COMINCO LTD. **WESTERN CANADA**

EXPLORATION

NTS: 82G/5

GEOPHYSICAL REPORT

ON

UTEM SURVEYS

ON THE VINE PROPERTY

FORT STEELE M.D., B.C.

- ASSESSMENT REPORT -

Latitude : 49°26'N

Longitude : 115°52'W

TIME PERIOD OF FIELD WORK : JUNE 5-10, 1991

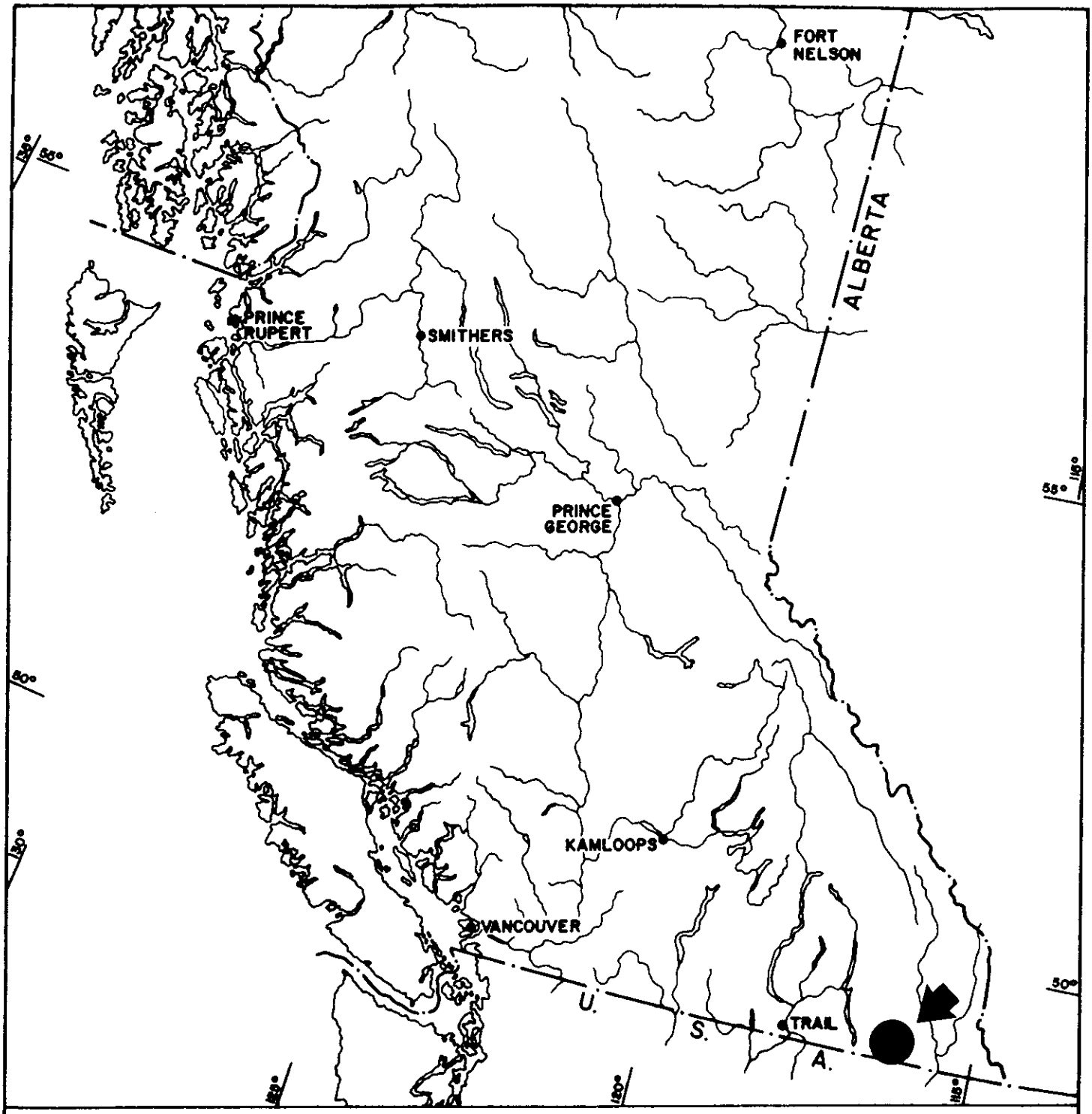
WORK PERFORMED BY : J.J. LAJOIE & I.JACKISCH

CLAIMS COVERED : VINE 37, 38, 41, 42
NEG 7

CLAIM OPERATOR : COMINCO LTD.

NOVEMBER 1991

INGO JACKISCH



0 100 200 300 400 500 Km.

NTS 82G/5

Drawn by:		Traced by: a. m. a.	
Revised by	Date	Revised by	Date

VINE PROPERTY

LOCATION MAP

Scale: 1 : 6,370,000 | Date: NOV. 1991 | Plate: 811-71-01

NCI - 112A - CL

210-0610

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COMINCO LTD.

EXPLORATION WESTERN CANADA
NTS: 82G/5

GEOPHYSICAL REPORT ON A UTEM SURVEY ON THE VINE PROPERTY FORT STEELE M.D.,B.C.

- ASSESSMENT REPORT -

INTRODUCTION

During the time period June 5 - 10, 1991, 9.3 kms of UTEM surveying was carried out on the VINE Property by a COMINCO geophysical crew under the direction of geophysicists, J.J. Lajoie and I. Jackisch. The purpose of the UTEM survey was to search for Zn/Pb Sullivan-type deposits at depth.

One UTEM loop with four grid lines to the southwest of the loop, and three reconnaissance lines to the north of the loop where surveyed in total.

This report describes the operation of the UTEM system, the UTEM plotting format, and presents the results.

LOCATION AND ACCESS

The VINE Property is located 10 kms southwest of Cranbrook, B.C., and 9 kms northwest of the north end of Moyie Lake, B.C. Access is from Highway 3/95. The turnoff onto a gravel road heading west occurs at Lumberton, which is half way between Cranbrook and Moyie Lake. This location is near a high voltage power line which crosses perpendicular to the highway. The center of the grid is 2 km along this gravel road.

LIST OF CLAIMS SURVEYED

The following list of claims were covered by UTEM surveying:

VINE 37, 38, 41, 42, NEG 7

DESCRIPTION OF THE UTEM SYSTEM AND FIELD PROCEDURE

Utem is an acronym for "University of Toronto Electro-Magnetometer". Dr. Y. Lamontagne [1975] developed the system as part of his doctoral thesis at that university.

The field procedure consists of first laying out a large transmitter loop of single strand, enamel insulated copper wire. Survey lines are usually oriented perpendicular to one side of

the loop and surveying can be performed both inside and outside the loop.

The UTEM III transmitter energizes the loop with a precise triangular waveform at a carefully controlled base frequency [30.974 Hz for this survey]. Power is supplied by a 2200W motor generator. The UTEM III receiver system includes a sensor coil and backpack portable receiver which has a digital recording facility on solid state memory and backup cassette magnetic tape. Time synchronization between transmitter and receiver is achieved through quartz crystal clocks in both units, accurate to about one second in 50 years.

The receiver sensor coil measures one or more components of the electromagnetic field and responds to its time derivative. In this survey, only the vertical component was measured. Since the transmitter current waveform is triangular, the coil will sense a perfect square wave in the absence of conductors. In the presence of electrical conductors, which may be geologic or cultural in origin, deviations from the perfect square wave are observed. The receiver stacks any pre-set number of cycles to increase the signal to noise ratio.

The UTEM receiver samples each half cycle of the waveform in ten channels or time windows. The delay time of each channel is equal to the width of the time window over which the signal is averaged. For a standard 30 Hz transmitted signal the delay times range from 16 microseconds for channel 10, to 8.33 milliseconds for channel 1. Therefore, the higher numbered channels [7-10] correspond to short time or high frequency while the lower numbered channels [1-4] correspond to late time or low frequency. Poor and/or small conductors will respond on channels 10, 9, 8, and 7. Better and/or larger conductors will give responses on progressively lower number channels as well. For example, large, massive, highly conducting sulphide or graphite bodies should produce a response on all ten channels.

At the end of the survey day, the data in the receiver is transferred to a personal computer and processed. It is then plotted on a digital plotter using Cominco Ltd. proprietary software. In this report, the data is presented on Data Sections as profiles, with one profile for each of the ten channels.

1. Continuously Normalized Plots

This is the standard normalization scheme for general presentation.

a] For Channel 1:

$$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.1} - P}{P} \times 100\%$$

where P is the primary field from the loop at the station and Ch.1 is the observed amplitude for channel 1.

b] The remaining channels [n=2 to 10] are channel 1 reduced and channel 1 normalized:

$$\% \text{ Ch.n anomaly} = \frac{\text{Ch.n - Ch.1}}{\text{Ch.1}} \times 100\%$$

where Ch.n is the observed amplitude of Channel n [n=2 to 10]

2. Point Normalized Plots

These plots display an arrow at the top of the section indicating the station to which all data on the line are normalized. The purpose of point normalized plots is to display only the relative amplitude variation of the SECONDARY field along the survey line, that is only that portion of the magnetic field resulting from electric currents induced in the ground.

a] For Channel 1:

$$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.1 - Ppn}}{\text{Ppn}} \times 100\%$$

where Ppn is the primary field from the loop at the point norm station and Ch.1 is the observed amplitude for Channel 1.

b] The remaining channels [n=2 to 10] are channel 1 reduced and channel 1 normalized:

$$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.n - Ch.1pn}}{\text{Ch.1pn}} \times 100\%$$

where Ch.n is the observed amplitude of Channel n and Ch.1pn is the observed channel 1 amplitude at the point norm station.

Point normalized plots are usually produced on data sections showing anomaly responses in order to help interpretation by providing a different perspective to the data. The point norm station is usually chosen at a constant distance from the loop front for the whole grid, or, if there is an anomaly, at a station near the center of the anomalous response.

The above normalizing procedures result in the errors from the miscalculations of the primary field, due to chainage errors,

being displayed in Channel 1 only.

The channel 10 window has such a small delay time that in most geological environments, it becomes completely saturated at a very short distance from the transmitter loop. In most cases, it provides no valuable information and overwrites other useful channels. Therefore, channel 10 is not presented in this report.

INTERPRETATION

The claim boundaries, UTEM loops, lines, and conductor locations along with their accompanying labels are shown on Plate 811-71-2. The individual line profiles are included in Data Sections 1-7, 1p-7p ["p" stands for point normalized plots].

The high voltage power line, which cuts through the inside of the loop, added significant 60 Hz noise to the UTEM readings. This was compensated for by taking longer than normal receiver readings, until an acceptable signal to noise ratio was achieved.

No significant conductors were detected; only isolated, shallow channel 4-6 crossover responses were seen.

CONCLUSIONS

9.3 kms of UTEM surveying carried out from June 5-10, 1991, detected a few shallow, channel 4-6 conductors.

Report by : Ingo Jackisch

Ingo Jackisch
Geophysicist
Cominco Ltd.

Approved
for Release : W. J. Wolfe

W. J. Wolfe
Manager, Exploration
Western Canada
Cominco Ltd.

Distribution:

Mining Recorder	[2]
Kootenay Exploration Office	[1]
Western District Files	[1]
Geophysics Files	[1]

REFERENCE

Lamontagne, Y., 1975 Applications of Wideband, Time Domain EM Measurements in Mineral Exploration: Doctoral Thesis, University of Toronto

SUMMARY GEOLOGY (lithology, age, structure, alteration, mineralization, size, and attitude):

The Vine claims cover NE & E dipping, Middle Aldridge sediments, Precambrian in age, composed predominantly of bedded quartzwacke quartzitic wackes and wackes. Intruded by gabbro sills & dykes. The area is bounded by three major faults, the E-W trending Cranbrook Fault on the N., the NW-SE trending Gold Creek Fault on the E. and the NE-SW trending Moyie Fault on the SE.

REFERENCES TO PREVIOUS WORK. To date, no mineralization of economic significance has been found on the property.

(over)

APPENDIX I

IN THE MATTER OF THE B.C. MINERAL ACT

AND THE MATTER OF A GEOPHYSICAL PROGRAMME

CARRIED OUT ON THE VINE PROPERTY

LOCATED 10 KMS SOUTHWEST OF CRANBROOK, B.C.

IN THE FORT STEELE MINING DIVISION OF THE

PROVINCE OF BRITISH COLUMBIA,

MORE PARTICULARLY

N.T.S. 82G/5

S T A T E M E N T

I, Ingo Jackisch, of 424 Somerset Street, in the City of North Vancouver, in the Province of British Columbia, make oath and say:

1. THAT I am employed as a geophysicist by Cominco Ltd. and, as such have a personal knowledge of the facts to which I hereinafter depose;

2. THAT annexed hereto and marked as "Exhibit A" to this statement is a true copy of expenditures incurred on a geophysical survey on the VINE Property;

3. THAT the said expenditures were incurred from June 5-10, 1991, for the purpose of mineral exploration on the above-noted property.

Ingo Jackisch

Ingo Jackisch
Geophysicist, Cominco Ltd.

Dated this 15 day of November, 1991
at Vancouver, B.C.

APPENDIX II

EXHIBIT "A"

STATEMENT OF EXPENDITURES

VINE PROPERTY - JUNE 5-10, 1991

1.	STAFF COSTS		
	a] J.J. Lajoie, Geophysicist		
	7 days at $515/day		3605.00
	b] I.Jackisch, Geophysicist		
	7 days at $365/day		2555.00
	c] V.R. Petryshen, Geophysicist in training		
	5 days at $109/day		545.00
	d] D.R. Nitsche, Assistant		
	4 days at $115/day		460.00
	e] D. Stenstrom		
	4 days at $85.57/day		342.28
			$7507.28
2.	OPERATING DAY CHARGES [covers cost of data compilation, drafting, and report writing]		
	3.5 days at $430/day		$1505.00
3.	EQUIPMENT RENTAL		
	UTEM SYSTEM	$1950.00	
	RENTAL TRUCK #1	390.00	
	RENTAL TRUCK #2	411.88	
			$2751.88
4.	EXPENSE ACCOUNTS		
	J.J. Lajoie	$230.25	
	I. Jackisch	508.98	
	V.R. Petryshen	240.07	
	D. Nitsche	70.75	
	D. Stenstrom	291.37	
			$1341.42
5.	MISCELLANEOUS		
	Freight	$300.00	
	Use of Copper Wire	75.00	
	Accommodation	1353.83	
			$1728.83
		INVOICE TOTAL	**$14,834.41**

LEGEND

UTEM DATA SECTIONS

ORDINATE: Amplitude scale is given in %

ABSCISSA: Station or Picket Numbers in Hundreds of Meters

SYMBOL	CHANNEL	MEAN DELAY TIME [30 HZ]
|	1	12.8 ms
/	2	6.4
\	3	3.2
□	4	1.6
Σ	5	0.8
Δ	6	0.4
7	7	0.2
X	8	0.1
△	9	0.05
◇	10	0.025

DESCRIPTION OF INTERPRETATION SYMBOLS

Superscript indicates depth to top {S shallow 0-50m {M moderate 50-150m {D deep >150m

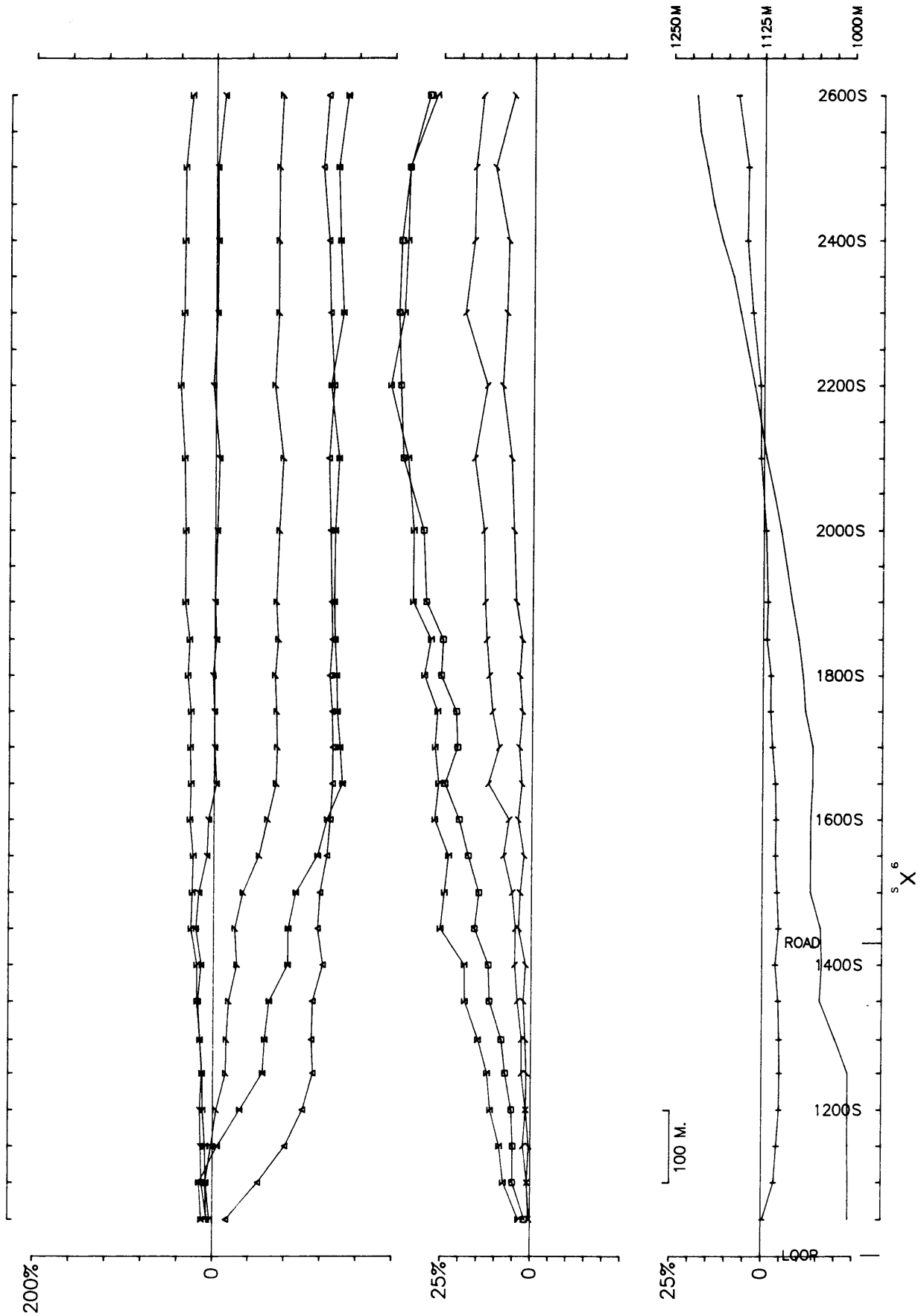
Superscript indicating latest anomalous channel

s 2
X — Axis of crossover conductor
A1

Conductor Name [for major features only]

Resistivity Contact [arrow points in direction of low resistivity zone]

R Reverse crossover conductor

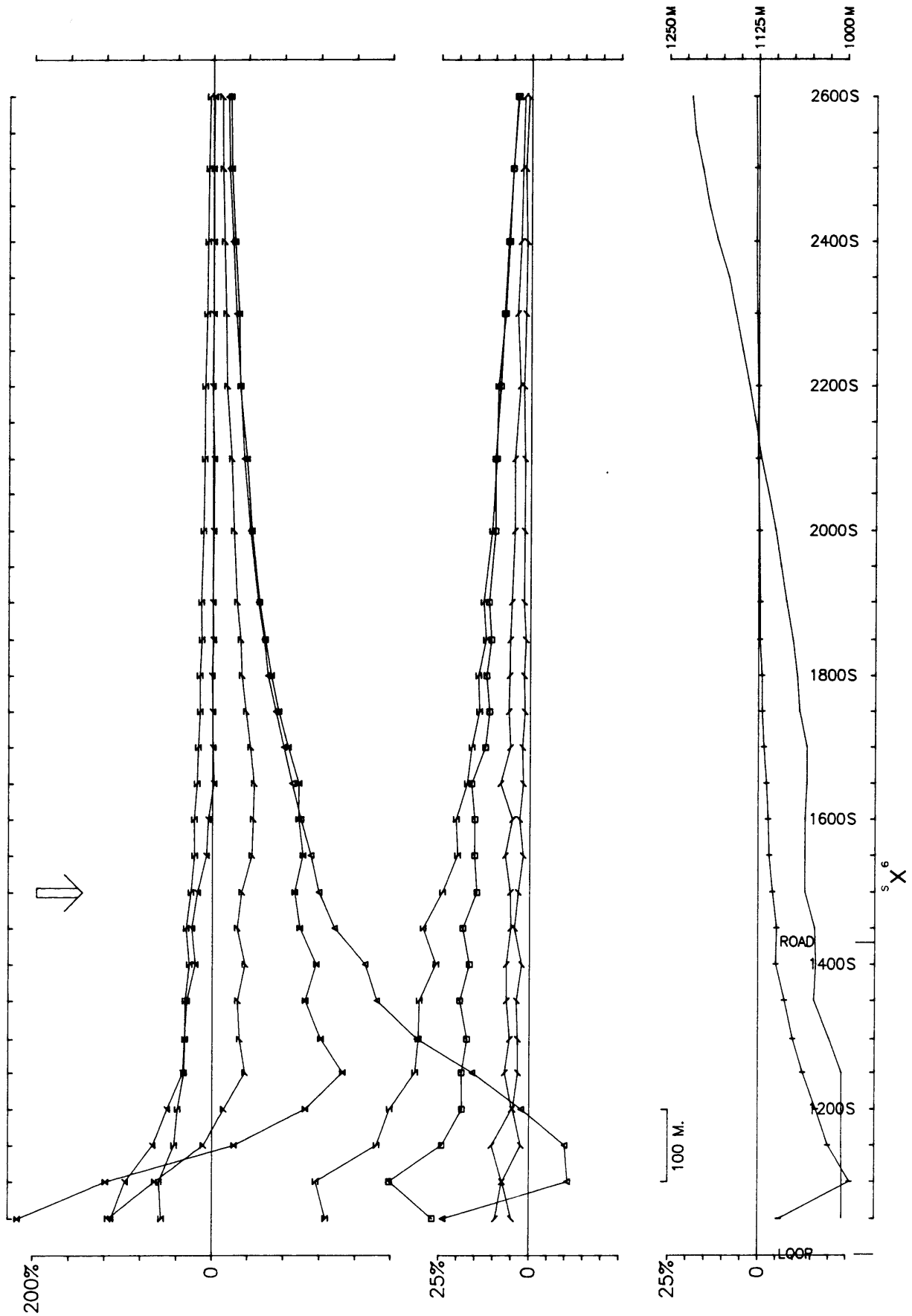


VINE 91 (SW SIDE) COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 1 Line: 0E

Ch1 reduced. Ch1 normalized. Totals:P- 1550M./L- 1550M. Line Azim.: 210 . Rx Label: 0

D.S. I

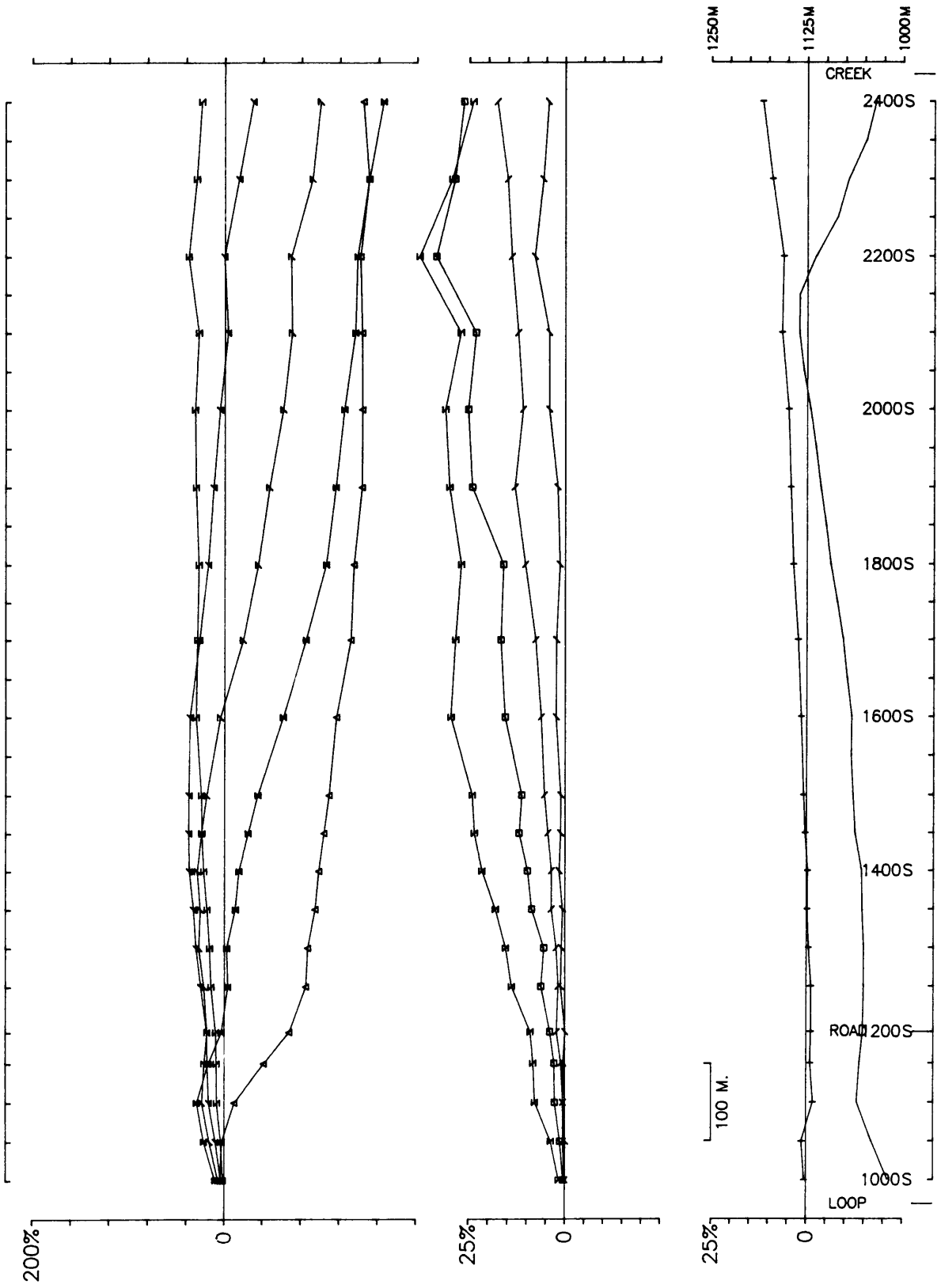


VINE 91 (SW SIDE) COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 1 Line: 0E

Ch1 reduced. Ch1 normalized. Totals:P- 1550M./L- 1550M. Line Azim.: 210 . Rx Label: 0 Point Normalized.

D.S. Ip

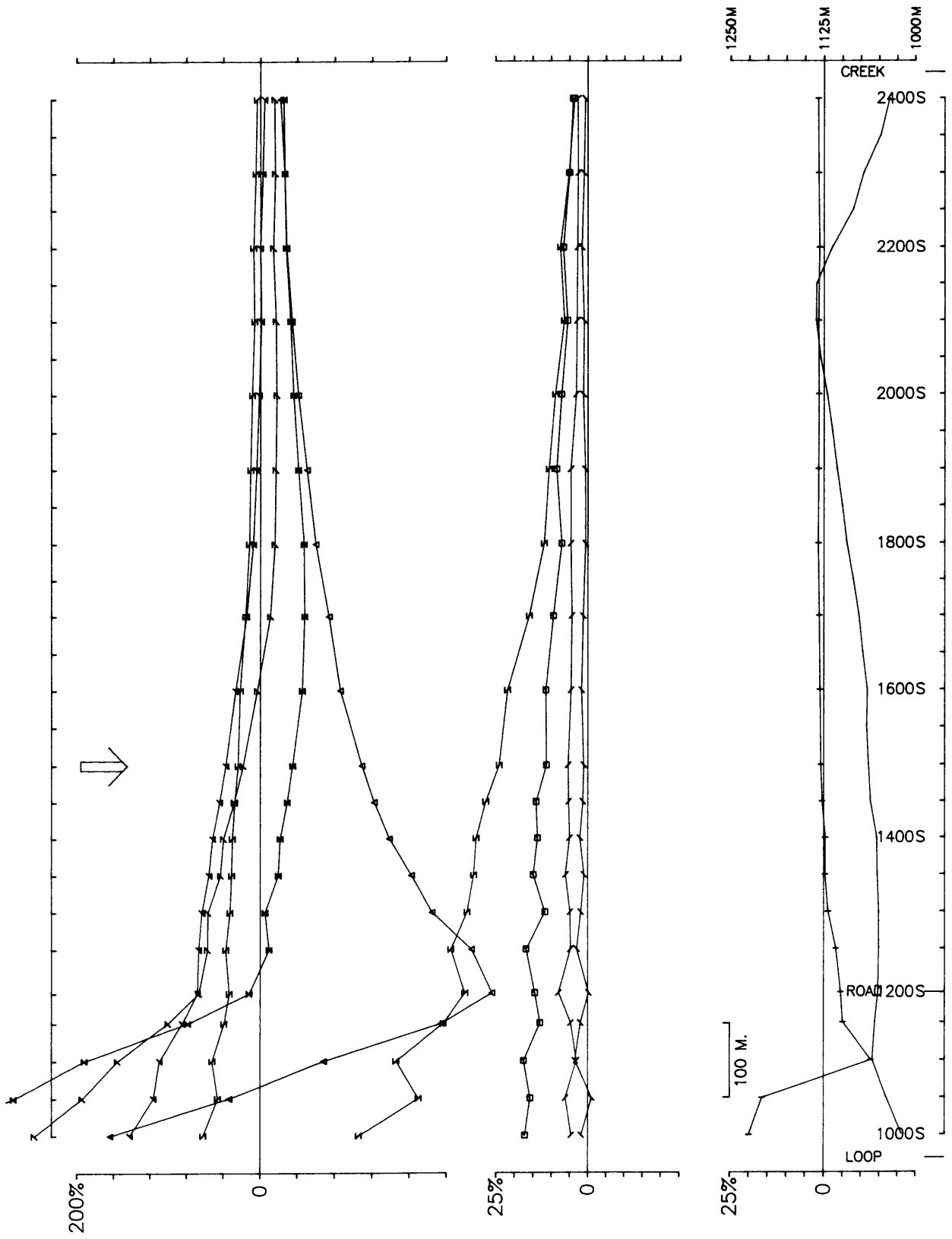


VINE 91 (SW SIDE) COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 1 Line: 500W

Ch1 reduced. Ch1 normalized. Totals:P- 1402M./L- 1402M. Line Azim.: 210 . Rx Label: 5

D.S. 2

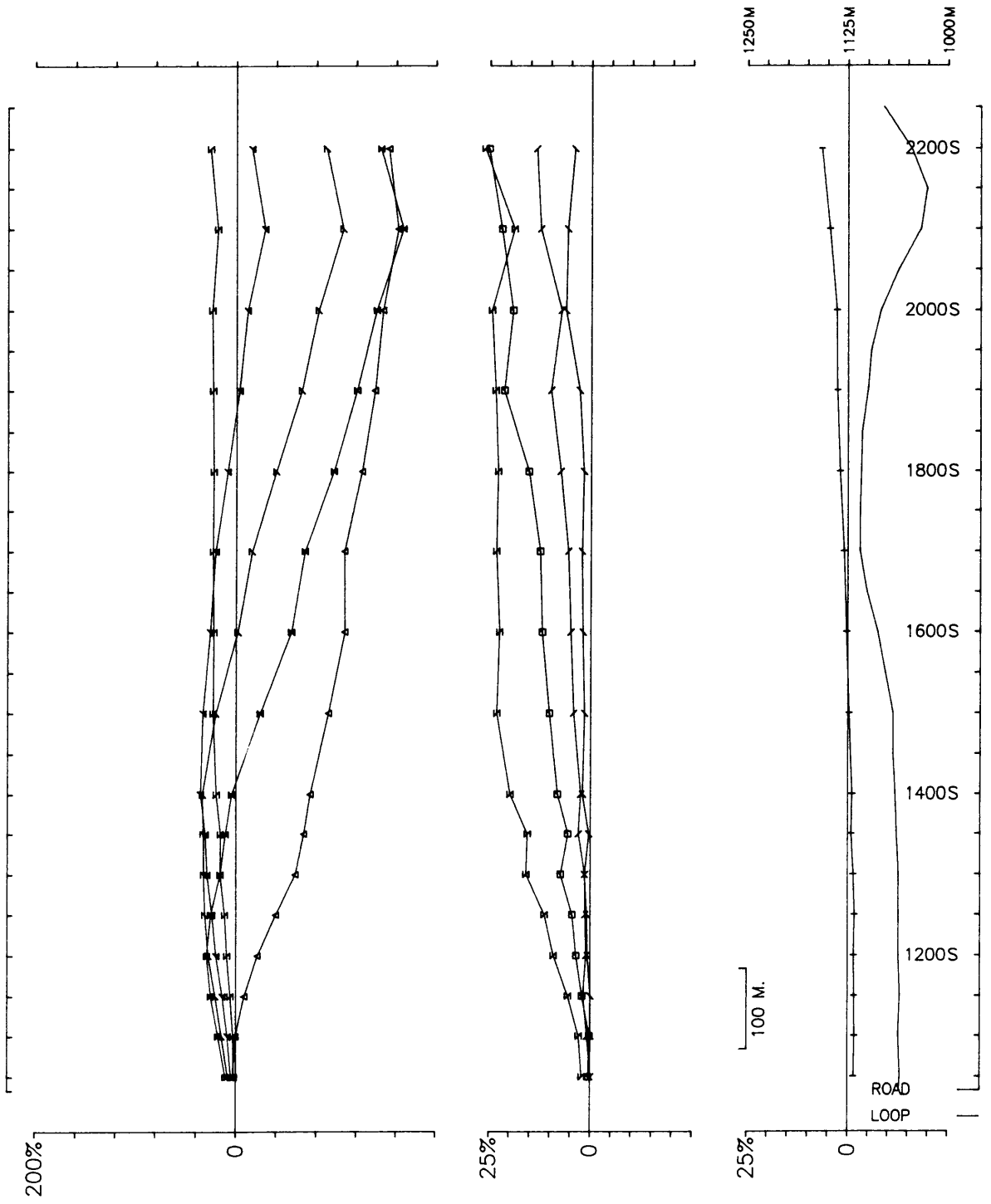


VINE 91 (SW SIDE) COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 1 Line: 500W

Ch1 reduced. Ch1 normalized. Totals:P- 1402M. /L- 1402M. Line Azim.: 210 . Rx Label: 5 Point Normalized.

D.S. 2p

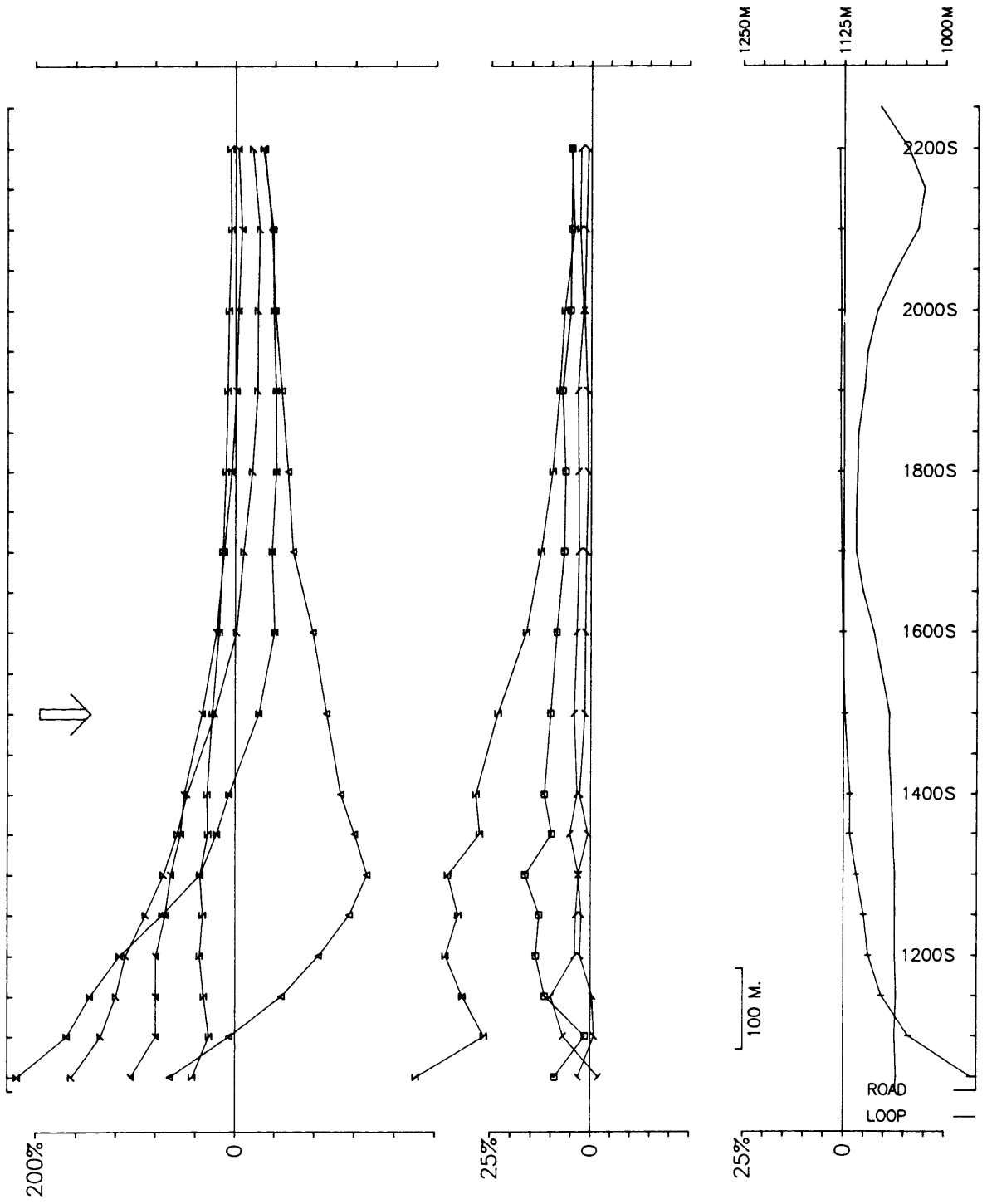


VINE 91 (SW SIDE) COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 1 Line: 1000W

Ch1 reduced. Ch1 normalized. Totals:P-1150M./L-1218M. Line Azim.: 210 . Rx Label: 10

D.S. 3

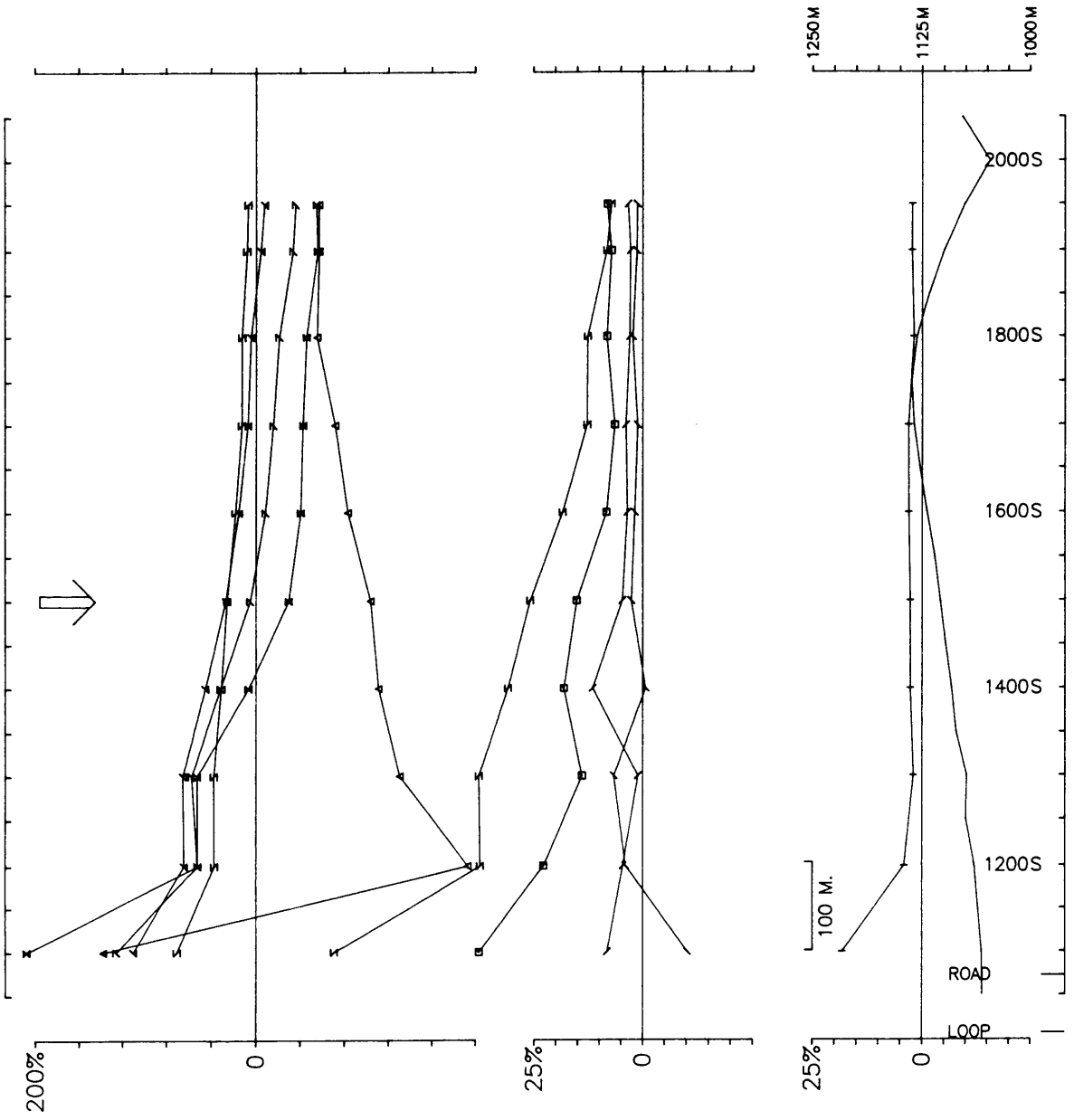


VINE 91 (SW SIDE) COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 1 Line: 1000W

Ch1 reduced. Ch1 normalized. Totals:P- 1150M. /L- 1218M. Line Azim.: 210 . Rx Label: 10 Point Normalized.

D.S. 3p

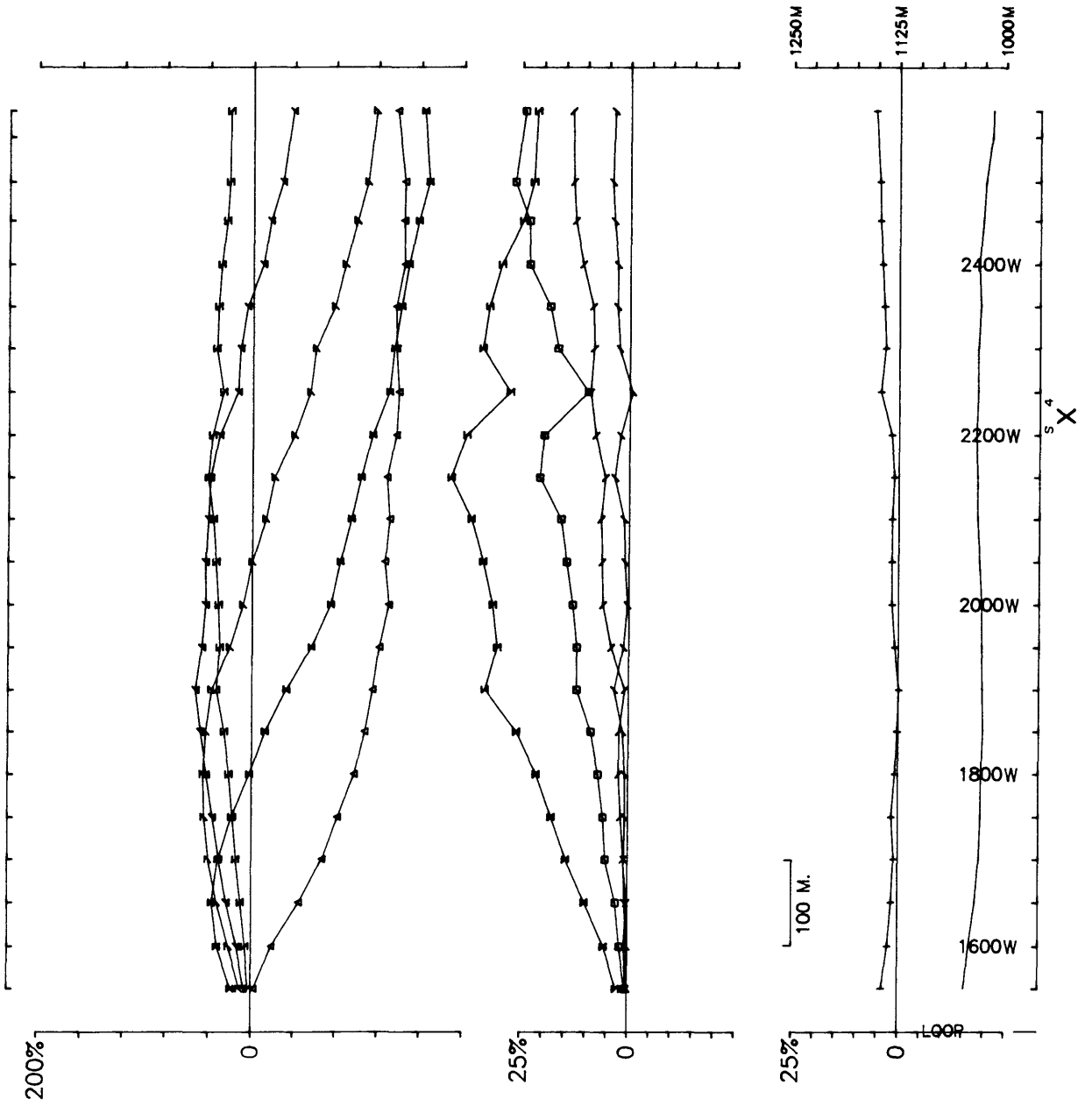


VINE 91 (SW SIDE) COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 1 Line: 1500W

Ch1 reduced. Ch1 normalized. Totals:P-851M./L-999M. Line Azim.: 210 . Rx Label: 15 Point Normalized.

D.S. 4p

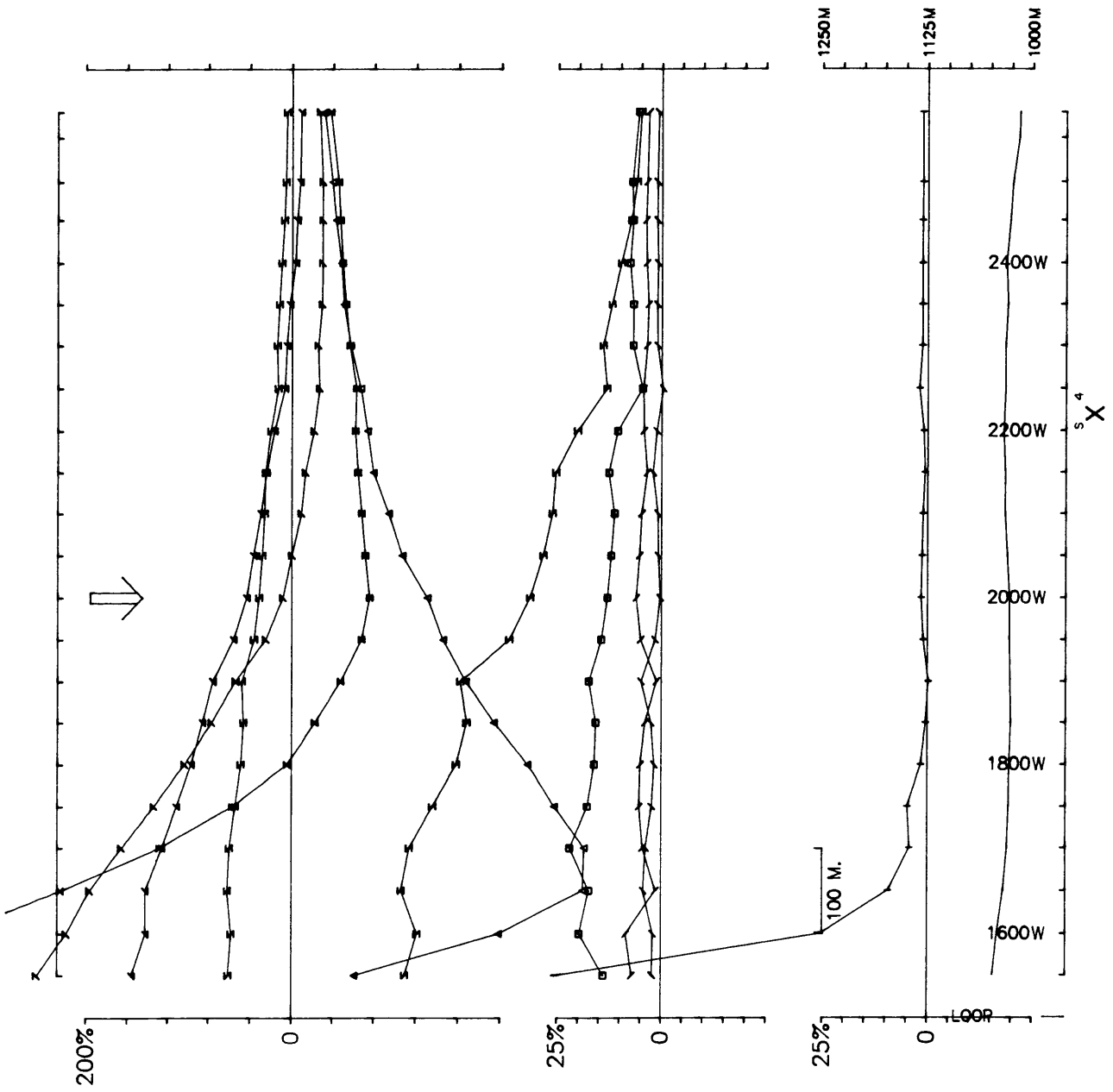


VINE 91 (NW SIDE) / COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 2 Line: 375S

Ch1 reduced. Ch1 normalized. Totals:P- 1030M. /L- 1030M. Line Azim.: 300 . Rx Label: 25

D.S. 5

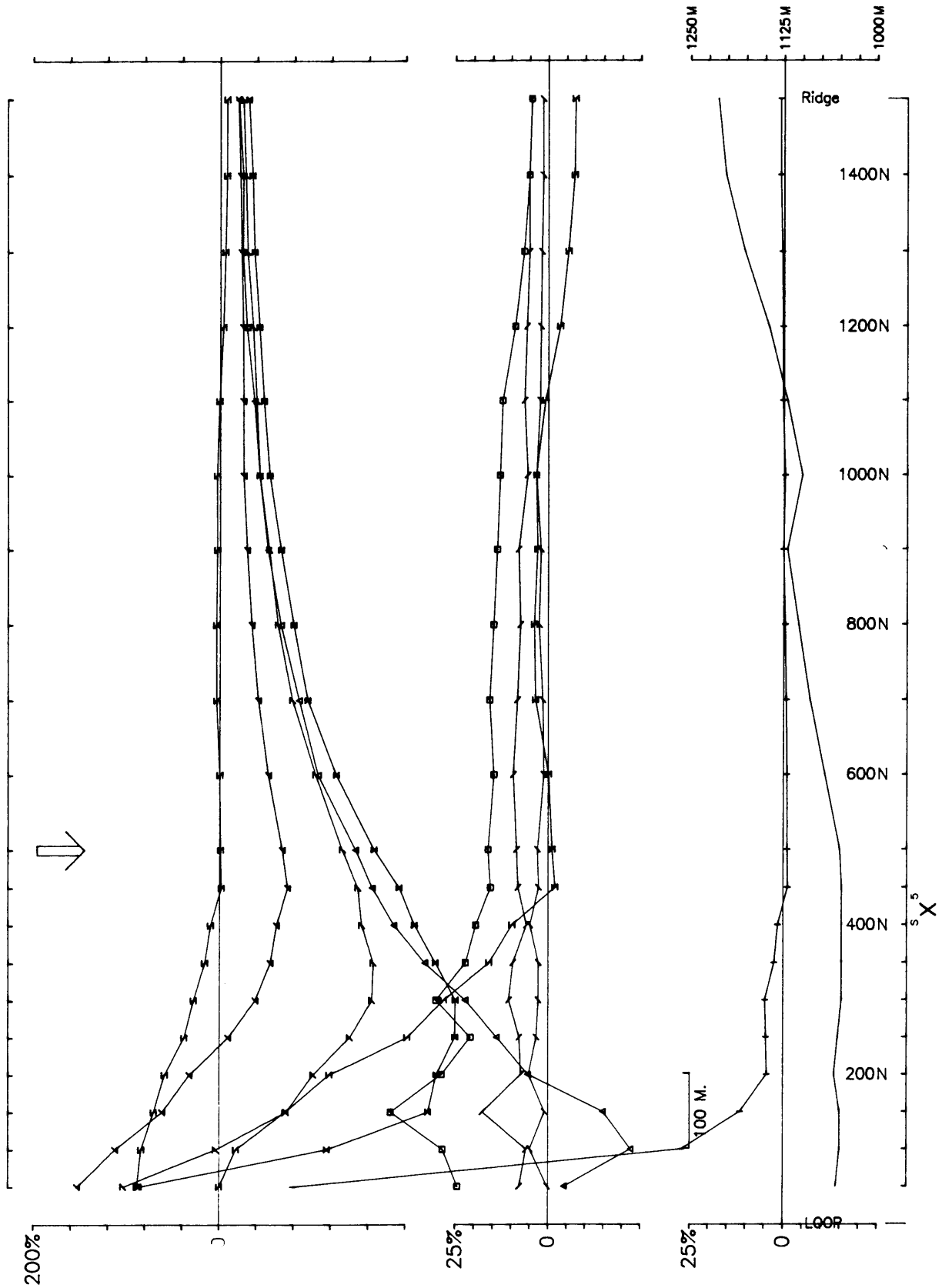


VINE 91 (NW SIDE) / COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 2 Line: 375S

Ch1 reduced. Ch1 normalized. Totals:P– 1030M. /L– 1030M. Line Azim.: 300 . Rx Label: 25 Point Normalized.

D.S. 5p

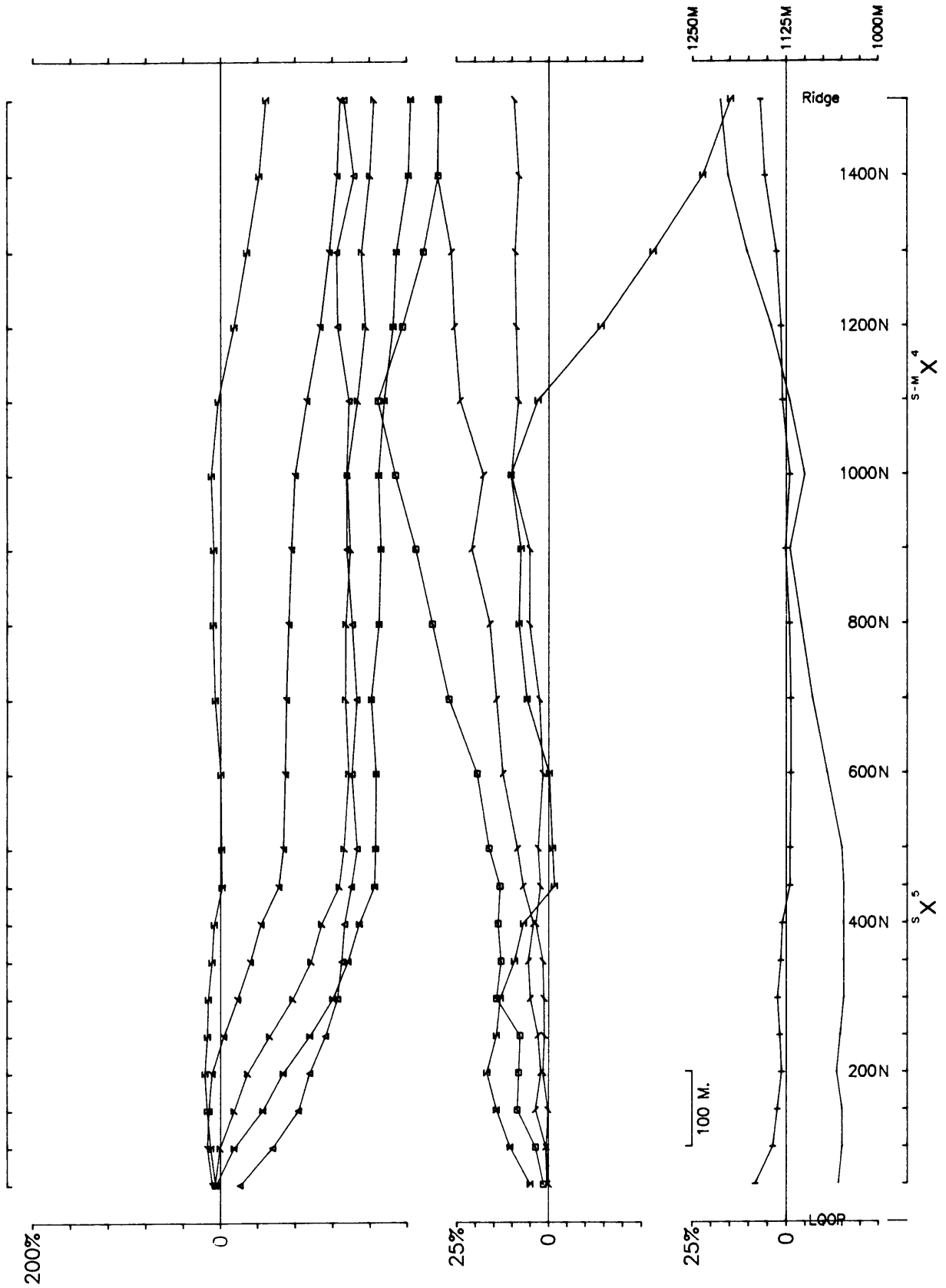


VINE 91 (NE SIDE) / COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 2 Line: 1500W

Ch1 reduced. Ch1 normalized. Totals:P- 1453M. /L- 1453M. Line Azim.: 0 . Rx Label: 27 Point Normalized.

D.S. 6p

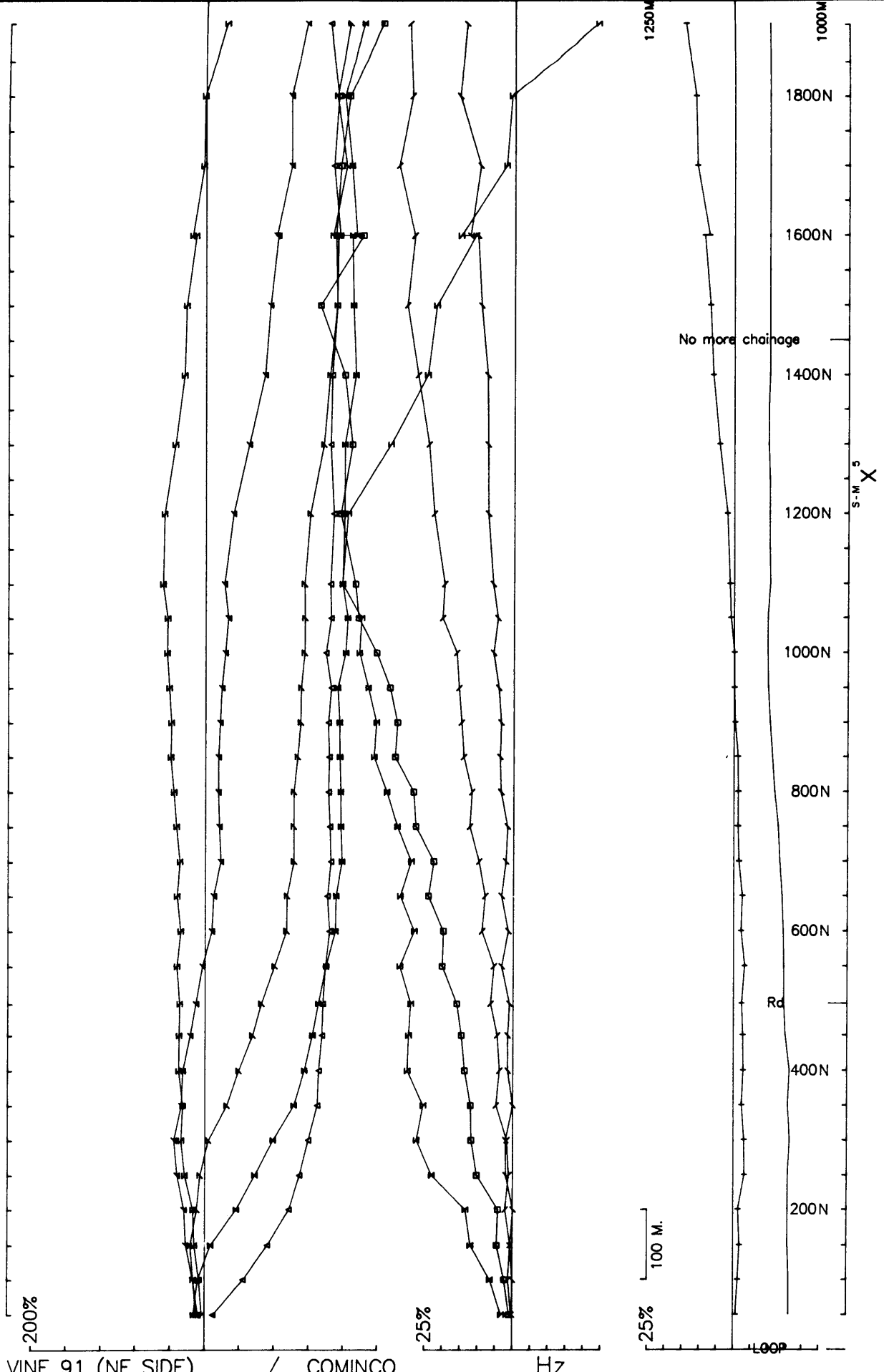


VINE 91 (NE SIDE) / COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 2 Line: 1500W

Ch1 reduced. Ch1 normalized. Totals:P-1453M./L-1453M. Line Azim.: 0 . Rx Label: 27

D.S. 6



VINE 91 (NE SIDE) / COMINCO

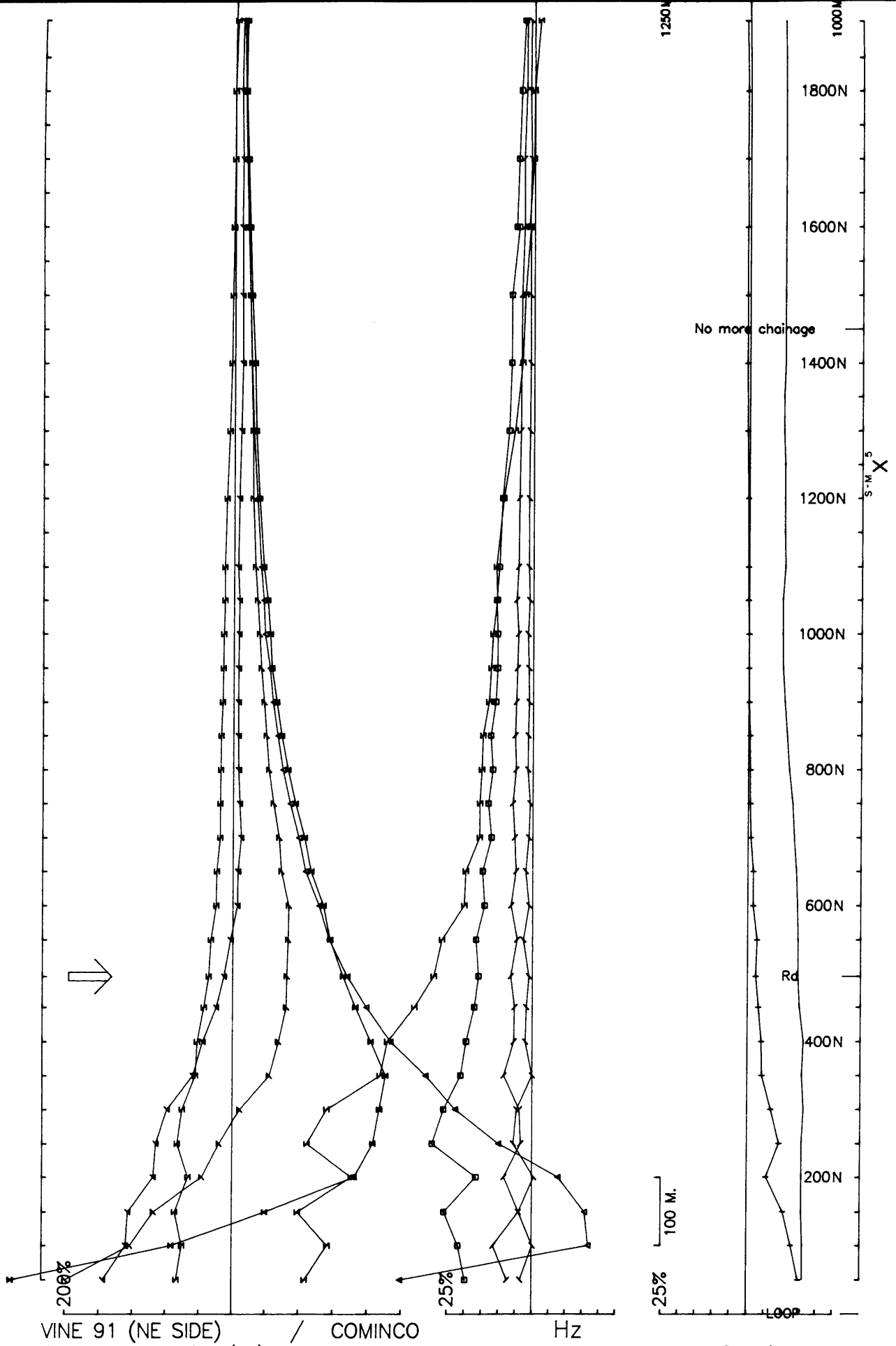
Hz

Op: JJL & IJ Freq(Hz): 30.974

Loop: 2 Line: 1000W

Ch1 reduced. Ch1 normalized. Totals:P- 1850M. /L- 1850M. Line Azim.: 30 . Rx Label: 30

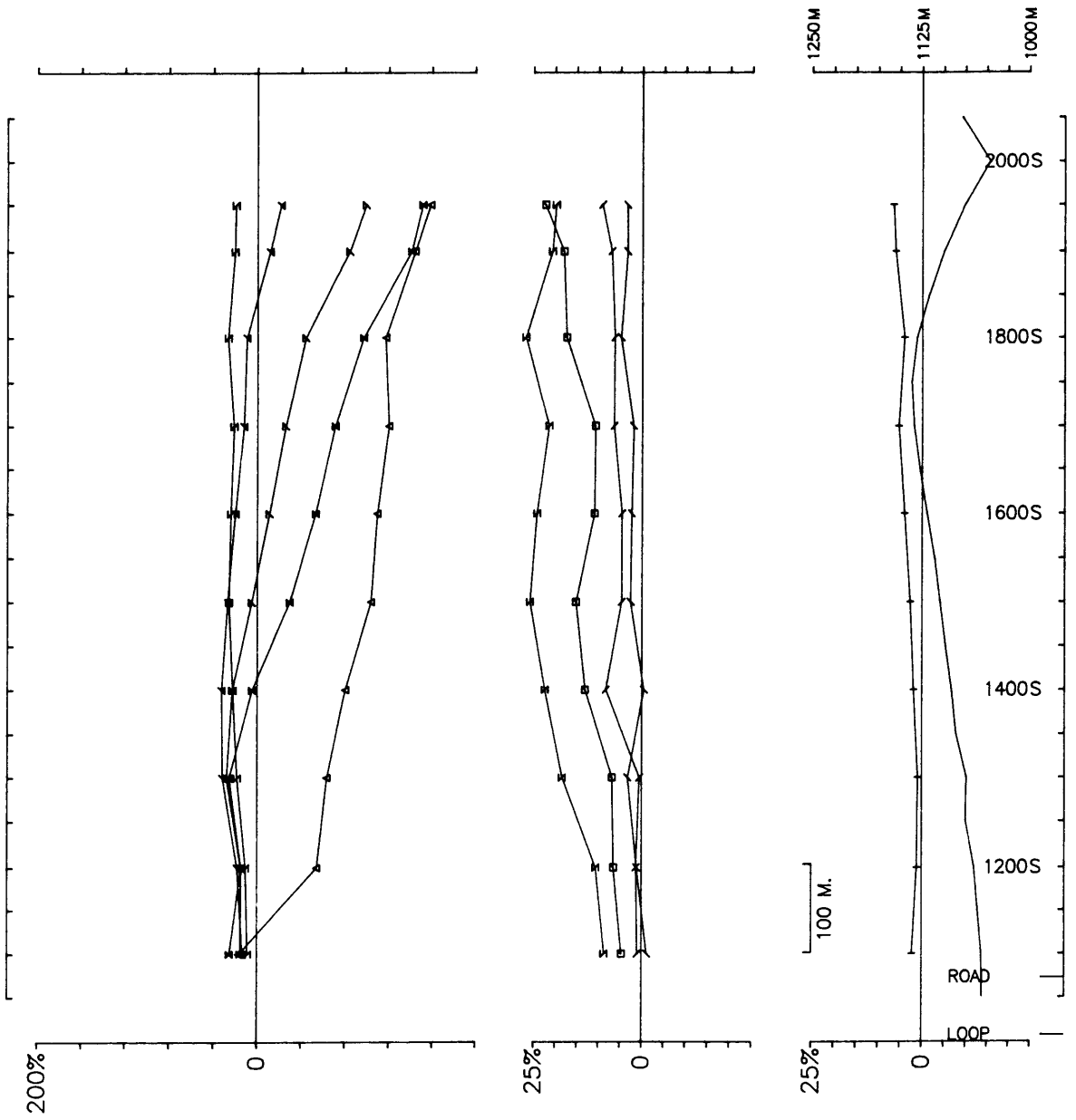
D.S. 7



Op: JJL & IJ Freq(Hz): 30.974 Loop: 2 Line: 1000W

Ch1 reduced. Ch1 normalized. Totals:P– 1850M. /L– 1850M. Line Azim.: 30 . Rx Label: 30 Point Normalized.

D.S. 7p

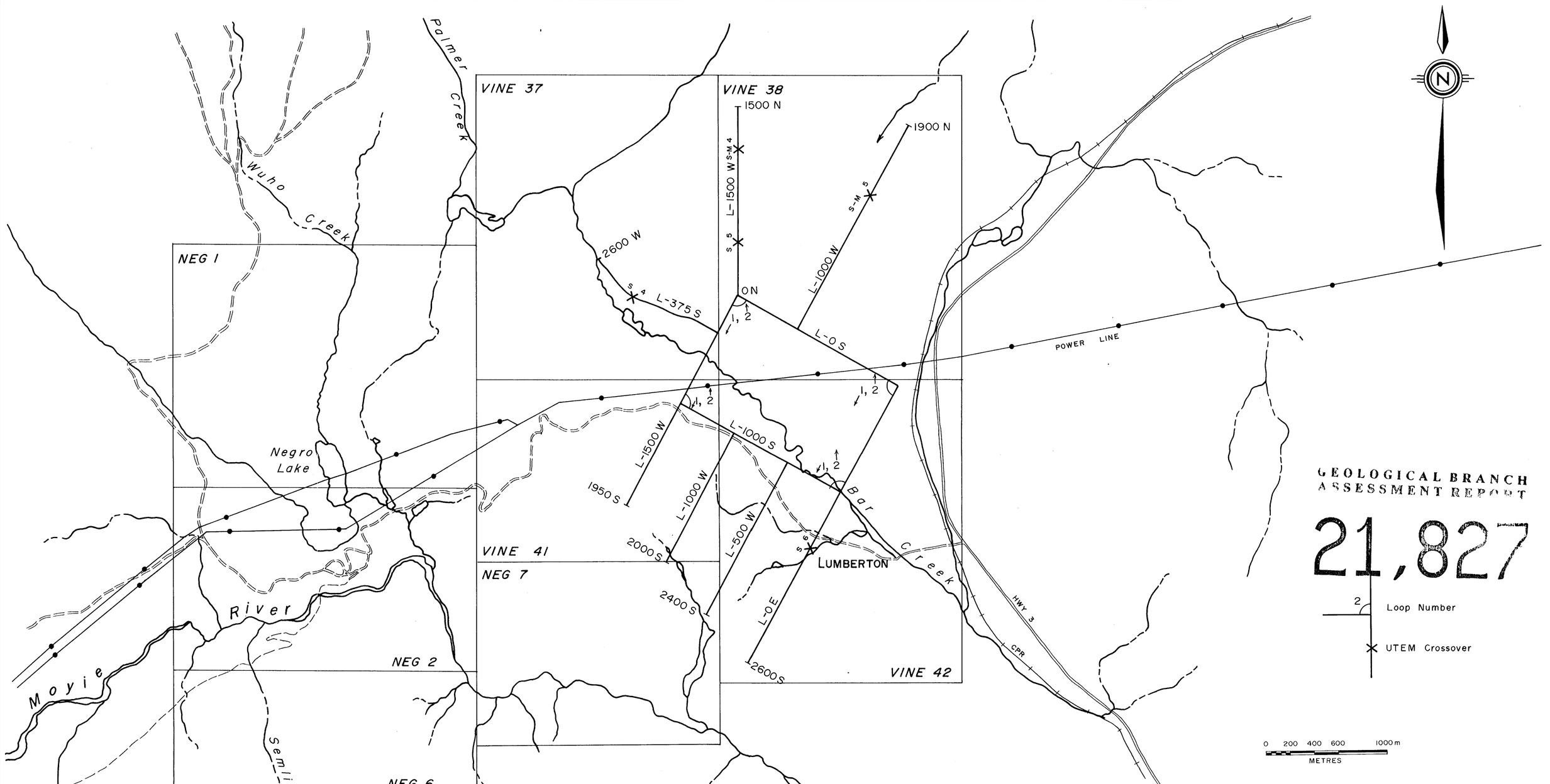


VINE 91 (SW SIDE) COMINCO Hz

Op: JJL & IJ Freq(Hz): 30.974 Loop: 1 Line: 1500W

Ch1 reduced. Ch1 normalized. Totals:P-851M./L-999M. Line Azim.: 210 . Rx Label: 15

D.S. 4



VINE PROPERTY

Commaco

N.T.S. 82G/5

CLAIM, GRID AND UTEM COMPILATION MAP

FT. STEELE M.D., B.C.

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

Scale: 1:20,000 | Date: NOV. 1991 | Plate: 811-71-2