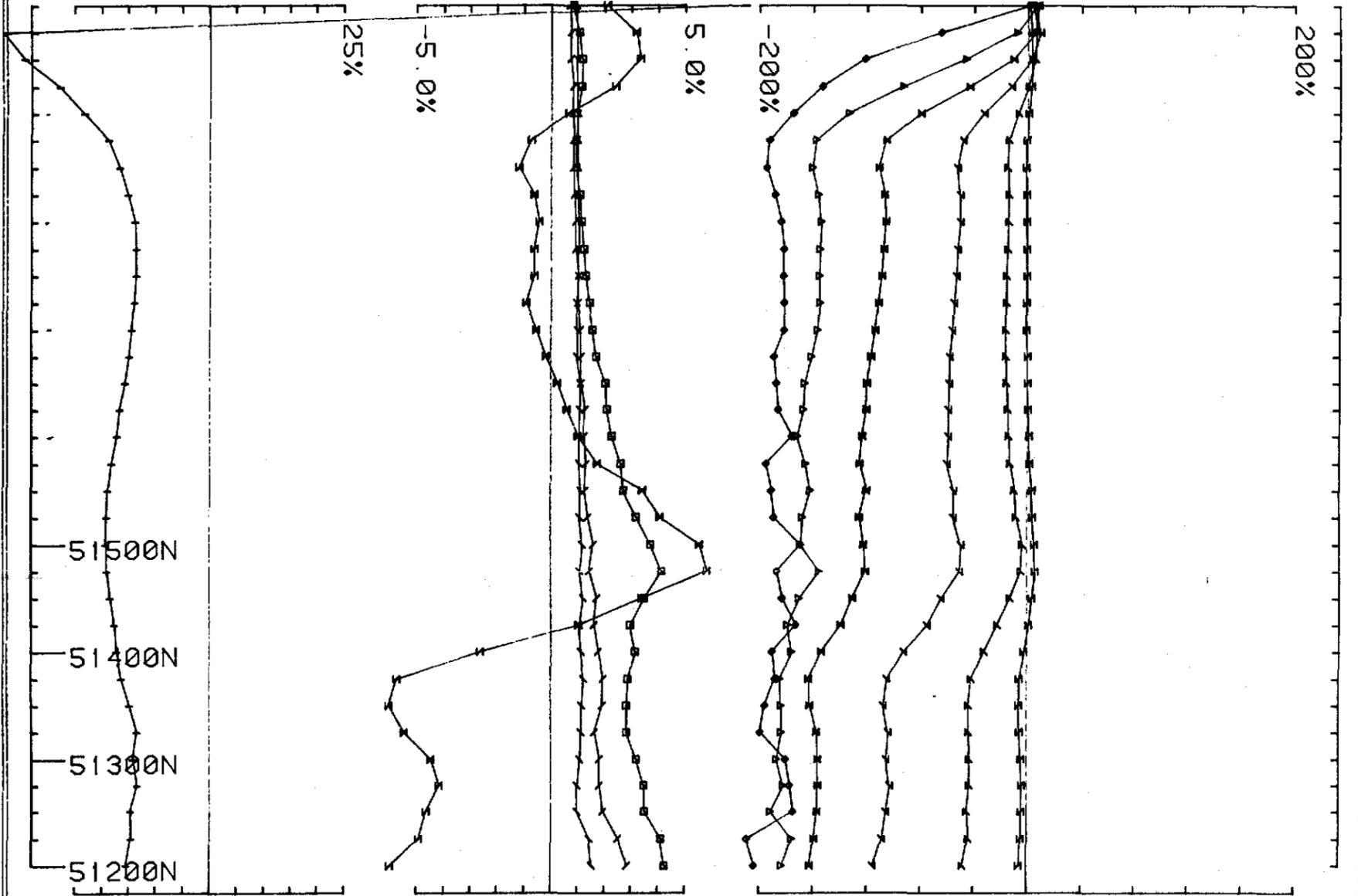
WINTERBROOK  
 LOOP 0003  
 LINE 11400  
 Hz



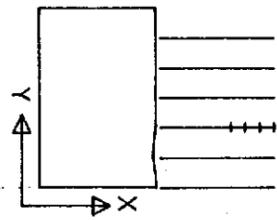
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 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



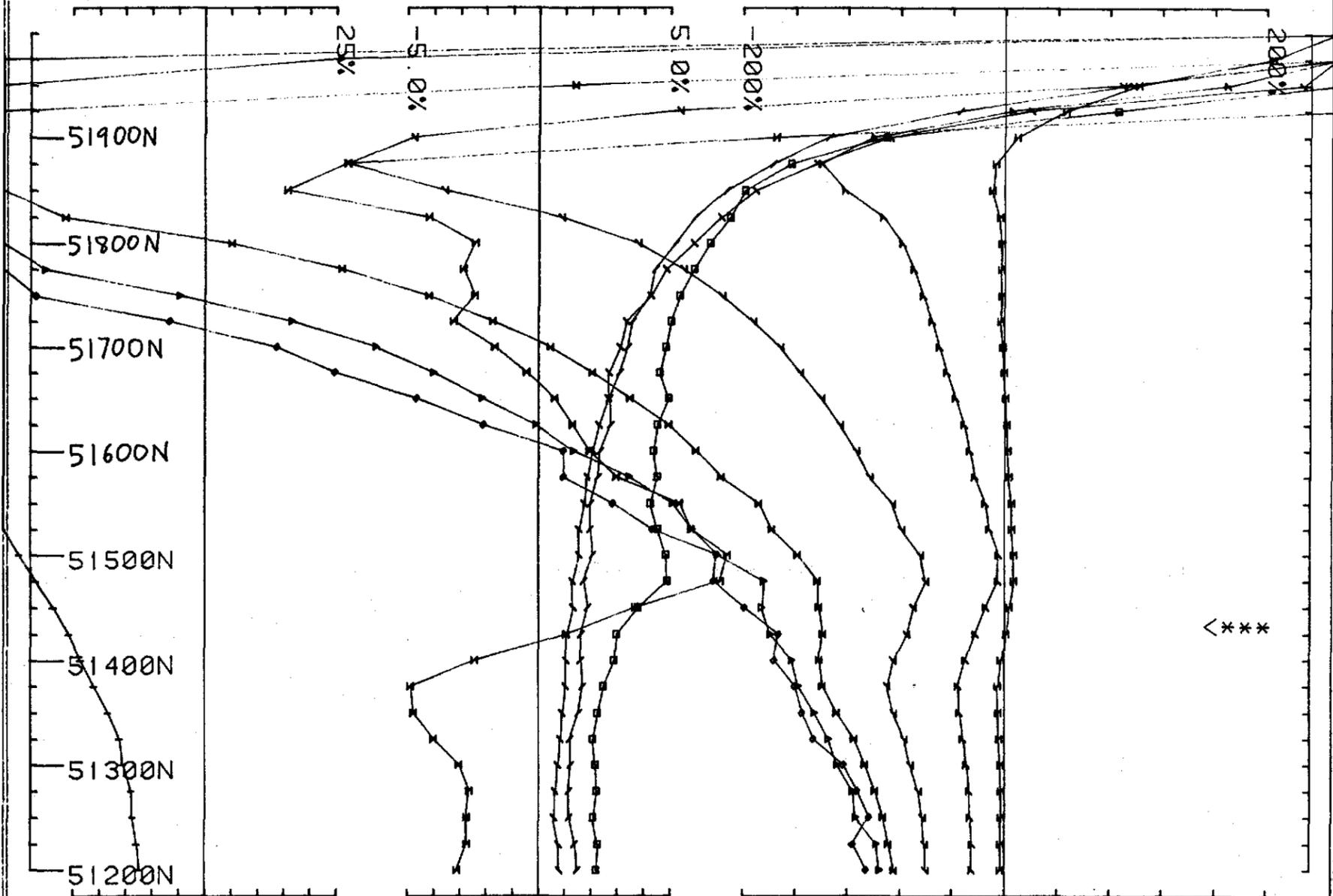
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 LOOP 0003  
 LINE 11600  
 Hz



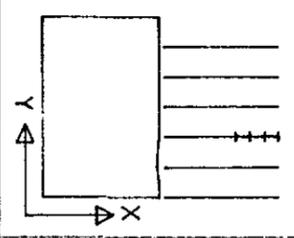
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 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



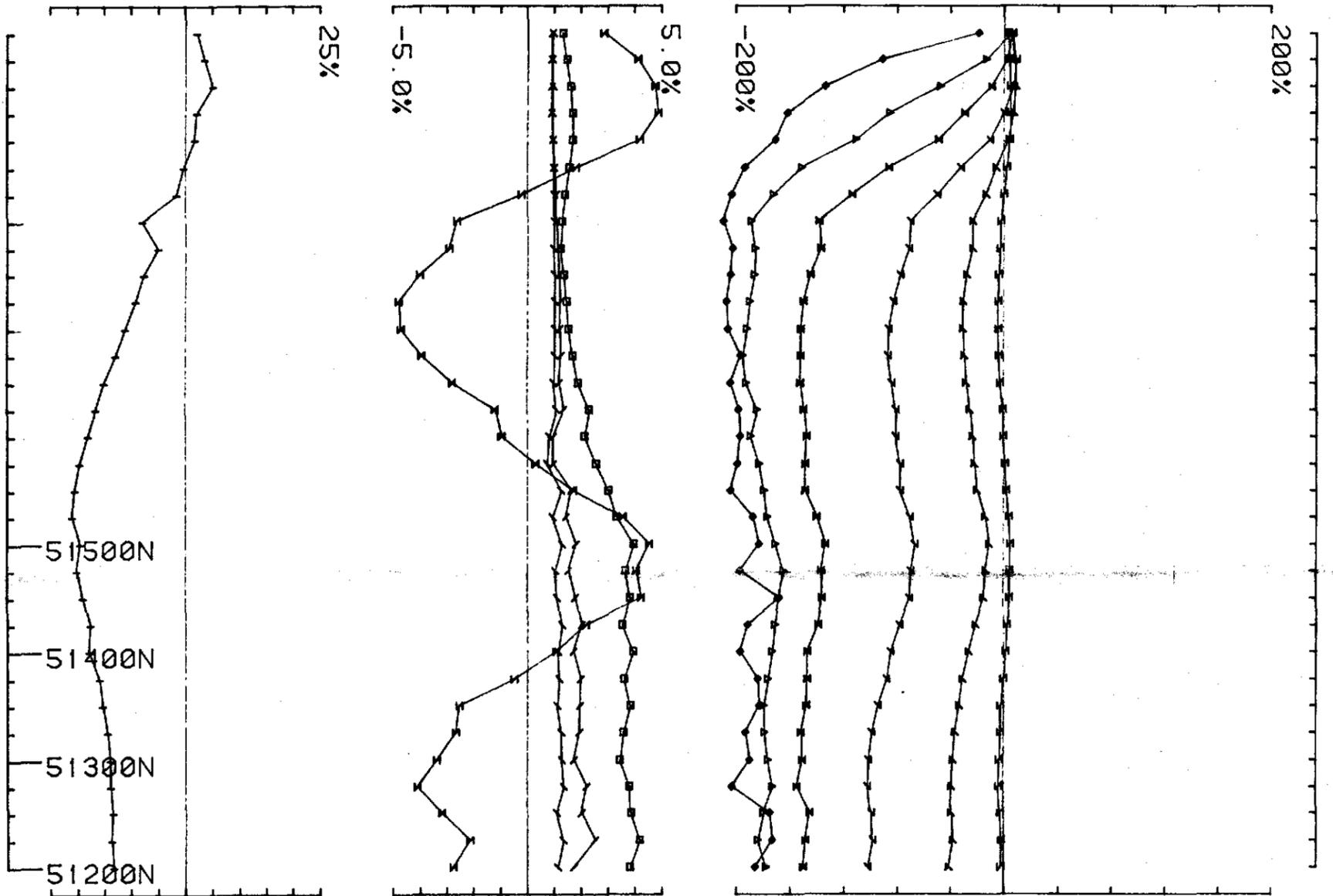
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 LINE 11800  
 Hz



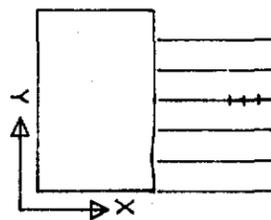
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 Line 11800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD POINT Ch 1 NORMALIZATION



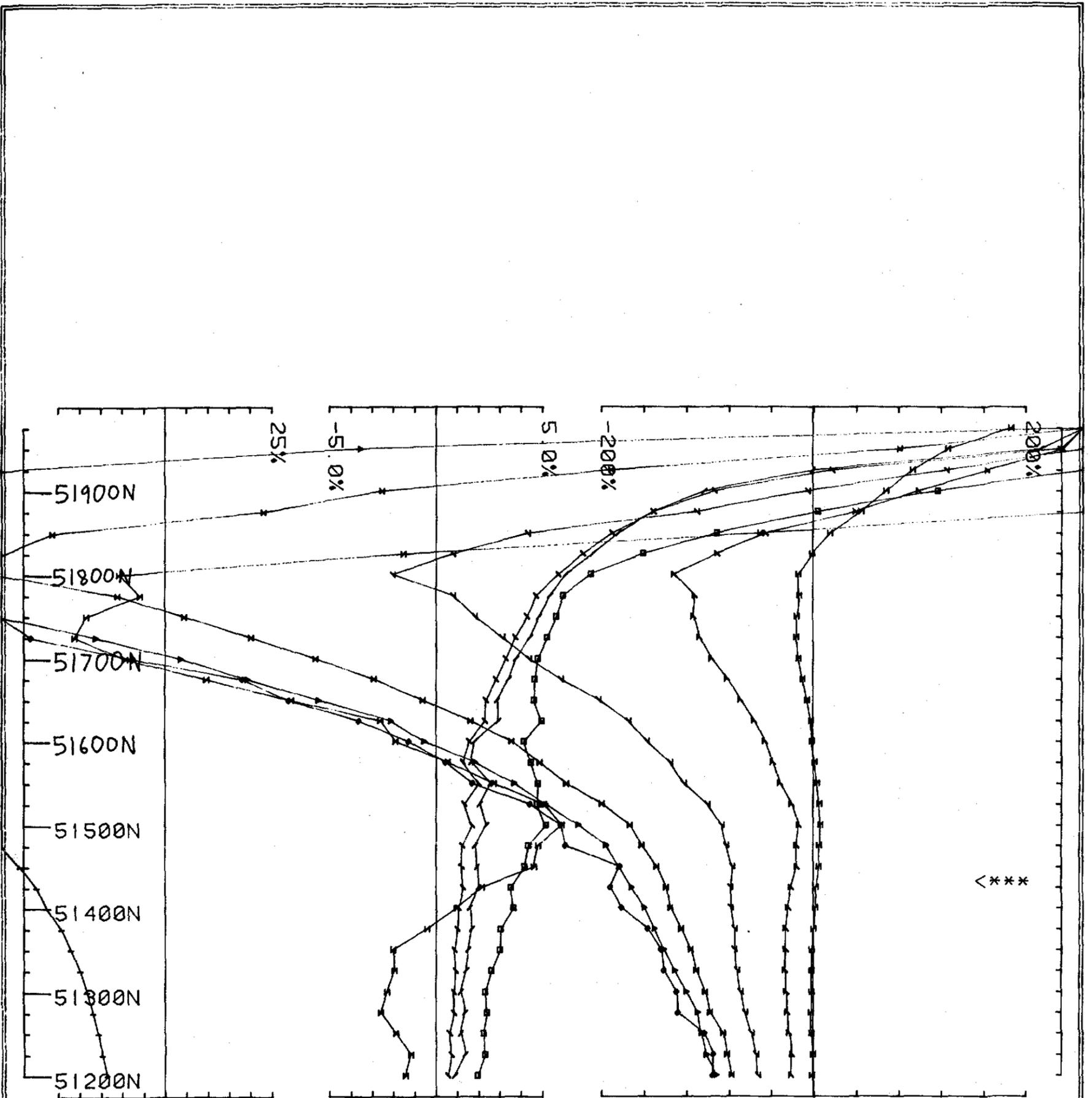
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 LOOP 0003  
 LINE 11800  
 Hz



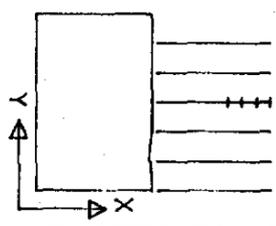
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW RMM BR  
 Line 12000E Hz COMPONENT BASE FREQ 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



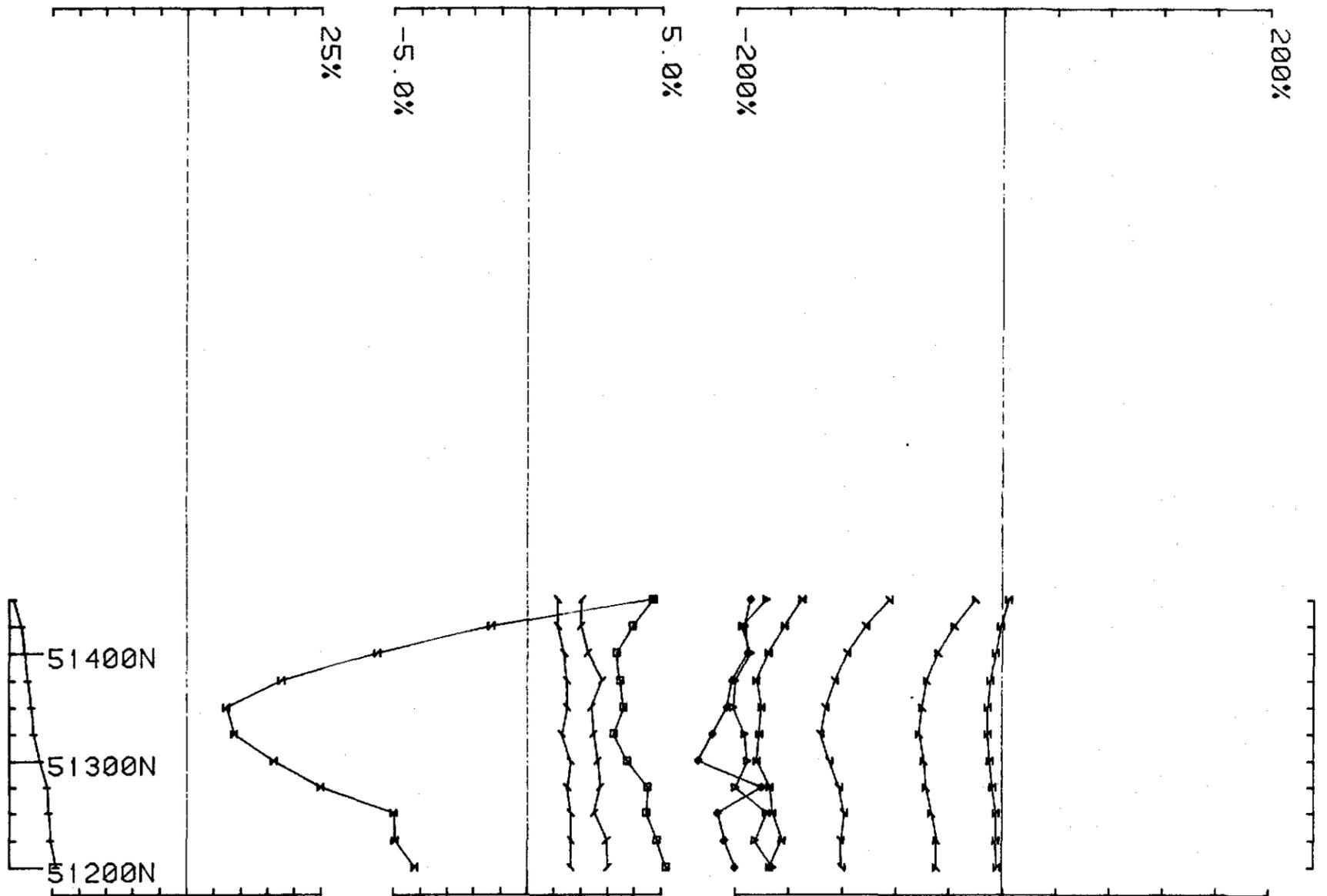
WINTERBROOK  
 LOOP 0003  
 LINE 12000  
 Hz



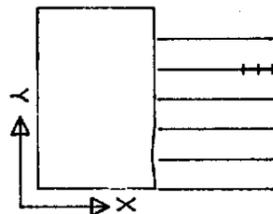
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BR  
 Line 12000E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD POINT Ch 1 NORMALIZATION



WINTERBROOK  
 LOOP 0003  
 LINE 12000  
 Hz

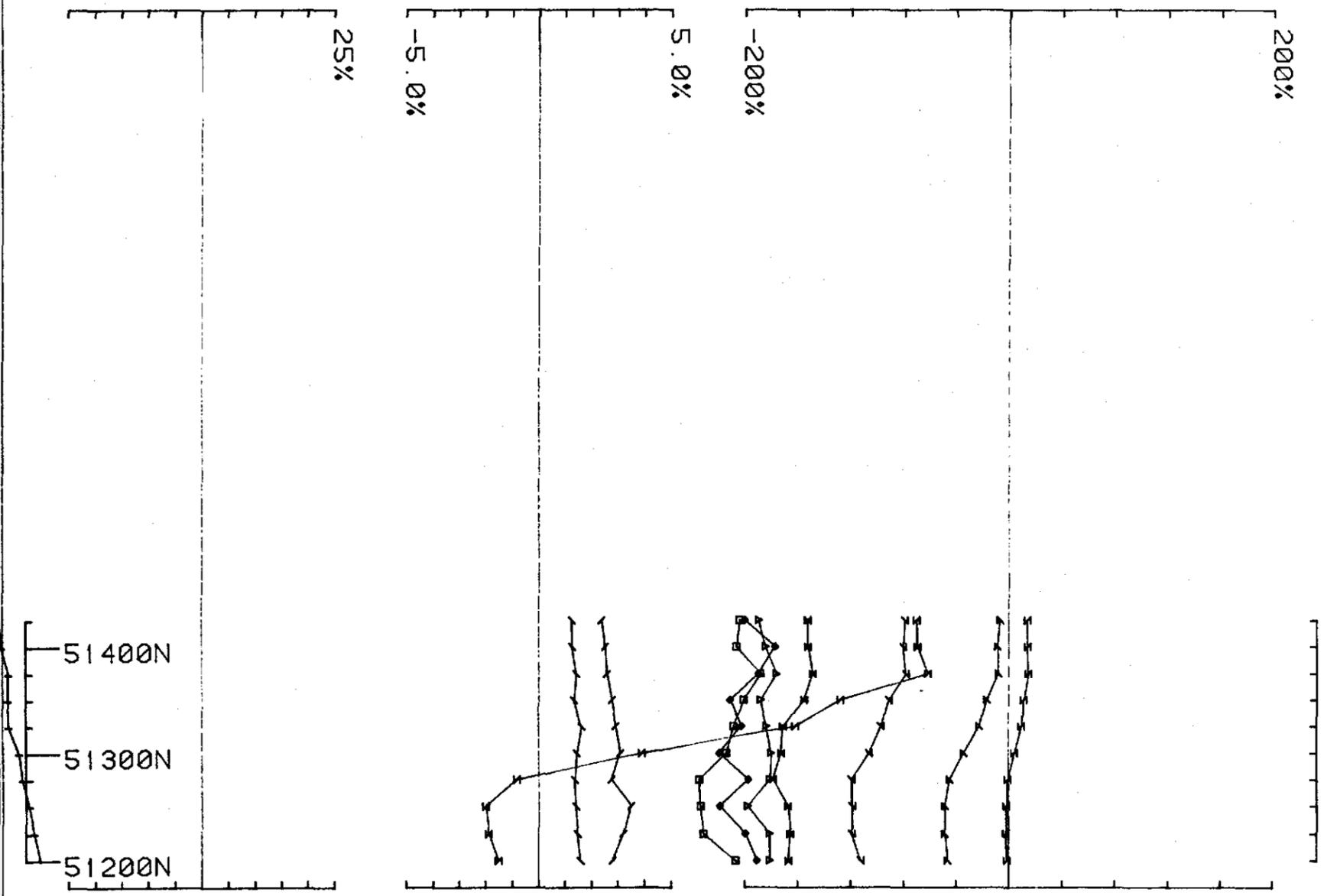


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
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 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

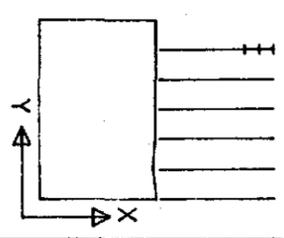


WINTERBROOK  
 LOOP 0003  
 LINE 12200  
 Hz

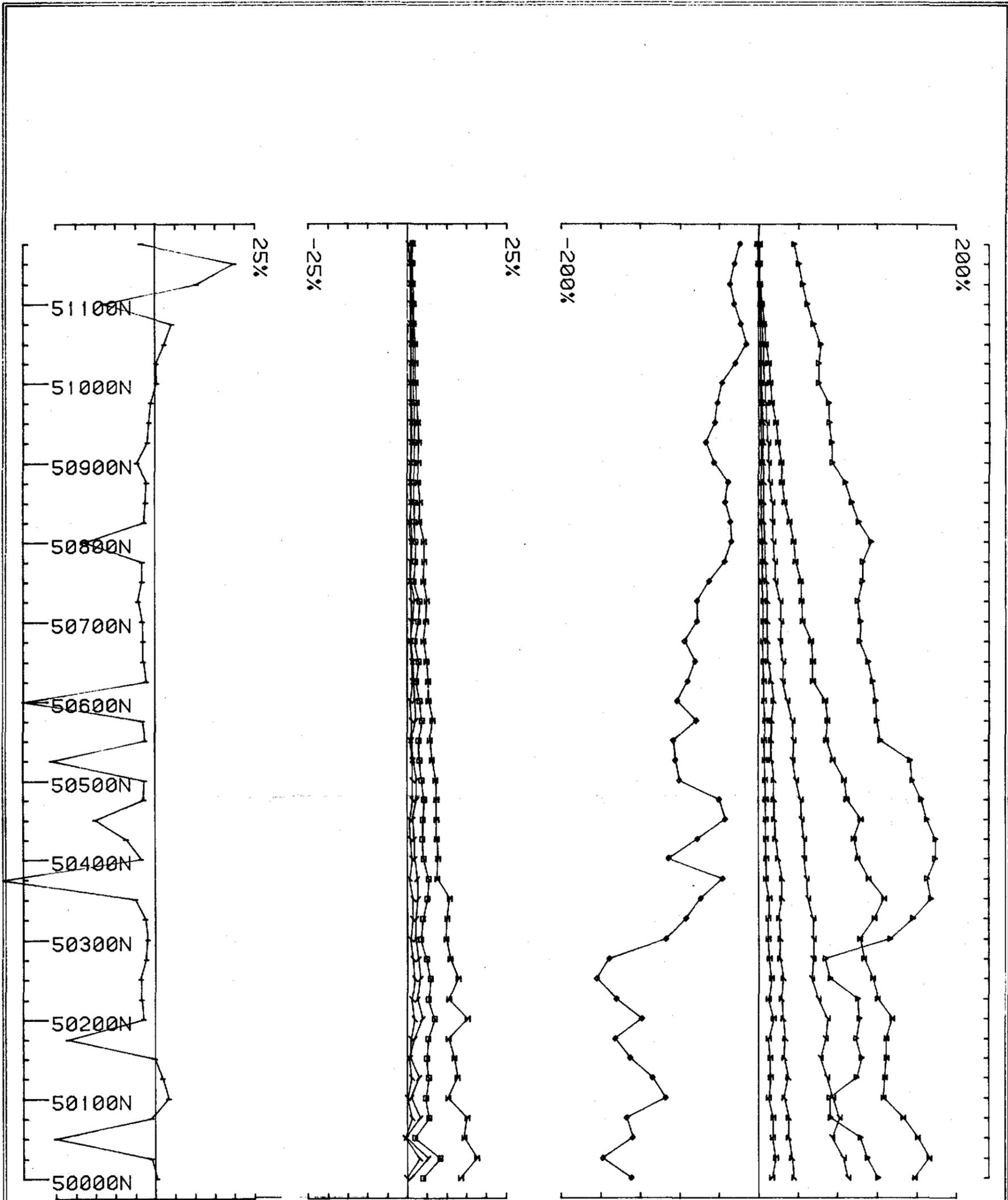
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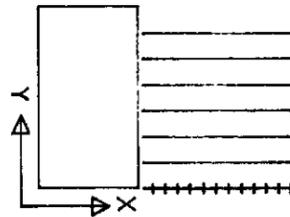
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BR  
 Line 12400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



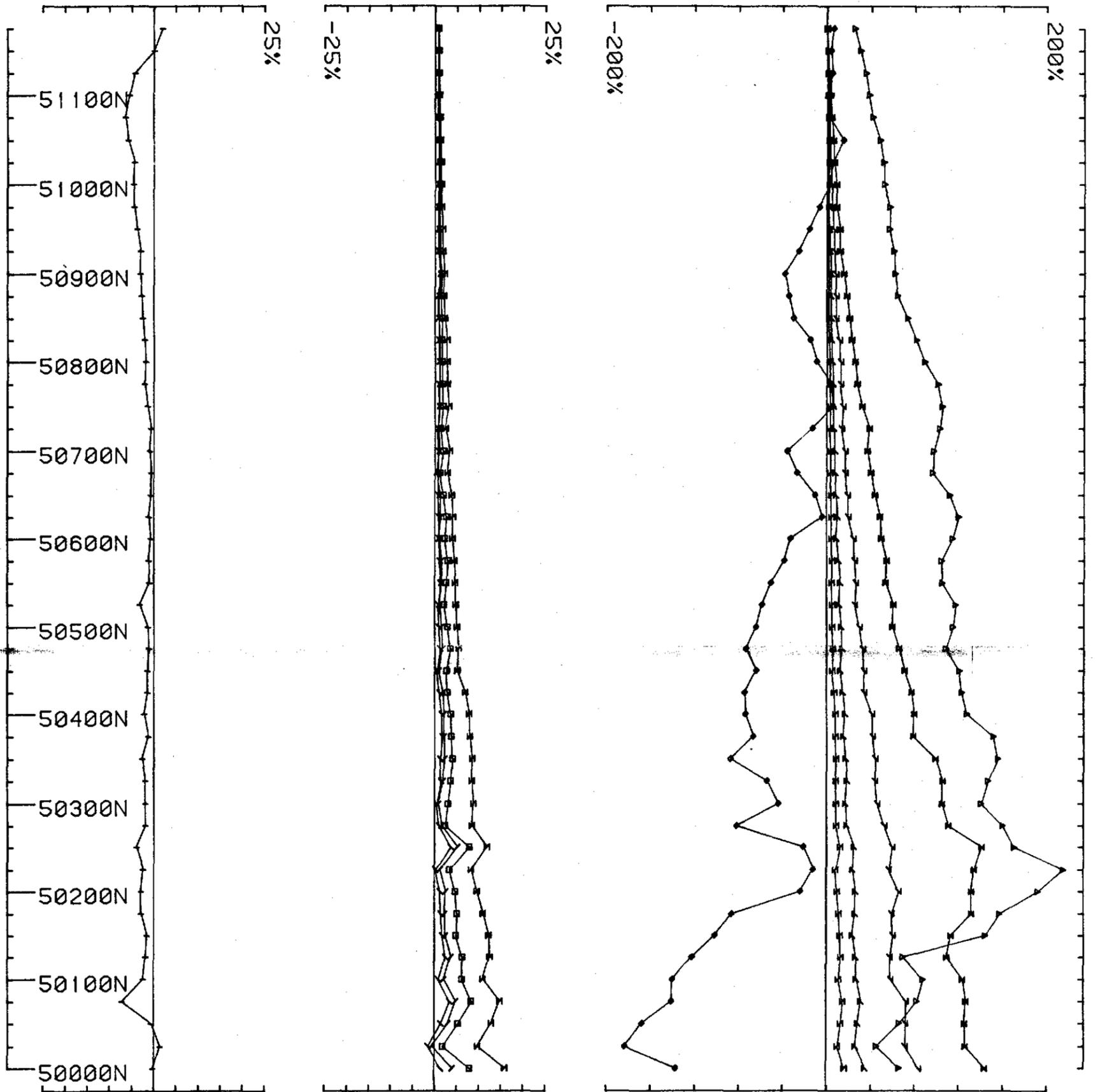
WINTERBROOK  
 LOOP 0003  
 LINE 12400  
 Hz



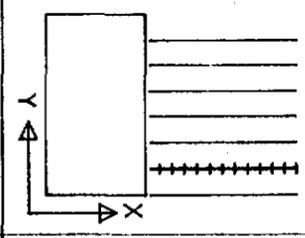
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 8600E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS CH 1 NORMALIZATION



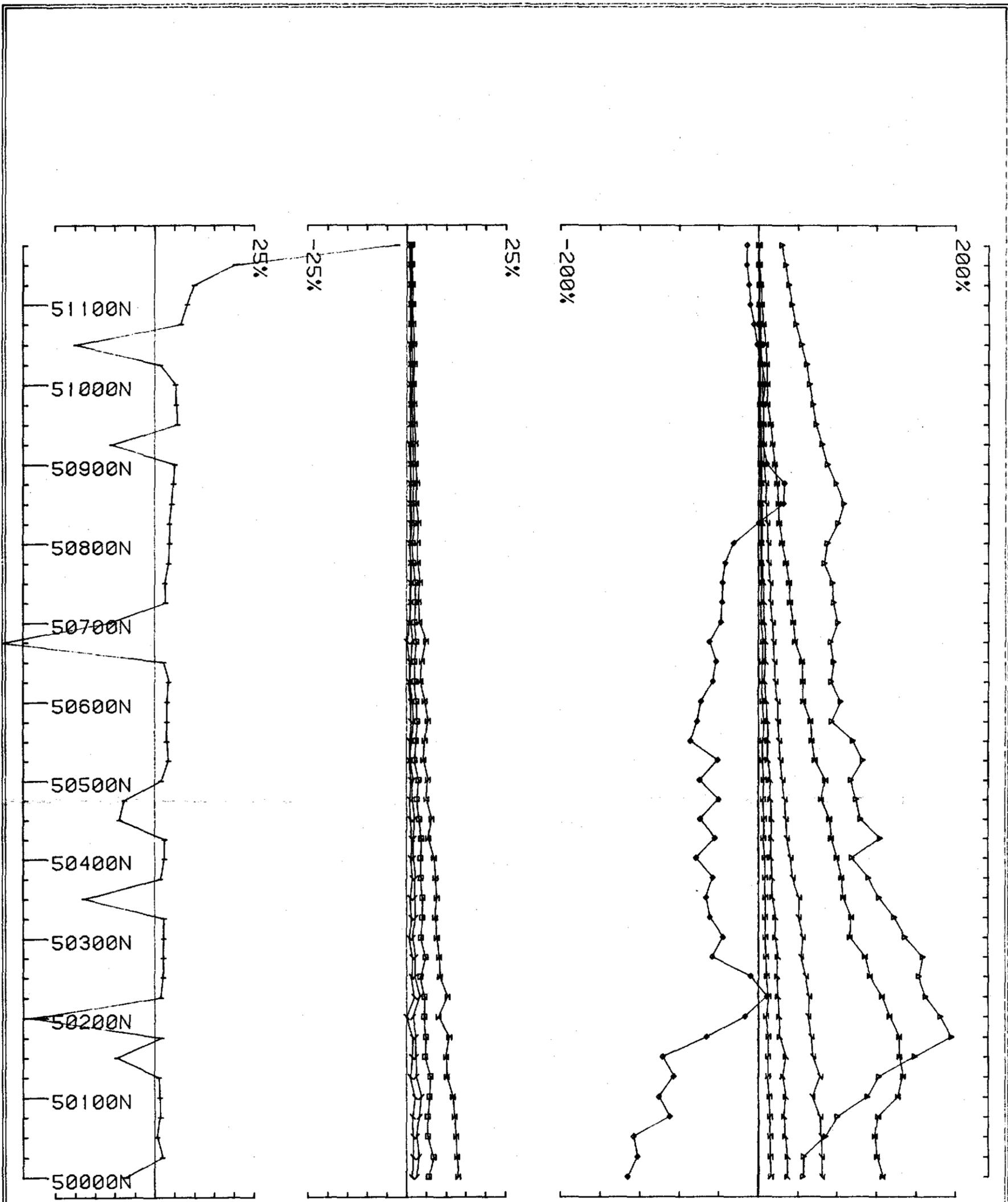
WINTERBROOK  
 LOOP 0004  
 LINE 8600  
 Hz



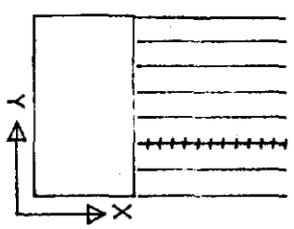
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 8800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



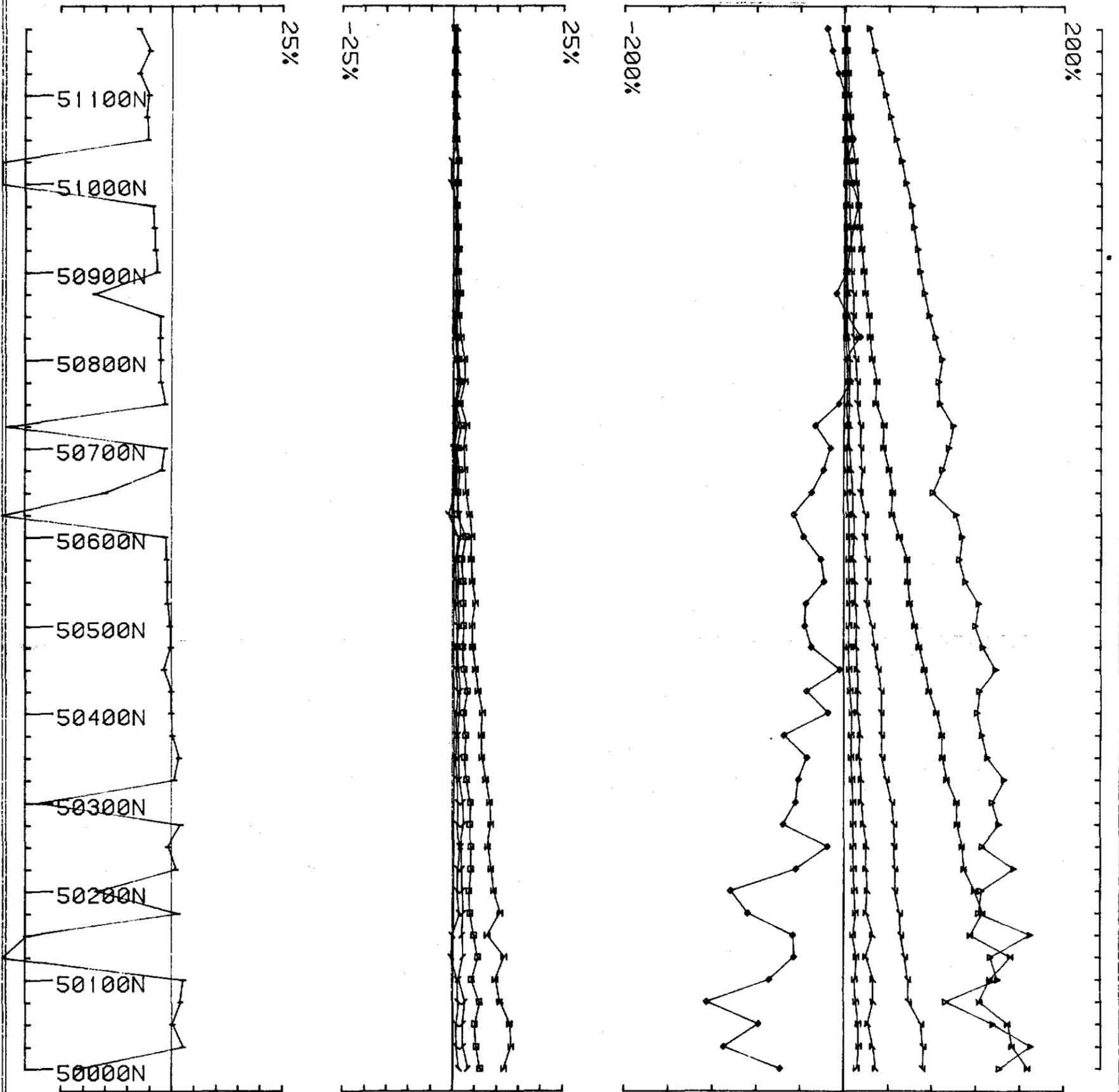
WINTERBROOK  
 LOOP 0004  
 LINE 8800  
 Hz



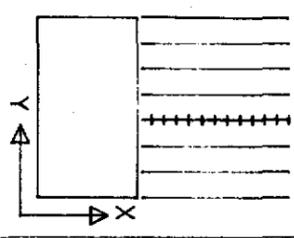
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 9000E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS ch 1 NORMALIZATION



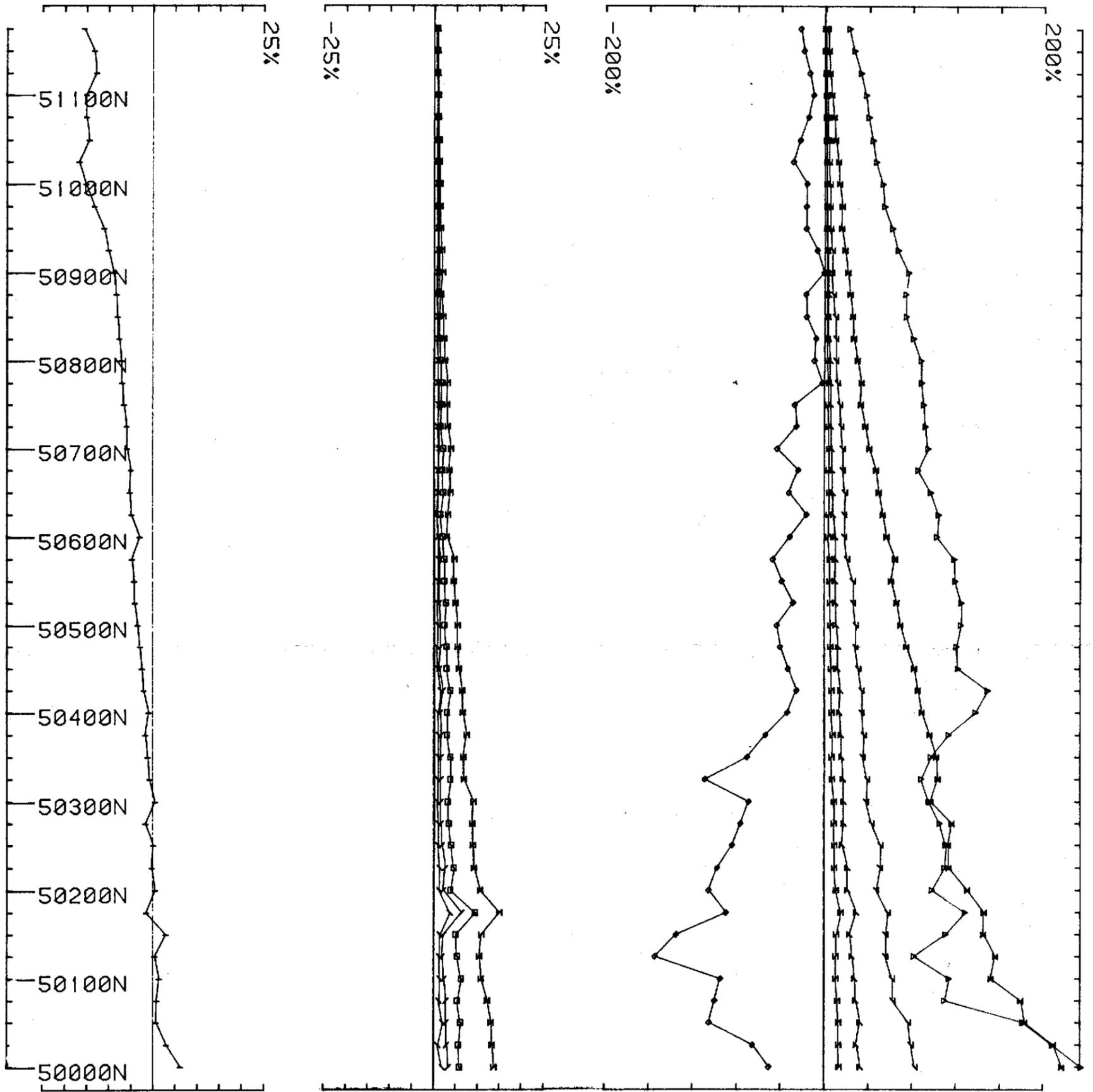
WINTERBROOK  
 LOOP 0004  
 LINE 9000  
 Hz



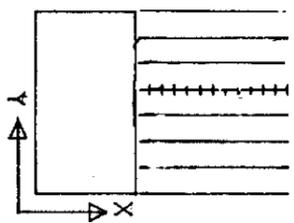
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 9200E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



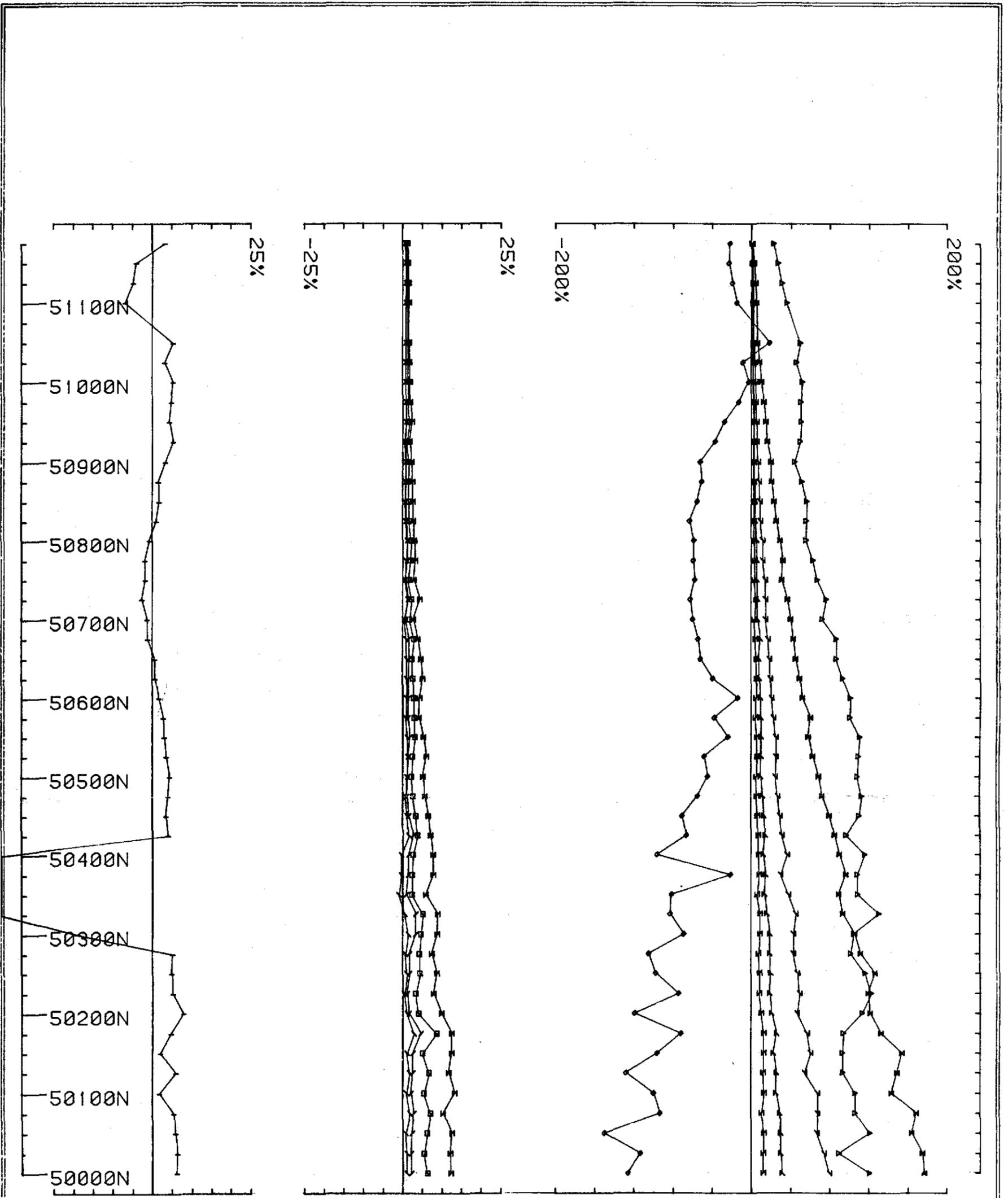
WINTERBROOK  
 LOOP 0004  
 LINE 9200  
 Hz



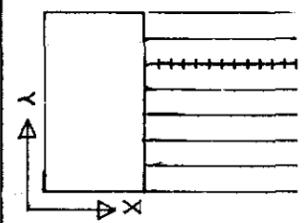
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 9400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



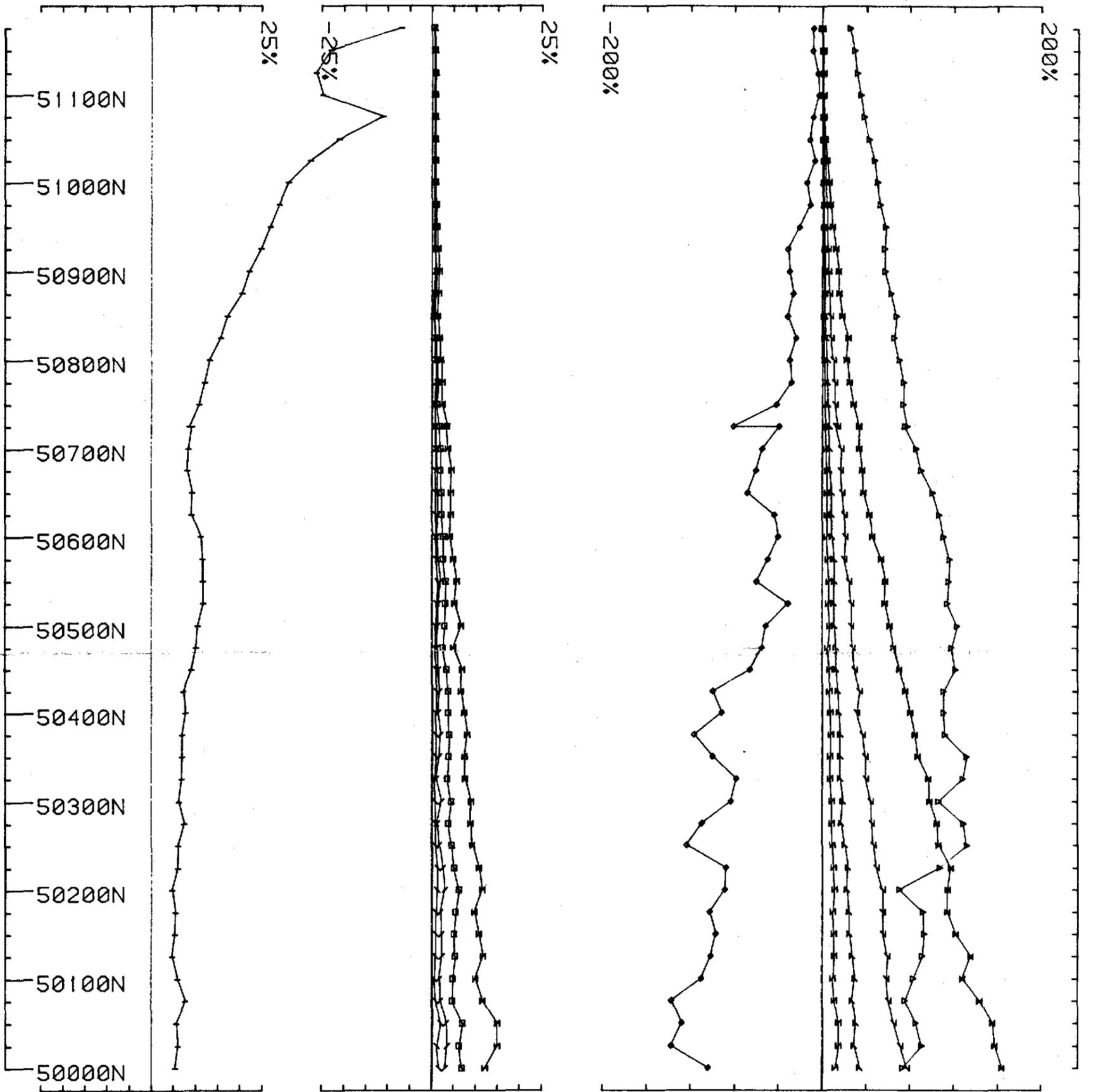
WINTERBROOK  
 LOOP 0004  
 LINE 9400  
 Hz



LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A EXPLORATION CREW - P.M.M ML  
 Line 9600E Hz COMPONENT BASE FREQ - 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

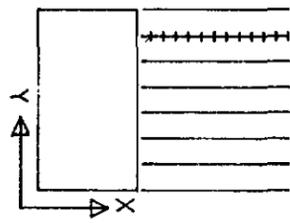


WINTERBROOK  
 LOOP 0004  
 LINE 9600  
 Hz

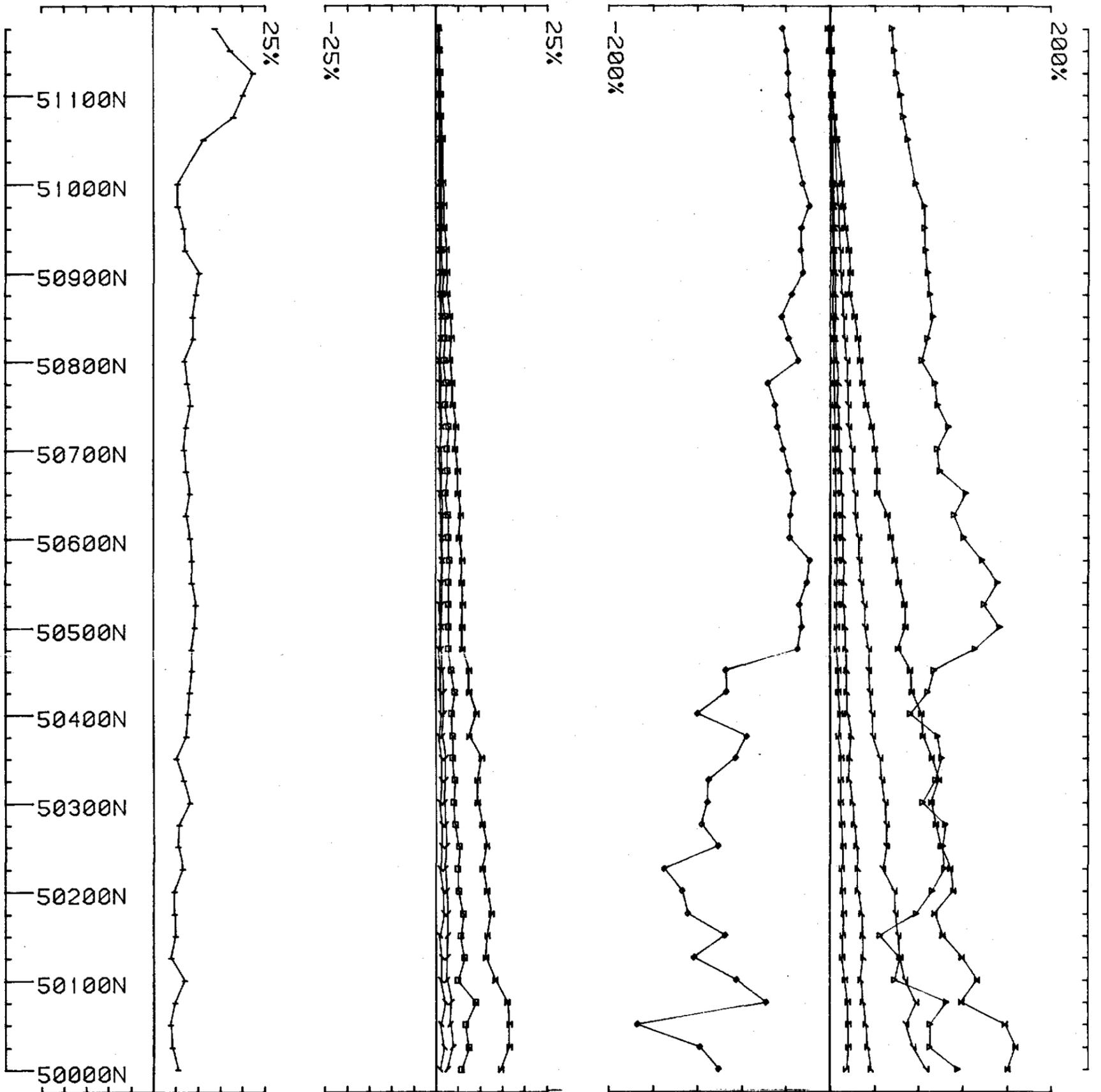


110 PAGES  
 110 NEW PAGES

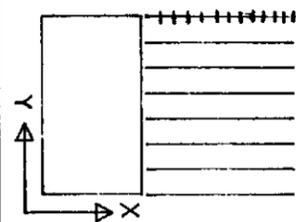
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 9800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



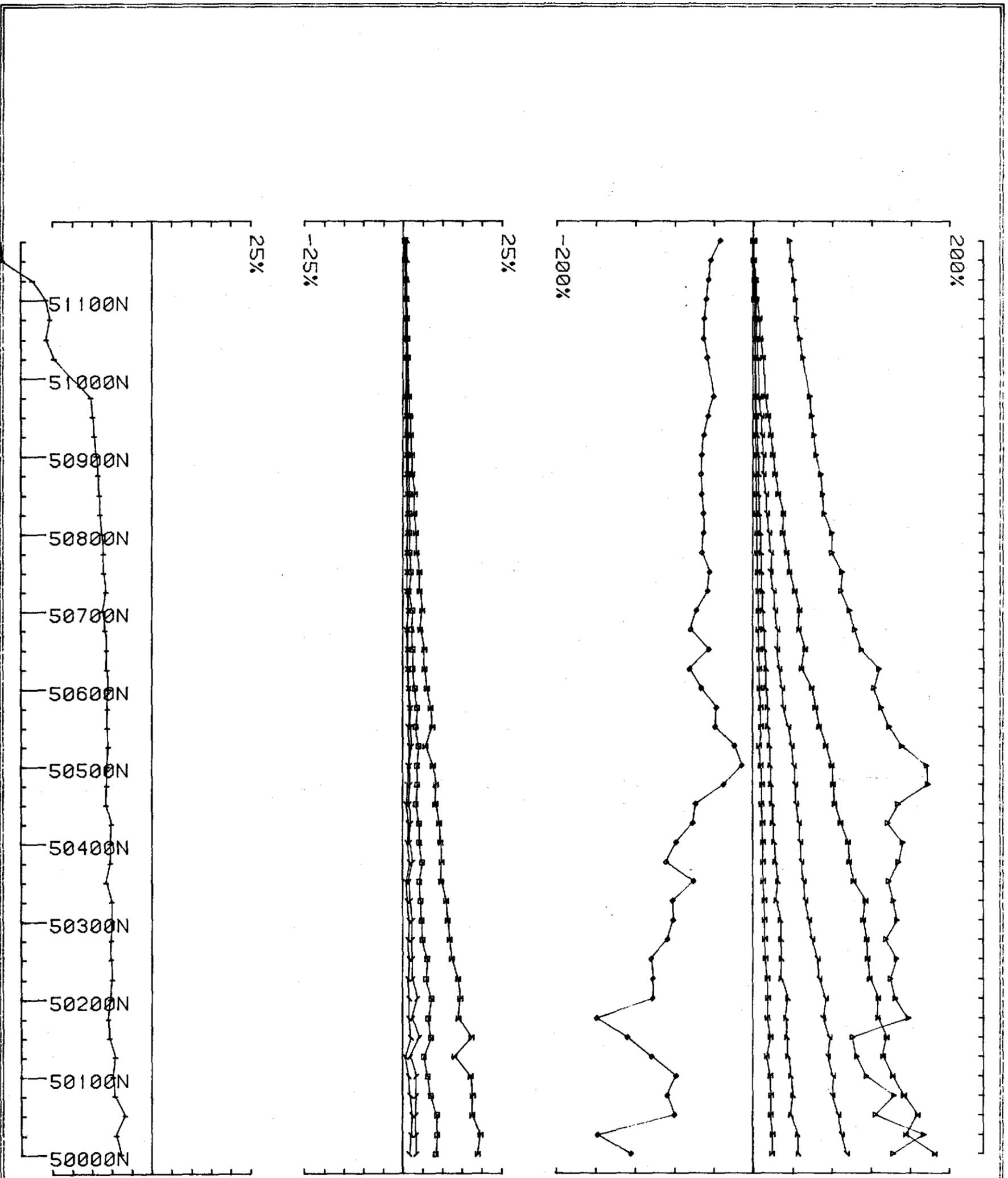
WINTERBROOK  
 LOOP 0004  
 LINE 9800  
 Hz



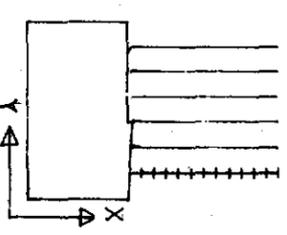
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line ~~5000~~<sup>10000</sup> E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



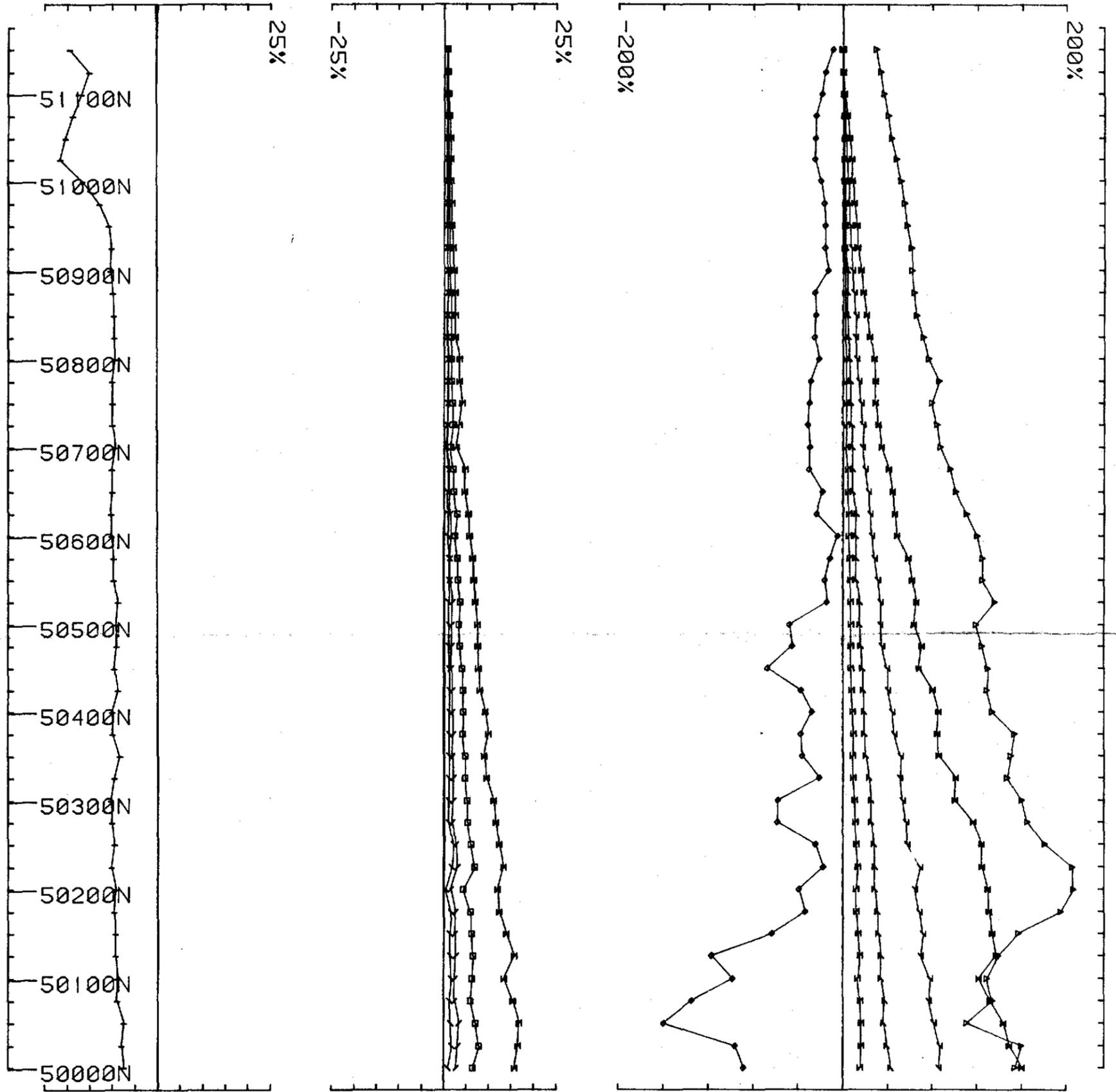
WINTERBROOK  
 LOOP 0004  
 LINE 10020  
 Hz



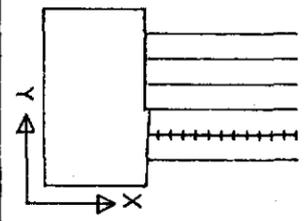
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BR  
 Line 10200E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



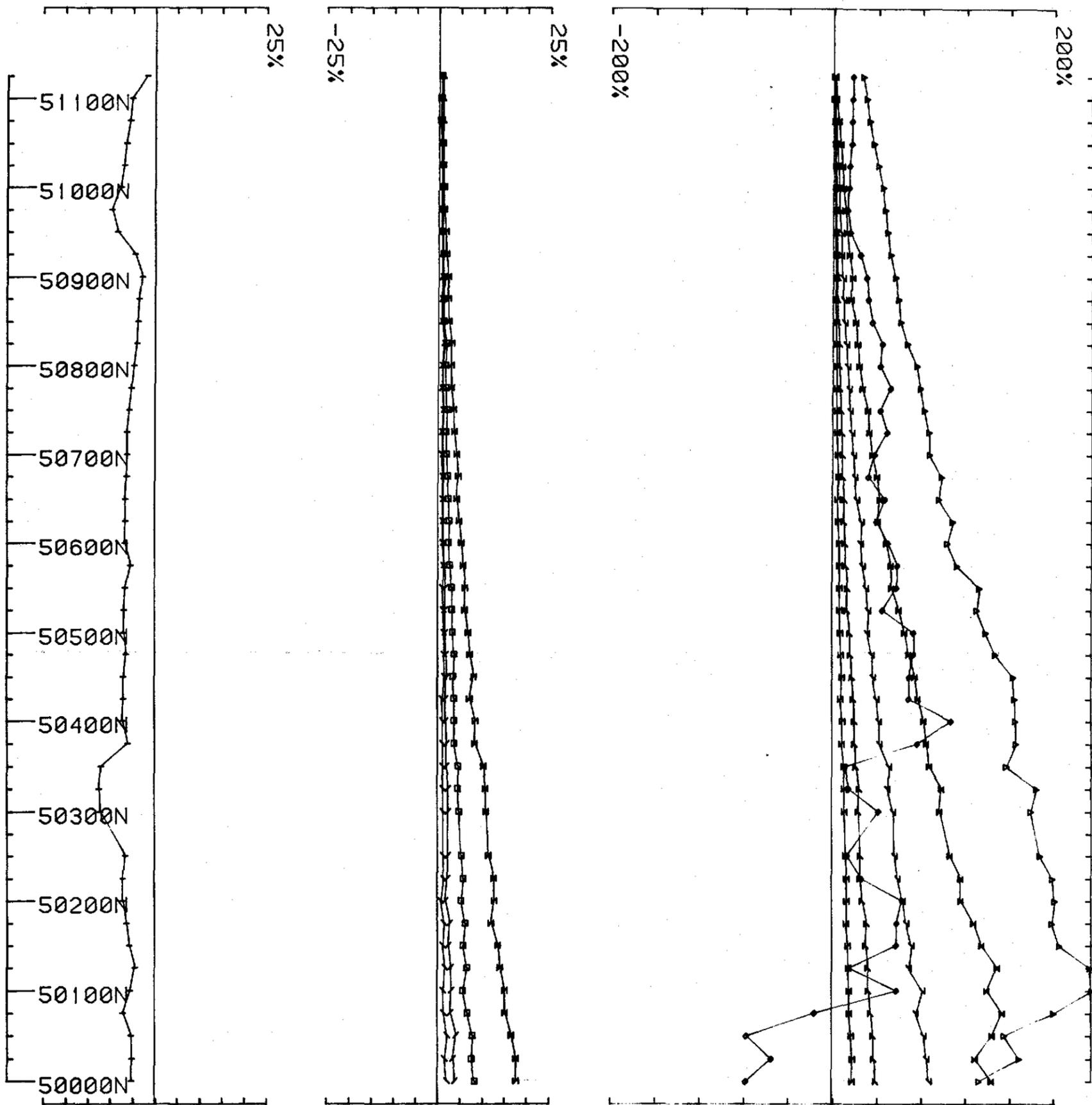
WINTERBROOK  
 LOOP 0005  
 LINE 10200  
 Hz



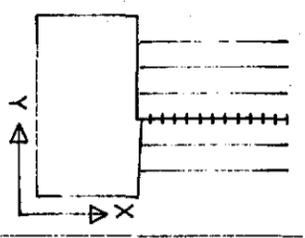
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BR  
 Line 10400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



WINTERBROOK  
 LOOP 0005  
 LINE 10400  
 Hz

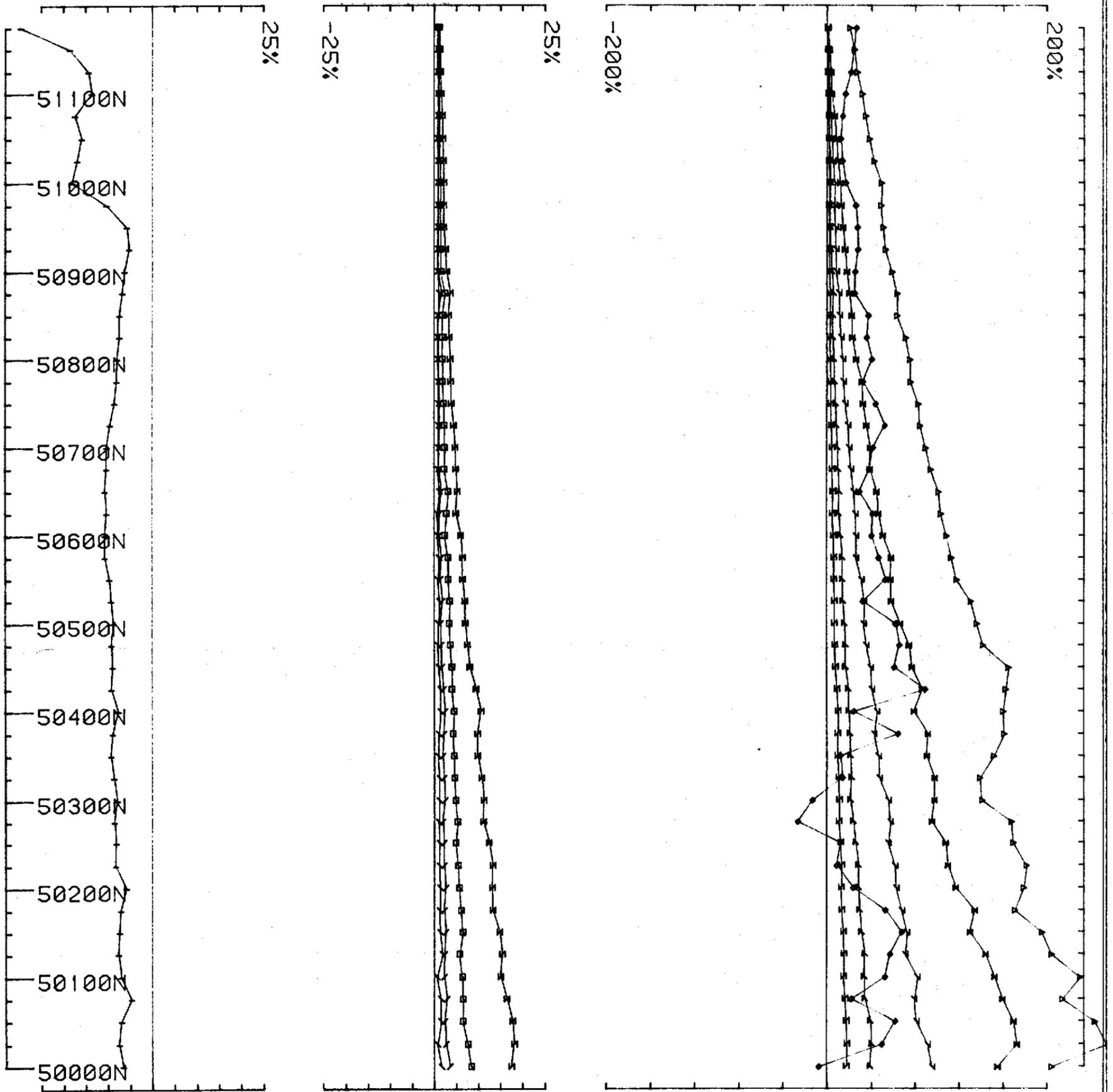


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BR  
 Line 10600E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

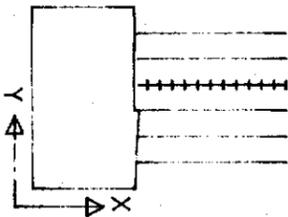


WINTERBROOK  
 LOOP 0005  
 LINE 10600  
 Hz

TASH  
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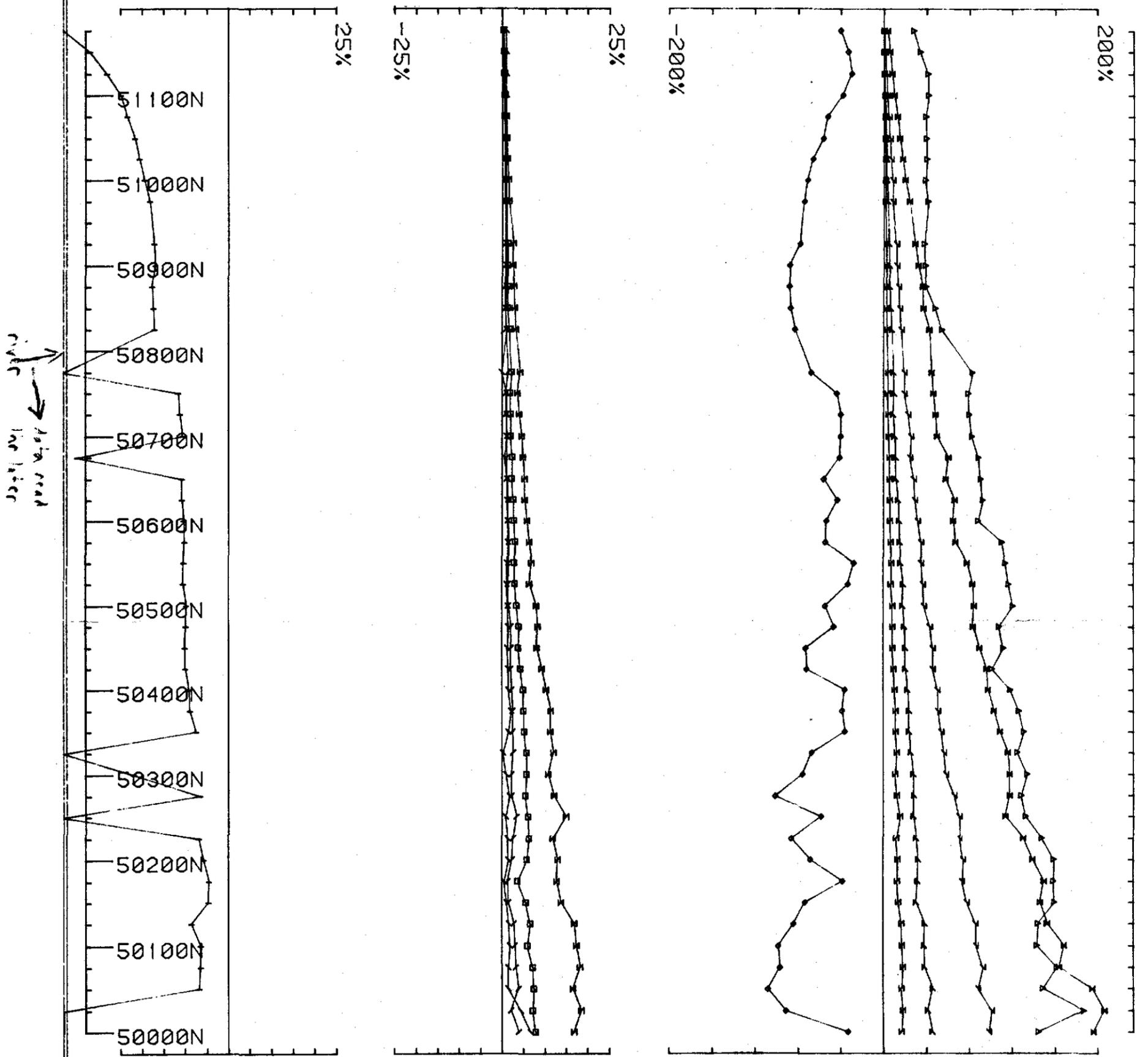


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BR  
 Line 10800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

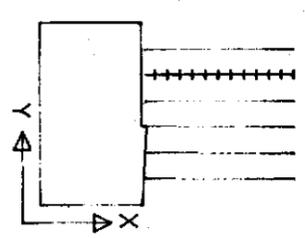


WINTERBROOK  
 LOOP 0005  
 LINE 10800  
 Hz

025105

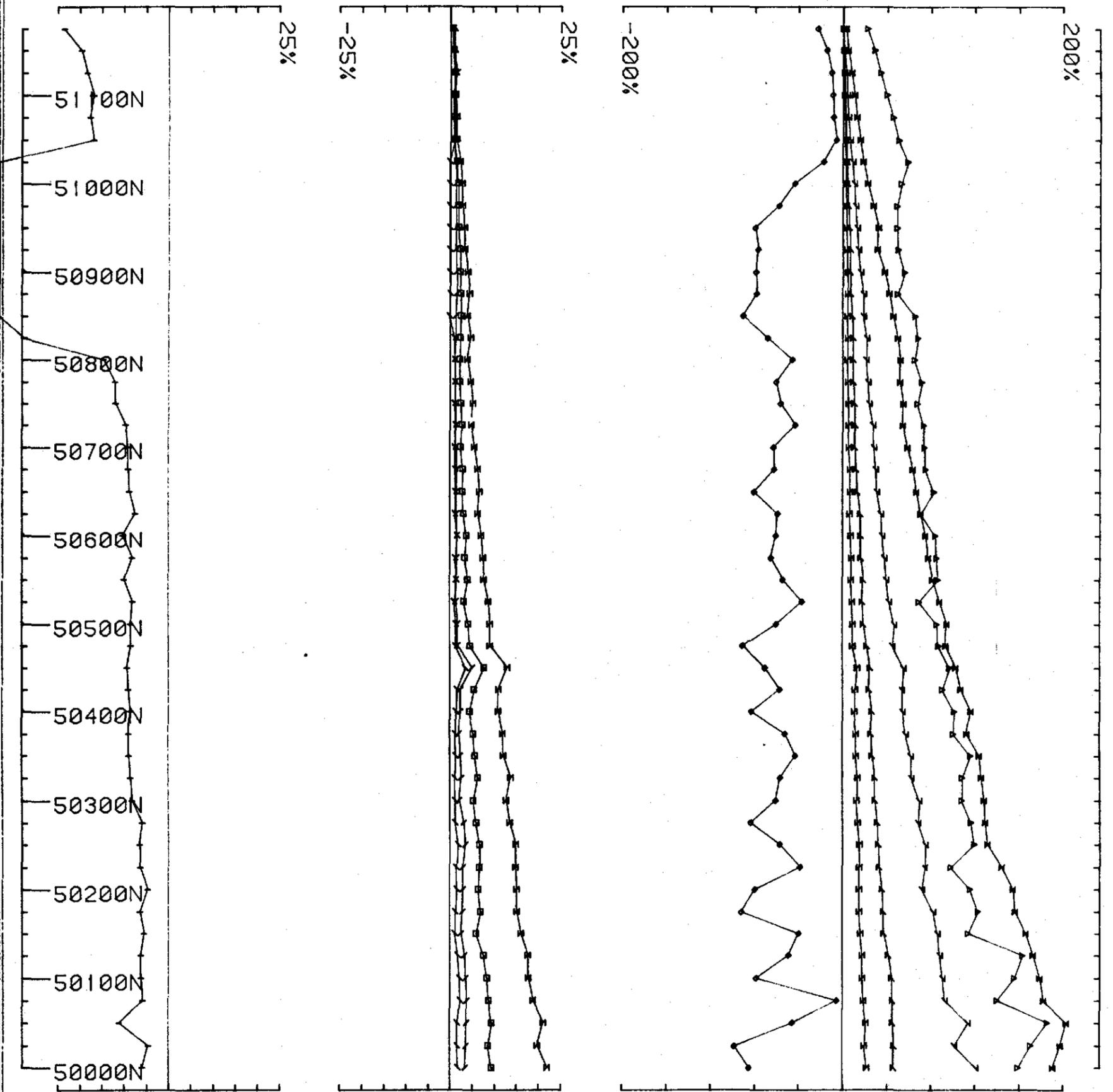


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BR  
 Line 11000E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

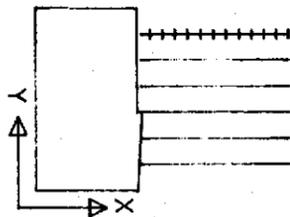


WINTERBROOK  
 LOOP 0005  
 LINE 11000  
 Hz

TASH  
 3045

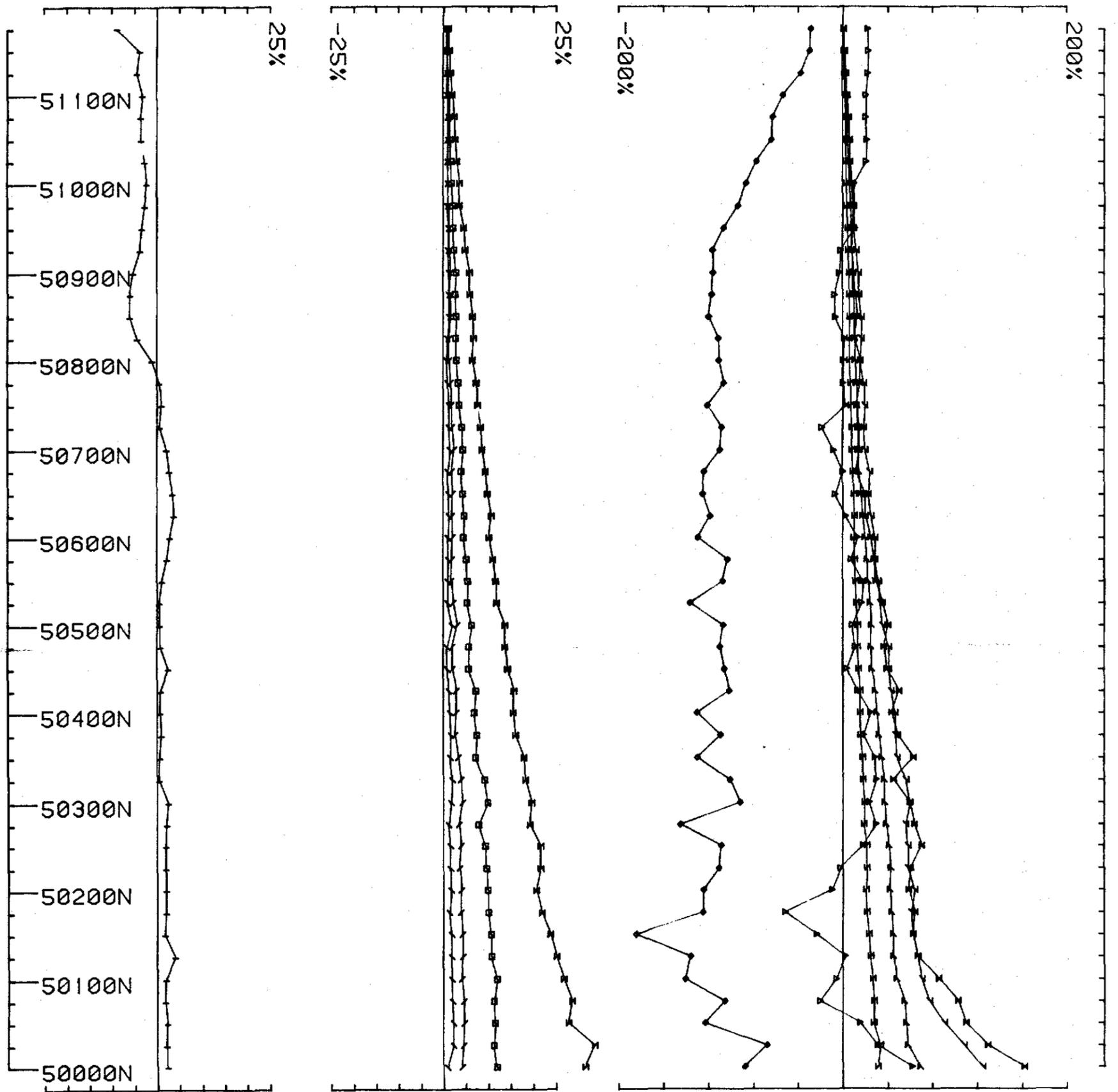


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BR  
 Line 11200E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

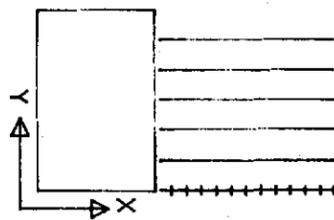


WINTERBROOK  
 LOOP 0005  
 LINE 11200  
 Hz

025107

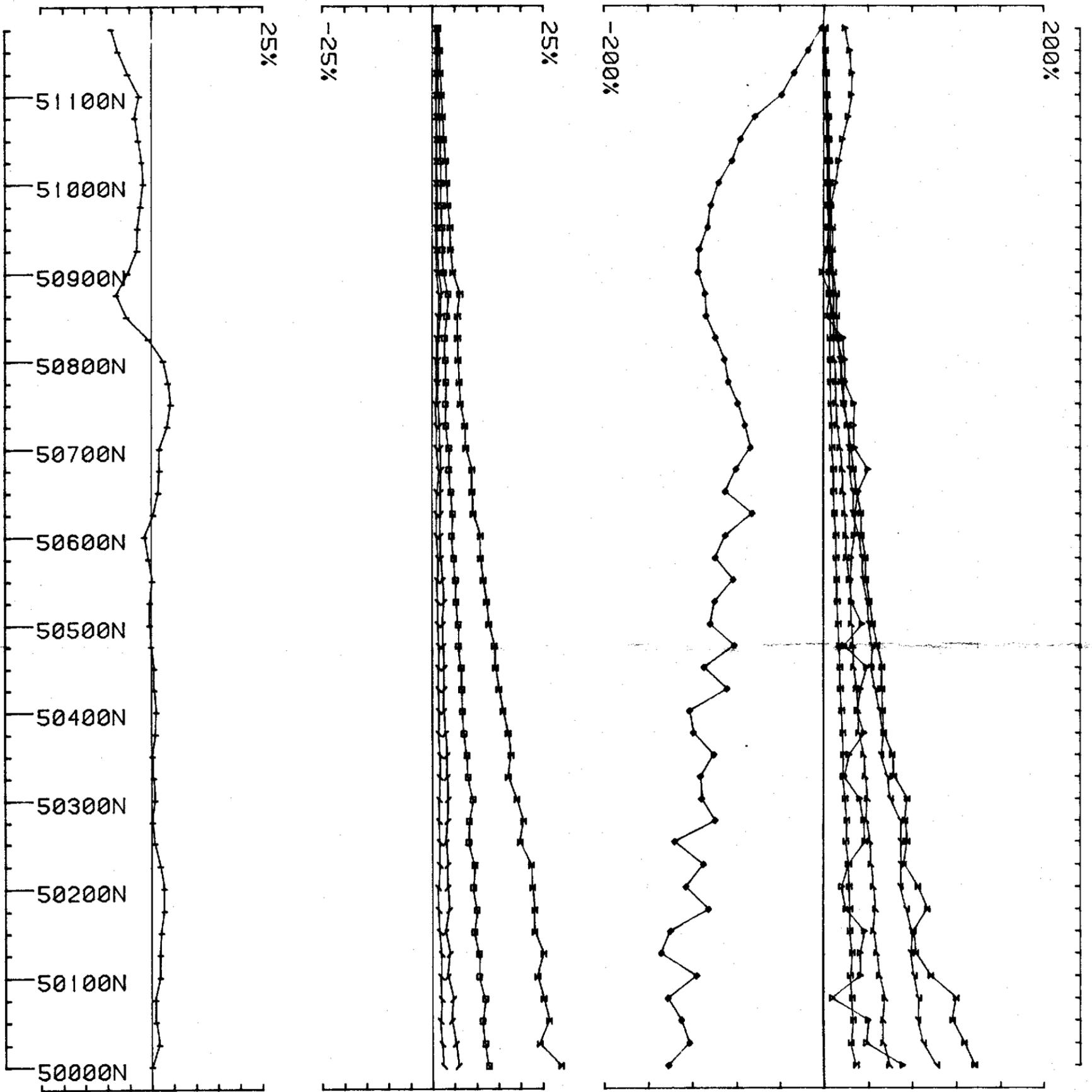


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 11400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

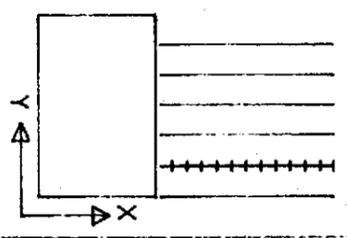


WINTERBROOK  
 LOOP 0006  
 LINE 11400  
 Hz

025108

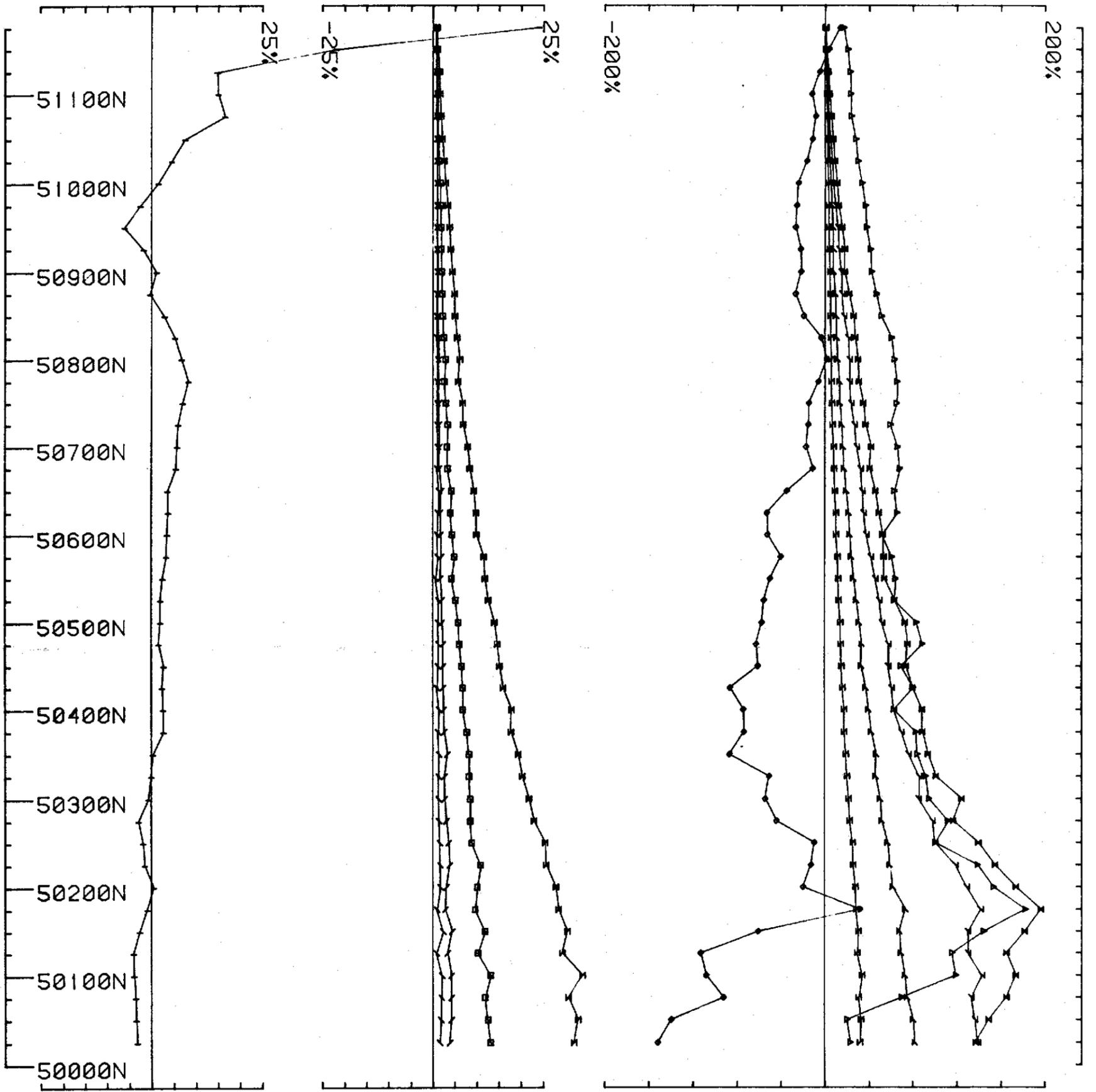


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 11600E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

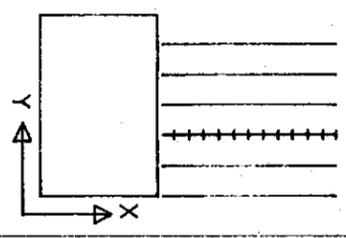


WINTERBROOK  
 LOOP 0006  
 LINE 11600  
 Hz

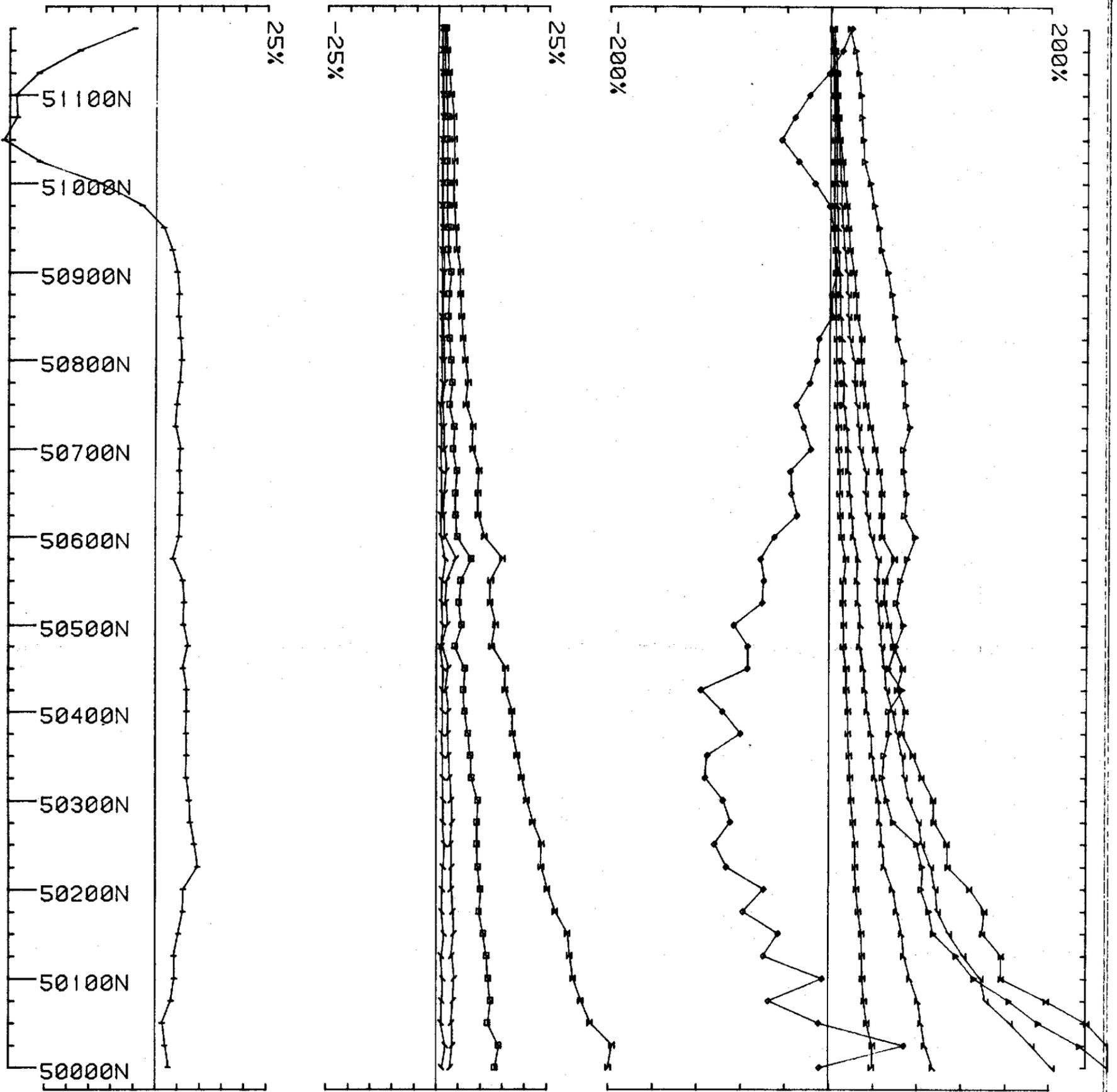
Revised as 1100N  
Slightly 25m from 1000N  
Revised as 5000N



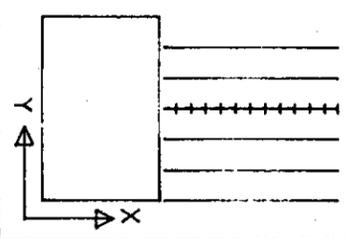
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 AREA :- WINTERBROOK  
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 Line 11800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



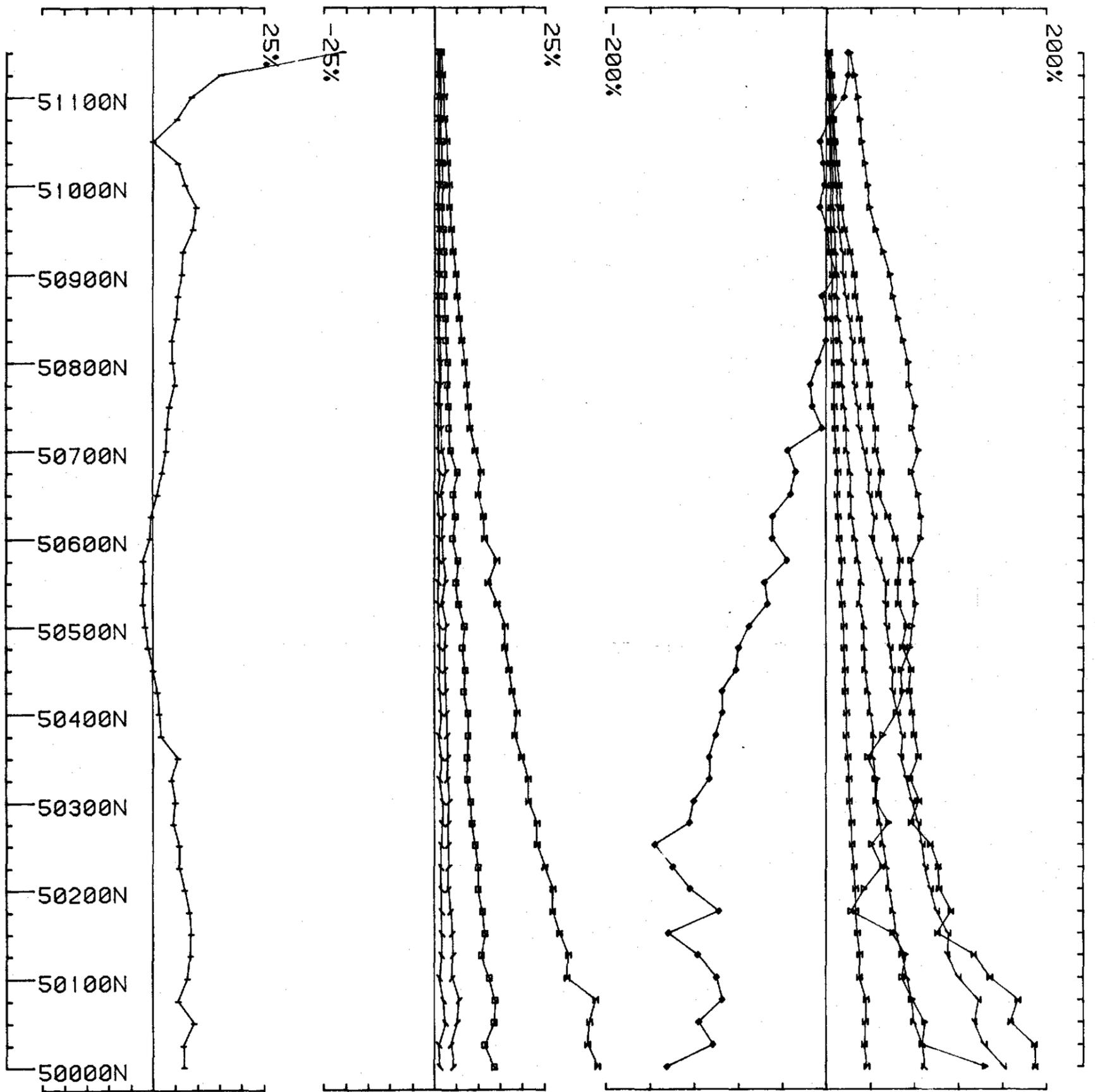
WINTERBROOK  
 LOOP 0006  
 LINE 11800  
 Hz



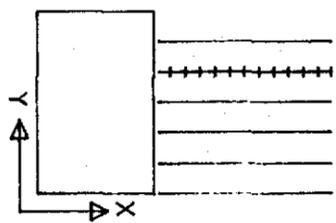
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 12000E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



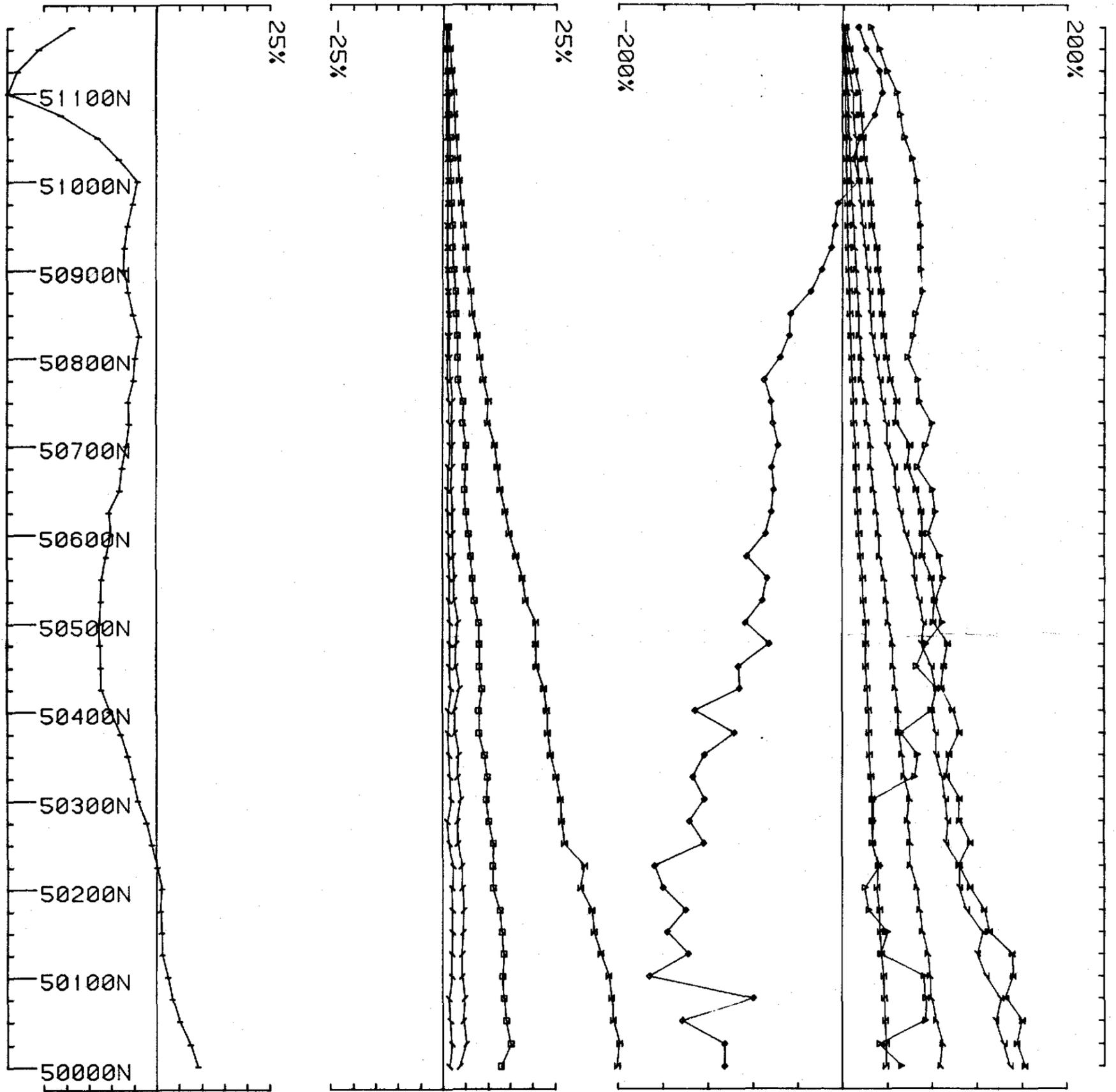
WINTERBROOK  
 LOOP 0006  
 LINE 12000  
 Hz



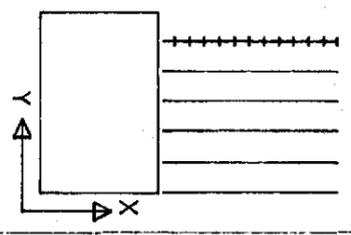
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 12200E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch I NORMALIZATION



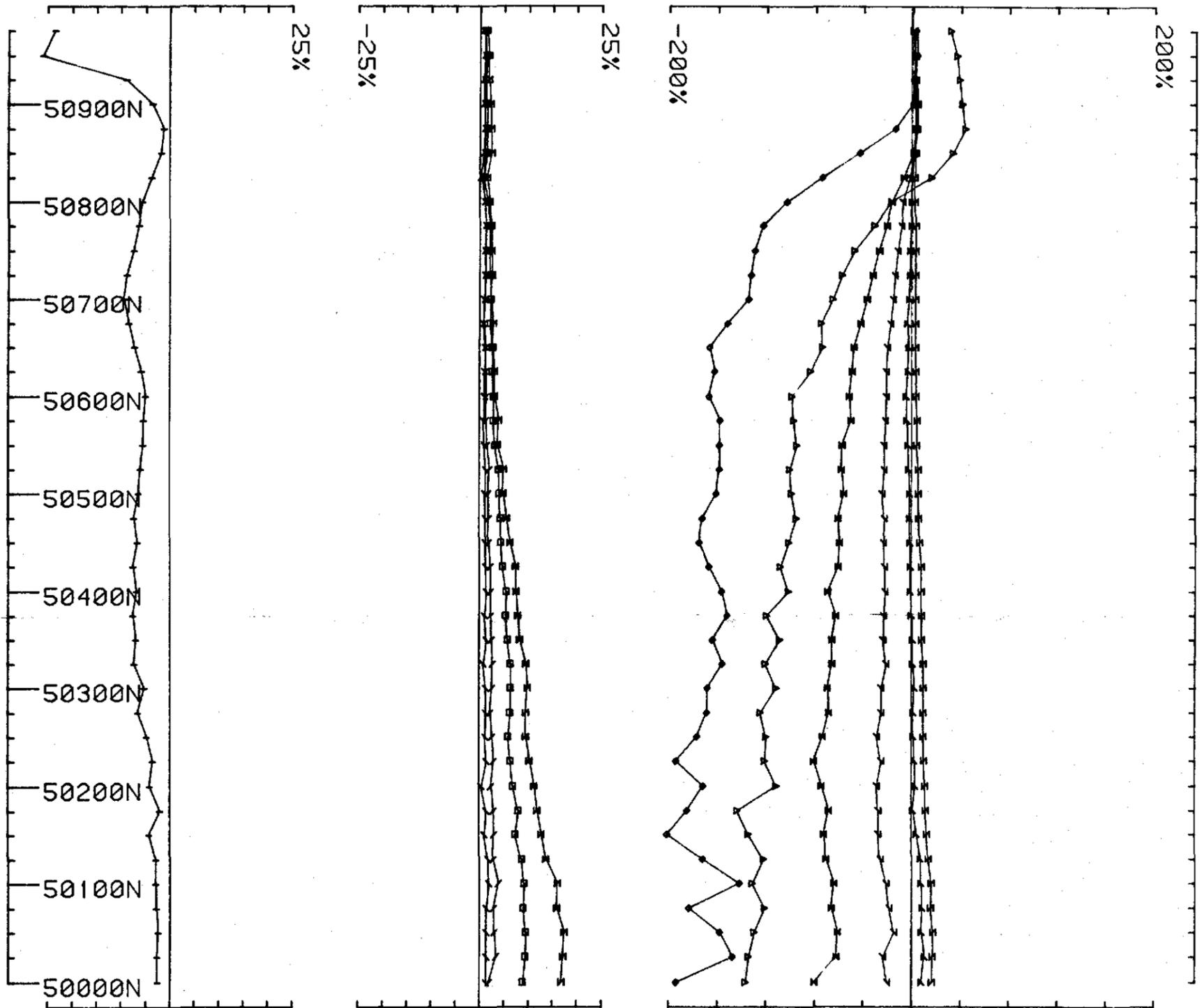
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 LINE 12200  
 Hz



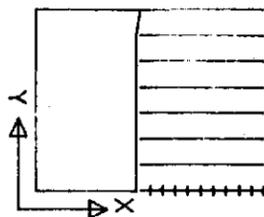
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 12400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



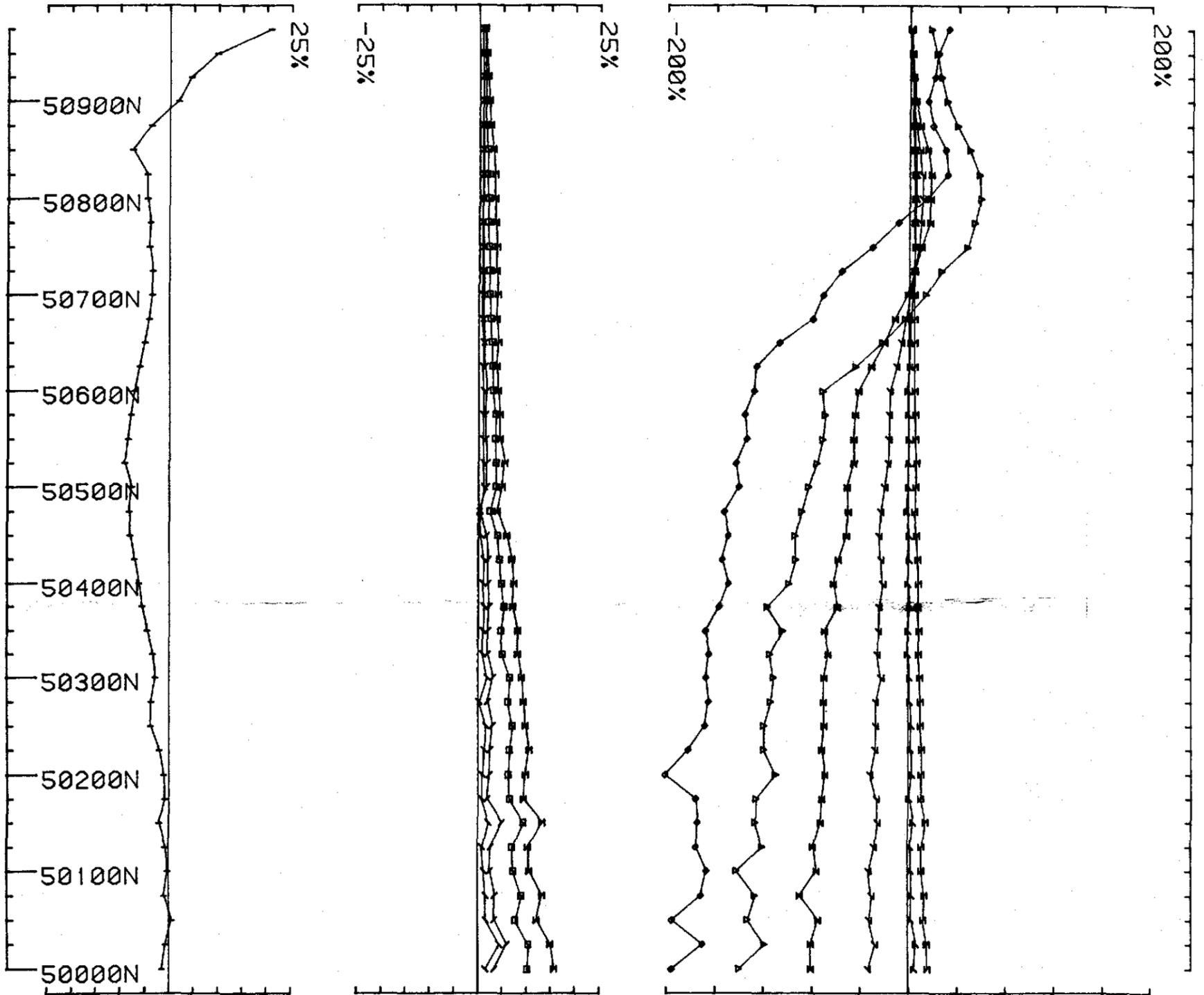
WINTERBROOK  
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 LINE 12400  
 Hz



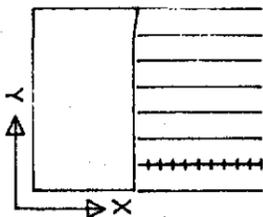
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM DA  
 Line 12600E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



WINTERBROOK  
 LOOP 0007  
 LINE 12600  
 Hz

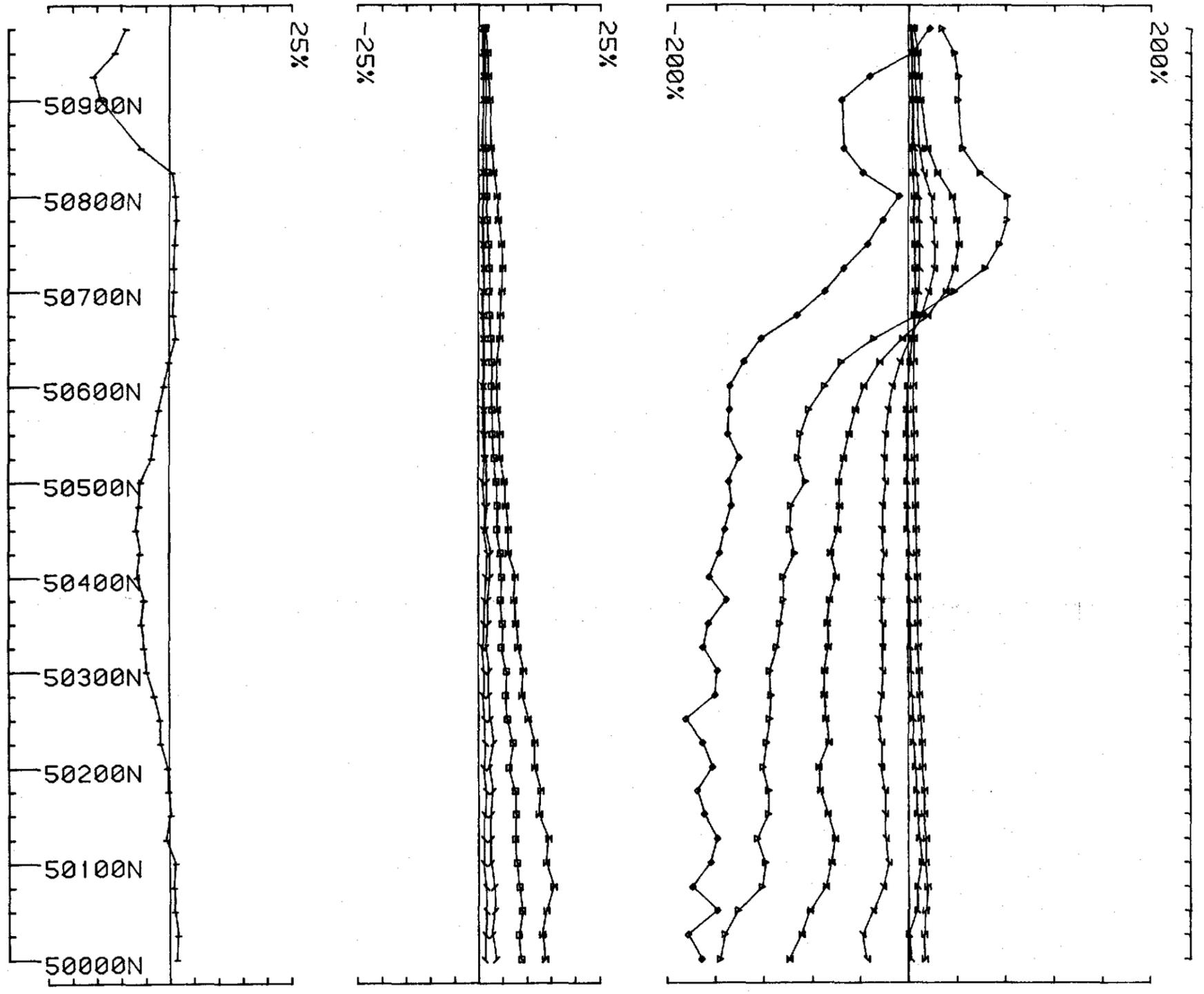


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM DA  
 Line 12800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

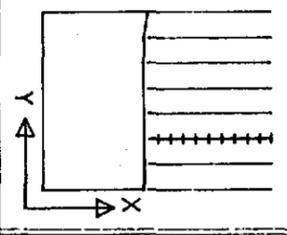


WINTERBROOK  
 LOOP 0007  
 LINE 12800  
 Hz

Scale 1000M →  
Reference 500m Sheet  
→ 50300N

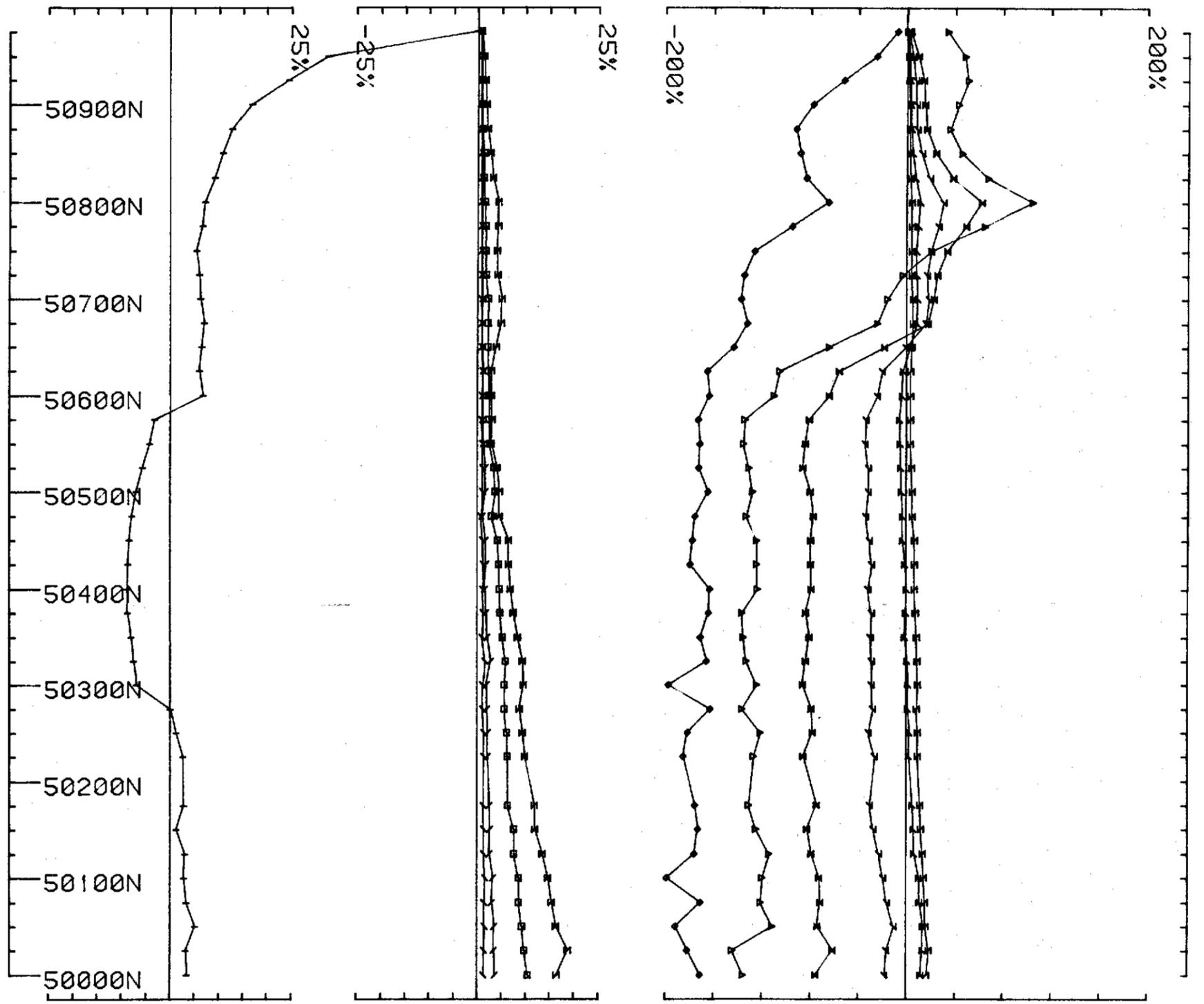


LAMONTAGNE GEOPHYSICS UTEM SURVEY Job 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM DA  
 Line 13000E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

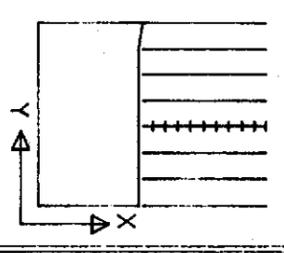


WINTERBROOK  
 LOOP 0007  
 LINE 13000  
 Hz

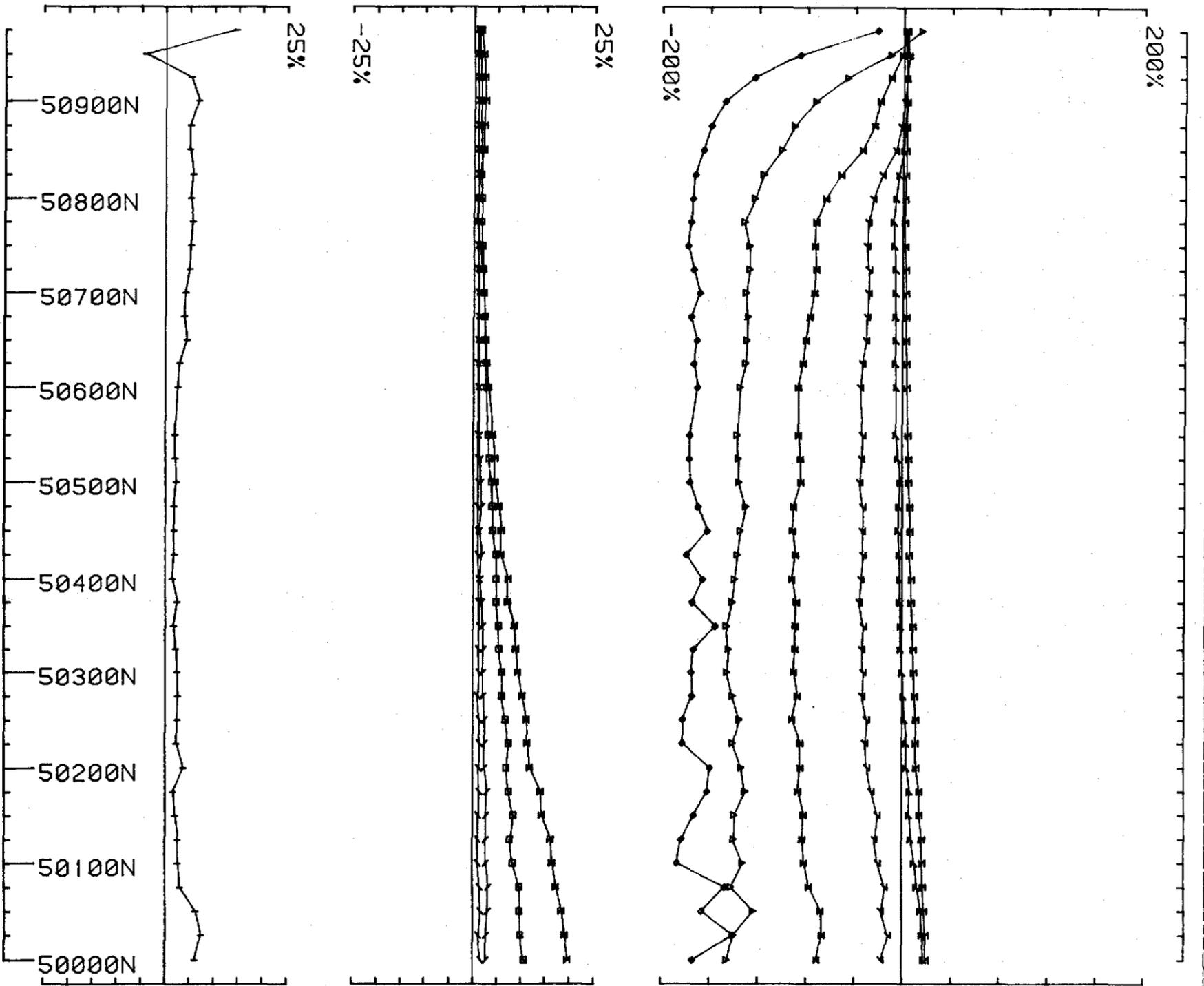
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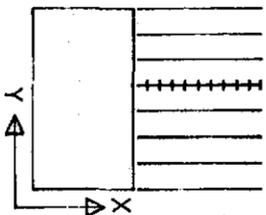
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM DA  
 Line 13200E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



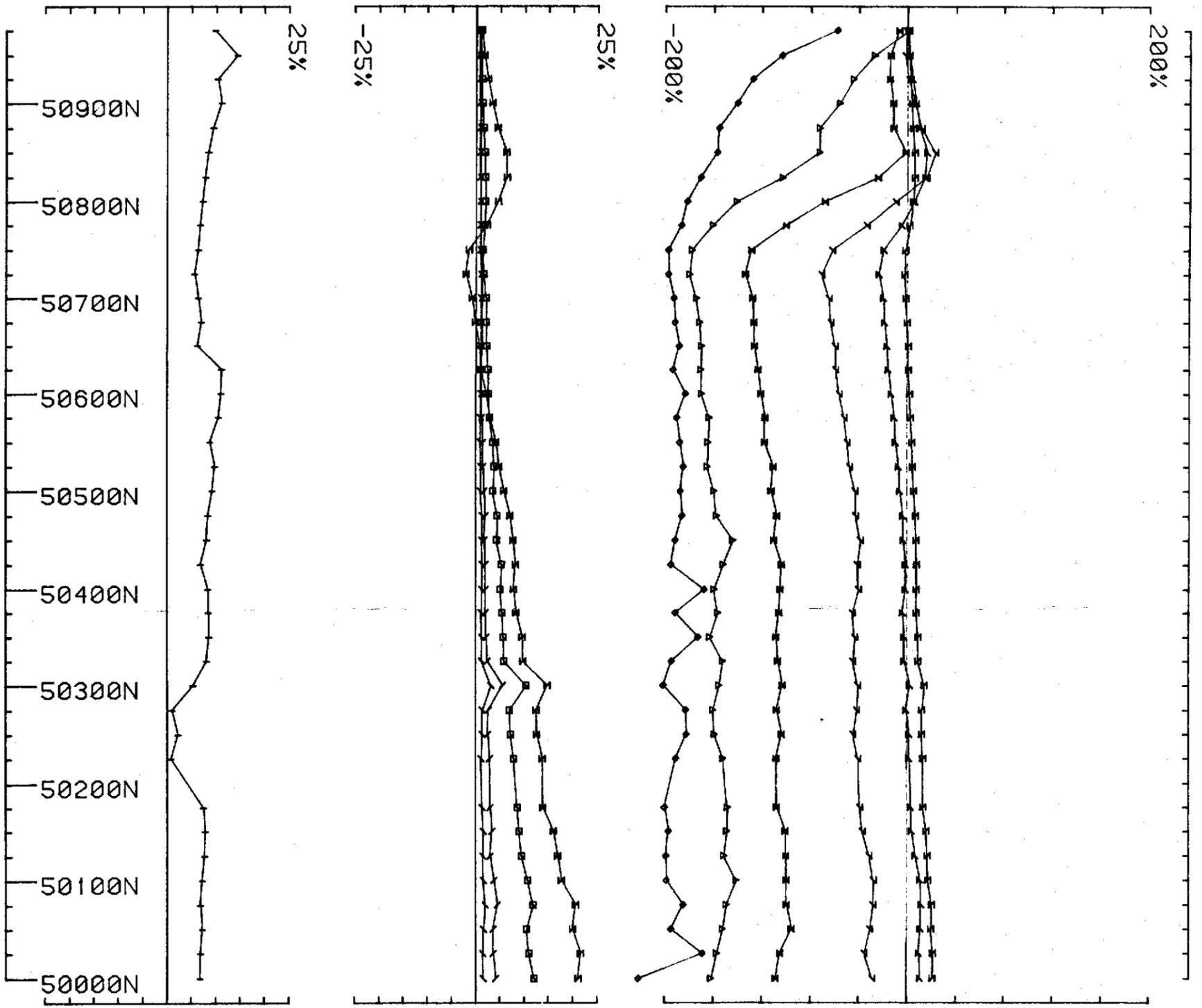
WINTERBROOK  
 LOOP 0007  
 LINE 13200  
 Hz



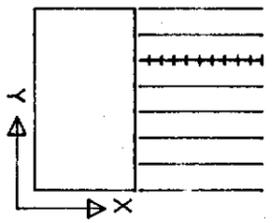
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM DA  
 Line 13400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



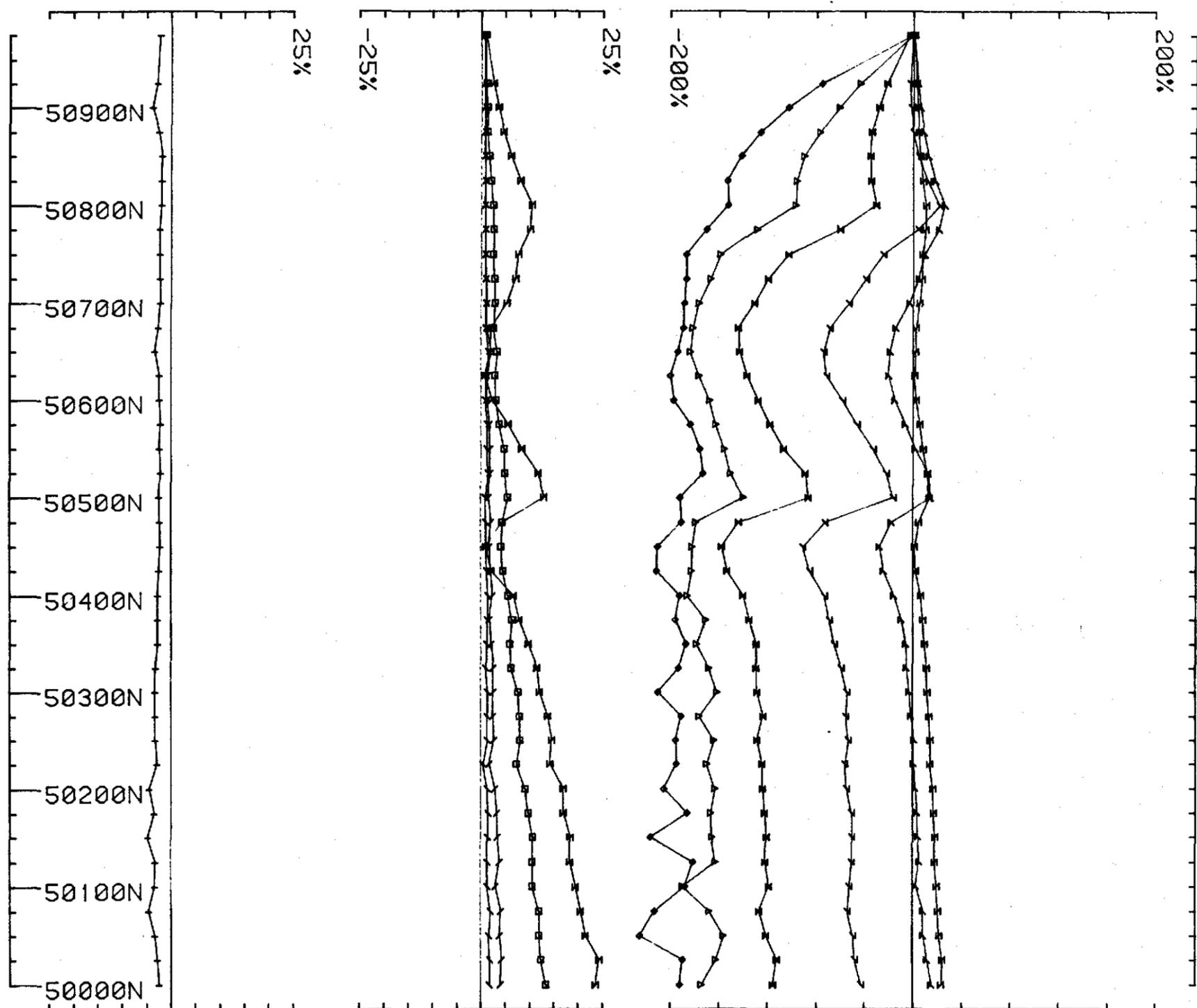
WINTERBROOK  
 LOOP 0007  
 LINE 13400  
 Hz



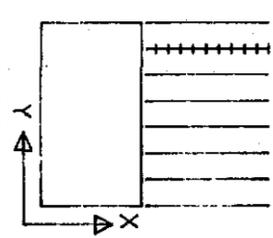
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM DA  
 Line 13600E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch I NORMALIZATION



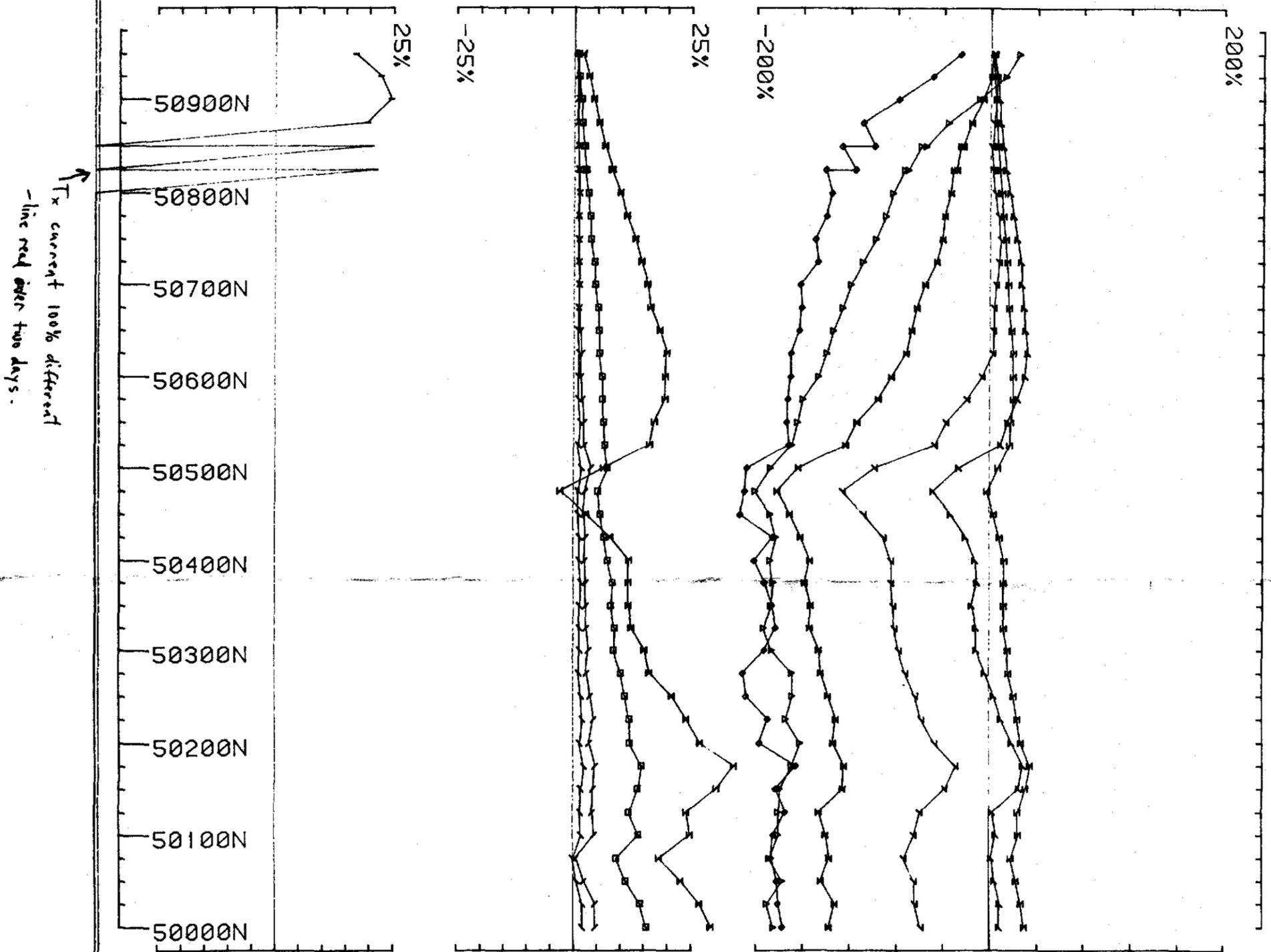
WINTERBROOK  
 LOOP 0007  
 LINE 13600  
 Hz



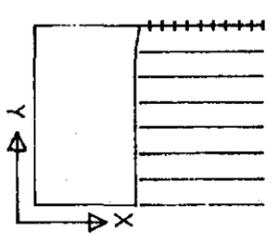
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM DA  
 Line 13800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



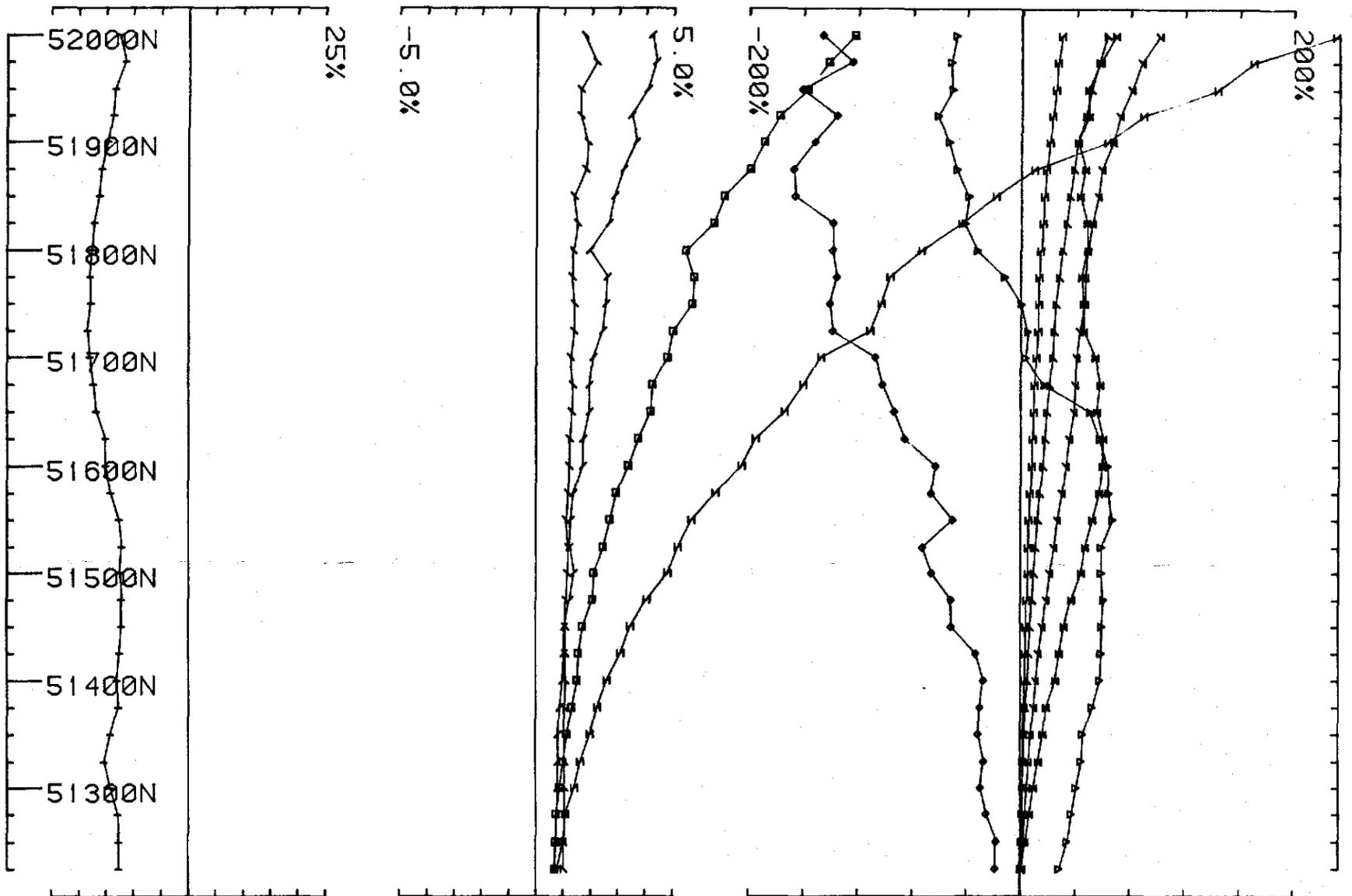
WINTERBROOK  
 LOOP 0007  
 LINE 13800  
 Hz



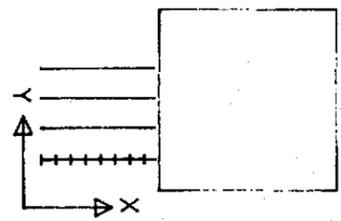
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 AREA :- WINTERBROOK  
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 Line 14000E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



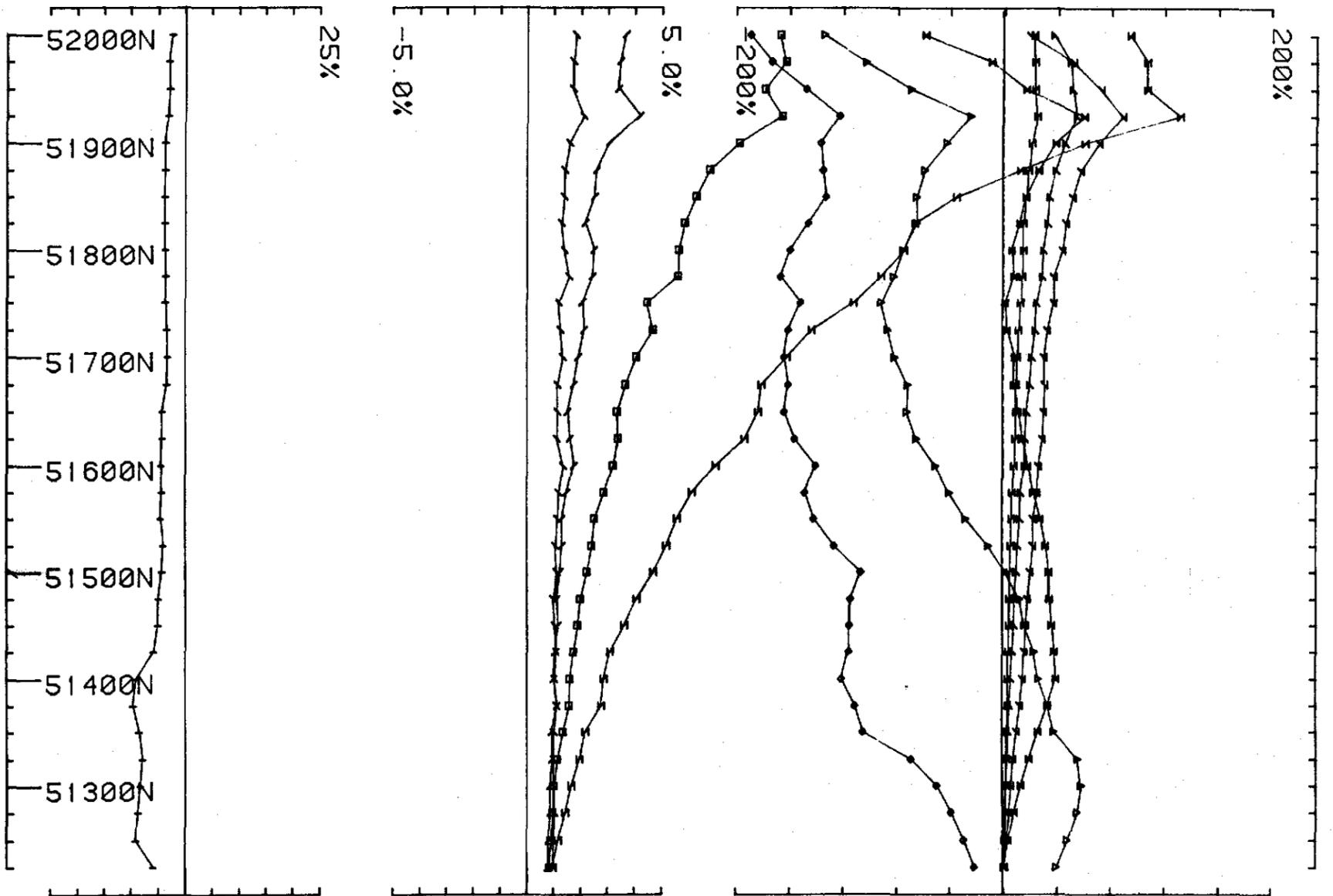
WINTERBROOK  
 LOOP 0007  
 LINE 14000  
 Hz



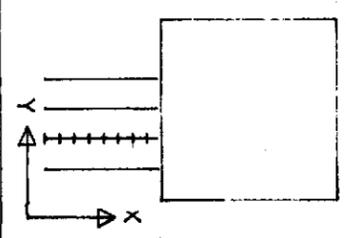
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 11400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



WINTERBROOK  
 LOOP 0008  
 LINE 11400  
 Hz

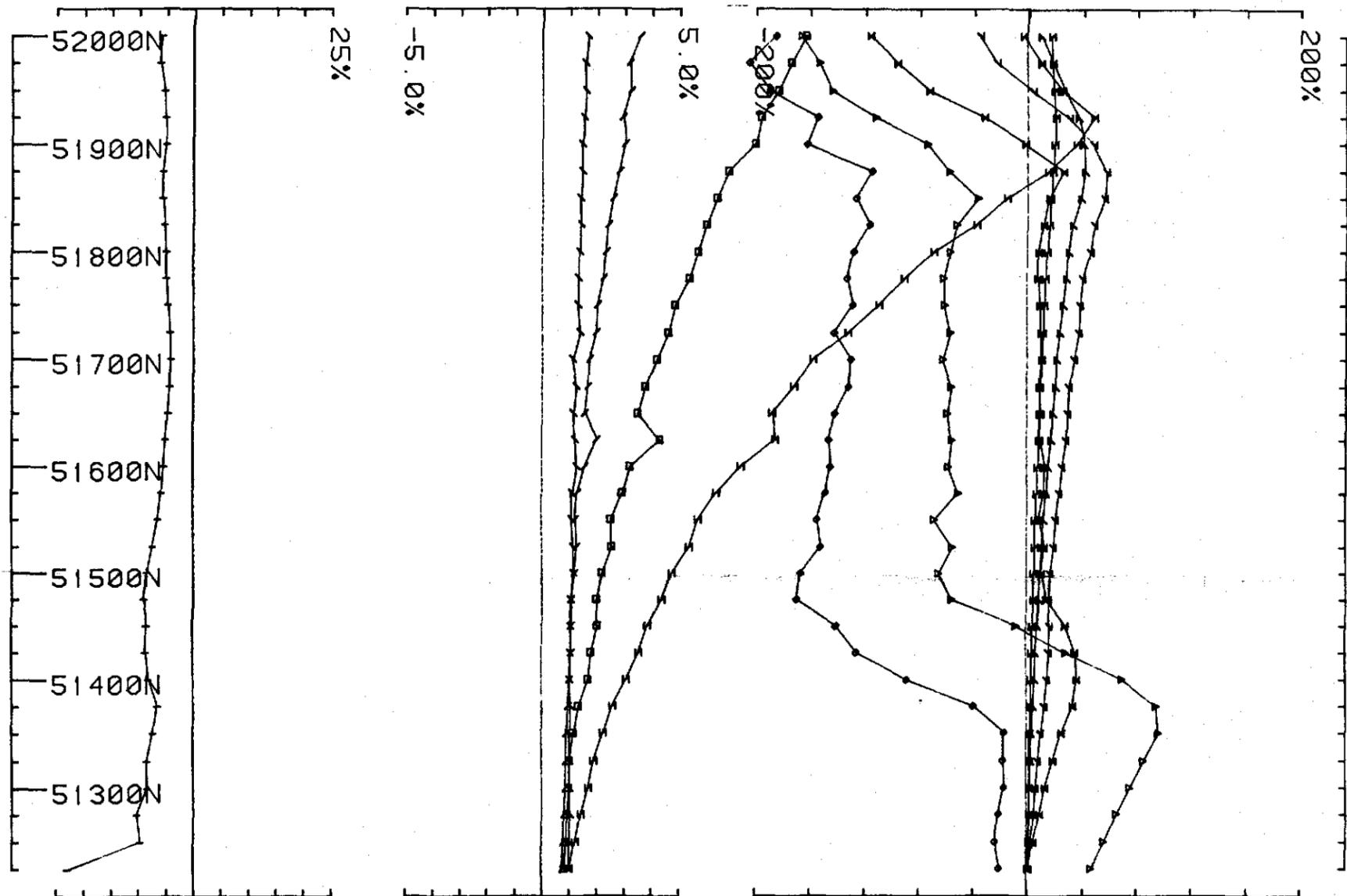


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 11600E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

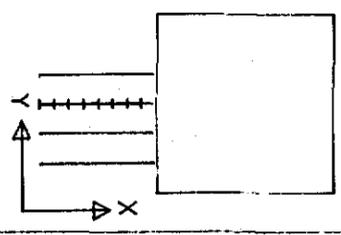


WINTERBROOK  
 LOOP 0008  
 LINE 11600  
 Hz

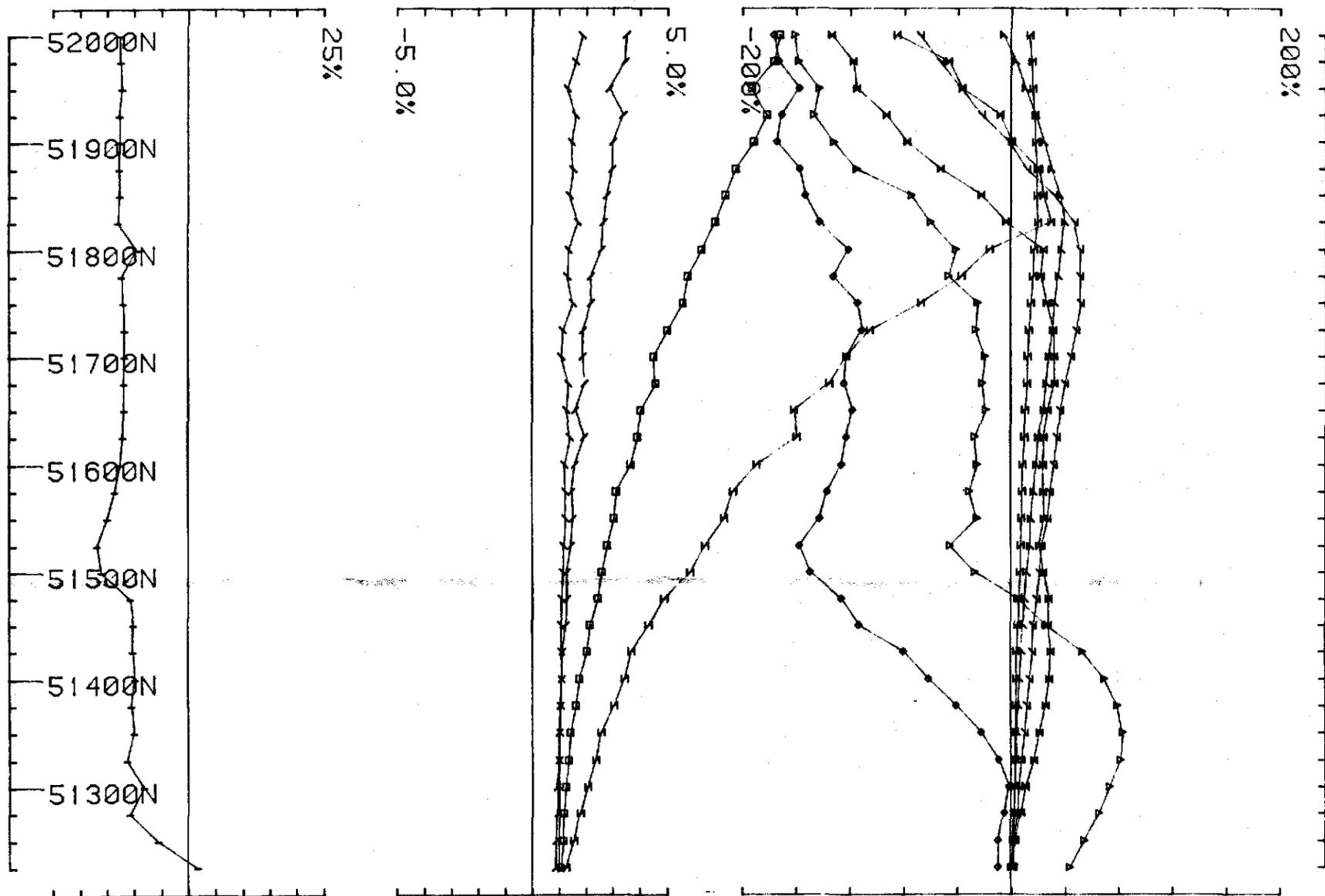
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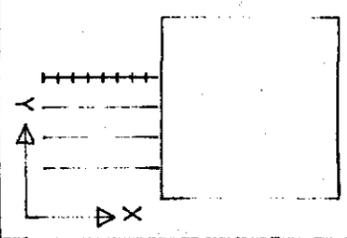
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 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 11800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



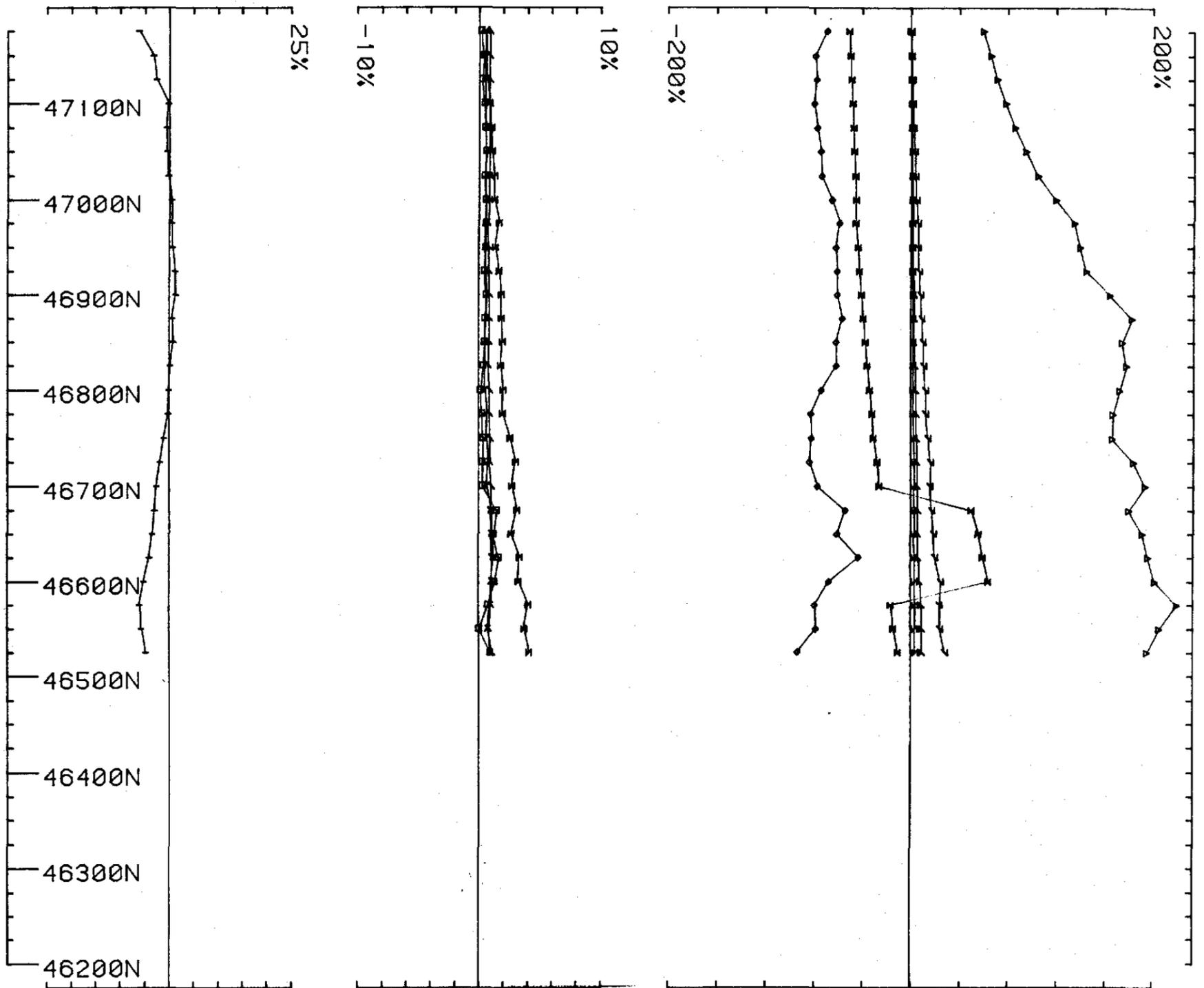
WINTERBROOK  
 LOOP 0008  
 LINE 11800  
 Hz



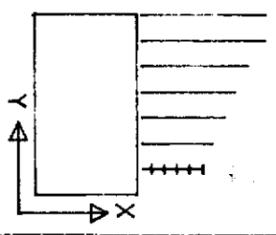
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTERBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM ML  
 Line 12000E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



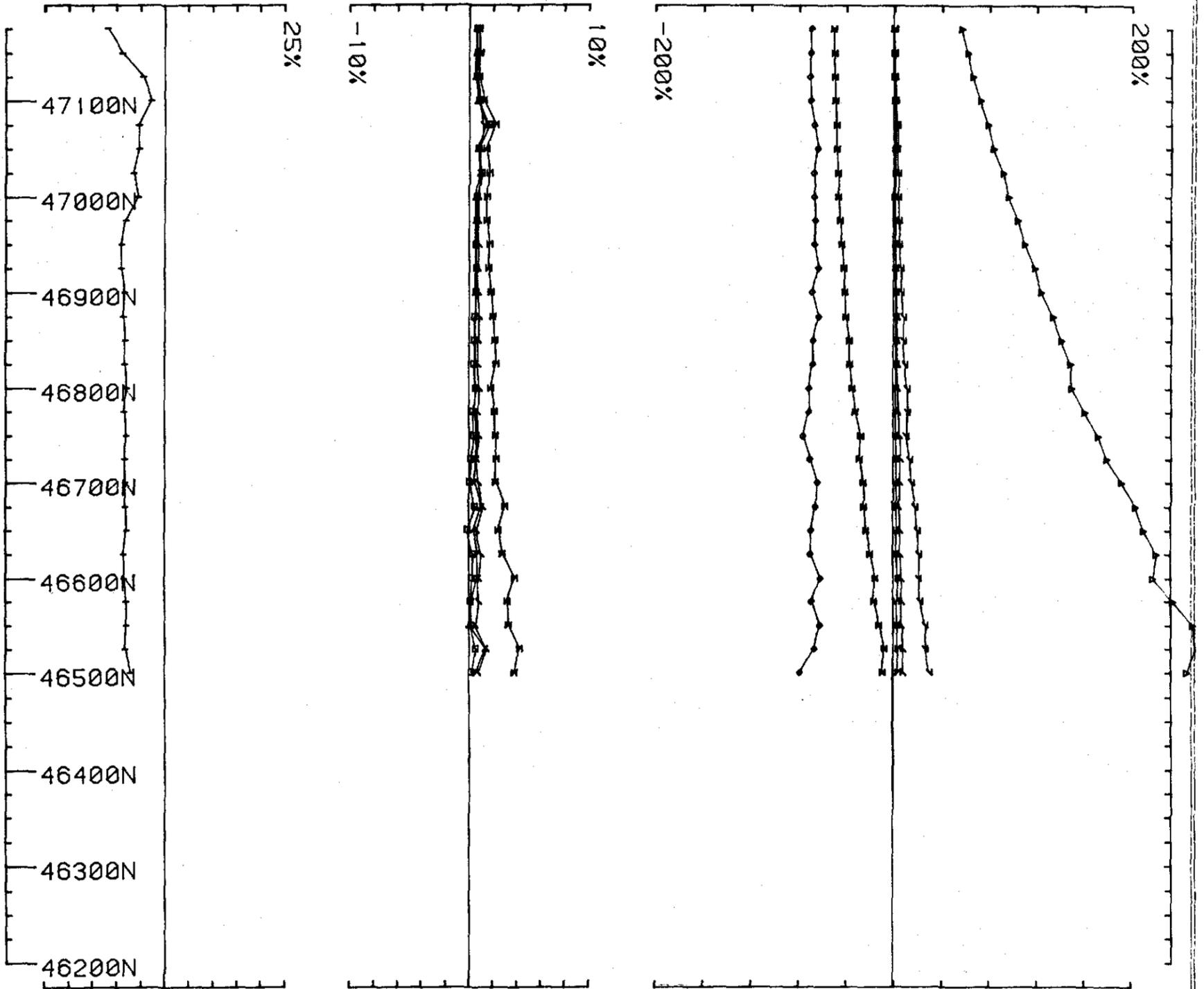
WINTERBROOK  
 LOOP 0008  
 LINE 12000  
 Hz



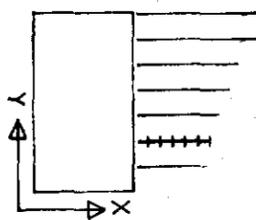
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTEBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BM  
 Line 10200E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



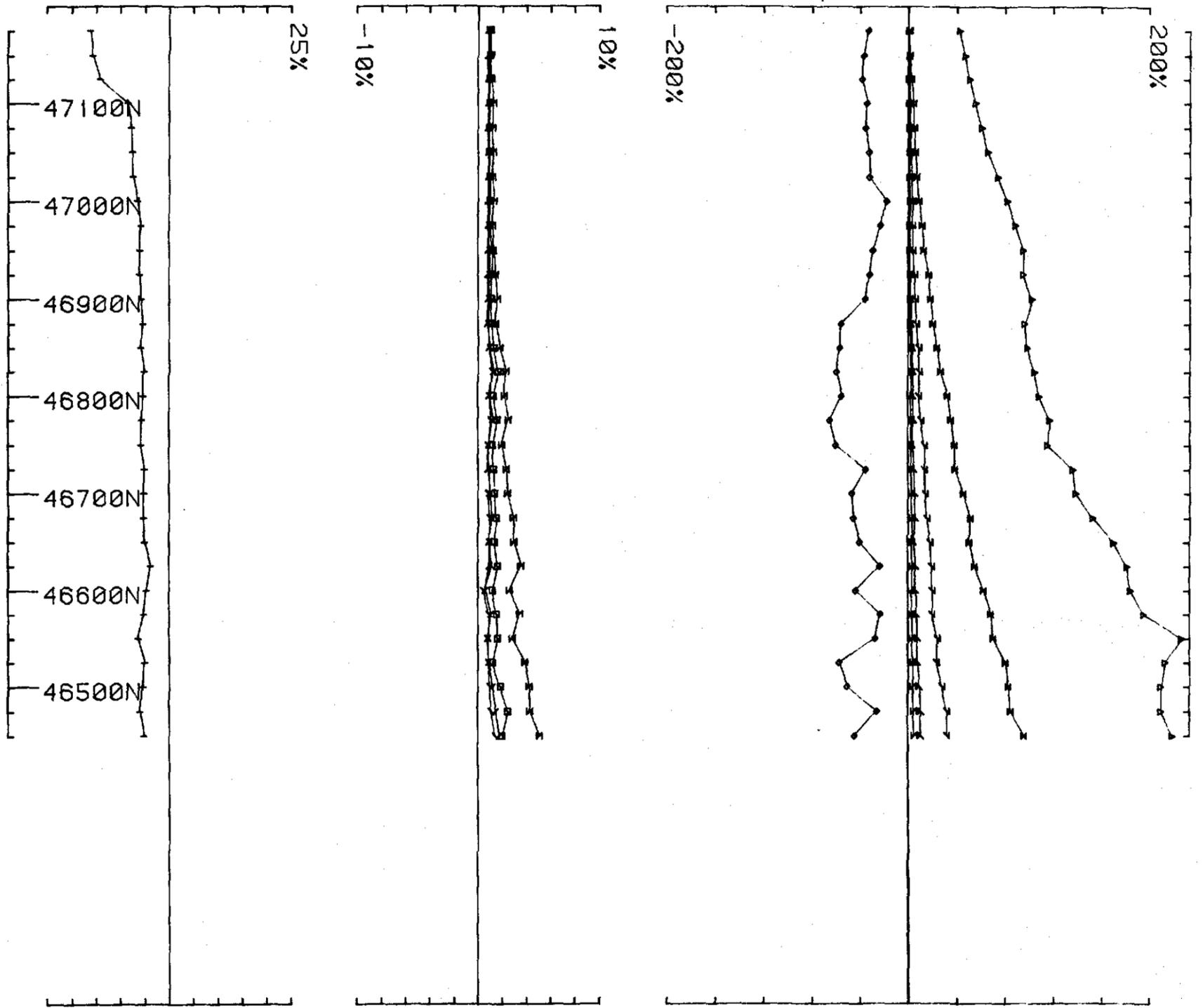
WINTEBROOK  
 LOOP 0009  
 LINE 10200  
 Hz



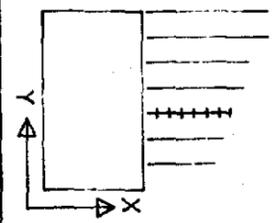
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTEBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BM  
 Line 10400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch I NORMALIZATION



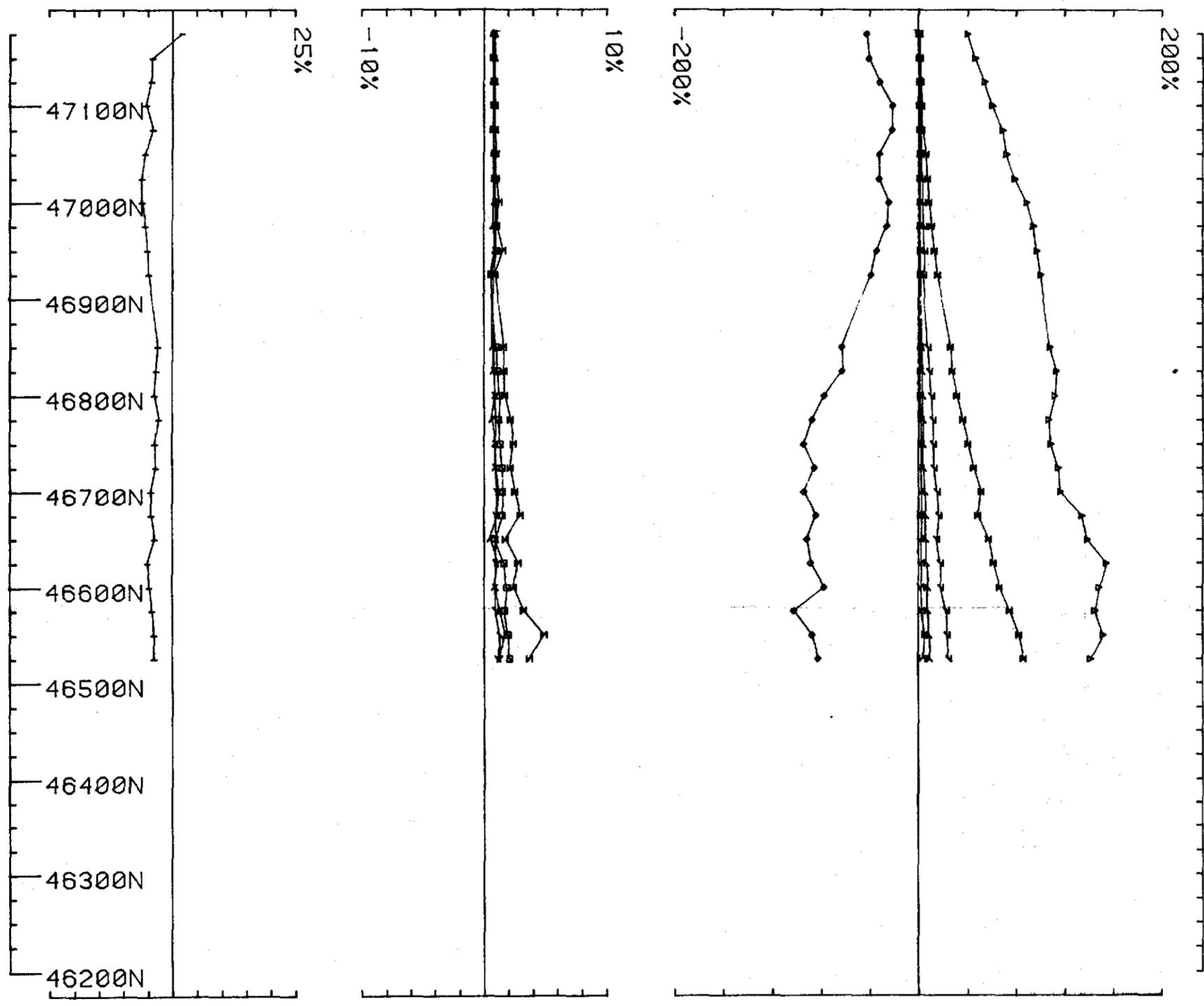
WINTEBROOK  
 LOOP 0009  
 LINE 10400  
 Hz



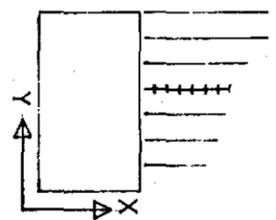
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 AREA :- WINTEBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BM  
 Line 10600E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



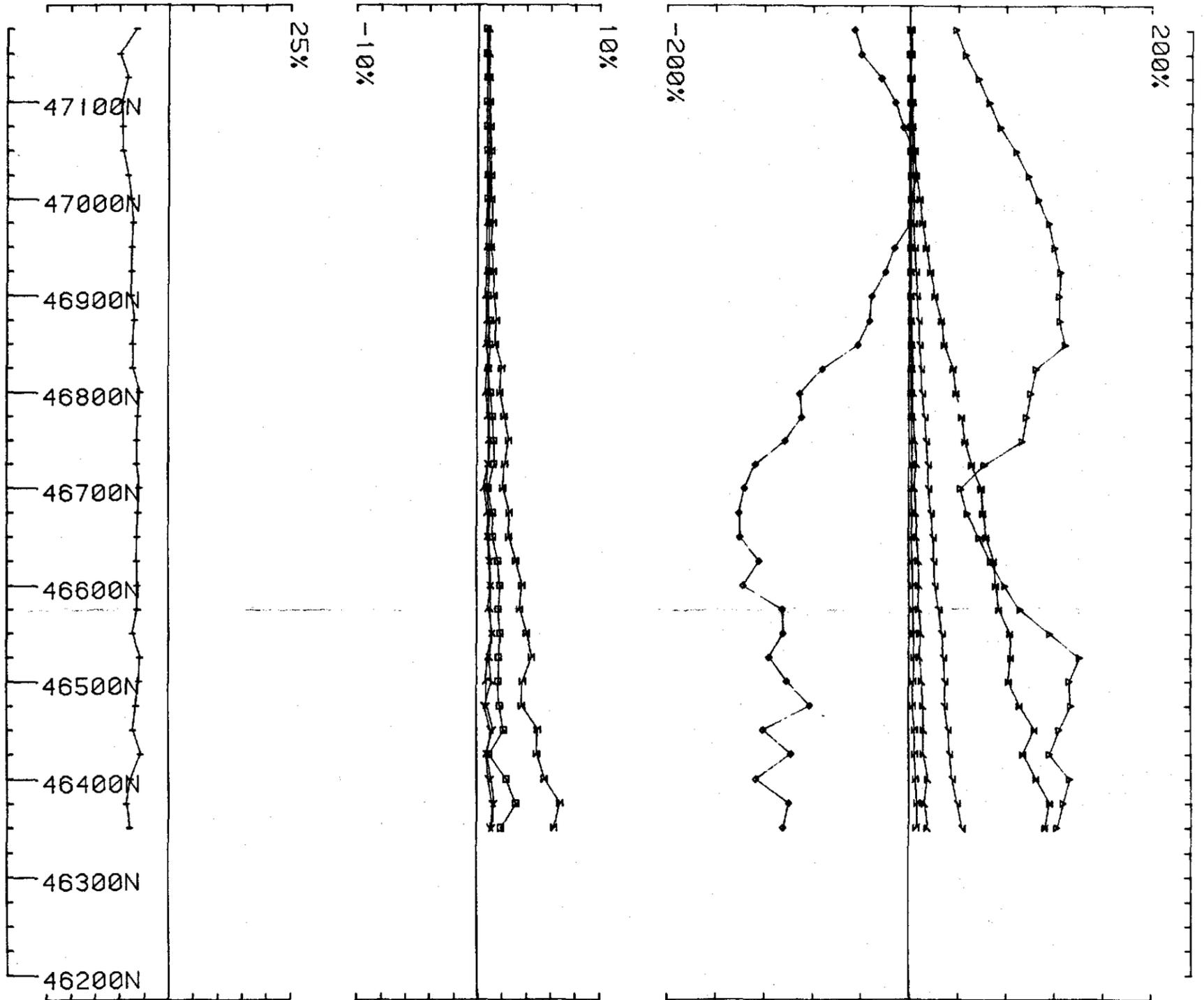
WINTEBROOK  
 LOOP 0009  
 LINE 10600  
 Hz



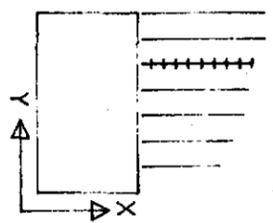
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTEBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BM  
 Line 10800E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS CH 1 NORMALIZATION



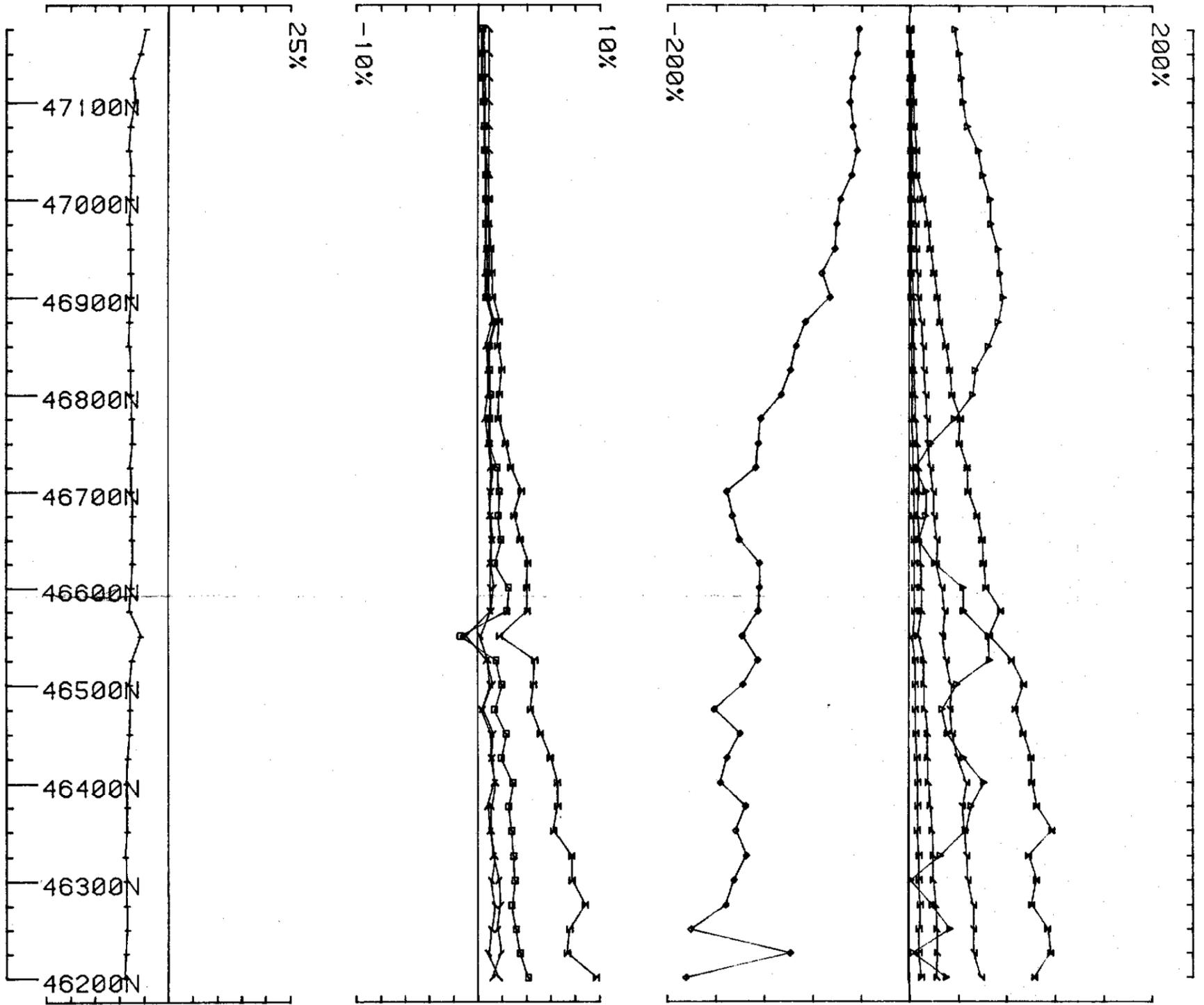
WINTEBROOK  
 LOOP 0009  
 LINE 10800  
 Hz



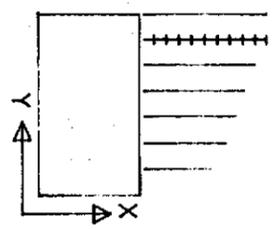
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTEBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BM  
 Line 11000E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



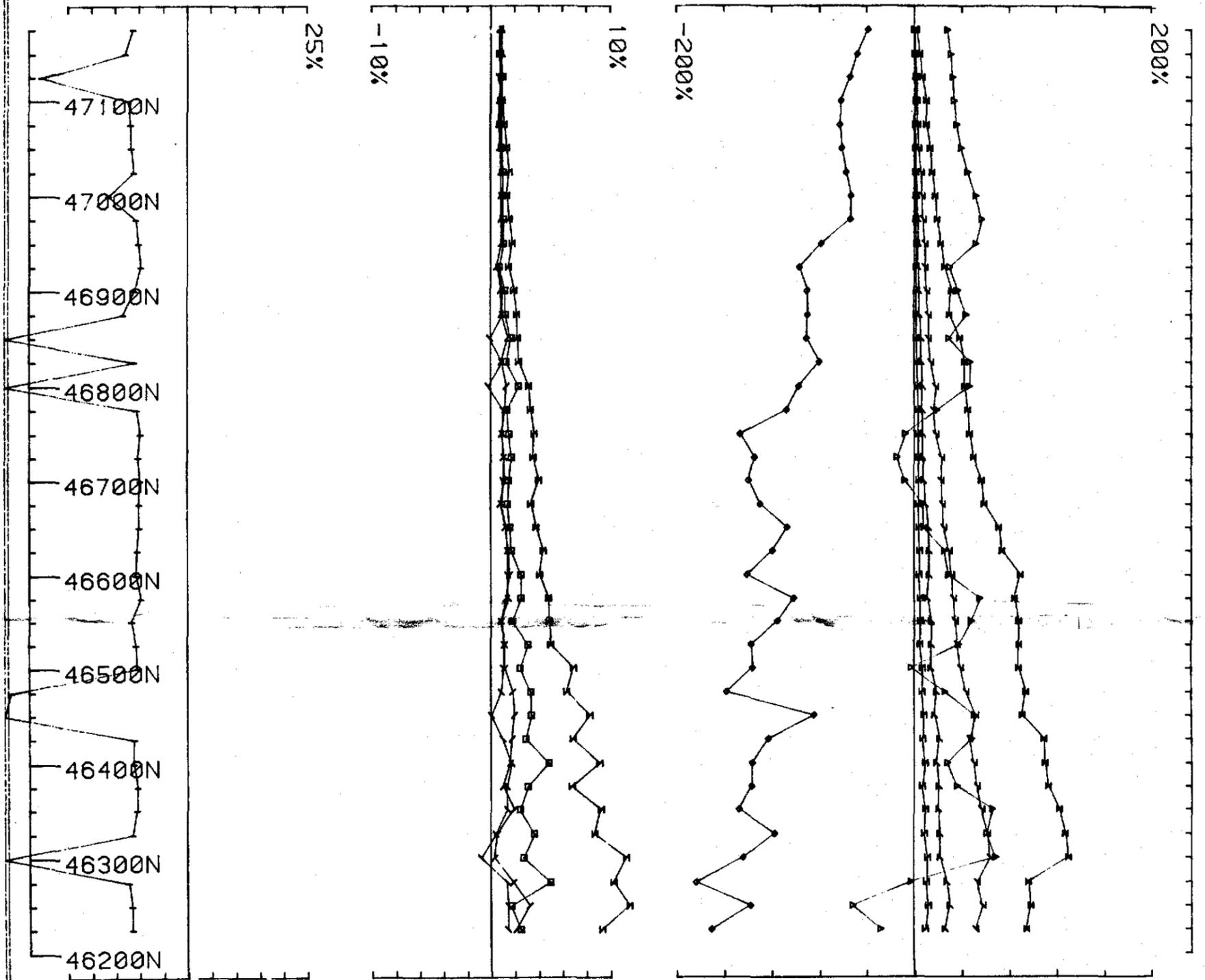
WINTEBROOK  
 LOOP 0009  
 LINE 11000  
 Hz



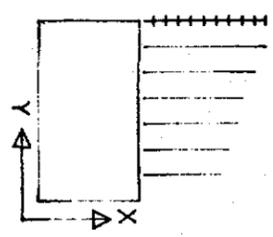
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTEBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BM  
 Line 11200E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



WINTEBROOK  
 LOOP 0009  
 LINE 11200  
 Hz



LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8602  
 AREA :- WINTEBROOK  
 CLIENT :- C.R.A. EXPLORATION CREW :- PMM BM  
 Line 11400E Hz COMPONENT BASE FREQ :- 26.230HERTZ  
 SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



WINTEBROOK  
 LOOP 0009  
 LINE 11400  
 Hz