COMINCO LTD.

EXPLORATION

NTS: 82F/1

SHA EAST 1988

UTEM SURVEY

FORT STEELE M.D., B.C.

- ASSESSMENT REPORT -

Latitude : 49°06'N

Longitude : 116°17'W

Field Work Performed by : I. Jackisch & M. A. Price
between August 28 and September 4, 1988

Claim Owner and Operator : COMINCO LTD.

Claims : SHA 29 to 32

GEOLOGICAL BRANCH
ASSESSMENT REPORT

NOVEMBER 1988

18,164

Michael A. Price

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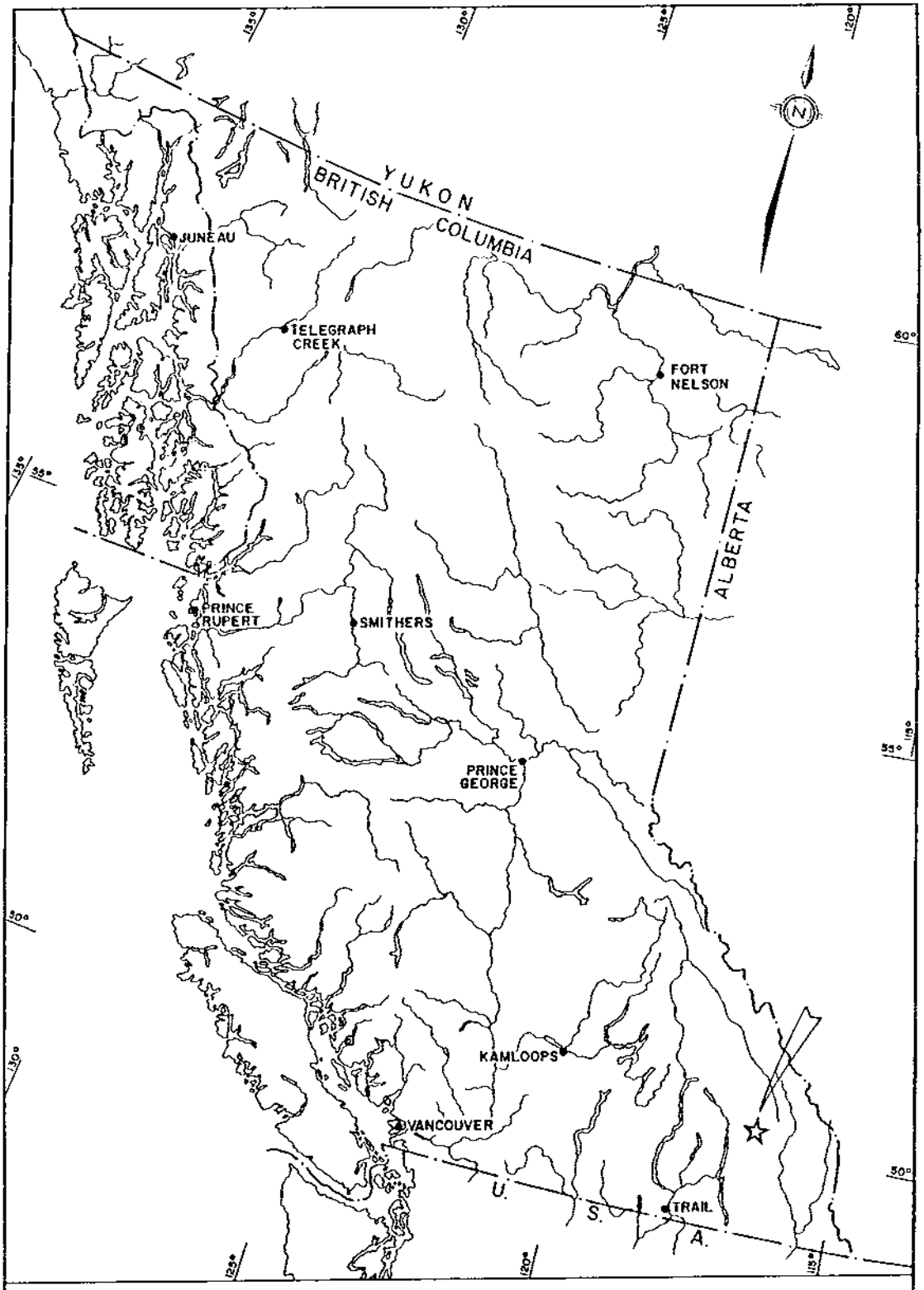

SHA (East) -1988-

NTS 82-F/1

0 100 200 300 400 500 Km.

Drawn by:		Traced by: e. m. b.	
Revised by	Date	Revised by	Date

Property Location Map

Scale: 1 : 6,370,000 | Date: DECEMBER 1988 | Plate: 346-88-1

NCI 112A CL

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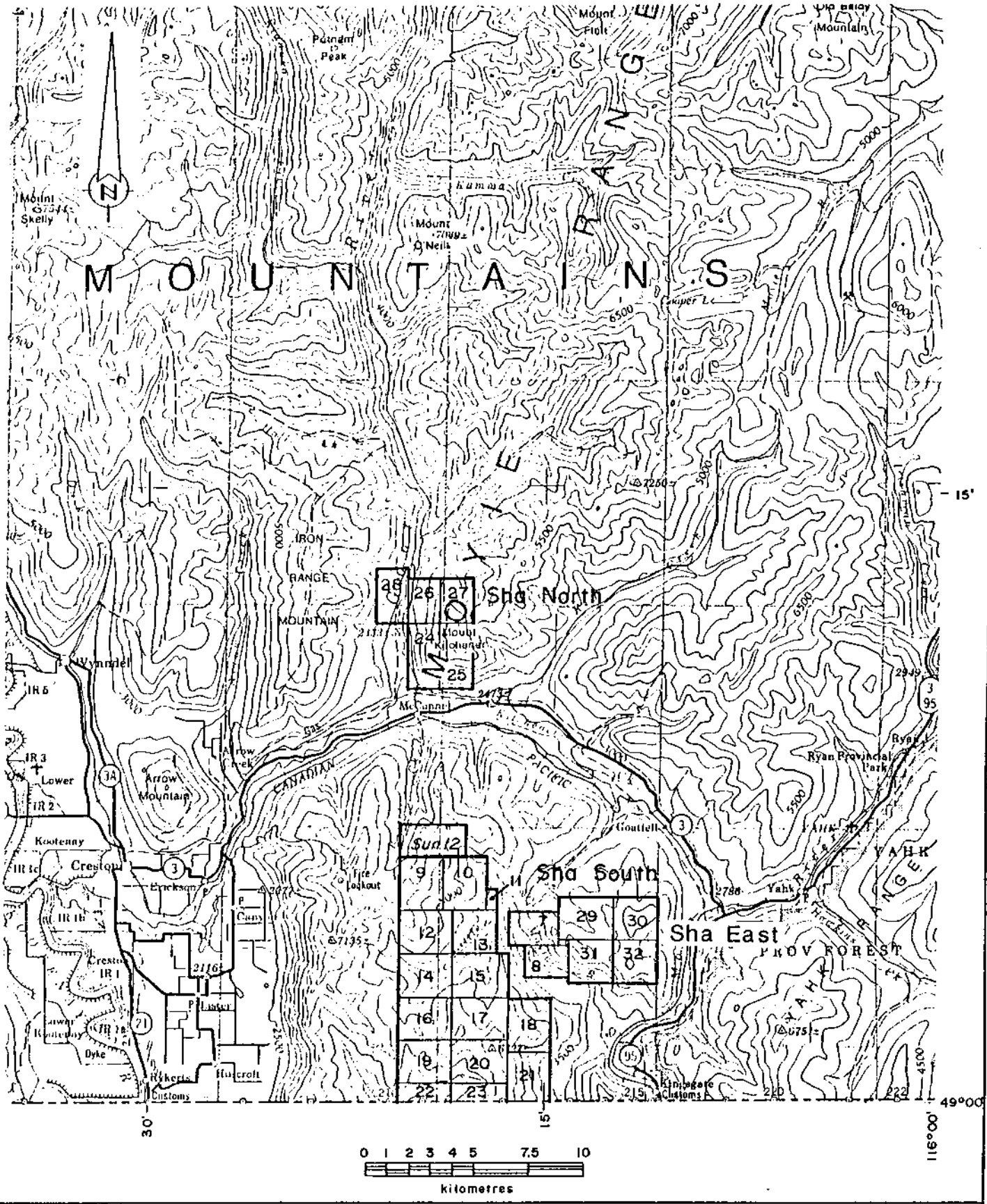

SHA PROPERTY

Comince

rawn by:		Traced by:	
Revised by	Date	Revised by	Date

CLAIM LOCATION MAP

Scale: 1:250,000 | Date: NOVEMBER 1988 | Plate 346-88-1a

COMINCO LTD.

EXPLORATION WESTERN DISTRICT

NTS: 82F/1

SHA EAST 1988
UTEM SURVEY
FORT STEELE M.D., B.C.

- ASSESSMENT REPORT -

INTRODUCTION

During the period of August 28 to September 4, 1988, a 21.1 km UTEM survey was carried out by a Cominco geophysical crew on the SHA EAST Property. This property consists of claims SHA 29, 30, 31 and 32.

This region has a favourable geological environment for Pb-Zn sulphides. The region is underlain by rocks of the Aldridge Formation. In particular, there is an interest in the Pb-Zn potential associated with the Lower/Middle Aldridge contact.

LOCATION AND ACCESS

The SHA EAST Property is approximately 35 km east of Creston and 15 km west of Yahk, B.C. Access to the property is provided by Caroll Creek road off of Highway 3.

GEOPHYSICAL SURVEY

The field work was carried out from August 22 to September 4, 1988. Two loops were used to survey a total of 21.1 km of UTEM data. The survey was done on a cut grid at 50 metre station intervals along lines that were 200 metres apart.

In 1987, a reconnaissance UTEM survey was conducted on the SHA property. In 1988, the SHA East property was one of the areas chosen for a more detailed geological and geophysical study. The purpose of the UTEM survey was to locate and detail the conductive characteristics of the property.

DESCRIPTION OF UTEM SYSTEM

UTEM is an acronym for "University of Toronto ElectroMagnetometer". The system was developed by Dr. Y. Lamontagne (1975) while he was a graduate student of that University.

The field procedure consists of first laying out a large loop of single strand insulated wire and energizing it with current from a transmitter which is powered by a 1.7 kW motor generator. The loop is generally square shaped, wherever possible, with sides between 500 metres and 1,500 metres long. In this survey, the loop dimension was 1,500 m x 1,000 m. Survey lines are generally oriented perpendicular to one side of the loop and surveying can be performed both inside and outside the loop. The field procedure is similar to Turam, a better known electromagnetic surveying method.

The transmitter loop is energized with a precise triangular current waveform at a carefully controlled frequency (30.9 Hz for this survey). The receiver system includes a sensor coil and backpack portable receiver module which has a digital recording facility on cassette magnetic tape. The time synchronization between transmitter and receiver is achieved through quartz crystal clocks in both units which must be accurate to about one second in 50 years.

The receiver sensor coil measures the vertical magnetic component of the electromagnetic field and responds to its time derivative. Since the transmitter current waveform is triangular, the receiver coil will sense a perfect square wave in the absence of geologic conductors. Deviations from a perfect square wave are caused by electrical conductors which may be geologic or cultural in origin. The receiver stacks any pre-set number of cycles in order to increase the signal to noise ratio.

The UTEM receiver gathers and records 9 channels of data at each station. The higher number channels (7-8-9) correspond to short time or high frequency while the lower number channels (1-2-3) correspond to long time or low frequency. Therefore, poor or weak conductors will respond on channels 9, 8, 7 and 6. Progressively better conductors will give responses on progressively lower number channels as well. For example, massive, highly conducting sulphides or graphite will produce a response on all nine channels.

The UTEM receiver records data digitally on a cassette. This tape is played back into a computer at the base camp. The mini computer processes the data and controls the plotting on a small (11" x 15") graphics plotter. Data are portrayed as profiles of each of the nine channels, shown for each survey line of each transmitter loop. These profiles and an interpretive plan are appended to this report.

The magnetic field amplitudes from both the transmitter loop (primary field) and from the electric currents induced in the ground (secondary field) vary considerably from the beginning of a line (near the

transmitter loop) to the end of the survey line (far away from the transmitter loop). In order to present such data, a normalizing scheme must be used. In this survey, the primary field from the loop is used for normalizing and presenting the data in two ways.

1. Continuously normalized plots.

This is the standard normalization scheme.

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) For the remaining channels (n=2 to 9)

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

where Ch.n is the observed amplitude of Channel n (2 to 9).

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 line, that is, only that magnetic field from the currents induced in the ground.

a) For Channel 1:

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

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 9) are Channel 1 reduced and Channel 1 normalized:

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

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 containing anomalies in order to help interpretation by providing a different perspective to the data. In this survey, all the Data Section numbers containing a "p" are point normalized plots.

The above normalizing procedures result in chaining errors displayed in Channel 1 only, since all other channels are normalized to Channel 1.

INTERPRETATION

Both crossover and contact responses were observed in the UTEM data. Plate 346-88-2 is a compilation of the UTEM anomalies depicted on the Data Sections (D.S. 1 - D.S. 12p).

The crossover responses are indicative of poor conductors with responses only in the early time channels (9, 8, 7 and 6). All appear to be due to localized and shallow conductive sources. The contact responses indicate two distinctive regions of slightly higher conductivity. One is the area to the west of about grid station 1800E, running parallel to the loop front. The second is a region between Stations 2500E and 3500E and also running near parallel to the loop front. These two regions, as was with the crossovers, show a weak conductivity and are relatively shallow. The late time channels (5, 4, 3 and 2) indicate that at depth, the property is fairly resistive and uniform. The one apparent change is that the conductivity appears to be increasing to the west.

CONCLUSIONS

During the 21.1 km UTEM survey, no conductors of economic interest were found. The results of the survey indicated a number of shallow and weak conductors and two regions of relatively high (but still poor) conductivity.

Report by:

M. A. Price, B.Sc.
Geophysicist, Cominco Ltd.

Distribution:

Mining Recorder	(2)
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Kootenay Expl.	(1)
Administration	(1)
Geophysics File	(1)

Endorsed for Release:

J. M. Hamilton, P.Eng.
Manager, Exploration
Western Canada
Cominco Ltd.

A P P E N D I X I

IN THE MATTER OF THE B.C. MINERAL ACT

AMD THE MATTER OF A GEOPHYSICAL PROGRAMME

CARRIED OUT ON THE SHA 29, 30, 31 and 32 CLAIMS

LOCATED 25 KM EAST OF CRESTON, B.C.

IN THE FT. STEELE MINING DIVISION OF THE

PROVINCE OF BRITISH COLUMBIA,

MORE PARTICULARLY

N.T.S. 82F/1

S T A T E M E N T

I, Michael A. Price, of the City of North York, in the Province of Ontario, 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 SHA 29, 30, 31 and 32 claims;

3. THAT the said expenditures were incurred between August 28th and September 4th, 1988 for the purpose of mineral exploration on the above-noted claims.

Michael A. Price, B.Sc.
Geophysicist, Cominco Ltd.

Dated this 21 day of November, 1988
at Vancouver, B.C.

A P P E N D I X II

E X H I B I T "A"

STATEMENT OF GEOPHYSICAL EXPENDITURES (1988)

SHA EAST PROPERTY

August 23 to 29, 31 to September 4, 1988

1. STAFF COSTS

a)	I. Jackisch, geophysicist 7.5 days @ $300/day	2,250.00	
b)	M.A. Price, geophysicist 9.5 days @ $275/day	2,612.50	
c)	S. Kemp, assistant 1 day @ $125/day	125.00	
d)	N. Murphy, assistant 6 days @ $100/day	600.00	
e)	P. Muir, assistant 9.5 days @ $100/day	950.00	6,537.50

2. OPERATING DAY CHARGES
Note: This charge is applied for those day on which useful data are acquired, to cover the cost of data compilation, drafting, interpretation and report.

6 days @ $350/day 2,100.00

3. EQUIPMENT RENTAL

UTEM System	9.5 days @ $150/day	1,425.00

4. EXPENSE ACCOUNTS

I. Jackisch	397.33	
M.A. Price	408.50	
S. Kemp	25.00	
N. Murphy	150.00	
P. Muir	237.50	1,218.33

Carried Forward $ 11,280.83

Carried Forward		$ 11,280.33

5. MISCELLANEOUS

Use of Radio	50.00	
Freight Charges	23.15	
Transportation: One 4x4		
8.5 days @ $40/day	340.00	
Domicile : Creston House	175.00	588.15
T O T A L		$ 11,868.98

I certify this to be a true Statement of Expenditures for the geophysical program on the SHA EAST claims in 1988.

Mike Price

Michael A. Price, B.Sc.
Geophysicist, Cominco Ltd.

A P P E N D I X III

CERTIFICATE OF QUALIFICATIONS

I, MICHAEL A. PRICE, of 35 Fourwinds Drive, in the City of North York, in the Province of Ontario, do hereby certify:

1. THAT I graduated from the University of Toronto in 1985 with a B.Sc. in Geophysics/Physics.

2. THAT I have been practising my profession for the past three years, and that I have been working with the UTEM system for these three years.

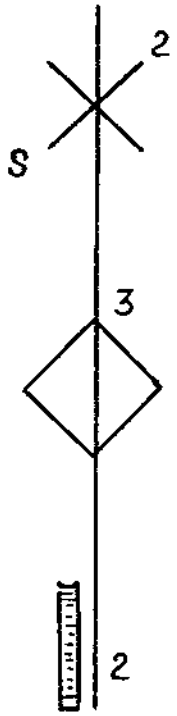
3. THAT I have been employed by Cominco Ltd. for the past four months.

Michael A. Price, B.Sc.
Geophysicist, Cominco Ltd.

NOVEMBER 1988

LEGEND

UTEM COMPILATION MAPS



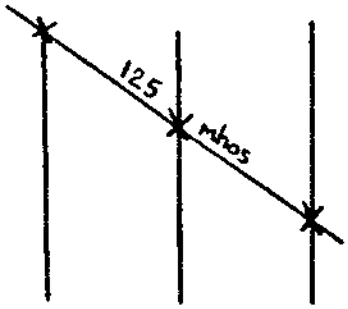
Axis of a crossover anomaly. The number indicates the latest anomalous channel.

Depth indicated by: S - Shallow (< 50 m)
M - Moderate (50-200 m)
D - Deep (> 200 m)

Axis of reversed crossover anomaly produced when a small conductor dips at less than 70° towards the transmitter. In normal crossover the positive response is towards the transmitter; reversed one, it is away from the transmitter.

Indicates a negative anomaly of width shown by the dash. The latest anomalous channel is shown. Can sometimes be confused with the negative part of a crossover anomaly.

Outline of a transmitter loop.



Conductor axis located by crossover anomalies with a conductance determination. The conductance is the interpreted conductivity x thickness of the conductor in mhos (same as Siemens).

Only the principal crossovers are indicated.

LEGEND

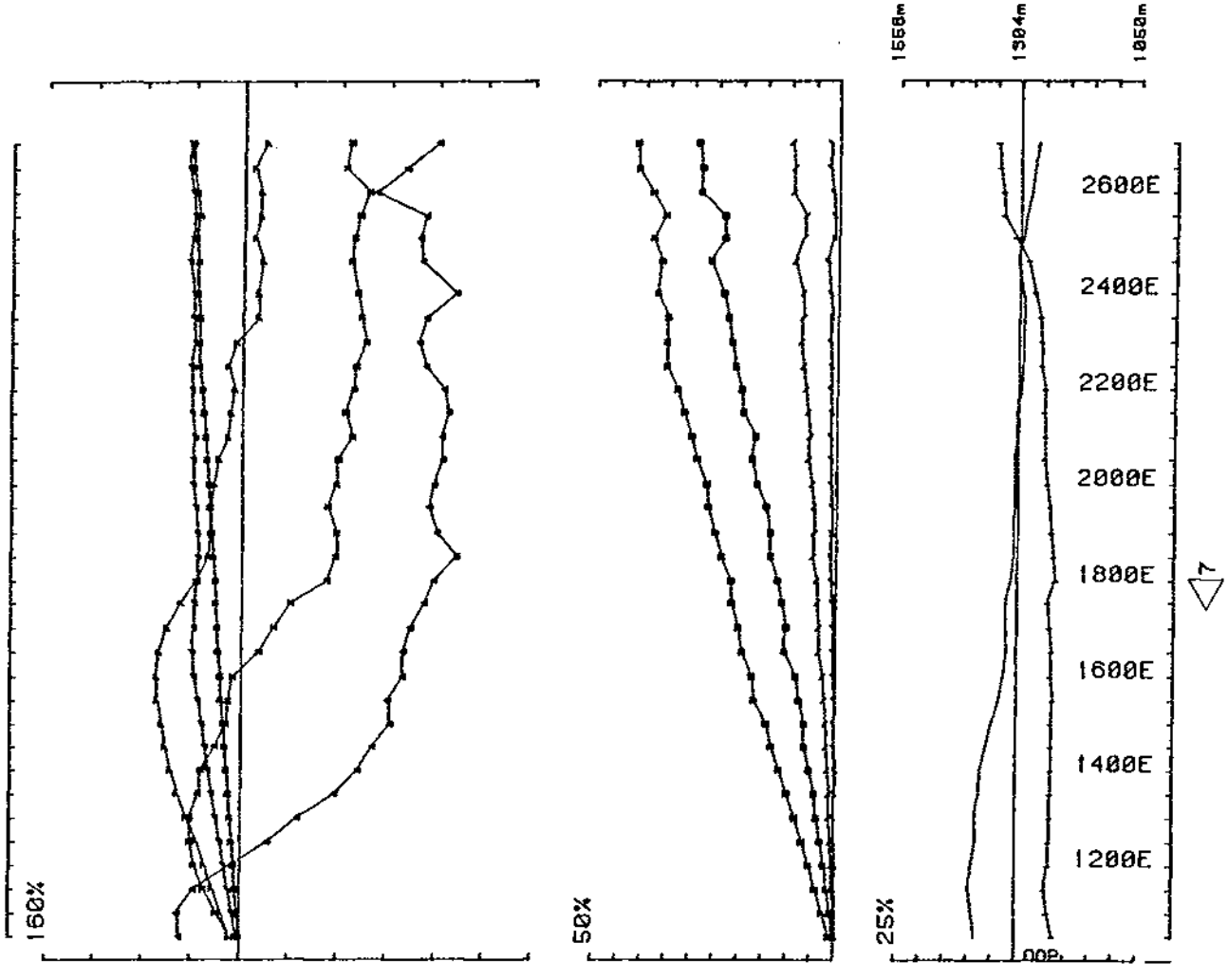
UTEM DATA SECTIONS

ORDINATE: Amplitude scale is given in %

ABSCISSA: Station or Picket Numbers in Hundreds of Meters

SYMBOL	CHANNEL	MEAN DELAY TIME	
		15 Hz	30 Hz
	1	25.6 ms	12.8 ms
	2	12.8	6.4
	3	6.4	3.2
	4	3.2	1.6
	5	1.6	0.8
	6	0.8	0.4
	7	0.4	0.2
	8	0.2	0.1
	9	0.1	0.05
	10	0.05	0.025

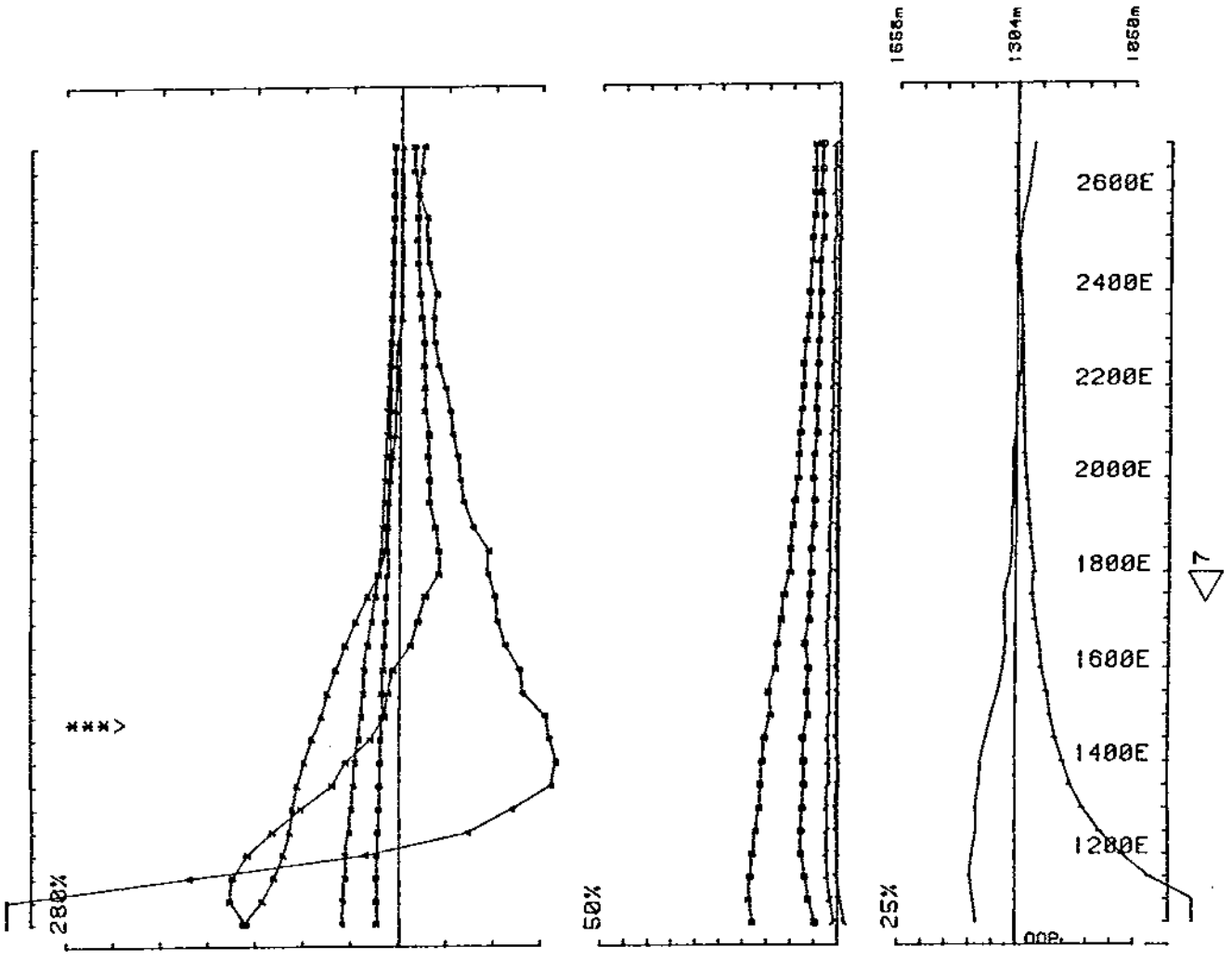
DATA SECTIONS



Area SHA EAST 88 COMINCO operator IJ MP freq(hz) 30.974

Loopno 1 Line 0N component Hz secondary Ch 1 normalized Ch 1 reduced

D.S. 1



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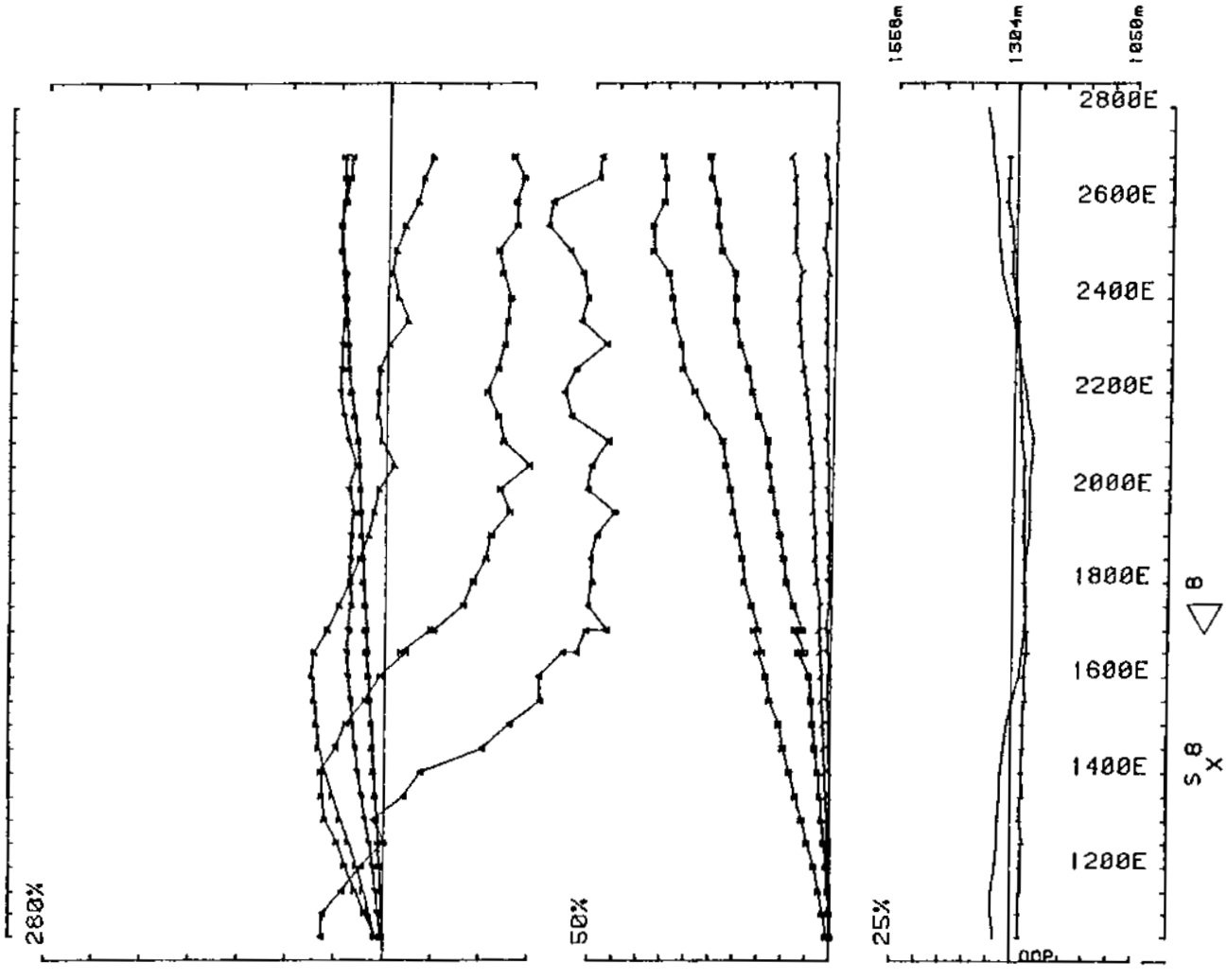
Loopno 1 Line ØN component Hz secondary Ch 1 normalized Ch 1 reduced

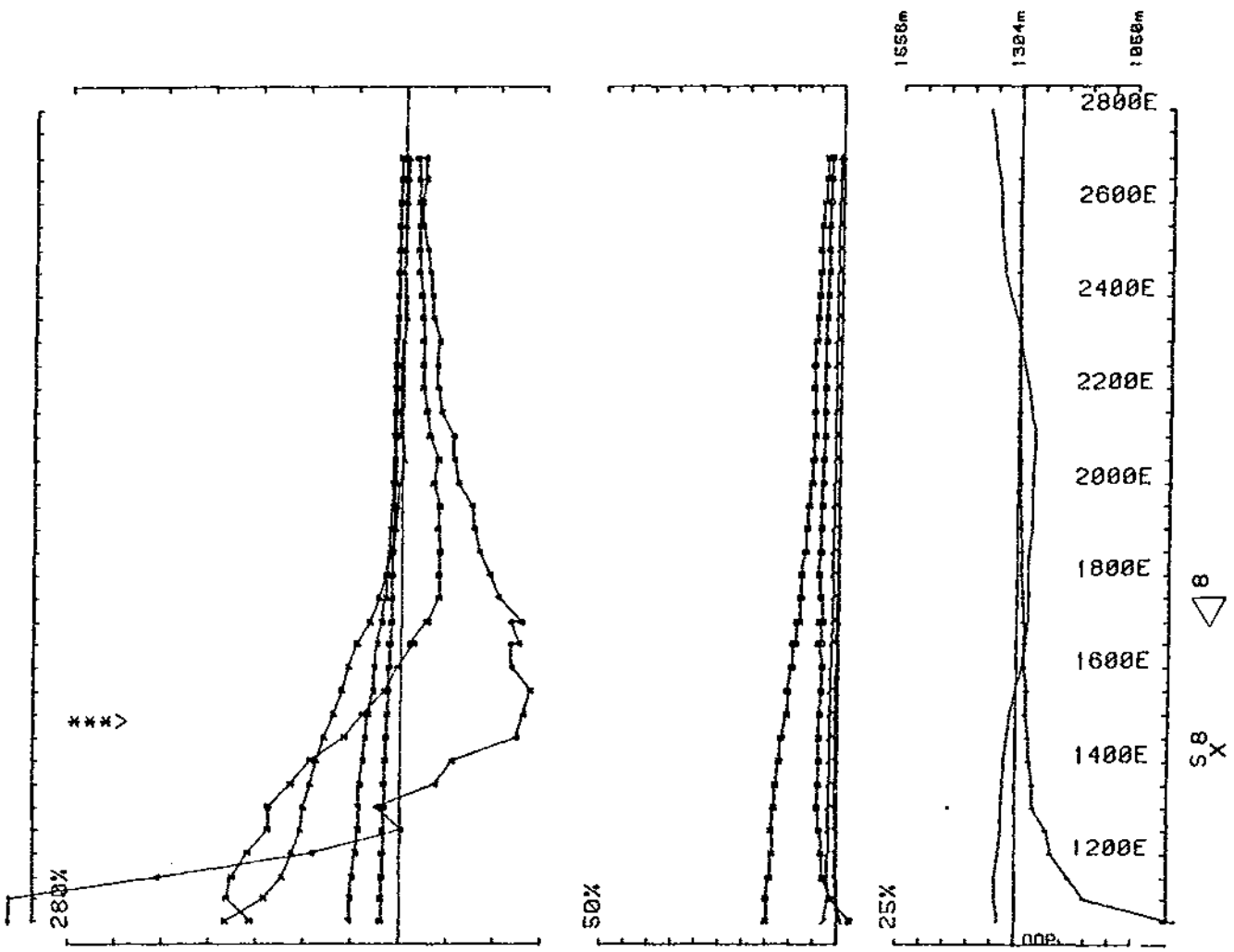
D.S. Ip



Area SHA EAST 88 COMINCO operator IJ MP freq(hz) 30.974

Loopno 1 Line 300N component Hz secondary Ch 1 normalized Ch 1 reduced

D.S. 2



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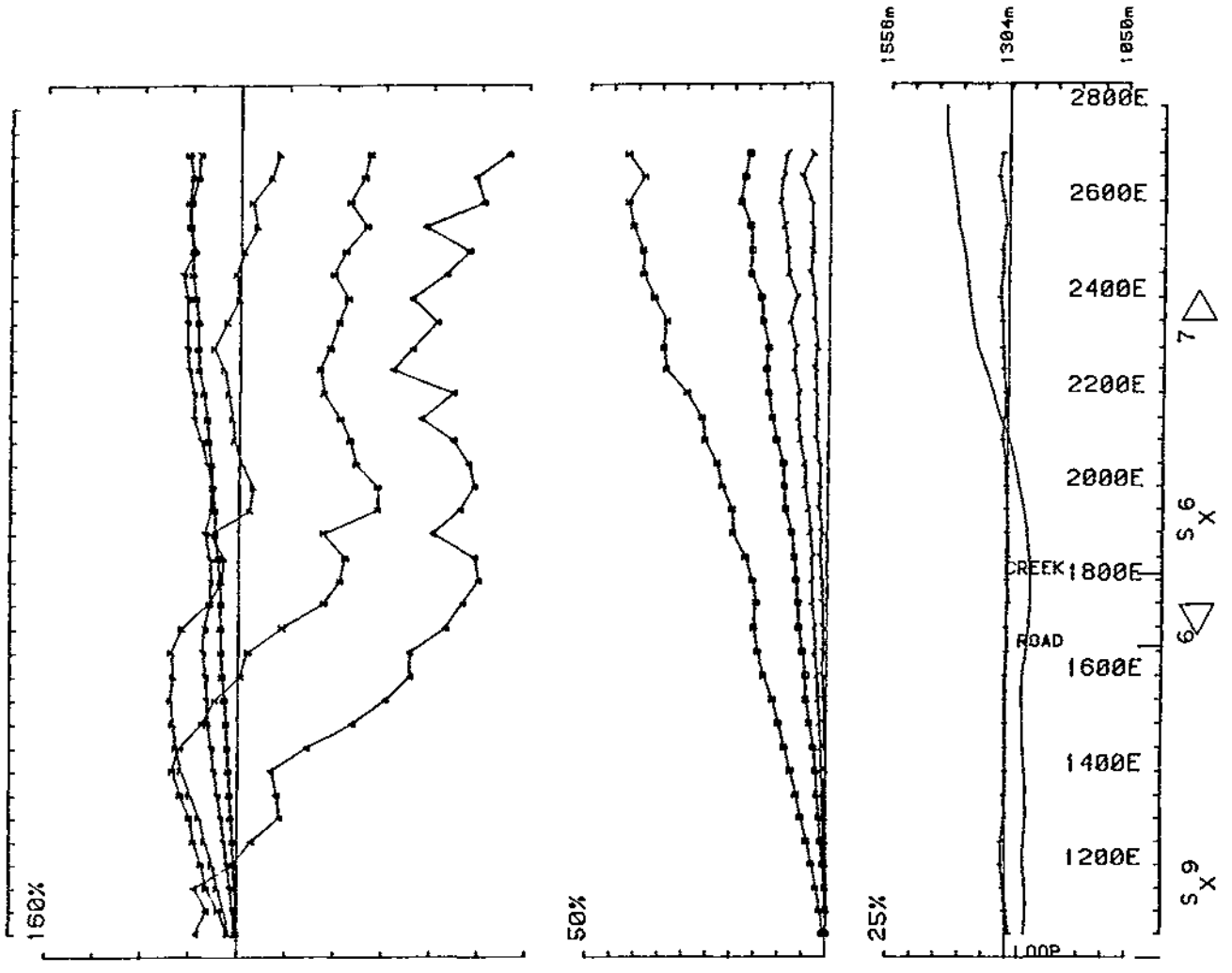
Loopno 1 Line 300N component Hz secondary Ch 1 normalized Ch 1 reduced

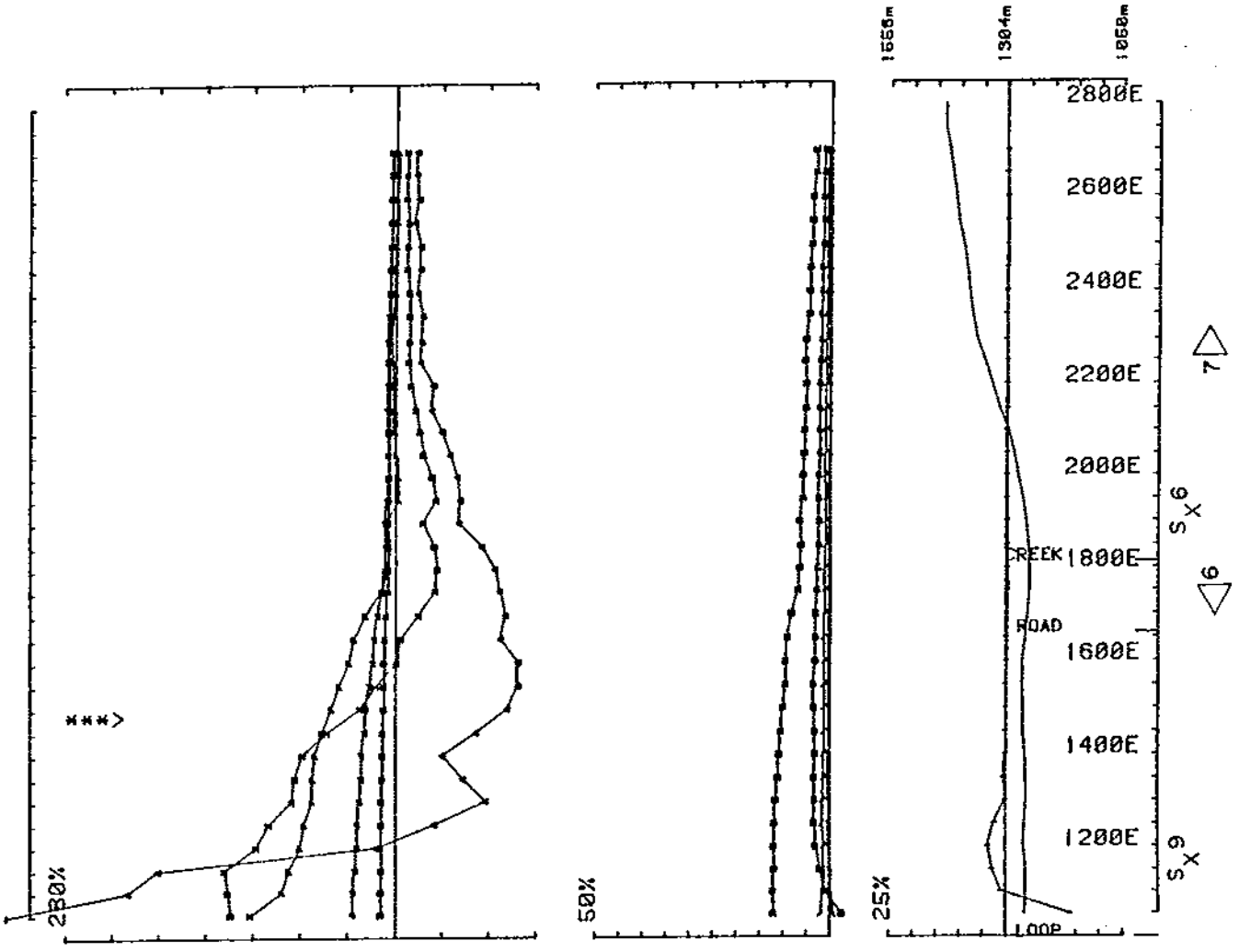
D.S. 2p



Area SHA EAST 88 COMINCO operator IJ MP freq(hz) 30.974

Loopno 1 Line 600N component Hz secondary Ch I normalized Ch I reduced

D.S. 3



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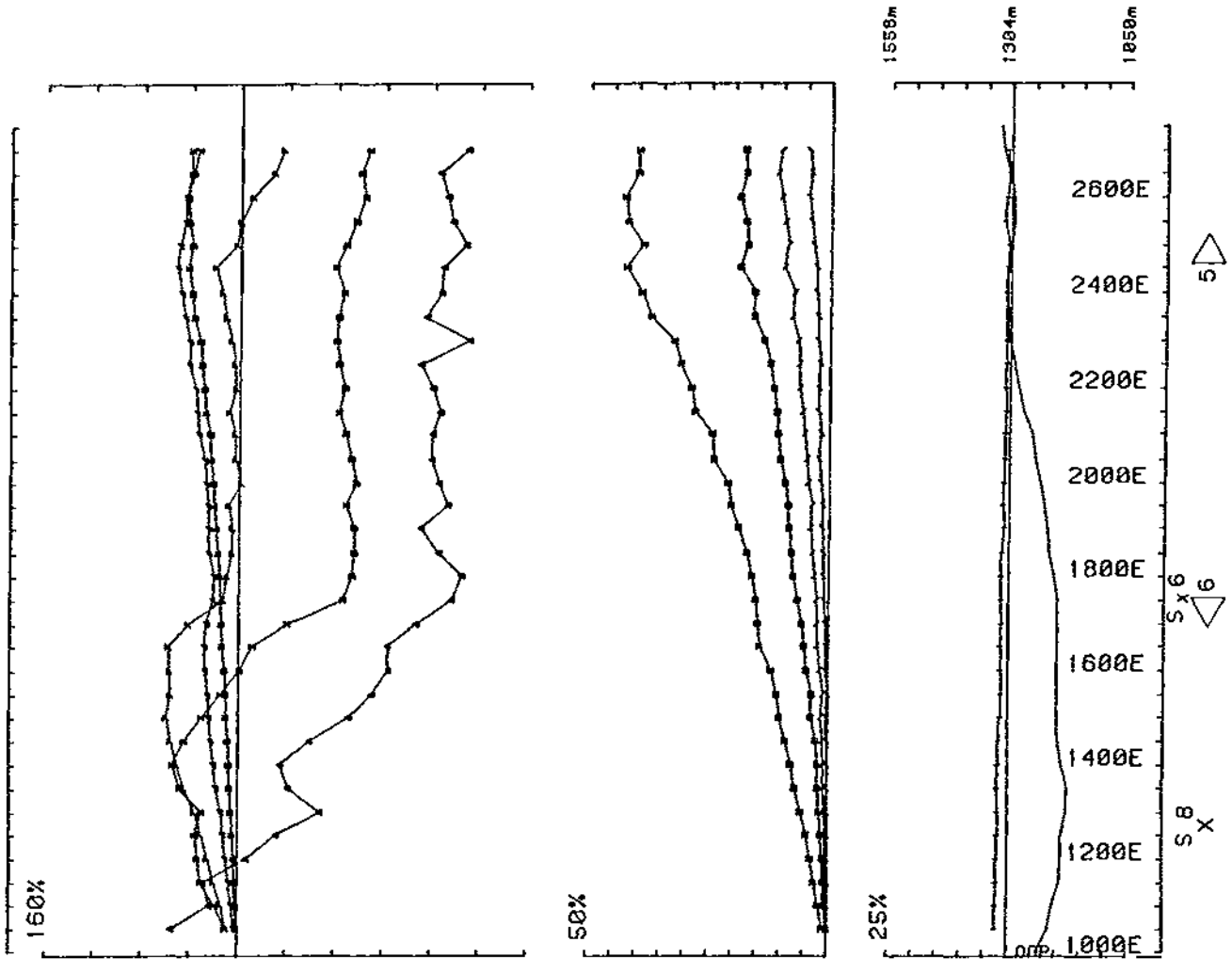
Loopno 1 Line 600N component Hz secondary Ch 1 normalized Ch 1 reduced

D.S. 3p



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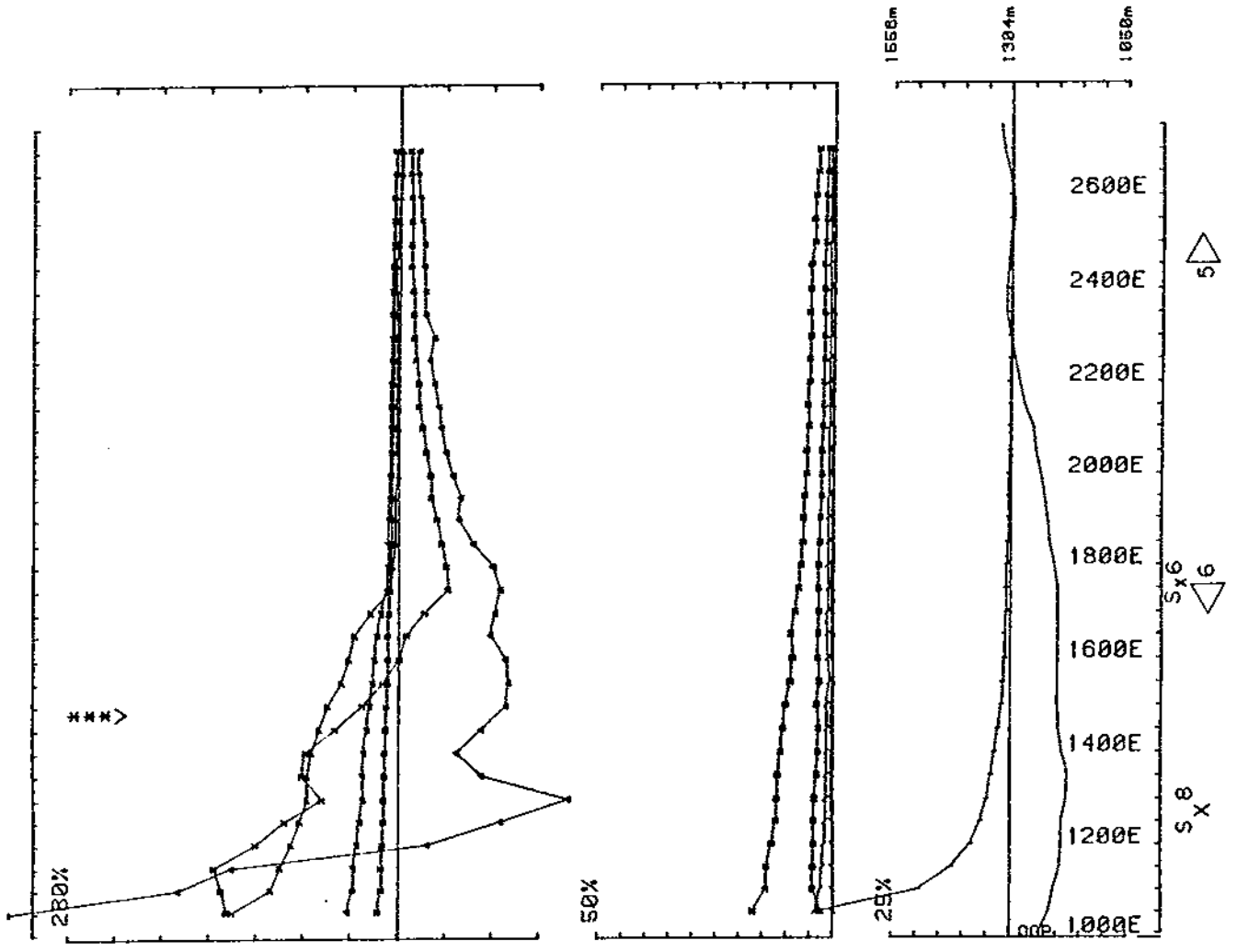

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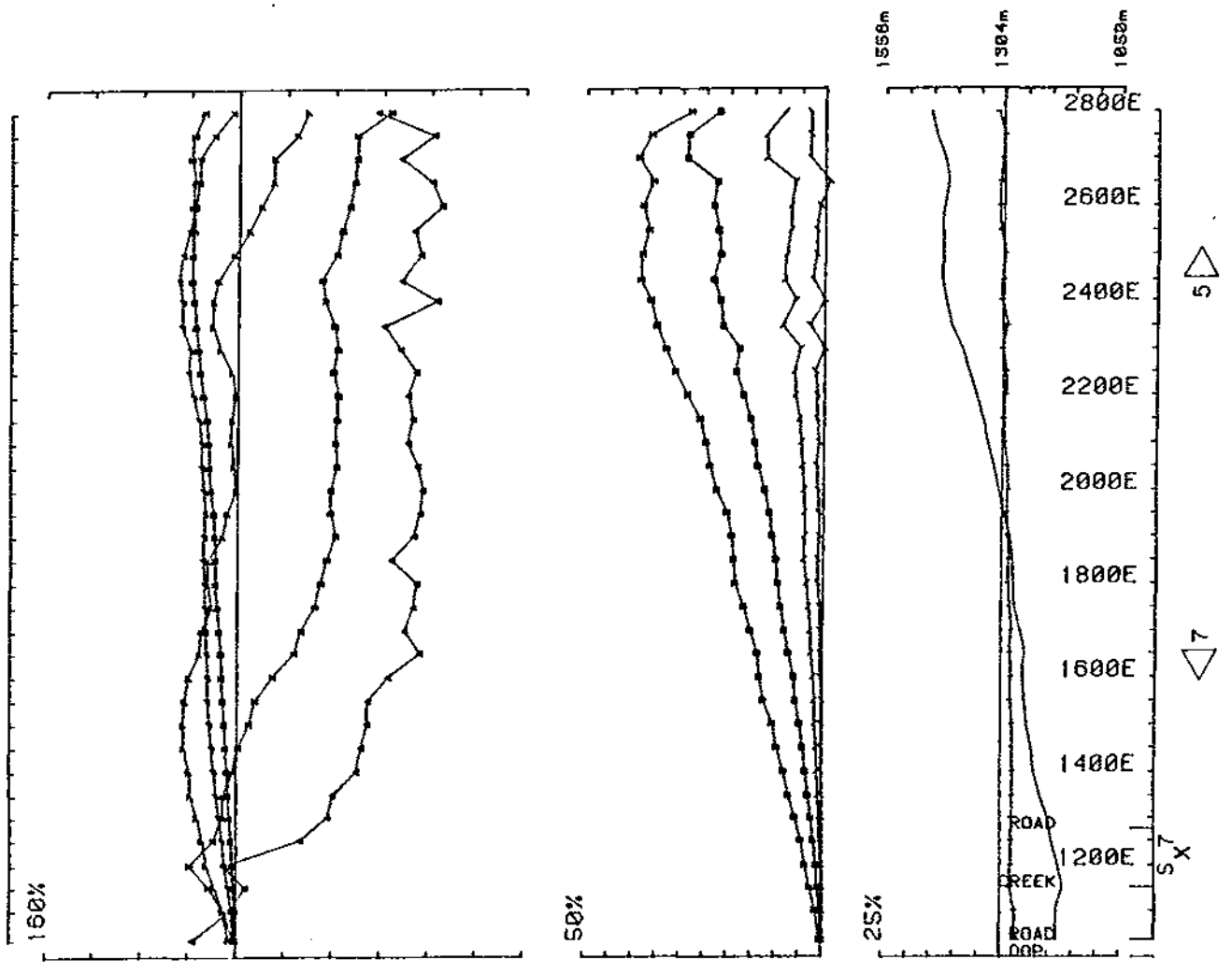

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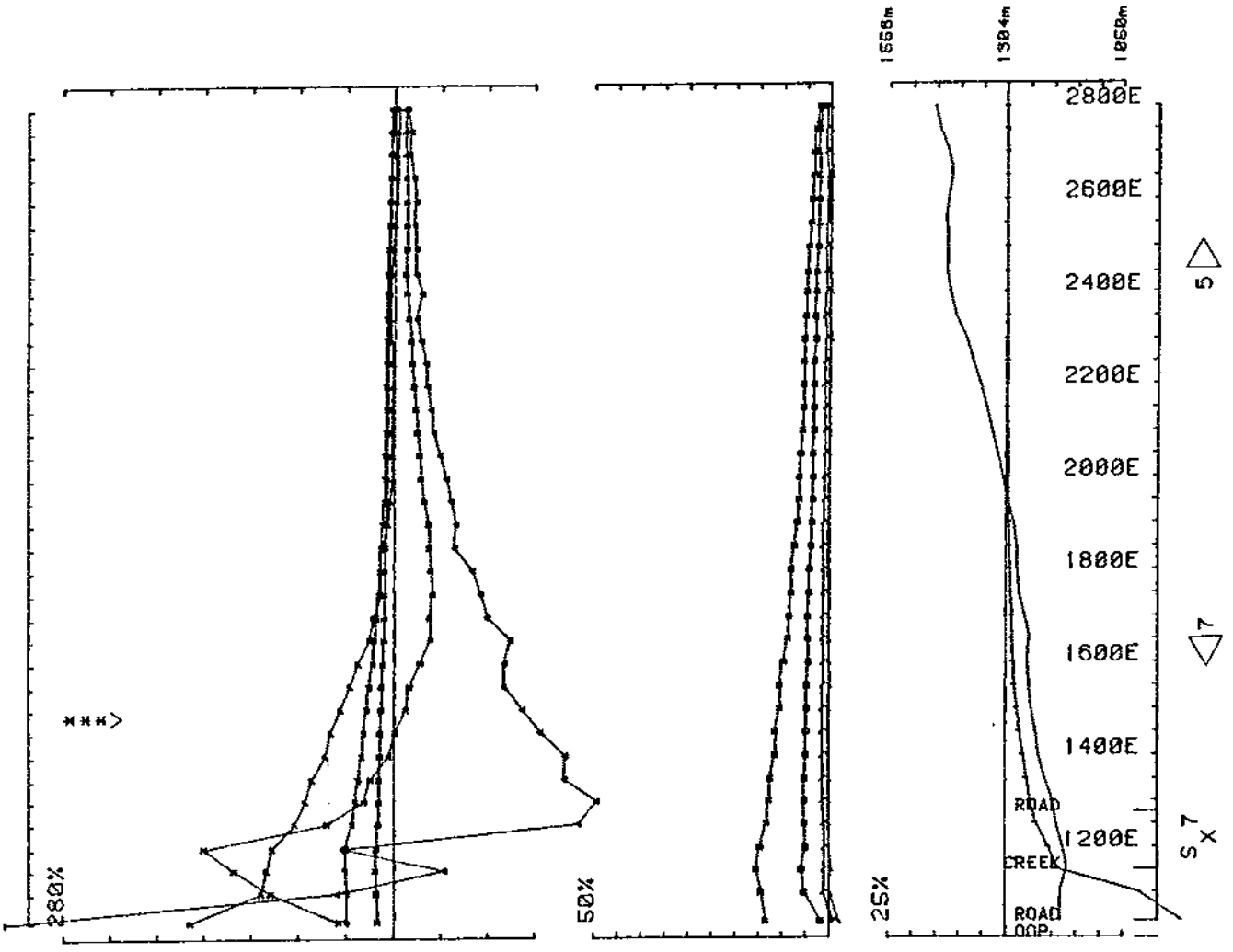

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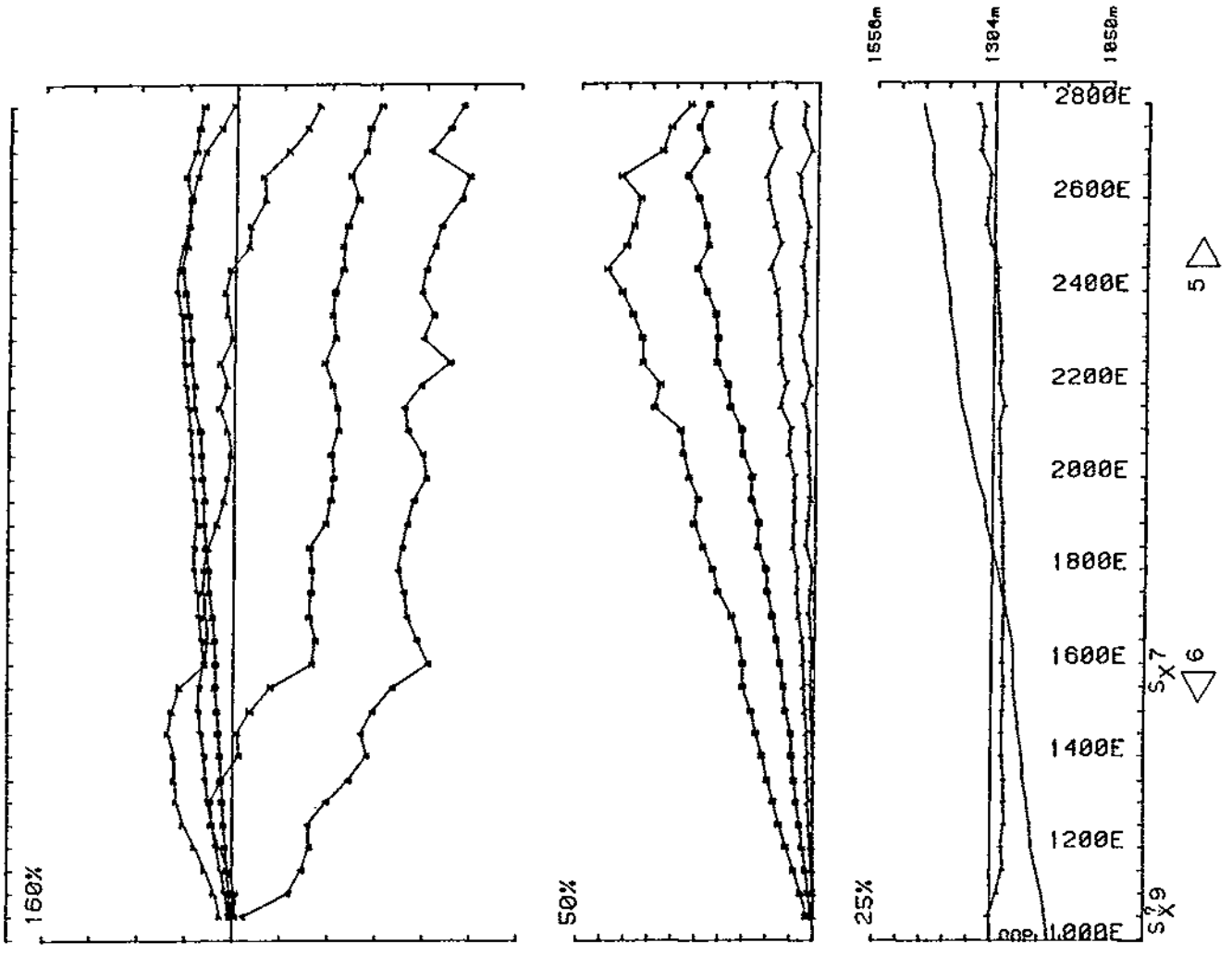
Loopno 1 Line 1200N component Hz secondary Ch I normalized Ch I reduced

D.S. 5p



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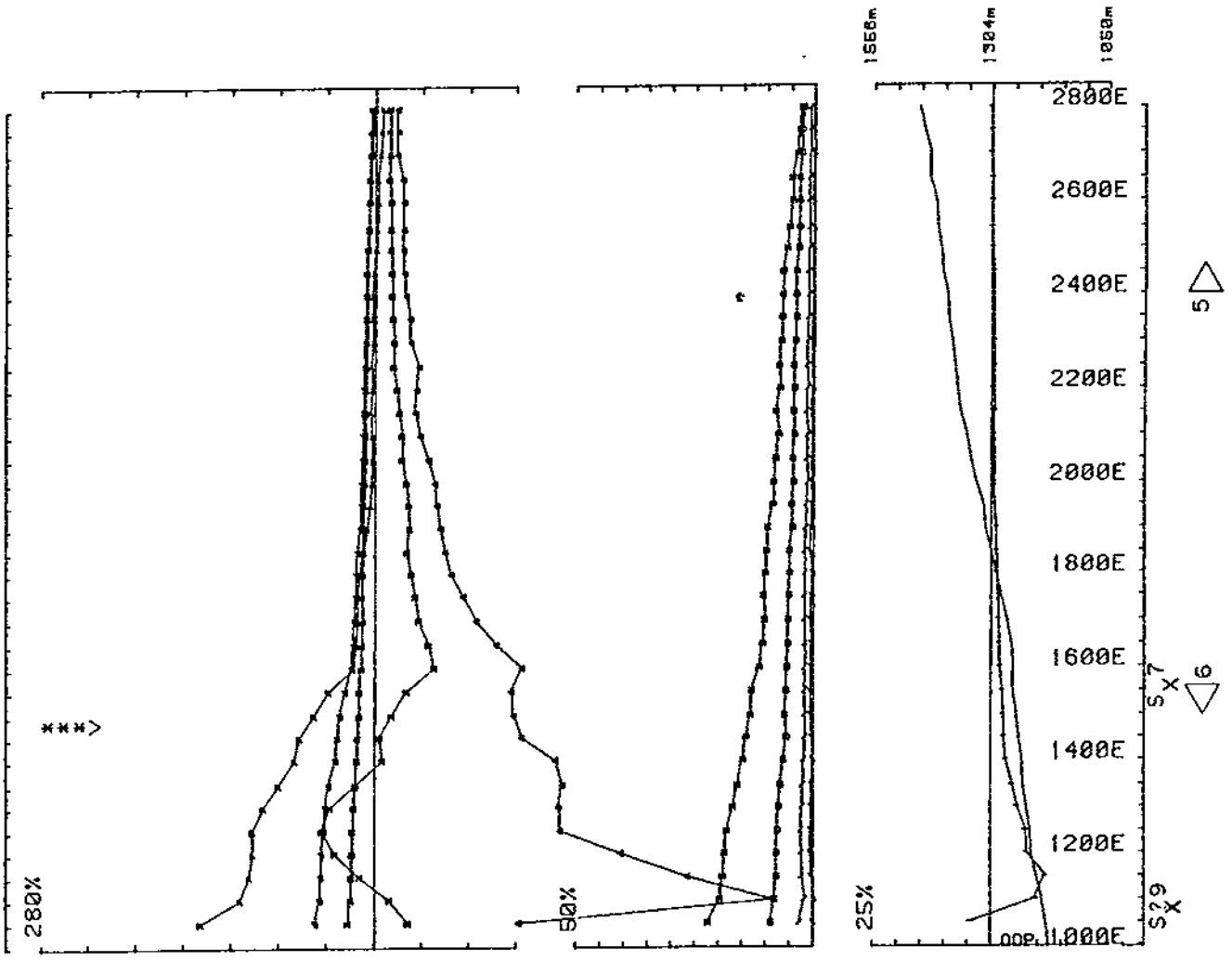

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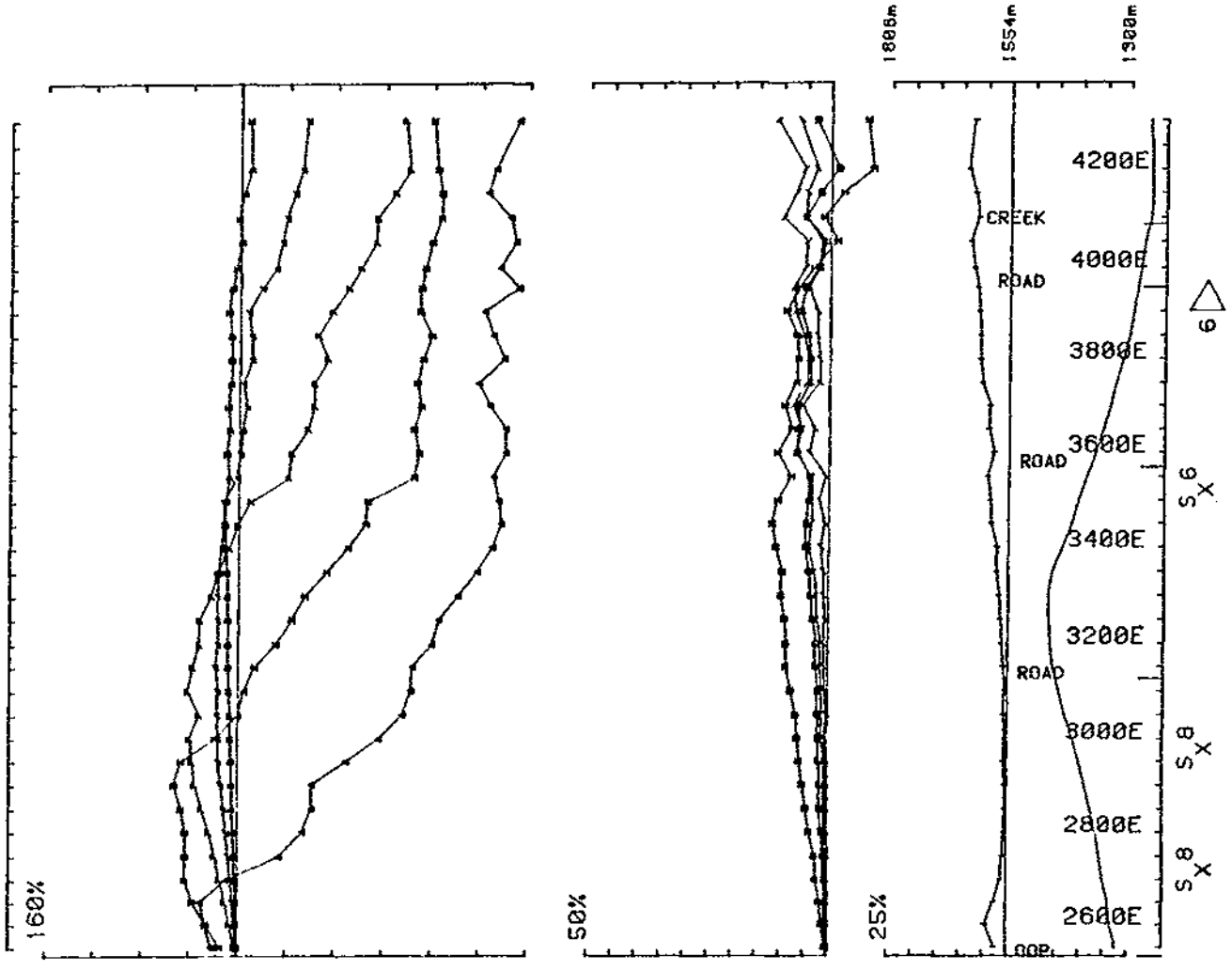

Area SHA EAST 88 COMINCO operator IJ MP freq(hz) 30.974

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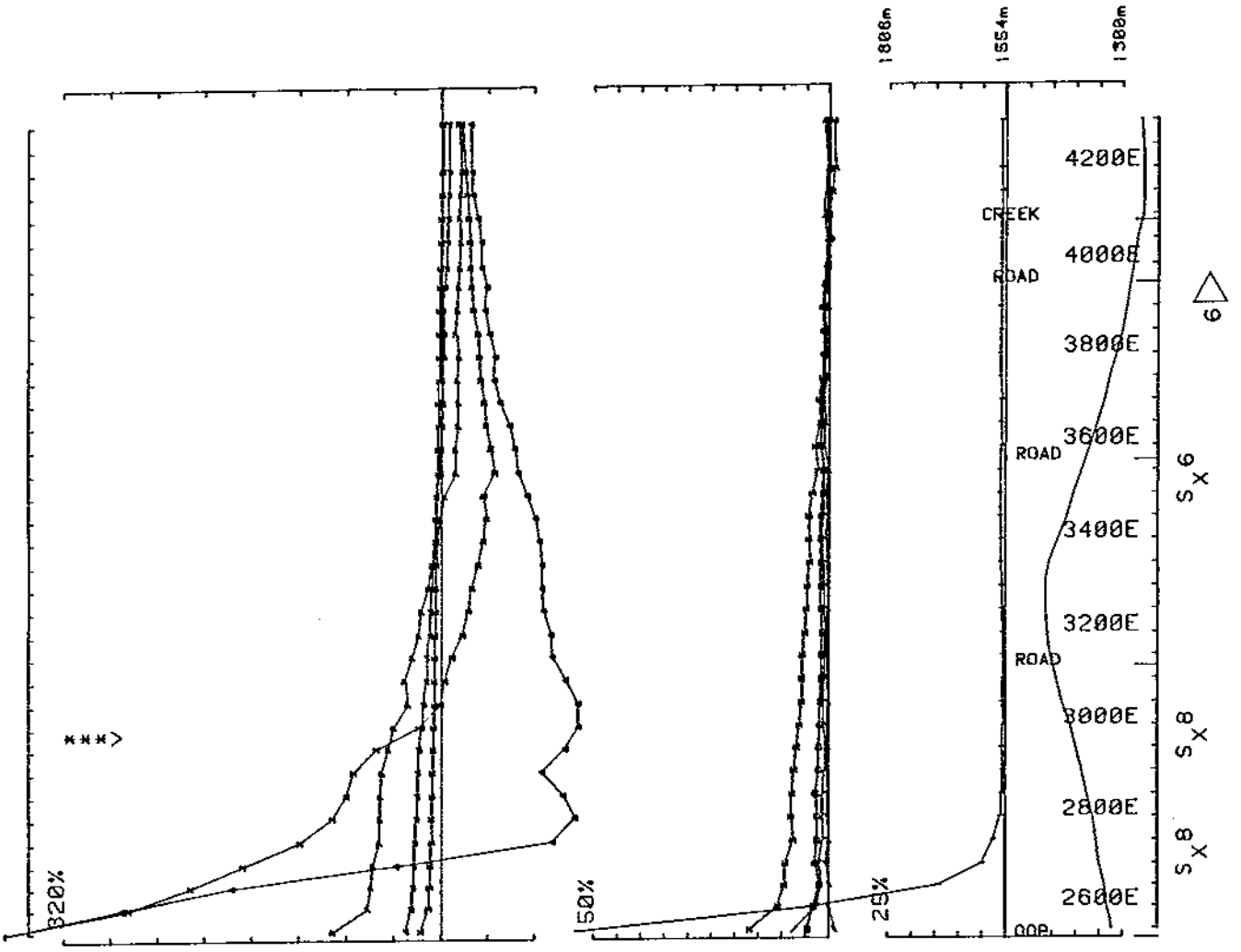
D.S. 7



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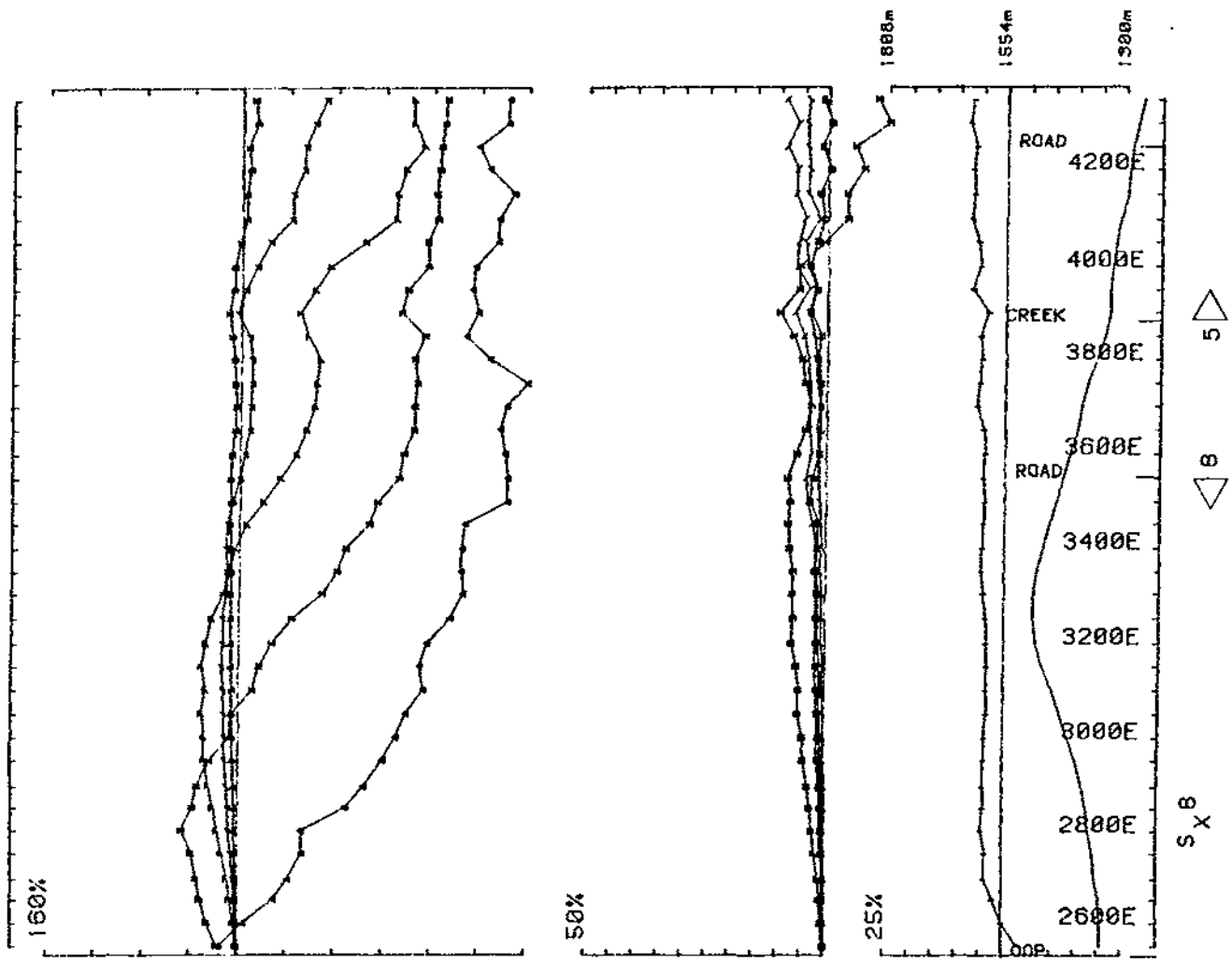
D.S. 7p



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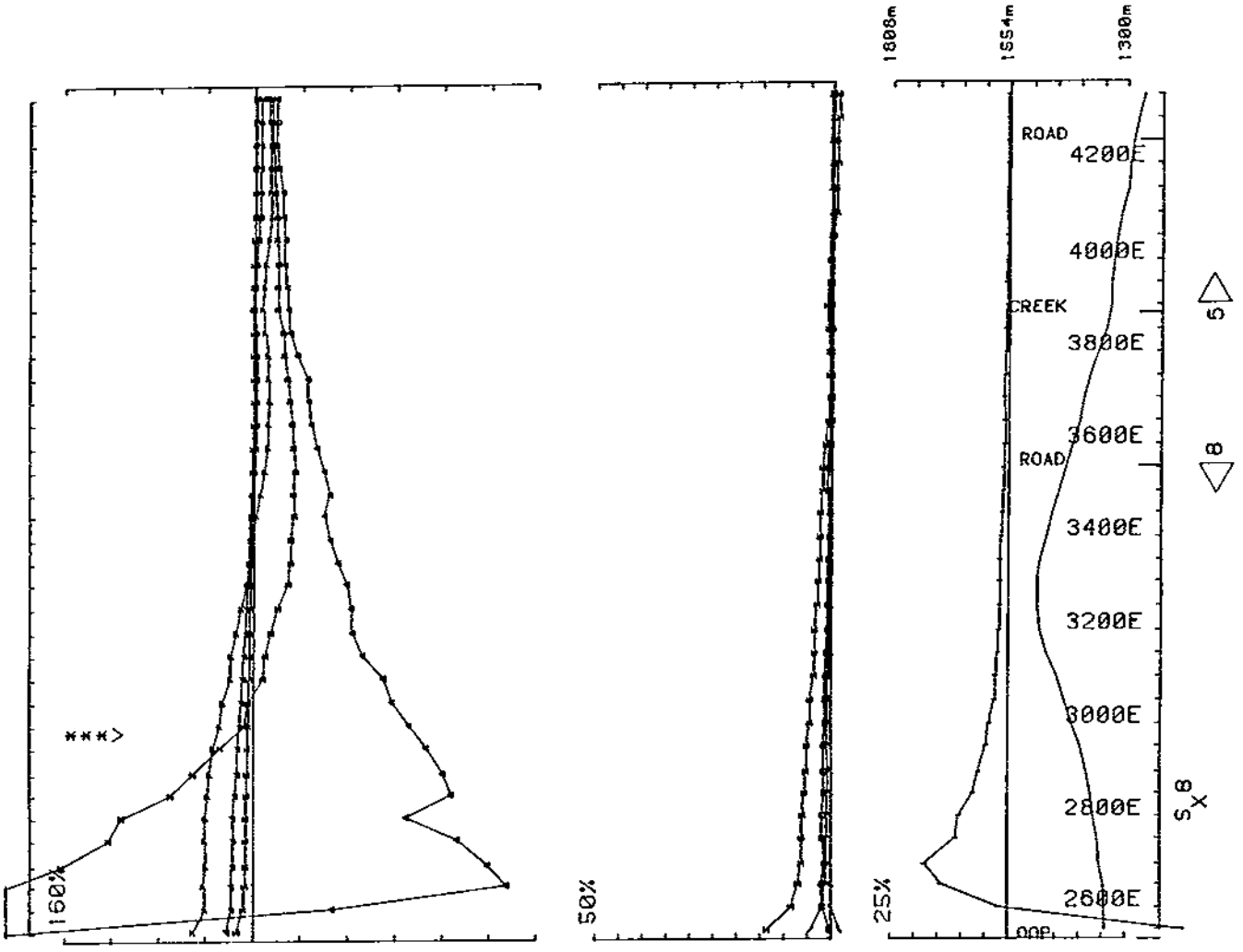

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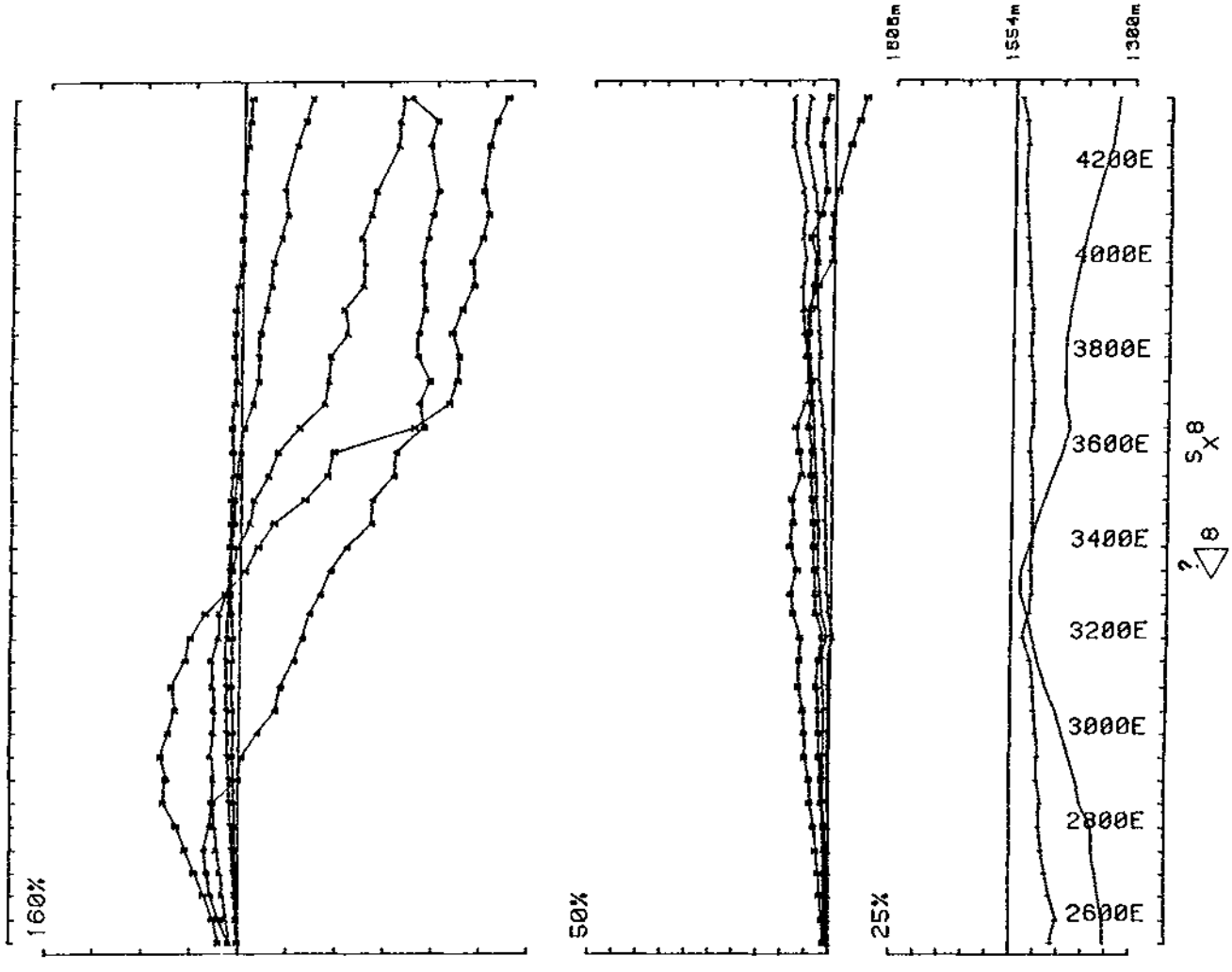

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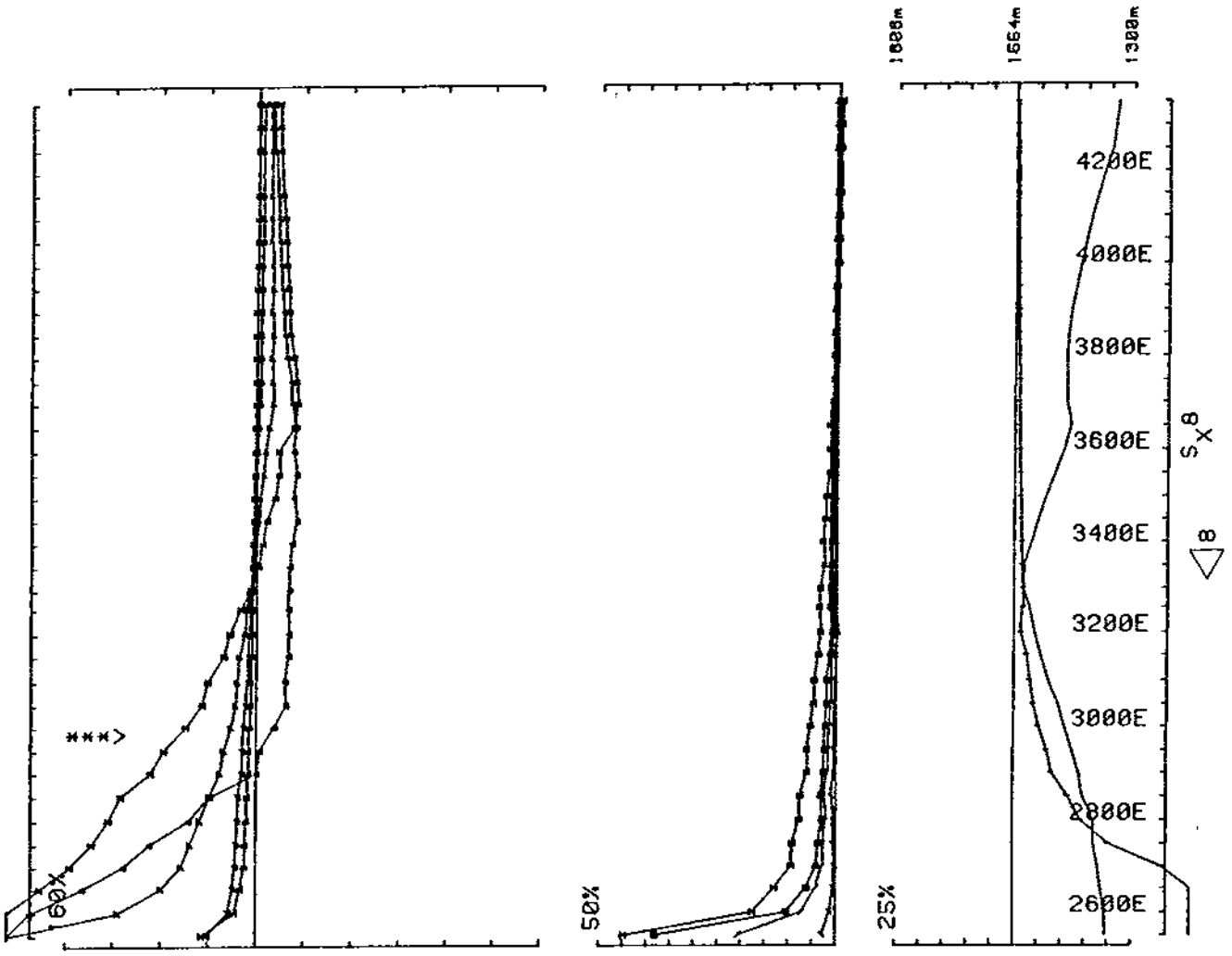
Loopno 2 Line 600N component Hz secondary Ch I normalized Ch I reduced

D.S. 9



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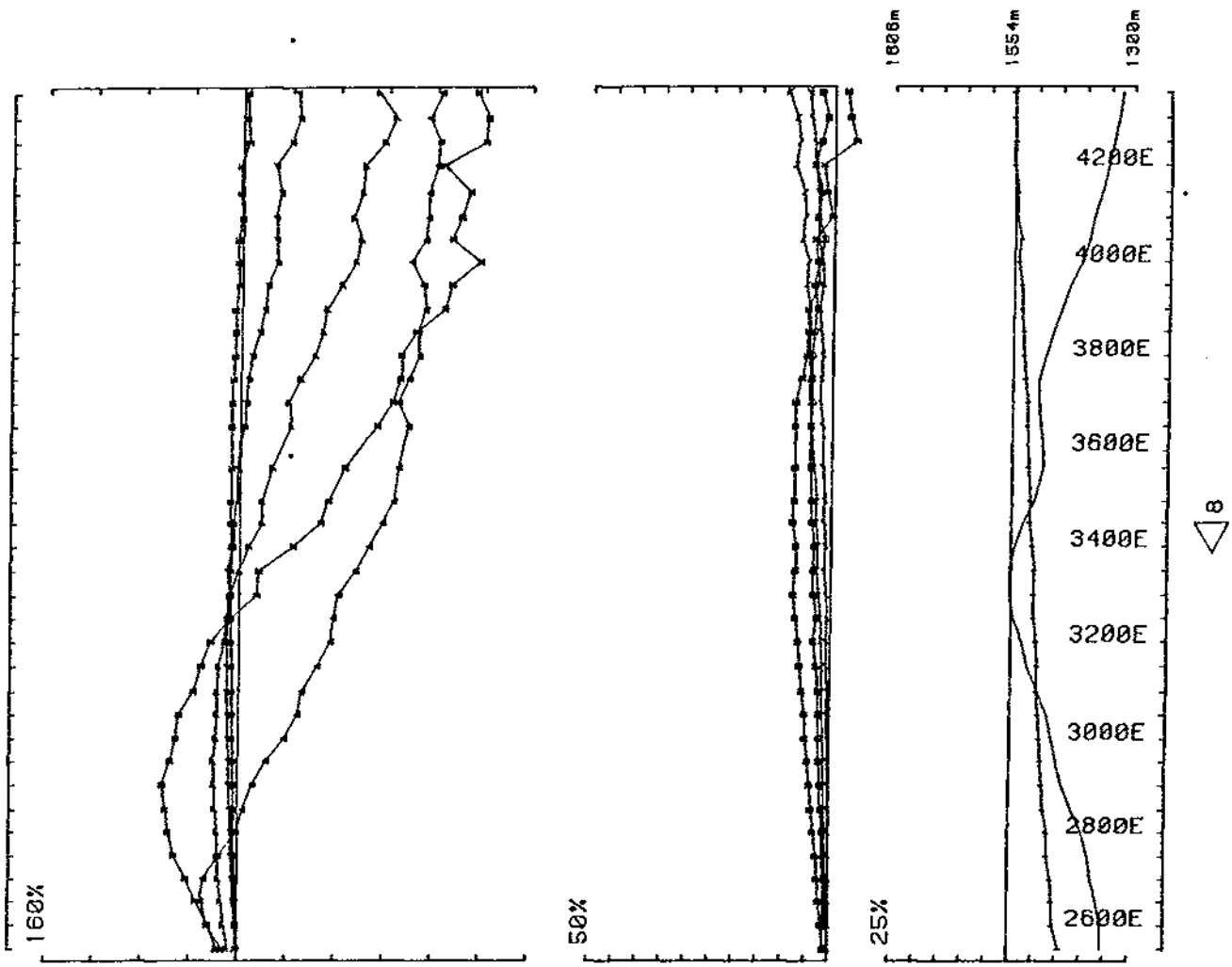

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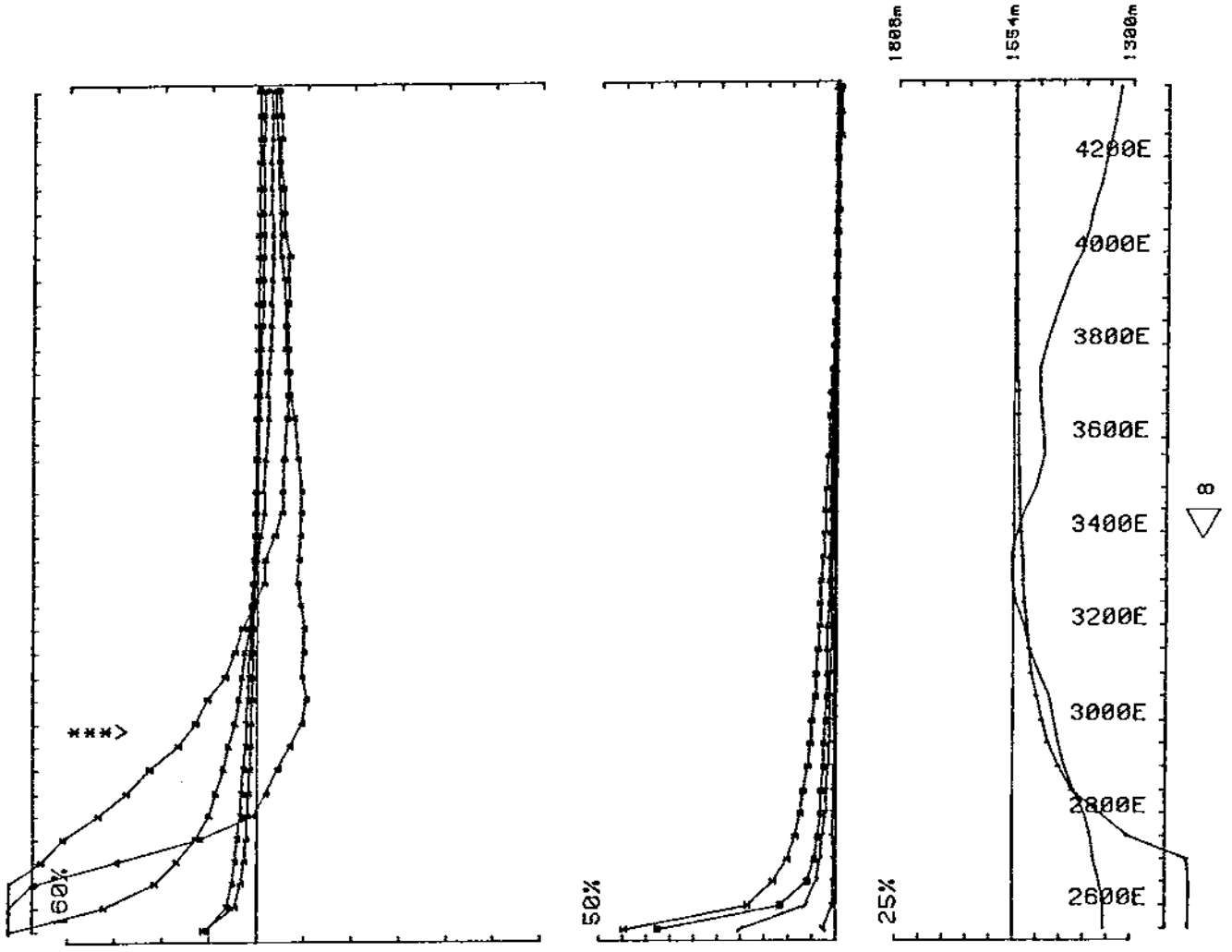

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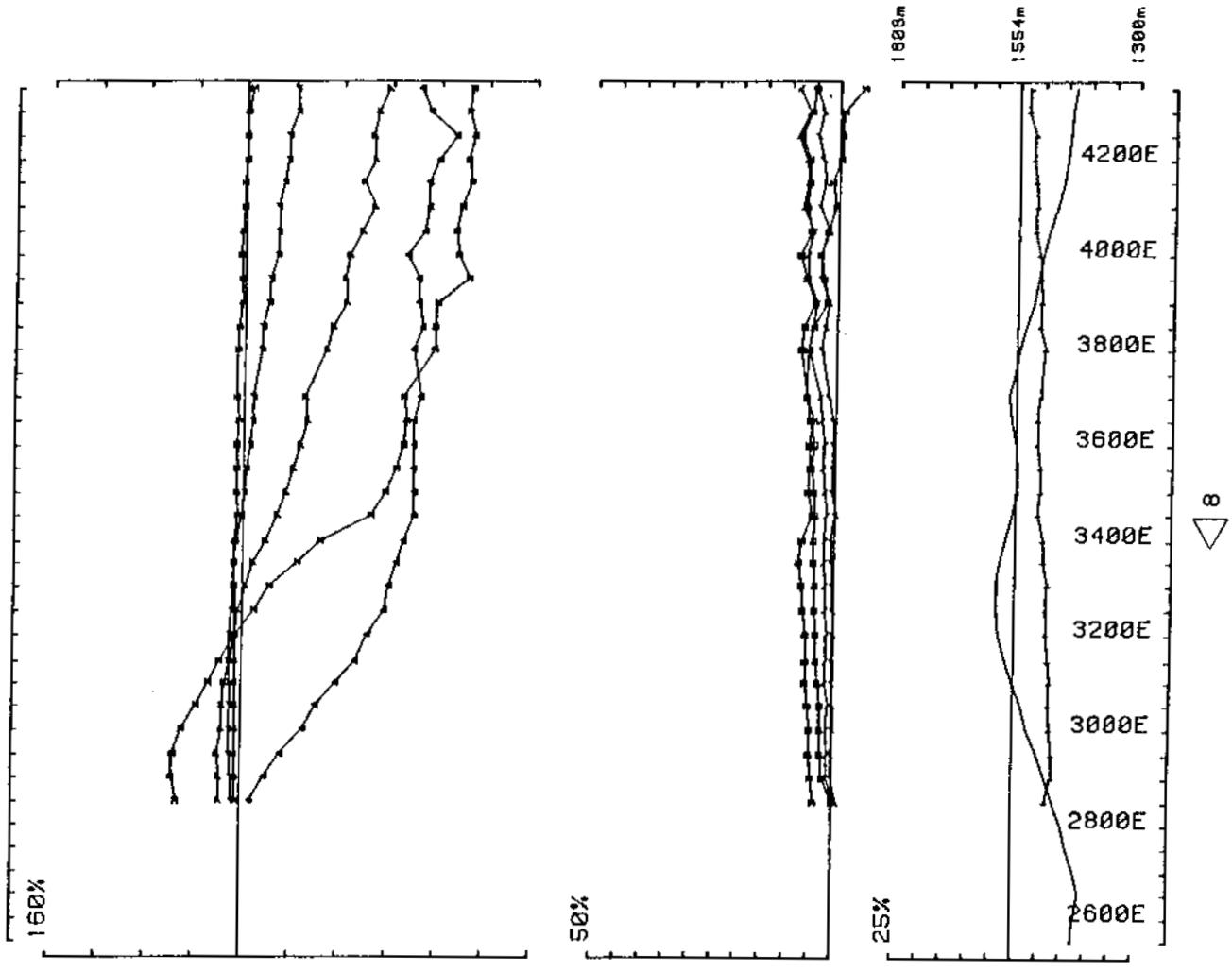

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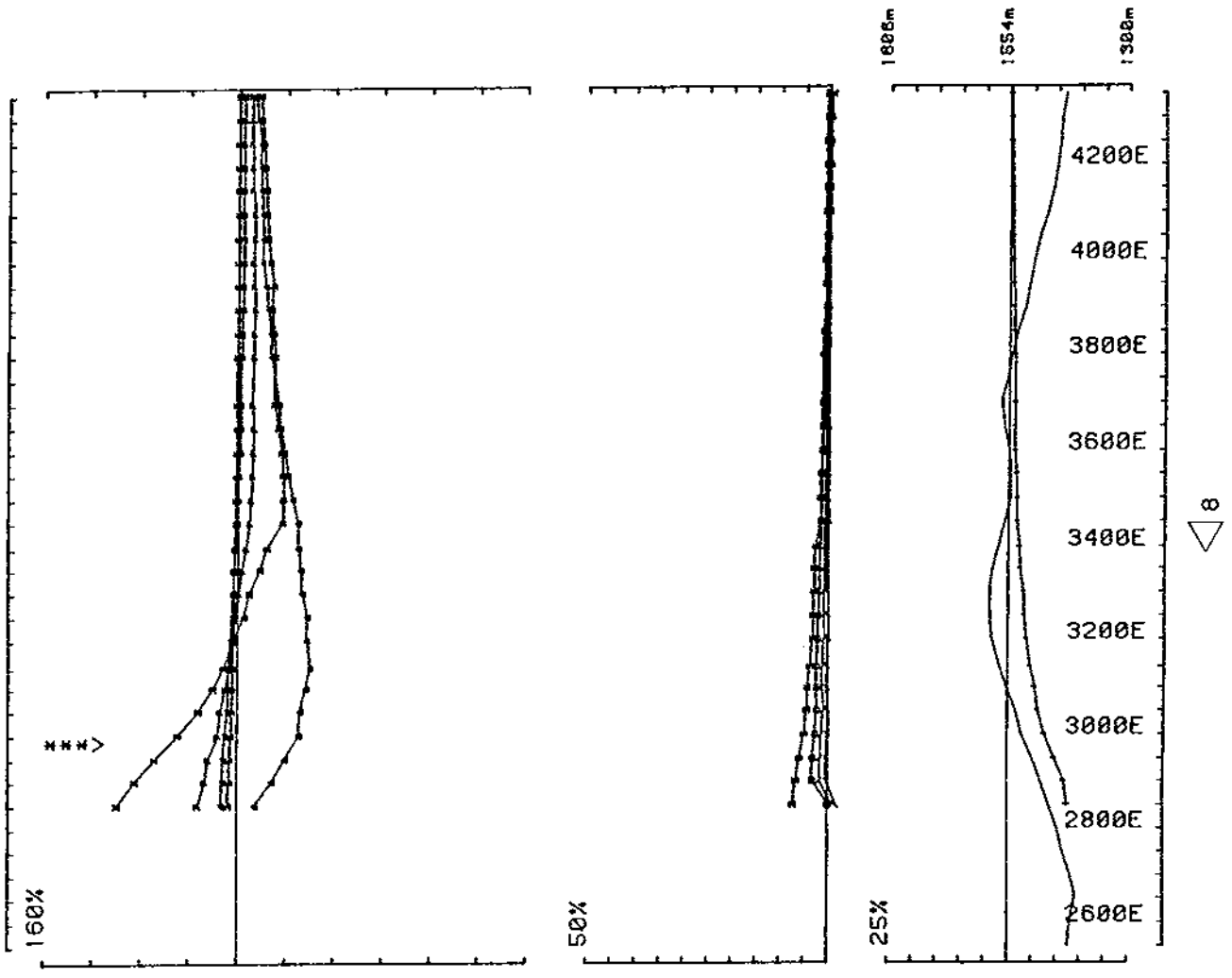
Loopno 2 Line 1200N component Hz secondary Ch 1 normalized Ch 1 reduced



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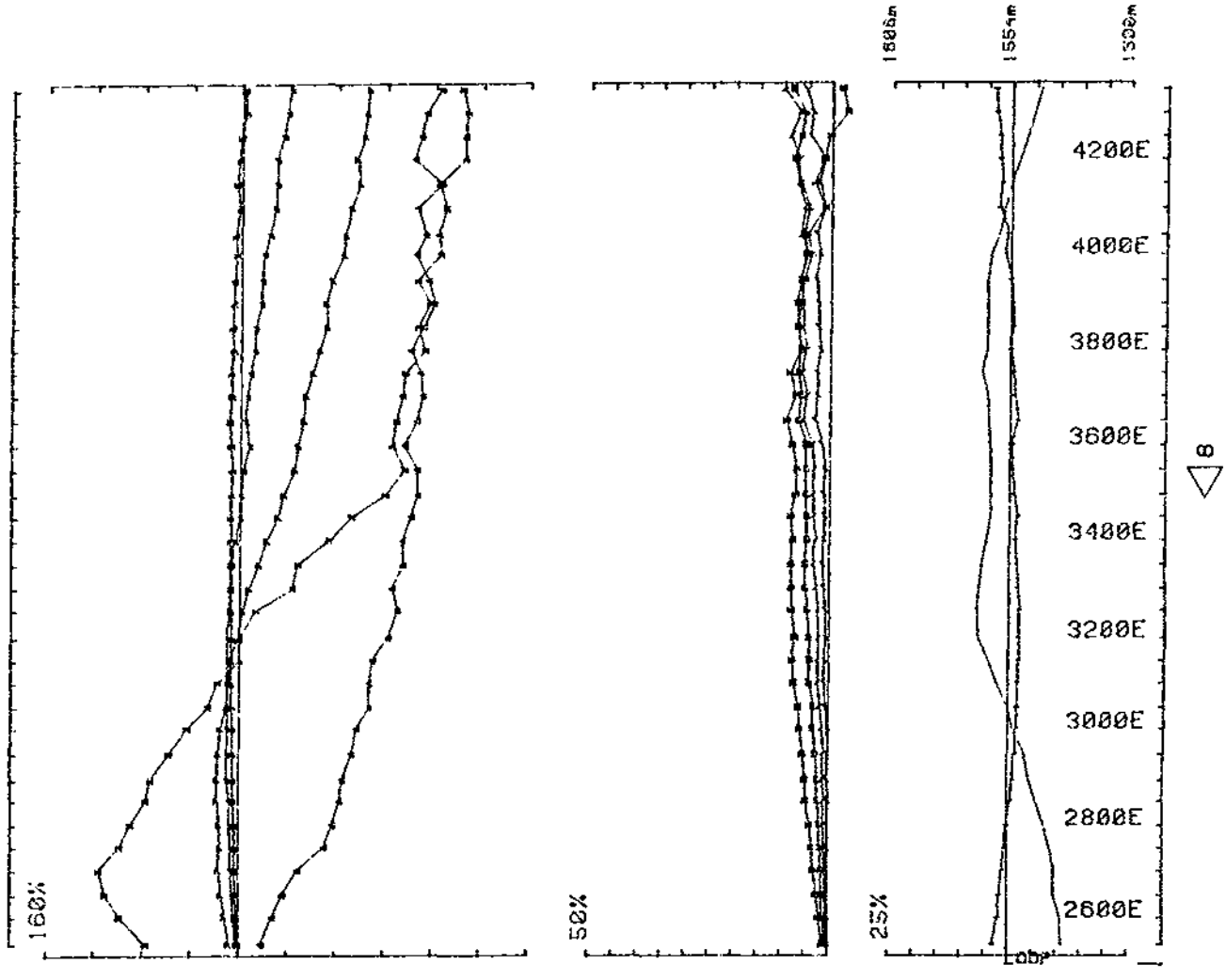
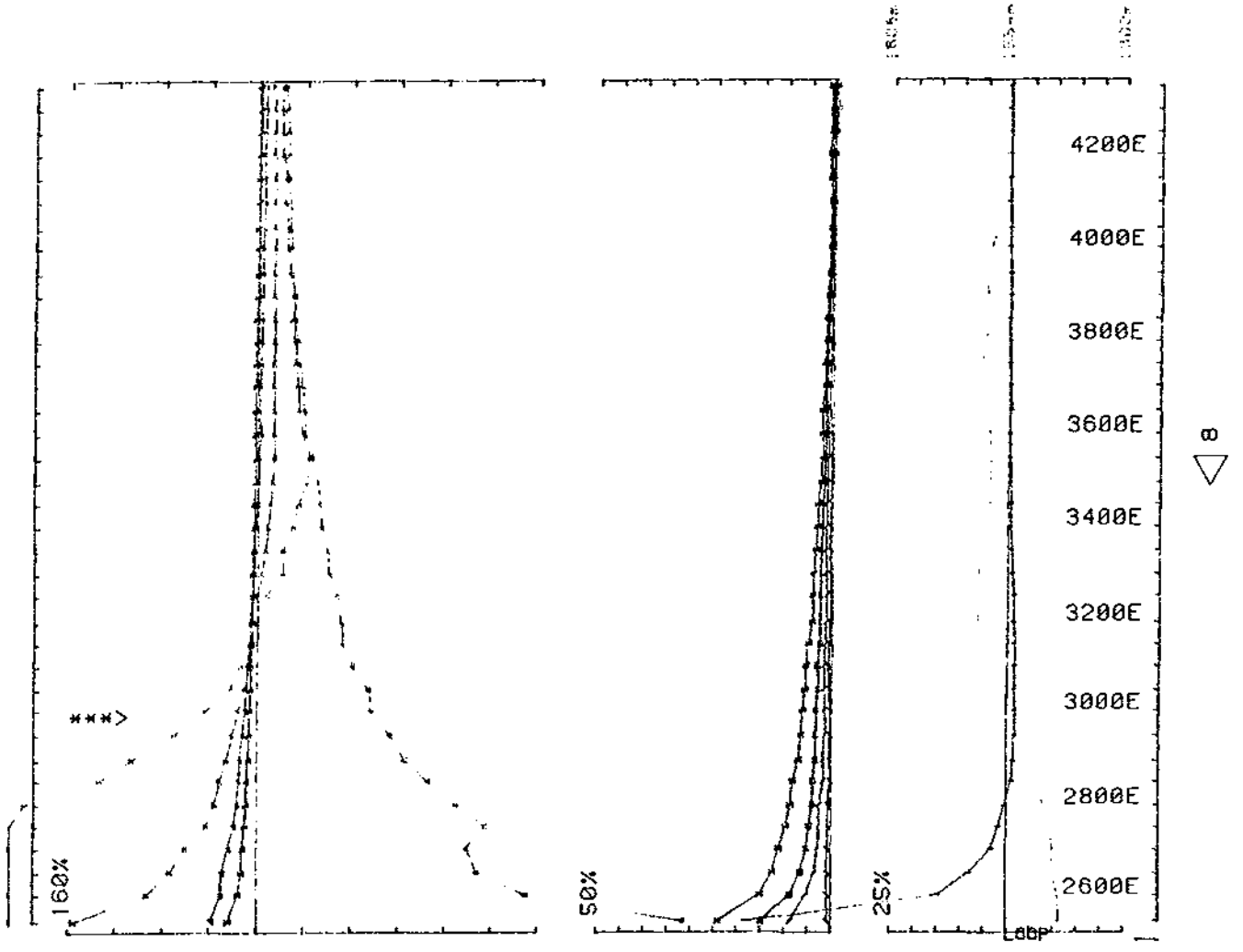


Area SHA EAST 88 COMINCO operator IJ MP freq(hz) 30.974

Loopno 2 Line 1500N component Hz secondary Ch 1 normalized Ch 1 reduced



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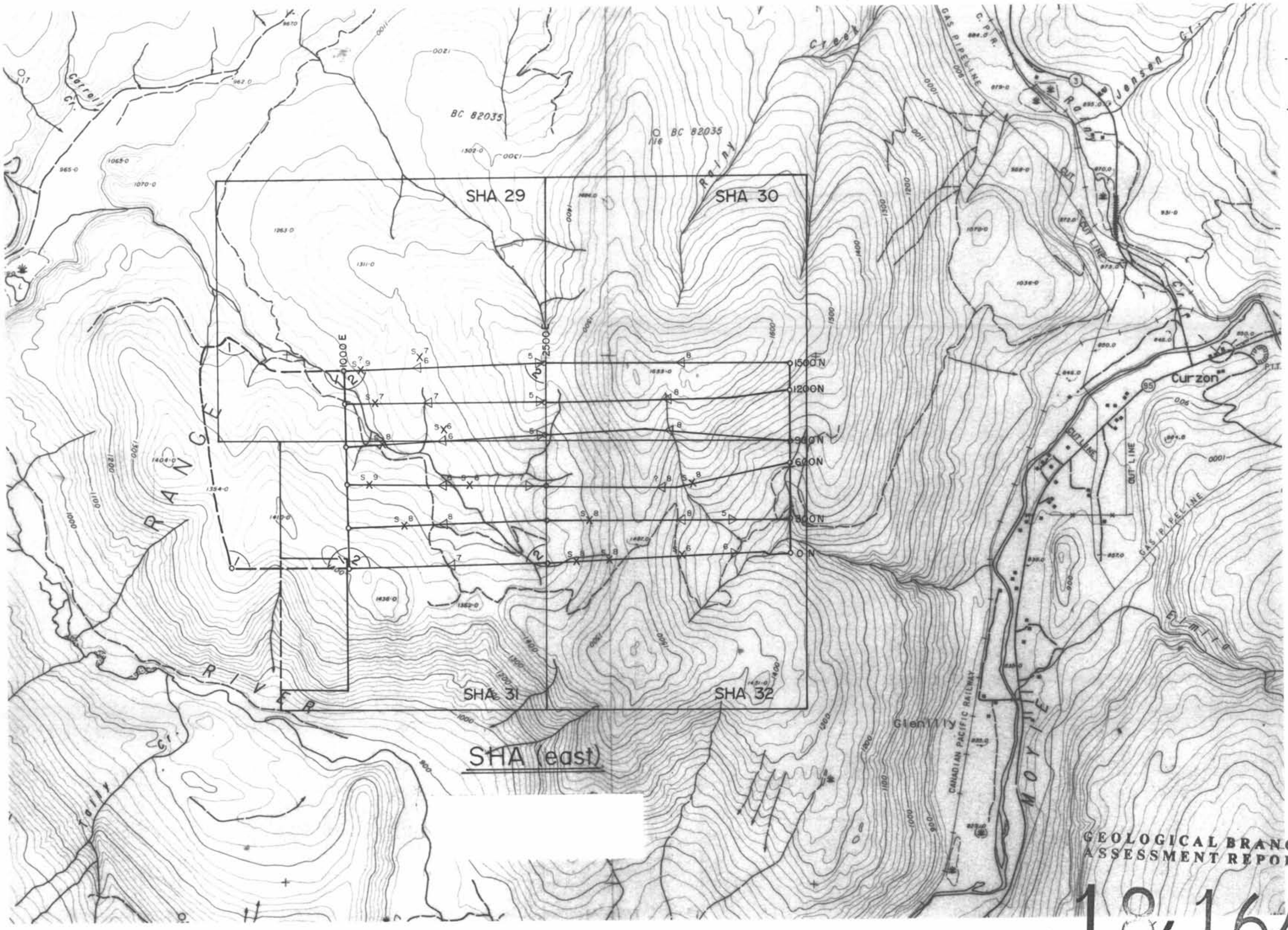

GEOLOGICAL BRANCH
ASSESSMENT REPORT

18,164

$^{S}x^{6}$ AXIS OF A CROSSOVER ANOMALY. THE NUMBER INDICATES THE LATEST ANOMALOUS CHANNEL. DEPTH INDICATED BY : S - Shallow, M - Moderate, D - Deep

AREA OF CONDUCTIVITY HIGHER THAN AVERAGE BACKGROUND

OUTLINE OF TRANSMITTER LOOP AND LOOP NUMBER

0 500 1000 1500 METRES

SHA (East) - 1988 -

FORT STEELE MD, BC

NTS 82-F/1

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

UTEM COMPILATION MAP

Scale: 1 : 20,000 | Date: DEC. 1988 | Plate: 346-88-2

210-0620