

MAP NO:105C/8,9

ASSESSMENT REPORT: X

DOCUMENT NO: 093259

PROSPECTUS:

MINING DISTRICT: Watson Lake

CONFIDENTIAL: X

TYPE OF WORK:Geophysics

OPEN FILE:

REPORT FILED UNDER: Cominco Ltd.

DATE PERFORMED:June 29-July 4, 1994

DATE FILED:October 17, 1994

LATITUDE:60 31

AREA:Wolf River

LONGITUDE:132 14

VALUE:\$42,000

CLAIM NAME AND #:ENG 1-44

WORK DONE BY:Jules J. Lajoie, Robert W. Holroyd

WORK DONE FOR:Cominco Ltd.

DATE TO GOOD STANDING	

REMARKS:22 line km of UTEM and magnetic surveys as well as 1.4 km of gravity were conducted on the property.

COMINCO LTD

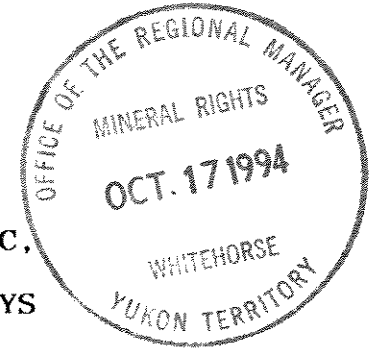
093259

EXPLORATION

GEOPHYSICS

CLAIM SHEET : NTS 105C/8 and 9

UTEM ELECTROMAGNETIC, MAGNETIC,
AND GRAVITY GEOPHYSICAL SURVEYS
ON THE BARENG PROPERTY, YUKON.
(ENG CLAIM GROUP)



- ASSESSMENT REPORT -

Latitude: 60° 31' N

Longitude: 132° 14' W

Work Performed by: Jules J. Lajoie, June 29 - July 4, 1994.
Robert W. Holroyd, August 16, 1994

Claim Owner and Operator: COMINCO LTD.

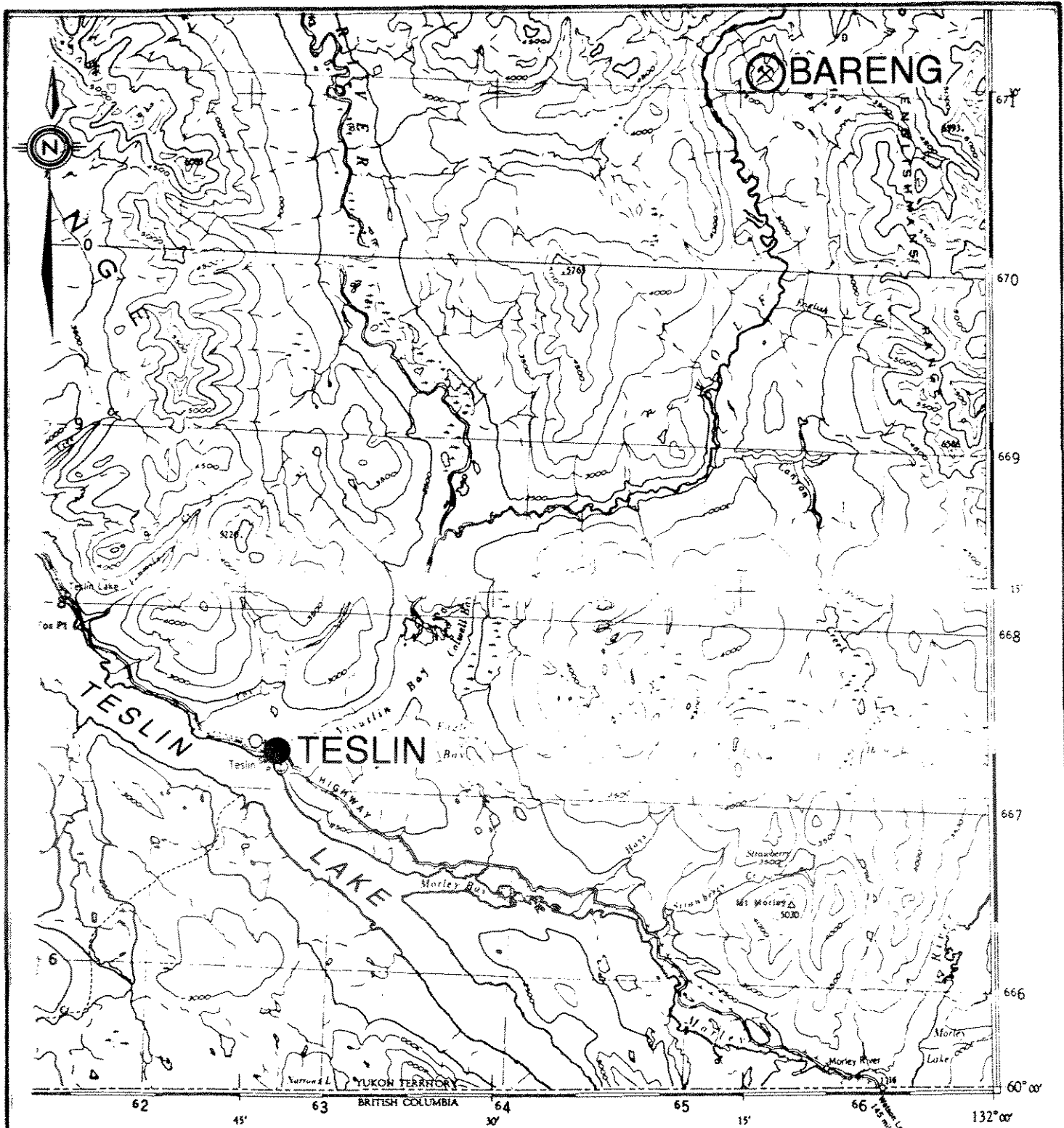
SEPT. 1994

Report by:
JULES J. LAJOIE

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(env = in envelope at back of report)

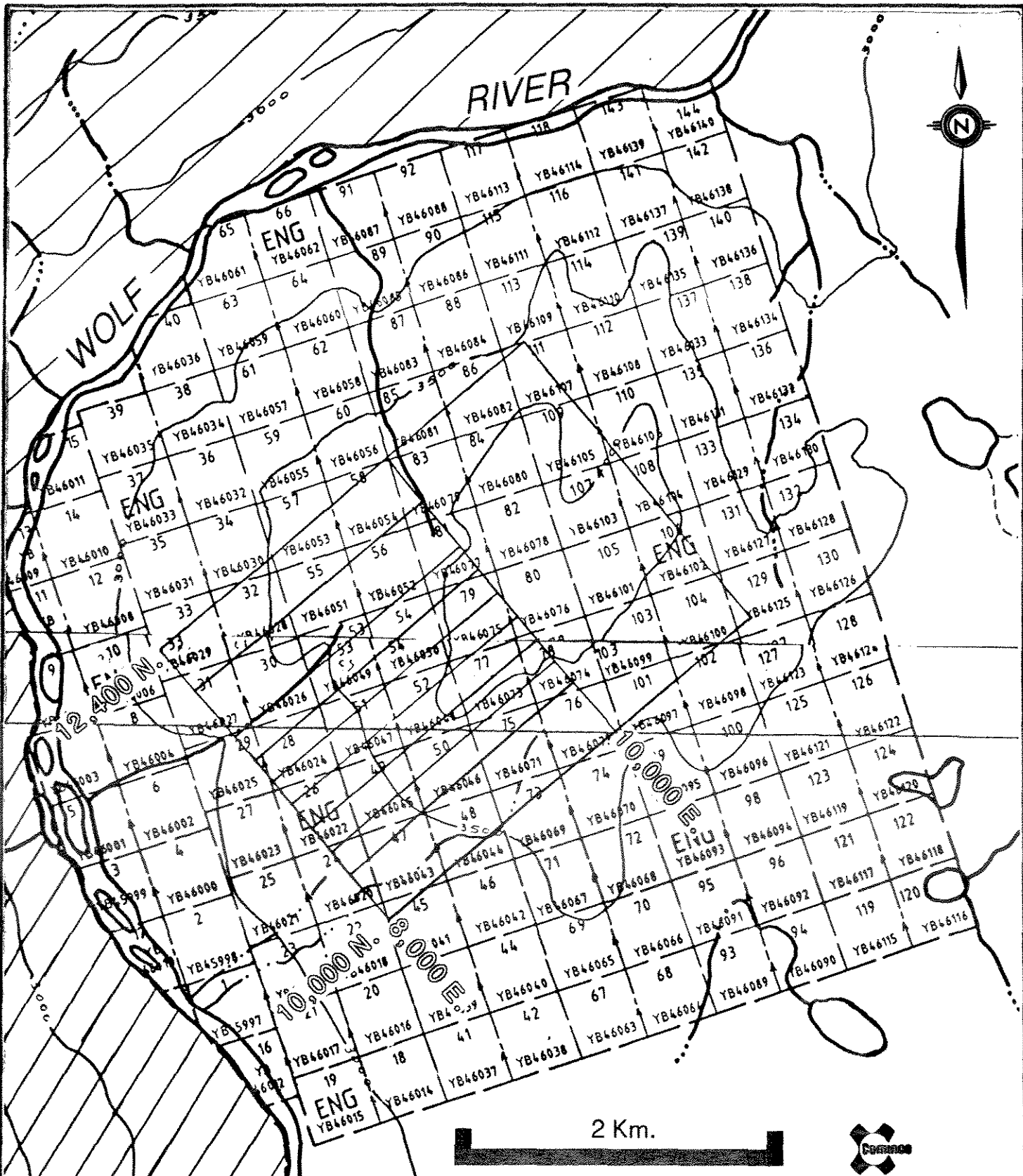


Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

BARENG PROPERTY - YUKON

Location Map

Scale: _____ Date: _____ Plate: 415-94-1



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

BARENG PROPERTY - YUKON
 Geophysical Grid and
 Claim Map

Scale: _____ Date: _____ Plate: 415-94-2

EXPLORATION
NTS: 105 C 8 & 9

COMINCO LTD

GEOPHYSICS

UTEM ELECTROMAGNETIC, MAGNETIC,
AND GRAVITY GEOPHYSICAL SURVEYS
ON THE BARENG PROPERTY, YUKON

ASSESSMENT REPORT

INTRODUCTION

The Bareng property is located in south central Yukon, 43 km northeast of Teslin, as shown on the Location map in Plate 415-94-1.

Bedrock geology on the property consists of an apparently conformable southwest dipping package of sedimentary and volcanoclastic sedimentary rocks ranging in age from Mississippian to lower Permian. Numerous rusty seeps, gossan zones, and minor surface showings of py-sph-gal occur on the property.

The objective of the geophysical surveys described in this report was to locate a conductive mineral deposit using the Utem electromagnetic system, aided by a magnetic survey, and followed by gravity on one Line 11,000N.

LIST OF CLAIMS AND TAG NUMBERS

CLAIMS: ENG 1-144

Respective TAG NUMBERS: YB 45997 - 46140

The geophysical grid on the claim map is shown in Plate 415-94-2. The claims are owned by Cominco Ltd.

FIELD WORK

Prior to field work, preparation, packing, and shipping of equipment required 1.75 days by J. Lajoie and 1.5 days by D. Hall.

A geophysics crew consisting of Cominco geophysicist Jules J. Lajoie and temporary employees A. Robulak, T. Dixon, and J. Allardyce mobilized from Vancouver to Teslin on June 26. The Yukon Motel in Teslin was the base of operations. A helicopter from Trans North Air, Whitehorse, and pilot C. Armstrong arrived on the morning of June 27.

The first Utem loop was installed on June 27 as well as

all equipment unpacked and prepared. The planned 22 km of Utem surveying was completed by June 30, including installation of Loop 2. On July 1, Loop 1 was moved to Loop 3 in the morning, and 1.8 km of detail (25M station separation) surveying was completed on Lines 10,800N and 11,000N.

The magnetic surveying was completed on July 2 and 3, while the loop wire was being picked up. Two EDA OMNI PLUS magnetometers were used on the lines and another was used for a base station located on the baseline at 10,000E, 11,300N.

On July 4, the crew packed equipment and demobilized to Vancouver.

The gravity surveying was done later by Cominco geophysicist Robert W. Holroyd on August 16, assisted by temporary employees A. Robulak and K. Bilquist. This crew flew in from another base camp located at Finlayson Lake on the Robert Campbell Hwy.

INTERPRETATION

The Utem data sections 1 to 14 are included at the back of this report. The 3 Utem loops used in the survey and the survey lines are shown in the Utem compilation in Plate 415-94-3.

The area is underlain by westerly dipping poorly to moderately conducting carbonaceous shale units as clearly evident in the Utem profiles. More prominent crossover anomalies interpreted to result from these units subcropping occur as follows:

- Line 10000N at 9675E and 9825E
- Line 10400N at 9887E
- Line 10600N at 9925E (est.)
- Line 12400N at 9950E

Contact type responses between units of different resistivity occur throughout the map sheet and likely reflect fault contacts. The inside loop data for Loops 1 (DS 4) and 2 (DS 10) show contacts and regions of lower resistivity interpreted to be caused by subcropping carbonaceous units. It would be difficult to isolate a low conductance target amongst these carbonaceous shales.

A low amplitude channel 1 crossover anomaly occurs at 8337E on Line 11,000N (DS 6). Indicated depth to top to the source is about 125M. In order to get a better look at this response in the conductive environment, Loop 1 was moved to Loop 3 and Lines 10,800N and 11,000N resurveyed west of 8800E. The results are shown in DS's 13 and 14. The response was confirmed with a channel 2 crossover anomaly at 8337E on line 11,000N (DS 14). However, the rapid time decay indicates a low conductance source.

The magnetic data is shown on Plate 415-94-4. All data

were drift corrected using a base station located at 10,000E, 11,300N. Station spacing was 12.5M throughout. Short wavelength variations of about 50 nT occur throughout the survey area. Two sharp anomalies from unknown shallow sources, 700nT and 350nT, occur at 8300E and 9225E, respectively, on Line 10,400N. Broad magnetic highs of 50 to 100 nT are centered just west of the Utem responses at 8337E on Line 11,000N and the contact response at 8450E on Line 10,800N.

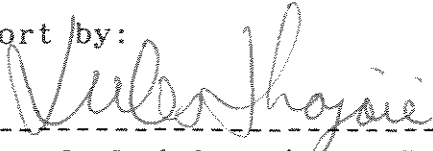
The above response on Line 11,000N was checked with gravity between 7900E and 9300E. The result is shown in Plate 415-94-5. The gravity measurements were reduced to a common datum plane applying free air and Bouguer corrections using a density of 2.67 gm/cc. East of about 8800E the gravity profile drops by about 1 mgal and this is likely a topographic effect while approaching the top of the hill. West of this station there is no correlation with topography in the gentle terrain. A gravity low of about 0.3 mgal is centered at 8300E, immediately west of the Utem crossover.

The gravity response and Utem crossover anomaly are interpreted to be caused by a moderately conducting and lower density shale unit in near surface fault contact.

CONCLUSIONS

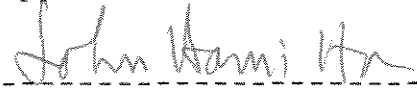
22 km of Utem electromagnetic surveying and magnetic surveying were completed on the BARENG property, as well 1.4 km of gravity. The grid is underlain by conductive formations which make the detection of a low conductance target difficult. A low priority Utem response was followed up with gravity with negative results. No further geophysical work can be recommended on this grid.

Report by:



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

Approved for release by:

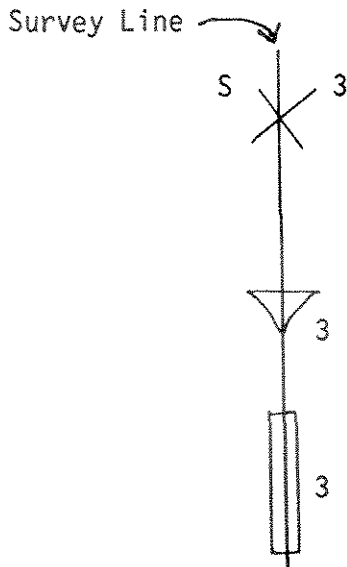


John M. Hamilton, P.Eng.
Manager, Exploration,
Western Canada,
Cominco Ltd.,

cc: WD, Cominco
Geoph., Cominco
Min. Rec.(2)

LEGEND
UTEM COMPILATION MAP AND DATA SECTIONS

SYMBOL	CHANNEL	MEAN DELAY TIME		
		15 Hz	30 Hz	26 Hz
	1	25.6 ms	12.8 ms	14.4 ms
/	2	12.8	6.4	7.2
\	3	6.4	3.2	3.6
□	4	3.2	1.6	1.8
∑	5	1.6	0.8	0.9
△	6	0.8	0.4	0.45
7	7	0.4	0.2	0.23
⊗	8	0.2	0.1	0.112
△	9	0.1	0.05	0.056

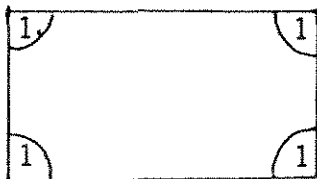


Axis of a cross-over anomaly. The number indicates the latest anomalous channel.

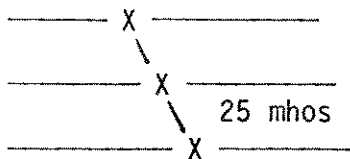
Depth indicated by: S - Shallow (<50 m)
M - Moderate (50-150 m)
D - Deep (>150 m)

Contact Response. Point of triangle along line indicates direction to more conductive unit. Number indicates latest anomalous channel.

Indicates a negative anomaly of width shown by the box length along line. The latest channel is shown.



Outline of transmitter loop. Number indicates loop number.



Conductor axis located by cross-over anomalies with conductance determination. the conductance* thickness of the conductor in mhos (equivalent to Siemens).

APPENDIX 1

DESCRIPTION OF THE UTEM SYSTEM

UTEM is an acronym for "University of Toronto ElectroMagnetometer" (West et al., 1984). Dr. Y. Lamontagne (1975) developed the system in 1971 as part of his doctoral thesis at that university. It was designed to achieve the sensitivity and interpretability necessary to handle problems of deep exploration, conductive environments, and a variety of terrain conditions in an economically viable manner. One of the essential characteristics that distinguishes it from other systems is that its system function closely approximates a step function response measurement. The UTEM III version of the system has been in use since 1981, but with numerous firmware, software, and hardware upgrades since that time.

The field procedure consists of first laying out a large transmitter loop (usually 1 to 2 km) of single strand enamel insulated wire. For this survey, 17 gauge wire (bare copper diam.= 1.15mm) was used. 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 (30.974Hz for this survey), chosen to minimize power line interference. 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. Time synchronization between transmitter and receiver is achieved through highly accurate quartz crystal clocks in both units.

The sensor coil measures one or more components of the electromagnetic field and responds to its time derivative. All three components may be measured, although, in this survey, only the vertical component was used. The receiver can stack any preset number of cycles to increase the signal to noise ratio. The transmitter current waveform is triangular and hence, the receiver 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.

Large scale current systems are induced in the earth and these produce the typical "half-space" Utem background profiles, where each Utem channel in turn crosses zero with increasing distance from the loop. This obviously varies from area to area depending on the resistivity of the rocks. Other currents may be induced in locally more conductive zones, and these anomalies are superimposed on the background response.

The UTEM receiver samples each half cycle of the waveform in ten channels or time windows. The delay time to the start of each channel window is equal to the width of the time window over which the signal is averaged. For a base frequency of 31 Hz, the delay times range from 15.8 microseconds for channel 10, to 8.07 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 numbered channels as well. For example, large, massive, highly conducting sulphide or graphite bodies should produce a response on all channels.

At the end of a survey day, the data stored in the memory of the receivers are transferred to a micro computer. The data are processed incorporating the chainage data, then printed and/or plotted using Cominco proprietary software. In this report, the data are portrayed on Data Sections (DS) as profiles of each of the channels, one section for each survey line.

REFERENCES -

- Lamontagne, Y., 1975, Applications of Wideband, time-domain EM measurements in mineral exploration: Ph.D. thesis, U. of Toronto.
- West, G. F., Macnae, J. C., and Lamontagne, Y., 1984, A Time-Domain EM System Measuring the Step Response of the Ground: Geophysics, vol. 49, pp. 1010-1026.

APPENDIX 2

DATA PRESENTATION

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 stations near the transmitter loop to stations far from the transmitter loop. Various data presentation schemes can be used, each having advantages and disadvantages.

Channel 1 Reduced and Normalized Plots

This is the standard "general purpose" type of data presentation, applicable to the widest variety of data sets when there is no anomalous channel 1 response. With this scheme, errors from miscalculation of the primary field due to chainage errors are displayed in Ch. 1 only.

1. Continuously normalized plots.

a) For channel 1:

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

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:

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

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 Data 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. They typically display strong amplitudes close to the loop front, often off scale, and, relatively very low amplitudes at the ends of the lines.

a) For Channel 1:

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

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 10) are channel 1 reduced and channel 1 normalized:

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

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 shown for each survey line in addition to the continuously normalized plots. This helps interpretation by providing a different perspective to the data. For Utem channels 2 to 10, point normalization is equivalent (within a constant factor) to the data presentation scheme used in most pulse type time domain EM systems. The station used for point normalization is usually chosen at a constant distance from the loop for the whole grid, or, if there is an anomaly, at a station near the center of the anomalous response, for quantitative interpretation.

The channel 10 window has such a small delay time, equivalent to very high frequency, that in most geological environments, it becomes completely saturated at a very short distance from the transmitter loop. In such cases, it provides no valuable information, overwrites other useful channels, and degrades the plot. This often applies also to channel 9. As this is the case in this survey, channels 10 and 9 are not presented in this report.

APPENDIX 3

IN THE MATTER OF THE YUKON MINERAL ACT
AND THE MATTER OF A GEOPHYSICAL PROGRAMME
CARRIED OUT ON THE BARENG CLAIMS
LOCATED 43 KM NE OF TESLIN, YUKON,
N.T.S. 105 C/ 8 and 9

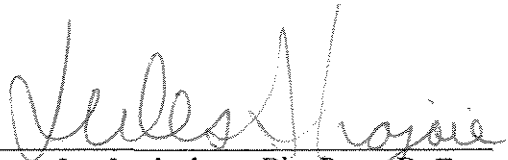
A F F I D A V I T

I, Jules J. Lajoie, of the City of 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 BARENG claims;

3. THAT the said expenditures were incurred between June 26 and July 4, and one more day, Aug. 16, 1994, for the purpose of mineral exploration of the above-noted claims.



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

APPENDIX 4

EXHIBIT 'A'

STATEMENT OF GEOPHYSICAL EXPENDITURES (1994)

BARENG CLAIMS

1. SALARIES

J. Lajoie	10.75	days	@ \$533/day	\$5729.75
R. Holroyd	1.0	day	@ \$415/day	\$ 415.00
D. Hall	1.5	days	@ \$240/day	\$ 360.00
A. Robulak	10.0	days	@ \$125/day	\$1250.00
T. Dixon	9.0	days	@ \$102/day	\$ 918.00
J. Allardyce	9.0	days	@ \$107/day	\$ 963.00
K. Bilquist	1.0	day	@ N/C	N/C

\$9635.75

2. OPERATING DAY CHARGES

Note: This charge is applied for those days on which useful data are acquired, to cover the costs of data compilation, drafting, interpretation, and report.

6.5 days @ \$445/day \$2892.50

3. EQUIPMENT RENTAL

UTEM:

Operating:	4	days	@ \$400/day	\$1600.00
Travel & Standby:	5	days	@ \$200/day	\$1000.00

MAGS:

Operating:	2	days	@ \$105/day	\$ 210.00
Travel & Standby:	2	days	@ \$ 53/day	\$ 106.00

GRAVITY

LaCoste & Romberg

Gravity Meter	1	day	@ \$75/day	\$ 75.00
Nikon D-50	1	day	@ \$40/day	\$ 40.00

\$3031.00

4. EXPENSE ACCOUNTS

J. Lajoie	3751.28 (incl. rooms)
A. Robulak	1075.11
T. Dixon	1363.89
J. Allardyce	1244.95

\$7435.23

5. HELICOPTER

Flying (\$4000+\$8950+\$2100)	\$15050.00
Pilot Board	\$ 350.00

\$15400.00

6. LINECUTTING CONTRACT

\$14760.00

by Coureur des Bois
Box 5301, Whitehorse, Yukon

7. MISCELLANEOUS

Wire Usage 4 days @ \$15/day	\$60.00
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T O T A L

\$53,214.48

I certify this to be a true statement of expenditures
for the geophysical program on the BARENG claims in 1994.

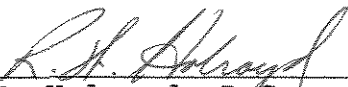


Jules J. Lajoie, Ph.D., P.Eng.
Geophysicist, Cominco Ltd.

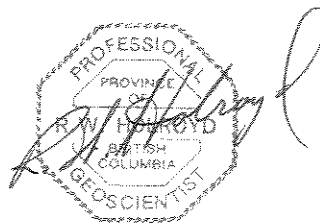
APPENDIX 5ACERTIFICATION

I, Robert W. Holroyd, of 2752 Dollarton Highway, in the City of North Vancouver, in the Province of British Columbia, do hereby certify that:

1. I graduated from the University of Waterloo in 1977 with an Honours Bachelor of Science in Applied Geology.
2. I am a registered member (#20895) of the Association of Professional Engineers and Geoscientists of the Province of British Columbia and the British Columbia Geophysical Society.
3. I have been practicing my profession for the past seventeen years.



R.W. Holroyd, P/Geo
Senior Geophysicist, Cominco Ltd.

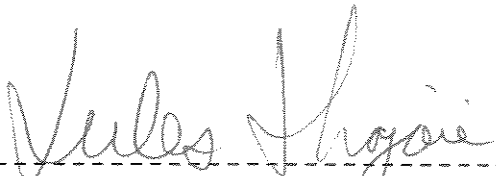


APPENDIX 5B

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

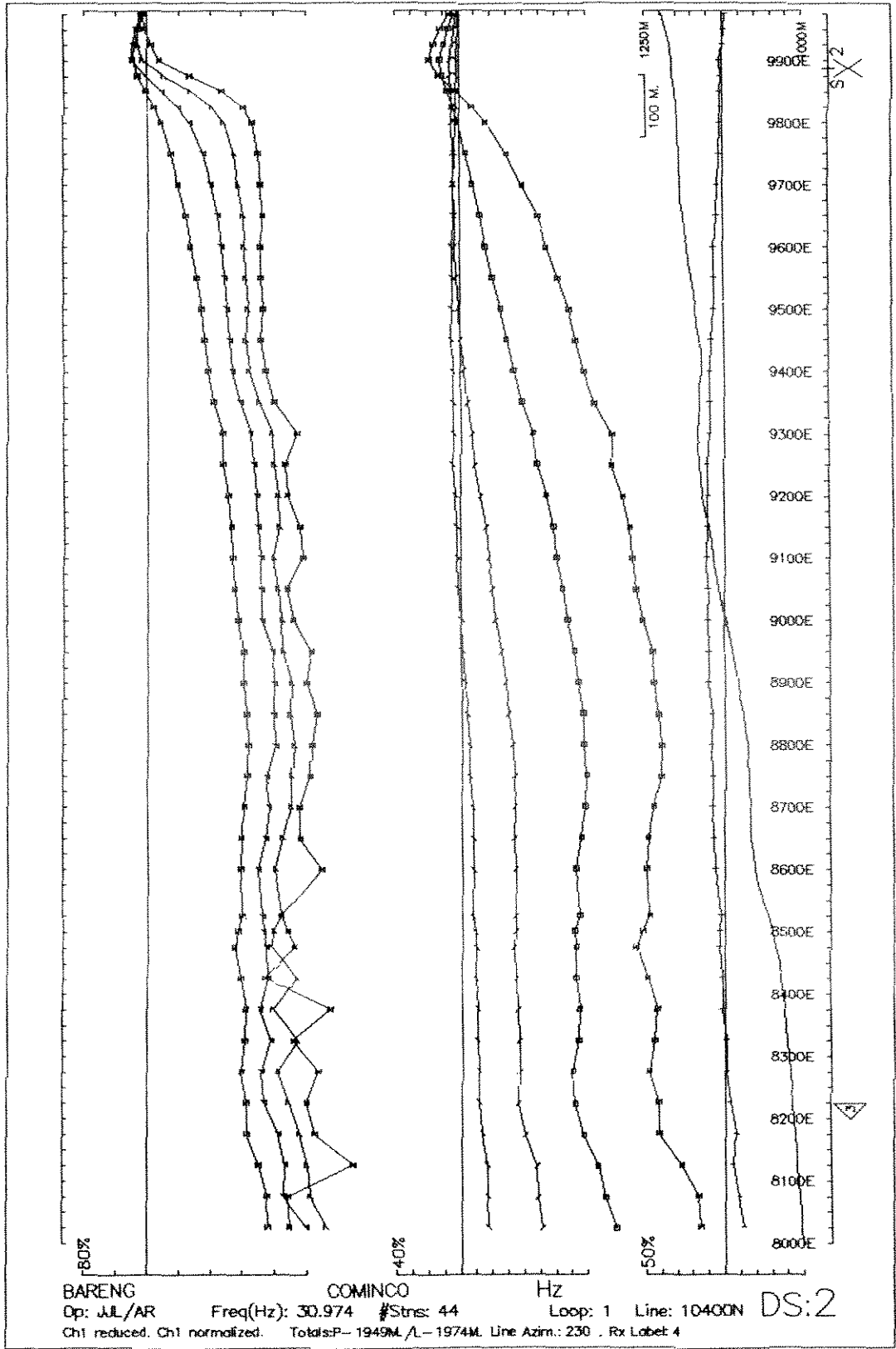
I, Jules J. Lajoie, of 1933 Creelman Ave, in the City of Vancouver, in the Province of British Columbia, do hereby certify that:

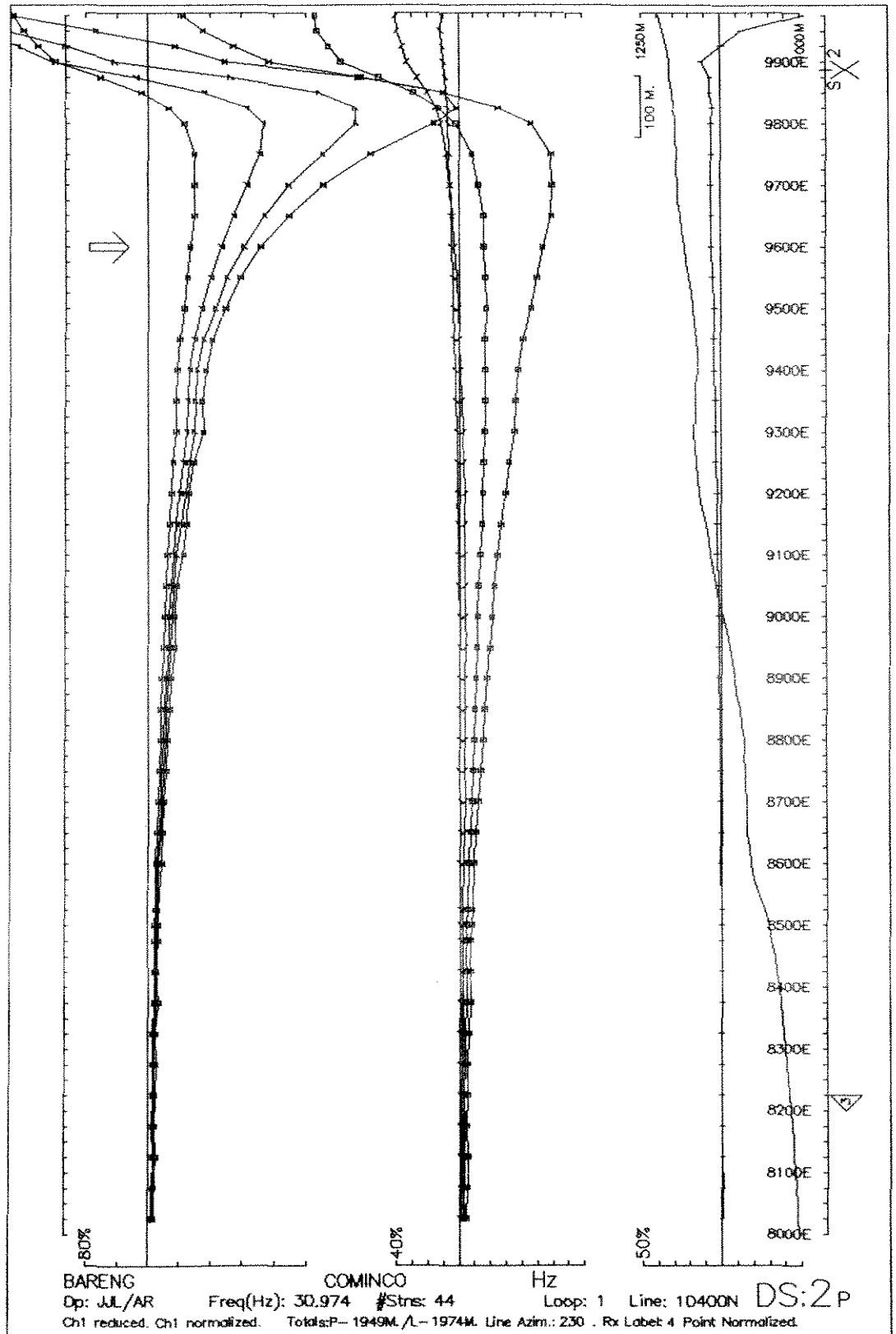
1. I graduated from the University of Ottawa in 1968 with an Honours B.Sc. in Physics, from the University of British Columbia in 1970 with an M.Sc. in Geophysics, and from the University of Toronto in 1973 with a Ph.D. in Geophysics.
2. I am a registered member (#12077) of the Association of Professional Engineers of the Province of British Columbia, the Society of Exploration Geophysicists, and the British Columbia Geophysical Society.
3. I have been practicing my profession for the past twenty years.

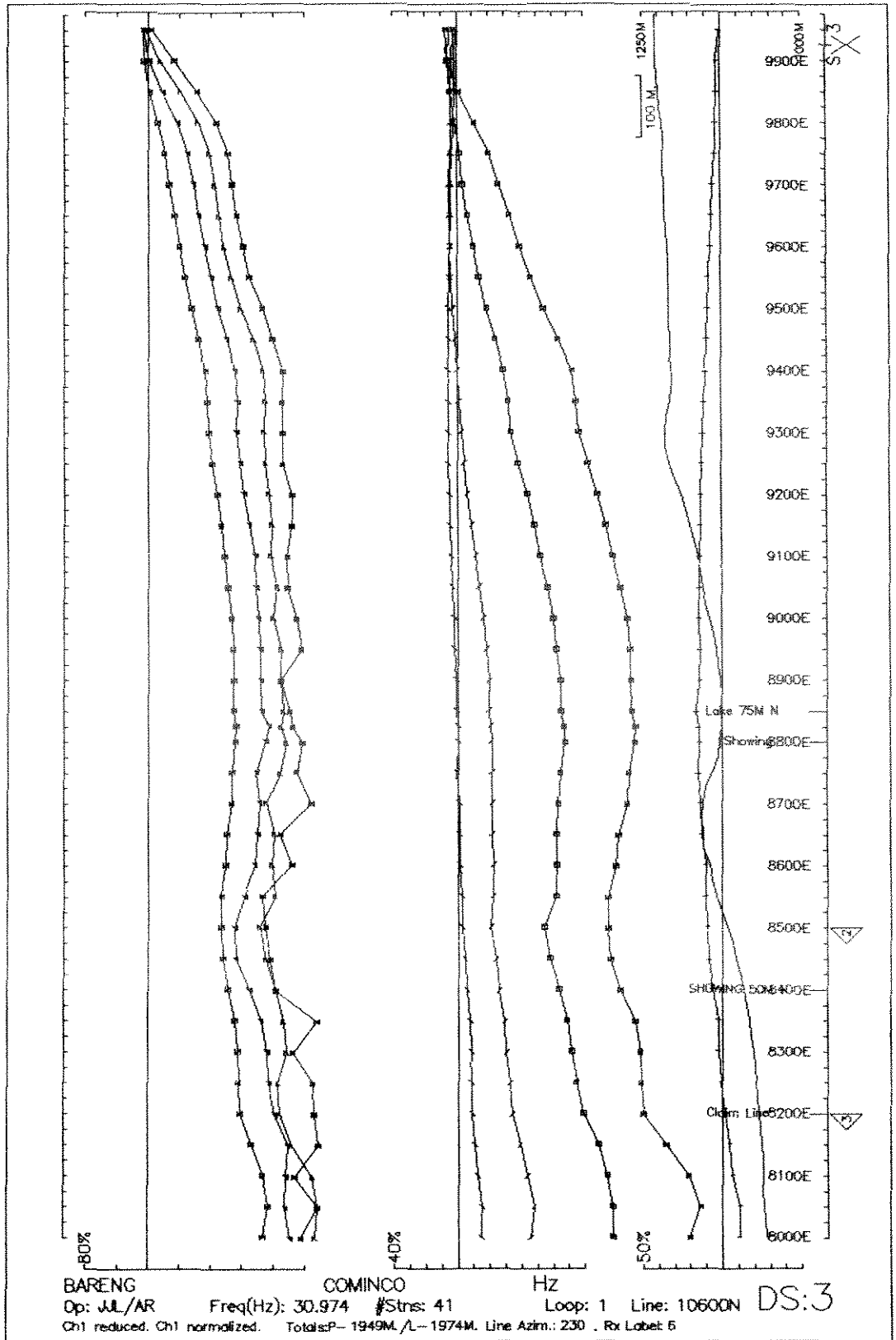


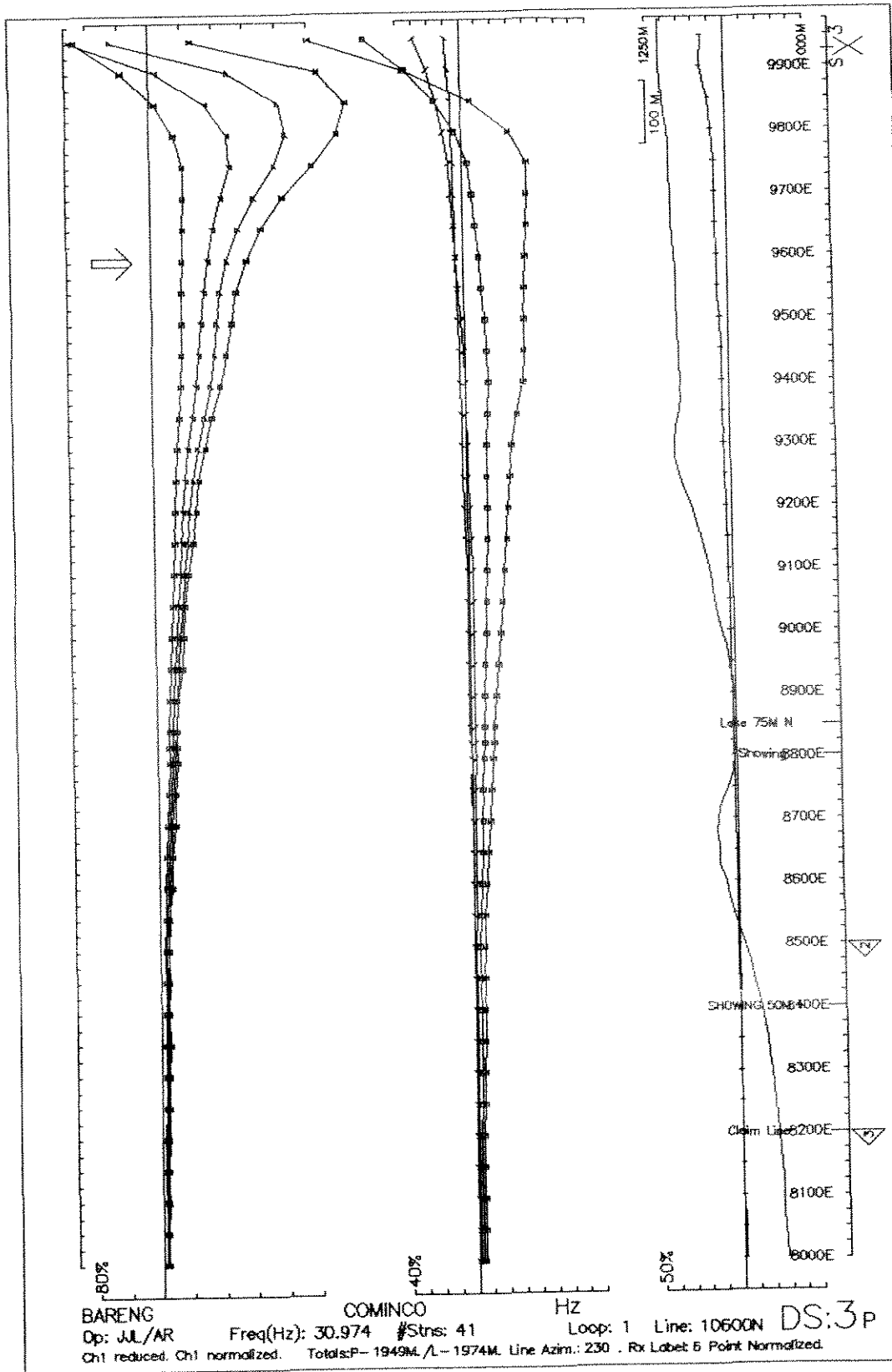
Jules J. Lajoie, Ph.D., P.Eng.
Geophysicist, Cominco Ltd.

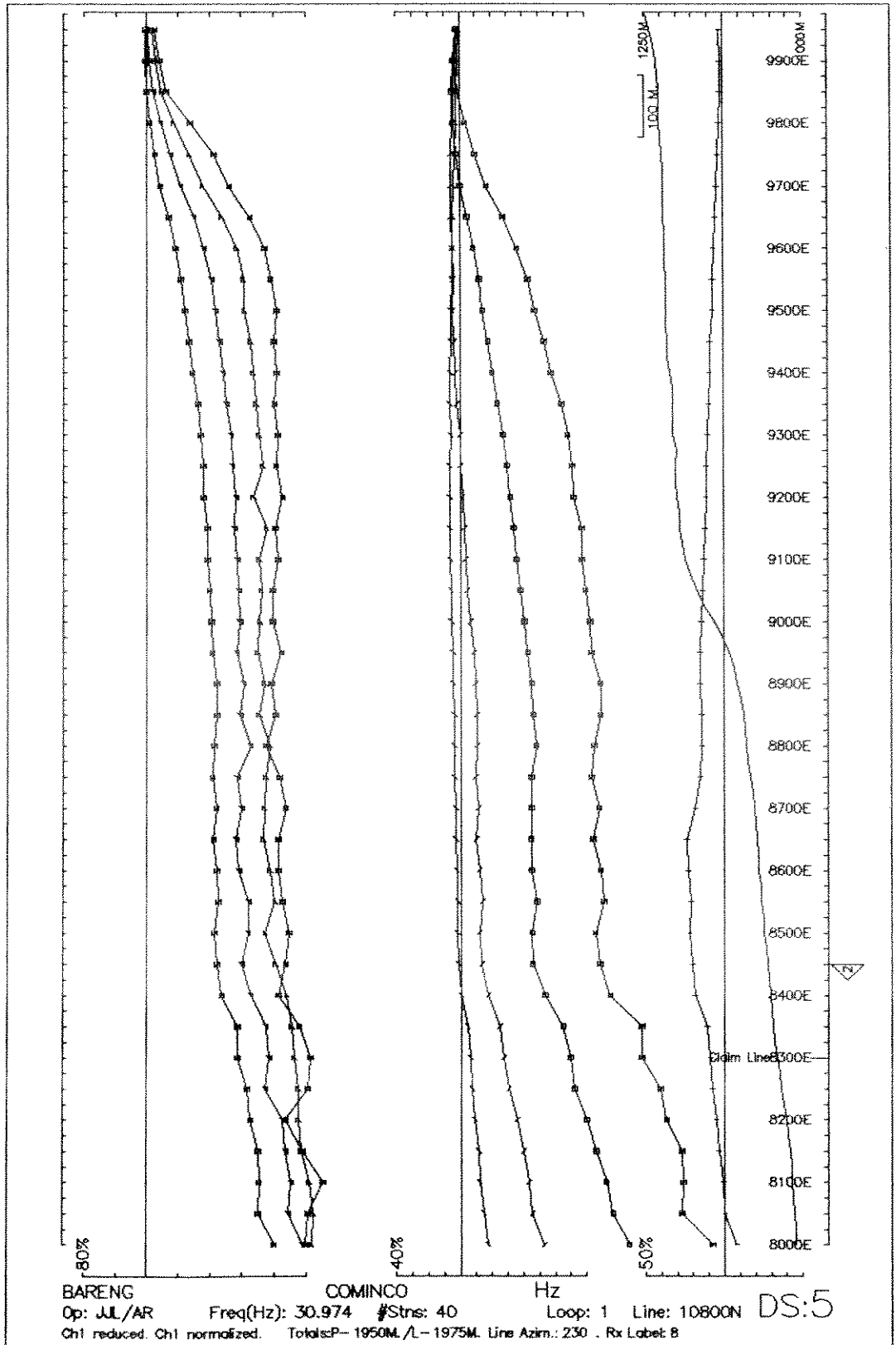
DATA SECTIONS

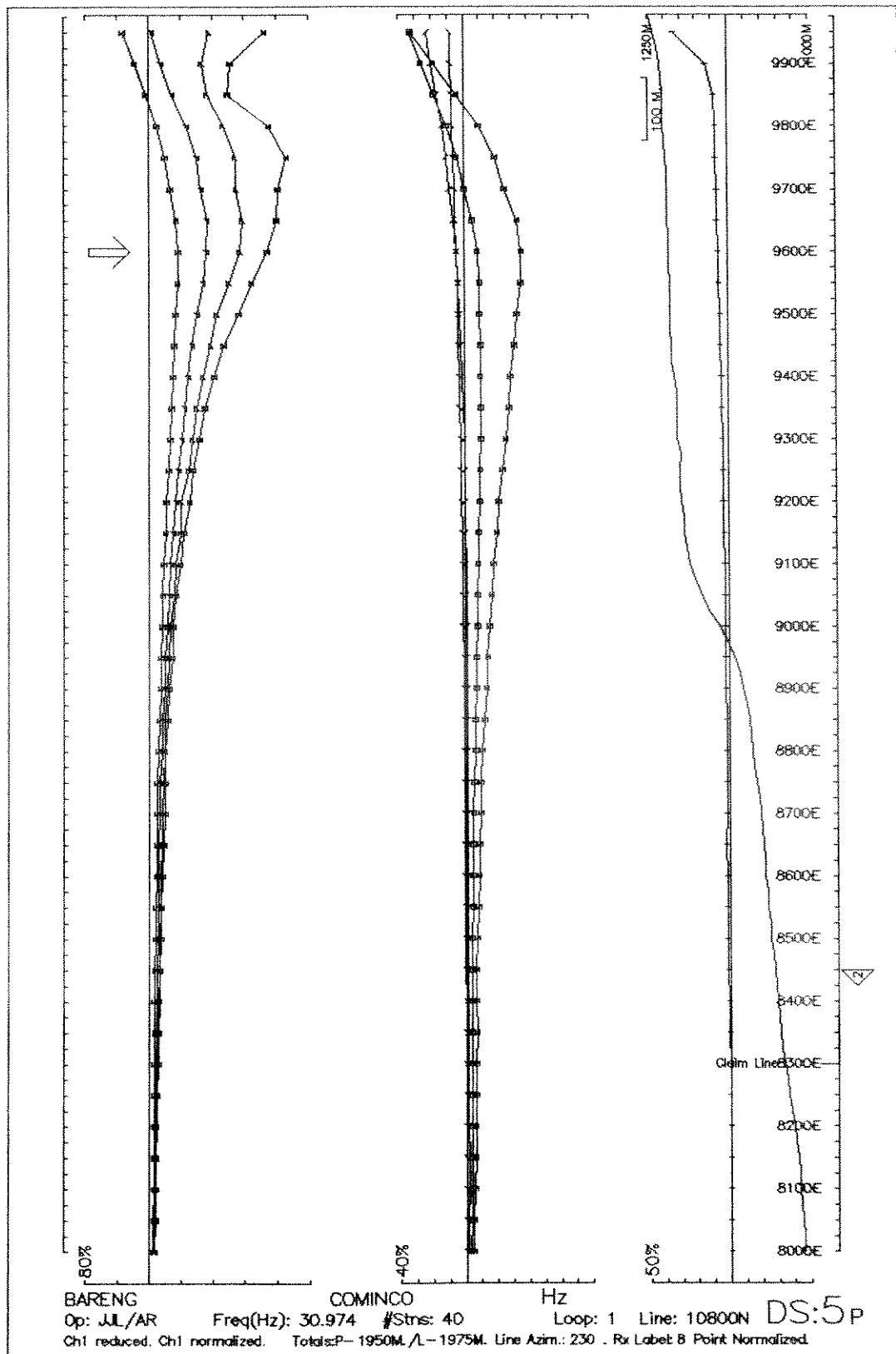


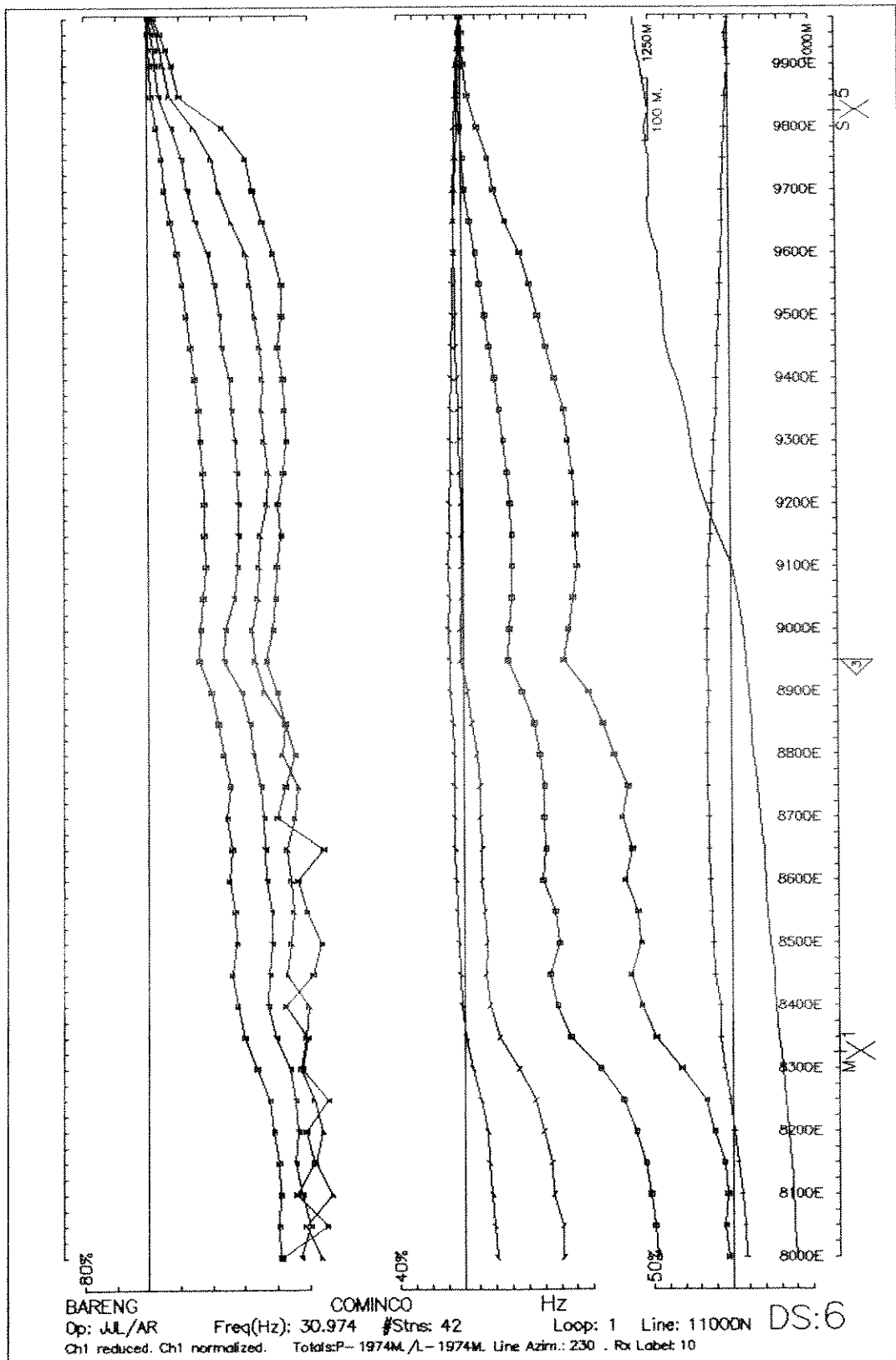


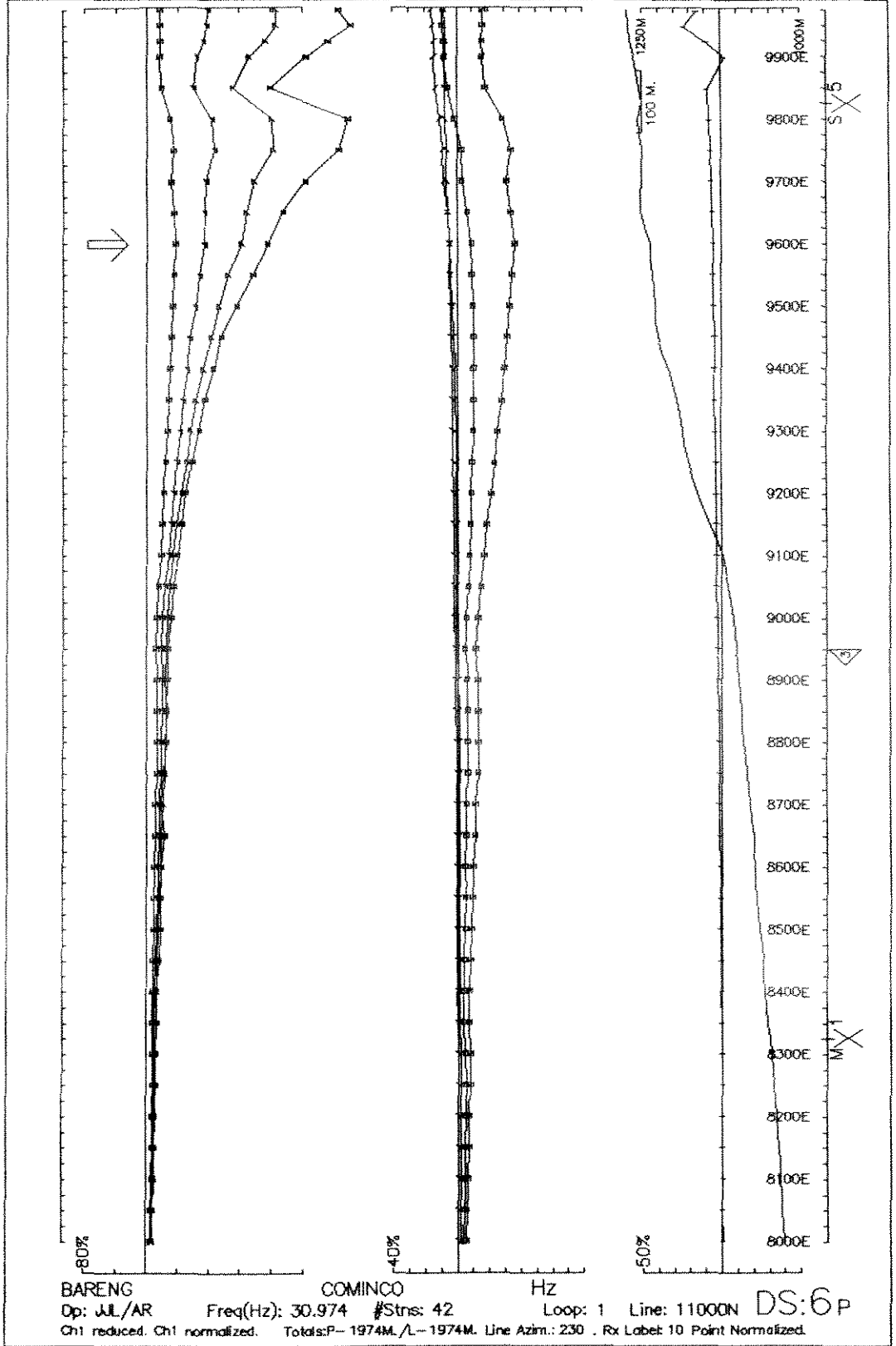


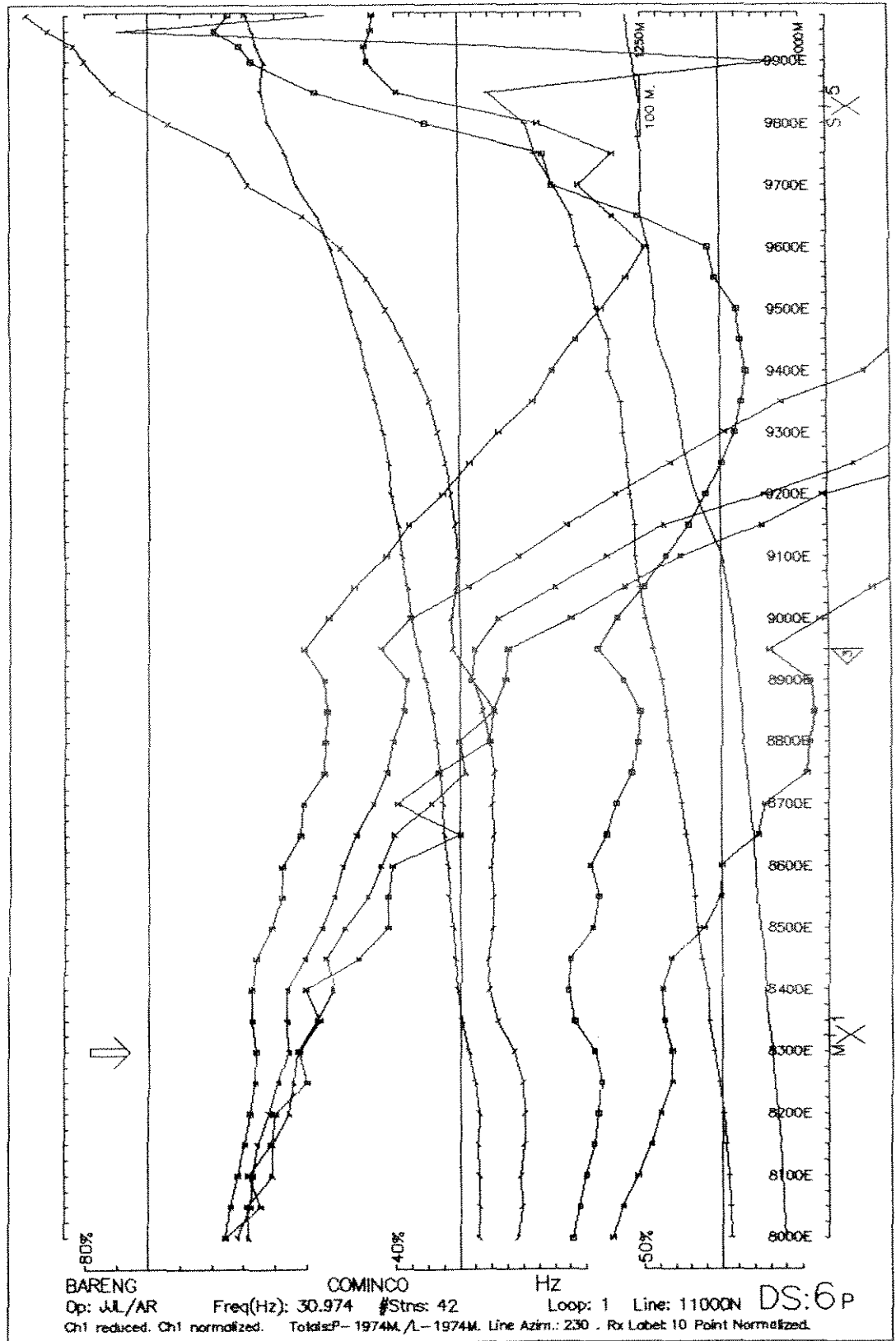


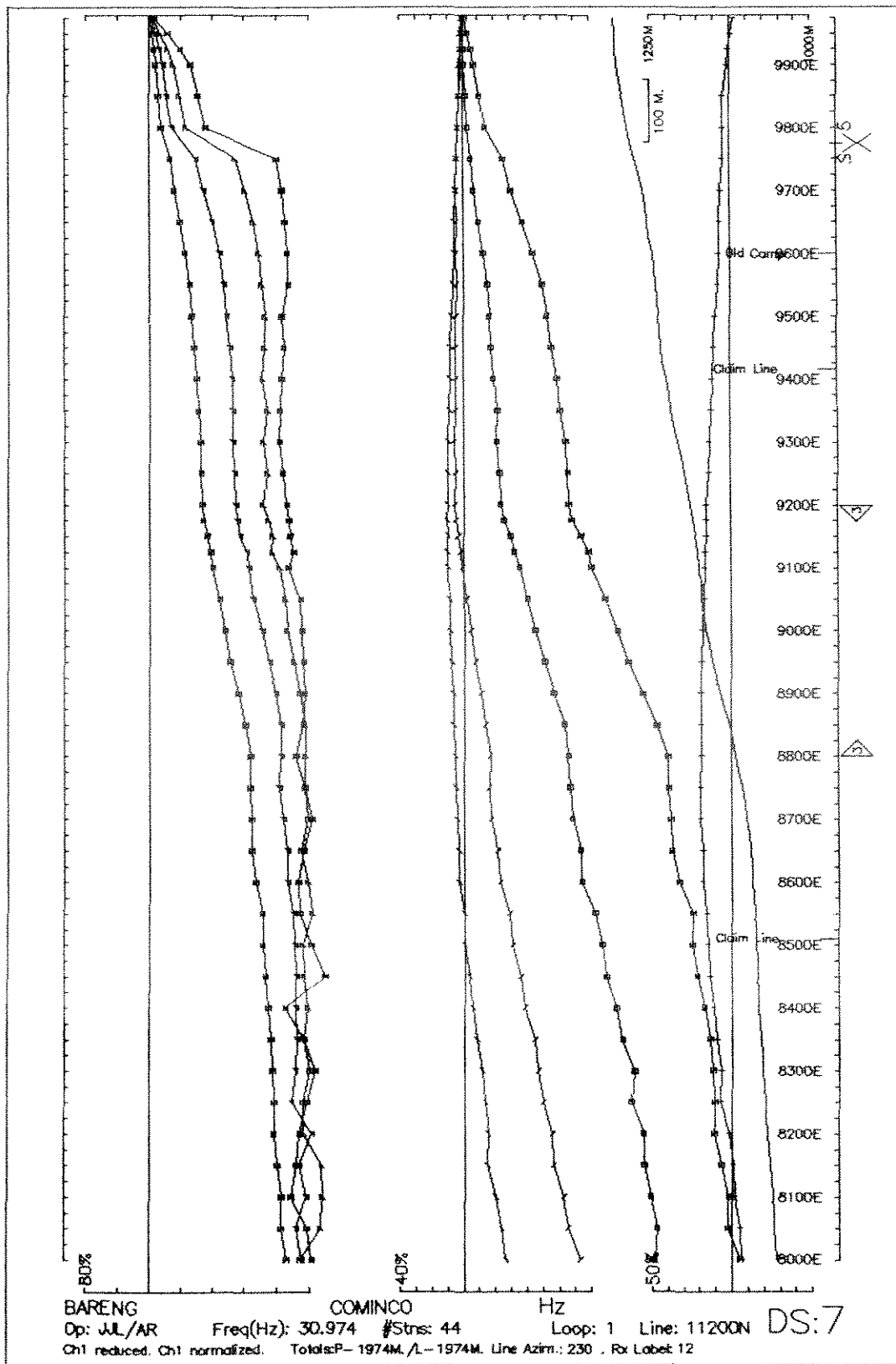


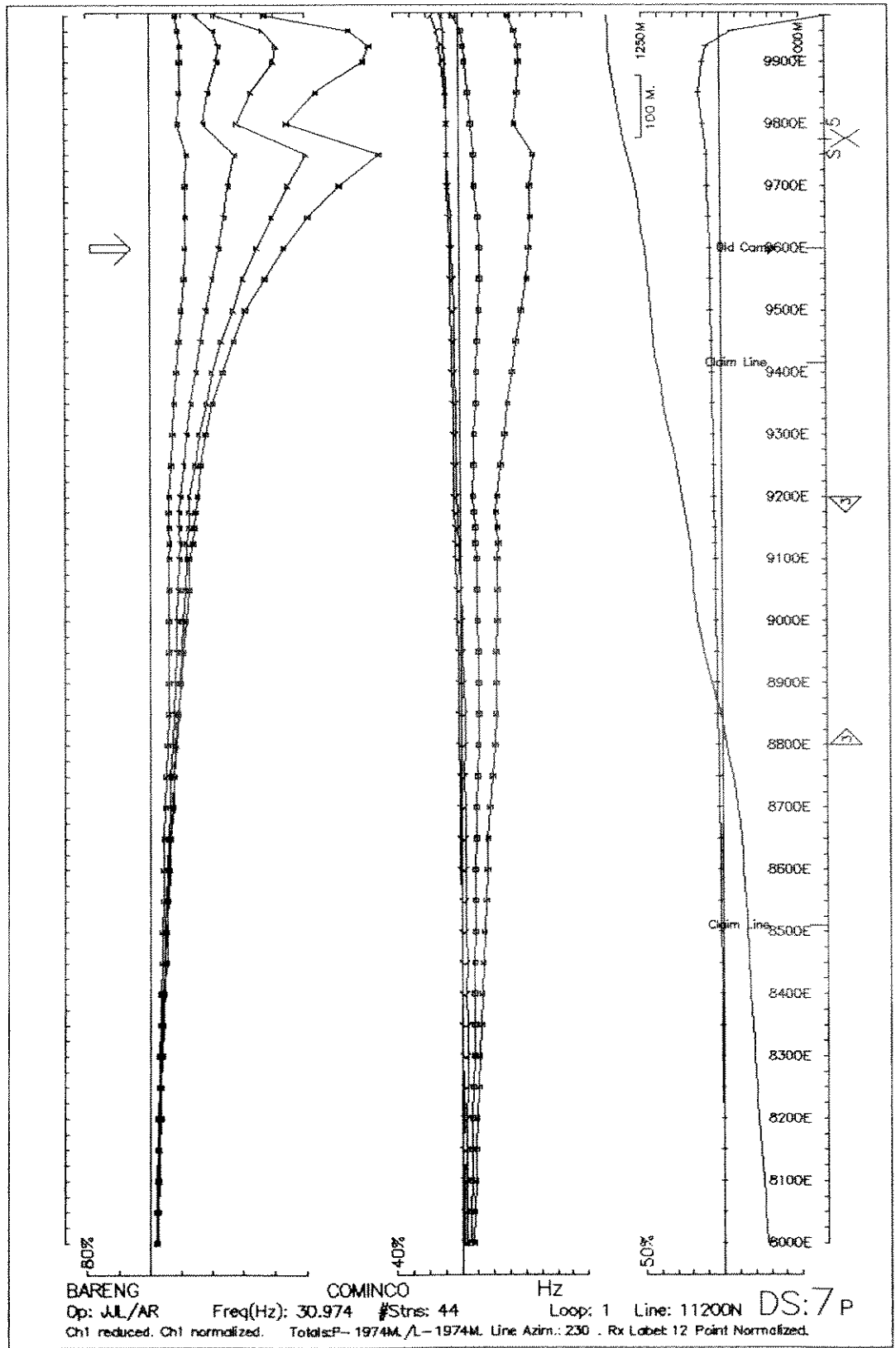


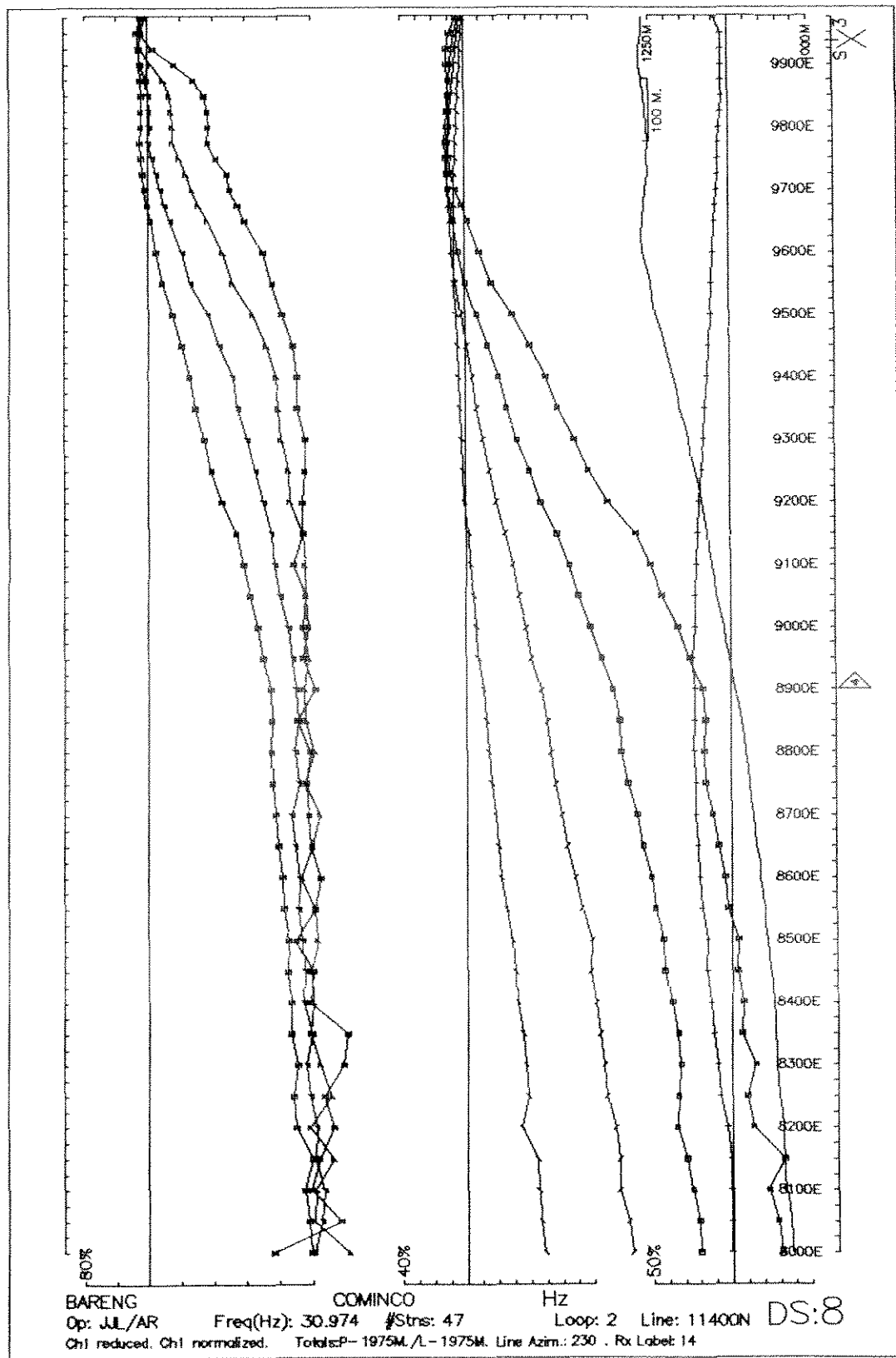


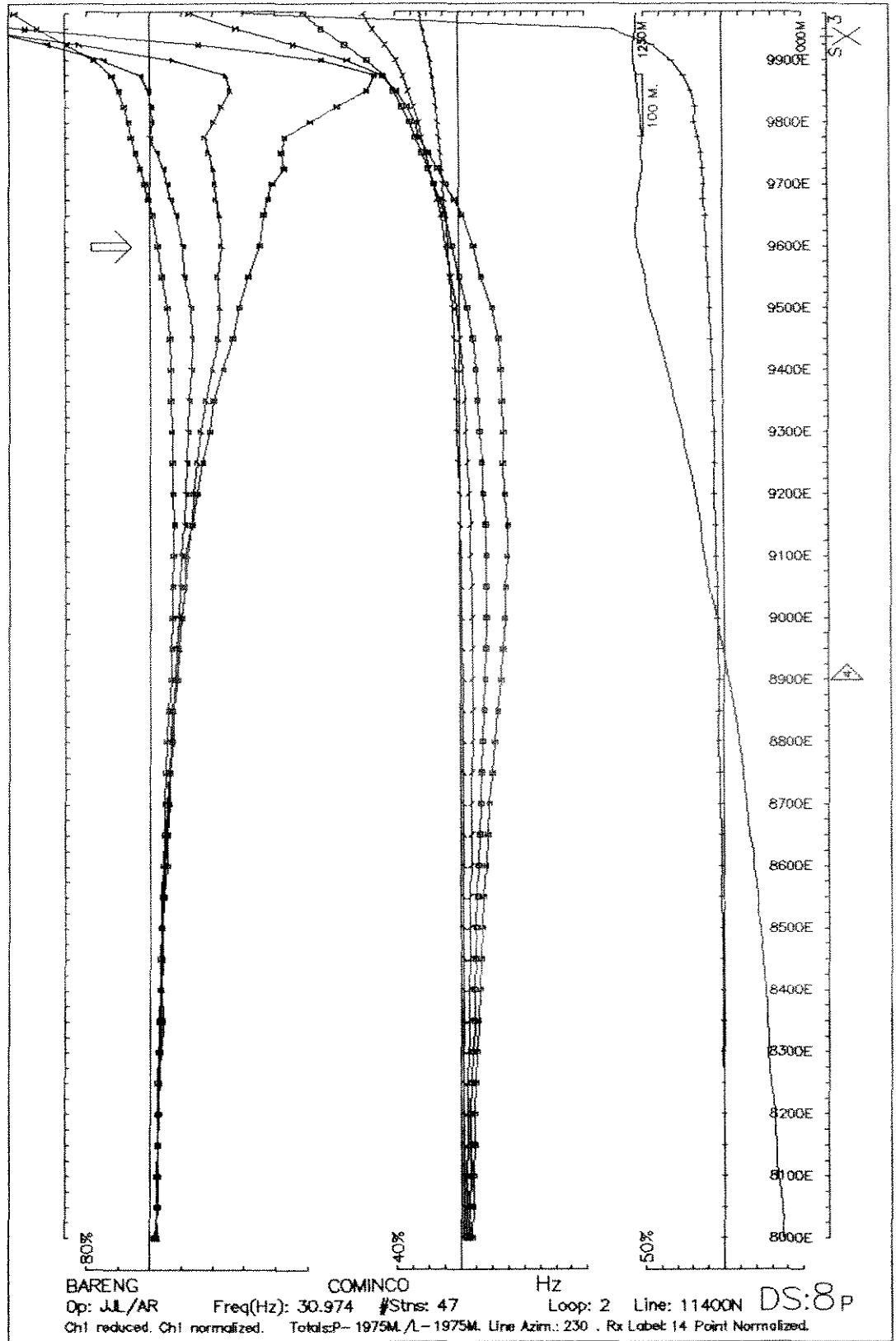


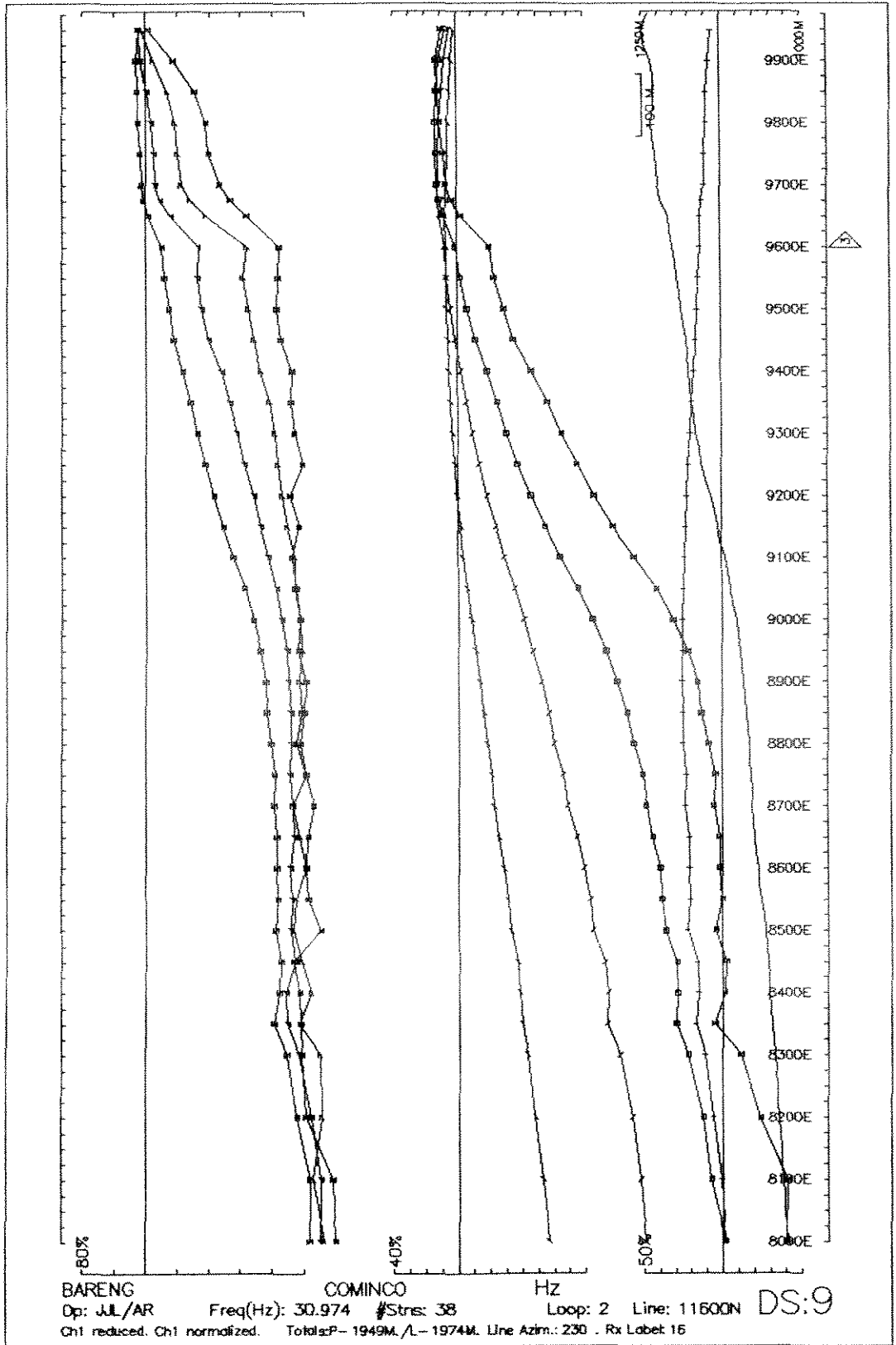


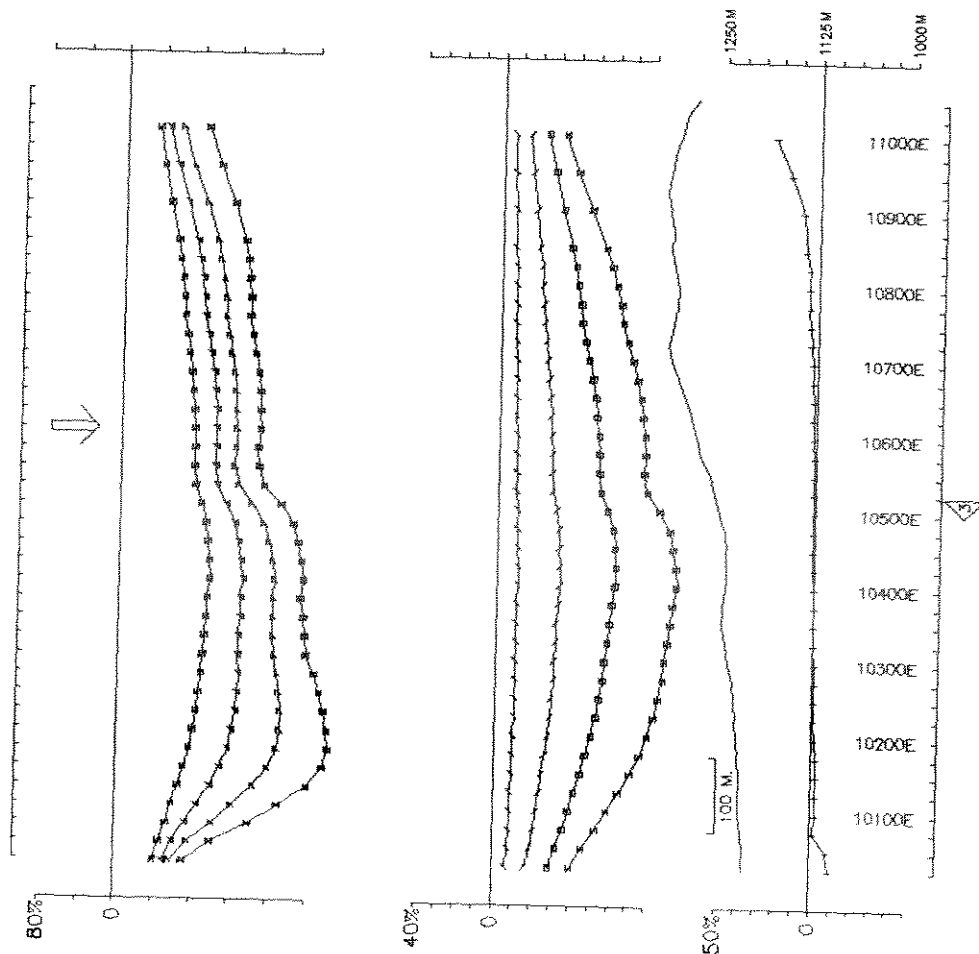




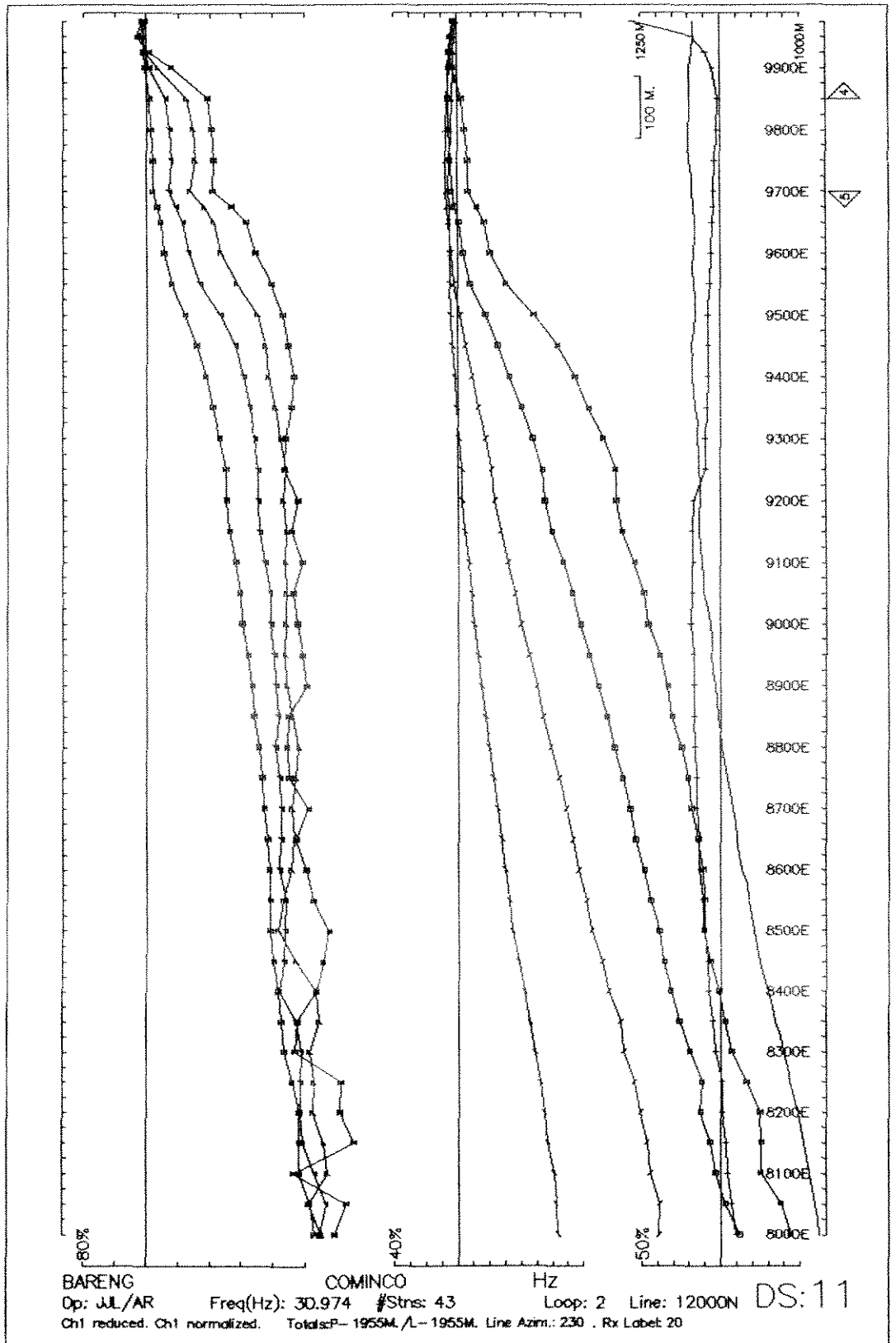


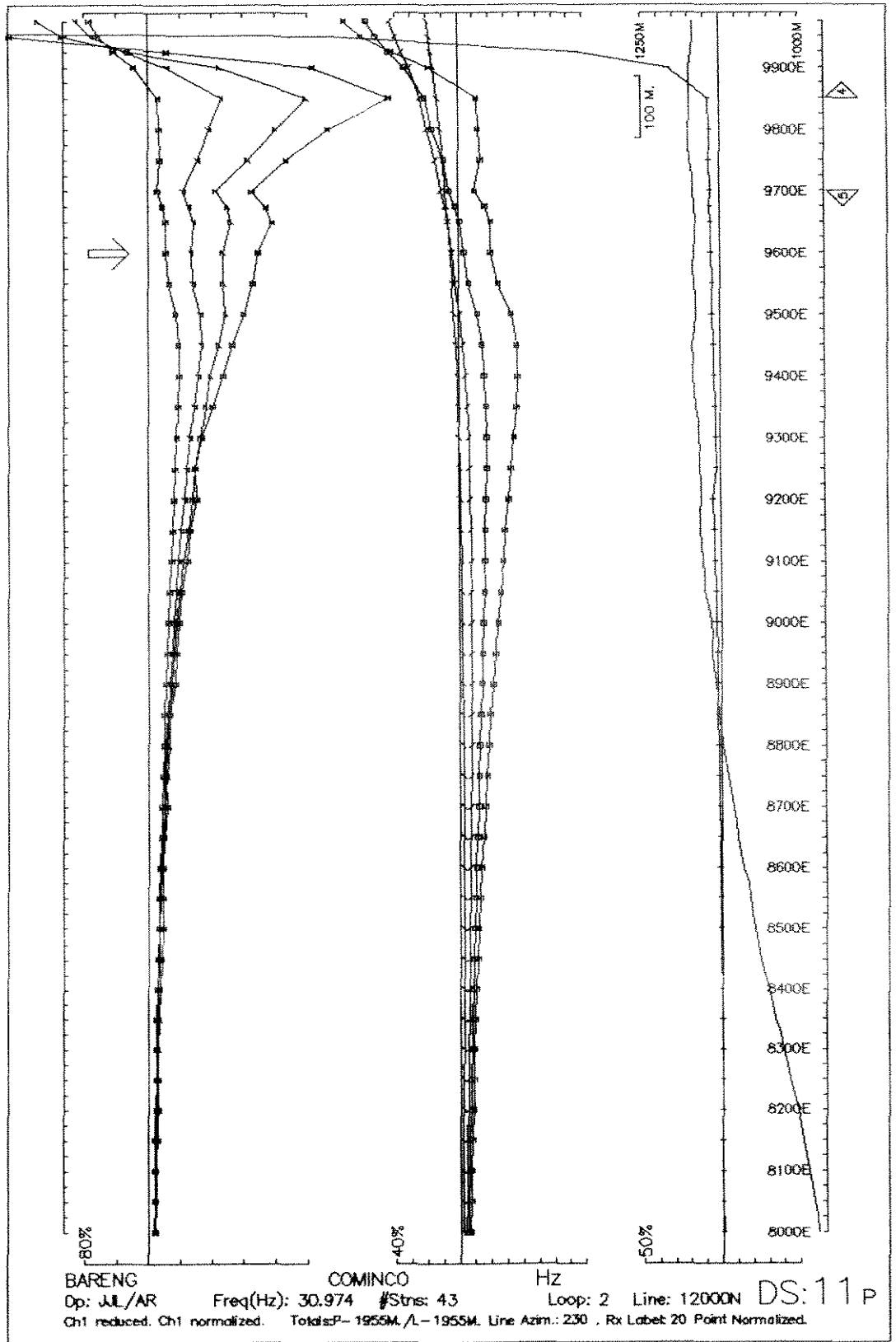


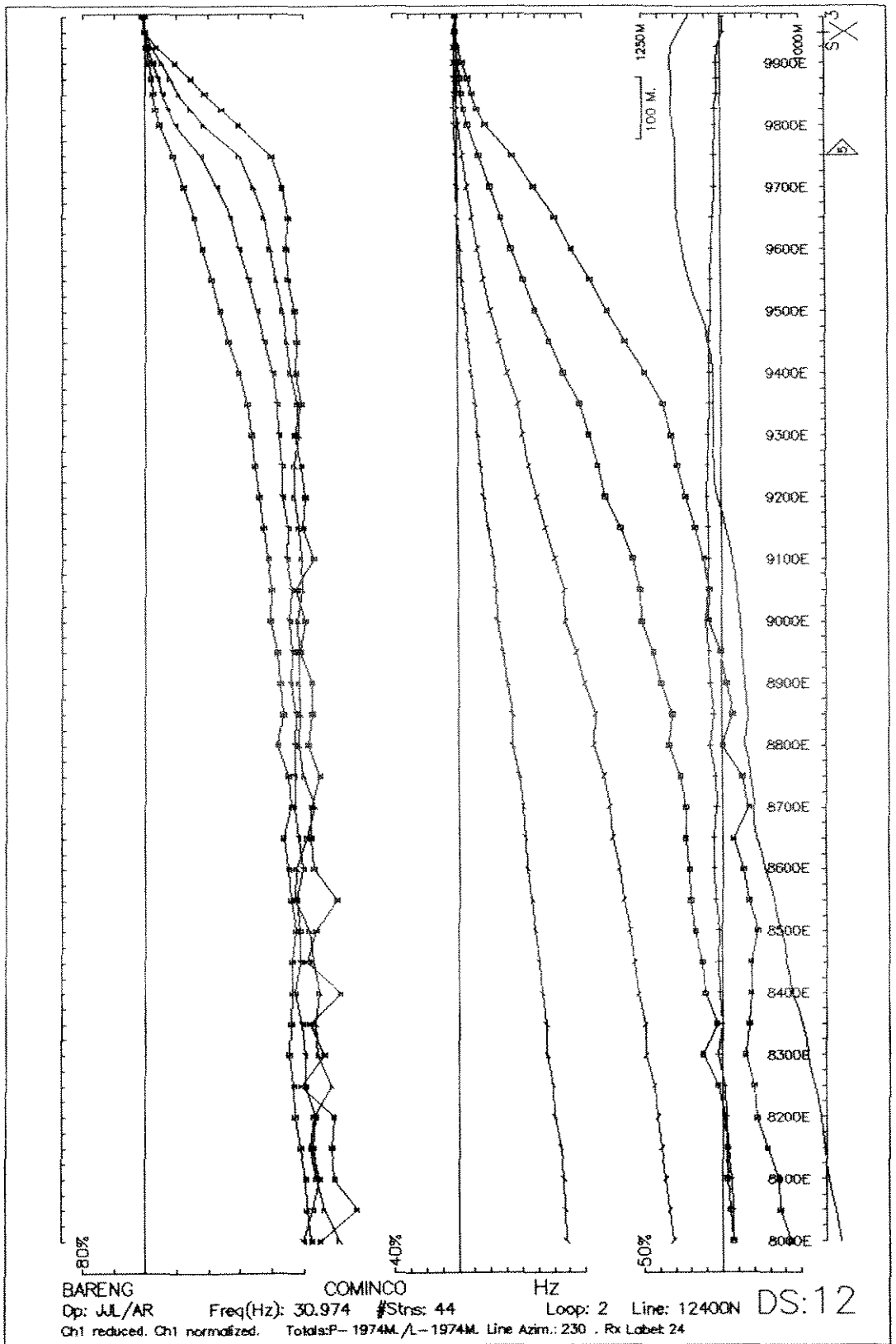




BARENG COMINCO Hz
 Dp: JLL/AR Freq(Hz): 30.974 #Stns: 37 Loop: 2 Line: 11800N DS: 10P
 Ch1 reduced. Ch1 normalized. Totals: P-975M, L-1025M. Line Azim.: 50. Rx Label: 18 Point Normalized.







BARENG

COMINCO

Hz

Op: J/L/AR

Freq(Hz): 30.974

#Strs: 44

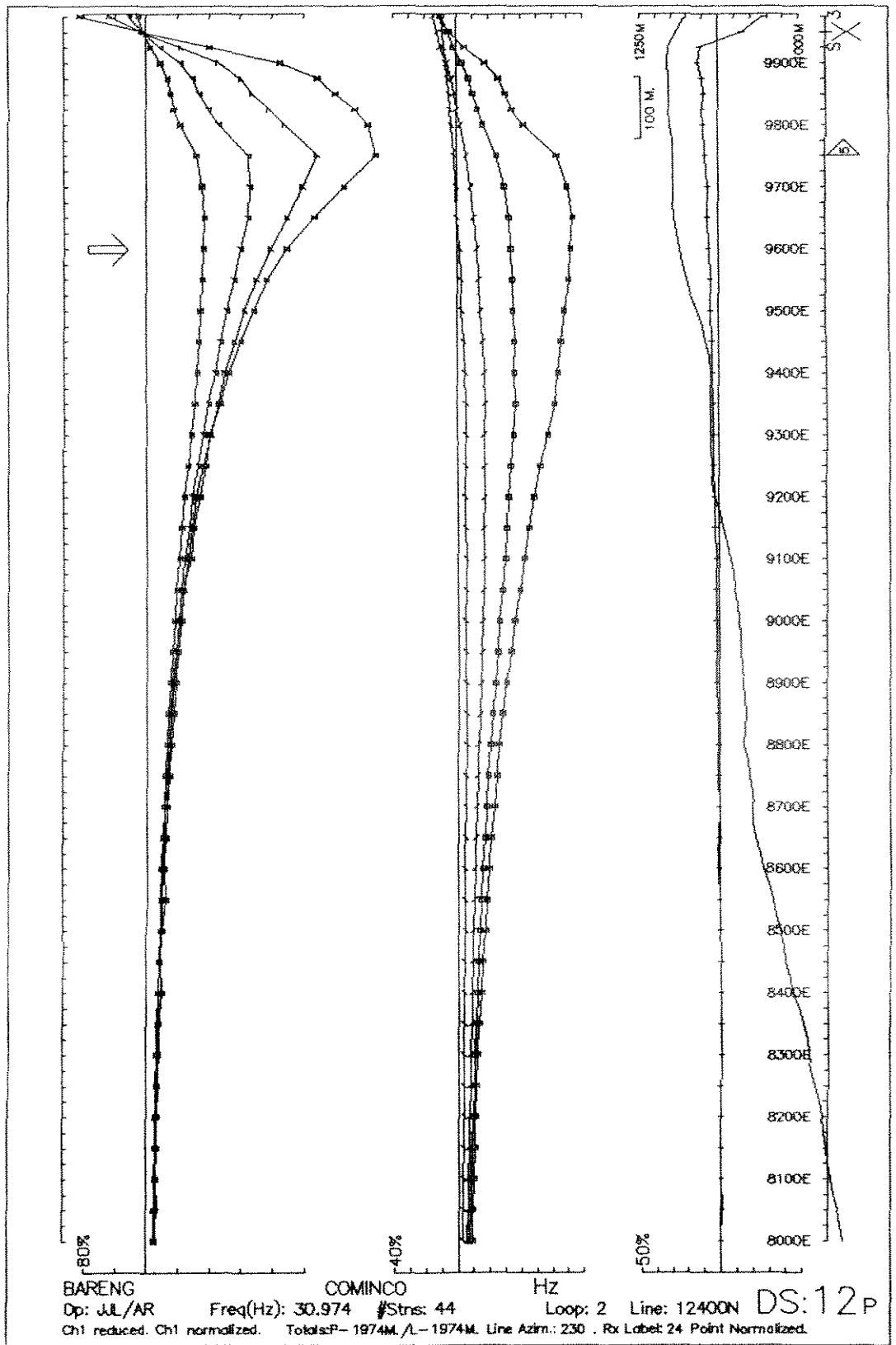
Loop: 2

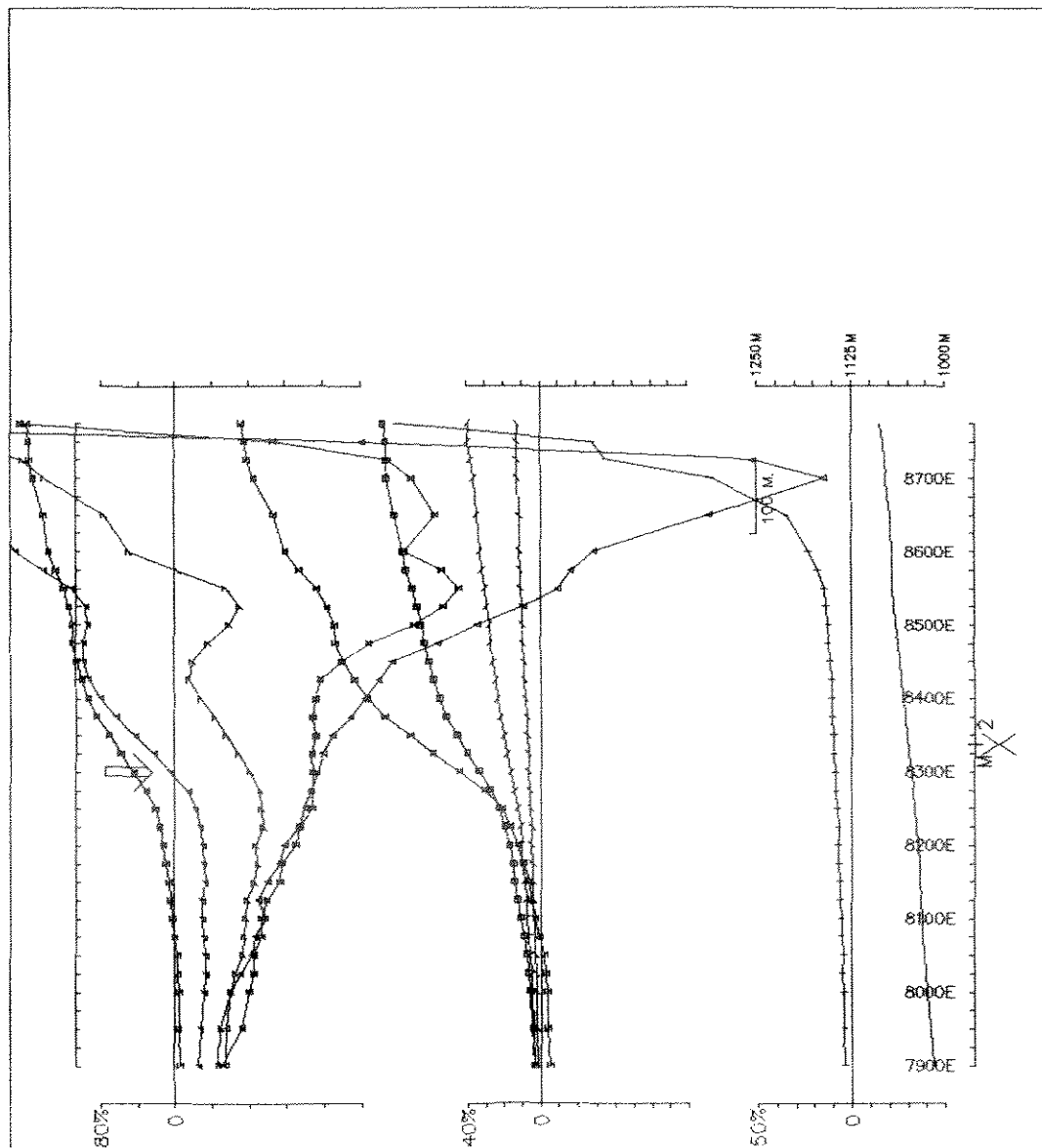
Line: 12400N

DS: 12

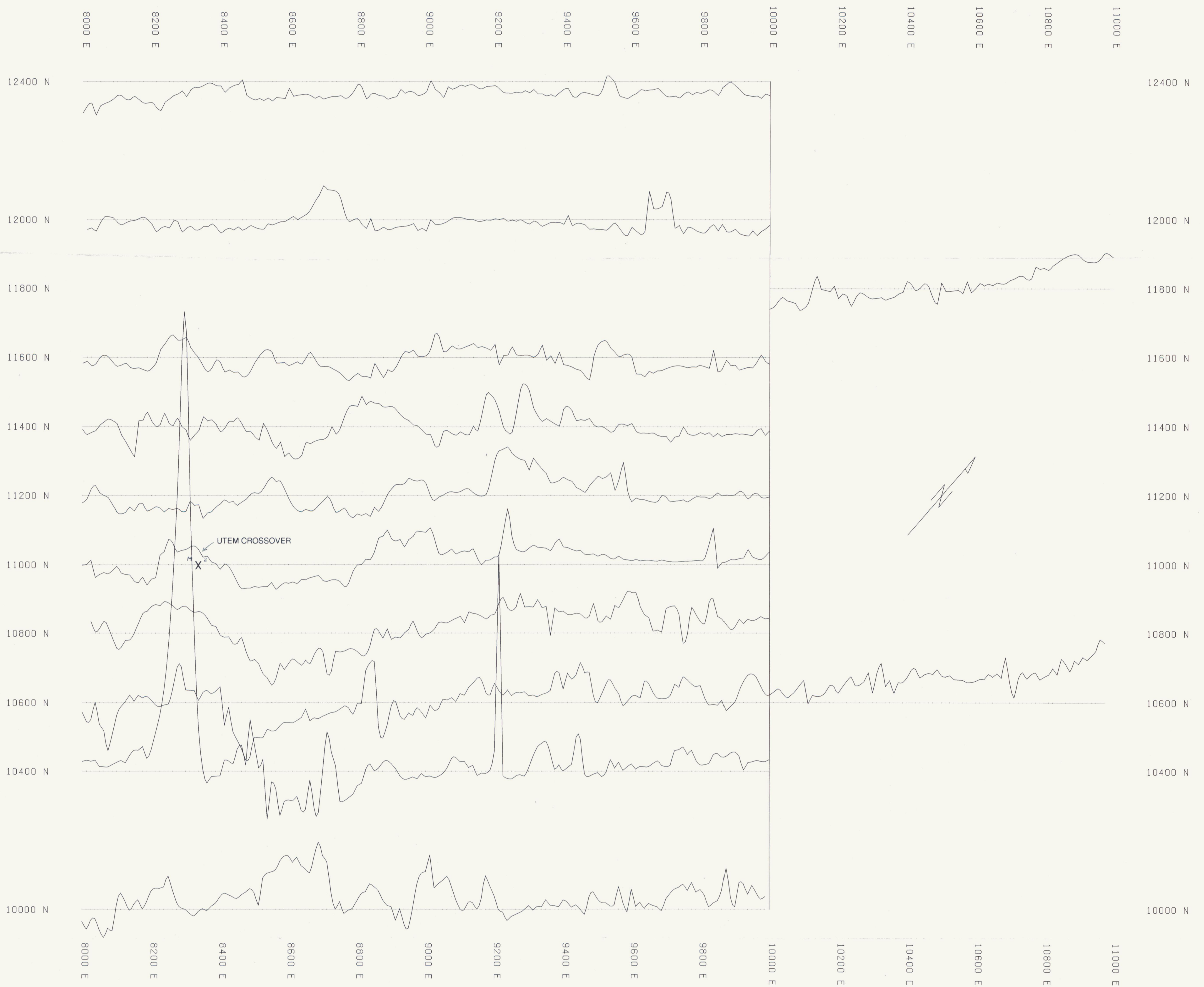
Ch1 reduced, Ch1 normalized.

Totals: P-1974M / L-1974M. Line Azim.: 230. Rx Label: 24





BARENG COMINCO Hz
 Op: JL/AR Freq(Hz): 30.974 #Strs: 32 Loop: 3 Line: 11000N DS:14P
 Ch1 reduced. Ch1 normalized. Totals:P-875M./L-875M. Line Azim.: 230 . Rx Label: 10 Point Normalized.



200 0 200 400 600



SCALE 1:5,000

BASE STATION AT 10,000E, 11,300N

BASE LEVEL = 57,900NT 1 CM = 25 NT

INSTRUMENTS - EDA OMNI PLUS MAGNETOMETERS

COMINCO LTD.

BARENG PROPERTY 093259
 TOTAL FIELD MAGNETICS 105C/8
 BASE STN CORRECTED

SCALE 1:5,000

AUGUST 94

PLATE: 415-94-4

DWA 2

