1-2-3 Sample Measurements

Twenty-six rock samples were collected from Erdouz sector and their resistivities were measured in laboratory. The results are as follows (see Table II-1-1 and II-1-2).

Resistivity of rock samples were measured under two conditions, one after samples being dried for one day in oven of 110 degrees called as dry measurement and one after samples immersed in water for three days called as wet measurement.

(1) Resistivity variation of rock samples for the same rock type are relatively large. Especially rock types with many samples, pelitic schist and psammitic schist, show larger variation. Dry measurements shows larger variation than wet sample measurements. For wet measurements, ratio of the highest resistivity value and the lowest resistivity value of the same rock type samples is from one to four to one to nineteen.

(2) Dry measurements show about 6 to 350 times larger resistivity value than those of wet measurements.

(3) From sample resistivity measurements, rocks are classified as follows.

	rock	average resistivity (ohm-m)
Resistive rocks	pelitic schist, porphyrite	2,891, 3,017
Intermediate rocks	psammitic schist, granit	1,170, 1,780
Conductive rocks	green schist, limestone	377, 745

1-3 Discussion

The results of the CSAMT survey are shown as "Apparent Resistivity vs Frequency Curves" (Fig. II-1-5(1) to (27)) at each station. The curves are classified into three groups. The three groups are as follows:

(1) Type 1

The curve of the station 5 represents the type 1. At the higher frequency range, apparent resistivity is high, and the lower frequency, the apparent resistivity becomes lower (on log-log plot the curve decrease by 45 degrees). The stations belong to this type are the stations 5, 6, 7, 21, 22, 23, 24, 26, 27, and 30.

(2) Type 2

The curve of the station 12 represents the type 2. At frequency over 1,000 Hz, apparent resistivity is over 10 k ohm-m, and at frequency from 1,000 Hz to 50 Hz, apparent resistivity is linear to frequency. At frequency below 50 Hz, apparent resistivity is almost unchange. However apparent resistivity value at 4 Hz is lower than that at 8 Hz. Stations belong to this type are the stations 8, 9, 10, 11, 12, 13, 14, 15, 16, 20, 25, 28, and 31.

(3) Type 3

The curve of the station 19 represent the type 3. Apparent resistivity at higher frequency is high, and it becomes lower along with frequency decrease. However the slope of curves are gentle and not so steep as that of type 1 (45 degrees). Apparent resistivity value changes very gently at frequency between 100 and 200 Hz and again decreases along with frequency below 20 Hz. Stations belongs to this type are the stations 4, 17, 18, and 19.

The classification of apparent resistivity vs frequency curve is not absolute and there are some intermediate stations of two types. Relation between classified type and geology is discussed in following paragraphs.

Most stations of type 1 are in the east of Erdouz fault. Station 7 is the only exception of this and is in the west of the fault. However the curve of the station 7 is not typical of type 1 but intermediate of type 1 and type 2.

Type 2 is seen in the west of Erdouz fault except the station 25.

Type 3 is seen only around Erdouz Northern ore deposit.

The distribution of each types suggests that classification of apparent resistivity vs frequency curves can be related to geology of the area.

No apparent resistivity vs frequency curve of the survey area show so called near-field effect.

1-3-1 Layered Earth Model Analysis

All apparent resistivity vs frequency curves are interpreted into horizontally layered earth models by computer. For calculating horizontally layered earth model, initial values of layer thicknesses and resistivities of each layer are infered from apparent resistivity vs frequency curve. The infered initial values are inputted to a computer and a computer calculated best fit layered earth model for each curve. Because thus calculated models are independently obtained, models of adjacent stations may disagree each other. In such occasion, after changing the initial values and putting some limitations on layer thickness or resistivity, layered earth model are recalculated. On some curves, layer thickness and resistivity cannot be determined from curves but only ratio of thickness and resistivity, namely conductance. For this survey, some stations can be interpreted as only conductance. For such occasion, either layer thickness or resistivity is assumed from model of adjacent station and is assumed to be continuous to the concerned station.

The result of layered model interpretation is discussed by the classified types in the following paragraphs:

(1) Type 1

The most stations of this type are interpreted as three layered earth. Resistivity structure is that the top layer is resistive with resistivity between 1 k and 10 k ohm-m and thickness between 300 to 1,500 m and is followed by conductive layer with resistivity below 20 ohm-m (except at the stations 23 and 24). Those stations of type 1 with apparent resistivity vs frequency curve having 45 degrees declination below 1,000 Hz are interpreted as two layer earth. The stations of this type with more gentle decrease curve are interpreted with intermediate second layer with intermediate resistivity. At the stations 5 and 6, the intermediate layer is with resistivity of 20 ohm-m and thickness of 100 m. The intermediate layer at the stations 23, 24, 26, and 27 are with resistivity between 800 and 3,000 ohm-m and thickness about 500 m.

(2) Type 2

Most stations of type 2 are interpreted as four layered earth.

Table II-1-1 Rock Sample Measurements, Erdouz Sector

Location Station No.	Resistivity (ohm-m) Dry	 Wet	Rock Type
10	13,282	377	tuffacious green schist
4	27,063	922	pelitic schist
5	280,193	3,912	pelitic balck schist
6	310,531	10,037	pelitic black schist
8	16,342	533	pelitic schist
9	41,070	6,993	pelitic schist
12	475,666	4,550	pelitic black schist
15	162,797	2,751	pelitic black schist
Av of 7 spls	102,927	2,891	
7	348,867	1,315	psammitic schist
11	86,764	1,097	psammitic schist
13	426,429	3,505	psammitic schist
14	529,397	4,321	psammitic schist
18	88,982	599	psammitic schist
19	43,761	1,850	psammitic schist
21	60,784	669	psammitic schist
24	60,503	2,232	psammitic schist
25	5,371	495	psammitic schist
26	223,887	629	psammitic schist
27	381	499	psammitic schist
Av of 11 spls	61,166	1,170	
22	91,019	1,329	limestone
30	27,881	325	limestone
20	27,051	957	calcarious schist
Av of 3 spls	40,946	745	
17	74,437	744	micro granite
23	280,500	4,258	micro granite
Av of 2 spls	144,498	1,780	
16	226,486	9,279	porphyrite
18	40,302	981	porphyrite
Av of 2 spls	95,540	3,017	

The general resistivity structure is as follows:

	Resistivity (ohm-m)	Thickness (m)
1st Layer	approx. 10,000	1,000 to 2,000
2nd layer	20	approx. 100
3rd layer	800	approx. 2,000
4th layer	below 10	

Resistivity values and thickness of 2nd, 3rd, and 4th layers are not thick enough to be determined independently from apparent resistivity vs frequency curves and are interpreted only as ratio of thickness and resistivity, namely conductance. Therefore before interpreting curves of type 2, either thickness or resistivity of 2nd, 3rd and 4th layers are needed to be determined. For interpreting curves of type 2, the second layer resistivity is fixed as 20 ohm-m, the third layer resistivity to be 800 ohm-m, and the fourth layer to be 10 ohm-m.

(3) Type 3

The curves of type 3 except the station 19 are interpreted as tow layered earth. The first layer is 200 to 500 m thick and 40 to 400 ohm-m. The bottom layer resistivity is infered to be as 1 to 15 ohm-m.

<u>1-3-2 Discussion About Sections</u>

As stated on the section 1-3-1, apparent resistivity vs frequency curves are interpreted into horizontally layered earth at each stations. Four resistivity sections are drawn along lines shown on Fig. II-2 (see Fig. II-1-1 to Fig. II-1-4).

Details of each sections are as follows:

(1) A-A' Section

Stations along this section, except the stations 7 and 14, have similar resistivity structure and continuity of resistivity layers along this section is relatively well.

Thicknesses of layers at the station 14 are about double of those at neighboring stations, the stations 13 and 15. The apparent resistivity vs frequency curves at the stations 13 and 15 are almost identical, however the curve at the station 14 fit to those at stations 13 and 15, if the former is shifted down in vertical direction, apparent resistivity axis. This may have caused by a typical effect in MT survey, called static shift. Static shift is that where resistivity structure is similar in the depths but have large change at only near surface on limited area around the station, apparent resistivity vs frequency curve shifts along vertical, resistivity axis, up or down depends on the limited area being resistive or conductive. In order to decide whether static shift has occurred and how much of shift has occurred, surface resistivity around the considered station need to be studied in details. Because station interval of this survey is 300 m, it cannot be concluded that static shift has occurred at the station 14 and resistivity is shifted by the factor of four and layer thickness by two. However the shape of the apparent resistivity vs frequency curve at station 14 is very similar to those at the stations 13, 15 and 28 so that it is reasonable to assume that static shift occurred at the station 14.

On the section A-A' (Fig. II-1-1), the depths of all layers at the station 14 are two to three times deeper than those at neighboring stations, but because of the reason stated above it is fair to assume that the true depths of all layers are about the same as those at the adjacent stations. The resistivity structures along A-A' are relatively homogeneous laterally.

(2) Section B-B'

The section B-B' runs from Erdouz Northern ore deposit to Erdouz Peak and is drawn for studying the N-S extension of Erdouz Northern ore deposit.

The resistivity structures along the line can be devided into three zones, the one north of the station 18, around Erdouz Northern ore deposit, the one between the station 20 and 24, and the one south of the station 25.

In the area around and the north of Erdouz Northern ore deposit, resistivity of the first layer is between 250 ohm-m and 450 ohm-m and its thickness is between 220 m and 325 m. Resistivity of the second layer, the bottom layer, is around 10 ohm-m. Because resistivity around Northern ore deposit is low, depth of survey must be less than 1,000 m. Therefore thickness of the second layer must be over 100 m but not determined.

The area between the stations 20 and 24 shows apparent resistivity vs frequency curves as the type 1. The curves here show relatively gentle slope at higher frequency and at lower frequency slope of the curves become 45 degrees. Resistivity and thickness of the first layer in the area is definitely interpreted as about 10 k ohm-m and about 1 km, but resistivity of the bottom layer is interpreted as less than 100 ohm-m and its thickness cannot be determined. In some stations, intermediate layer with resistivity of around 100 ohm-m is interpreted between resistive top layer and conductive bottom layer. The intermediate layer appeares because of slope of curves being less than 45 degrees if curves are interpreted as layered earth.

The apparent resistivity vs frequency curve of the station 25 belongs to type 2 and its resistivity structure is similar to that of the section A-A'. However the curve of the station 25 appears to be shifted to higher resistivity than those of typical station of type 2. This shift may have caused by static shift as the station 14 but because no station neighboring to the station 25 show the same type curve, it is hard to decide whether static shift occurred at the station. If static shift has caused resistivity shift on the CSAMT data at the station 25, resistivity structure at the station 25 would be a few times less than what is stated on the interpretation.

(3) Section C-C'

The section C-C' is NE-SW direction, parallel to the section A-A', and the east of Erdouz fault. The direction of the section A-A' is extension of the line connecting the stations belong to type 3 around Erdouz Northern ore deposit.

The area north of the station 19 has type 3 apparent resistivity vs frequency curve and the south of the station shows type 1. No indication of type 3 has found in the south of the station 19.

(4) Section D-D'

The section D-D' is E-W direction and cuts Erdouz fault. Type of apparent resistivity vs frequency curve changes at between the stations 27 and 28. Those at east of the station 27 are type 1 and those at west of the station 28 are type 2. It seems that resistivity structure has changed between the stations 14 and 28, but as stated at the (1) Section A-A', it is likely due to static shift at the station 14. The difference of resistivity structures at the stations 14 and 28 may not be so large.

At the stations east of the station 27, there are no indication of type 3 and all stations show type 1.

The sections and the type classification of apparent resistivity vs frequency curve show that Erdouz fault affect largely on resistivity structures in the area. Around Erdouz Northern ore deposit, low resistivity zone extending NE-SW direction is found and may correspond to limestone with complex fault system. However from this survey result, it is not found that the low resistivity zone around Northern ore deposit may extend under Erdouz Peak.

CHAPTER 2 AZEGOUR SECTOR

2-1 Outline of the SIP Survey

2-1-1 Outline of SIP Method

Spectral Induced Polarization Method (called as SIP, also known as complex resistivity method) is introduced by Zonge et al (1975) and Pelton et al (1978) as a new phase of IP method. The conventional IP method measures PFE or chargeability and apparent resistivity, while SIP measures phase differences of transmitting signal and received signal in the wide range of frequencies from 0.1 Hz to several tens of Hz and phase spectrum is analized.

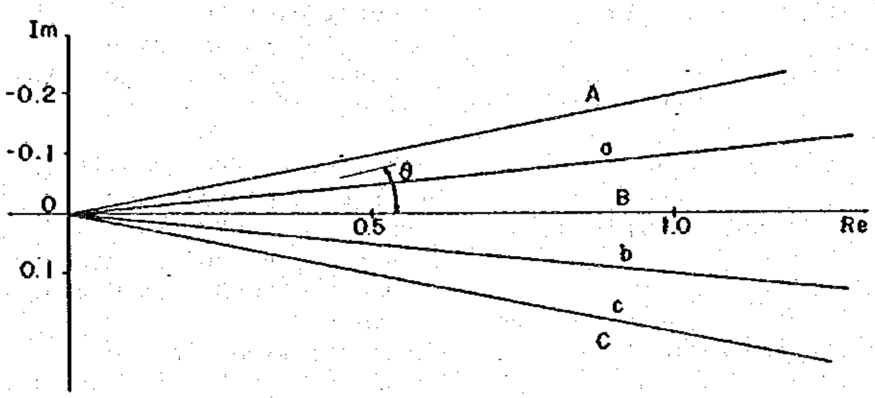
The advantage of SIP over conventional IP is as follows:

1) Electromagnetic coupling, which is the largest noise source in IP measurements, can be eliminated.

2) Source of IP effect may be identified as mineral name or mineralization type from the shape of spectrum.

The difficiency of SIP is that SIP equipment is more complicated and heavier than conventional IP equipment, so that they are more delicate to handle and more difficult to transport. In order to measure phase spectrum in wide range of frequency, SIP measurements are more time consuming.

On this report the spectrum type is presented by Zonge's notation which is as follows:



$\frac{-Im}{Re} = \tan\theta$

$\tan\theta \geq 20\%$	..... A
$20\% > \tan\theta \geq 10\%$	..... a
$10\% > \tan\theta \geq 0\%$	..... B
$0\% > \tan\theta \geq -10\%$	..... b
$-10\% > \tan\theta \geq -20\%$	 c
$-20\% > \tan\theta$	 C

Phase Notation

2-1-2 Outline of the Survey

Azegour sector is at the middle between Erdouz sector and Amezmiz. The elevation of the area is from 1,400 m to 1,700 m. There is deserted old Azegour mine about 2 km south of the survey area. In the survey area there are several old exploration tunnels (see Fig. II-2-14).

SIP survey was carried out along four lines in E-W direction totaling 4.6 km and 144 points. Separation between the survey lines is about 200 m.

SIP measurements were carried out from the survey tent being set at the center of each lines. For confirming varidity of the survey, repeat measurement was made by interchanging positions of current electrodes and potential electrodes at several points for each survey line.

Two tin coated iron plates (50 cm by 50 cm) are burried as each current electrode. In order to lower resistance between tin plate and earth, mixture of bentnite, salt, and water were inserted near tin plates.

The frequencies of transmitting current signal were 0.125 Hz, 1.0 Hz and 8.0 Hz and the first to eleventh order odd harmonics of transmitting current signal were recorded. Apparent resistivity and phase difference between source signal and received signal were calculated at each station. Transmitting signal current was over 2 A.

Electrode configuration used is dipole-dipole, electrode separation (a) is 100 m, and electrode separation constant (N) is from 1 to 5. Current electrods are burried only between stations 2 and 8.

Four exploratory drill holes, ATE-1, ATE-2, ATE-3, and ATE-4, were drilled at near the station 5's of line A and line B.

Equipment used for SIP survey is as follows:

(1) Transmitter

XMT-12 Transmitter Controler:	product of ZERO, frequency range: 1/1024 to 4096 Hz
GGT-3 Transmitter:	product of ZERO, frequency range: DC to 10 kHz max. output power: 1,000 V, 27 A
ZMG-5 Engine Generator:	product of ZERO, 5 kW, 400 Hz, AC generator
Voltage Regulator:	product of ZERO, regulating output voltage of ZMG-5

(2) Receiver

GDP-12 Data Processor:	product of ZERO, amplifier, filter, and processor
Cassett Recorder/Printer:	product of ZERO, record data on cassett tape and print hard copy
EPROM Loader:	product of ZERO, load programs on GDP-12
Communication Wire:	transmit signal to GDP-12
Field Pre-Amplifier:	product of ZERO, at potential electrode site, amplify signal
Isolation Amplifier:	product of ZERO, isolate receiving unit from transmitter
Electrode Pot:	product of ZERO, copper- copper-sulphate electrode

The amount of SIP survey is as follows:

Survey Line	Length of Line	Survey Points
A	1.1 km	34 pts
B	1.1 km	34 pts
C	1.2 km	38 pts
D	1.2 km	38 pts
total	4.6 km	144 pts

2-2 Results of SIP Measurements

The result of the survey is presented as pseudo sections along each survey lines about apparent resistivity, phase difference, percentage frequency effect (between 0.125 Hz and 1 Hz, hereafter called as PFE), 3 point decoupled phase, cole-cole diagram, phase spectrum and amplitude

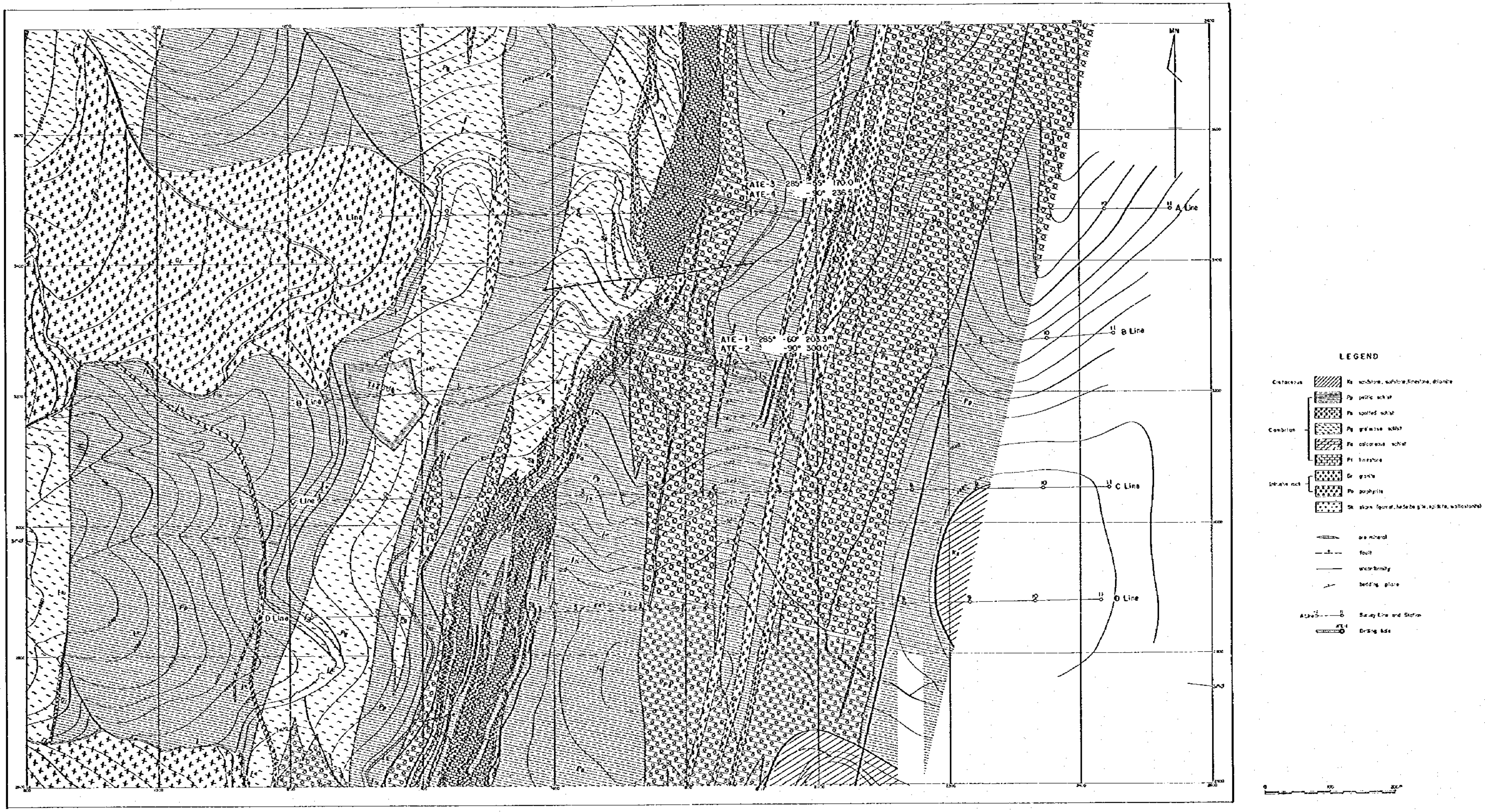


Fig. II-2-14 Index Map of Azegour Sector

spectrum. Also plan view of apparent resistivity and PFE of each electrode separation constant (N=1 to 5) (see Fig. II-2-1 to Fig. II-2-8 and PL.II-2-2 to PL.II-2-15).

Because topography of the survey area is very rugged, topography must have affected on apparent resistivity values. In order to reduce topographic effect on apparent resistivity values, all apparent resistivity raw data was put through topographic-effect reduction process of finite element method by computer.

In the following sections, apparent resistivity, phase, PFE and cole-cole diagrams along each line are described.

2-2-1 A Line

(1) Apparent Resistivity

Apparent resistivity values along this line are relatively high. The east of the station 7 is over 1 k ohm-m. Low resistivity zone under 500 ohm-m extends from near surface between the stations 2 and 3 to depths in the ground with eastward dip.

(2) IP Effect

Pseudo sections of 0.125 Hz phase difference and 3pt decoupled phase along this line is almost identical and there must be only negligible electromagnetic coupling effect on low frequency data. Distribution pattern of PFE is very similar to that of 0.125 Hz.

PFE value of nonmineralized area along this line is under 3%, and it is distributed N=1 to 3 at east of the station 3. High PFE, over 4% is between the stations 4 and 5 at N=3 with eastward dip. PFE values of the former high PFE zone is higher than the latter.

Most decoupled cole-cole diagrams show horizontal flat line at all frequency (from .125 Hz to 88 Hz) and do not vary by stations. At the stations between 6 and 9 for N being 1 to 2, decoupled cole-cole diagrams increases with frequency, and all other station show either horizontal or decreasing with frequency. Their inclination is very gentle.

2-2-2 B Line

(1) Apparent Resistivity

High resistivity zone over 1 k ohm-m is seen at depths, N over 3, at the stations between 3 and 5 and east of the station 7.

Conductive zone with resistivity below 500 ohm-m is between the stations 1 and 3 and between the stations 5 and 6.

(2) IP Effect

Phase of 0.125 Hz and 3 point decoupled phase are very similar in value and their distribution pattern is similar to that of PFE.

High PFE values, over 4%, are at the stations 1 and 2 of N = 1 and at the stations 6 and 7 with eastward dip.

Cole-cole diagrams are also similar to those along the line A and increases gently with frequency or is horizontal.

2-2-3 C Line

(1) Apparent Resistivity

High resistivity zone over 1 k ohm-m is distributed at depths of the stations 2 to 5 (N over 2), at depths of the stations 5 to 7 (N = 1 to 5), and east of the station 7. Conductive zone with resistivity under 500 ohm-m is at the stations 1 to 3, and at depths of the station 4.

(2) IP Effect

Distribution patterns of 0.125 Hz phase, 3pt decoupled phase and PFE are similar.

Low PFE values, under 3%, are seen at depths of the stations 2 and 4, and east of the station 6. PFE values along this line are generally smaller than along other lines. High PFE, over 4%, are at the stations 1 and 2, and at depths of the station 3 (N = 4 to 5).

Cole-cole diagrams along the line show either horizontal or increasing with frequency.

Phase spectrum at depths of the station 8 (N = 5) show negative values at higher frequencies. The other phase spectra show positive values and at higher frequencies phase values being larger and very homogeneous. However PFE value at that point is low 2.5%.

2-2-4 D Line

(1) Apparent Resistivity

Apparent resistivity values along the line D are generally high (over 1 k ohm-m). Low resistivity, under 500 ohm-m, is at the stations 2 to 5, and at depths of the stations 7 to 8 (N = 4 and 5).

(2) IP Effect

Distribution patterns of 0.125 Hz phase, 3pt decoupled phase and PFE are similar.

Low PFE value of below 3% is at east of the station 3. High PFE values, over 4%, are seen only at depths of the stations 1 to 3.

Cole-cole diagrams generally show horizontal to increasing-with-frequency flat lines at the east of the station 5, and at the west of the station 5, they are horizontal to decreasing-with-frequency lines.

Phase spectrum at depths of the station 8 (N=4,5) show negative values at higher frequencies. However PEF values at these points are low, 1.0 and 1.1%. The phase spectra at other points show positive values and, at higher frequencies, phase values being larger and very homogeneous.

2-2-5 Plan Distribution of Apparent Resistivity

Apparent resistivity plans of five electrode separation constants (N = 1 to 5) are made (see PL.II-2-2 to PL.II-2-6). Their details are described in the following section.

(1) Electrode Separation Constant N = 1

Conductive zone with apparent resistivity under 500 ohm-m continues from the stations 3 to 4 of the line A to the stations 2 to 3 of the lines B, C and D. This conductive zone runs a few tens meters west of and parallel to the host rock, limestone layer. Conductive zone below 500 ohm-m is at the stations 4 and 5 of the line C. This small conductive zone is 50 m to 100 m east of granit dyke which is about 300 m east of the above mentioned limestone layer.

Resistive zone with apparent resistivity over 1 k ohm-m extends from east of the station 7 of the line A to east of the station 3 of the line D.

(2) Electrode Separation Constant N = 2 to 5

The conductive zone at N = 1, parallel to the host rock limestone can be traced to the plan of N = 4. However its location moves westward with depth. At N = 5, this conductive zone is outside of the survey area and is not seen. A conductive zone which is thought to be a supplement of the above mentioned conductive zone is from the station 5 of the line B to the stations 2 to 4 of the line D at N = 2. This supplementary conductive zone moves eastward with depth, and at N = 5, it runs from the stations 5 to 6 of the line A to the stations 4 to 5 of the line D.

2-2-6 Plan Distribution of PFE

Plan distribution of PFE of five electrode separation constants (N = 1 to 5) are made (see PL.II-2-7 to PL.II-2-11).

The general distributions of PFE in those maps are discribed in the following section.

(1) Electrode Separation Constant N = 1

High PFE zone with 4% continues from the stations 2 to 3 of the line A to the stations 2 to 3 of the line D. The other high PFE zone is at the stations 6 and 7 of the line B. Most of the other area shows PFE below 3% and the east ends, east of the stations 8, of all lines shows PFE values below 2%.

(2) Electrode Separation Constant N = 2 to 5

The high PFE zone continuing at the west end of each lines continues to N = 5. The complimentary high PFE zone to the above mentioned high PFE zone runs from the stations 4 to 6 of the line A to the stations 4 to 5 of the line C at N = 2, and can be traced to N = 5.

2-2-7 Sample Measurements

Twenty-seven rock samples from Azegour sector survey area were taken and their resistivities and phase spectra were measured under wet condition. The results are as follows:

(1) Resistivity values vary largely even for the same rock type. The difference of resistivity values of the same rock type is very large. The PFE values of spotted schist and gneissose schist show variation of two to three times, and variation of pelitic schist and garnet skarn is over ten times.

(2) Most spectrum types of samples are CCC or CCc. The only exception is three garnet skarn samples which show BaA, AAA and Cba.

(3) General features of resistivity, phase and spectrum of each rock type are as follows:

i) black pelitic schist:	High resistivity (average 17 k ohm-m). Phase of this rock is devided into two types, one over 10 m rad, the other under 7 m rad. Spectra are CCC.
ii) spotted (black) schist:	Low resistivity (average 1.3 k ohm-m). Phase is low (average 7 m rad). Spectrum is CCC, CCc and CcC.

iii) (silicified) gneissose schist:

Moderate resistivity middle between i) and ii). PFE is low (average 7 m rad). Spectrum is CCC.

vi) green skarn:

Low resistivity (average 835 ohm-m). PFE is large (average 33.2 m rad). Spectrum shows high degree of mineralization, AAA or BaA.

2-3 Results of Diamond Drillings

Four diamond drillings were carried out in Azegour sector by B.R.P.M. crew during this phase.

These drilling operations were performed at the east and northeast of the Tizgui village.

The purpose of these diamond drillings is to clarify geological condition of skarnization and molibdenum-mineralization in the lower part of this area, and to examine the results of SIP survey which was carried out during the same phase.

Coordinates, directions, inclinations and depth of each drilled hole are as follows.

1) ATE-1 Hole:	Coordinate;	x = 1,643 m, y = 3,443 m
	Direction;	285 degrees
	Inclination;	-60 degrees
	Length;	203.30 m
2) ATE-2 Hole:	Coordinate;	x = 1,643 m, y = 3,443 m
	Direction;	-------
	Inclination;	-90 degrees
	Length;	300.00 m
3) ATE-3 Hole:	Coordinate;	x = 1,895 m, y = 3,480 m
	Direction;	285 degrees
	Inclination;	-55 degrees
	Length;	170.00 mm
4) ATE-4 Hole:	Coordinate;	x = 1,895 m, y = 3,480 m
	Direction;	--------
	Inclination;	-90 degrees
	Length;	236.50 m

The drilling locations are shown in PL.II-2-1, and the geology of core and the results of chemical analysis are shown in PL.II-2-17 (1) to (4), and geological sections are shown in PL.II-2-12.

The geology of each drill hole is as follows:

1) ATE-1 Hole:

0.00 m - 31.50 m	Black spotted schist
31.50 - 33.00	Fractured zone
33.00 - 43.50	Black spotted schist
43.50 - 56.50	Black spotted schist (Intercalated thin skarn layer)
56.50 - 73.30	Black spotted schist
73.30 - 80.80	Hornblende-quartz porphyry
80.80 - 90.50	Black spotted schist

Table II-2-1 Rock Sample Measurements, Azegour Sector

Location	Resistivity	Phase Shift	Spectral	Rock Type
AB	2,355	4.9	CCC	black peritic schist
B5 west	1,721	7.0	CCb	black peritic schist
C3	20,241	1,6	acC	black peritic schist
C4	69,988	14.4	CCC	black peritic schist
C10	19,758	18.0	CCC	black peritic schist
D0-D1	527,816	18.2	CCC	black peritic schist
D3	6,903	11.3	CCC	black peritic schist
Av of 7 spls	17,018	10.8		
A5	535	6.2	CCc	spotted black schist
A6	4,438	8.1	CcC	spotted black schist
A7	989	8.5	Ccb	spotted black schist
A9	1,201	9.1	Ccb	spotted black schist
A9-A10	246	2.9	CCc	spotted schist
B5 east	9,537	9.6	CCC	spotted black schist
C5	625	8.5	Ccc	spotted black schist
C6	1,126	6.9	CCC	spotted schist
C7	1,494	8.6	CcC	spotted schist
C8	1,011	6.6	CCC	spotted black schist
C9	777	7.2	CCc	spotted black schist
D0	11,969	10.0	CCC	spotted balck schist
D6	397	5.3	CCc	spotted schist
Av of 13 spls	1,285	7.5		
C0	2,251	5.0	CCC	scilicified gneissose schist
C1	3,234	9.9	ccC	scilicified gneissose schist
C2	30,395	7.4	CCC	scilicified gneissose schist
Av of 3 spls	6,048	7.4		
B5	226	3.7	CCc	garnet skarn
B5	2,154	62.9	BaA	garnet skarn with Mo
B5	858	47.0	AAA	garnet skarn
B5	1,163	19.0	Cba	garnet skarn with Mo
Av of 4 spls	835	33.2		

	(Dissemination of Mo at 88.25 m)
90.50 - 113.60	Garnet, skarnized hornblende, intercalated schist (Dissemination of Mo)
113.60 - 123.50	Gneissose schist
123.50 - 125.60	Garnet skarn (Dissemination of Mo)
125.60 - 145.00	Gneissose schist
145.00 - 161.70	Garnet skarn (Dissemination of Mo)
161.70 - 167.20	Silicified hornblende-biotite schist
167.20 - 171.10	Aplite dyke
171.10 - 173.60	Gneissose schist
173.60 - 174.20	Garnet skarn
174.20 - 203.30	Gneissose schist

Mineralizations of molibdenum were observed at 93.0 m - 95.50 m (2.50 m) with Mo grade of 0.24%, at 123.50 m - 124.50 m (2.00 m) with Mo grade of 0.15%, and at 154.00 m - 157.00 m (3.00 m) with Mo grade of 0.15%.

2) ATE-2 Hole:

0.00 m - 47.00 m	Black spotted schist
47.00 - 48.00	Fractured zone
48.00 - 63.00	Black schist
63.00 - 67.20	Fractured zone
67.20 - 93.50	Black spotted schist
93.50 - 95.50	Fractured zone of quartz
95.50 - 109.60	Black spotted schist
109.60 - 119.40	Black spotted schist
119.40 - 120.50	Silicified zone
120.50 - 135.70	Black spotted schist
135.70 - 136.80	Fractured zone of quartz
136.80 - 142.80	Black spotted schist
142.80 - 143.50	Banded silicified-skarnized zone
143.50 - 146.60	Garnet skarn
146.60 - 149.20	Silicified schist
149.20 - 167.50	Garnet skarn (intercalated skarnized schist)
167.50 - 171.50	Silicified rock intercalated skarn
171.50 - 203.70	Garnet skarn
203.70 - 209.80	Skarnized schist
209.80 - 212.40	Garnet skarn
212.40 - 218.00	Skarnized schist
218.00 - 221.50	Garnet skarn
221.50 - 232.50	Gneissose schist
232.50 - 255.80	Gneissose schist (weakly skarnized)
255.80 - 262.50	Porphyrite dykes
262.50 - 300.00	Gneissose schist

Mineralizations of molibdenum were observed at 143.50 m - 144.10 m (0.60 m) with Mo grade of 0.46%, at 144.10 m - 144.85 m (0.75 m) with Mo grade of 0.12%, and at 144.85 m - 167.60 m (22.75 m) with Mo grade of 0.01%. Furthermore, mineralizations of copper were observed at 217.00 m - 217.60 m (0.60 m) with Cu grade of 3.50%, and at 219.85 m - 223.35 m (3.50 m) with Cu grade of 0.13%.

3) ATE-3 Hole

0.00 m - 22.20 m	Black spotted schist

22.20 - 22.25	Black spotted schist (decolorized zone of disseminated pyrite)
22.25 - 34.30	Black spotted schist
34.30 - 34.38	Quartz dyke containing pyrite
34.38 - 46.70	Black spotted schist
46.70 - 48.70	Fractured zone of quartz
48.70 - 53.25	Black schist, intercalated thin layer of skarn, disseminated by pyrrhotite.
53.25 - 55.00	Hornblende-garnet skarn (disseminations of Cu, Py, Mo)
55.00 - 69.90	White crystalline limestone
69.90 - 74.25	Same as above (disseminated with pyrite and chalcopyrite)
74.25 - 83.00	White crystalline limestone
83.00 - 91.50	Same as above (disseminated with pyrite and chalcopyrite)
91.50 - 116.75	White crystalline limestone (contain spots of garnet skarn)
116.75 - 117.90	Quartz porphyry
117.90 - 120.10	White limestone
120.10 - 125.70	Diopside garnet skarn
125.70 - 134.40	Silicified gneissose schist
134.40 - 135.20	Dark green dolerite dyke
135.20 - 154.00	Gneissose schist
154.00 - 154.50	Aplite dyke
154.50 - 169.00	Gneissose dyke
169.00 - 170.00	Garnet skarn

No remarkable mineralization of molibdenum was observed in this hole except slight dissemination of pyrite.

4) ATE-4 Hole

0.00 m - 11.70 m	Silicified black schist (many fractured zones are observed.)
11.70 - 24.80	Black spotted schist
24.80 - 25.90	Fractured zone
25.90 - 44.60	Black spotted schist
44.60 - 45.80	Fractured zone
45.80 - 53.00	Black spotted schist
53.00 - 54.00	Fractured zone
54.00 - 68.00	Black spotted schist (intruded with veins of quartz and calcite.)
68.00 - 80.10	Black spotted schist
80.10 - 84.00	Silicified black spotted schist (partially fractured zone)
84.00 - 85.20	Green skarn
85.20 - 93.50	Silicified limestone (disseminated with pyrite.)
93.50 - 94.20	Same as above. (disseminated with Mo.)
94.20 - 101.70	Silicified limestone
101.70 - 102.30	Vein of calcite (disseminated with chalcopyrite.)
102.30 - 109.20	Silicified limestone
109.20 - 125.50	Grayish white limestone
125.50 - 130.30	Same as above (fine veins of calcite, disseminated with pyrite)

130.30 - 154.90	Grayish white limestone
154.90 - 157.20	Same as above (dessiminated with pyrite.)
157.20 - 176.20	Grayish white limestone (slightly dessiminated with pyrrhotite.)
176.20 - 177.30	Silicified hornblende
177.30 - 182.00	Grayish white limestone
182.00 - 182.60	Hornblende
182.60 - 191.00	Grayish white limestone
191.00 - 191.50	Hedenbergite skarn
191.50 - 193.50	Silicified and chloritized schist
193.50 - 194.60	Garnet skarn
194.60 - 196.20	Silicified and chloritized schist
196.20 - 197.60	Garnet skarn
197.60 - 198.70	Silicified and chloritized schist
198.70 - 204.50	Garnet skarn (disseminated with hematite.)
204.50 - 236.60	Gneissose schist

No remarkable mineralization of molibdenum was observed in this hole except slight dissemination of pyrite.

As the results of the above four diamond drillings, it has revealed that the stronger skarnizations as replacing all of the limestone were made downward and the mineralization of molibdenum tended to be predominated downward at the hanging walls of skarnized zones in ATE-1 hole and ATE-2 hole. On the other hand, no such remarkable tendency of skarnization and mineralization of molibdenum were observed in ATE-3 hole and ATE-4 hole. Later two holes were characterized by the dissemination of pyrite in limestone layers. These facts might indicate the possibility of strong mineralization of molybdenite at the southern side of the ENE-WSW fault, but it still remains in question. Therefore, it needs the further exploration to elucide this unsolved problem.

2-4 Discussion

All apparent resistivity values measured in Azegour sector are over 200 ohm-m. Phase pseudo sections of frequency below 1 Hz show very similar values. Therefore pseudo sections of low frequency phase, 3 pt decoupled phase show almost identical pattern. PFE pseudo sections also have the same pattern as phase pseudo sections. Values obtained by multiplying 7.7 to PFE values in percent are approximately same as phase values of 0.125 Hz in m rad. The reason why the difference of phase distributions in lower frequencies and PFE is negligible is because resistivity of the ground is very high, over 200 ohm-m, and no electro magnetic coupling between transmitting circuit and receiving circuit occurred.

Arithmatic average of PFE values in this area is 3.21% and rather high. The high PFE is probably caused by the fact that fine-grained pyrite is distributed in most layers in this area.

From IP measurements, two demensional structure models were made for each survey line and studied with computer. The model shows that a high PFE layer (4 to 5%) with resistivity of 200 to 300 ohm-m is along limestone layer, host rock of the area. The mentioned high PFE layer dips toward east. At the east of granite dykes, there is low PFE layer (1 to 2%) with resistivity of over 1,000 ohm-m. The small limestone layers attached to this granite dykes show also high PFE and conductive. PFE values at the west of the granite dyke is 1 to 2% higher than that at east of the dyke. This PFE change is thought to be caused by change of pyrite contents in respective layers. If mineralization of the area has close relation to pyrite contents, possibility of existence of ore deposit in the area is higher in west of the granite dykes.

Other than the above mentioned high PFE zone along limestone layer, high PFE with high resistivity around 3000 ohm-m are at depths of each lines along the above mentioned conductive high PFE layer. This is considered to be a reflect of compact layer (silicified layer ?) with large amount of pyrite.

In this survey area, pyrite, high PFE material, is distributed ubiquitously and PFE values seems to show only pyrite contents in the ground. Therefore in order to descriminate IP effect of ore mineralization from pyrite, phase spectrum were measured. However, phase spectra and cole cole diagrams in the area are very uniform and could not be related to any special mineralization. The major IP cause of the area must be pyrite and molibdenite or skarn do not play such important role in microscopic IP effect in the area.

For confirming validity of the measurements, at several stations along each line measurements were repeated by exchanging current electrode positions and potential electrode positions. As a principle of reciprocity of electrical measurements, repeat measurements must repeat the same readings. For this survey, the most measurements were repeated the same readings. However for apparent resistivity measurements at the stations 2-3 and the stations 7-8 along the line A, apparent resistivity measured by putting potential electrodes at the stations 2-3 is about a half of that at the stations 7-8 (360 ohm-m and 750 ohm-m). This measurement were repeated again by respreding cables and the results were repeated. Moreover apparent resistivity measurements at the stations 2-3 and the stations 6-7 showed the similar tendency (ratio of apparent resistivities is 1:0.77). Spontaneous potential along the line A is as Fig. II-2-10. Gradient of spontaneous potential between the stations 1 and 4 is very large, over 7 mV/m. The above mentioned non-reciprocity may have caused by this large gradient of spontaneous potential. However it is not clear.

Phase spectra at depths of the station 8 of the lines C and D show negative values or decrease with frequency at higher frequencies with low PFE, but relation between this fact and geology is unknown because PFE values there are very low, less than 2.2%.

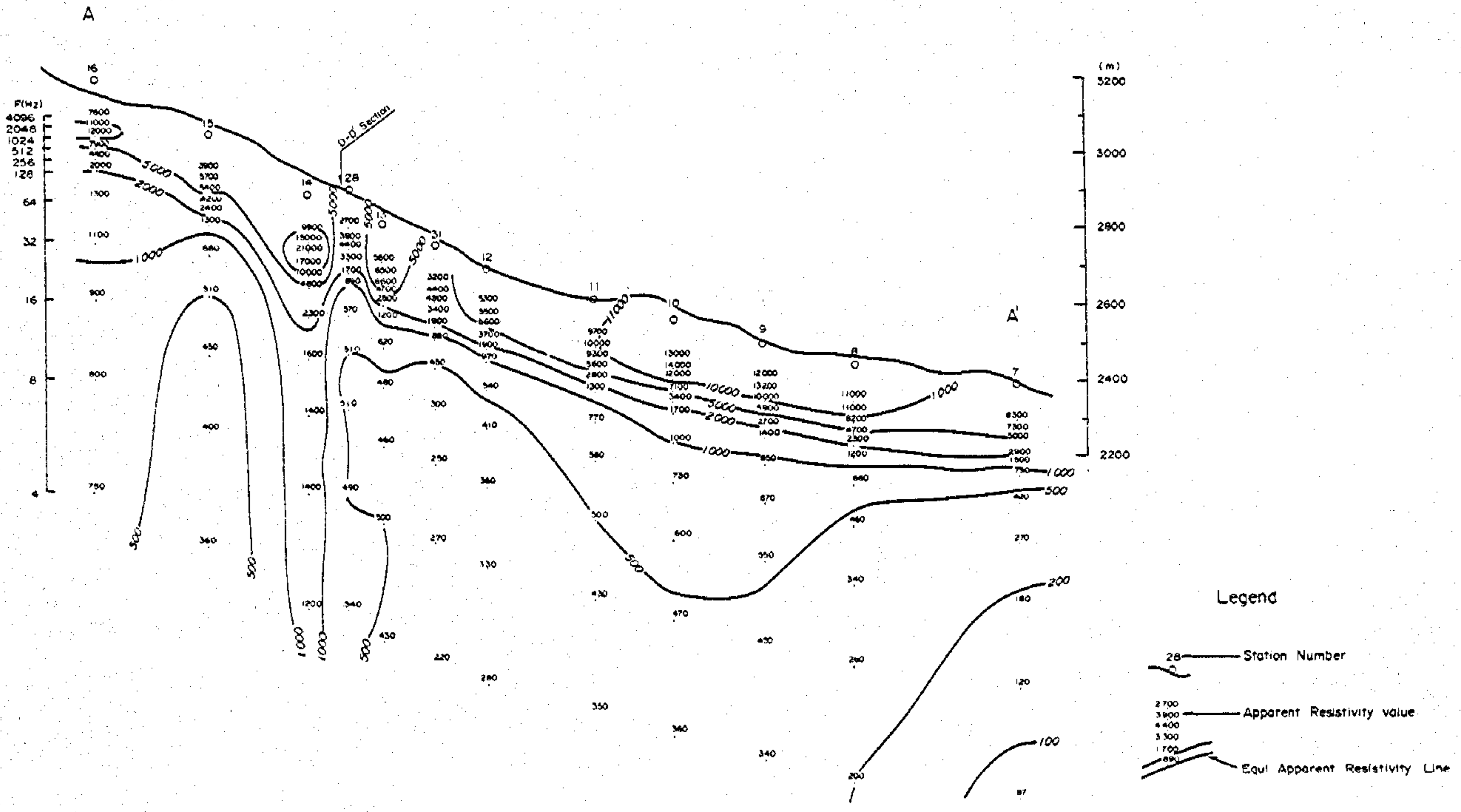
Four drill holes, ATE-1, ATE-2, ATE-3 and ATE-4 were drilled by B.R.P.M. along the line B for the former two holes and along the line A for the latter two holes. It was recognized that skarnization and molibdenum mineralization is stronger with depth in the ATE-1 hole and the ATE-2 hole. Especially, Mo grade of 0.46% was obtained in ATE-2 hole at the depth of 143.50 m to 144.10 m (thickness: 0.6 m) at the hanging wall side of skarn zone, and Mo grade of 0.12% was obtained in the same hole at the depth of 144.10 m to 144.85 m (thickness: 0.75 m). Copper mineralization accompanied with quartz vein is seen with Cu grade of 3.5% at the depth between 217.00 m and 217.60 m (thickness: 0.60 m). However cores from ATE-3 and ATE-4 holes do not indicate enrichment of skarnization nor molibdenum mineralization beside silicification and pyritization.

Thus the cores from drill holes along the line A and along the line B show large difference but SIP survey results do not show such difference neither in apparent resistivity, PFE, nor phase spectrum. Therefore it is not easy to identify skarnization and molibdenum mineralization from pyritization and silicification. Especially, poor molibdenum mineralization in the area makes identification more difficult.

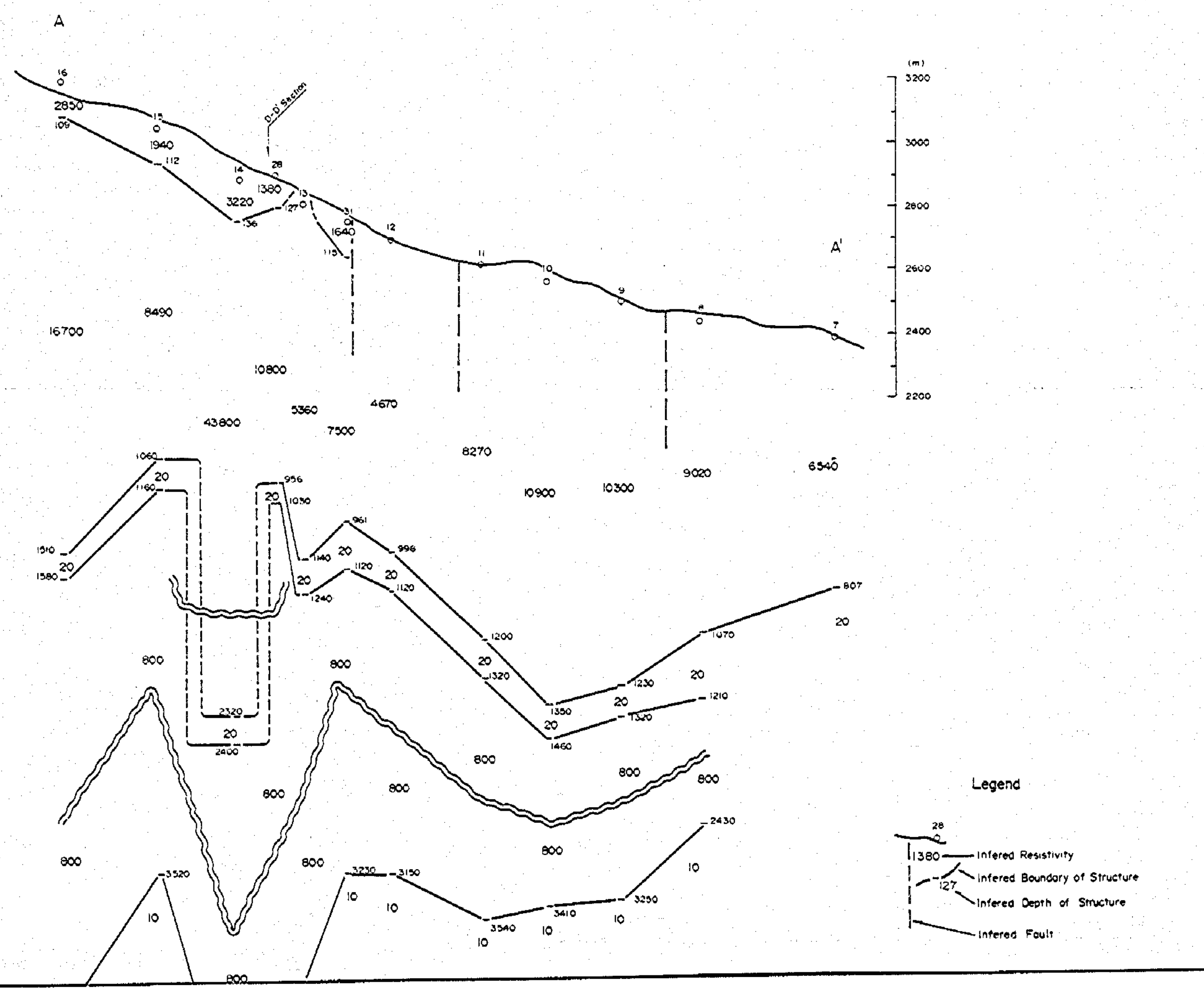
The line B, where skarnization and molibdenum mineralization is stronger with depth, is at the south of NEE-SWW fault and the south of the fault may have more potential of having skarnization and molibdenum mineralization.

Therefore for further exploration it is suggested to confirm the location of the above mentioned fault and to explore at the depth only in the south of the fault whether mineralization is enriched.

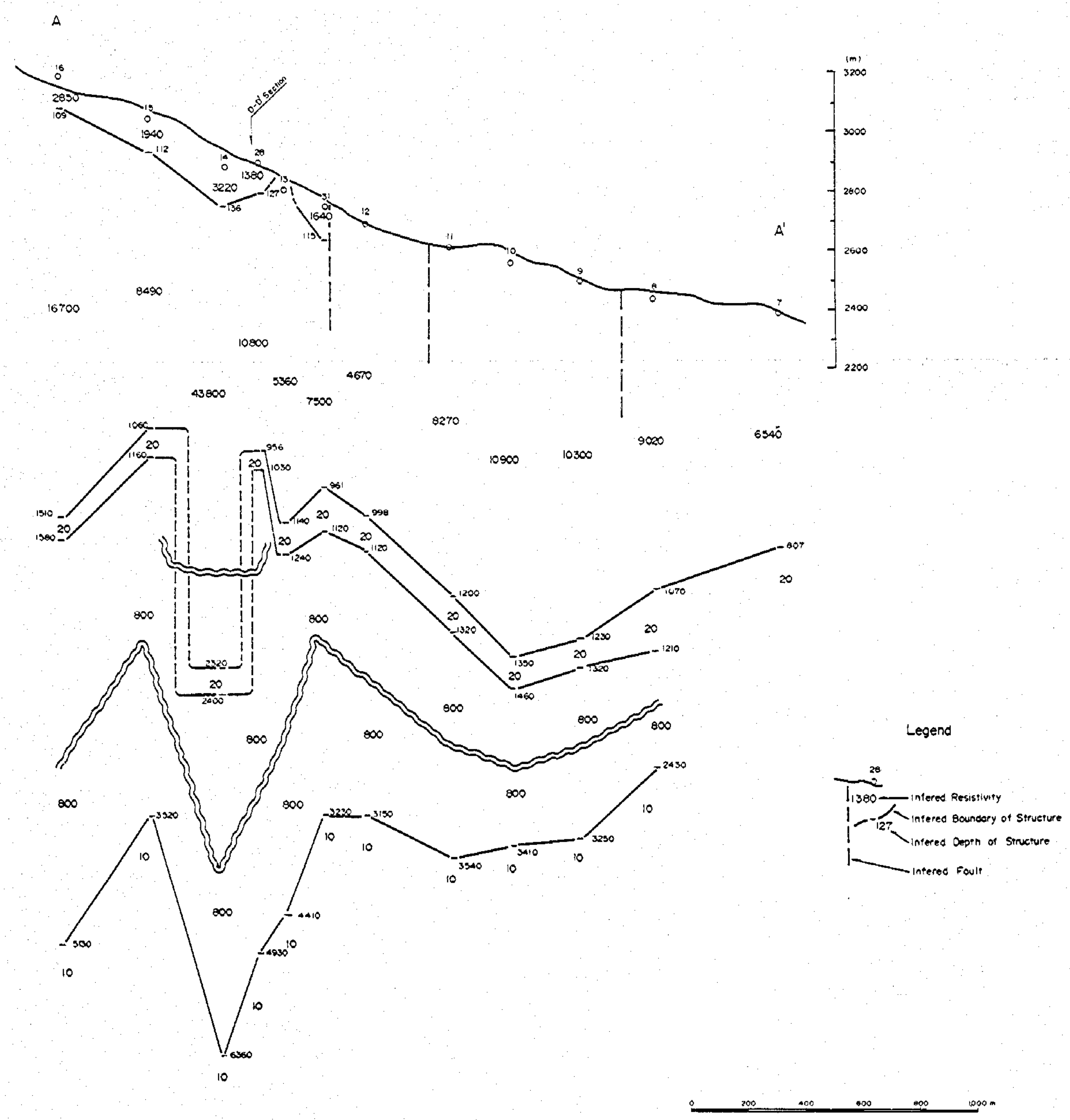
Apparent Resistivity Pseudo Section (A–A')



Infered Resistivity Structures (A–A')



Infered Resistivity Structures (A-A')



Geological Section (A-A')

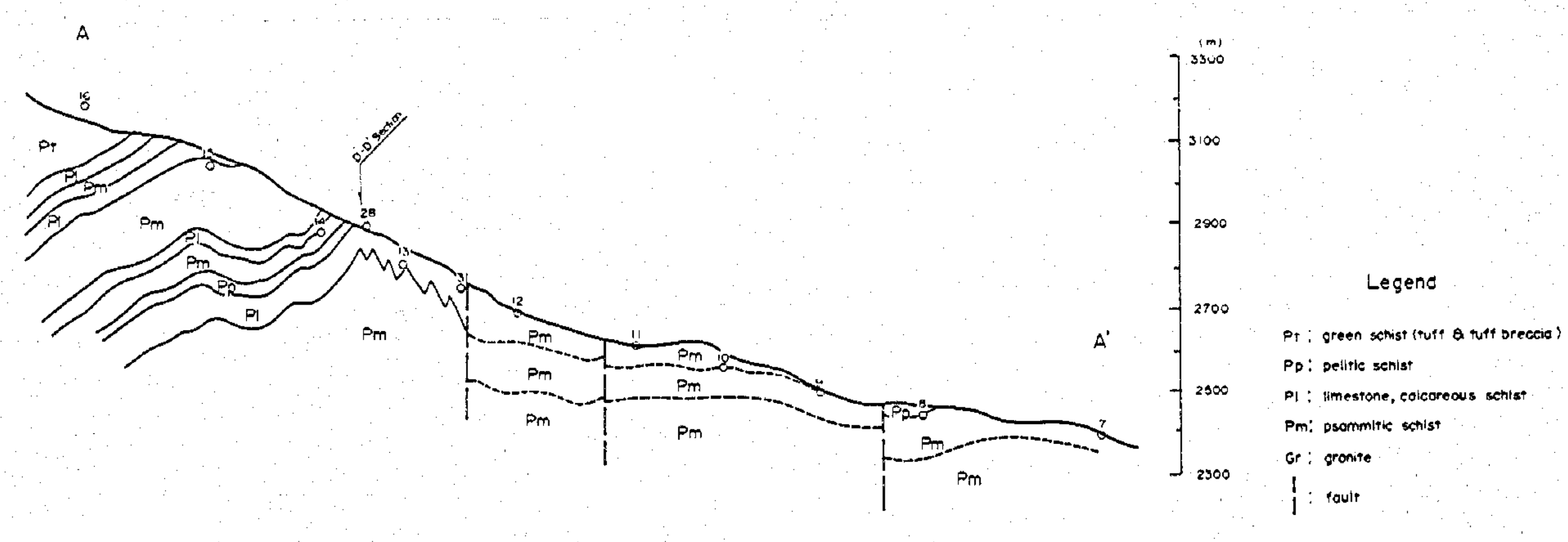
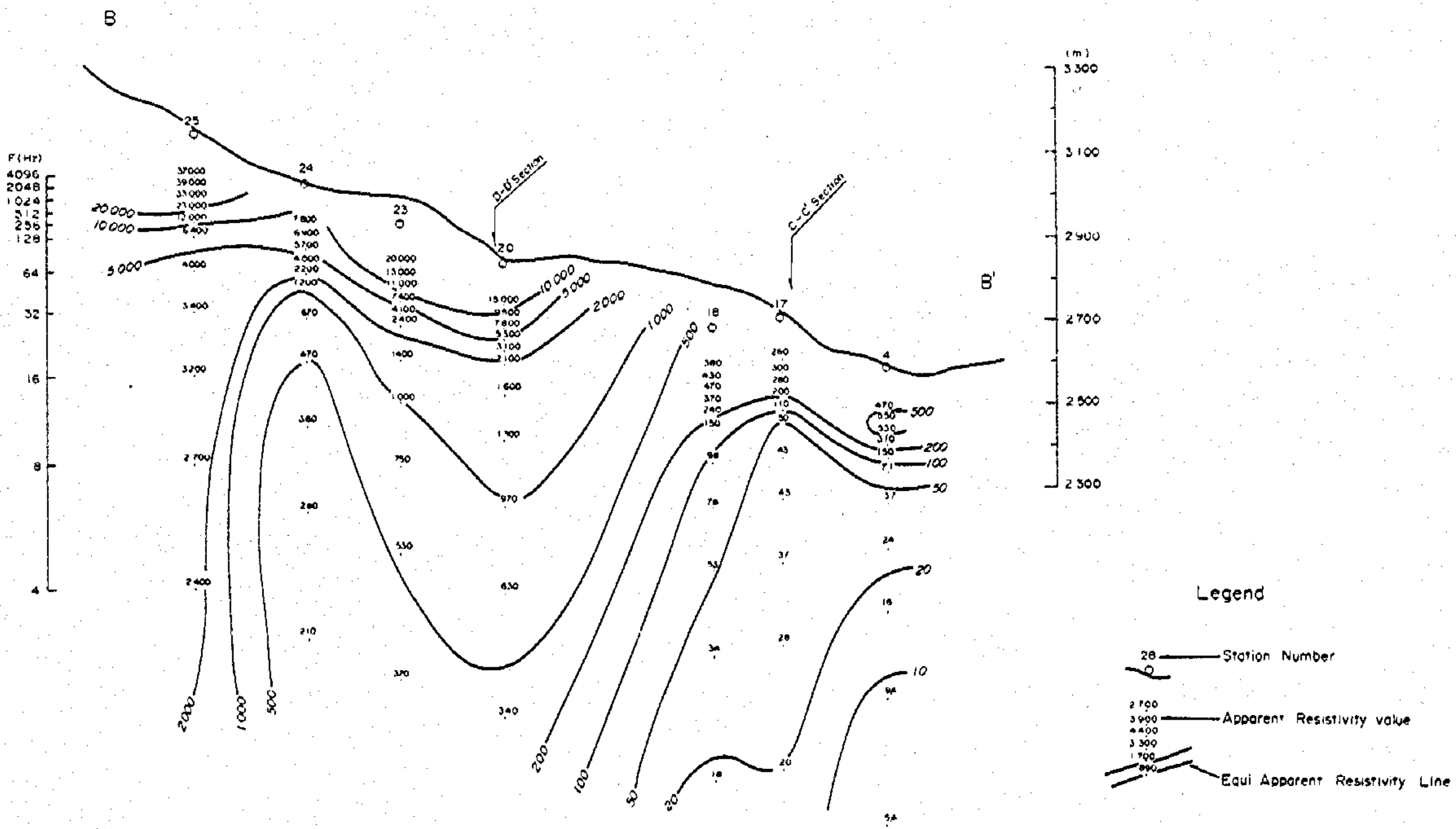
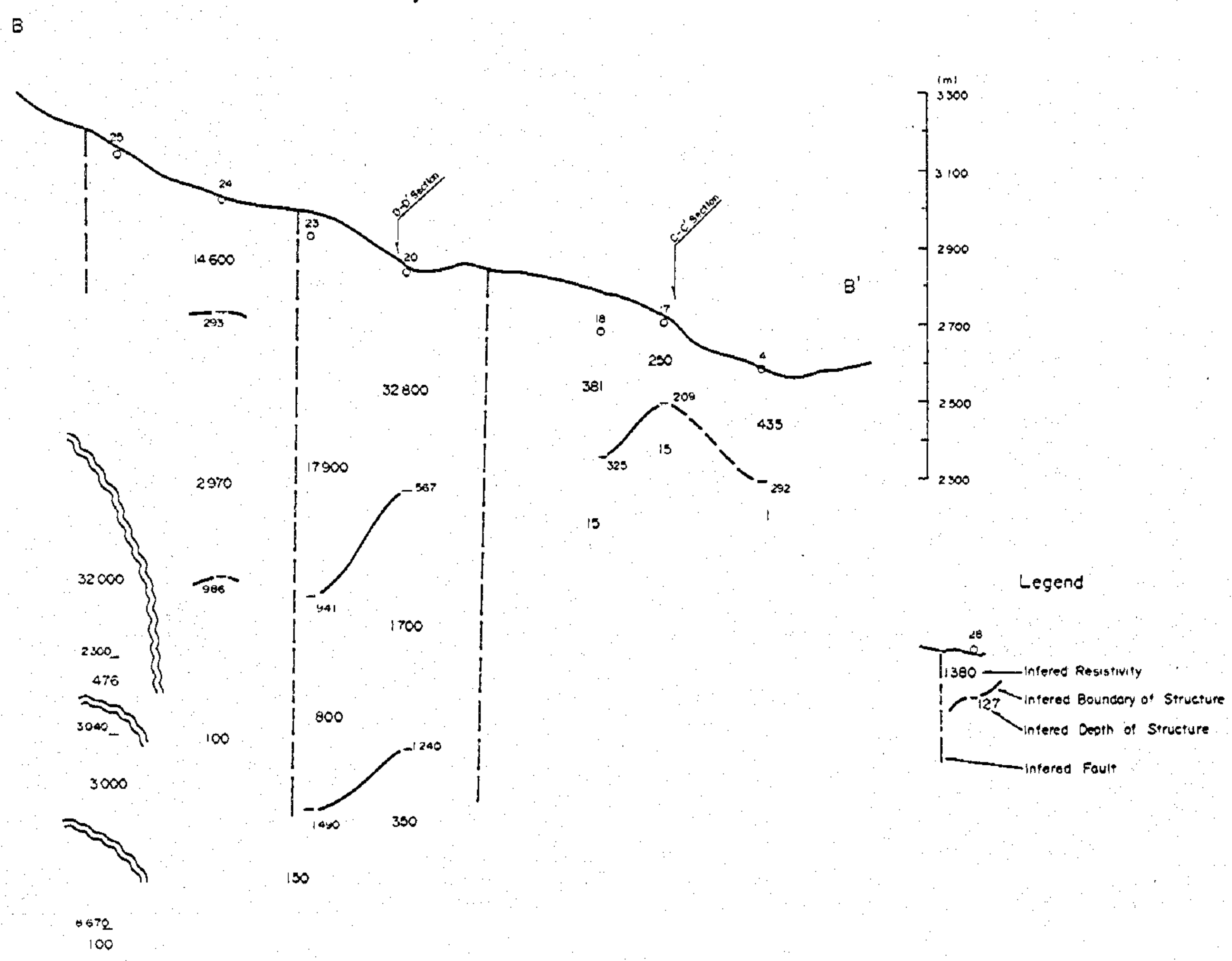


Fig II-1-1 Apparent Resistivity Pseudo Section with Infered Resistivity Structures (A-A')

Apparent Resistivity Pseudo Section (B-B')



Infered Resistivity Structures (B-B')



Geological Section (B-B')

B

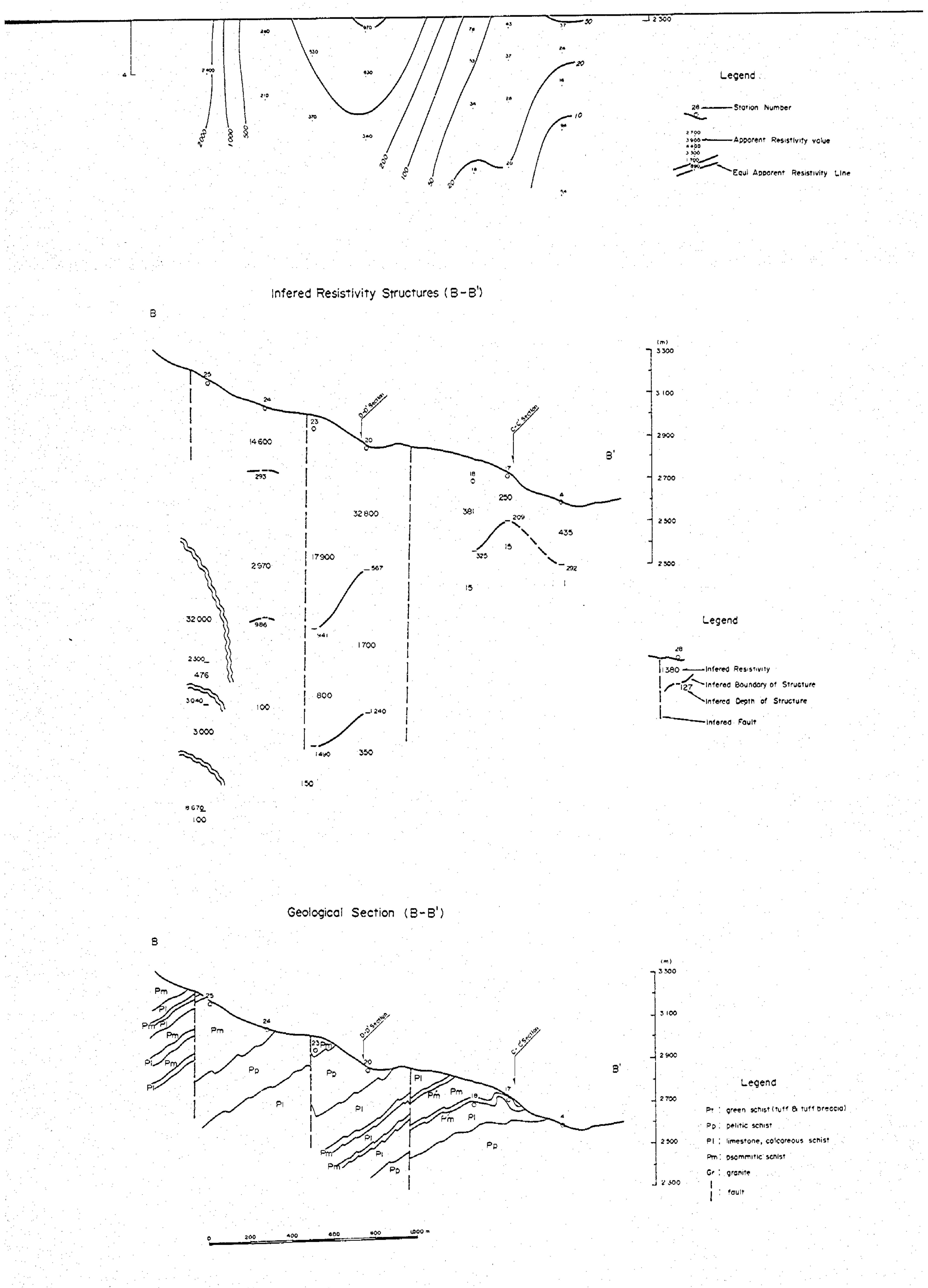
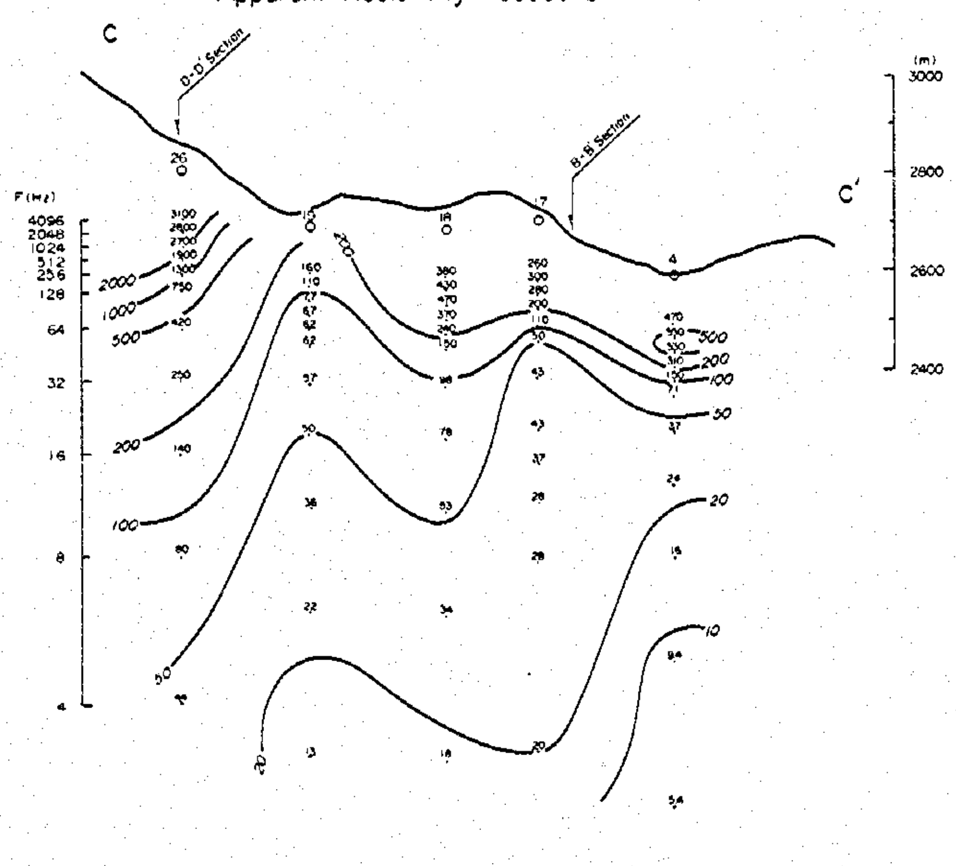
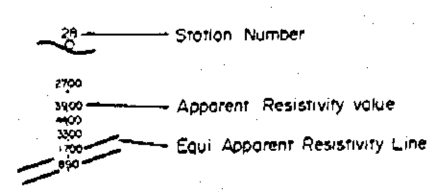


Fig. II-1-2 Apparent Resistivity Pseudo Section with Infered Resistivity Structures (B-B')

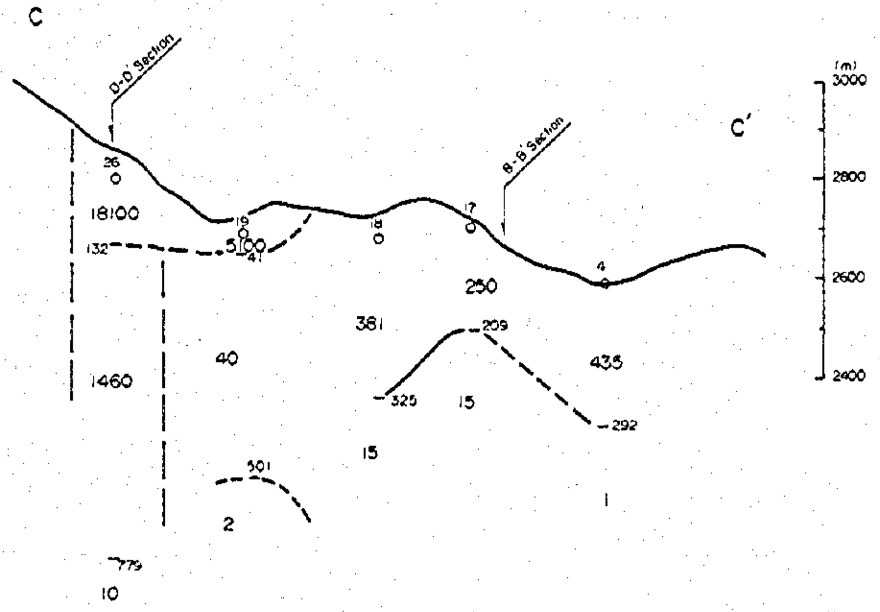
Apparent Resistivity Pseudo Section (C-C')



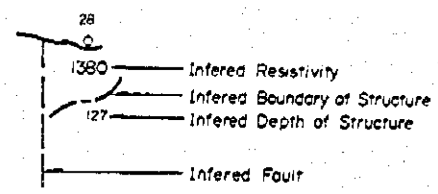
Legend



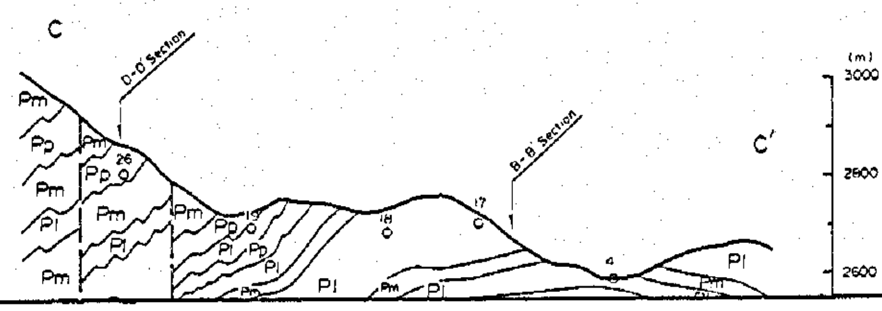
Infered Resistivity Structures (C-C')

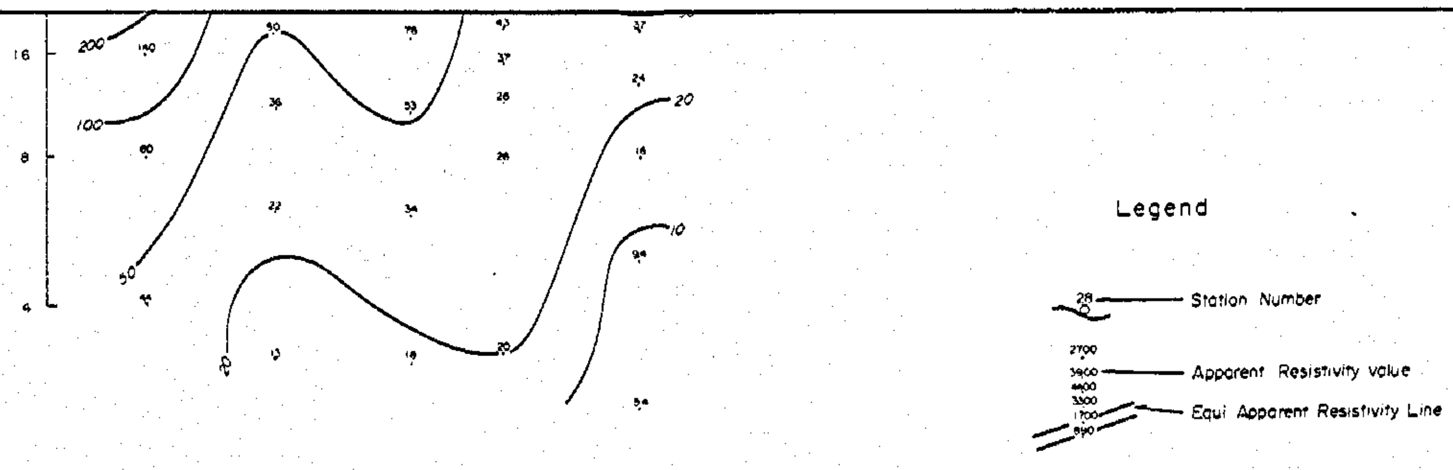


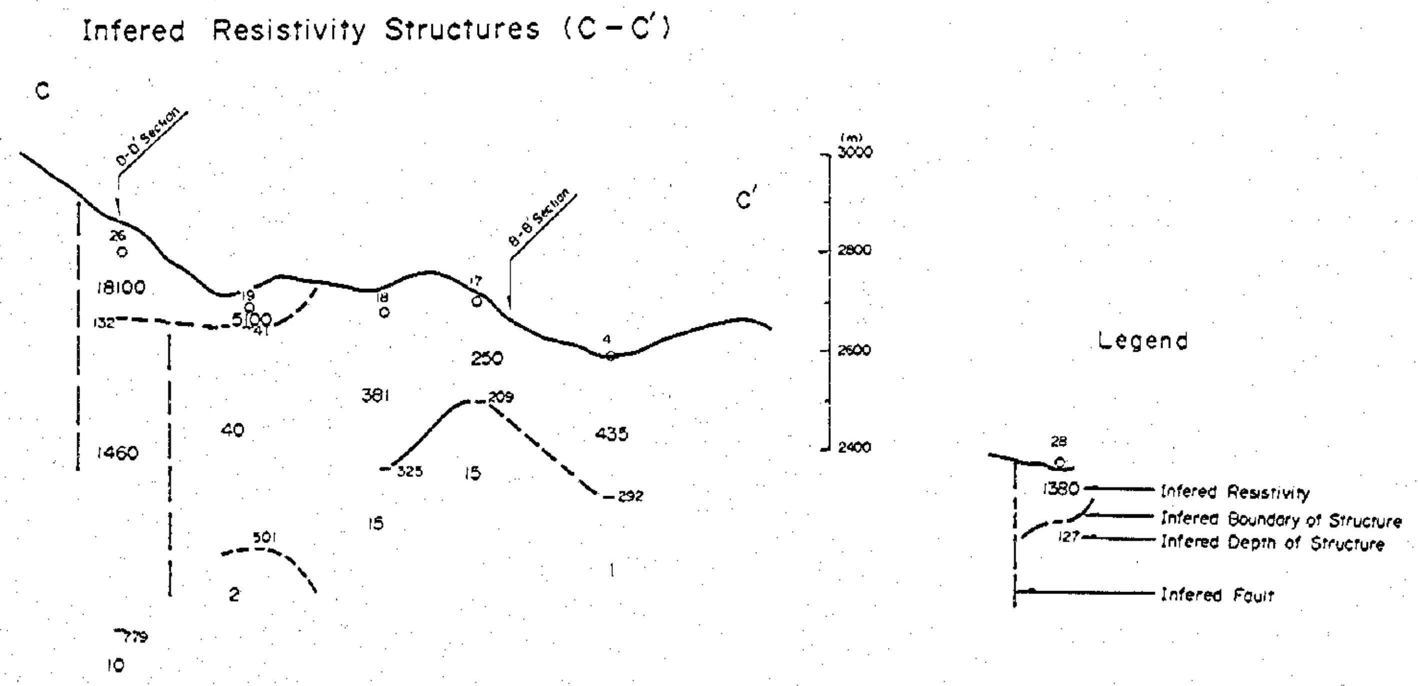
Legend



Geological Section (C-C')







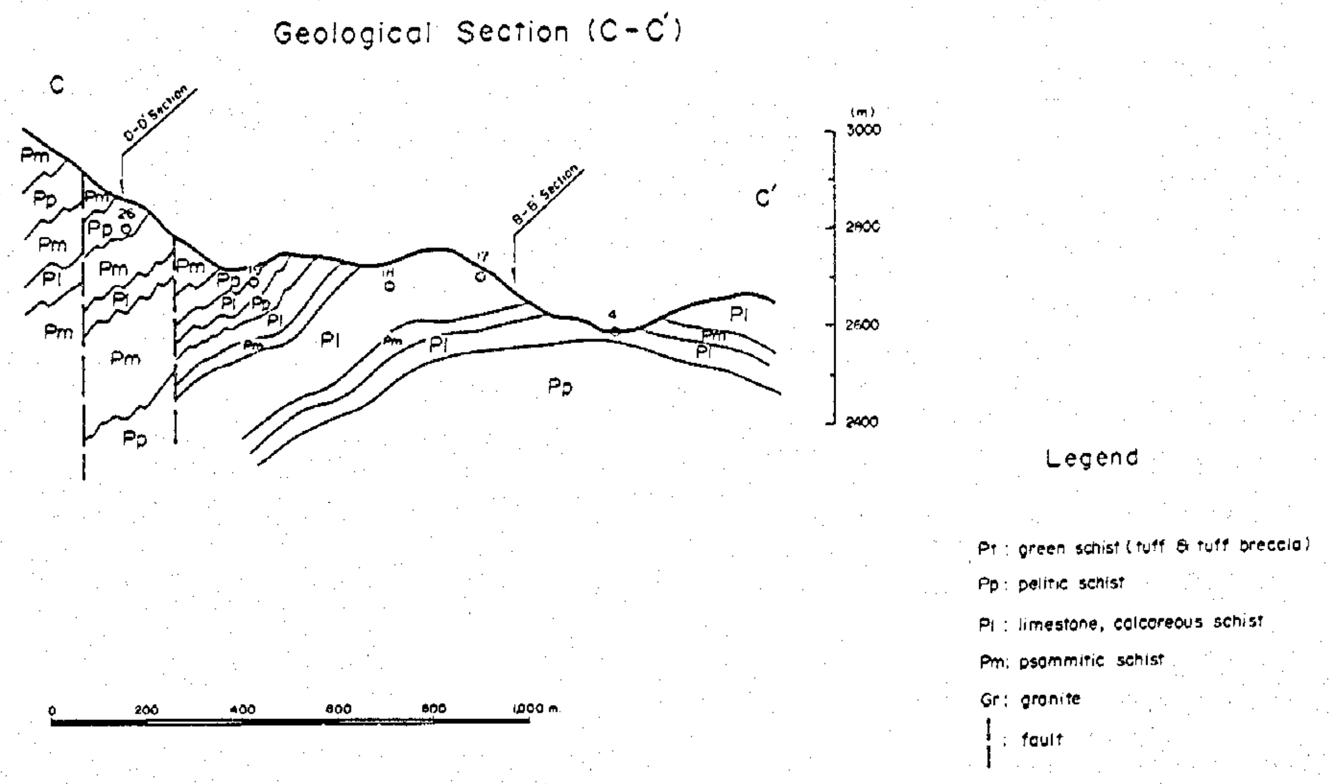
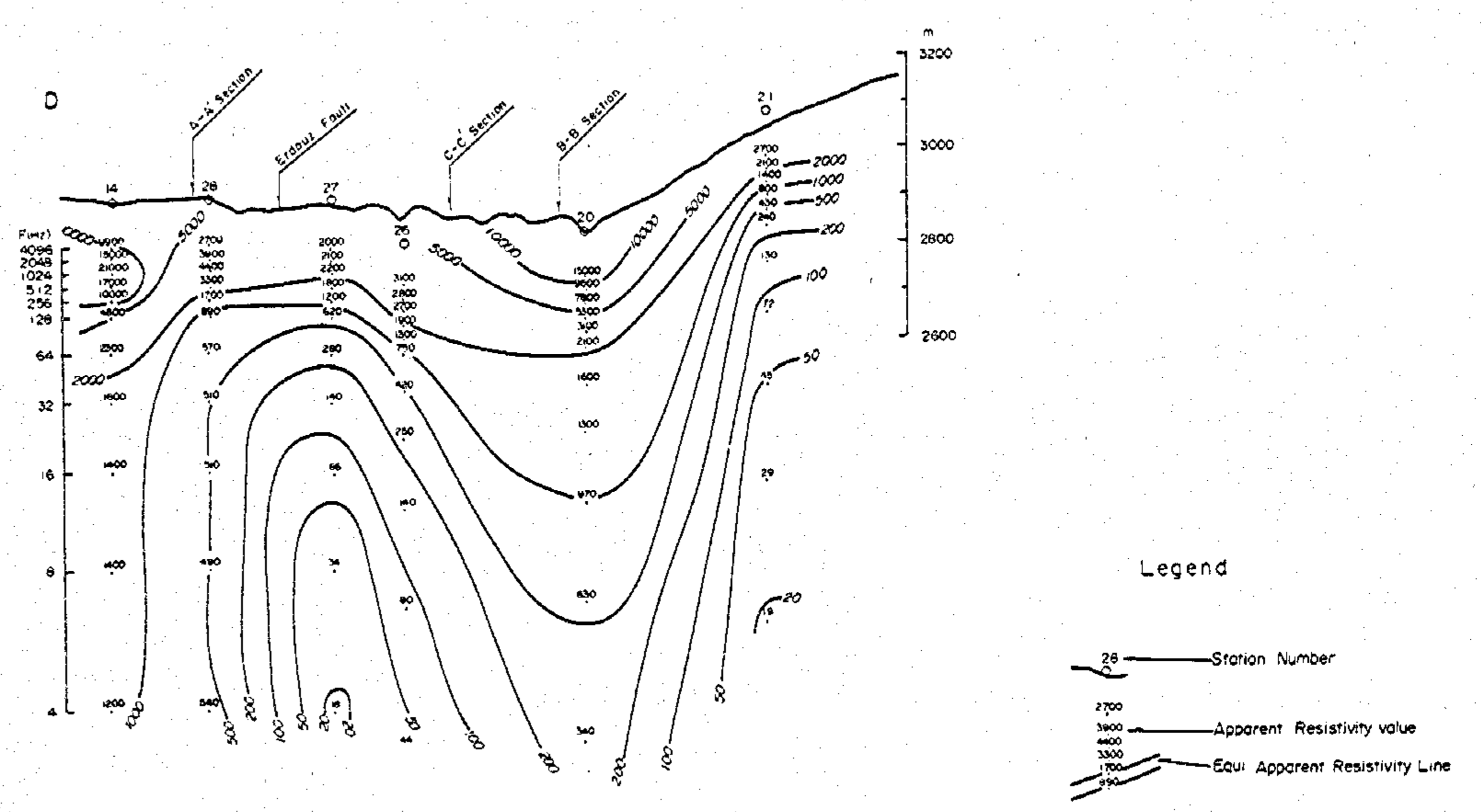
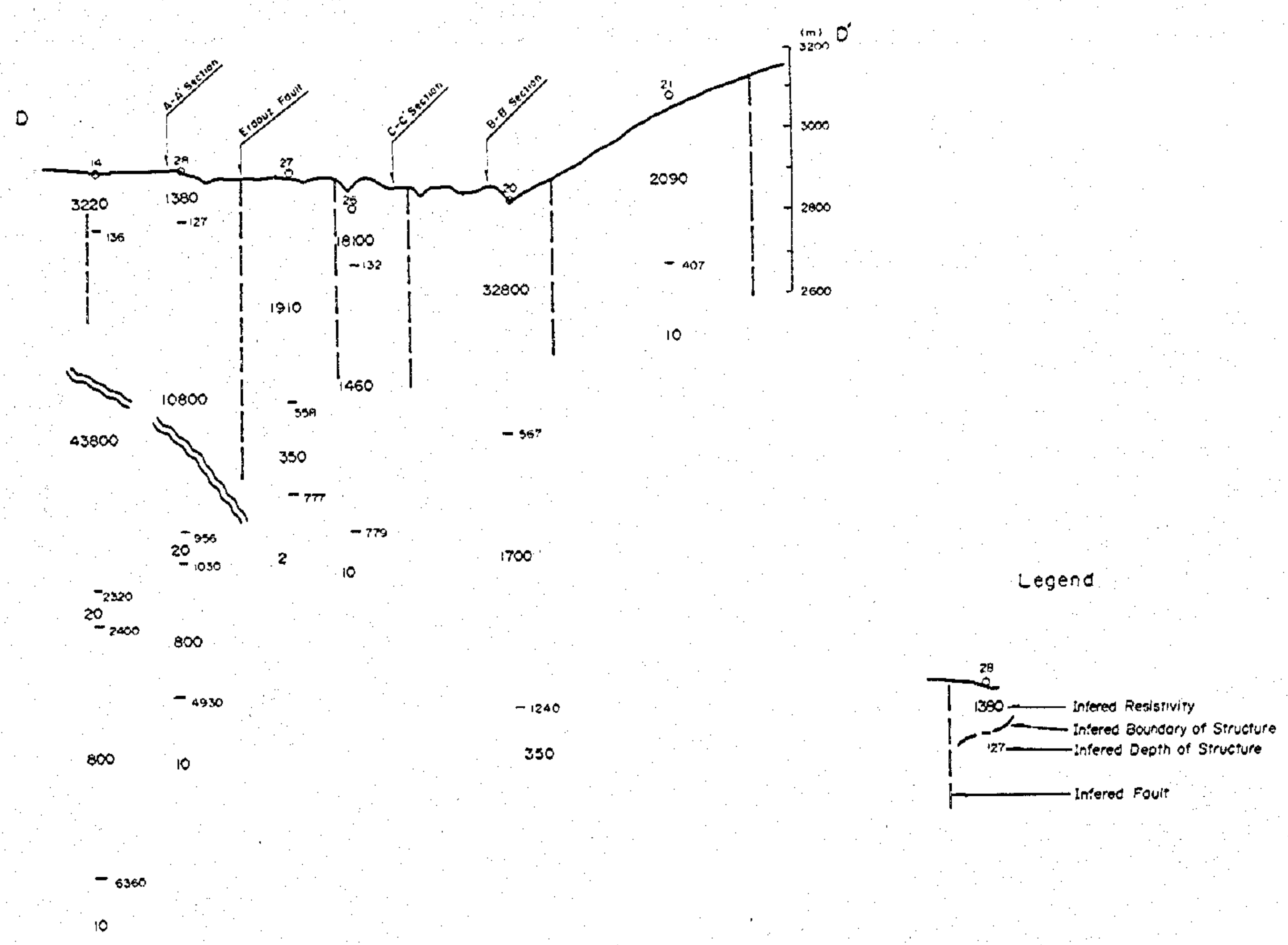


Fig. II-1-3 Apparent Resistivity Pseudo Section with Infered Resistivity Structures (C−C′)

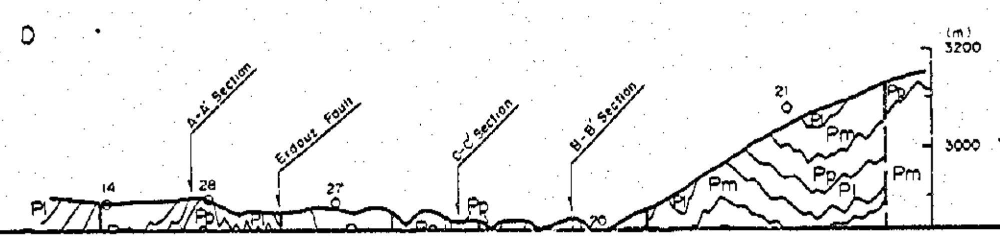
Apparent Resistivity Pseudo Section (D-D')



Infered Resistivity Structures (D-D')



Geological Section (D-D')



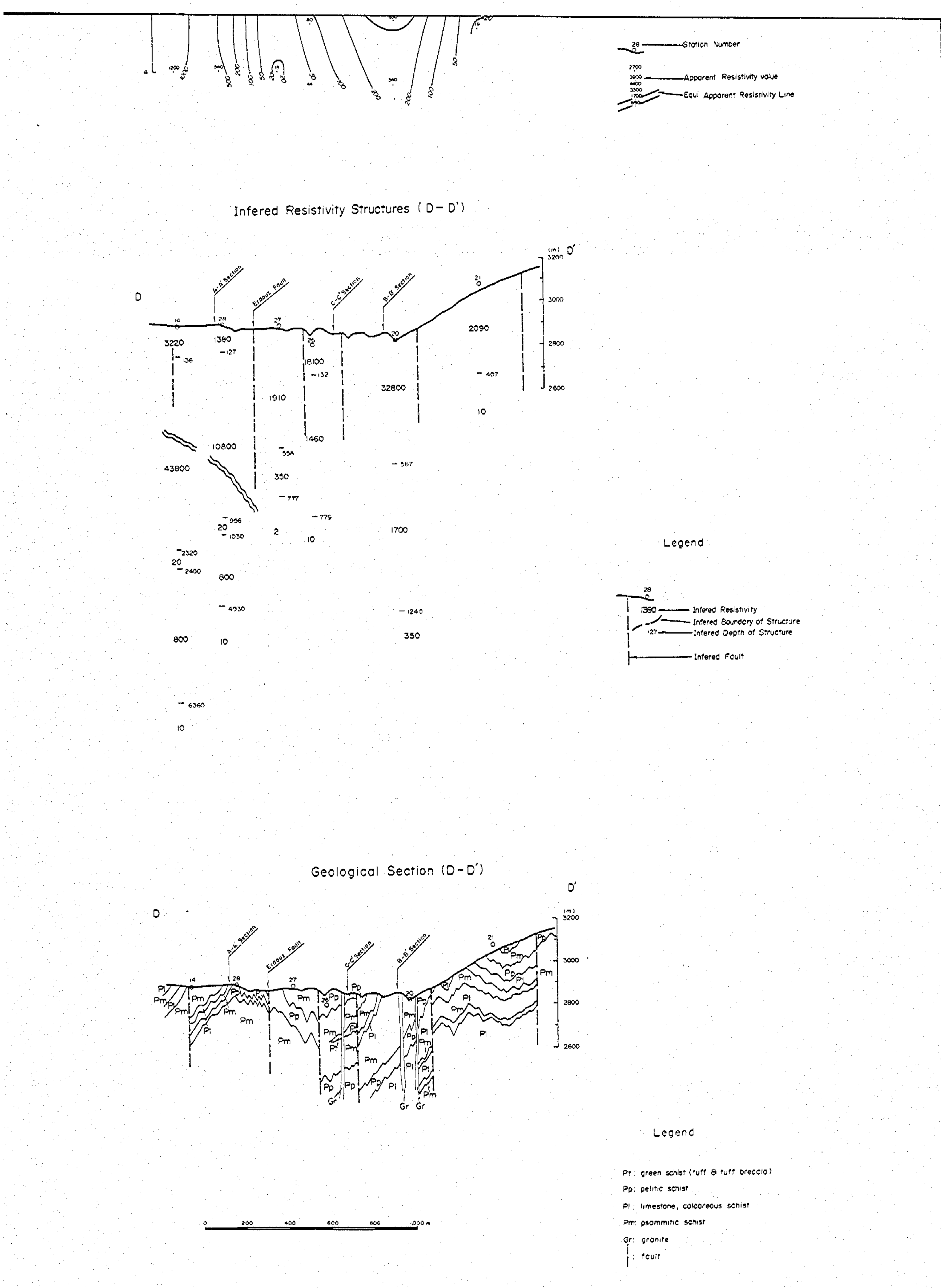
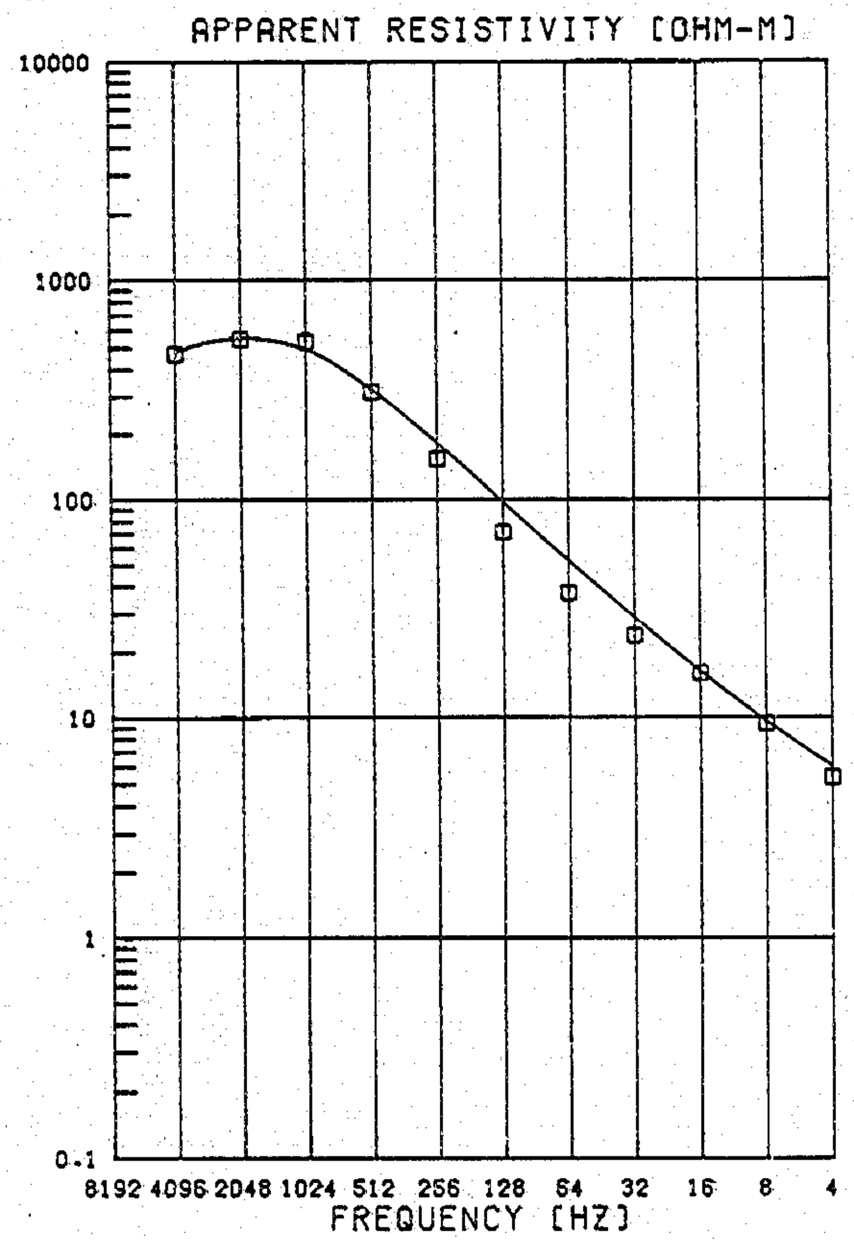


Fig. II-1-4 Apparent Resistivity Pseudo Section with Infered Resistivity Structures (D-D')



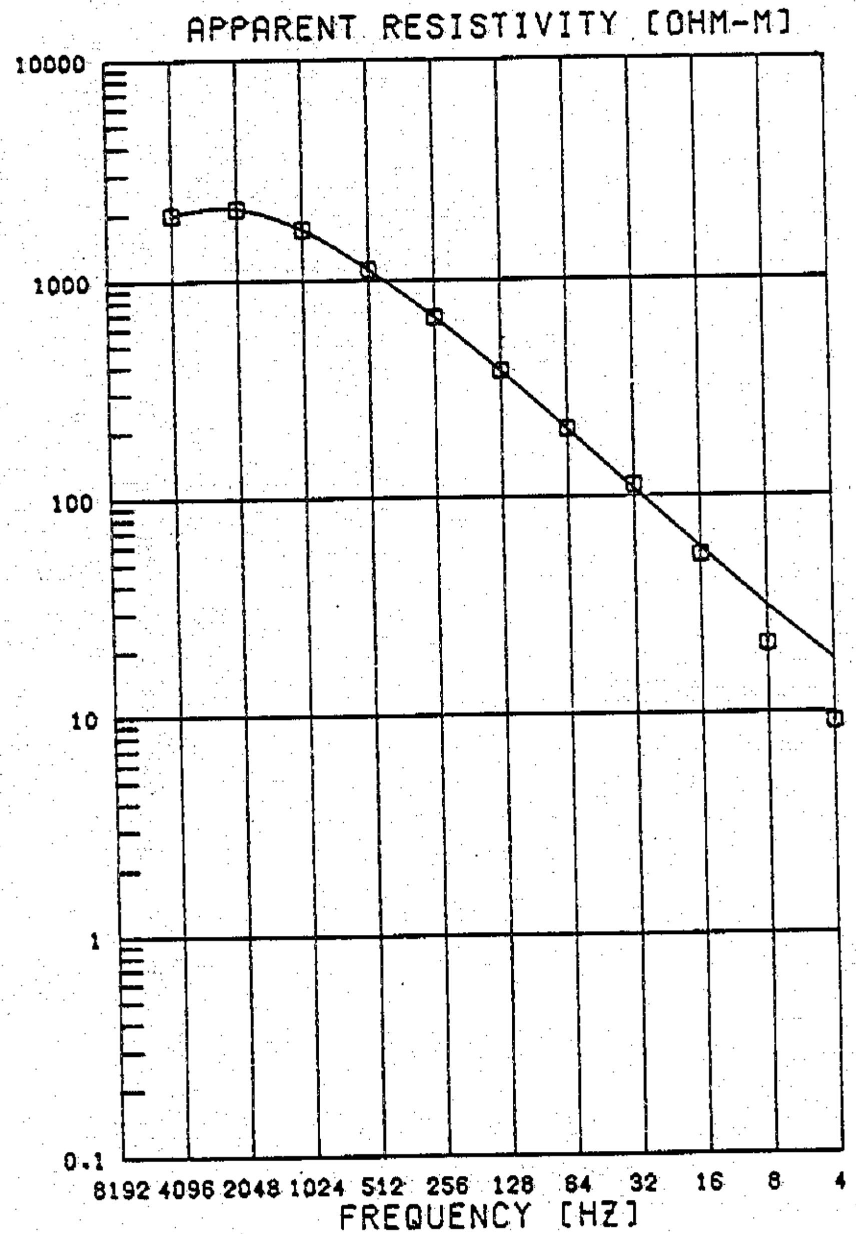
STATION NUMBER : 4

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	468.00	478.44
2048	545.00	552.03
1024	533.00	492.60
512	313.00	322.24
256	153.00	180.89
128	71.00	97.29
64	37.20	52.37
32	23.80	28.73
16	15.90	16.26
8	9.35	9.60
4	5.35	5.98

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	435	
		292
R 2	1.0	

Fig. II-1-5 (1) Apparent Resistivity vs Frequency Curve



STATION NUMBER : 5

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	1990.00	1987.64
2048	2120.00	2123.39
1024	1710.00	1708.82
512	1120.00	1120.75
256	675.00	673.04
128	378.00	377.47
64	204.00	203.12
32	113.00	108.10
16	53.90	57.95
8	21.00	31.66
4	9.08	17.82

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	1720	
		509
R 2	20	
		623
R 3	1.0	

Fig. II-1-5 (2) Apparent Resistivity vs Frequency Curve

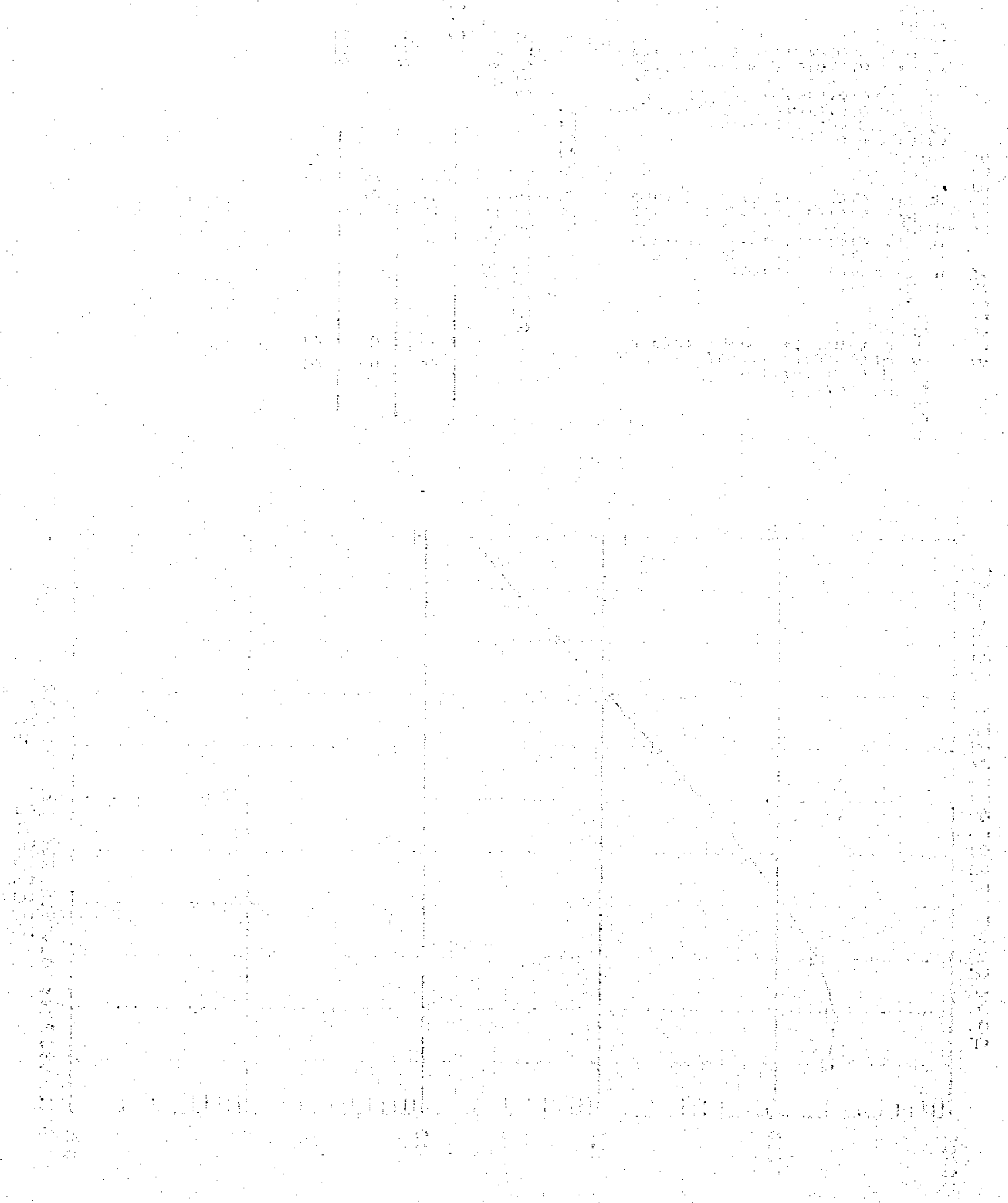
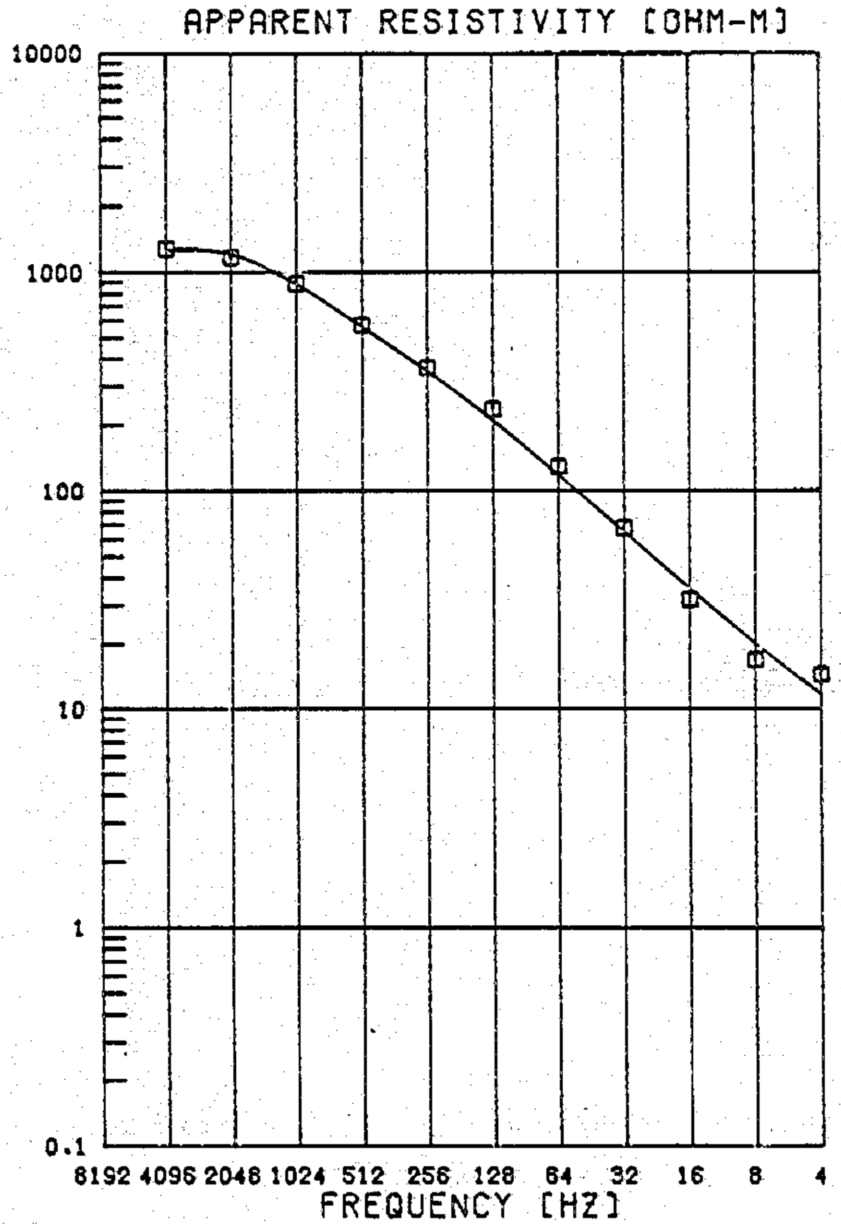


Fig. II-15 (2) Apparent Resistivity vs Frequency Curve



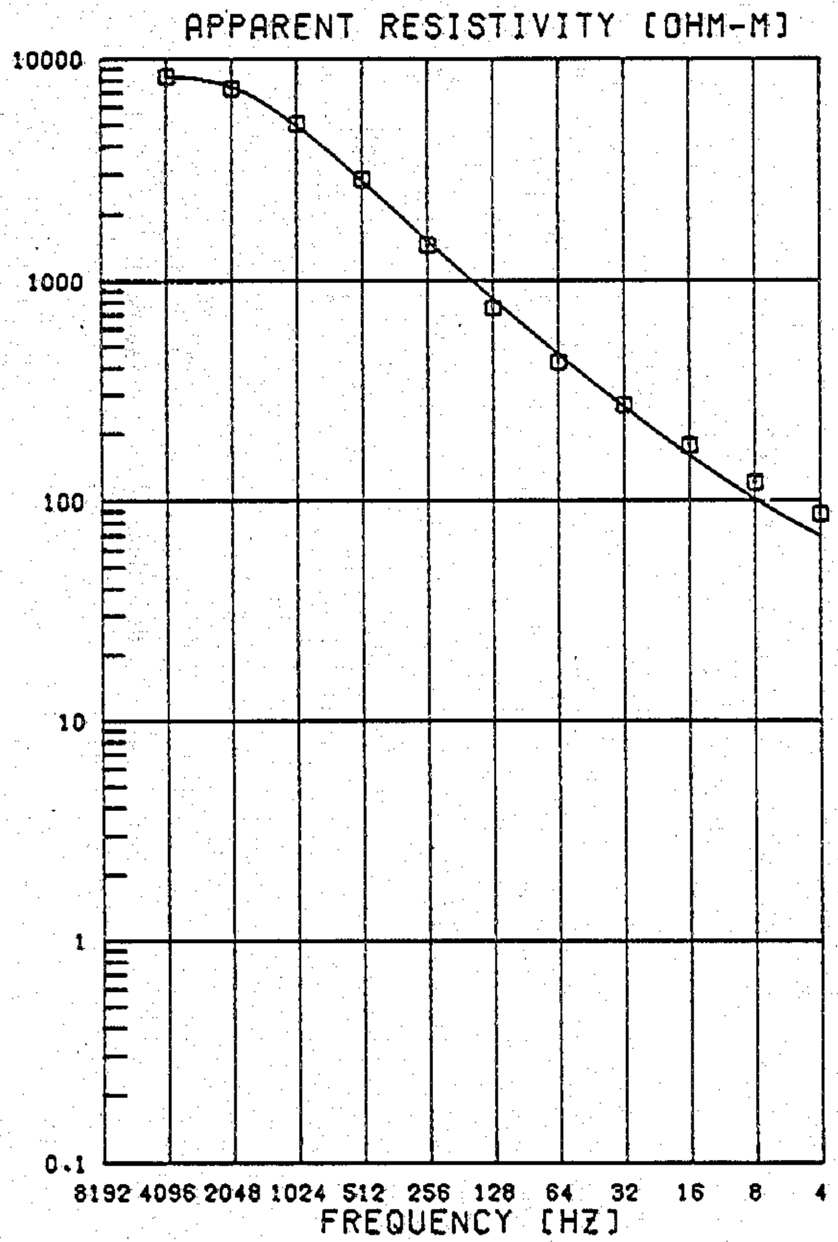
STATION NUMBER : 6

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	1280.00	1257.88
2048	1170.00	1209.62
1024	886.00	880.33
512	573.00	560.18
256	364.00	350.43
128	235.00	209.41
64	129.00	117.90
32	67.50	64.67
16	31.80	35.59
8	16.80	20.01
4	14.40	11.65

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	1050	
		342
R 2	20	
		479
R 3	1.0	

Fig. Ⅱ-1-5 (3) Apparent Resistivity vs Frequency Curve



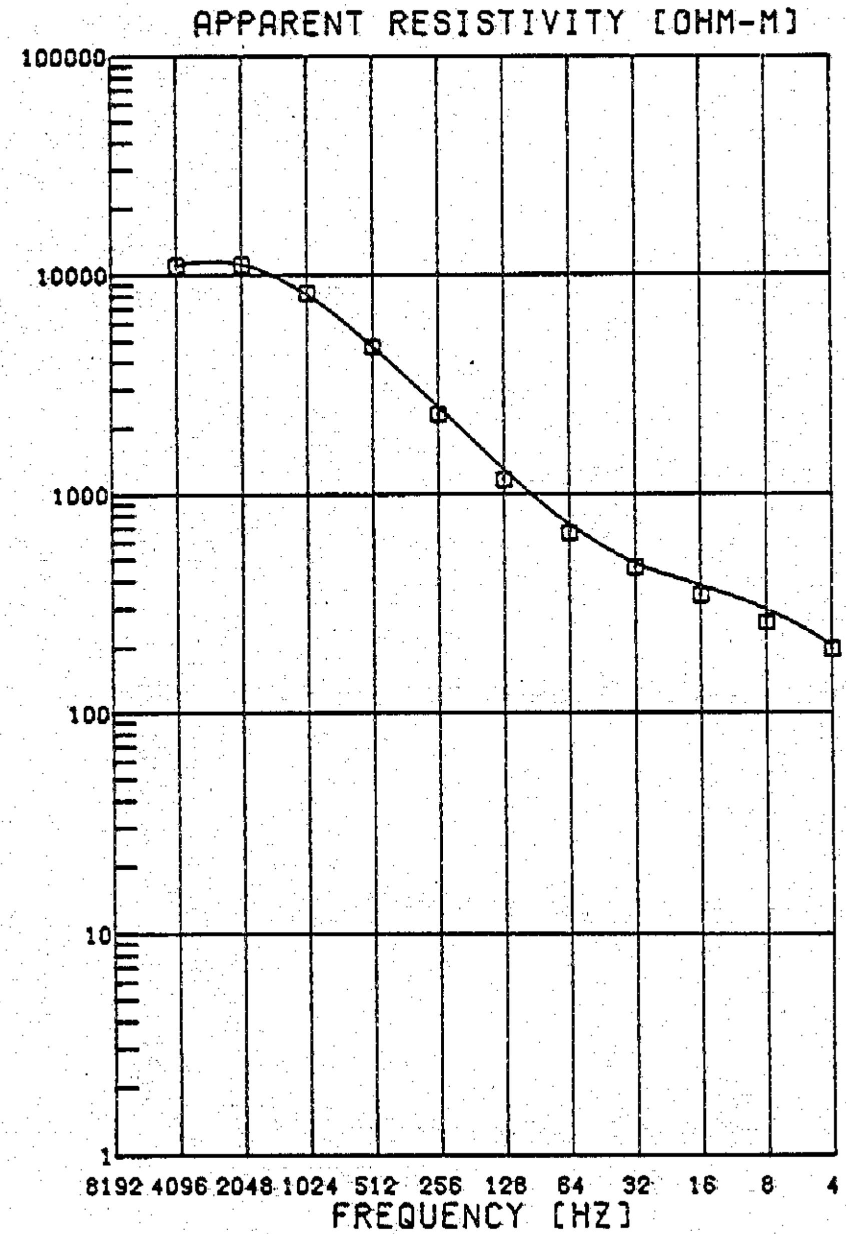
STATION NUMBER : 7

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	8300.00	8256.46
2048	7330.00	7448.17
1024	5040.00	4931.20
512	2850.00	2794.14
256	1450.00	1515.97
128	748.00	824.15
64	423.00	457.81
32	269.00	263.26
16	176.00	158.61
8	120.00	101.23
4	86.80	69.02

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	6540	
		807
R 2	20	

Fig. II-1-5 (4) Apparent Resistivity vs Frequency Curve



STATION NUMBER : 8

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	11000.00	10998.17
2048	11100.00	11141.46
1024	8240.00	8103.35
512	4690.00	4688.42
256	2290.00	2474.81
128	1160.00	1293.00
64	659.00	720.66
32	459.00	476.87
16	343.00	378.72
8	257.00	294.60
4	195.00	200.18

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	9020	
		1070
R 2	20	
		1210
R 3	800	
		2430
R 4	10	

Fig. II-I-5 (5) Apparent Resistivity vs Frequency Curve

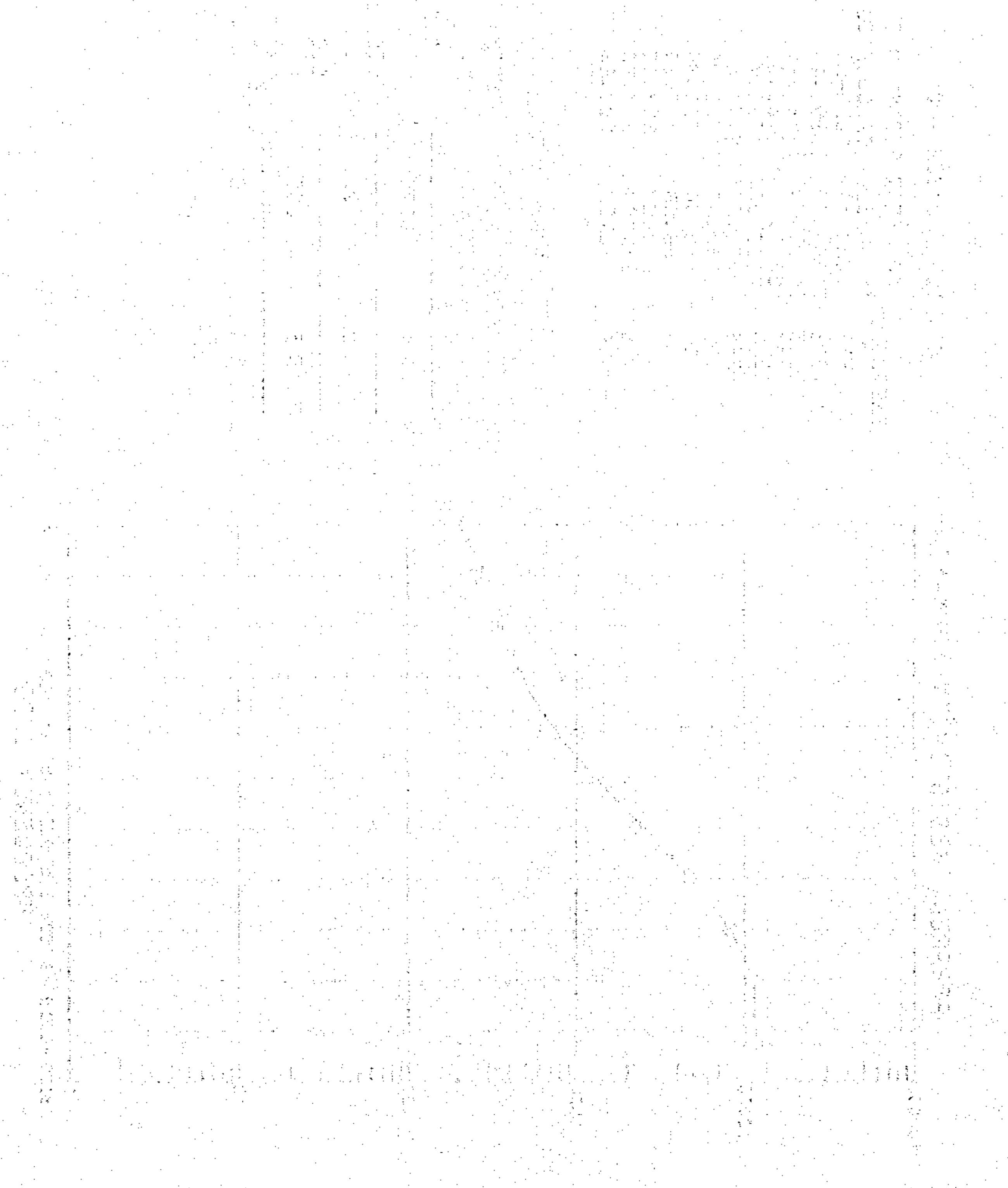
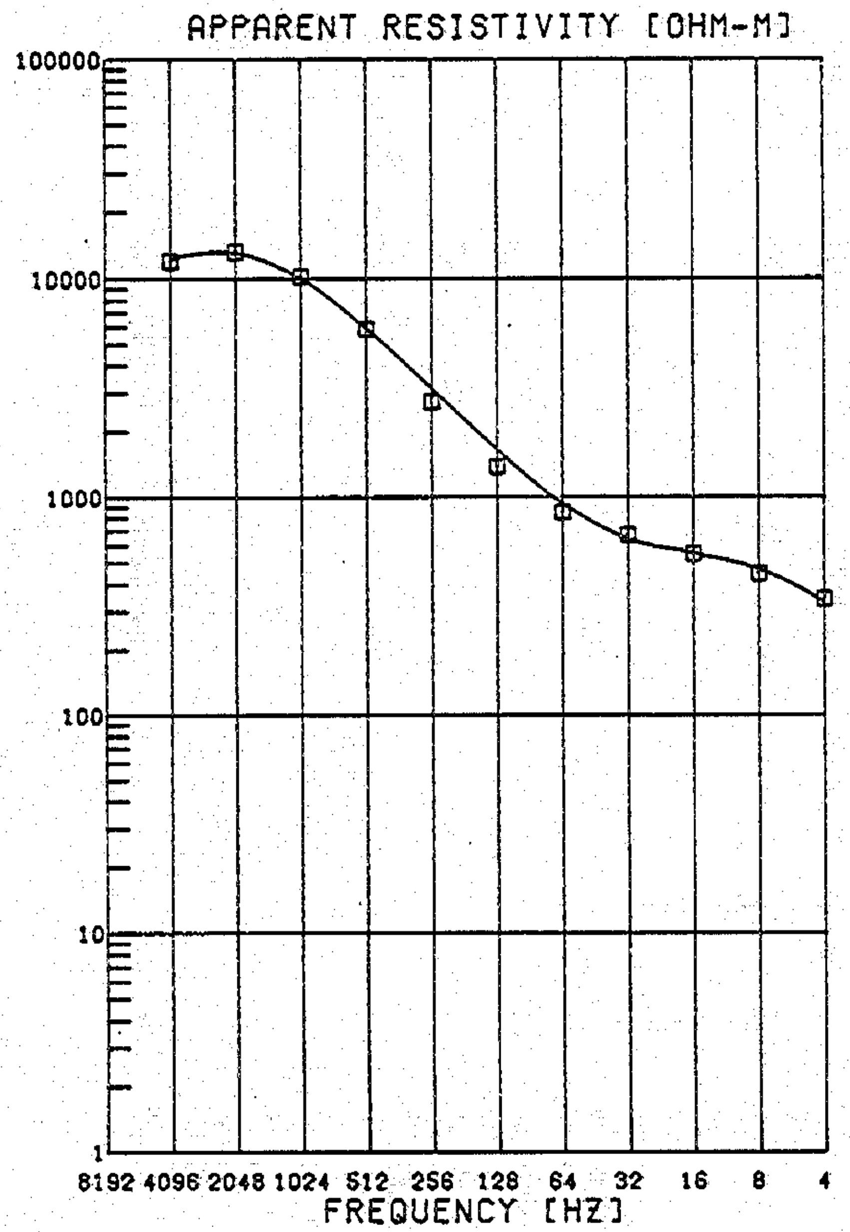


Fig. 1.15 (b) Amplitude ... vs Frequency



STATION NUMBER : 9

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	12000.00	12168.98
2048	13200.00	13028.20
1024	10200.00	10020.82
512	5860.00	5901.55
256	2730.00	3137.97
128	1380.00	1652.34
64	849.00	931.99
32	665.00	638.44
16	547.00	548.38
8	445.00	464.60
4	340.00	326.81

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	10300	
		1230
R 2	20	
		1320
R 3	800	
		3250
R 4	10	

Fig. II-1-5 (6) Apparent Resistivity vs Frequency Curve

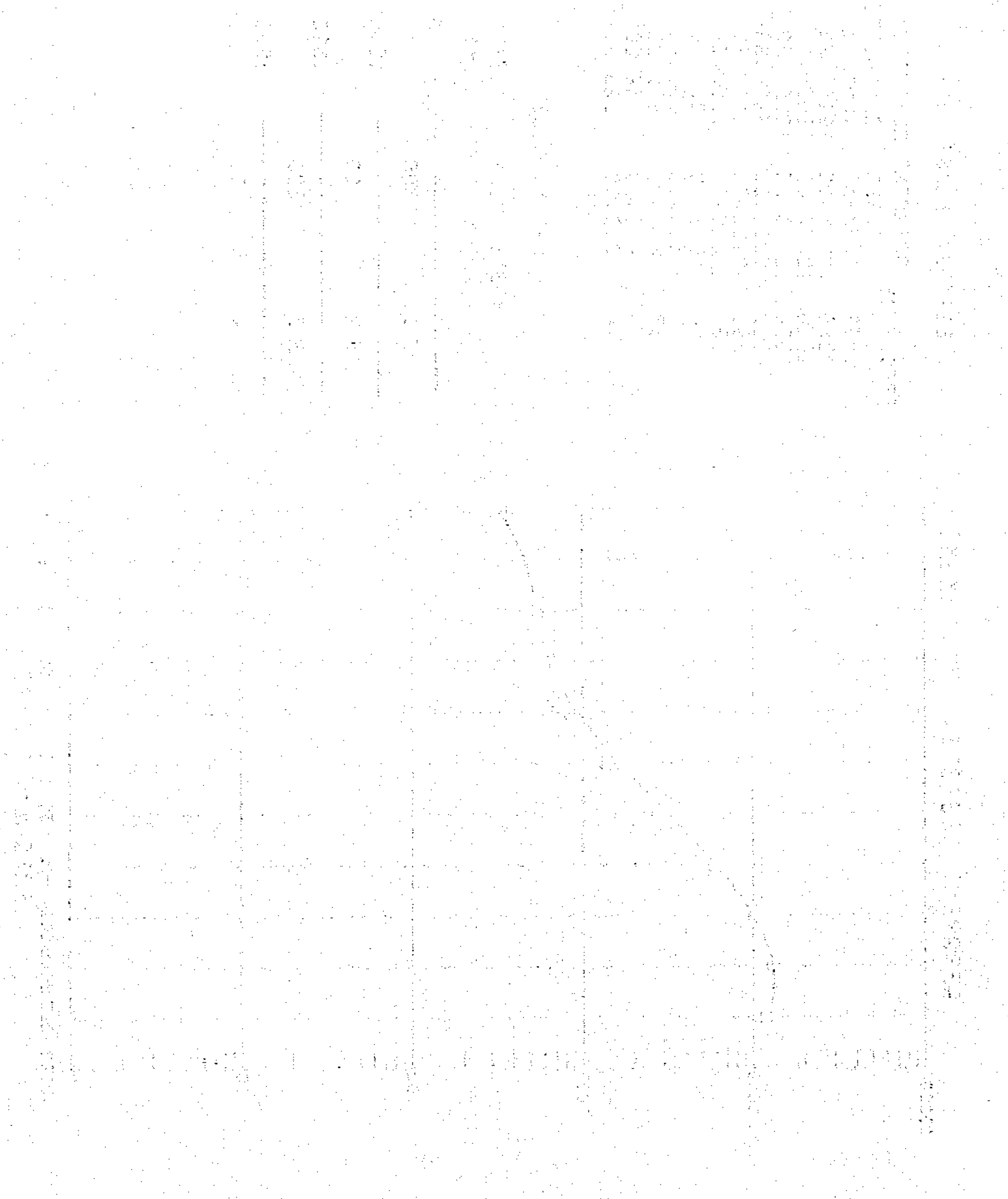
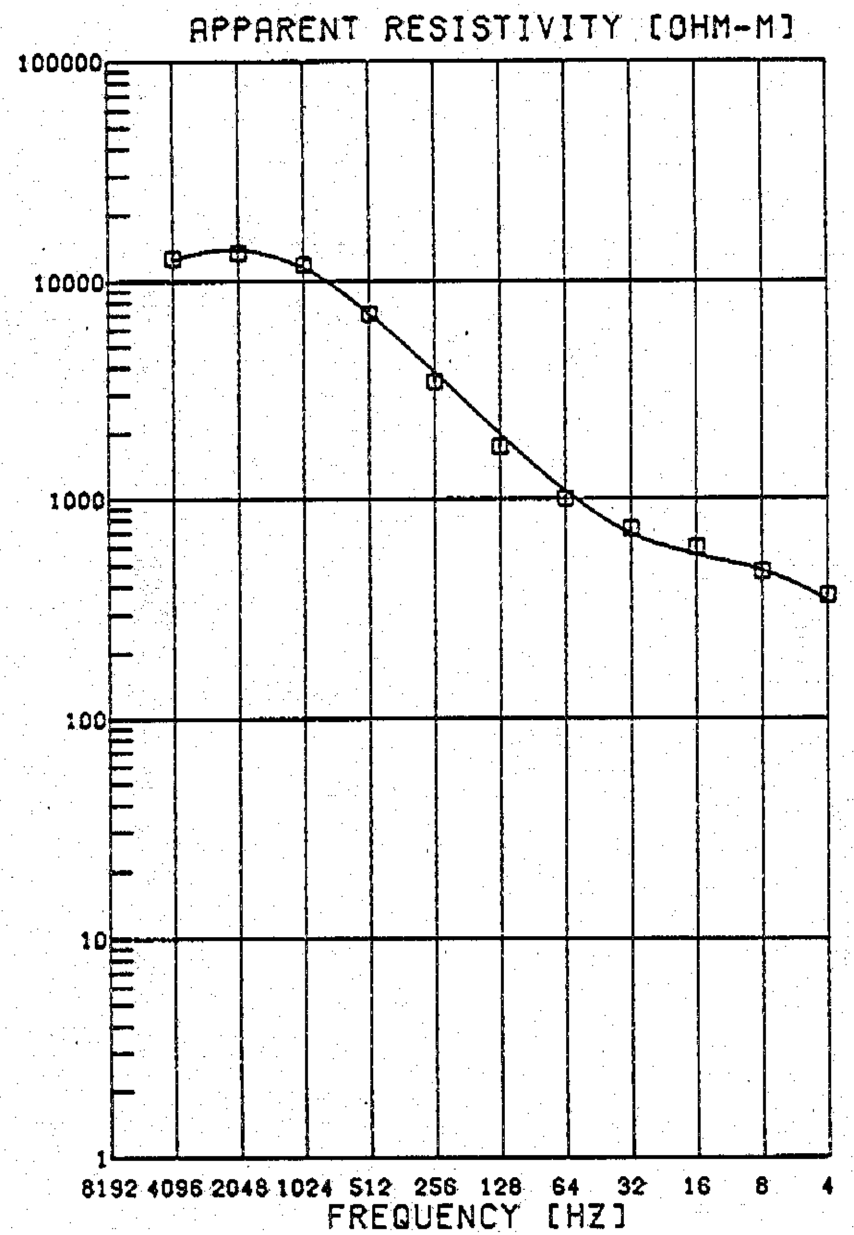


Fig. [illegible] Apparent Resistivity vs Frequency [illegible]



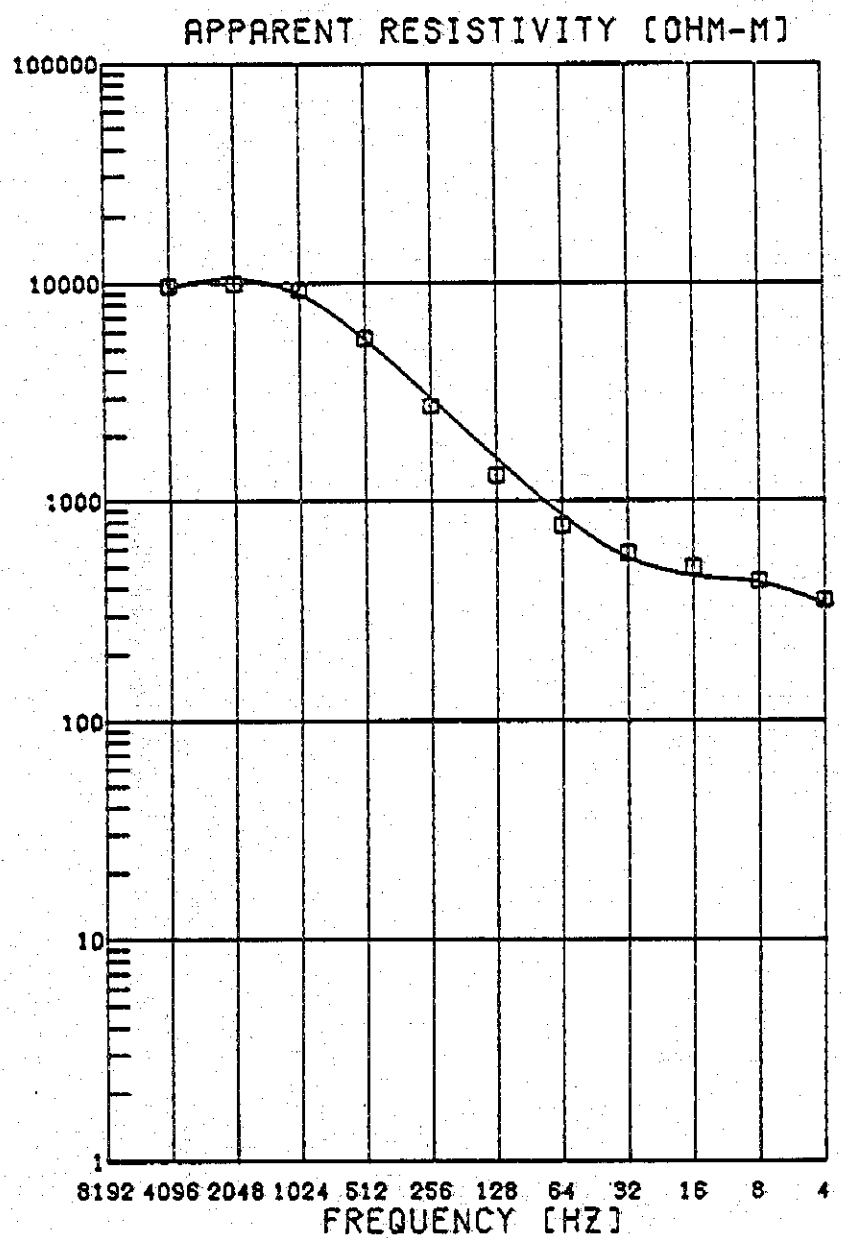
STATION NUMBER : 10

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	12700.00	12455.59
2048	13500.00	13930.41
1024	11900.00	11502.97
512	7080.00	7051.59
256	3440.00	3787.05
128	1740.00	1979.04
64	1000.00	1079.96
32	728.00	687.41
16	600.00	552.80
8	466.00	471.10
4	364.00	342.22

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	10900	
		1350
R 2	20	
		1460
R 3	800	
		3410
R 4	10	

Fig. II-1-5 (7) Apparent Resistivity vs Frequency Curve



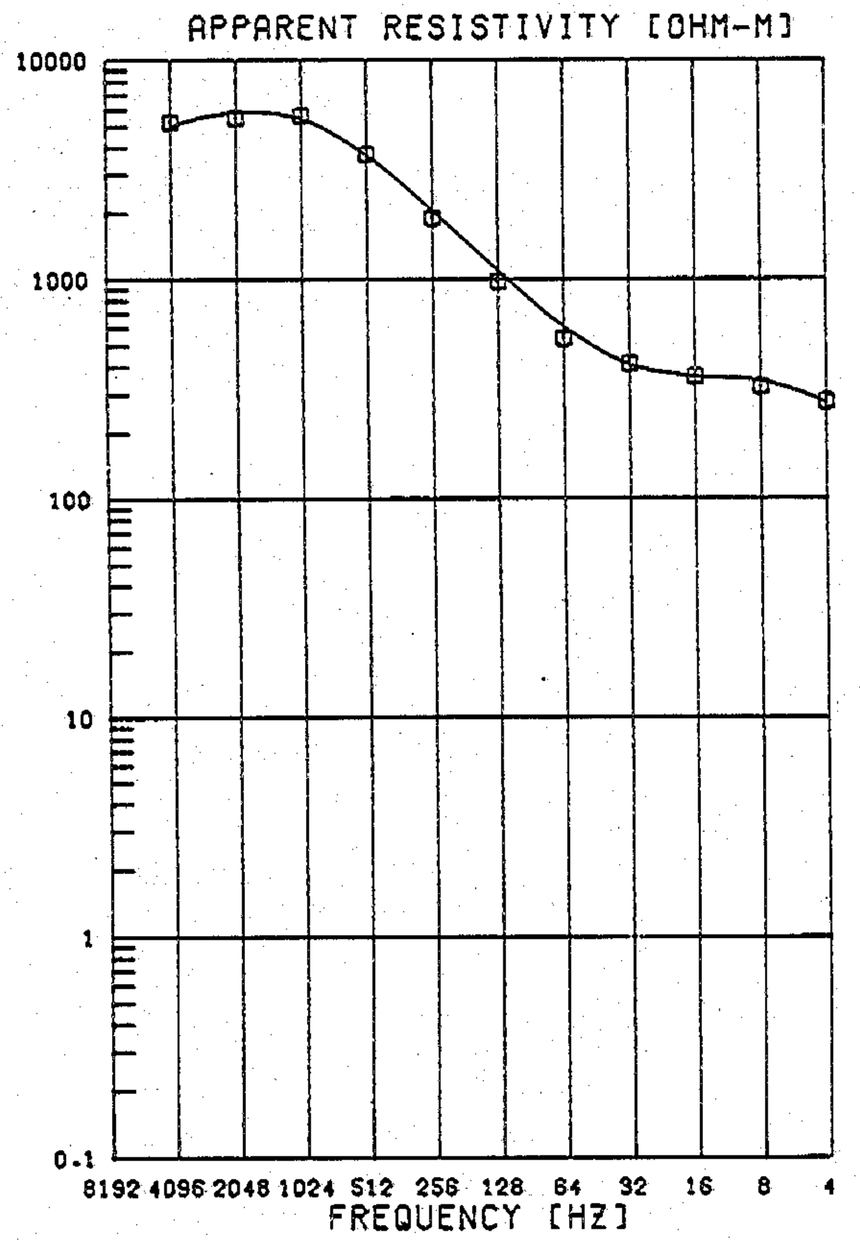
STATION NUMBER : 11

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	9740.00	9354.17
2048	9960.00	10543.66
1024	9280.00	8894.33
512	5600.00	5542.24
256	2750.00	2998.01
128	1310.00	1572.60
64	768.00	858.56
32	576.00	547.40
16	499.00	455.00
8	432.00	423.43
4	352.00	335.88

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	8270	
		1200
R 2	20	
		1320
R 3	800	
		3540
R 4	10	

Fig. II-1-5 (8) Apparent Resistivity vs Frequency Curve



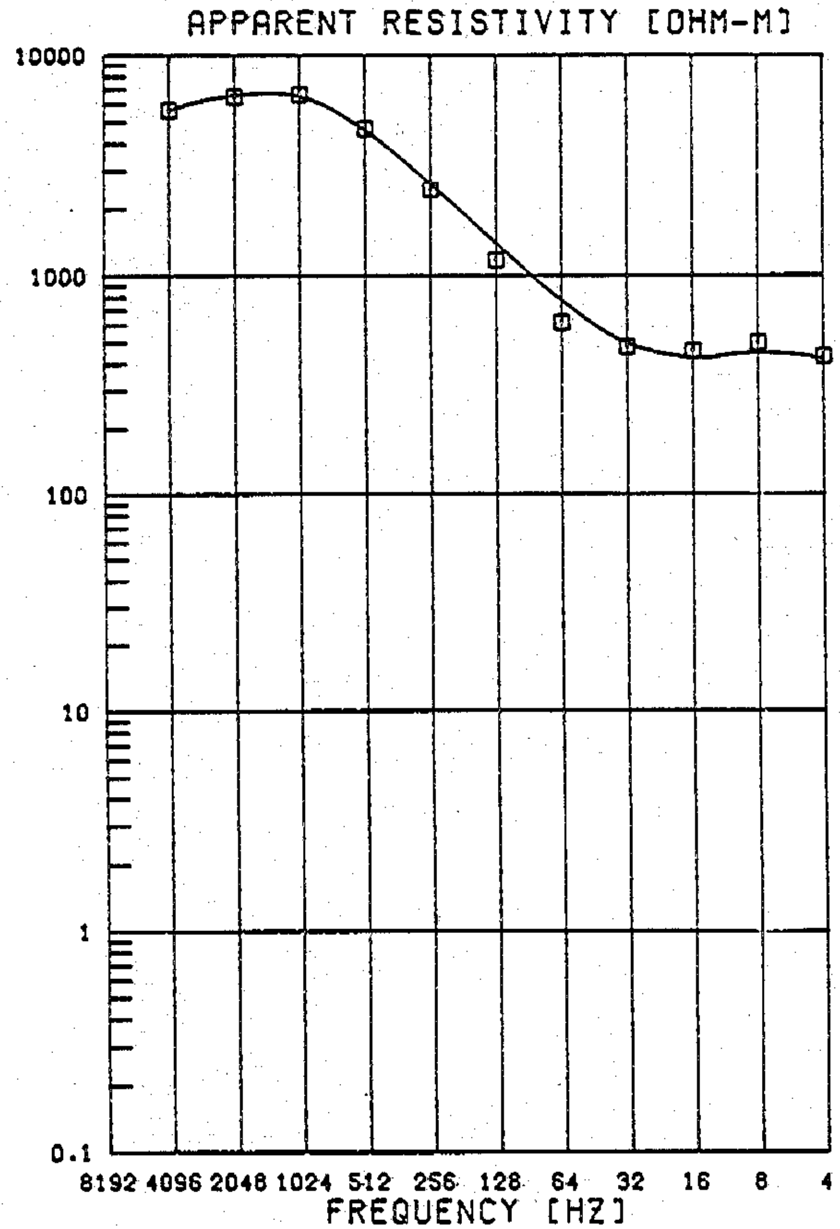
STATION NUMBER : 12

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	5260.00	5016.05
2048	5500.00	5822.31
1024	5620.00	5443.44
512	3720.00	3672.34
256	1900.00	2053.47
128	974.00	1092.87
64	538.00	609.39
32	413.00	407.82
16	360.00	359.93
8	325.00	343.97
4	279.00	273.91

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	4670	
		998
R 2	20	
		1120
R 3	800	
		3150
R 4	10	

Fig. Ⅱ-1-5 (9) Apparent Resistivity vs Frequency Curve



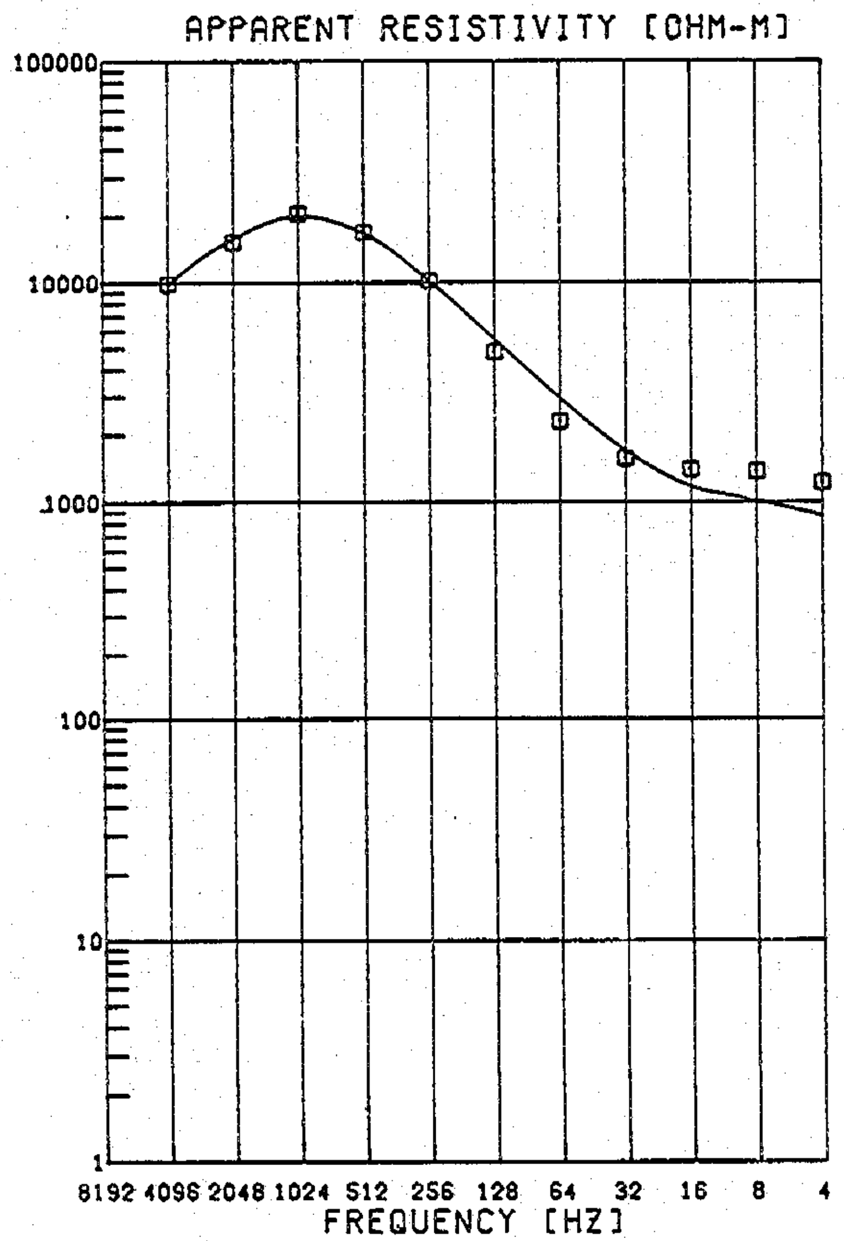
STATION NUMBER : 13

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	5640.00	5618.17
2048	6460.00	6574.17
1024	6630.00	6492.07
512	4670.00	4563.25
256	2450.00	2592.04
128	1170.00	1390.25
64	615.00	770.49
32	475.00	493.77
16	456.00	424.74
8	498.00	448.76
4	430.00	418.81

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	5360	
		1140
R 2	20	
		1240
R 3	800	
		4410
R 4	10	

Fig. II-1-5 (10) Apparent Resistivity vs Frequency Curve



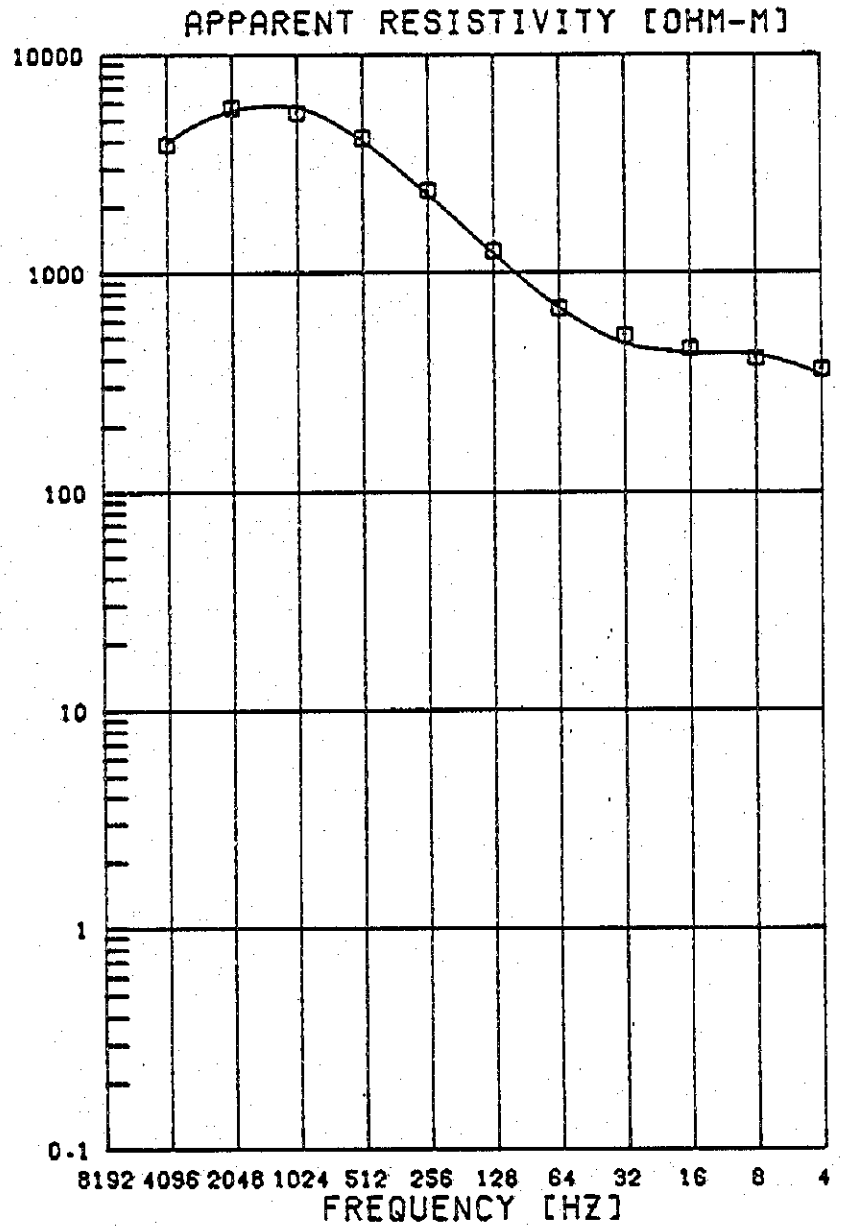
STATION NUMBER : 14

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	9850.00	9730.08
2048	15300.00	15835.61
1024	20700.00	20213.44
512	17000.00	16832.04
256	10200.00	10205.35
128	4810.00	5514.26
64	2310.00	2963.79
32	1570.00	1700.97
16	1400.00	1174.47
8	1370.00	1016.73
4	1220.00	865.27

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	3220	
		136
R 2	43800	
		2320
R 3	20	
		2400
R 4	800	
		6360
R 5	10	

Fig. II-1-5 (11) Apparent Resistivity vs Frequency Curve



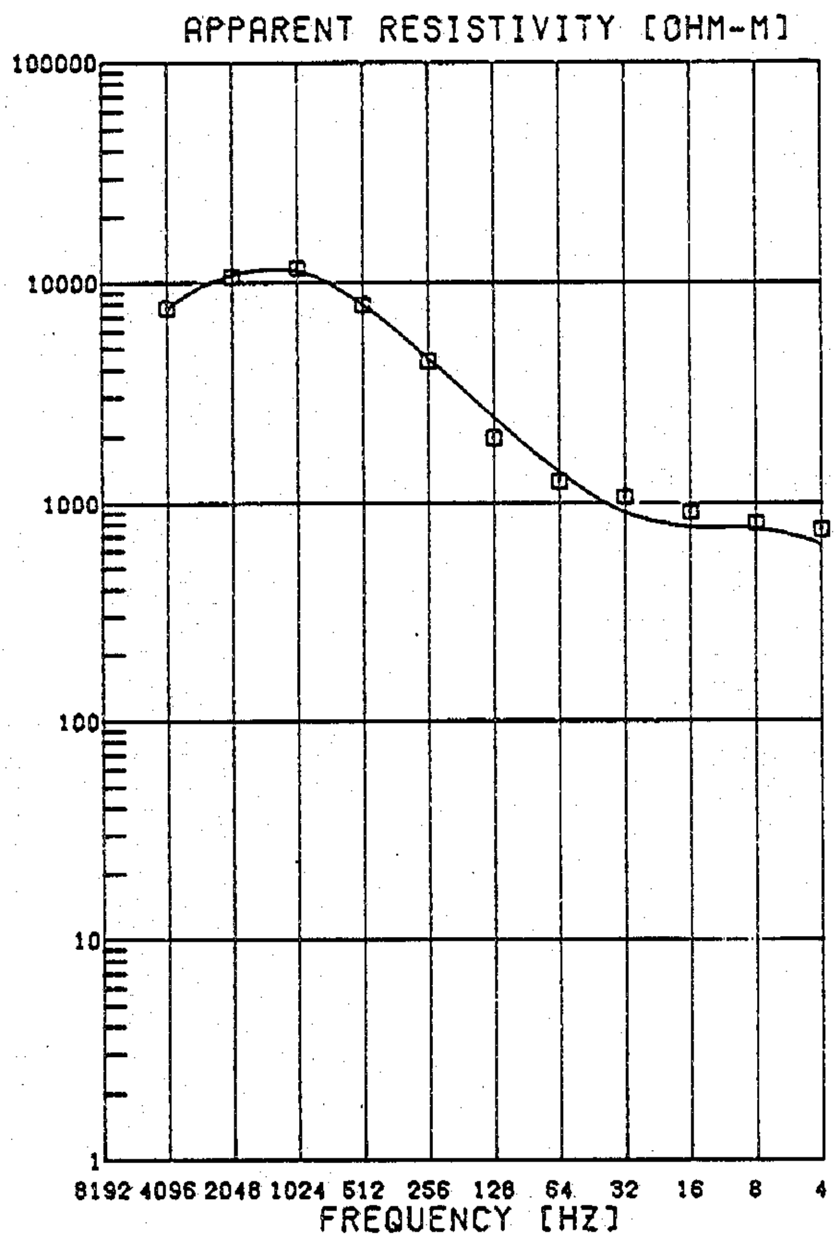
STATION NUMBER : 15

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	3880.00	3936.68
2048	5710.00	5513.61
1024	5410.00	5709.87
512	4150.00	4014.15
256	2390.00	2275.30
128	1250.00	1221.88
64	683.00	688.62
32	512.00	468.96
16	445.00	424.53
8	400.00	414.95
4	356.00	333.25

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	1940	
		112
R 2	8490	
		1060
R 3	20	
		1160
R 4	800	
		3520
R 5	10	

Fig. Ⅱ-1-5 (12) Apparent Resistivity vs Frequency Curve



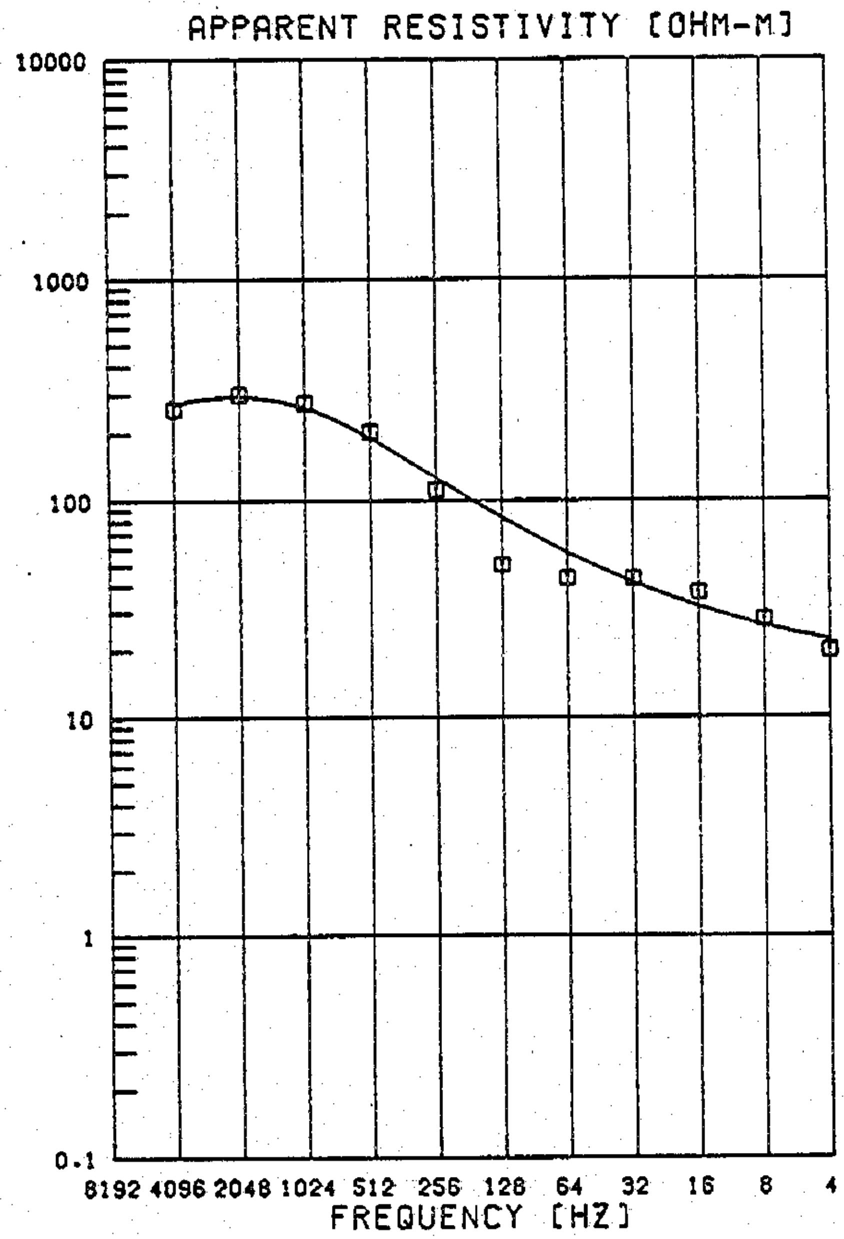
STATION NUMBER : 16

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	7640.00	7577.64
2048	10600.00	10824.45
1024	11600.00	11294.52
512	7930.00	7918.70
256	4370.00	4492.44
128	1970.00	2434.72
64	1250.00	1377.65
32	1060.00	900.20
16	903.00	770.10
8	803.00	761.00
4	748.00	637.25

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	2850	
		109
R 2	16700	
		1510
R 3	20	
		1580
R 4	800	
		5130
R 5	10	

Fig. II-1-5 (13) Apparent Resistivity vs Frequency Curve



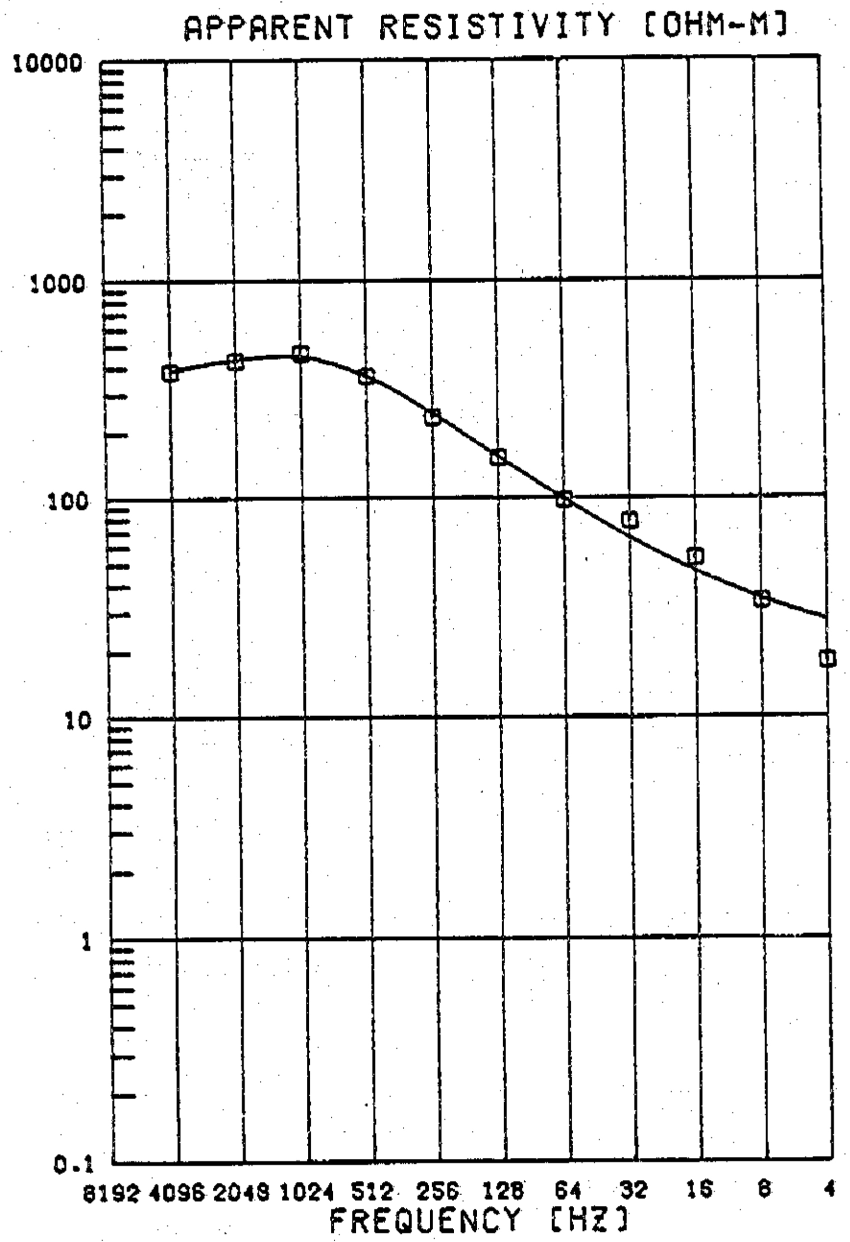
STATION NUMBER : 17

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	259.00	271.70
2048	300.00	294.23
1024	275.00	262.37
512	204.00	190.90
256	112.00	126.61
128	50.10	83.45
64	43.30	57.07
32	43.10	41.28
16	37.00	31.76
8	27.70	25.91
4	19.90	22.23

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	250	
		209
R 2	15	

Fig. II-1-5 (14) Apparent Resistivity vs Frequency Curve



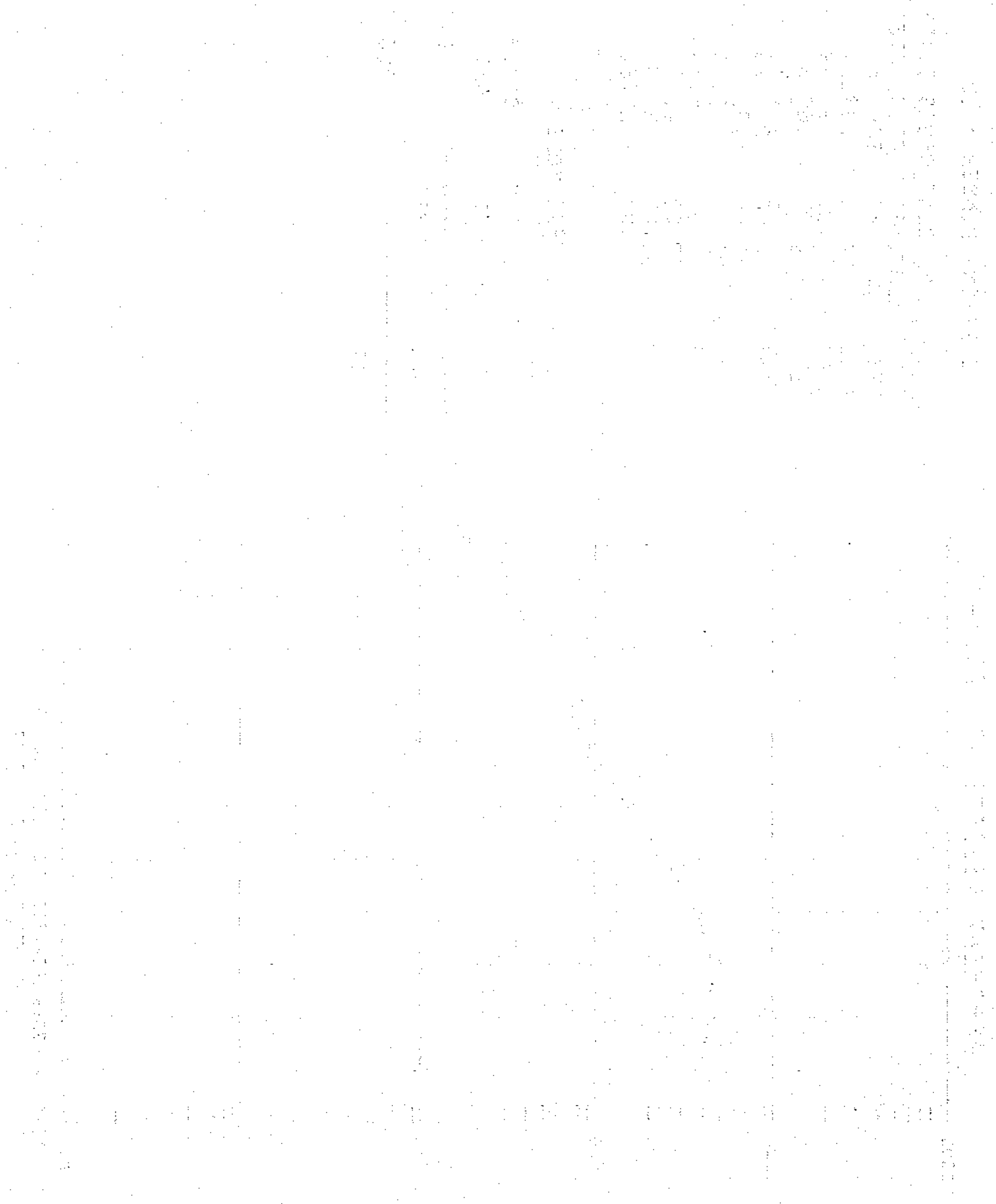
STATION NUMBER : 18

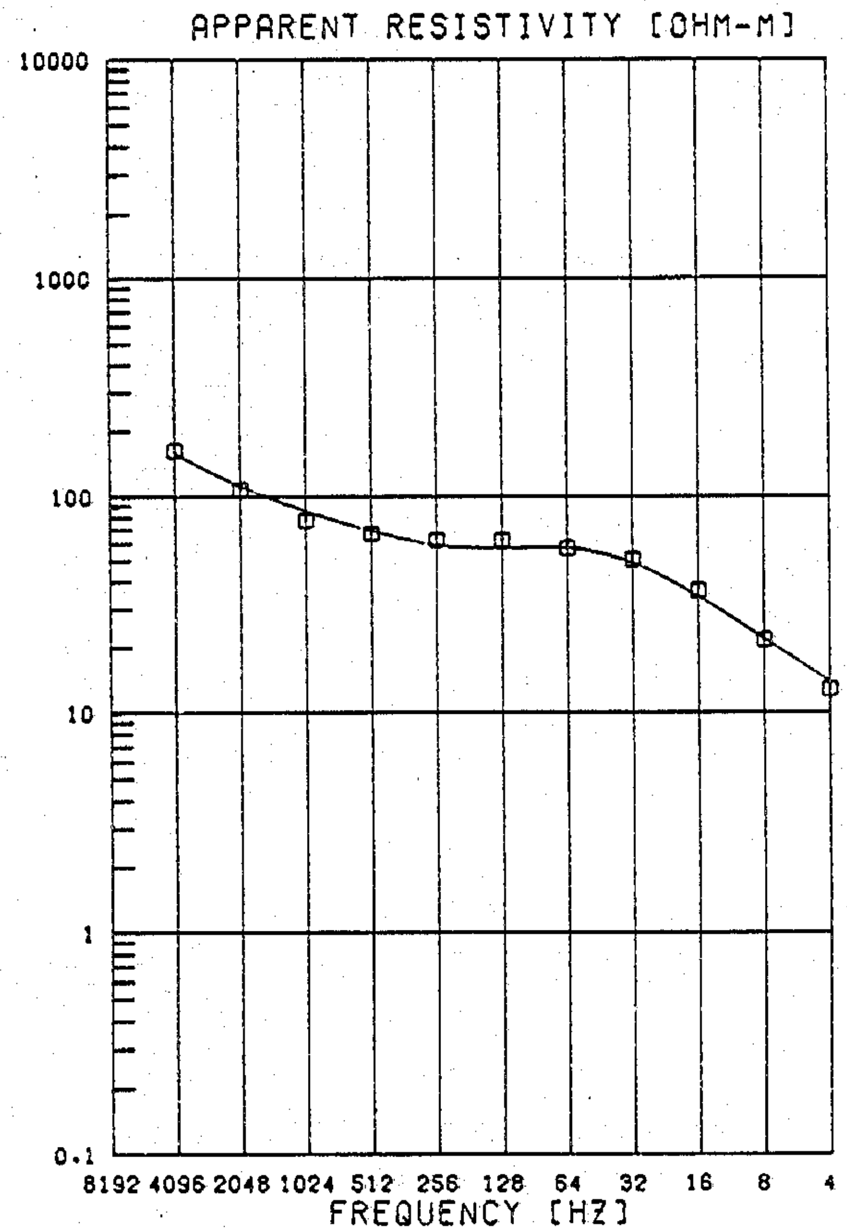
FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	384.00	388.27
2048	429.00	435.49
1024	465.00	450.58
512	365.00	365.29
256	236.00	245.96
128	153.00	155.20
64	97.70	98.70
32	77.60	65.49
16	53.00	46.09
8	33.80	34.60
4	17.90	27.64

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	381	
		325
R 2	15	

Fig. Ⅱ-1-5 (15) Apparent Resistivity vs Frequency Curve





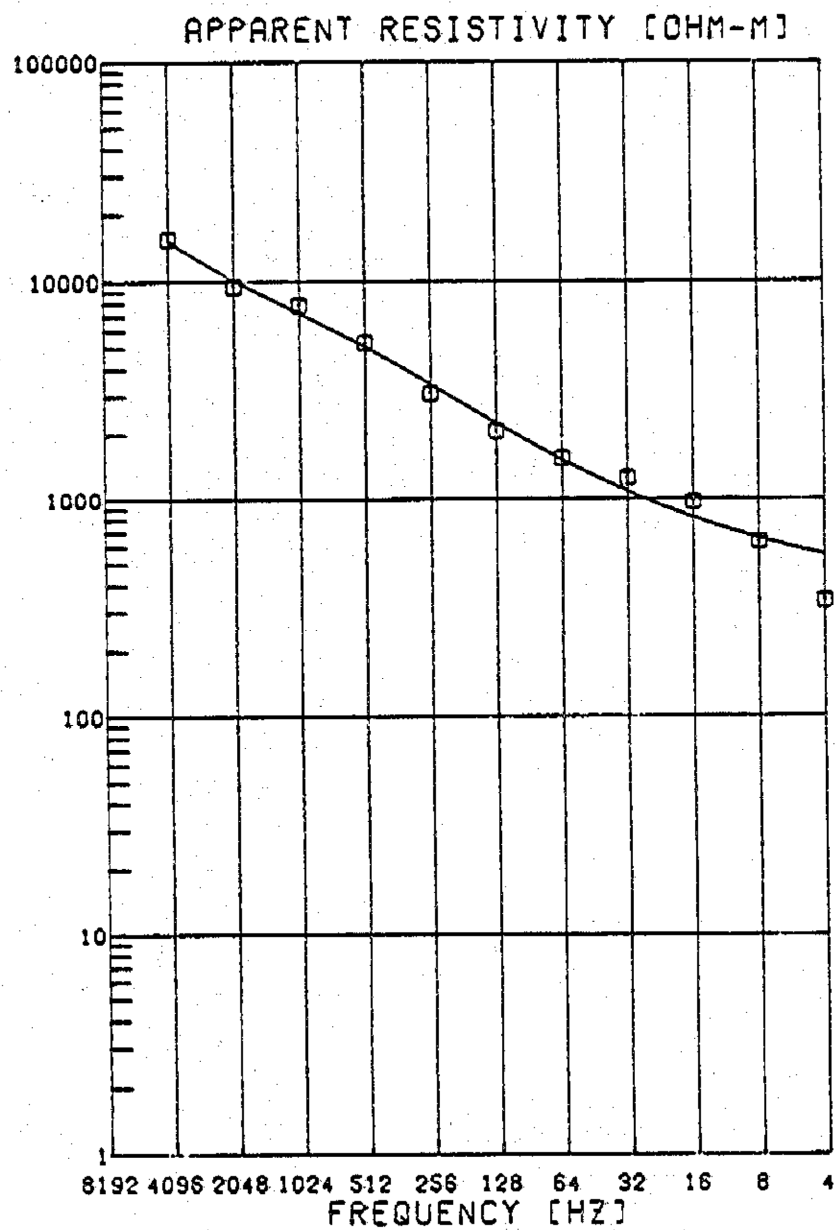
STATION NUMBER : 19

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	163.00	158.00
2048	108.00	112.41
1024	77.20	85.62
512	66.90	69.24
256	62.40	59.19
128	62.20	57.24
64	56.90	57.46
32	50.40	48.59
16	36.10	33.93
8	21.50	21.74
4	12.80	13.86

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	5100	
		41
R 2	40	
		501
R 3	2.0	

Fig. II-1-5 (16) Apparent Resistivity vs Frequency Curve



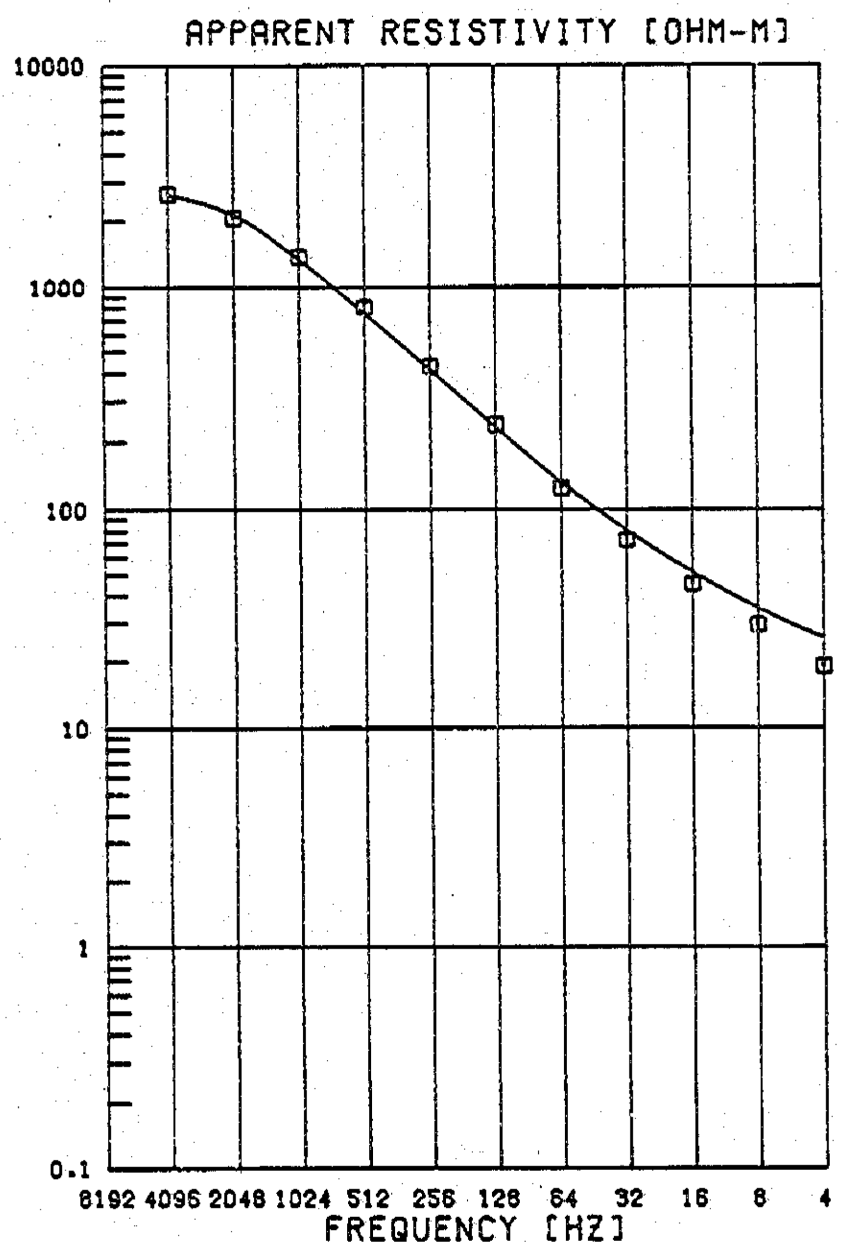
STATION NUMBER : 20

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	15400.00	15145.26
2048	9480.00	10150.52
1024	7810.00	7219.60
512	5280.00	5073.74
256	3090.00	3409.32
128	2070.00	2257.51
64	1550.00	1529.32
32	1250.00	1085.80
16	967.00	816.95
8	629.00	652.11
4	337.00	549.11

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	32800	
		567
R 2	1700	
		1240
R 3	350	

Fig. II - I -5 (17) Apparent Resistivity vs Frequency Curve



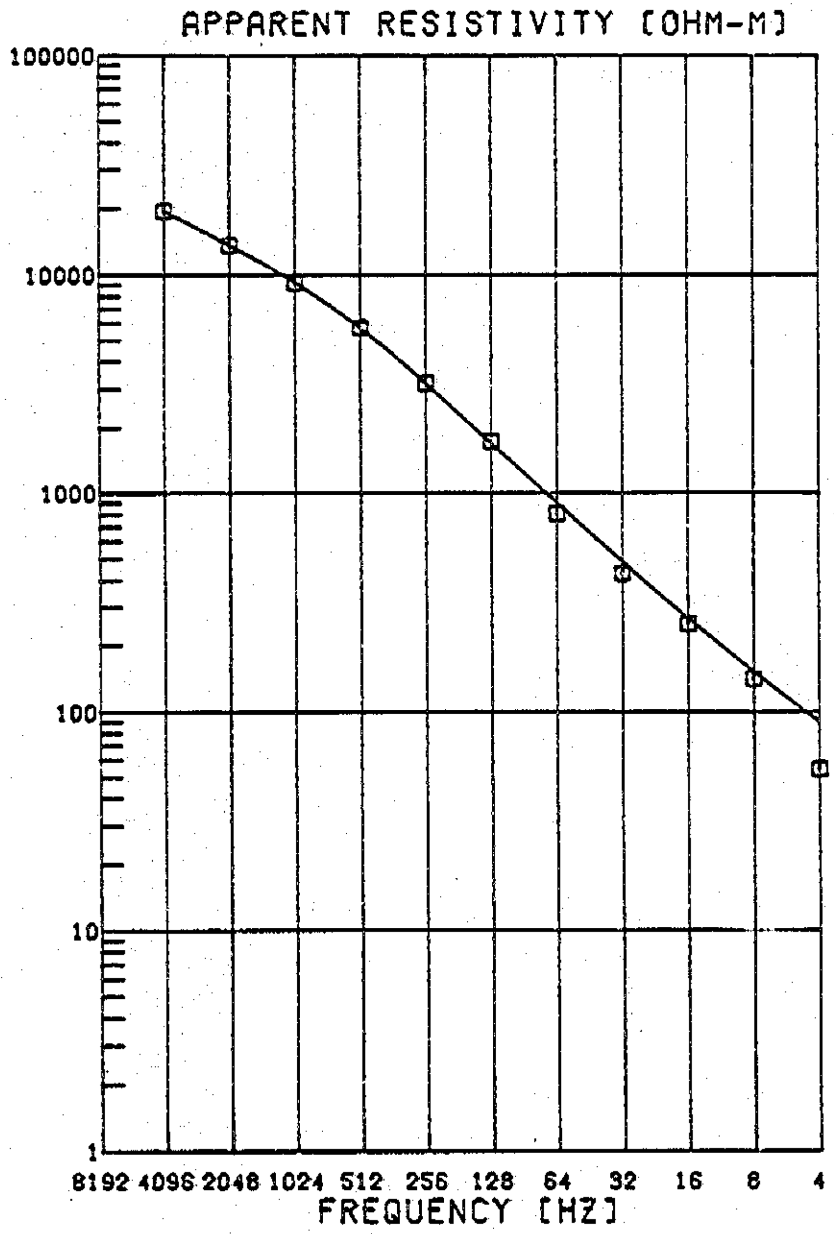
STATION NUMBER : 21

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	2650.00	2626.26
2048	2060.00	2131.83
1024	1370.00	1333.33
512	801.00	749.22
256	429.00	412.27
128	237.00	230.06
64	125.00	132.53
32	72.00	79.88
16	44.90	50.96
8	29.10	34.72
4	18.80	25.35

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	2090	
		407
R 2	10	

Fig. II-1-5 (18) Apparent Resistivity vs Frequency Curve



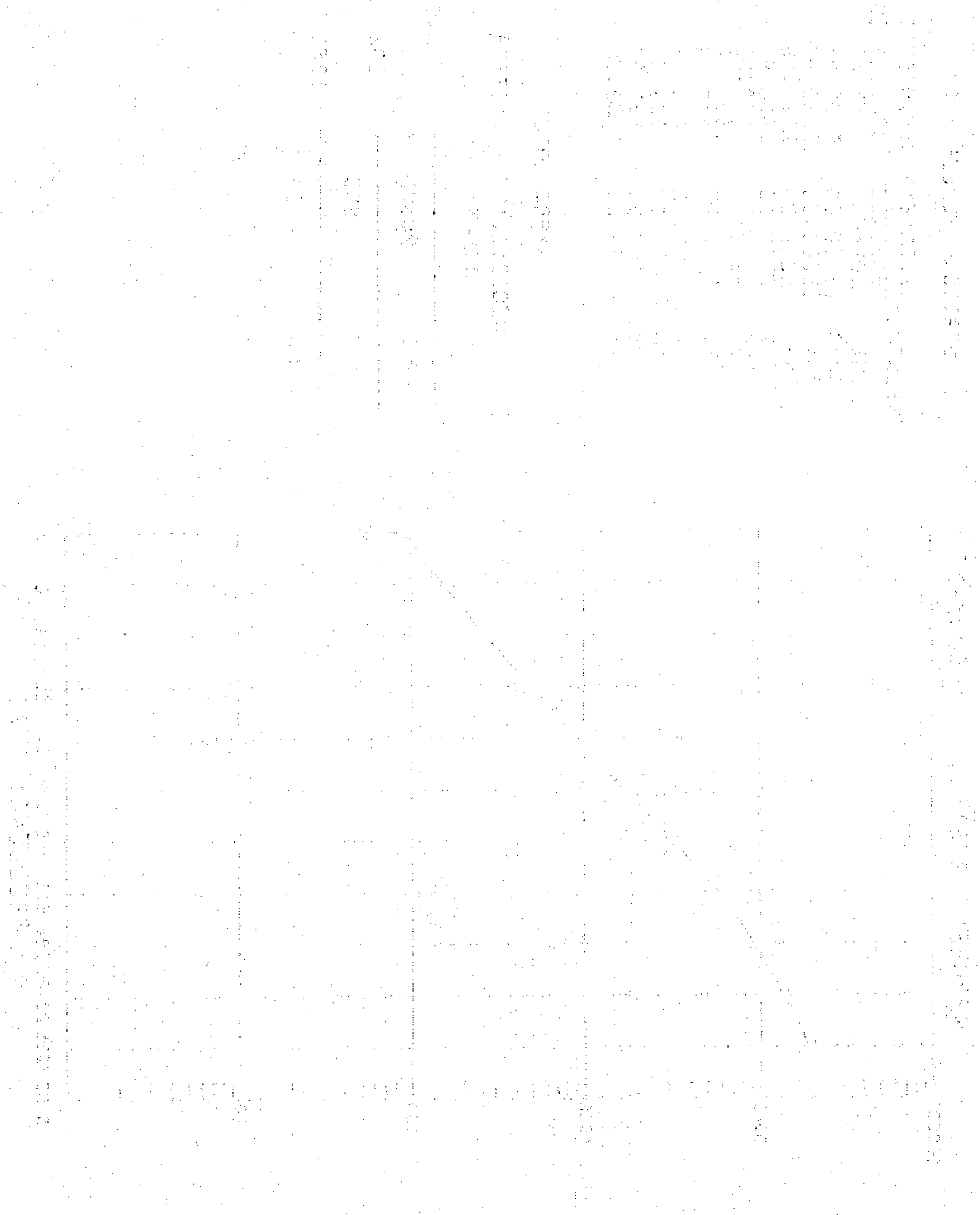
STATION NUMBER : 22

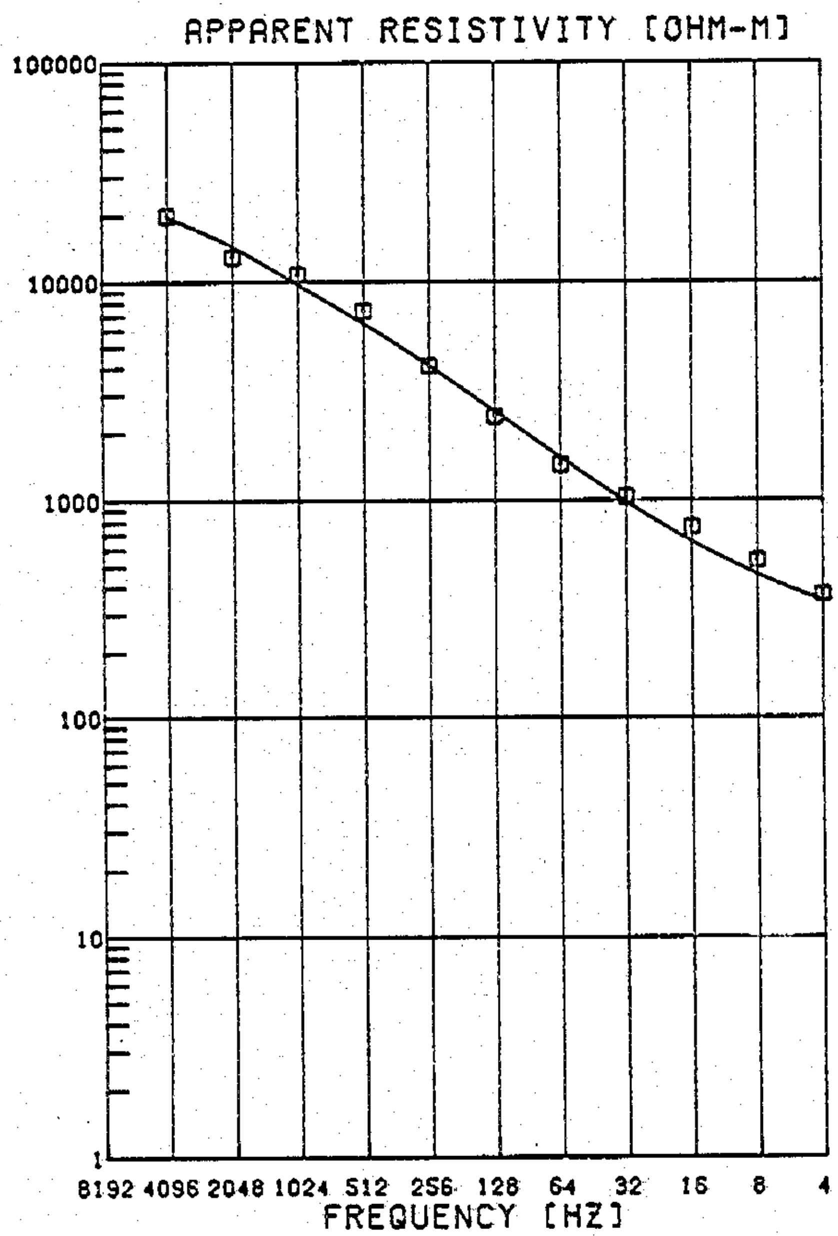
FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	19400.00	19403.21
2048	13600.00	13582.94
1024	9210.00	9241.15
512	5710.00	5688.94
256	3180.00	3166.60
128	1730.00	1691.10
64	801.00	898.48
32	427.00	483.06
16	251.00	265.71
8	140.00	151.08
4	54.00	89.79

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	20500	
		836
R 2	800	
		1250
R 3	10	

Fig. II-1-5 (19) Apparent Resistivity vs Frequency Curve





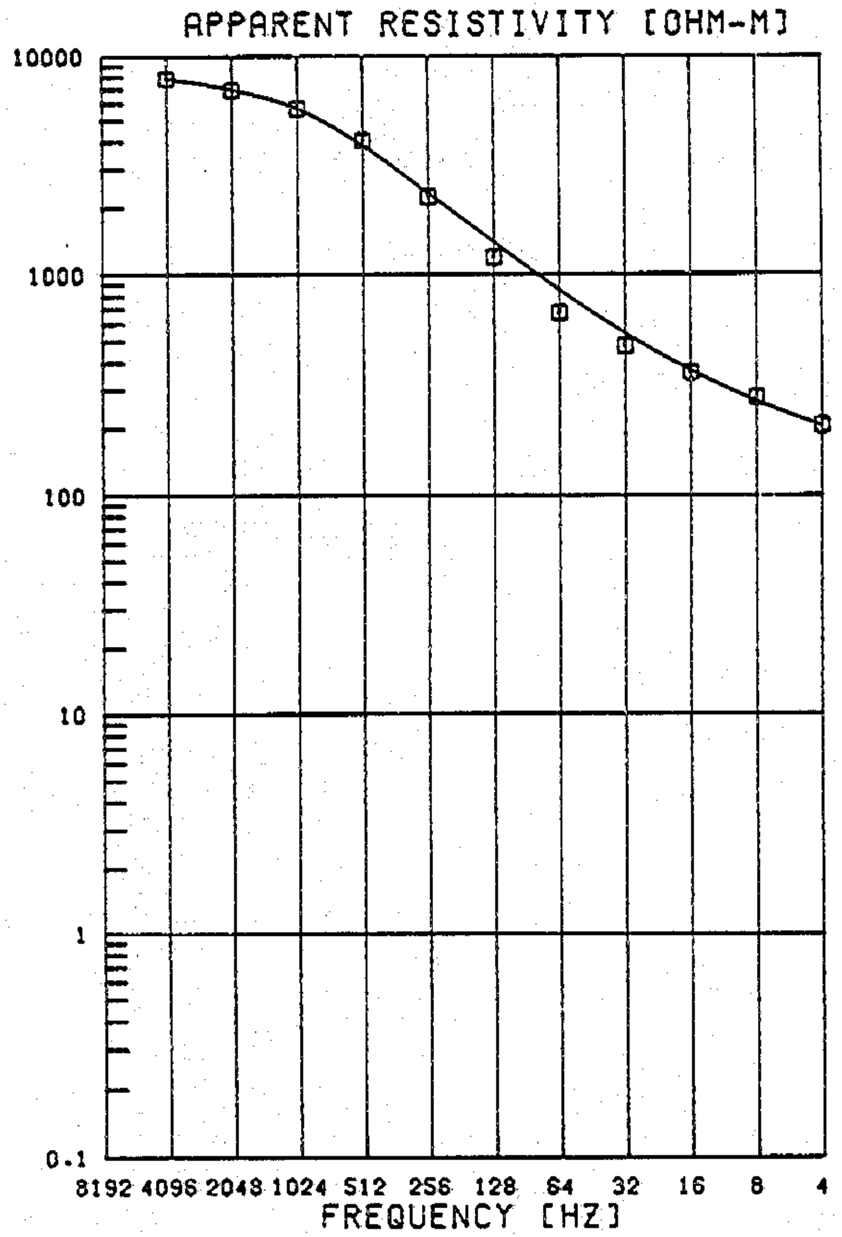
STATION NUMBER : 23

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	20000.00	19669.50
2048	13000.00	14448.89
1024	10800.00	9700.02
512	7380.00	6413.45
256	4080.00	4085.19
128	2390.00	2514.02
64	1440.00	1544.30
32	1030.00	975.71
16	754.00	647.18
8	531.00	456.14
4	369.00	343.08

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	17900	
		941
R 2	800	
		1490
R 3	150	

Fig. II-1-5 (20) Apparent Resistivity vs Frequency Curve



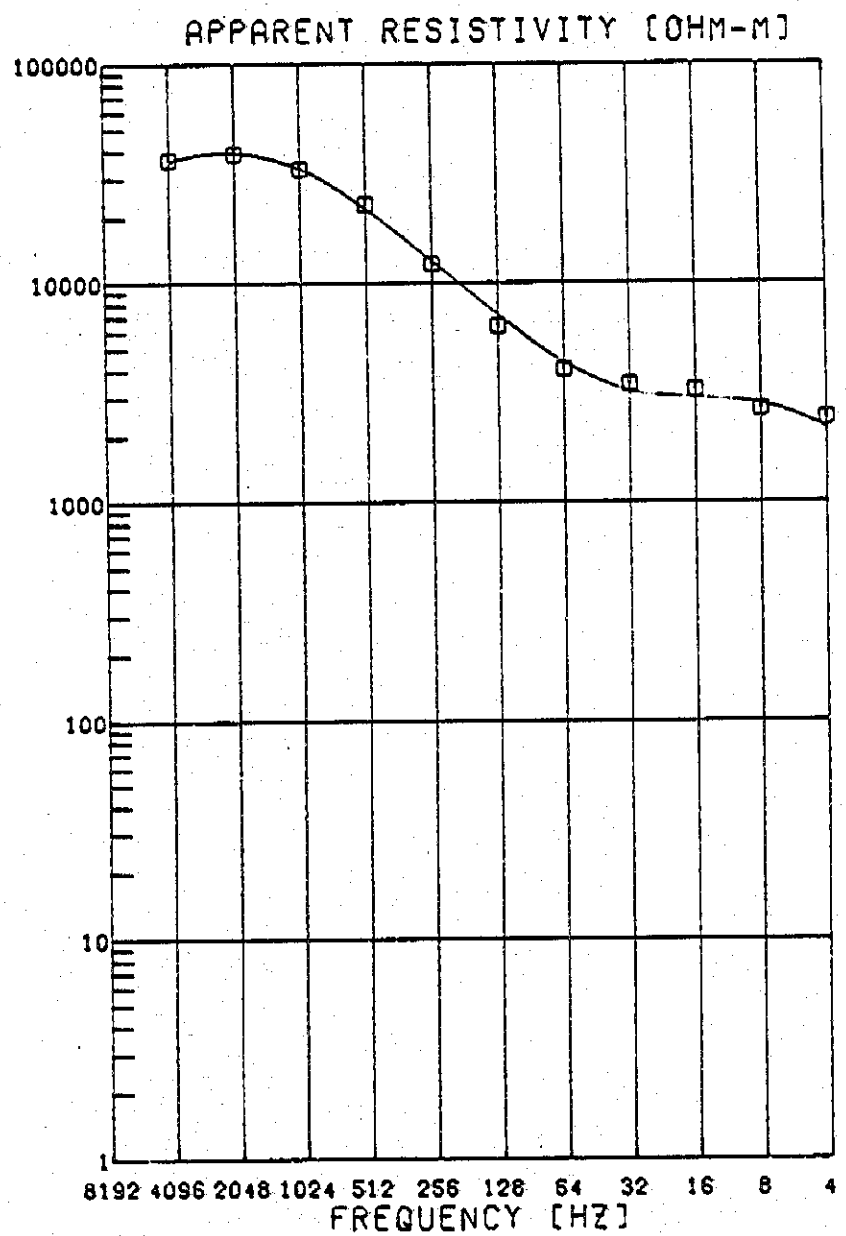
STATION NUMBER : 24

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	7840.00	7816.16
2048	6920.00	6957.28
1024	5670.00	5666.47
512	4040.00	3833.59
256	2240.00	2334.41
128	1190.00	1391.00
64	669.00	847.76
32	474.00	540.98
16	360.00	366.46
8	277.00	265.27
4	206.00	205.14

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	14600	
		293
R 2	2970	
		986
R 3	100	

Fig. II-1-5 (21) Apparent Resistivity vs Frequency Curve



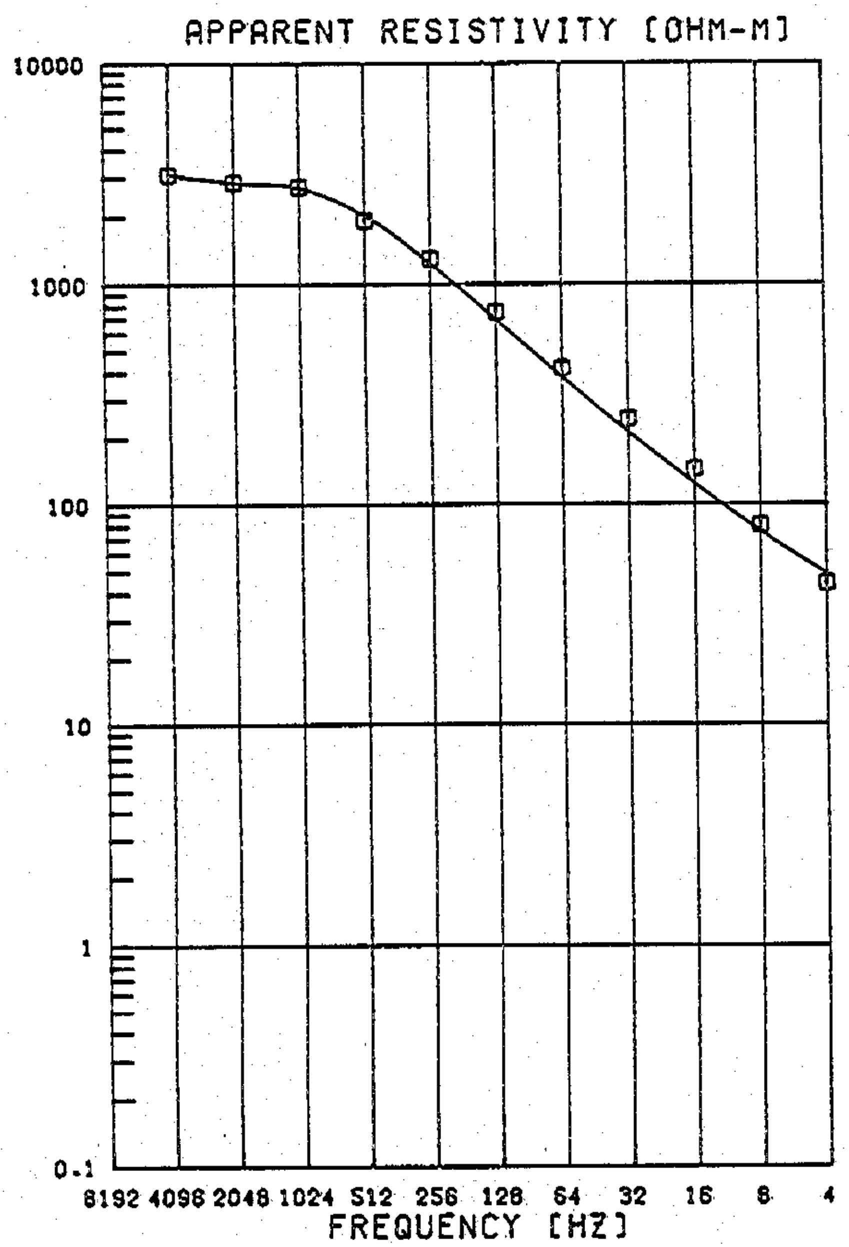
STATION NUMBER : 25

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	CALCULATED (OHM-M)
4096	36500.00	36014.77
2048	38900.00	39470.50
1024	33200.00	33384.68
512	22900.00	21883.94
256	12200.00	12611.50
128	6360.00	7148.11
64	4030.00	4343.03
32	3440.00	3200.21
16	3240.00	2987.77
8	2650.00	2802.74
4	2420.00	2164.36

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	32000	
		2300
R 2	476	
		3040
R 3	3000	
		8670
R 4	100	

Fig. II-1-5 (22) Apparent Resistivity vs Frequency Curve



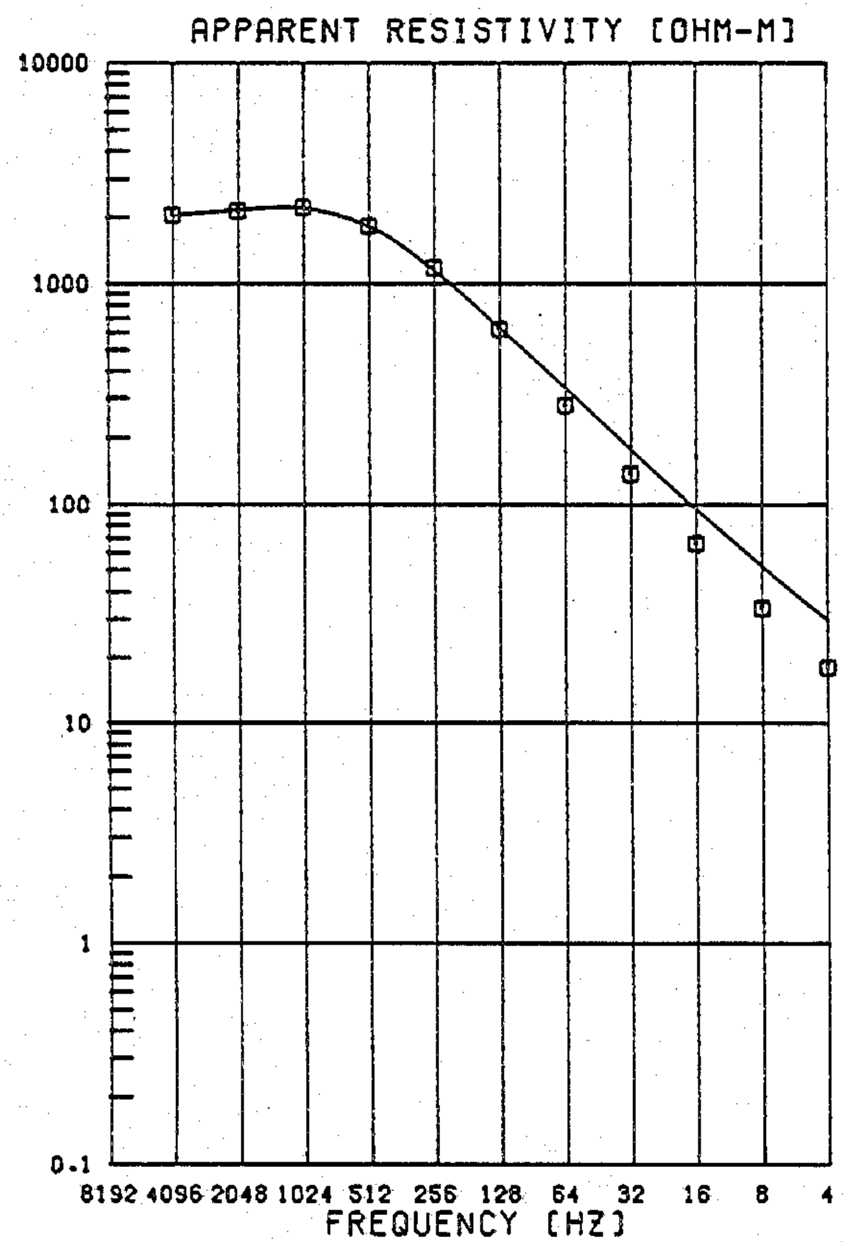
STATION NUMBER : 26

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	3090.00	3094.31
2048	2840.00	2830.99
1024	2710.00	2682.37
512	1920.00	2027.20
256	1300.00	1236.65
128	749.00	691.45
64	418.00	381.08
32	246.00	213.52
16	144.00	123.70
8	80.00	75.08
4	44.00	48.30

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	18100	
		132
R 2	1460	
		779
R 3	10	

Fig. II-1-5 (23) Apparent Resistivity vs Frequency Curve



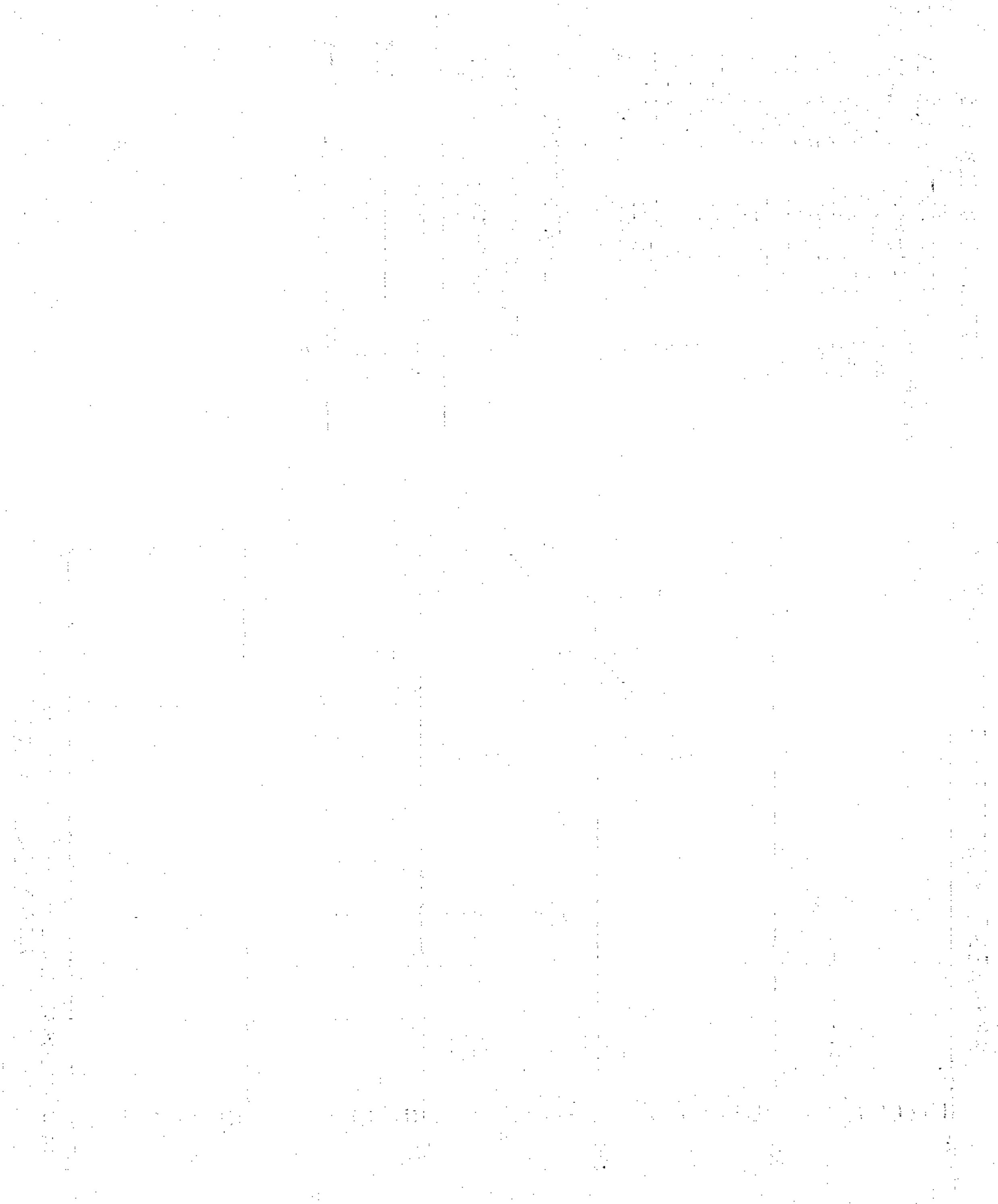
STATION NUMBER : 27

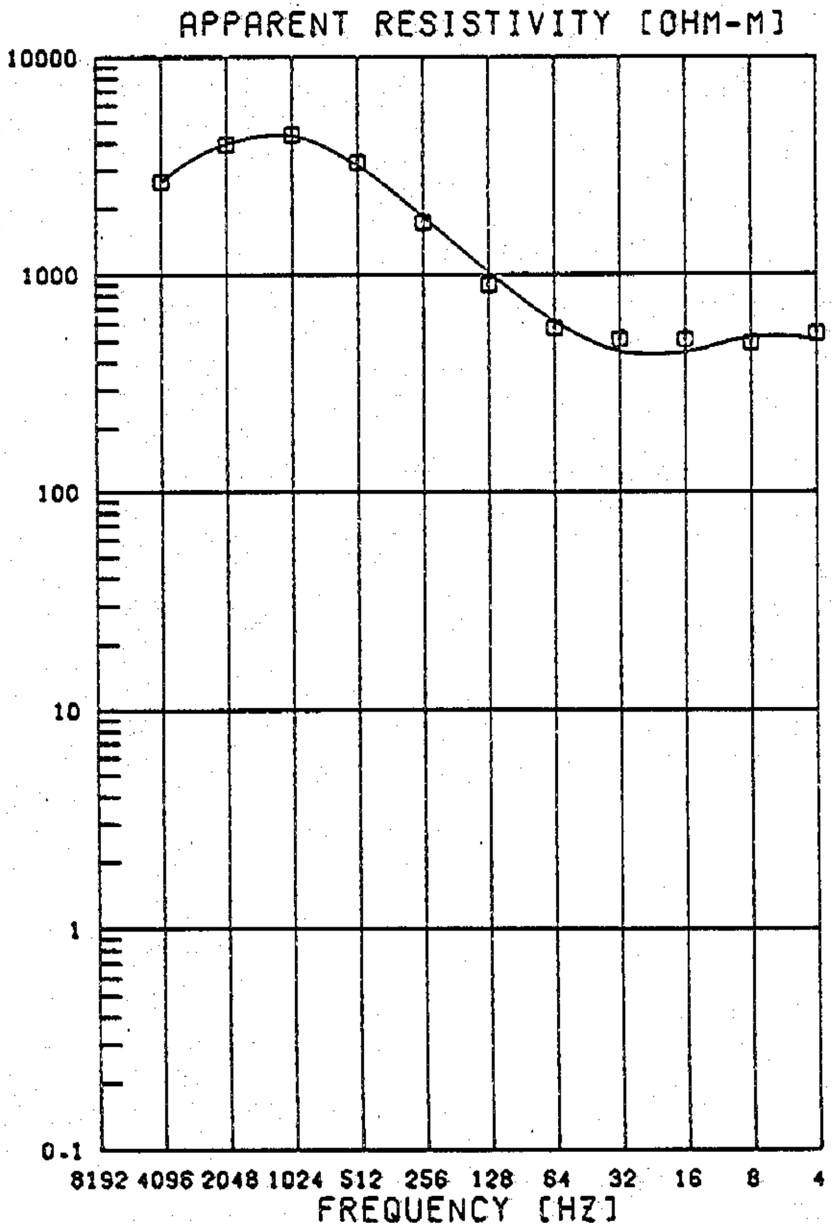
FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	2040.00	2023.20
2048	2130.00	2154.20
1024	2210.00	2203.01
512	1810.00	1808.90
256	1170.00	1138.82
128	619.00	627.65
64	277.00	332.82
32	137.00	176.22
16	65.80	94.61
8	33.60	52.03
4	17.90	29.61

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	1910	
		558
R 2	350	
		777
R 3	2.0	

Fig. II-1-5 (24) Apparent Resistivity vs Frequency Curve





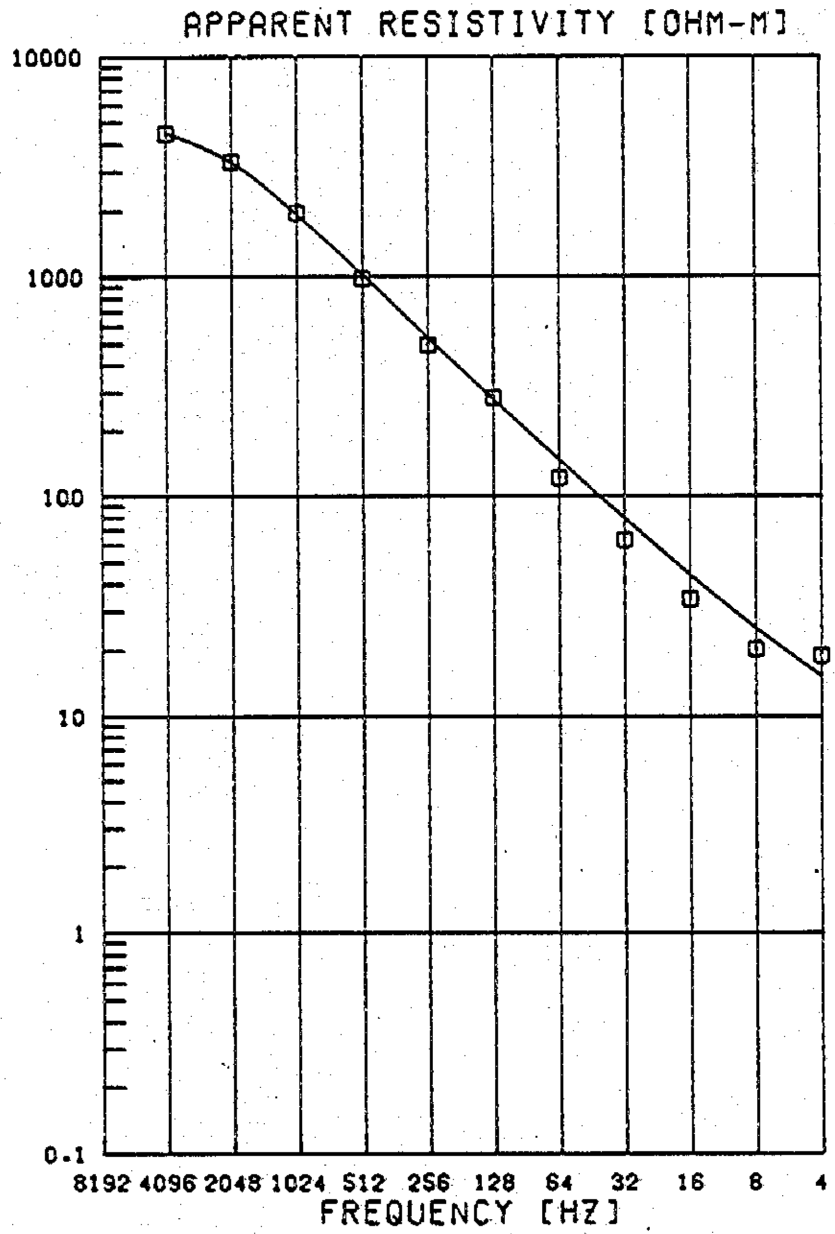
STATION NUMBER : 28

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	2660.00	2645.08
2048	3930.00	3970.45
1024	4370.00	4346.64
512	3270.00	3161.06
256	1720.00	1833.86
128	893.00	1022.29
64	570.00	614.30
32	508.00	447.34
16	506.00	444.94
8	488.00	518.29
4	539.00	504.84

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	1380	
		127
R 2	10800	
		556
R 3	20	
		1030
R 4	800	
		4930
R 5	10	

Fig. II-1-5 (25) Apparent Resistivity vs Frequency Curve



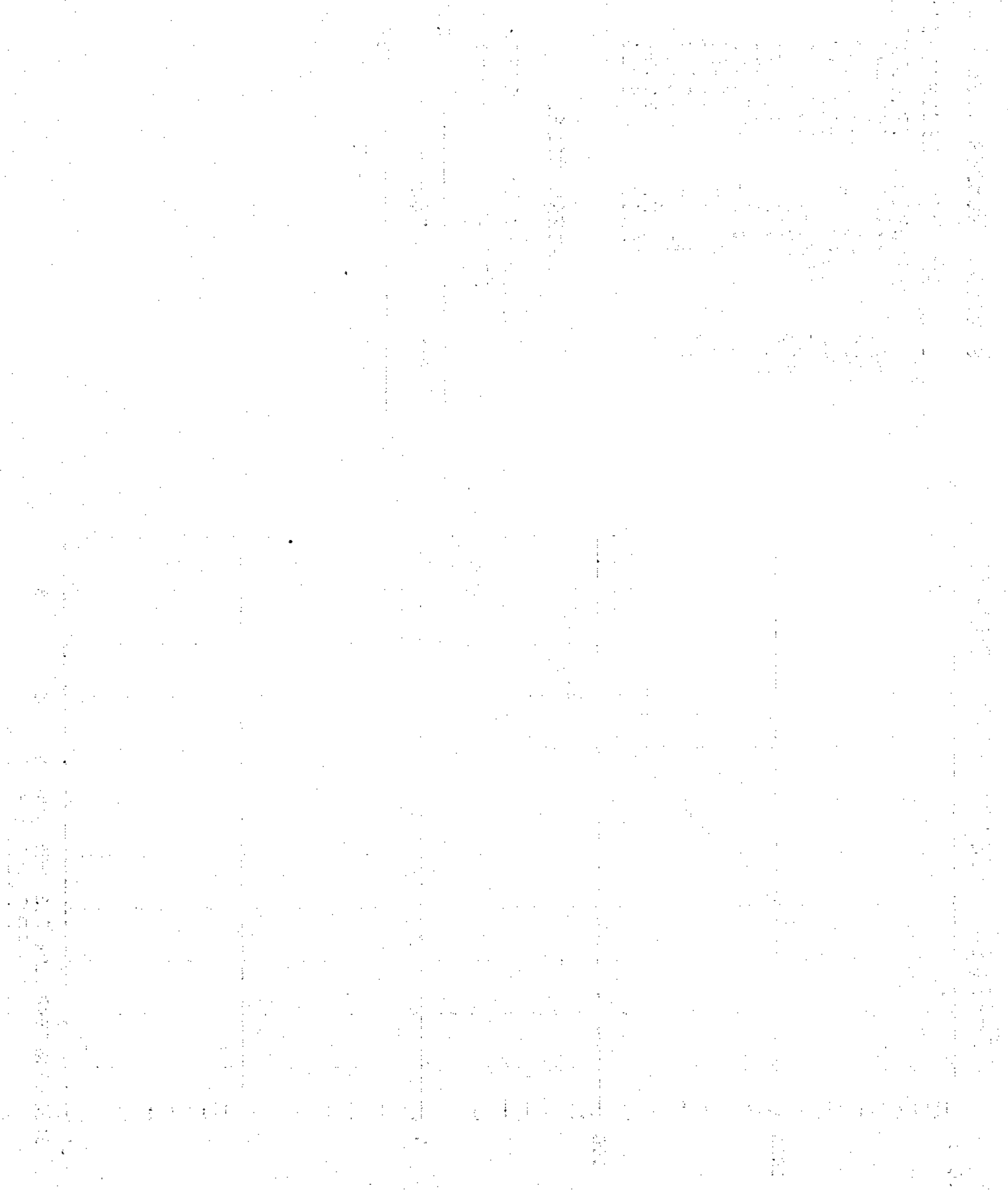
STATION NUMBER : 30

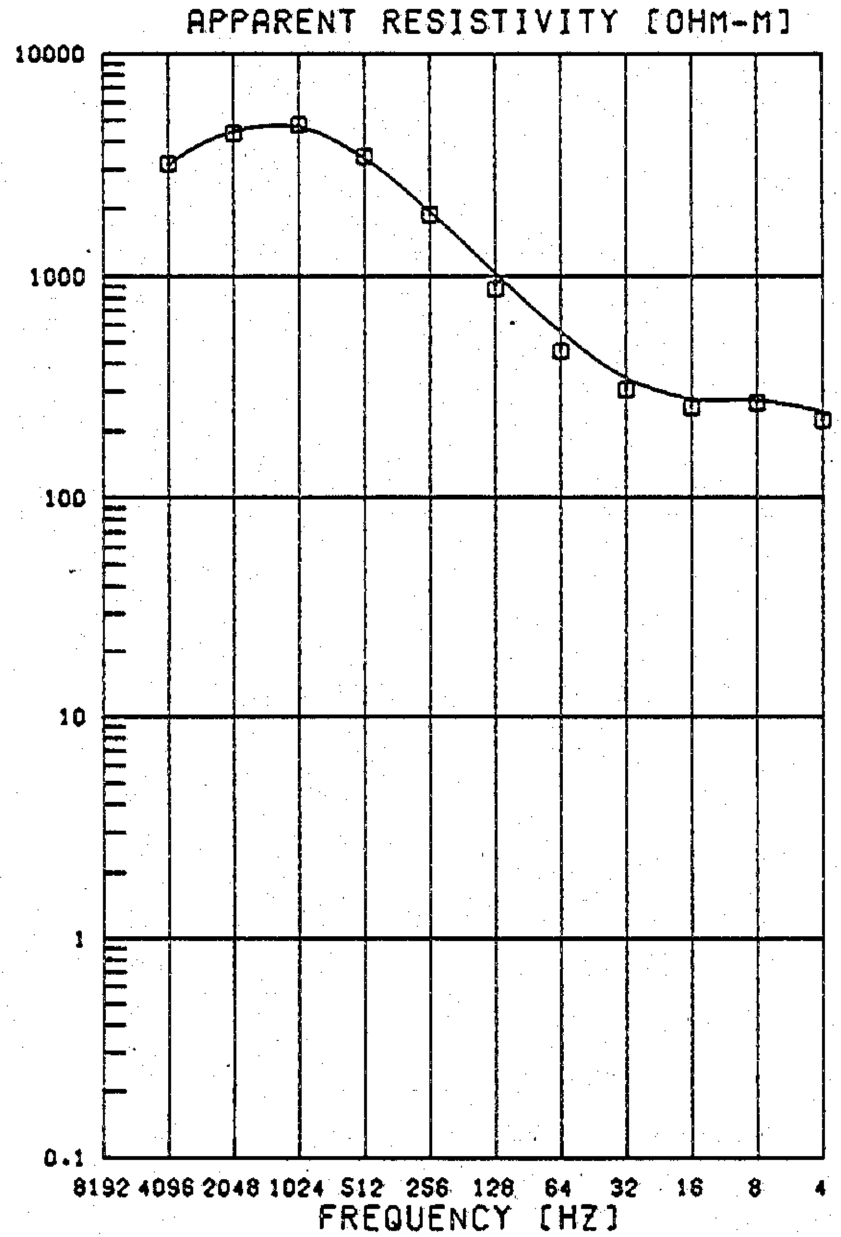
FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	4460.00	4464.58
2048	3330.00	3318.86
1024	1960.00	1930.42
512	977.00	1025.65
256	494.00	533.58
128	283.00	278.28
64	121.00	146.95
32	63.00	79.16
16	34.10	43.86
8	20.20	25.24
4	18.90	15.25

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	3520	
		494
R 2	2.0	

Fig. II-I-5 (26) Apparent Resistivity vs Frequency Curve





STATION NUMBER : 31

FREQUENCY (HZ)	APPARENT RESISTIVITY MEASURED (OHM-M)	APPARENT RESISTIVITY CALCULATED (OHM-M)
4096	3170.00	3141.21
2048	4360.00	4444.43
1024	4750.00	4662.85
512	3430.00	3367.25
256	1880.00	1938.69
128	876.00	1032.07
64	454.00	557.80
32	304.00	343.73
16	254.00	278.19
8	266.00	273.91
4	223.00	243.35

LAYERD MODEL

	RESISTIVITY (OHM-M)	DEPTH (M)
		0.0
R 1	1640	
		115
R 2	7500	
		961
R 3	20	
		1120
R 4	800	
		3230
R 5	10	

Fig. II-1-5 (27) Apparent Resistivity vs Frequency Curve

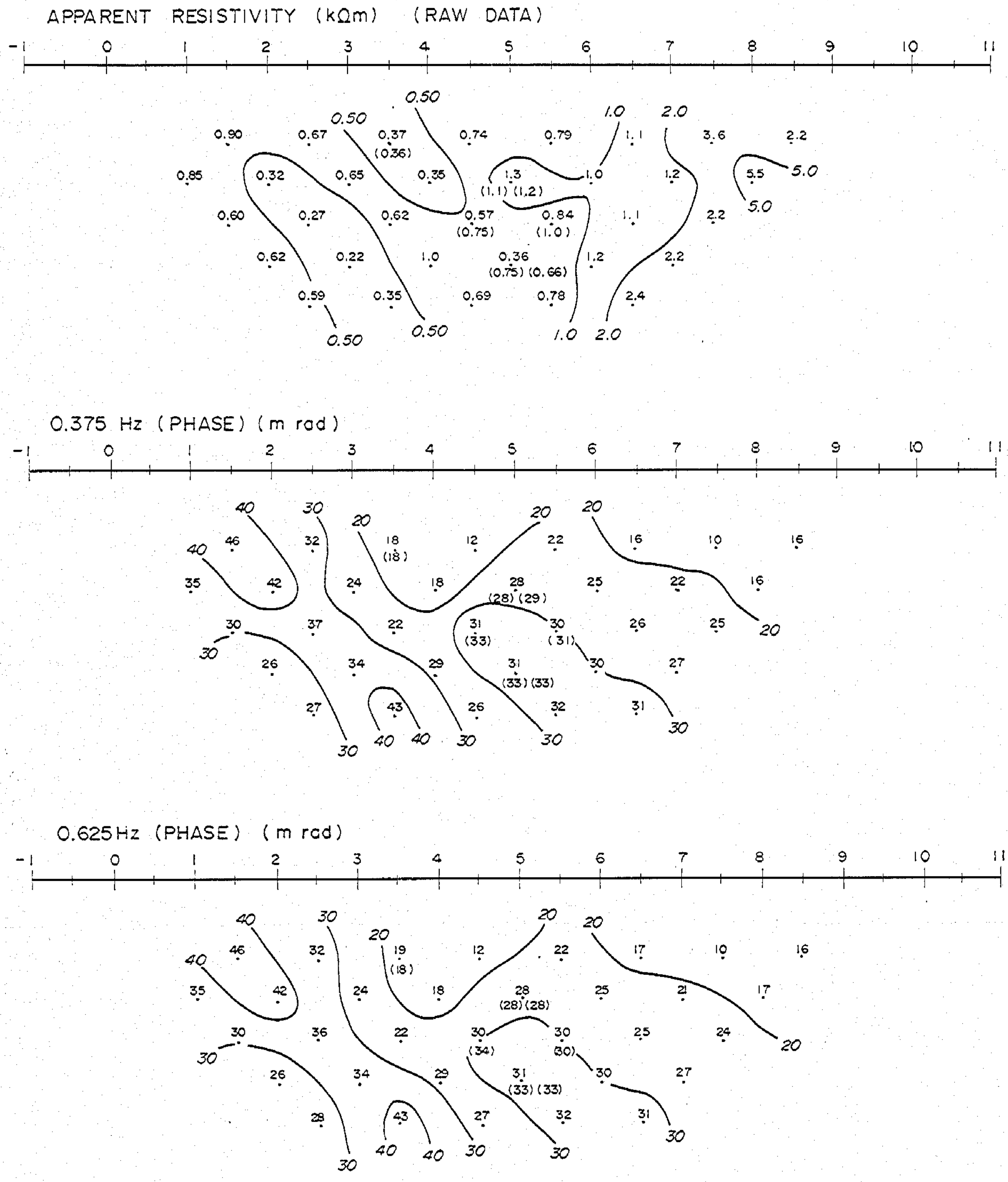


Fig. II-2-1 (1) Apparent Resistivity and IP Effect Pseudo Section (Line A)

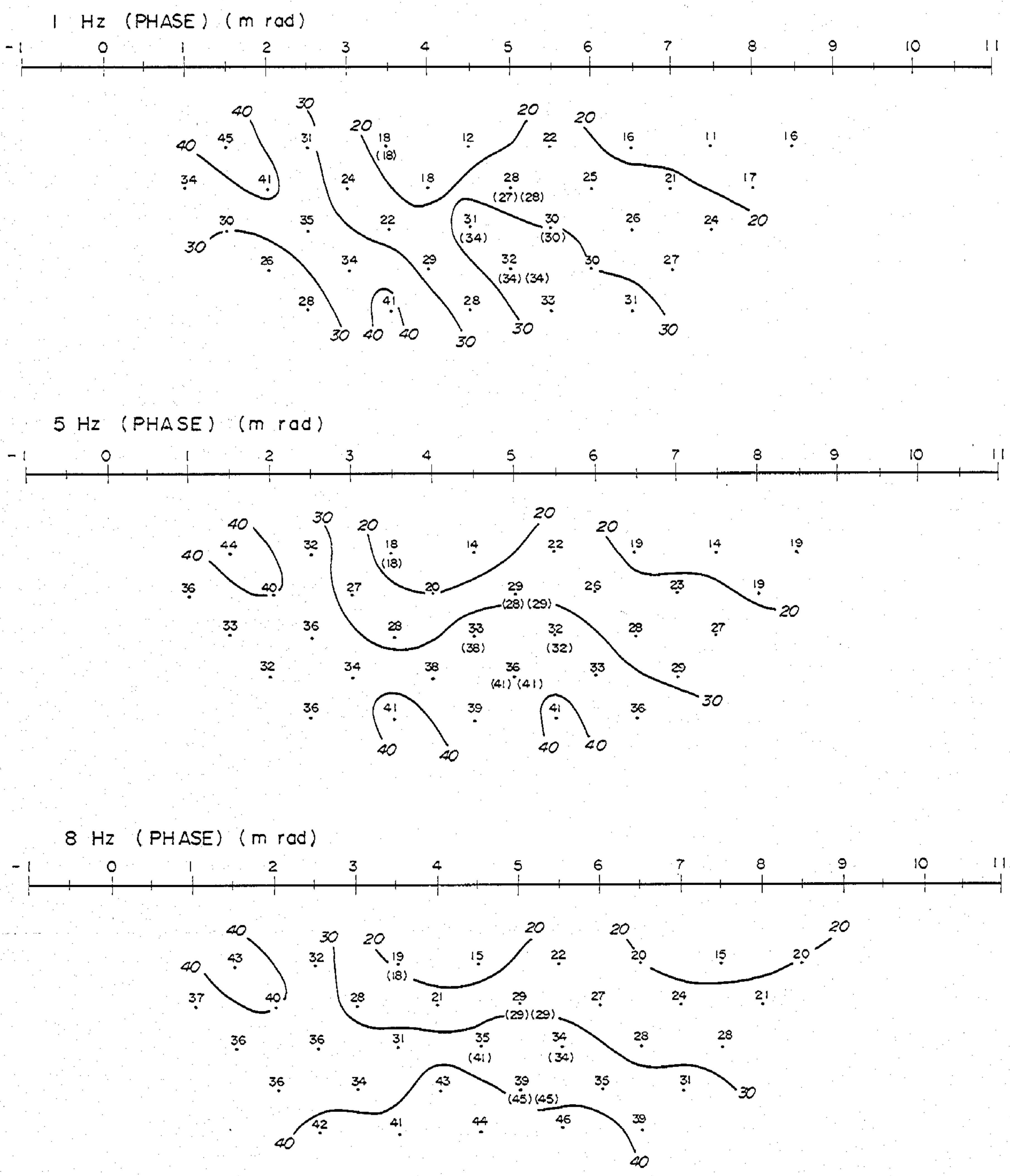


Fig. II-2-1 (2) Apparent Resistivity and IP Effect Pseudo Section (Line A)

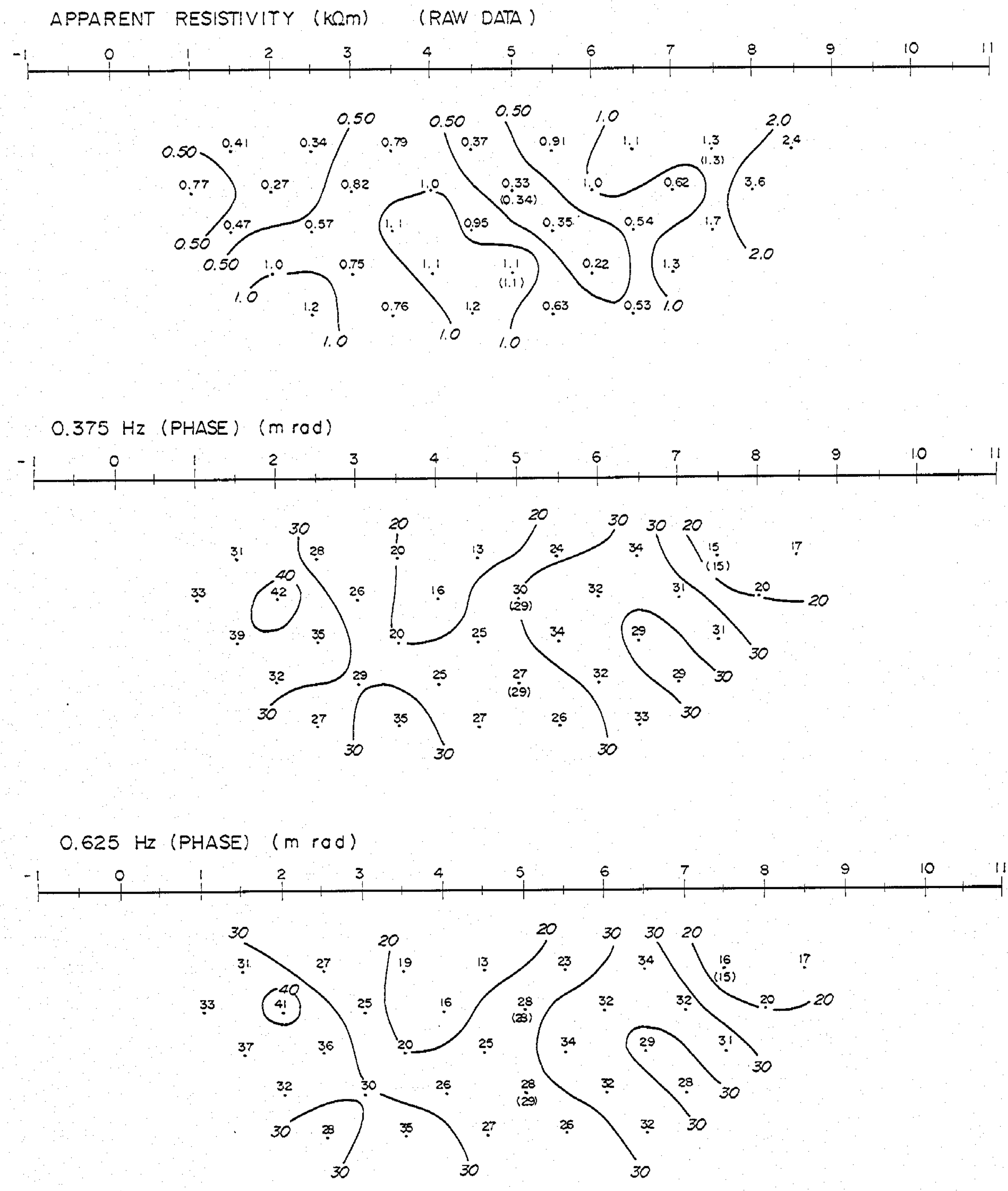


Fig. II-2-2 (1) Apparent Resistivity and IP Effect Pseudo Section (Line B)

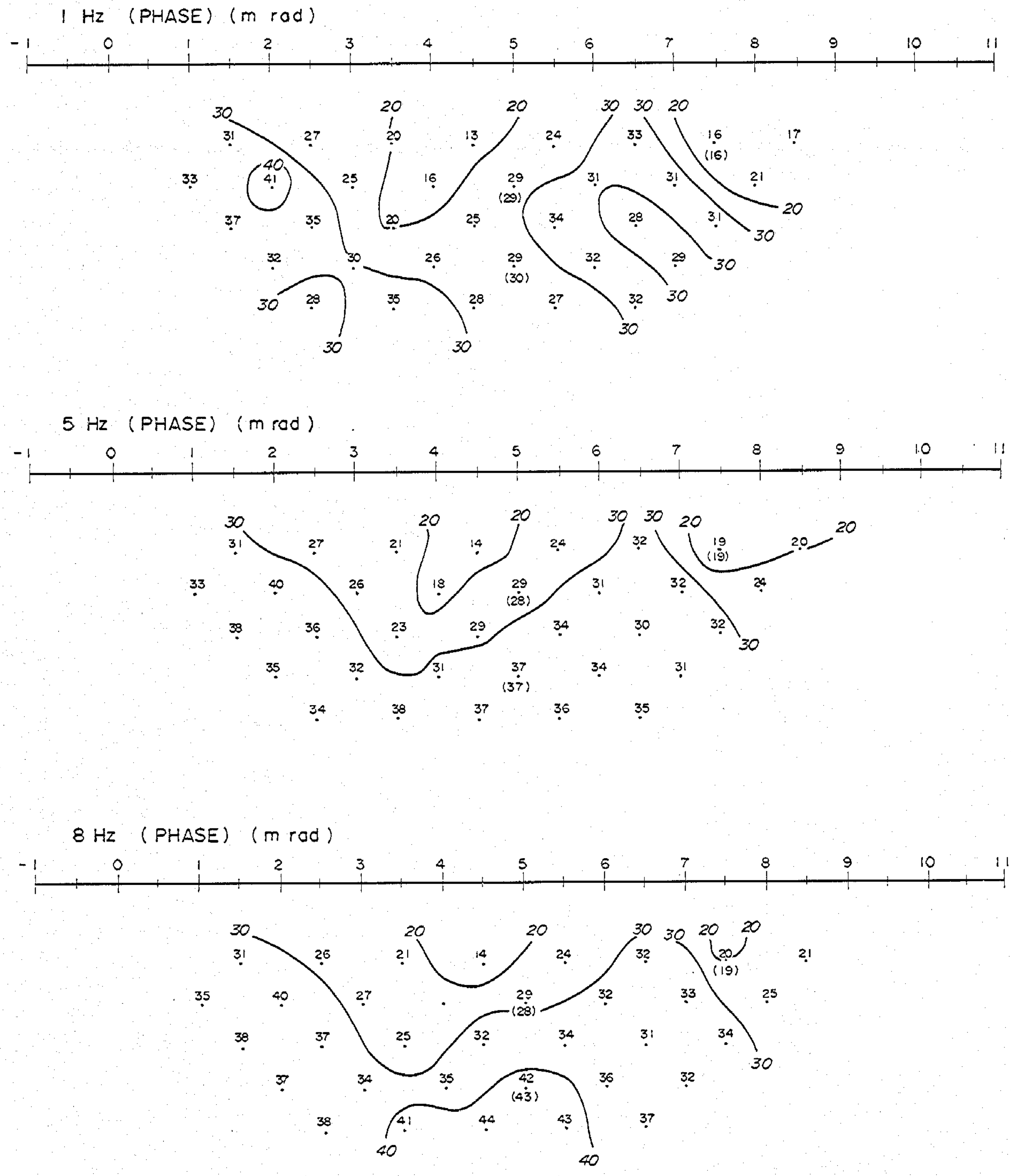


Fig.Ⅱ-2-2 (2) Apparent Resistivity and IP Effect Pseudo Section (Line B)

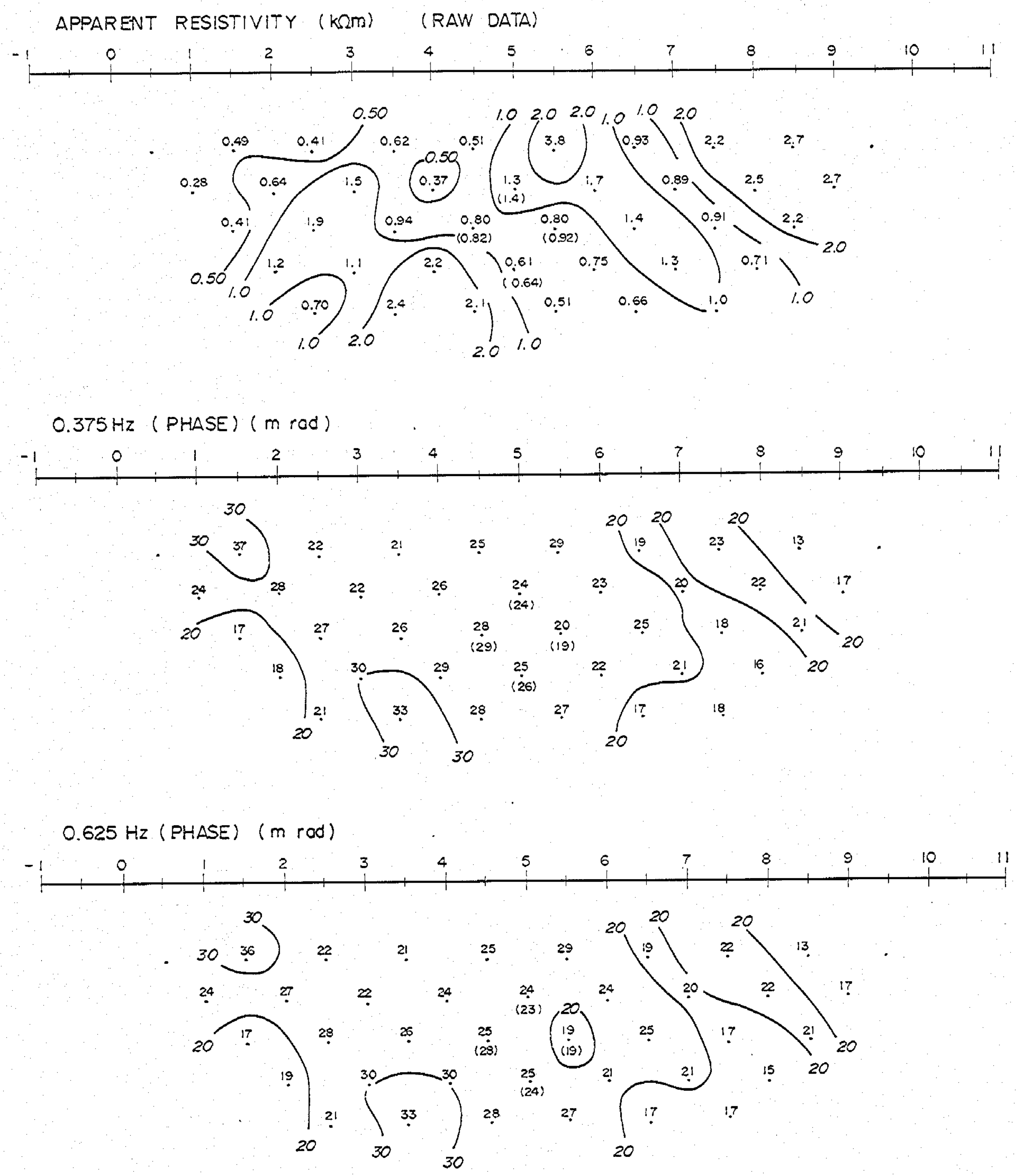


Fig. II-2-3 (1) Apparent Resistivity and IP Effect Pseudo Section
(Line C)

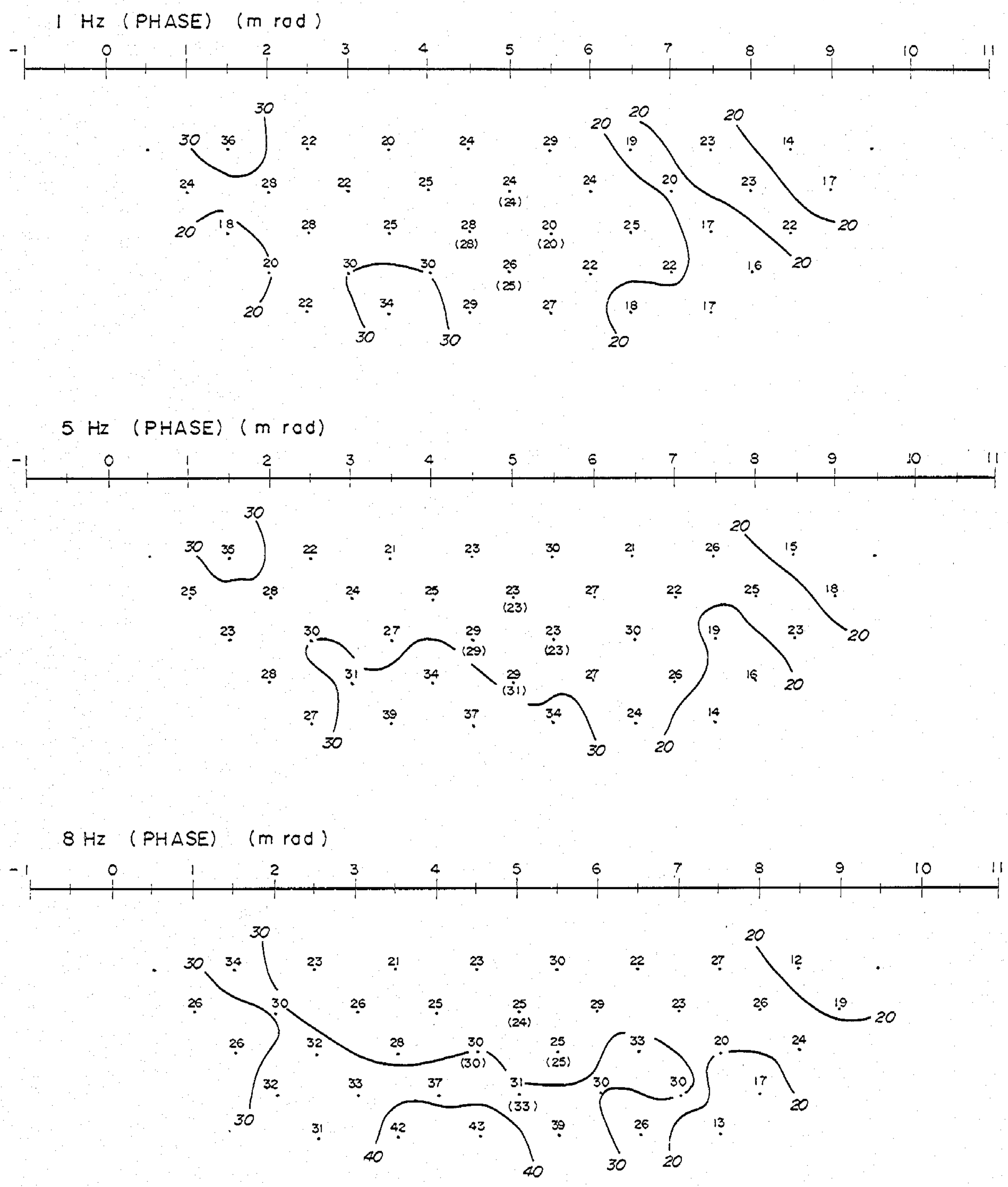


Fig.II-2-3 (2) Apparent Resistivity and IP Effect Pseudo Section
(Line C)

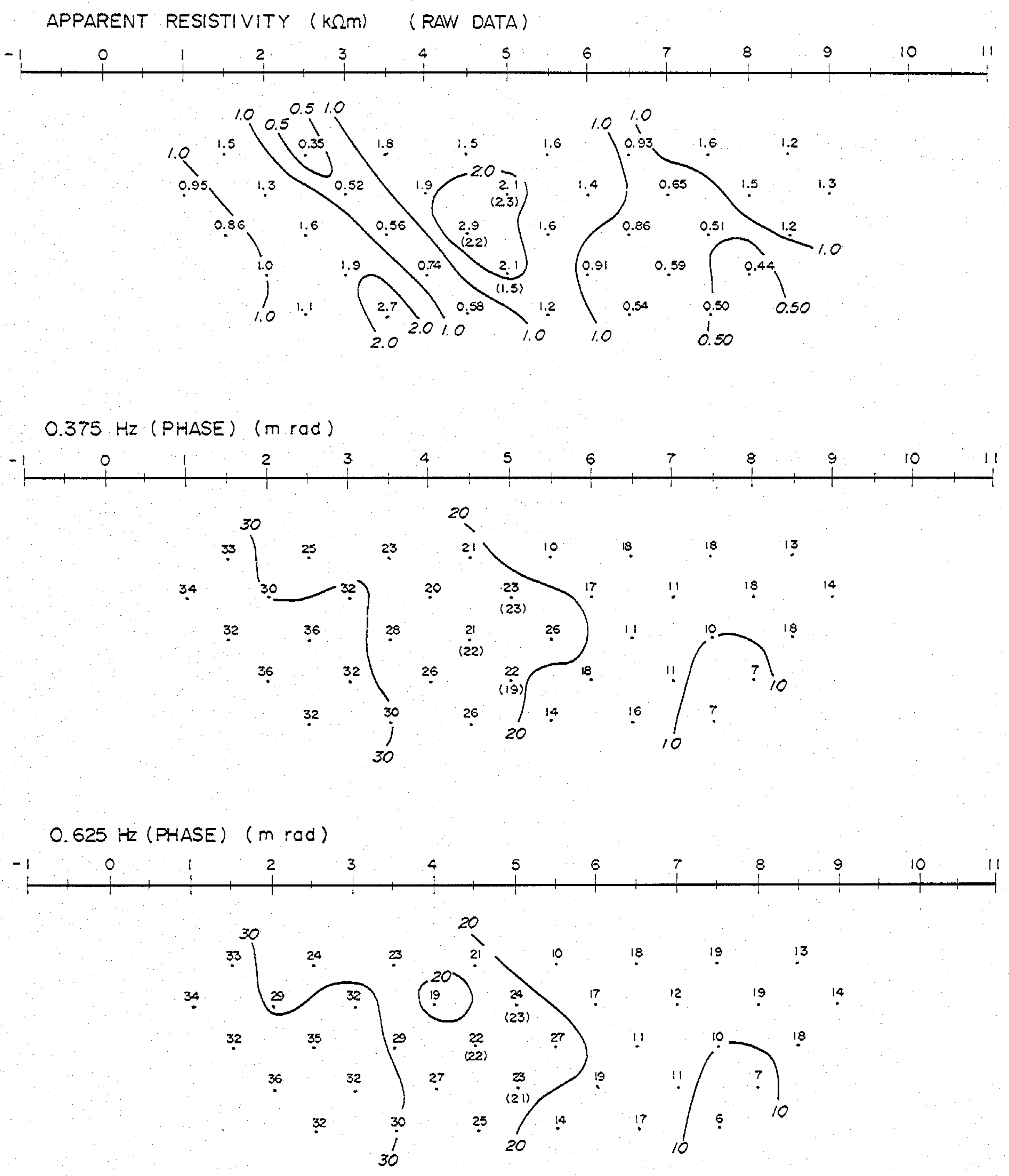


Fig. II-2-4 (1) Apparent Resistivity and IP Effect Pseudo Section (Line D)

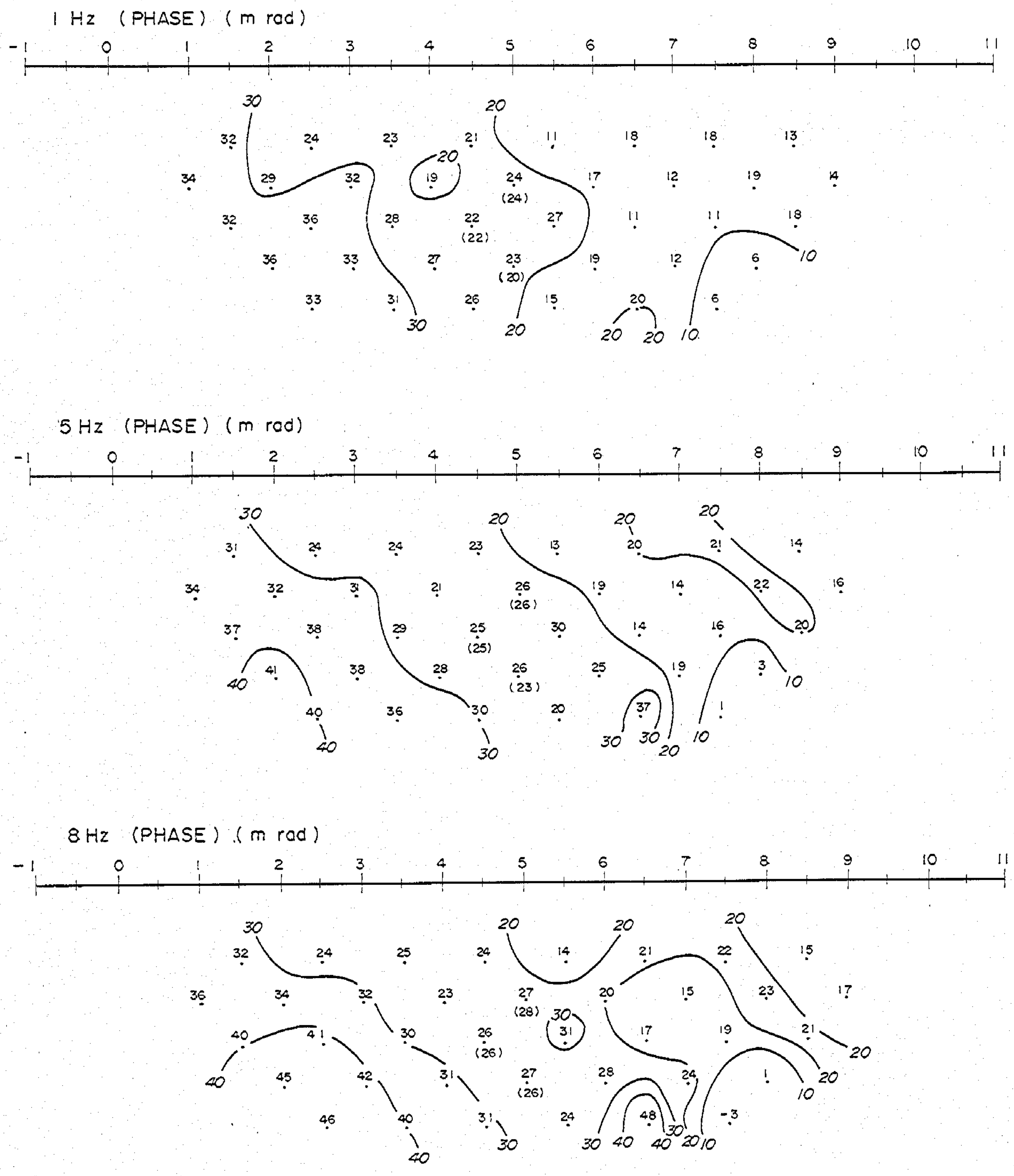
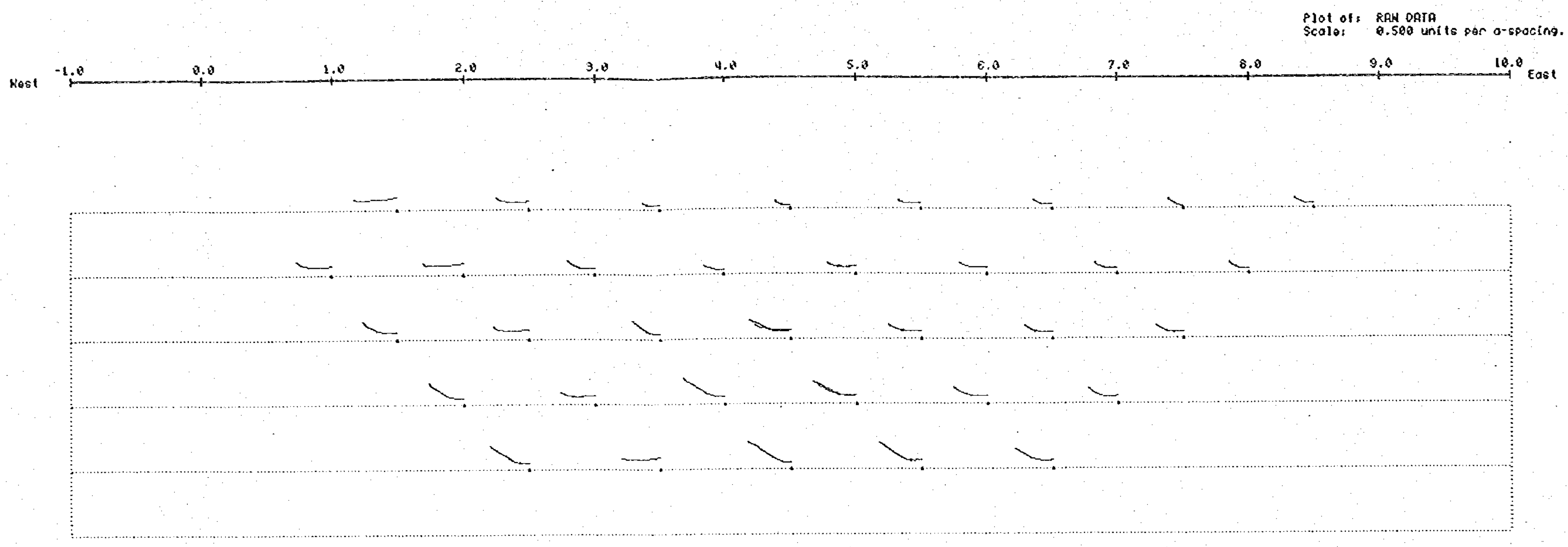


Fig.II-2-4(2) Apparent Resistivity and IP Effect Pseudo Section
(Line D)



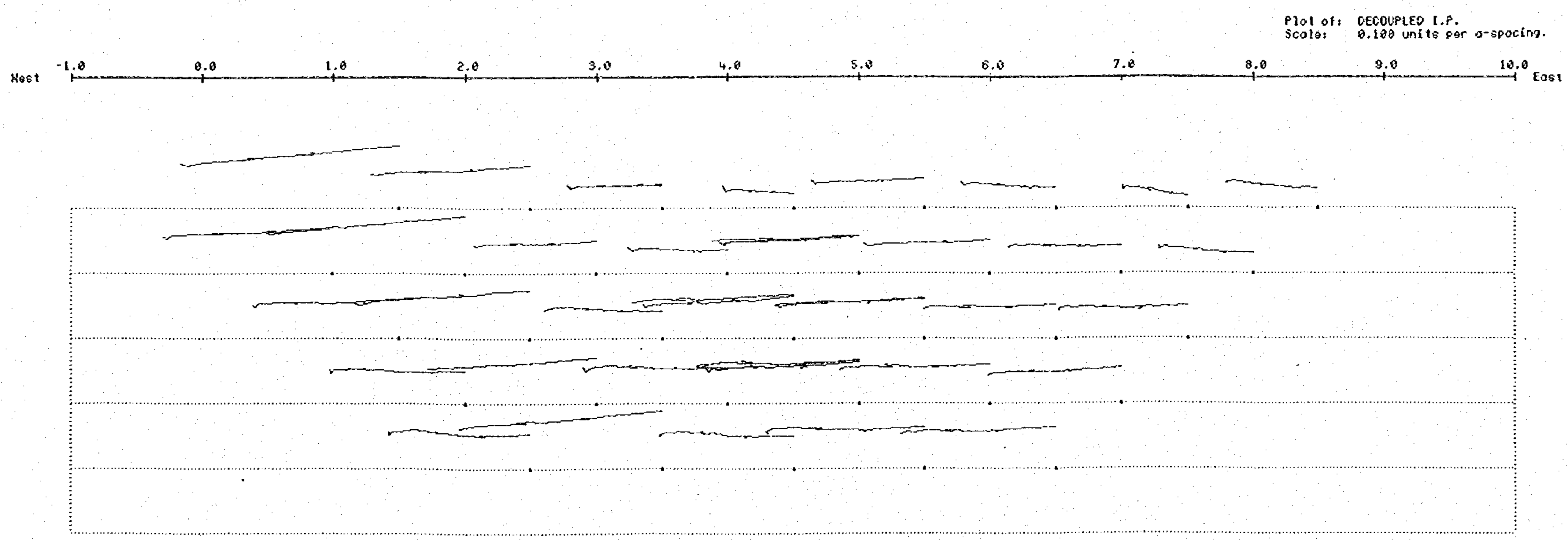
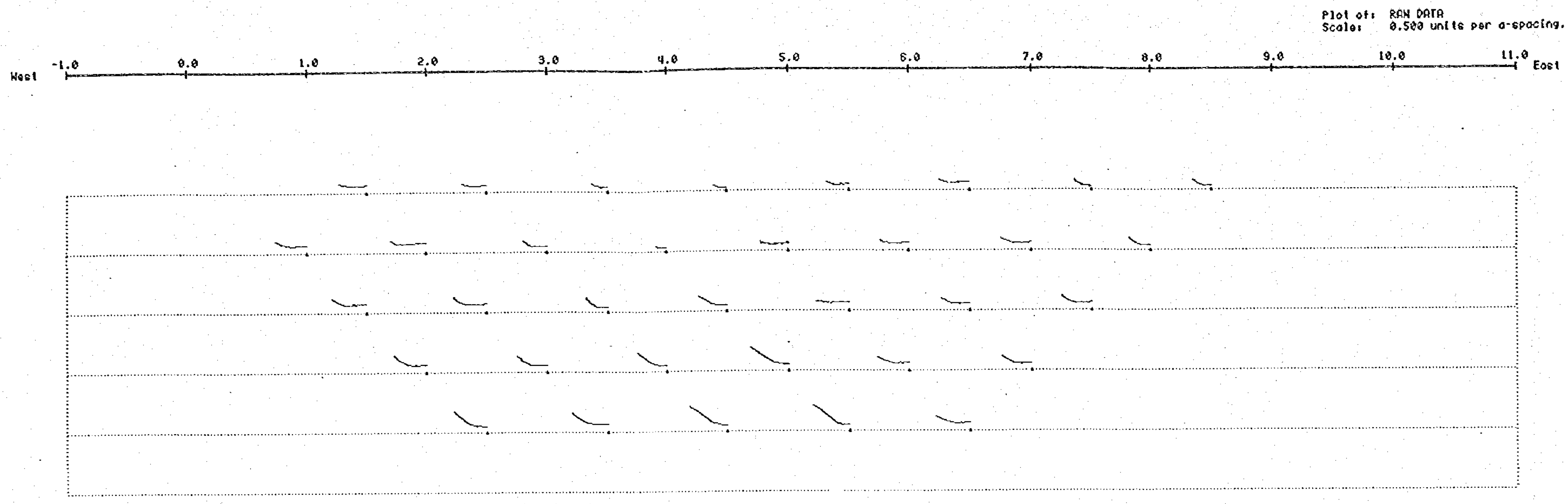


Fig. II-2-5 Spectral Pseudo Section (Line A)
(Cole-Cole Diagram)



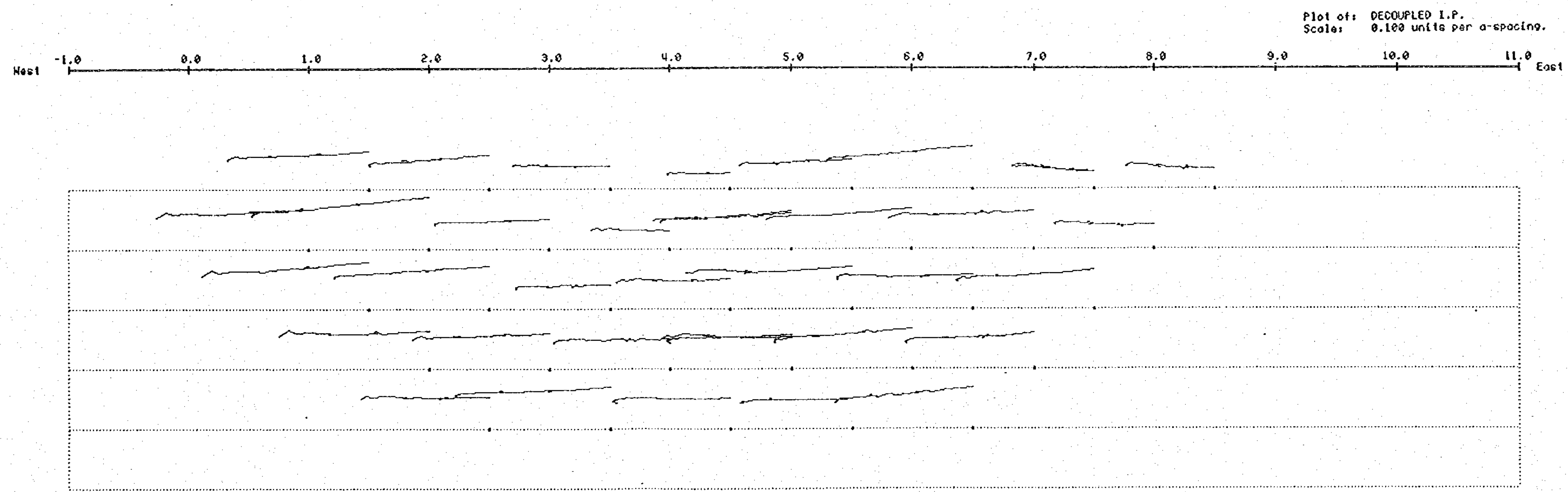


Fig. Ⅱ-2-6 Spectral Pseudo Section (Line B)
(Cole-Cole Diagram)

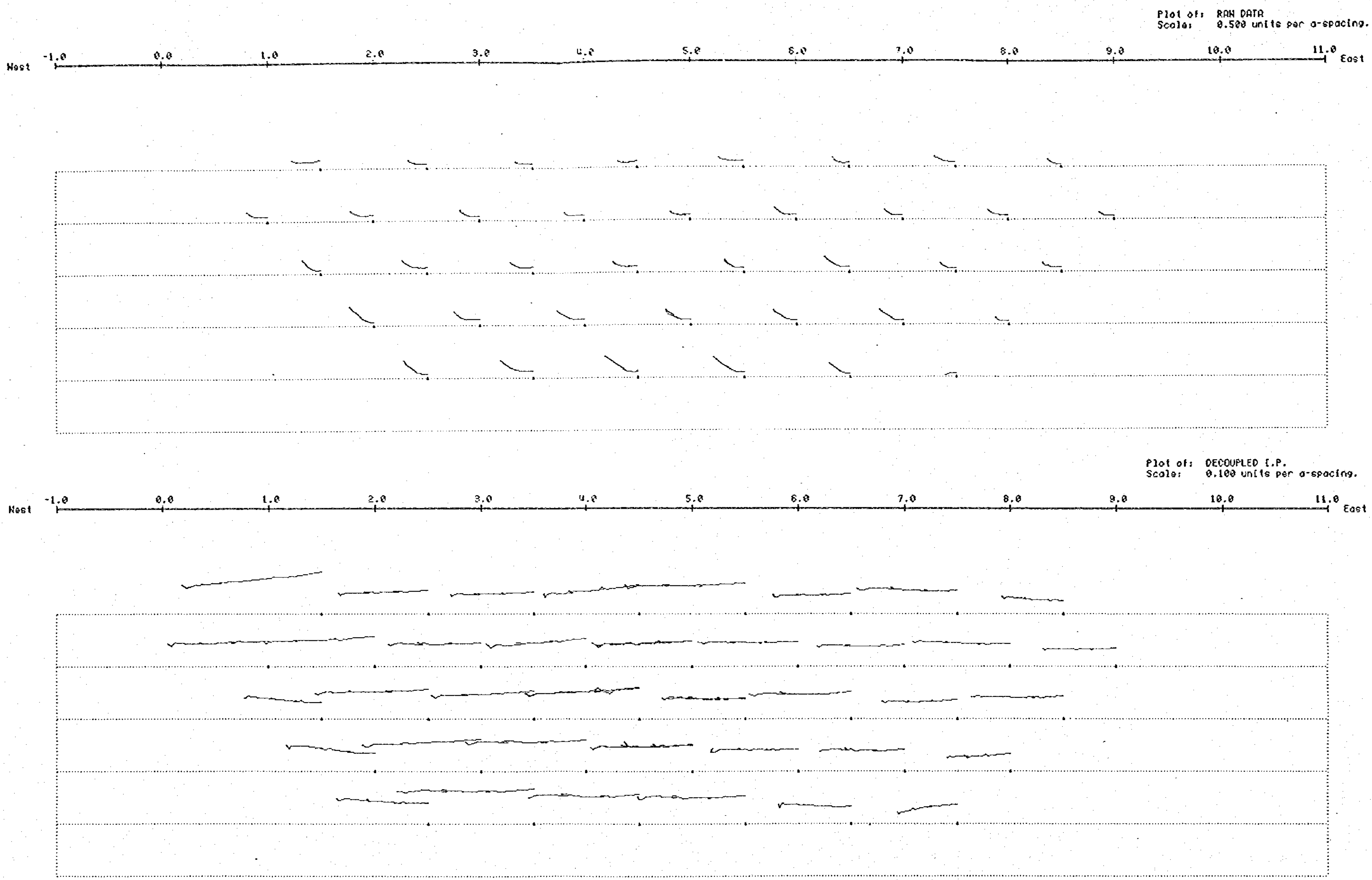


Fig. Ⅱ-2-7 Spectral Pseudo Section (Line C)

(Cole-Cole Diagram)

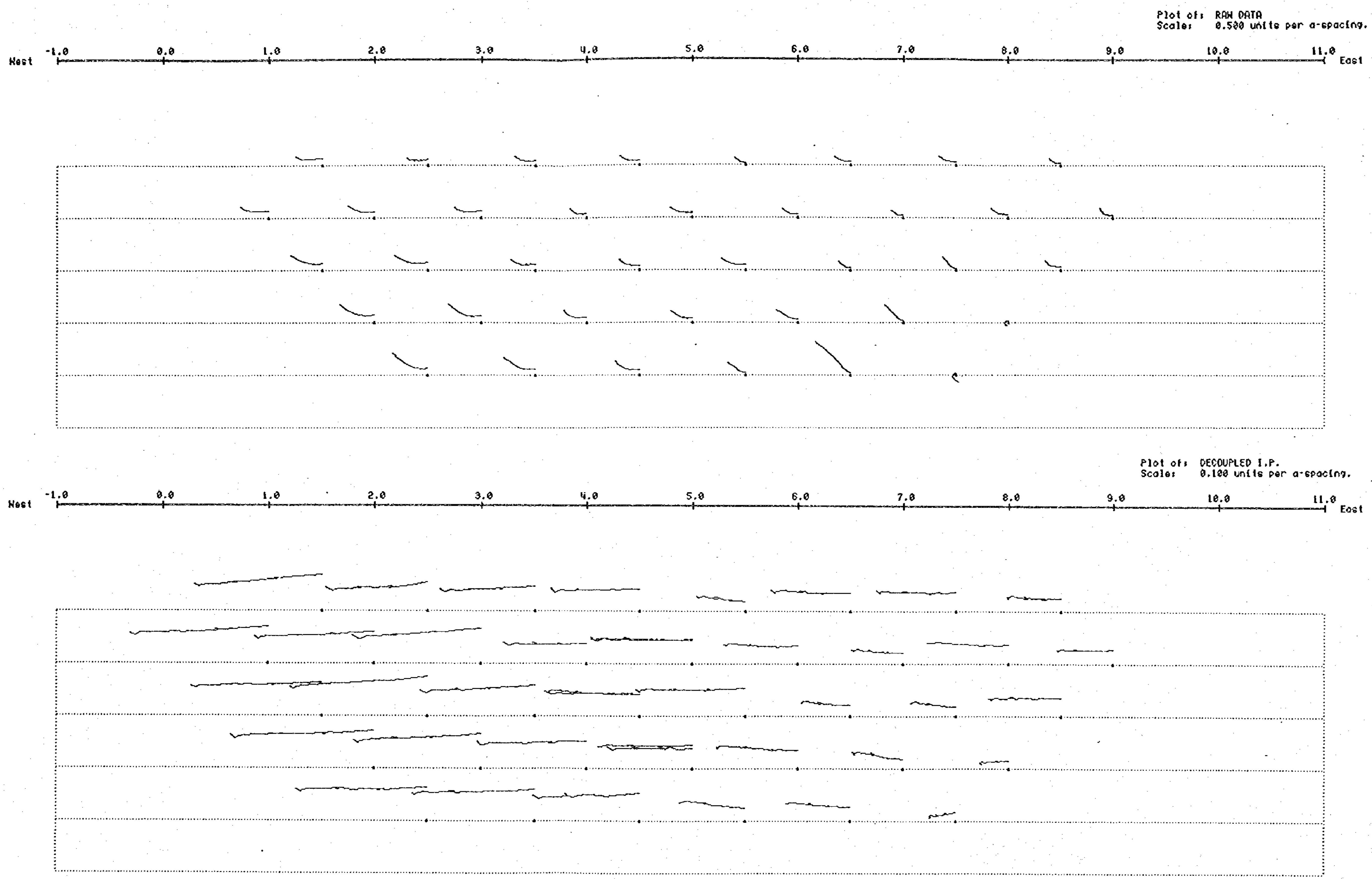


Fig. Ⅱ-2-8 Spectral Pseudo Section (Line D)

(Cole-Cole Diagram)

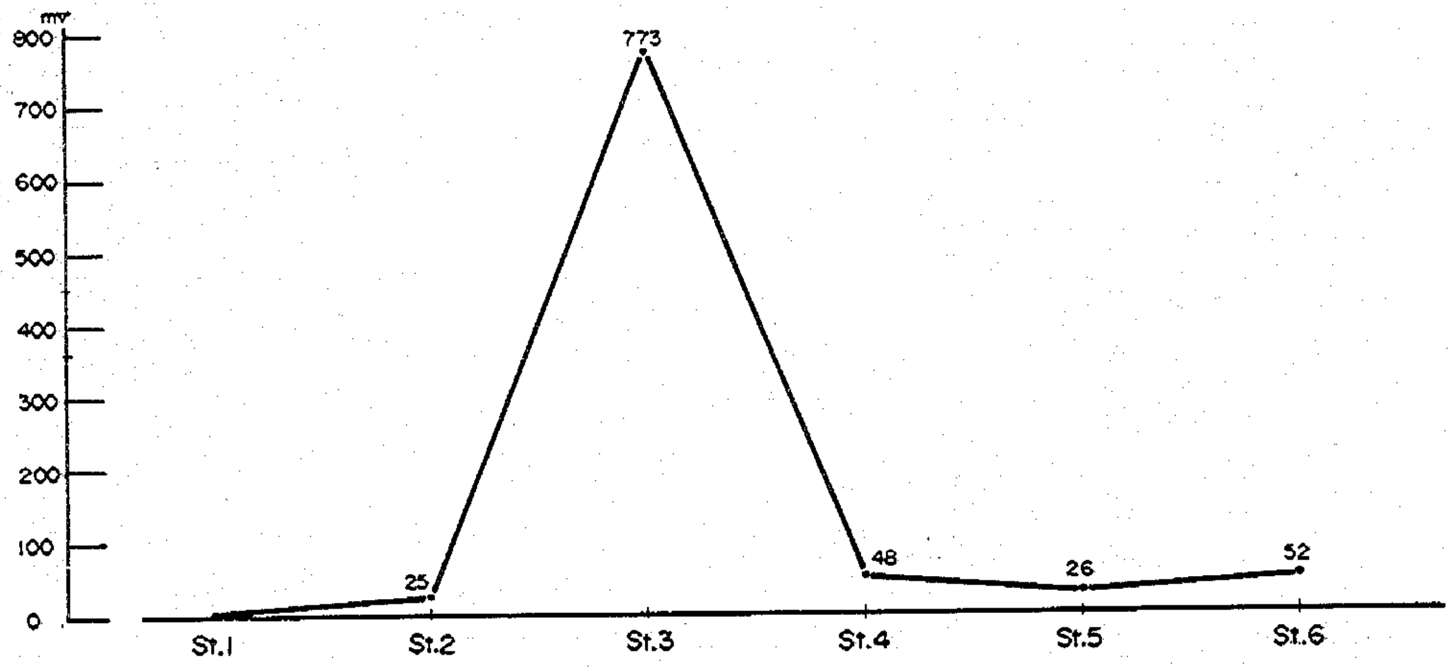


Fig. II-2-9 Spontaneous Potential Along Line A

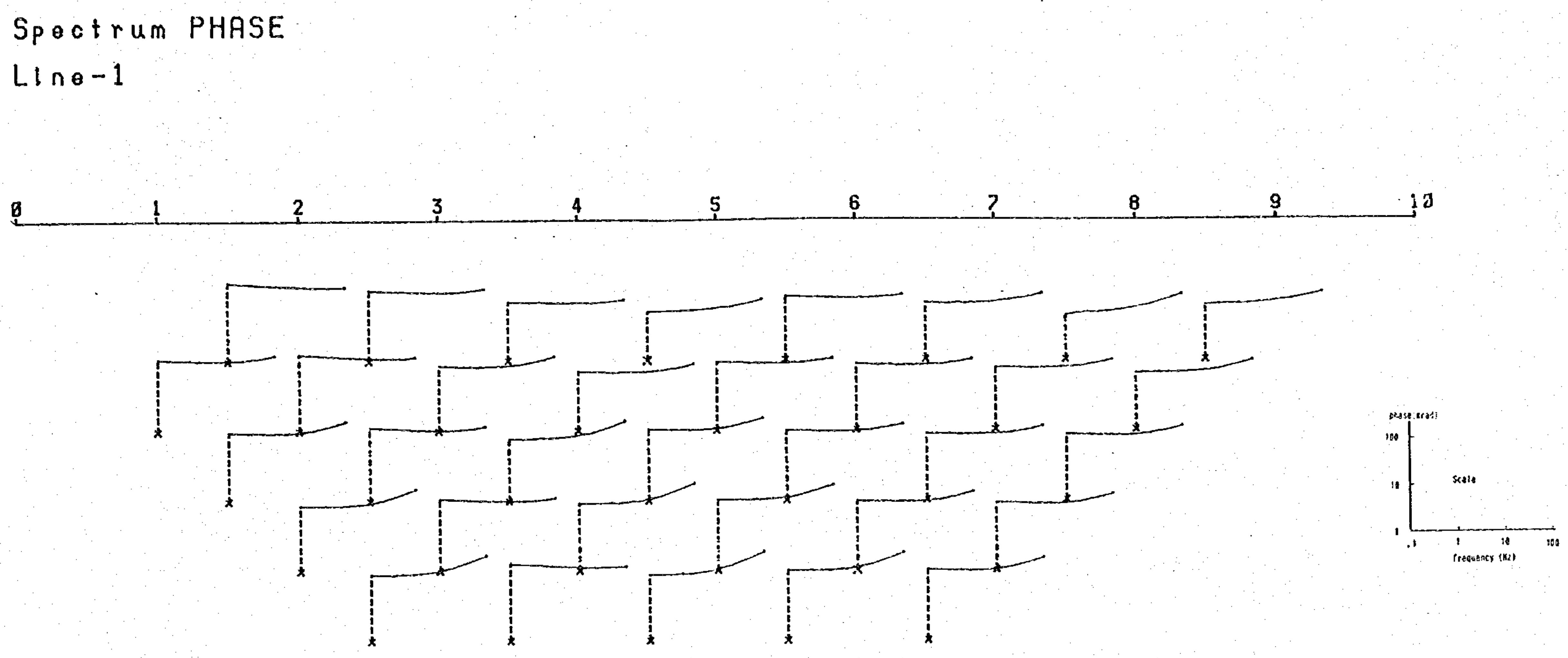


Fig. II-2-10 Phase Spectrum Pseudo Section (Line A)

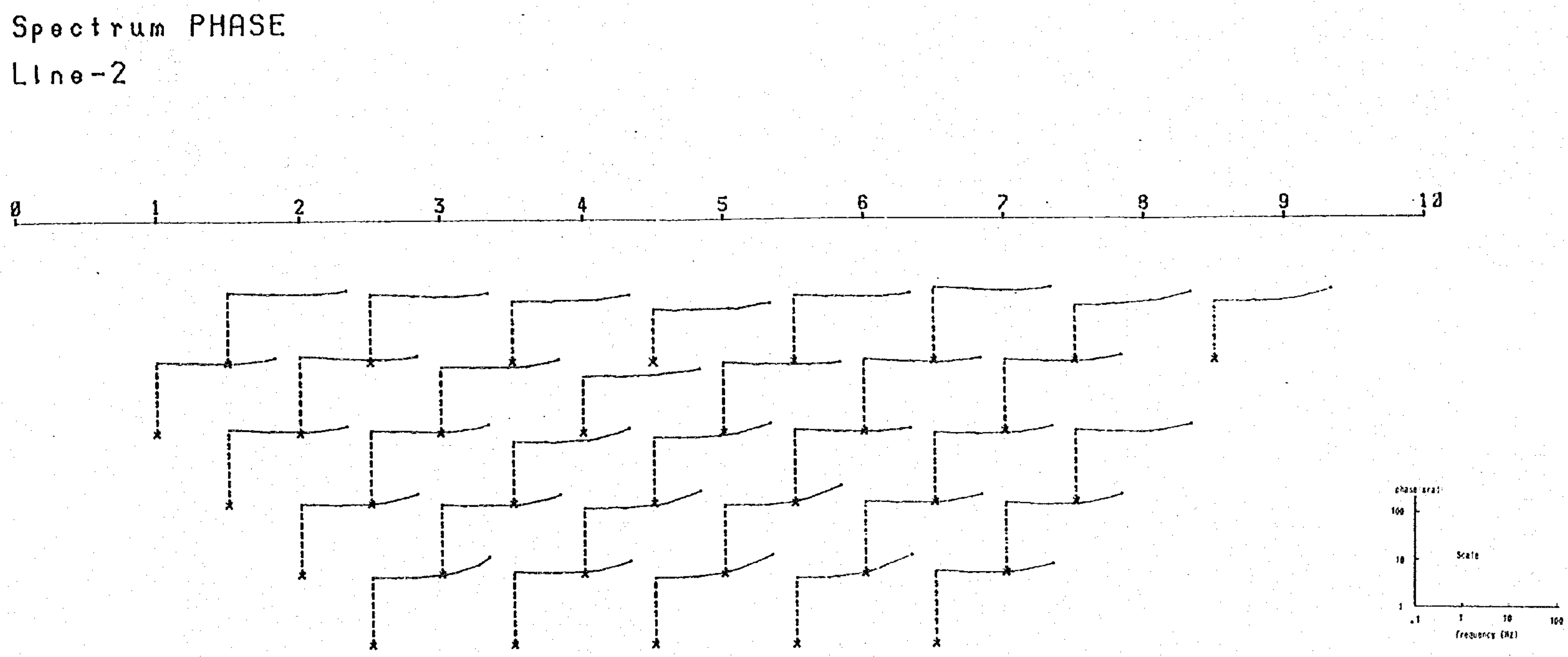


Fig. Ⅱ-2-11 Phase Spectrum Pseudo Section (Line B)

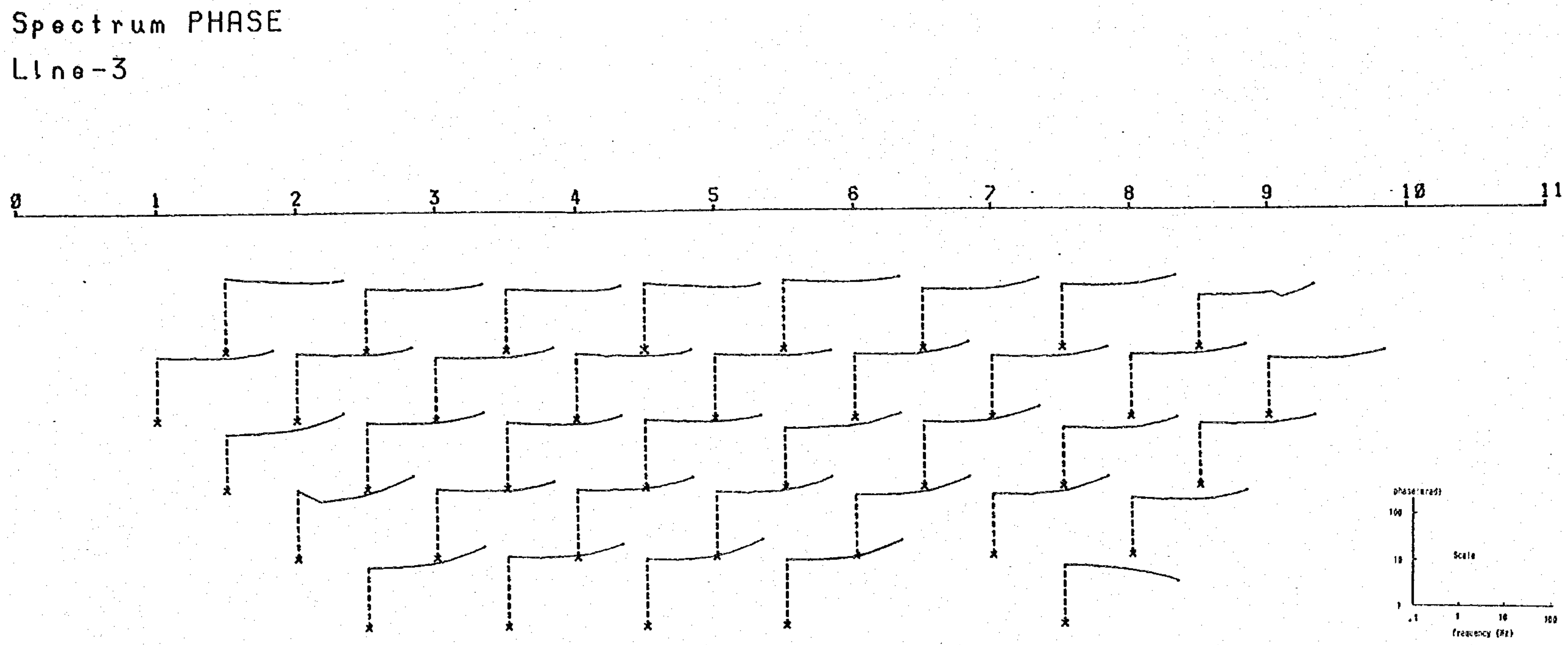


Fig. Ⅱ-2-12 Phase Spectrum Pseudo Section (Line C)

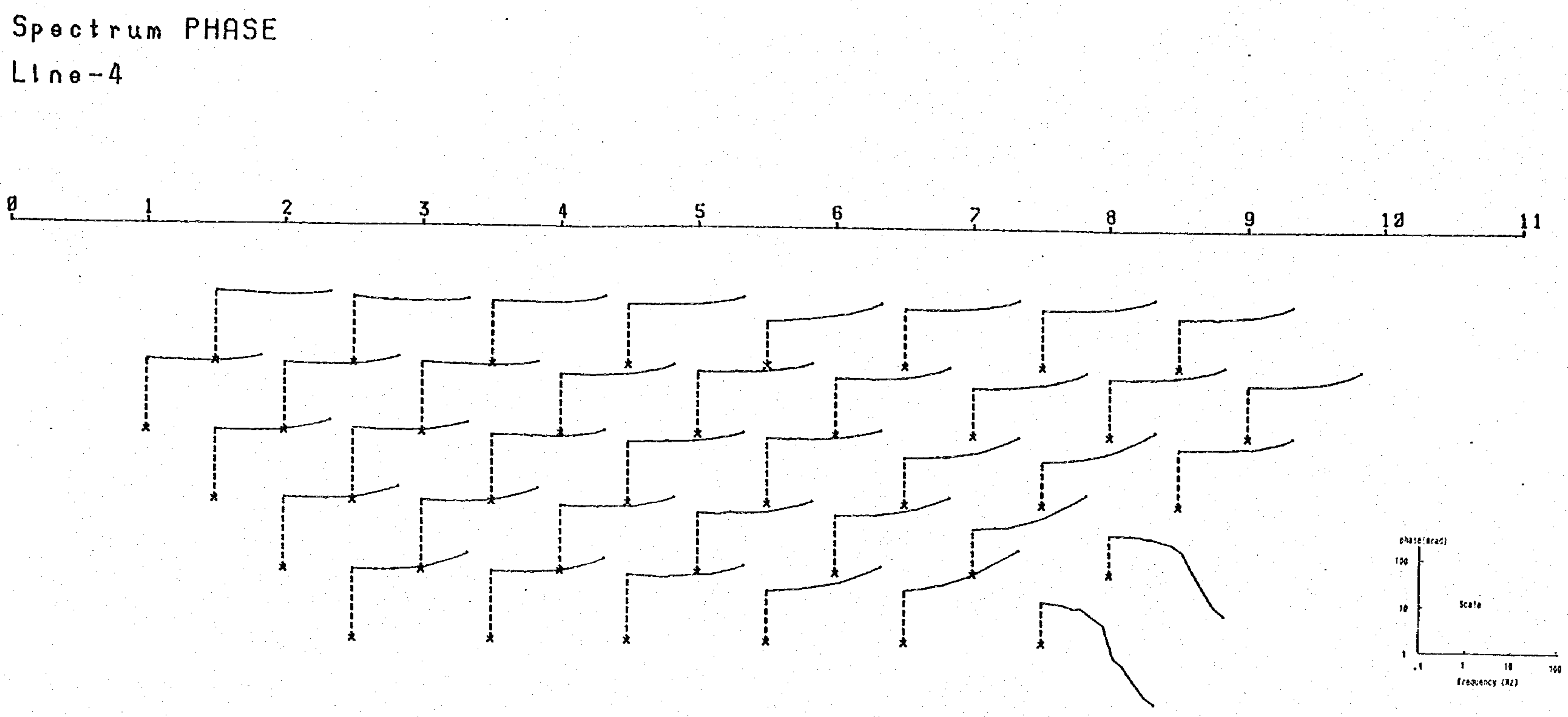


Fig. Ⅱ-2-13 Phase Spectrum Pseado Section (Line D)