U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

# Interpretation of transient electromagnetic soundings at the Medicine Lake volcano, Siskiyou County, California

by

Walter L. Anderson [1]

Open-File Report 88-582

1988



1/ Denver, Colorado.

CONTENTS

## INTRODUCTION

In 1983, two reports were published by Anderson et al. (1983a, 1983b) that summarized the results of least-squares inversion of transient electromagnetic (TEM) soundings obtained at the Medicine Lake volcano, California. Since that time, several new interpretation aids have been developed to process TEM data; e.g., Eaton and Hohmann (1988), Newman et al. (1987).

As a sequel to the earlier Medicine Lake work, the present report uses some of these new techniques to further interpret the original Medicine Lake TEM data along several cross-sectional lines. The station location map used by Anderson et al. (1983b) is also used in this report, and is reproduced here as Figure 1. (Note: all figures are given at the end of this report.) Refer to Anderson et al. (1983a, 1983b) on the physical aspects of the loop sizes and TEM configurations used.

## INTERPRETATION OF RESULTS

The profile lines studied are marked on Figure 1, and are denoted as lines AA+, BB+, and CC+, respectively. The center point of these lines is approximately located at Medicine Lake (grid square 11), with the lines spanning across the caldera rim (Donnelly-Nolan, 1988, Fig.2) in generally east-west and north-south directions. The sparsity of TEM stations and station spacing used by Anderson et al. (1983a, 1983b) makes a detailed analysis difficult at best.

It should be recognized that we previously assumed localized one-dimensional (1-D) layered earth models beneath each TEM station, as processed separately by least-squares inversion (Anderson et al., 1983a, 1983b). However, it is quite possible that nearby 2-D and/or 3-D structural effects could play a large role in distorting the assumed 1-D layered earth solutions as discussed by Newman et al. (1987). Furthermore, it is obvious that higher dimensional analysis would require many more TEM stations, possibly on a dense grid over the study area. The economy and logistics of such a venture precludes this approach. Thus, I attempted to piece together a crude interpretation of three cross-sections using just the TEM data at hand and the new interpretational aids previously mentioned.

### Cross-section AA+

Line AA+ consists of the TEM station numbers as noted at the top of Figure 2. (Note that station 19 was excluded on line AA+ because a smaller loop size and configuration was

used than at the other stations.) Each 1-D layered solution obtained from Anderson et al. (1983a, 1983b) is recast as a continuous distribution of apparent resistivity -vs- depth. Then a grid of points was interpolated in the xz-plane and contoured using the resistivity scale: 10, 15, 30, 50, 70, 100, 300, 500, 1000, 3000, and 4000 ohm-m. A logarithmic transformation of the unequally-spaced data was used before interpolation to an equal-interval grid, and then an anti-logarithmic transformation was finally used prior to contouring; this approach was used for all 1-D layered solutions in this report to minimize the introduction of fictitious anomalies between the original data points at the widely-spaced station locations.

In general, Figure 2 shows highly resistive material exist near the surface, and a lower resistivity zone (denoted by hashed lines) of 10 ohm-m or less occurs at approximately 500 m depth beneath stations 13, 1, and 17. The low resistivity zone in Figure 2 may or may not represent a hydrothermal altered region. Note that the basement (near 1000 m depth) generally has increasing resistivity under stations 13, 7, and 18, but this is questionable when observing the transient responses used in Anderson et al. (1983a, 1983b); i.e., the deeper interpreted layer resistivities generally had poorer standard errors as determined by least-squares for the time-range of the observed TEM data. It should be emphasized that the term "basement" used here is not the true electrical basement, but represents the approximate maximum probing depth obtainable from the TEM survey used.

Cross-section BB+

Line BB+ stations and cross-section contours are shown in Figure 3. Two stations from line AA+ (station 14 and 7) are also used in line BB+, with station 9 substituted for station 13. All 1-D results for line BB+ were processed and contoured as described for line AA+ above. Figure 3 shows a 15 ohm-m band between 500 and 1000 m depth generally between stations 9 and 6, but is not quite as conductive as in the hashed zone for cross-section AA+ (Figure 2).

A closer look at the layered inversion fits for stations 9 and 6 given by Anderson et al. (1983a) reveals that good 1-D layered models could not be obtained at late-time. For these stations, this resulted in a very high resistivity basement that was poorly resolved from the analysis. We suspected that the late-time observed TEM data here was in error, or perhaps, the soundings indicated the presence of a lateral 2-D or 3-D boundary below or near the transmitting loop at these locations. Subsequent studies by Newman et al. (1987) showed that such an effect is possible in the vicinity of a 3-D structure beneath the transmitter loop, or

in the range of the diffusing "smoke-ring" from a single transmitter loop. They also showed that about the best one can do in this situation, using 1-D inversion, is to truncate the observed data at the minimum point, or before the TEM curve begins to rise faster than 1-D models can rise. In this way, at least the depth to the top of a 3-D structure is well estimated with 1-D inversion; however, the conductance (product conductivity and thickness) of a confined 3-D body is over-estimated. (See Newman et al., 1987, p.898-901 for more information on this 3-D/1-D effect.)

The TEM data for stations 9 and 6 were reinverted as suggested by Newman et al. (1987) by truncating the soundings at the respective minimum points. The revised 1-D results for stations 9 and 6 are plotted and listed in Figures 4 and 5, and Figures 6 and 7, respectively. These results indeed reflect a better least-squares solution for low resistivity layers at depth, however, the extent of a possible 3-D body could not be estimated by this 1-D method. The definition of column headings used in figures 5 and 7 are the same as described by Anderson et al. (1983a, Appendix).

A revised line BB2+, with replaced 1-D interpretations for stations 9 and 6 (denoted by an *), is given in Figure 8. Comparing the cross-sections in Figures 3 and 8, we see that the basement is somewhat more realistic in Figure 8 than in Figure 3, and also, a 10 ohm-m zone now is shown, somewhat like in cross-section AA+ (Figure 2). But, again, I would like to stress the fact that much more TEM data would need to be observed before either interpretation (BB+ or BB2+) is marked as "best".

Cross-section CC+

Line CC+ stations and cross-section contours are shown in Figure 9. The method described for line AA+ was used for line CC+ as well. The results from the north-south line CC+ (Figure 9) are somewhat more complex than in the east-west lines AA+ and BB2+. The basement has alternating low (10 ohm-m) and high resistivity zones under stations 3, 15, 1, and 10. Another notable feature in Figure 9 is the shallow (250 m) low resistivity zone beneath station 3. This compares approximately with the shallow low resistivity zone under station 6 in line BB2+ (Figure 8). The area on the map in Figure 1 bounded by stations 3, 15, 4, and 6 (near Bullseye Lake) may be an anomalous near surface conductor distinct from the deeper (>500 m) 10 ohm-m zone shown on the rest of the cross-sections. The significance of this is unknown at this time.

## A New Inversion Technique

Eaton and Hohmann (1988) developed a new and rapid inversion technique for processing TEM soundings, which they call an "image" method. The image method uses an approximation based on the diffusion velocity (Raiche and Gallagher, 1985) of TEM waves in any host media. Using observed magnetic field data as a function of time, the approximation leads to an estimate of earth resistivity as a continuous (or discrete) function of depth. This one-to-one mapping (magnetic field to resistivity) is very fast compared to least-squares inversion of layered earth parameters. However, a disadvantage of using the image method is the fact that one usually observes voltage data instead of magnetic field directly as a function of time; an approximation given by Eaton and Hohmann (1987, Appendix) to convert voltage to magnetic field transients (i.e., impulse to step response) can be used as a pre-processing phase to overcome this drawback. Another disadvantage of the image method is that a 1-D approach is still used independently below each station, and therefore, a vertical cross-section (2-D) is at best an interpolation between stations in the xz-plane, same as described above for the least-squares 1-D inversion results and cross-sections.

Nevertheless, all the original observed voltage TEM data from the Medicine Lake area obtained by Anderson et al. (1983a, 1983b) were processed using Eaton and Hohmann's (1988) image inversion scheme. Final output from the program is listed and plotted for all stations in Figures 10-26; the column headings used in these figures define V(t) as the observed voltage, Hz(t) is the converted magnetic field, "Z" is the image depth, and "RES" is the estimated resistivity. These results were truncated and plotted at a maximum image depth of 1100 m, and then processed as cross-section contour maps, denoted as image line AA+ (Figure 27), image line BB+ (Figure 28), and image line CC+ (Figure 29). Comparison of image and least-squares line AA+, Figures 27 and 2, respectively, show a general agreement for the low resistivity (10 ohm-m or less) zones beneath stations 13, 7, and 17. However, the image method does not give the near surface resistivity nearly as high as in Figure 2. (This is also true for the rest of the image contour plots.) Image line BB+ (Figure 28) compares only approximately with the least-squares line BB2+ (Figure 8). The 10 ohm-m zone under stations 6 and 12 in image line BB+ (Figure 28) shows that this zone reaches the surface, which I believe cannot occur here, and thus it was not hashed in to the surface. Image line CC+ (Figure 29) compares somewhat better with least-squares line CC+ (Figure 9) in a few places, notably between stations 3 and 15, which is near Bullseye Lake in Figure 1.

It appears that the image results and cross-sections may be best used in practice as a first approximation to subsequent layered earth least-squares inversion. However, due to the speed of computer processing, the image approach might be useful in the field during the measurement of TEM data. Fast microcomputers could implement the image technique as a byproduct of making TEM observations, thus helping to establish possible other sites dynamically. Least-squares inversion usually requires minicomputers or main-frame systems, and much longer codes than the image method. In addition, the image method does not require any initial estimates of the parameters, such as needed by the least-squares method for a fixed number of layers.

## CONCLUSIONS

The interpretation of TEM soundings at the Medicine Lake volcano generally indicate a moderate to deep 10 ohm-m or less resistivity zone starting at a depth of about 500 m, and located directly below the caldera. The vertical and lateral extent of this low resistivity zone is difficult to estimate, due to the time-range of the TEM data, station locations, and signal-to-noise ratio observed at late time.

Because of the sparsity of TEM stations, only three cross-sections were estimated across the caldera. An anomalous shallow 10 ohm-m section starting at 250 m depth and near Bullseye Lake may be a localized intrusion of hydrothermally altered rock. This is hard to interpret more precisely without many more soundings in the Bullseye Lake region.

## REFERENCES


Anderson, W.L., Frischknecht, F.C., Raab, P.V., Bradley, J.A., Turnross, J., and Buckley, T.W., 1983a, Inversion results of time-domain electromagnetic soundings near Medicine Lake, California, geothermal area: U.S. Geological Survey Open-File Report 83-233, 31 p.

Anderson, W.L., Frischknecht, F.C., Bradley, J.A., Grette, R., and Grose, C., 1983b, Inversion results of time-domain electromagnetic soundings near Medicine Lake, California (Part 2): U.S. Geological Survey Open-File Report 83-910, 29 p.

Donnelly-Nolan, Julie, 1988, A magmatic model of Medicine Lake volcano, California: J. Geophy. Res., v. 93, n. B5, p. 4412-4420.

Eaton, P.A., and Hohmann, G.W., 1987, An evaluation of electromagnetic methods in the presence of geologic noise: Geophysics, v. 52, n. 8, p. 1106-1126.

---------, 1988, A rapid inversion technique for transient electromagnetic soundings: Physics of the Earth and Planetary Interiors [in press].

Newman, G.A., Anderson, W.L., and Hohmann, G.W., 1987, Interpretation of transient electromagnetic soundings over three-dimensional structures for the central-loop configuration: Geophys. J. Royal astr. Soc., v. 89, n. 3, p. 889-914.

Raiche, A.P., and Gallagher, R.G., 1985, Apparent resistivity and diffusion velocity: Geophysics, v. 50, n. 10, p. 1628-1633.

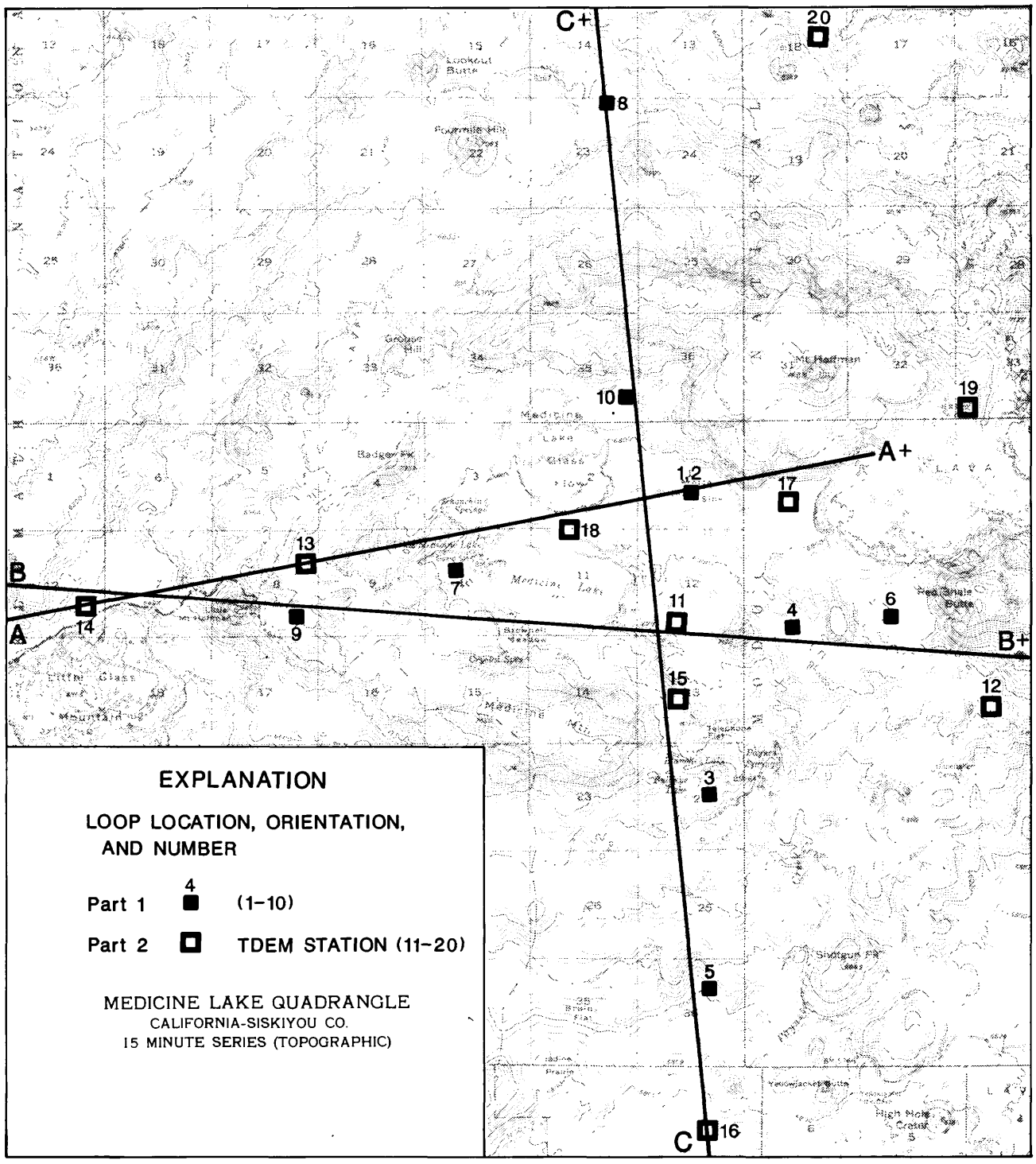
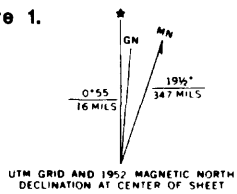
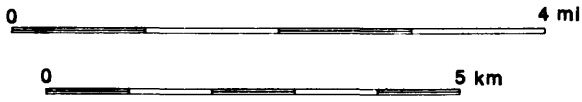



Figure 1.




UTM GRID AND 1952 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET





QUADRANGLE LOCATION

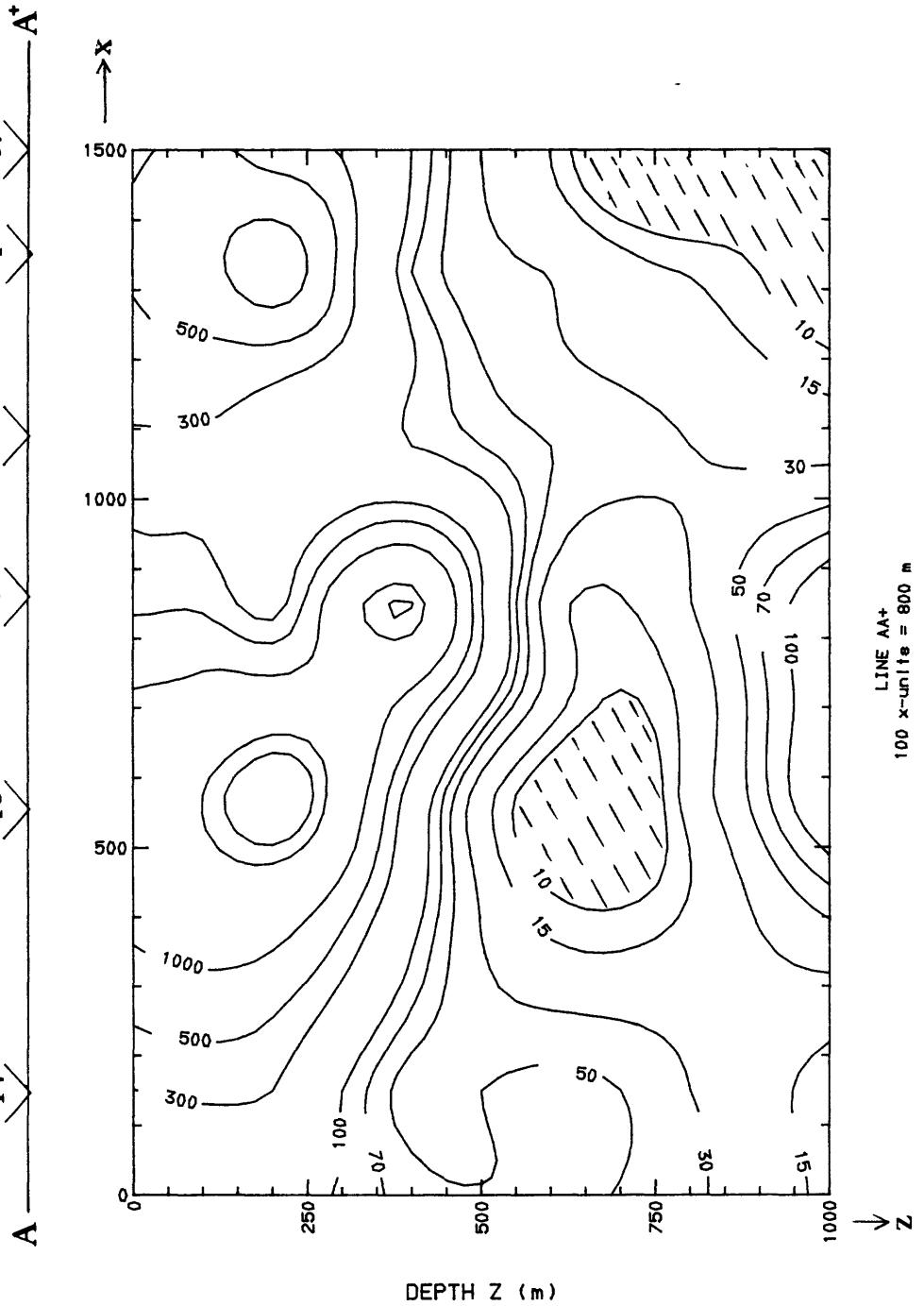

A
A+
14
13
7
18
1
17
X
Z
1500
1000
500
0
0
250
500
750
1000
500
300
1000
500
300
100
70
50
30
15
10
15
30
50
70
100
10
15
LINE AA+
100 x-units = 800 m
DEPTH Z (m)

Fig. 2



Fig. 2

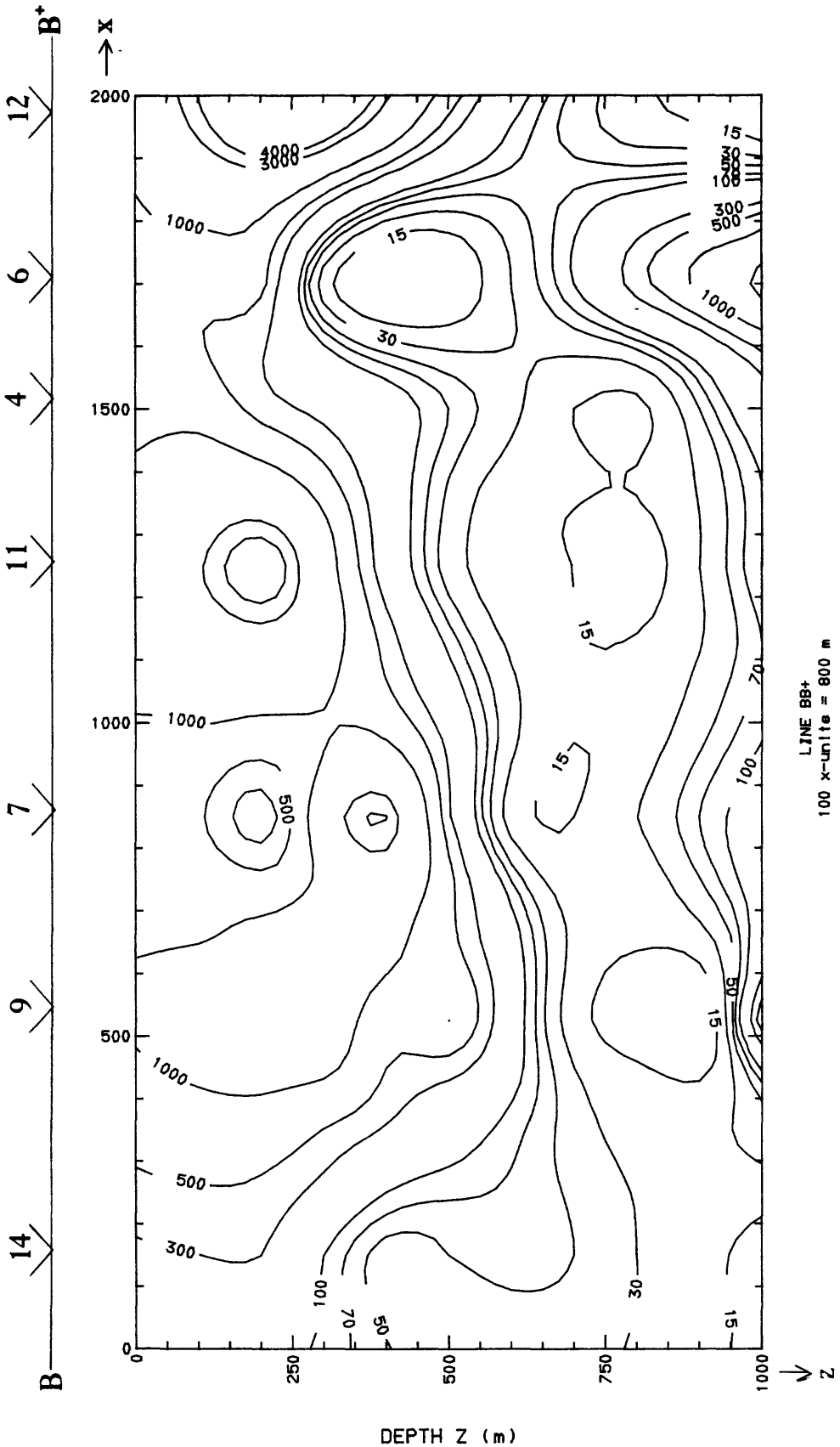
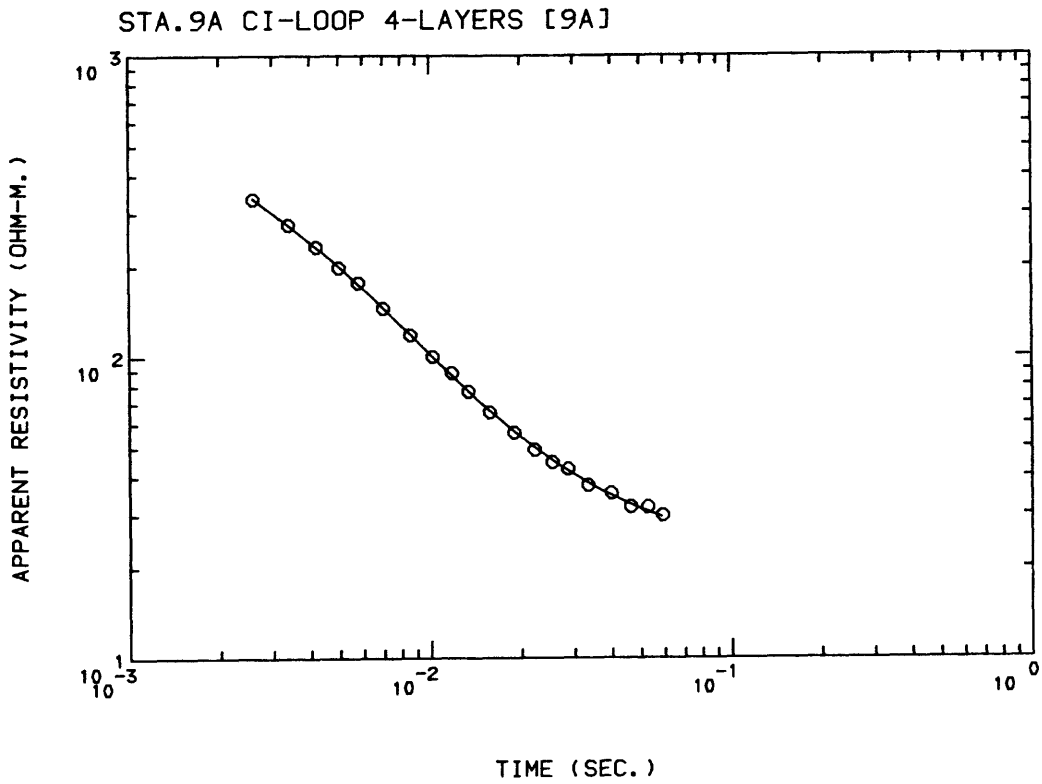

B+
B
x
z
2000
1500
1000
500
0
0
250
500
750
1000
12
6
4
11
7
9
14
4000
3000
1000
500
300
100
70
50
30
15
LINE BB+
100 x-units = 800 m
DEPTH Z (m)

Fig. 3



Fig. 3


STA.9A CI-LOOP 4-LAYERS [9A]
APPARENT RESISTIVITY (OHM-M.)
TIME (SEC.)

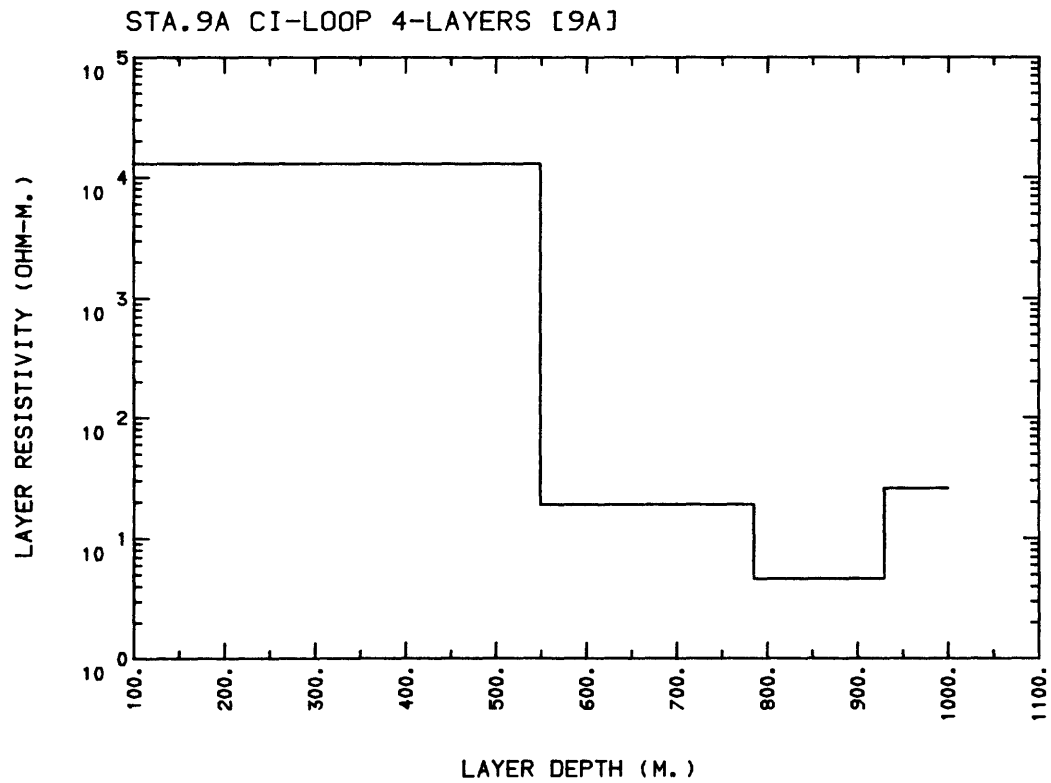

STA.9A CI-LOOP 4-LAYERS [9A]
LAYER RESISTIVITY (OHM-M.)
LAYER DEPTH (M.)

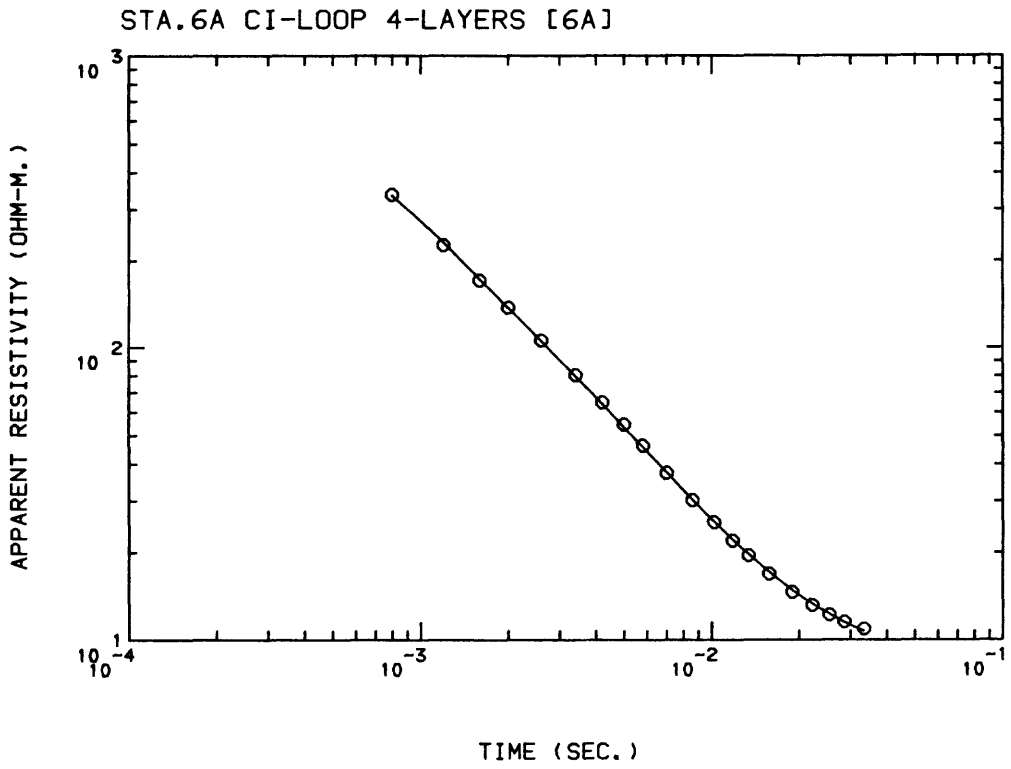


Fig. 4

```
<NLSTCI>:     STA.9A CI-LOOP 4-LAYERS [9A]
 A= 0.257950E+03  (equivalent loop radius)
 PARAMETERS HELD FIXED: IB=  8
***** X-CONVERGENCE *****

  I     OBS.Y(I)       CAL            RES         %RES.ERR       X(I,1)
  1   0.334950E+03  0.336326E+03 -0.138E+01 -0.409111E+00  0.260000E-02
  2   0.275150E+03  0.274235E+03  0.915E+00  0.333614E+00  0.340000E-02
  3   0.232910E+03  0.232061E+03  0.849E+00  0.365904E+00  0.420000E-02
  4   0.198440E+03  0.200212E+03 -0.177E+01 -0.885003E+00  0.500000E-02
  5   0.176990E+03  0.174932E+03  0.206E+01  0.117659E+01  0.580000E-02
  6   0.145490E+03  0.145877E+03 -0.387E+00 -0.265329E+00  0.700000E-02
  7   0.118310E+03  0.118773E+03 -0.463E+00 -0.389676E+00  0.860000E-02
  8   0.100250E+03  0.100007E+03  0.243E+00  0.242490E+00  0.102000E-01
  9   0.883630E+02  0.865543E+02  0.181E+01  0.208963E+01  0.118000E-01
 10   0.765070E+02  0.766678E+02 -0.161E+00 -0.209742E+00  0.134000E-01
 11   0.652650E+02  0.660240E+02 -0.759E+00 -0.114954E+01  0.158000E-01
 12   0.559110E+02  0.564525E+02 -0.541E+00 -0.959194E+00  0.190000E-01
 13   0.489930E+02  0.499741E+02 -0.981E+00 -0.196314E+01  0.222000E-01
 14   0.447180E+02  0.453785E+02 -0.660E+00 -0.145547E+01  0.254000E-01
 15   0.424660E+02  0.419515E+02  0.514E+00  0.122630E+01  0.286000E-01
 16   0.374820E+02  0.381705E+02 -0.688E+00 -0.180375E+01  0.334000E-01
 17   0.352890E+02  0.347179E+02  0.571E+00  0.164487E+01  0.398000E-01
 18   0.318470E+02  0.323910E+02 -0.544E+00 -0.167956E+01  0.462000E-01
 19   0.317110E+02  0.307036E+02  0.101E+01  0.328100E+01  0.526000E-01
 20   0.298230E+02  0.294044E+02  0.419E+00  0.142344E+01  0.590000E-01

** RMSERR=  0.12205231E+01  AVE|%RES.ERR|=  0.114767E+01

CORRELATION MATRIX
 1  0.1000E+01
 2 -0.1966E+00  0.1000E+01
 3 -0.2344E+00 -0.1035E+00  0.1000E+01
 4 -0.3581E+00 -0.5436E+00  0.1482E+00  0.1000E+01
 5 -0.1940E+00  0.9097E+00 -0.1199E+00 -0.4258E+00  0.1000E+01
 6  0.2516E+00 -0.1029E+00 -0.1348E+00 -0.2420E+00 -0.1668E+00  0.1000E+01
 7  0.2049E+00  0.2129E+00 -0.4832E+00 -0.4680E+00 -0.2467E-01  0.4070E+00  0.1000E+01

  **PARM_SOL.    STD_ERROR    REL_ERROR     % ERROR **

 1  0.7735E-04  0.2791E-04  0.1003E-01  0.1003E+01
 2  0.5203E-01  0.9383E-03  0.1300E-01  0.1300E+01
 3  0.2160E+00  0.1368E-02  0.9273E-02  0.9273E+00
 4  0.3867E-01  0.1038E-02  0.1667E-01  0.1667E+01
 5  0.5489E+03  0.3037E-02  0.3661E-02  0.3661E+00
 6  0.2358E+03  0.3919E-02  0.7872E-02  0.7872E+00
 7  0.1445E+03  0.9293E-02  0.2462E-01  0.2462E+01

PARAMETER NAME       FINAL SOLUTION        RESISTIVITY   LAYER DEPTH

   1    SIGMA( 1) =  0.77351659E-04    1  0.12927971E+05
   2    SIGMA( 2) =  0.52033640E-01    2  0.19218336E+02
   3    SIGMA( 3) =  0.21597953E+00    3  0.46300683E+01
   4    SIGMA( 4) =  0.38674708E-01    4  0.25856691E+02
   5    THICK( 1) =  0.54886871E+03                      1  0.54886871E+03
   6    THICK( 2) =  0.23577098E+03                      2  0.78463971E+03
   7    THICK( 3) =  0.14450076E+03                      3  0.92914050E+03
   8 *  SHIFT     =  0.10000000E+01

     * FIXED
```



Fig. 5


STA.6A CI-LOOP 4-LAYERS [6A]
APPARENT RESISTIVITY (OHM-M.)
10 3
10 2
10 1
10 -4
10 -3
10 -2
10 -1
TIME (SEC.)

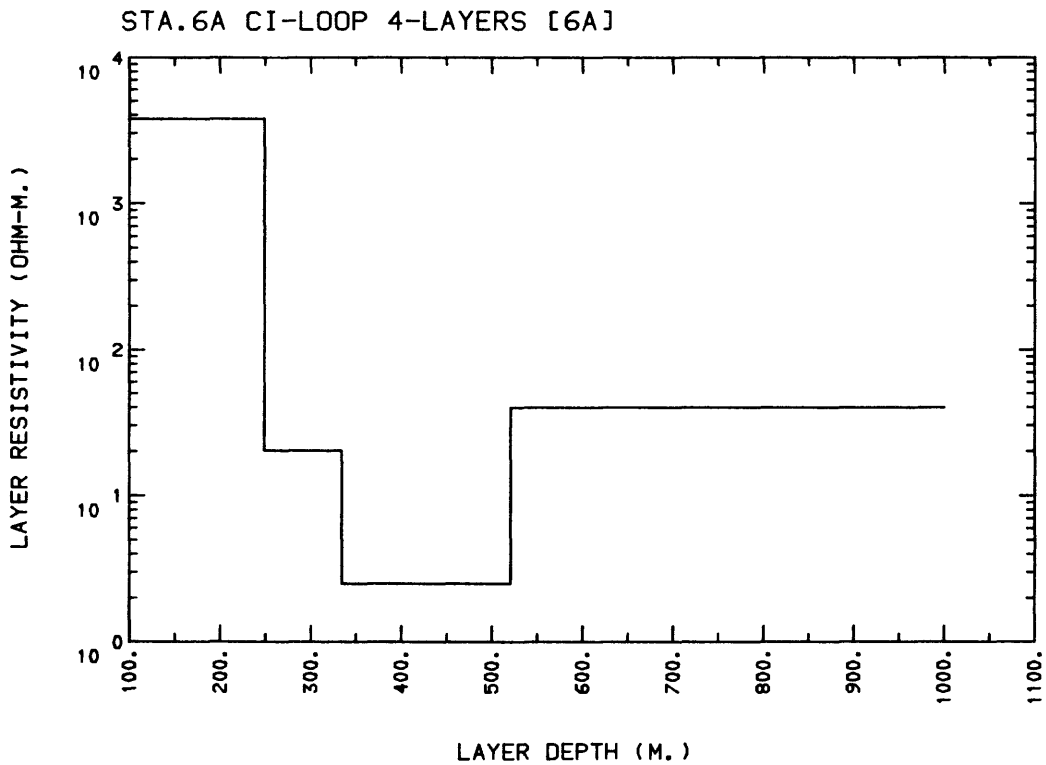

STA.6A CI-LOOP 4-LAYERS [6A]
LAYER RESISTIVITY (OHM-M.)
10 4
10 3
10 2
10 1
10 0
100.
200.
300.
400.
500.
600.
700.
800.
900.
1000.
1100.
LAYER DEPTH (M.)



Fig. 6

```
<NLSTCI>:     STA.6A CI-LOOP 4-LAYERS [6A]
 A= 0.257950E+03  (equivalent loop radius)
 PARAMETERS HELD FIXED: IB=  8
***** VARIABILITY CONVERGENCE *****

  I     OBS.Y(I)       CAL            RES         %RES.ERR      X(I,1)
  1  0.336600E+03  0.334114E+03  0.249E+01  0.744110E+00  0.800000E-03
  2  0.226150E+03  0.230209E+03 -0.406E+01 -0.176309E+01  0.120000E-02
  3  0.171010E+03  0.172507E+03 -0.150E+01 -0.867595E+00  0.160000E-02
  4  0.137660E+03  0.137244E+03  0.416E+00  0.302887E+00  0.200000E-02
  5  0.105460E+03  0.104718E+03  0.742E+00  0.708816E+00  0.260000E-02
  6  0.803470E+02  0.794658E+02  0.881E+00  0.110895E+01  0.340000E-02
  7  0.647570E+02  0.639421E+02  0.815E+00  0.127448E+01  0.420000E-02
  8  0.545770E+02  0.533697E+02  0.121E+01  0.226209E+01  0.500000E-02
  9  0.463230E+02  0.457165E+02  0.606E+00  0.132662E+01  0.580000E-02
 10  0.374370E+02  0.375377E+02 -0.101E+00 -0.268265E+00  0.700000E-02
 11  0.302070E+02  0.302933E+02 -0.863E-01 -0.284756E+00  0.860000E-02
 12  0.254090E+02  0.255065E+02 -0.975E-01 -0.382069E+00  0.102000E-01
 13  0.219990E+02  0.221659E+02 -0.167E+00 -0.752833E+00  0.118000E-01
 14  0.195750E+02  0.197285E+02 -0.153E+00 -0.778051E+00  0.134000E-01
 15  0.169000E+02  0.171310E+02 -0.231E+00 -0.134828E+01  0.158000E-01
 16  0.146440E+02  0.148529E+02 -0.209E+00 -0.140620E+01  0.190000E-01
 17  0.132100E+02  0.133489E+02 -0.139E+00 -0.104066E+01  0.222000E-01
 18  0.122220E+02  0.122942E+02 -0.722E-01 -0.587244E+00  0.254000E-01
 19  0.115550E+02  0.115178E+02  0.372E-01  0.323103E+00  0.286000E-01
 20  0.109140E+02  0.106870E+02  0.227E+00  0.212433E+01  0.334000E-01

** RMSERR=  0.14971093E+01  AVE|%RES.ERR|=  0.982721E+00

CORRELATION MATRIX
 1  0.1000E+01
 2  0.4308E+00  0.1000E+01
 3 -0.1984E-01 -0.1137E+00  0.1000E+01
 4 -0.1643E+00 -0.3885E+00  0.5924E+00  0.1000E+01
 5  0.4416E+00  0.9806E+00 -0.2826E+00 -0.4984E+00  0.1000E+01
 6 -0.4407E+00 -0.9375E+00  0.3472E+00  0.6059E+00 -0.9740E+00  0.1000E+01
 7 -0.1268E+00 -0.1030E+00 -0.5344E+00 -0.5733E+00 -0.1103E-02 -0.1560E+00  0.1000E+01

  **PARM_SOL.    STD_ERROR    REL_ERROR     % ERROR **

 1  0.2654E-03  0.7003E-04  0.2355E-01  0.2355E+01
 2  0.4959E-01  0.2933E-02  0.7213E-01  0.7213E+01
 3  0.3986E+00  0.2288E-02  0.1981E-01  0.1981E+01
 4  0.2510E-01  0.4120E-02  0.1424E+00  0.1424E+02
 5  0.2492E+03  0.8499E-02  0.1631E-01  0.1631E+01
 6  0.8550E+02  0.1169E-01  0.3984E-01  0.3984E+01
 7  0.1862E+03  0.1368E-01  0.3081E-01  0.3081E+01

PARAMETER NAME       FINAL SOLUTION        RESISTIVITY   LAYER DEPTH

   1    SIGMA( 1) =  0.26538665E-03    1  0.37680869E+04
   2    SIGMA( 2) =  0.49589511E-01    2  0.20165554E+02
   3    SIGMA( 3) =  0.39857146E+00    3  0.25089605E+01
   4    SIGMA( 4) =  0.25096988E-01    4  0.39845417E+02
   5    THICK( 1) =  0.24920154E+03                      1  0.24920154E+03
   6    THICK( 2) =  0.85504211E+02                      2  0.33470575E+03
   7    THICK( 3) =  0.18620593E+03                      3  0.52091168E+03
   8 *  SHIFT     =  0.10000000E+01

     * FIXED
```



Fig. 7

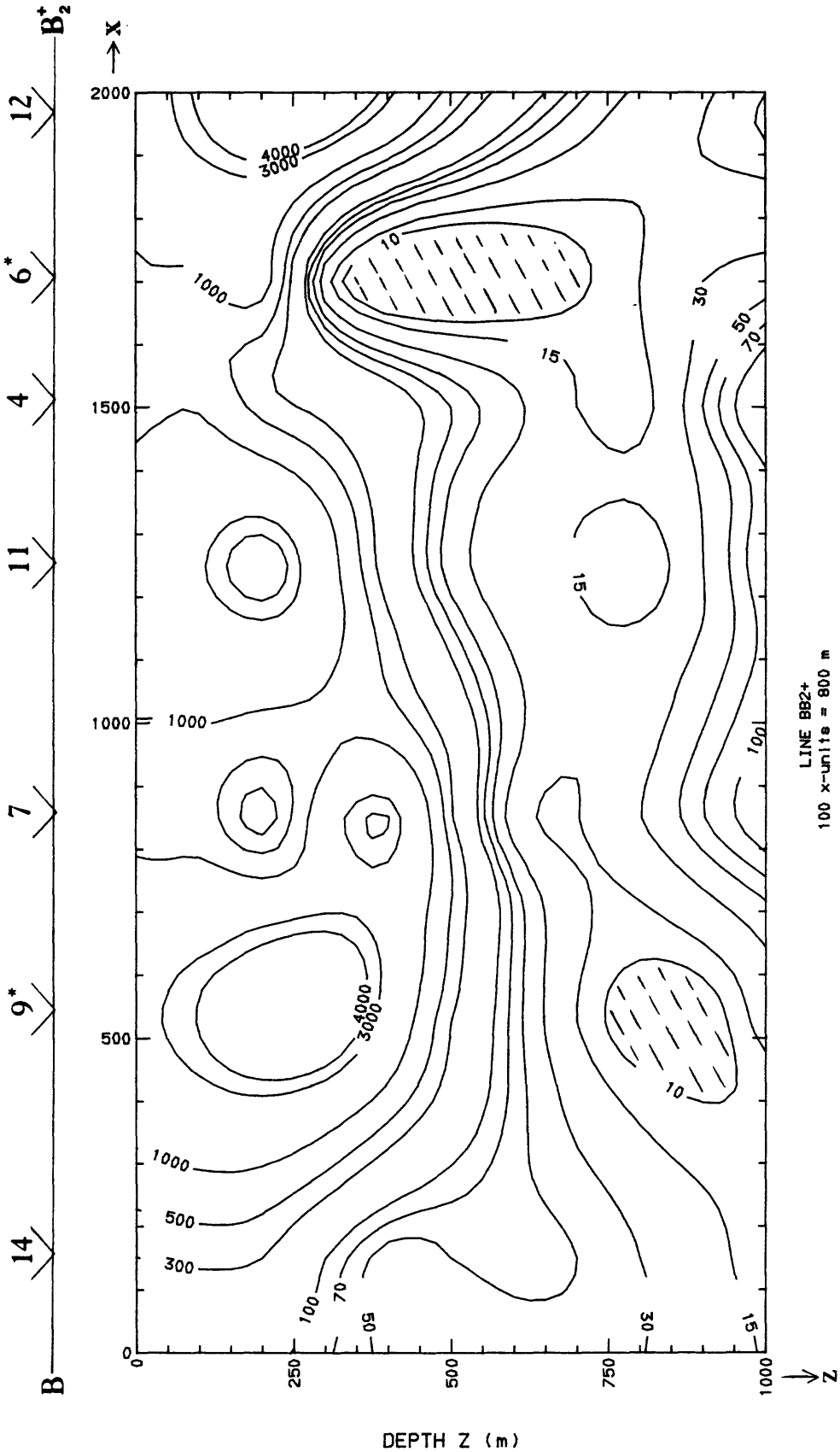

B
B₂*
x
z
12
6*
4
11
7
9*
14
2000
1500
1000
500
0
0
250
500
750
1000
4000
3000
1000
10
15
30
50
70
100
1000
500
300
100
70
50
30
15
LINE BB2+
100 x-units = 800 m
DEPTH Z (m)

Fig. 8



Fig. 8

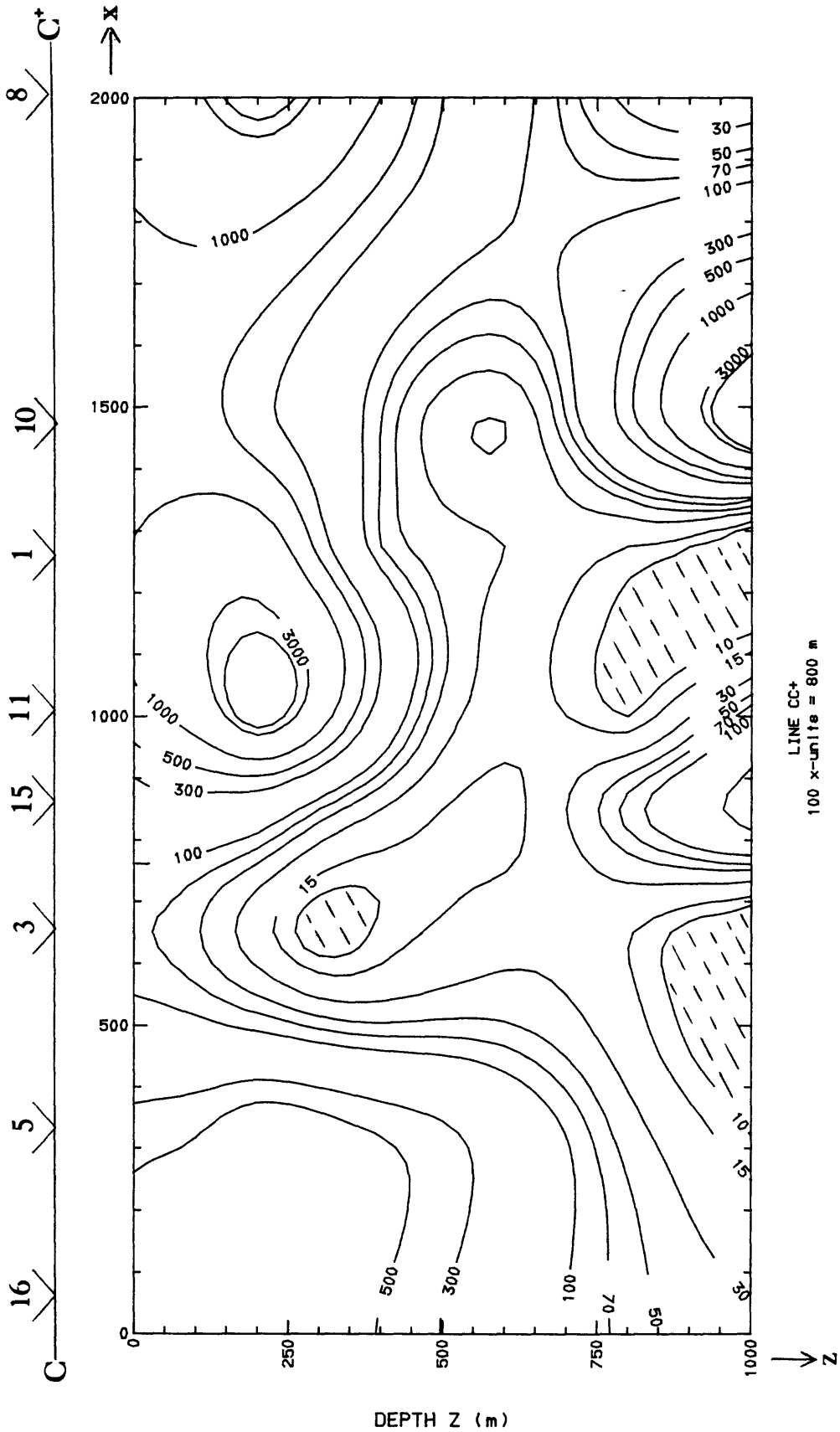

C
C+
x
z
8
10
1
11
15
3
5
16
2000
1500
1000
500
0
250
500
750
1000
1000
3000
500
300
100
15
30
50
70
100
300
500
1000
3000
10
15
30
50
70
100
500
300
100
70
50
15
10
15
LINE CC+
100 x-units = 800 m
DEPTH Z (m)

Fig. 9



Fig. 9

MED.LAKE STA.1 [F]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.2814058E-07 | 0.2773841E-04 | 452.6576 | 146.8129 |
| 2 | 0.1200000E-02 | 0.1477383E-07 | 0.2091178E-04 | 500.0688 | 8.068719 |
| 3 | 0.1600000E-02 | 0.8978363E-08 | 0.1713339E-04 | 536.7825 | 32.51300 |
| 4 | 0.2000000E-02 | 0.5894857E-08 | 0.1476742E-04 | 565.2654 | 17.57367 |
| 5 | 0.2600000E-02 | 0.3801282E-08 | 0.1245341E-04 | 599.1295 | 17.21228 |
| 6 | 0.3400000E-02 | 0.2427498E-08 | 0.1047122E-04 | 635.9420 | 15.25346 |
| 7 | 0.4200000E-02 | 0.1708215E-08 | 0.9155114E-05 | 666.6247 | 12.10348 |
| 8 | 0.5000000E-02 | 0.1266069E-08 | 0.8208606E-05 | 690.9105 | 11.14064 |
| 9 | 0.5800000E-02 | 0.1033944E-08 | 0.7476673E-05 | 714.5115 | 12.19782 |
| 10 | 0.7000000E-02 | 0.7871049E-09 | 0.6607331E-05 | 744.9279 | 10.51837 |
| 11 | 0.8600000E-02 | 0.5903807E-09 | 0.5730506E-05 | 781.9646 | 11.72333 |
| 12 | 0.1020000E-01 | 0.4588027E-09 | 0.5062658E-05 | 816.0280 | 11.49324 |
| 13 | 0.1180000E-01 | 0.3646018E-09 | 0.4538528E-05 | 846.8420 | 11.22468 |
| 14 | 0.1340000E-01 | 0.3016311E-09 | 0.4114444E-05 | 875.5301 | 11.34097 |
| 15 | 0.1580000E-01 | 0.2336781E-09 | 0.3603304E-05 | 915.6295 | 11.66857 |
| 16 | 0.1900000E-01 | 0.1776216E-09 | 0.3079653E-05 | 965.7739 | 12.53461 |
| 17 | 0.2220000E-01 | 0.1421320E-09 | 0.2672556E-05 | 1013.190 | 13.26318 |
| 18 | 0.2540000E-01 | 0.1105312E-09 | 0.2350875E-05 | 1058.002 | 13.30866 |
| 19 | 0.2860000E-01 | 0.9081379E-10 | 0.2094531E-05 | 1099.880 | 13.58054 |
| 20 | 0.3340000E-01 | 0.7046210E-10 | 0.1786529E-05 | 1160.520 | 14.82171 |
| 21 | 0.3980000E-01 | 0.5075555E-10 | 0.1477861E-05 | 1237.007 | 15.27288 |
| 22 | 0.4620000E-01 | 0.3825048E-10 | 0.1251216E-05 | 1308.085 | 15.68256 |
| 23 | 0.5260000E-01 | 0.3014787E-10 | 0.1077046E-05 | 1375.784 | 16.38249 |
| 24 | 0.5900000E-01 | 0.2464107E-10 | 0.9375318E-06 | 1441.180 | 18.00448 |
| 25 | 0.6860000E-01 | 0.1963312E-10 | 0.7684204E-06 | 1540.703 | 21.85076 |

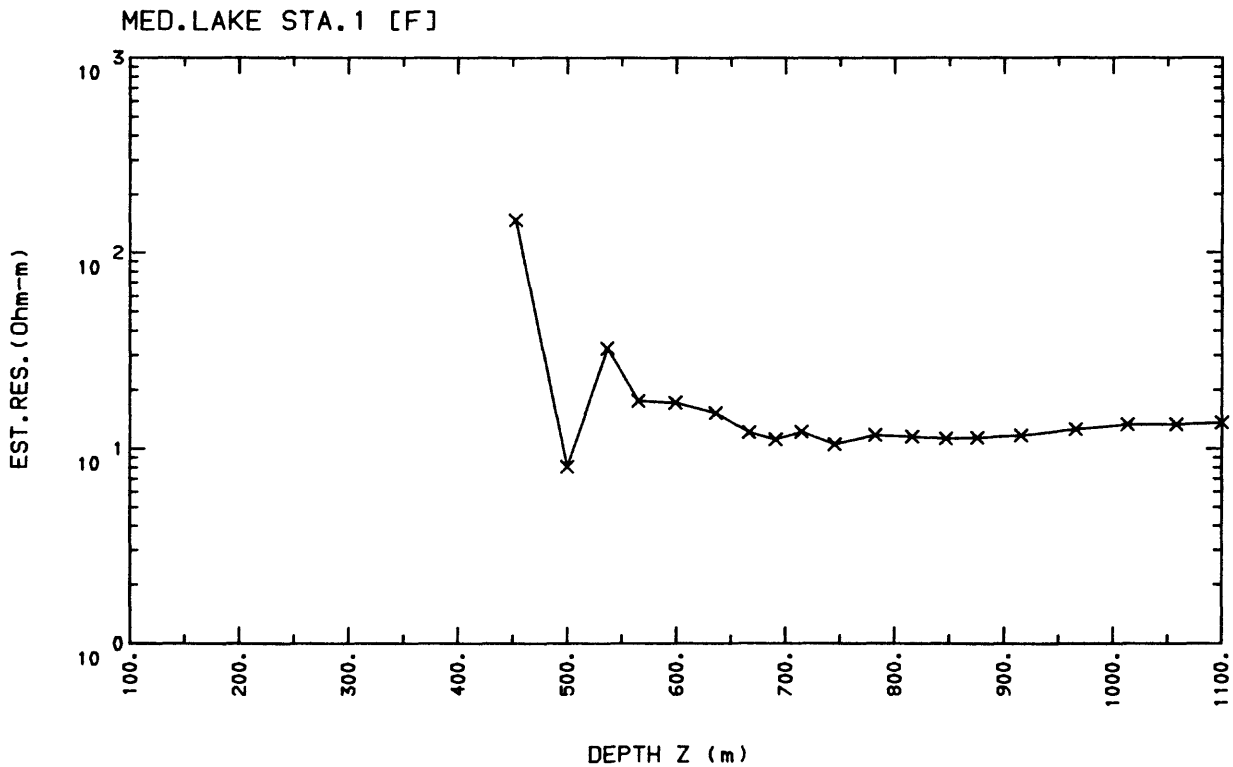





Fig. 10

MED.LAKE STA.3 [A]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.4379000E-06 | 0.3461315E-03 | 165.6824 | 19.54085 |
| 2 | 0.1200000E-02 | 0.1955000E-06 | 0.2453732E-03 | 194.5852 | 4.508749 |
| 3 | 0.1600000E-02 | 0.1170000E-06 | 0.1956621E-03 | 214.4064 | 4.051740 |
| 4 | 0.2000000E-02 | 0.8135000E-07 | 0.1641095E-03 | 231.1697 | 3.490939 |
| 5 | 0.2600000E-02 | 0.5216500E-07 | 0.1322458E-03 | 252.7171 | 4.038093 |
| 6 | 0.3400000E-02 | 0.3401700E-07 | 0.1048201E-03 | 277.1249 | 5.292808 |
| 7 | 0.4200000E-02 | 0.2423700E-07 | 0.8628186E-04 | 298.8416 | 5.980507 |
| 8 | 0.5000000E-02 | 0.1831800E-07 | 0.7273957E-04 | 318.5060 | 6.917862 |
| 9 | 0.5800000E-02 | 0.1447700E-07 | 0.6230321E-04 | 337.8041 | 8.234689 |
| 10 | 0.7000000E-02 | 0.1055200E-07 | 0.5035473E-04 | 365.4212 | 9.320056 |
| 11 | 0.8600000E-02 | 0.7218500E-08 | 0.3904309E-04 | 400.9063 | 11.13297 |
| 12 | 0.1020000E-01 | 0.5190000E-08 | 0.3114458E-04 | 434.9654 | 12.04136 |
| 13 | 0.1180000E-01 | 0.3811700E-08 | 0.2541463E-04 | 467.1289 | 12.91474 |
| 14 | 0.1340000E-01 | 0.2902400E-08 | 0.2114084E-04 | 498.4601 | 14.18578 |
| 15 | 0.1580000E-01 | 0.1978700E-08 | 0.1648012E-04 | 543.8333 | 15.34326 |
| 16 | 0.1900000E-01 | 0.1248000E-08 | 0.1237202E-04 | 600.7255 | 15.82624 |
| 17 | 0.2220000E-01 | 0.8286500E-09 | 0.9728112E-05 | 652.7184 | 15.25277 |
| 18 | 0.2540000E-01 | 0.5676500E-09 | 0.7950399E-05 | 699.5075 | 13.80365 |
| 19 | 0.2860000E-01 | 0.4020000E-09 | 0.6715879E-05 | 741.0009 | 12.52542 |
| 20 | 0.3340000E-01 | 0.2728200E-09 | 0.5427122E-05 | 796.8333 | 11.58107 |
| 21 | 0.3980000E-01 | 0.1653400E-09 | 0.4311392E-05 | 861.7300 | 9.986535 |
| 22 | 0.4620000E-01 | 0.1188900E-09 | 0.3587629E-05 | 917.1388 | 8.804315 |
| 23 | 0.5260000E-01 | 0.8363500E-10 | 0.3071920E-05 | 966.5897 | 8.147869 |
| 24 | 0.5900000E-01 | 0.6838500E-10 | 0.2684816E-05 | 1011.503 | 7.927237 |
| 25 | 0.6860000E-01 | 0.4731700E-10 | 0.2242876E-05 | 1074.902 | 7.954424 |
| 26 | 0.8140000E-01 | 0.3286700E-10 | 0.1834509E-05 | 1150.210 | 7.037002 |
| 27 | 0.9420000E-01 | 0.2246700E-10 | 0.1552699E-05 | 1216.619 | 6.985835 |

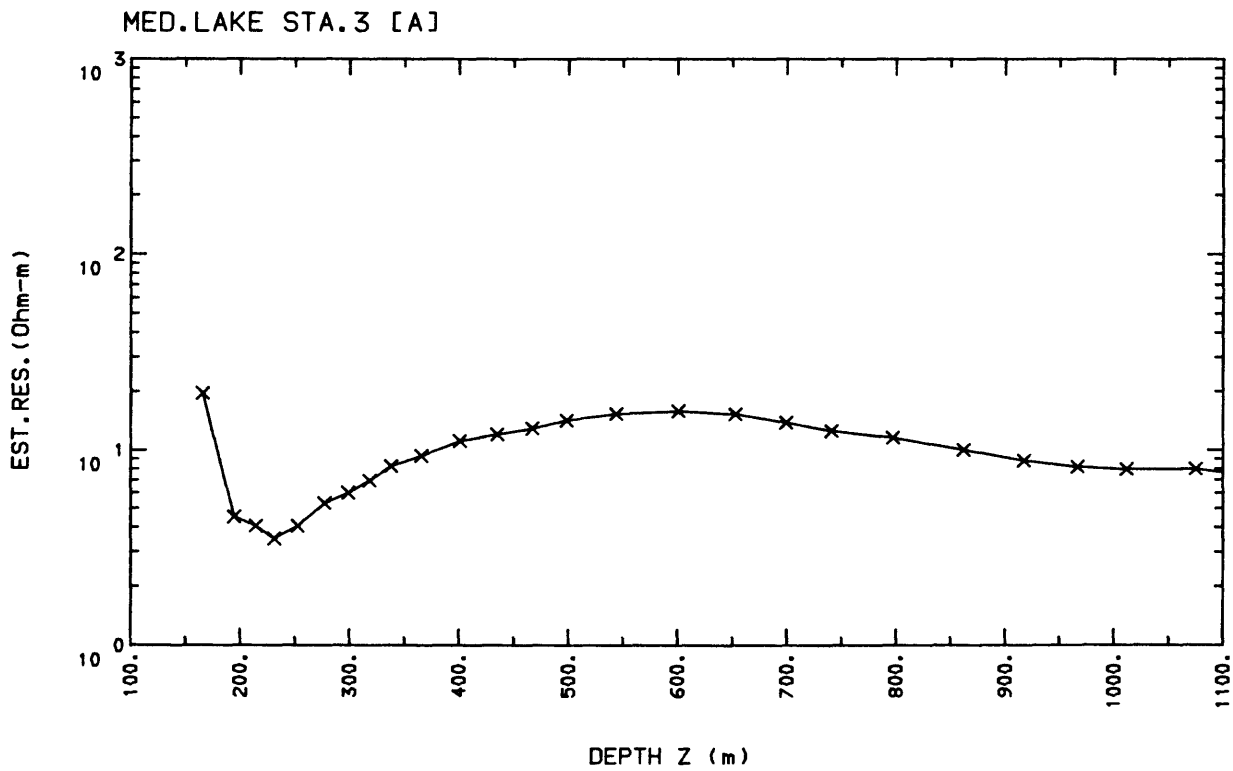





Fig. 11

MED.LAKE STA.4 [G]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.1743000E-07 | 0.3095704E-04 | 435.6412 | 93.90369 |
| 2 | 0.1200000E-02 | 0.1095500E-07 | 0.2644168E-04 | 460.4488 | 2.915980 |
| 3 | 0.1600000E-02 | 0.7463000E-08 | 0.2351183E-04 | 480.0370 | 6.361572 |
| 4 | 0.2000000E-02 | 0.5589500E-08 | 0.2143550E-04 | 495.8814 | 2.922499 |
| 5 | 0.2600000E-02 | 0.4061000E-08 | 0.1913238E-04 | 516.4508 | 3.515581 |
| 6 | 0.3400000E-02 | 0.2821500E-08 | 0.1694216E-04 | 538.8499 | 2.862787 |
| 7 | 0.4200000E-02 | 0.2201000E-08 | 0.1534385E-04 | 557.7247 | 3.604664 |
| 8 | 0.5000000E-02 | 0.1781900E-08 | 0.1407637E-04 | 574.5369 | 4.241511 |
| 9 | 0.5800000E-02 | 0.1498300E-08 | 0.1303251E-04 | 590.3452 | 4.492689 |
| 10 | 0.7000000E-02 | 0.1213000E-08 | 0.1173817E-04 | 611.4196 | 4.841372 |
| 11 | 0.8600000E-02 | 0.9382500E-09 | 0.1036882E-04 | 638.7947 | 5.985589 |
| 12 | 0.1020000E-01 | 0.7679999E-09 | 0.9282719E-05 | 663.7301 | 5.779578 |
| 13 | 0.1180000E-01 | 0.6356000E-09 | 0.8389272E-05 | 686.6818 | 6.247862 |
| 14 | 0.1340000E-01 | 0.5415800E-09 | 0.7639949E-05 | 709.0639 | 6.907217 |
| 15 | 0.1580000E-01 | 0.4303300E-09 | 0.6711921E-05 | 741.2202 | 7.474757 |
| 16 | 0.1900000E-01 | 0.3355800E-09 | 0.5736795E-05 | 782.0075 | 8.166605 |
| 17 | 0.2220000E-01 | 0.2599500E-09 | 0.4978590E-05 | 820.5394 | 8.659180 |
| 18 | 0.2540000E-01 | 0.2146600E-09 | 0.4374336E-05 | 857.4264 | 9.331227 |
| 19 | 0.2860000E-01 | 0.1752600E-09 | 0.3877906E-05 | 893.2634 | 9.945539 |
| 20 | 0.3340000E-01 | 0.1359800E-09 | 0.3283506E-05 | 945.0372 | 10.85450 |
| 21 | 0.3980000E-01 | 0.9985000E-10 | 0.2682988E-05 | 1011.737 | 11.84653 |
| 22 | 0.4620000E-01 | 0.7235000E-10 | 0.2244498E-05 | 1074.522 | 12.08853 |
| 23 | 0.5260000E-01 | 0.5769000E-10 | 0.1913364E-05 | 1133.898 | 12.70583 |
| 24 | 0.5900000E-01 | 0.4490800E-10 | 0.1652109E-05 | 1191.371 | 13.30004 |
| 25 | 0.6860000E-01 | 0.3227500E-10 | 0.1357298E-05 | 1272.789 | 13.35875 |
| 26 | 0.8140000E-01 | 0.2087500E-10 | 0.1086611E-05 | 1371.521 | 12.23009 |
| 27 | 0.9420000E-01 | 0.1413300E-10 | 0.9052970E-06 | 1458.190 | 11.86510 |

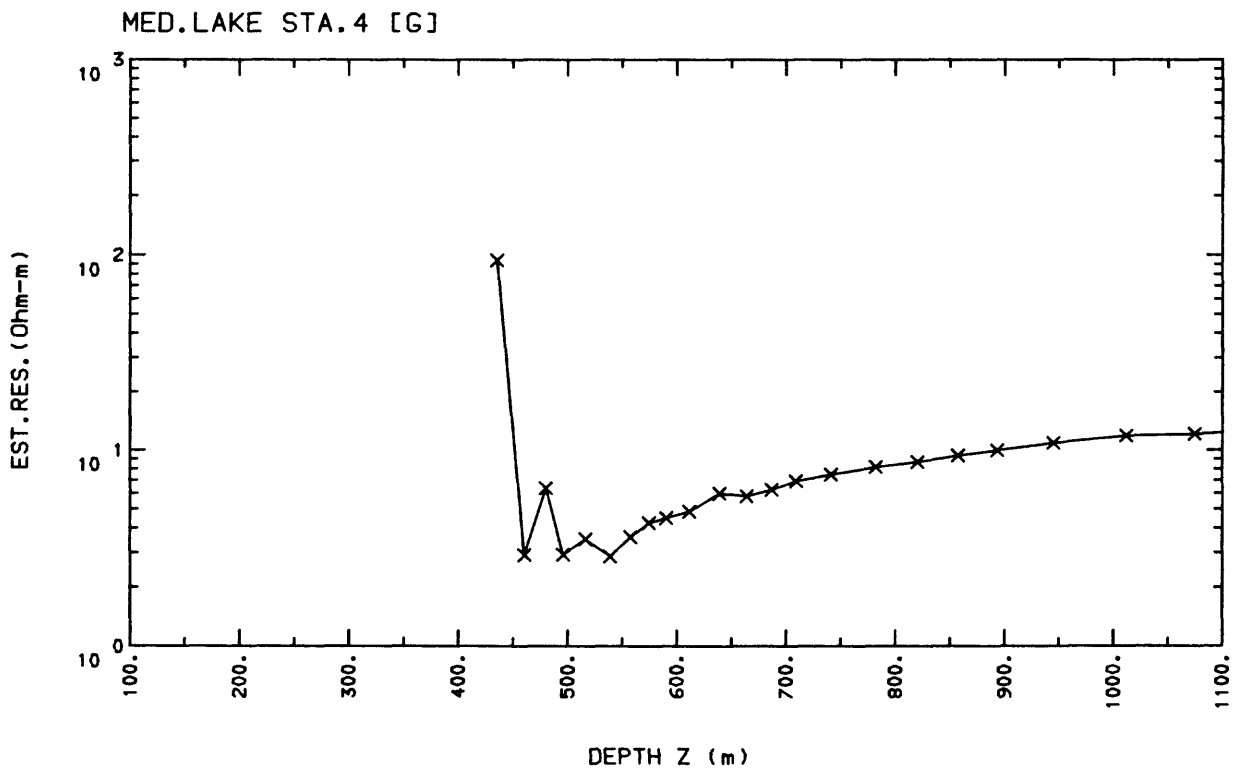





Fig. 12

MED.LAKE STA.5 [H]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.1056000E-07 | 0.1028243E-04 | 640.0795 | 289.8165 |
| 2 | 0.1200000E-02 | 0.4343500E-08 | 0.7911650E-05 | 700.4213 | 8.512280 |
| 3 | 0.1600000E-02 | 0.2638500E-08 | 0.6800985E-05 | 738.0231 | 34.30034 |
| 4 | 0.2000000E-02 | 0.1866500E-08 | 0.6084350E-05 | 766.7859 | 17.46571 |
| 5 | 0.2600000E-02 | 0.1184200E-08 | 0.5356292E-05 | 800.1732 | 15.94729 |
| 6 | 0.3400000E-02 | 0.7818999E-09 | 0.4730619E-05 | 834.6901 | 11.90669 |
| 7 | 0.4200000E-02 | 0.5811800E-09 | 0.4296846E-05 | 862.2927 | 10.36332 |
| 8 | 0.5000000E-02 | 0.4531800E-09 | 0.3967682E-05 | 885.8192 | 9.616709 |
| 9 | 0.5800000E-02 | 0.3652500E-09 | 0.3707232E-05 | 906.7461 | 8.948213 |
| 10 | 0.7000000E-02 | 0.2811300E-09 | 0.3398660E-05 | 933.7844 | 7.775112 |
| 11 | 0.8600000E-02 | 0.2155600E-09 | 0.3082497E-05 | 964.8800 | 7.763739 |
| 12 | 0.1020000E-01 | 0.1672300E-09 | 0.2838835E-05 | 993.0589 | 7.158998 |
| 13 | 0.1180000E-01 | 0.1407700E-09 | 0.2642781E-05 | 1016.991 | 6.322391 |
| 14 | 0.1340000E-01 | 0.1153700E-09 | 0.2479738E-05 | 1039.086 | 6.394201 |
| 15 | 0.1580000E-01 | 0.9560800E-10 | 0.2278285E-05 | 1069.219 | 6.221056 |
| 16 | 0.1900000E-01 | 0.7675000E-10 | 0.2058846E-05 | 1106.274 | 6.542090 |
| 17 | 0.2220000E-01 | 0.6273300E-10 | 0.1881262E-05 | 1140.523 | 6.513466 |
| 18 | 0.2540000E-01 | 0.5326800E-10 | 0.1733574E-05 | 1172.204 | 6.694894 |
| 19 | 0.2860000E-01 | 0.4550000E-10 | 0.1607827E-05 | 1202.413 | 6.659126 |
| 20 | 0.3340000E-01 | 0.3386800E-10 | 0.1456251E-05 | 1243.173 | 6.173784 |
| 21 | 0.3980000E-01 | 0.2930800E-10 | 0.1295380E-05 | 1292.926 | 6.416599 |
| 22 | 0.4620000E-01 | 0.2042500E-10 | 0.1168740E-05 | 1338.396 | 5.594378 |
| 23 | 0.5260000E-01 | 0.1721700E-10 | 0.1072888E-05 | 1377.389 | 5.500376 |
| 24 | 0.5900000E-01 | 0.1766700E-10 | 0.9840596E-06 | 1417.920 | 7.428136 |
| 25 | 0.6860000E-01 | 0.1475600E-10 | 0.8602155E-06 | 1483.384 | 9.457768 |
| 26 | 0.8140000E-01 | 0.1165600E-10 | 0.7257023E-06 | 1570.516 | 10.81189 |
| 27 | 0.9420000E-01 | 0.9344300E-11 | 0.6187503E-06 | 1656.707 | 12.43626 |

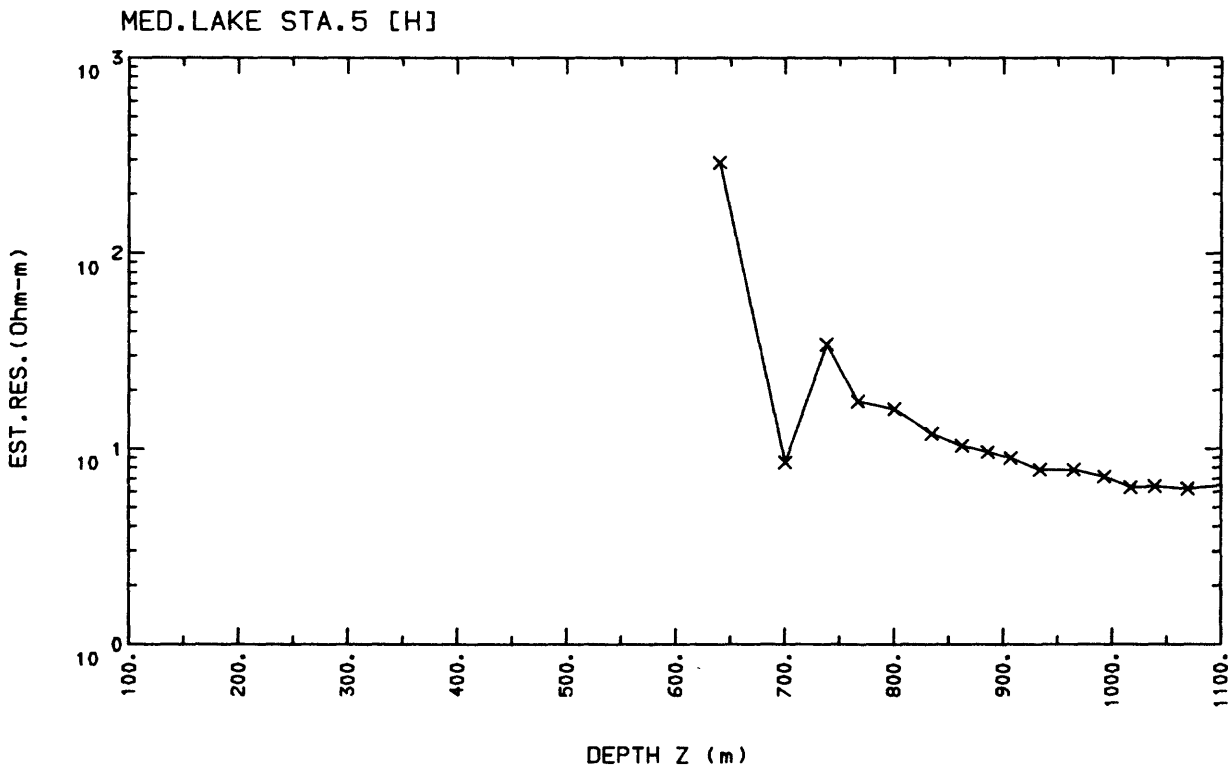





Fig. 13

MED.LAKE STA.6 [C]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.3266000E-07 | 0.8428149E-04 | 301.4819 | 33.04400 |
| 2 | 0.1200000E-02 | 0.2153000E-07 | 0.7566120E-04 | 314.0714 | 1.457991 |
| 3 | 0.1600000E-02 | 0.1595700E-07 | 0.6969794E-04 | 323.9561 | 2.937496 |
| 4 | 0.2000000E-02 | 0.1265100E-07 | 0.6514711E-04 | 331.9305 | 2.058157 |
| 5 | 0.2600000E-02 | 0.9790000E-08 | 0.5979150E-04 | 343.0909 | 1.809834 |
| 6 | 0.3400000E-02 | 0.7526700E-08 | 0.5428080E-04 | 355.3138 | 1.393960 |
| 7 | 0.4200000E-02 | 0.6132000E-08 | 0.4993419E-04 | 366.2857 | 1.216374 |
| 8 | 0.5000000E-02 | 0.5126700E-08 | 0.4635132E-04 | 376.2859 | 1.083573 |
| 9 | 0.5800000E-02 | 0.4520000E-08 | 0.4328146E-04 | 385.9071 | 1.022182 |
| 10 | 0.7000000E-02 | 0.3882300E-08 | 0.3927032E-04 | 399.7090 | 1.080479 |
| 11 | 0.8600000E-02 | 0.3200000E-08 | 0.3476215E-04 | 417.9766 | 1.945337 |
| 12 | 0.1020000E-01 | 0.2707200E-08 | 0.3100198E-04 | 435.0872 | 2.512804 |
| 13 | 0.1180000E-01 | 0.2334800E-08 | 0.2779254E-04 | 452.3858 | 3.483060 |
| 14 | 0.1340000E-01 | 0.2025200E-08 | 0.2501723E-04 | 469.9573 | 4.058780 |
| 15 | 0.1580000E-01 | 0.1674000E-08 | 0.2148505E-04 | 495.6441 | 4.859620 |
| 16 | 0.1900000E-01 | 0.1311600E-08 | 0.1768390E-04 | 530.6248 | 6.398264 |
| 17 | 0.2220000E-01 | 0.1040100E-08 | 0.1468981E-04 | 566.0277 | 7.737610 |
| 18 | 0.2540000E-01 | 0.8370000E-09 | 0.1229997E-04 | 601.9437 | 9.286037 |
| 19 | 0.2860000E-01 | 0.6787700E-09 | 0.1037015E-04 | 638.5173 | 10.90783 |
| 20 | 0.3340000E-01 | 0.5037700E-09 | 0.8111757E-05 | 694.6319 | 13.62564 |
| 21 | 0.3980000E-01 | 0.3436700E-09 | 0.5953836E-05 | 772.0705 | 17.41360 |
| 22 | 0.4620000E-01 | 0.2392900E-09 | 0.4469387E-05 | 851.2742 | 20.98444 |
| 23 | 0.5260000E-01 | 0.1719900E-09 | 0.3422103E-05 | 931.9069 | 24.90648 |
| 24 | 0.5900000E-01 | 0.1261900E-09 | 0.2662818E-05 | 1014.398 | 29.44211 |
| 25 | 0.6860000E-01 | 0.8025700E-10 | 0.1874265E-05 | 1141.966 | 36.48862 |
| 26 | 0.8140000E-01 | 0.4659000E-10 | 0.1228248E-05 | 1316.229 | 44.81480 |
| 27 | 0.9420000E-01 | 0.2826700E-10 | 0.8470105E-06 | 1491.075 | 50.55396 |
| 28 | 0.1070000 | 0.1792200E-10 | 0.6117755E-06 | 1662.868 | 56.62263 |
| 29 | 0.1198000 | 0.1242200E-10 | 0.4572371E-06 | 1833.145 | 58.78993 |
| 30 | 0.1390000 | 0.4811300E-11 | 0.3255858E-06 | 2053.683 | 36.92173 |
| 31 | 0.1646000 | 0.2511100E-11 | 0.2510010E-06 | 2240.502 | 18.46988 |

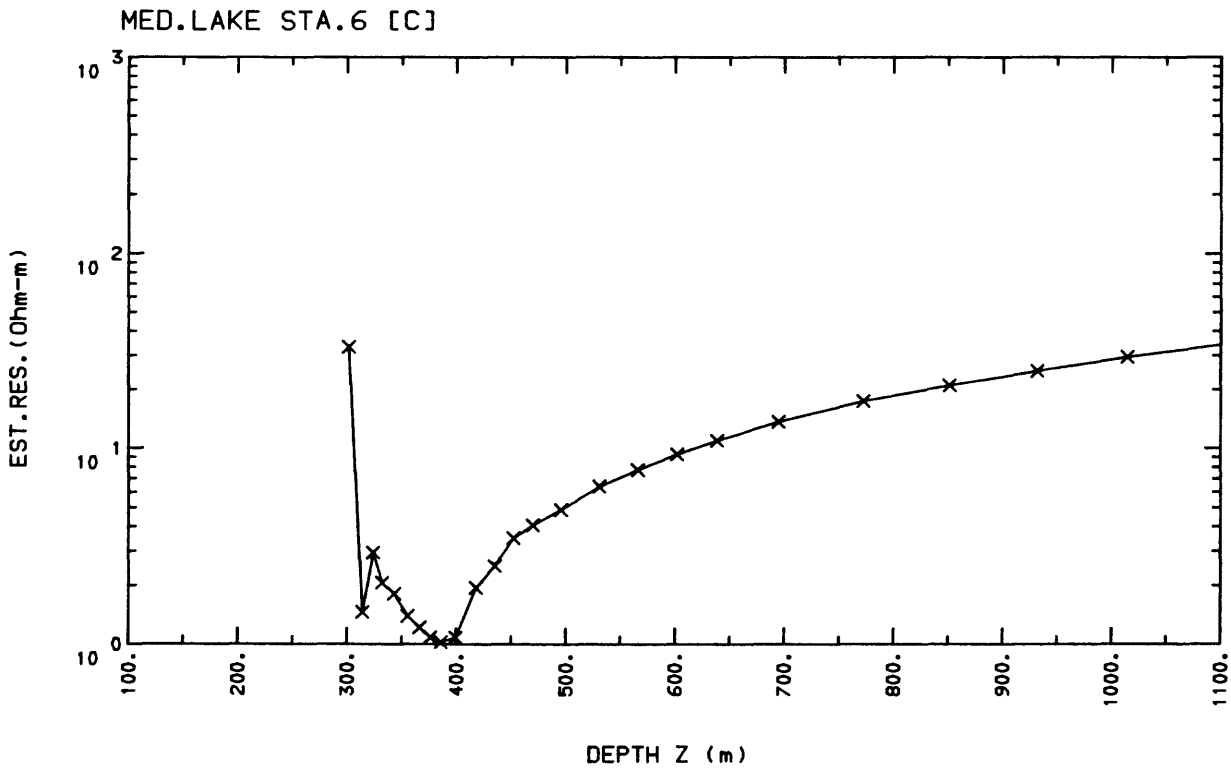





Fig. 14

MED.LAKE STA.7 [I]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.5688500E-07 | 0.5662795E-04 | 349.6504 | 84.03047 |
| 2 | 0.1200000E-02 | 0.2506200E-07 | 0.4359219E-04 | 385.2810 | 4.253025 |
| 3 | 0.1600000E-02 | 0.1647300E-07 | 0.3698500E-04 | 408.4491 | 9.224458 |
| 4 | 0.2000000E-02 | 0.1192900E-07 | 0.3246694E-04 | 428.0888 | 6.183858 |
| 5 | 0.2600000E-02 | 0.8242000E-08 | 0.2765307E-04 | 453.5379 | 8.307341 |
| 6 | 0.3400000E-02 | 0.5536600E-08 | 0.2326830E-04 | 481.6974 | 7.772239 |
| 7 | 0.4200000E-02 | 0.4050600E-08 | 0.2021737E-04 | 506.0444 | 8.177521 |
| 8 | 0.5000000E-02 | 0.3012200E-08 | 0.1796977E-04 | 527.8040 | 8.181516 |
| 9 | 0.5800000E-02 | 0.2531400E-08 | 0.1620563E-04 | 547.6015 | 8.209576 |
| 10 | 0.7000000E-02 | 0.1951400E-08 | 0.1406560E-04 | 574.8521 | 8.888824 |
| 11 | 0.8600000E-02 | 0.1456500E-08 | 0.1189634E-04 | 609.2875 | 10.08270 |
| 12 | 0.1020000E-01 | 0.1143100E-08 | 0.1024159E-04 | 641.4771 | 10.67426 |
| 13 | 0.1180000E-01 | 0.9163400E-09 | 0.8930672E-05 | 672.1000 | 11.71851 |
| 14 | 0.1340000E-01 | 0.7497400E-09 | 0.7870146E-05 | 701.9538 | 12.75552 |
| 15 | 0.1580000E-01 | 0.5761200E-09 | 0.6604148E-05 | 745.1978 | 14.20903 |
| 16 | 0.1900000E-01 | 0.4174600E-09 | 0.5339161E-05 | 801.3456 | 16.16223 |
| 17 | 0.2220000E-01 | 0.3116200E-09 | 0.4410925E-05 | 855.1610 | 17.30731 |
| 18 | 0.2540000E-01 | 0.2394400E-09 | 0.3709338E-05 | 906.7501 | 18.39884 |
| 19 | 0.2860000E-01 | 0.1871300E-09 | 0.3166246E-05 | 956.6577 | 19.71270 |
| 20 | 0.3340000E-01 | 0.1370300E-09 | 0.2547172E-05 | 1029.638 | 21.80481 |
| 21 | 0.3980000E-01 | 0.8942599E-10 | 0.1970525E-05 | 1122.837 | 22.85961 |
| 22 | 0.4620000E-01 | 0.6431600E-10 | 0.1579036E-05 | 1209.772 | 23.84338 |
| 23 | 0.5260000E-01 | 0.4812200E-10 | 0.1292724E-05 | 1293.803 | 25.61302 |
| 24 | 0.5900000E-01 | 0.3498800E-10 | 0.1081092E-05 | 1373.995 | 25.03841 |
| 25 | 0.6860000E-01 | 0.2256000E-10 | 0.8612800E-06 | 1482.721 | 23.25562 |
| 26 | 0.8140000E-01 | 0.1516000E-10 | 0.6663370E-06 | 1615.973 | 24.95547 |

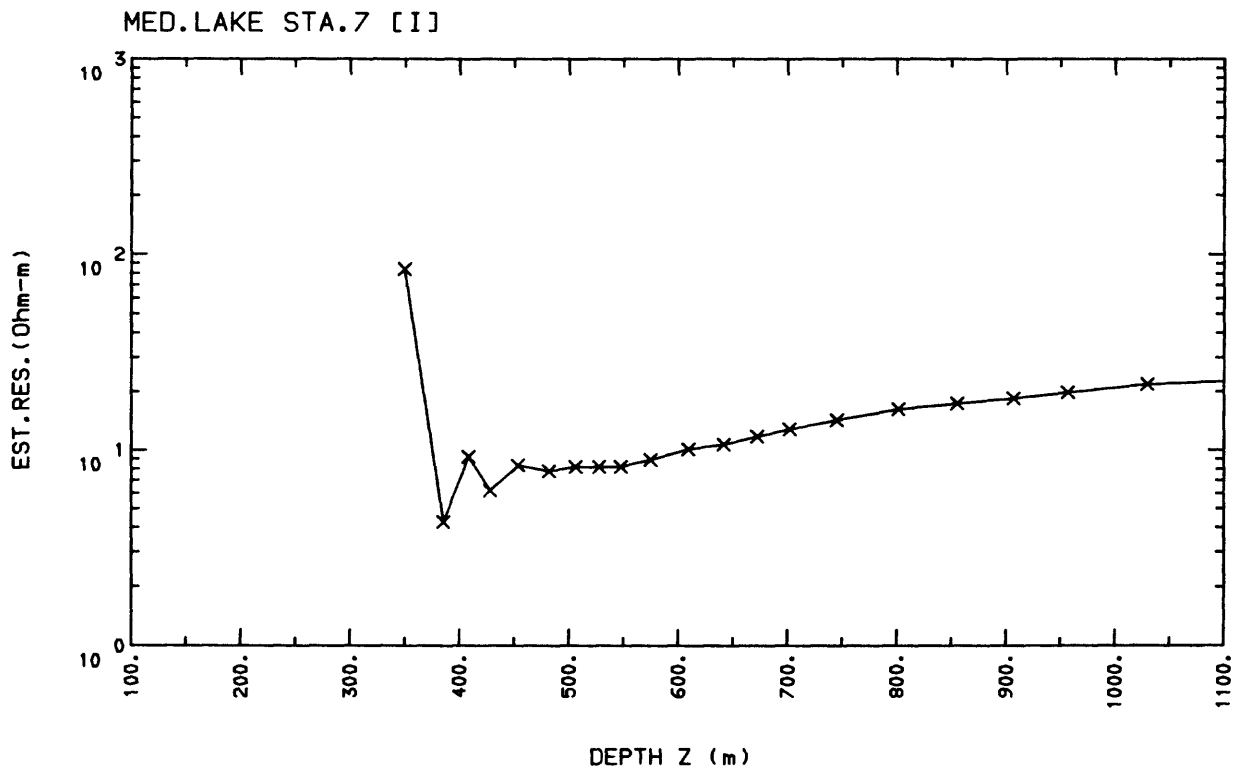





Fig. 15

MED.LAKE STA.8 [J]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.1200000E-02 | 0.3701000E-08 | 0.8093750E-05 | 695.4397 | 122.0949 |
| 2 | 0.1600000E-02 | 0.2272600E-08 | 0.7143497E-05 | 725.2548 | 3.295686 |
| 3 | 0.2000000E-02 | 0.1705600E-08 | 0.6510663E-05 | 748.7281 | 19.38833 |
| 4 | 0.2600000E-02 | 0.1232900E-08 | 0.5809381E-05 | 778.7456 | 11.02062 |
| 5 | 0.3400000E-02 | 0.8978500E-09 | 0.5131312E-05 | 812.4573 | 13.56792 |
| 6 | 0.4200000E-02 | 0.6911000E-09 | 0.4625660E-05 | 841.8378 | 11.93091 |
| 7 | 0.5000000E-02 | 0.5595000E-09 | 0.4227681E-05 | 867.1722 | 12.85688 |
| 8 | 0.5800000E-02 | 0.4639300E-09 | 0.3901995E-05 | 892.1710 | 13.97976 |
| 9 | 0.7000000E-02 | 0.3751000E-09 | 0.3501454E-05 | 925.0803 | 12.89084 |
| 10 | 0.8600000E-02 | 0.2872000E-09 | 0.3079873E-05 | 965.9494 | 14.54169 |
| 11 | 0.1020000E-01 | 0.2311600E-09 | 0.2749916E-05 | 1003.882 | 14.96927 |
| 12 | 0.1180000E-01 | 0.1890100E-09 | 0.2482461E-05 | 1039.191 | 14.76026 |
| 13 | 0.1340000E-01 | 0.1562700E-09 | 0.2262677E-05 | 1071.603 | 14.89848 |
| 14 | 0.1580000E-01 | 0.1271100E-09 | 0.1992091E-05 | 1118.601 | 16.73270 |
| 15 | 0.1900000E-01 | 0.9568000E-10 | 0.1708444E-05 | 1178.004 | 17.26812 |
| 16 | 0.2220000E-01 | 0.7419799E-10 | 0.1492162E-05 | 1232.891 | 18.00209 |
| 17 | 0.2540000E-01 | 0.6371800E-10 | 0.1316573E-05 | 1286.001 | 19.79504 |
| 18 | 0.2860000E-01 | 0.5099000E-10 | 0.1170531E-05 | 1337.713 | 20.95645 |
| 19 | 0.3340000E-01 | 0.3975800E-10 | 0.9972224E-06 | 1411.738 | 21.68164 |
| 20 | 0.3980000E-01 | 0.2726800E-10 | 0.8265475E-06 | 1503.510 | 22.12456 |
| 21 | 0.4620000E-01 | 0.2277500E-10 | 0.6991179E-06 | 1590.284 | 24.64568 |
| 22 | 0.5260000E-01 | 0.1750000E-10 | 0.5965617E-06 | 1676.864 | 27.51396 |
| 23 | 0.5900000E-01 | 0.1430000E-10 | 0.5155862E-06 | 1761.073 | 29.27959 |
| 24 | 0.6860000E-01 | 0.1035000E-10 | 0.4214321E-06 | 1884.030 | 31.11004 |
| 25 | 0.8140000E-01 | 0.6625300E-11 | 0.3349789E-06 | 2034.232 | 28.79049 |
| 26 | 0.9420000E-01 | 0.4808300E-11 | 0.2767490E-06 | 2168.522 | 29.17511 |
| 27 | 0.1070000 | 0.4000000E-11 | 0.2318894E-06 | 2300.749 | 33.63390 |

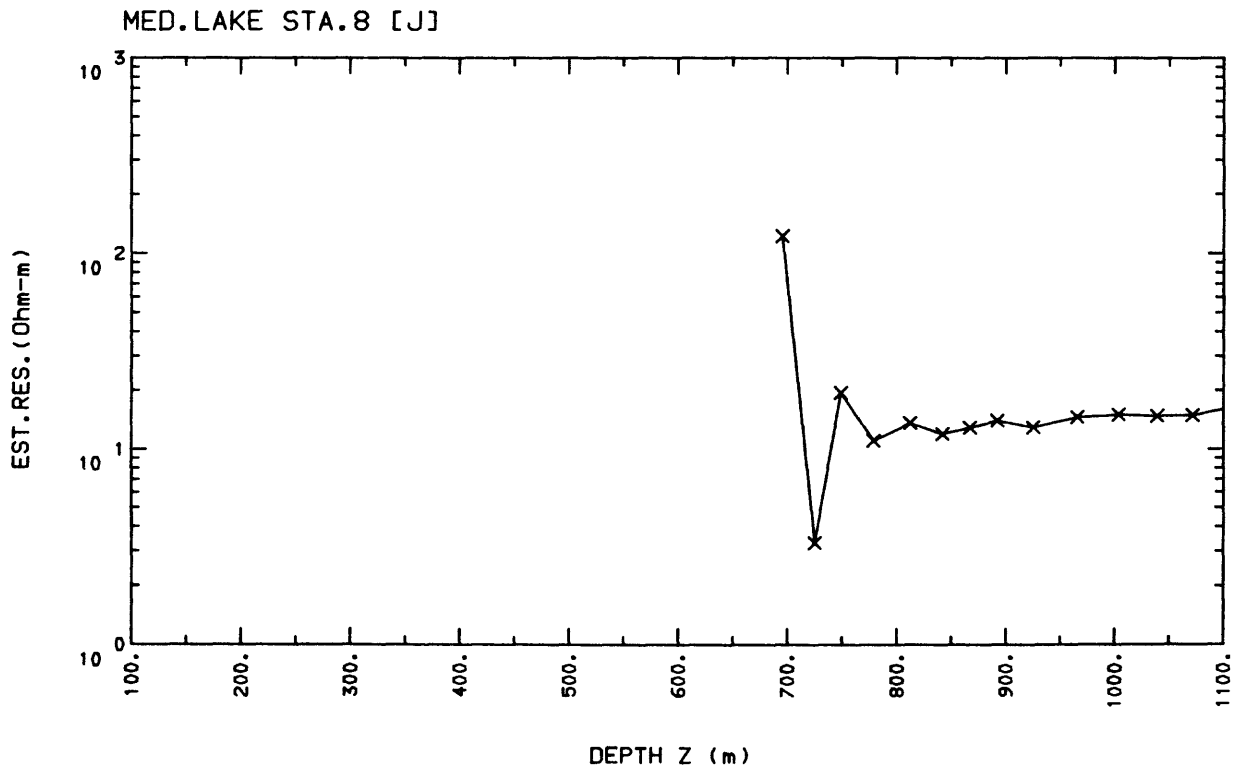





Fig. 16

MED.LAKE STA.9 [K]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.2600000E-02 | 0.1792800E-08 | 0.9102442E-05 | 667.4146 | 47.14936 |
| 2 | 0.3400000E-02 | 0.1232800E-08 | 0.8139604E-05 | 693.5718 | 1.561479 |
| 3 | 0.4200000E-02 | 0.9340000E-09 | 0.7450063E-05 | 715.0616 | 7.947584 |
| 4 | 0.5000000E-02 | 0.7681800E-09 | 0.6908377E-05 | 734.2010 | 4.954840 |
| 5 | 0.5800000E-02 | 0.6296000E-09 | 0.6463561E-05 | 750.9283 | 5.664255 |
| 6 | 0.7000000E-02 | 0.5278500E-09 | 0.5911012E-05 | 774.5663 | 6.149160 |
| 7 | 0.8600000E-02 | 0.4302500E-09 | 0.5301142E-05 | 803.3136 | 6.779800 |
| 8 | 0.1020000E-01 | 0.3600800E-09 | 0.4798065E-05 | 831.0433 | 8.155671 |
| 9 | 0.1180000E-01 | 0.3023800E-09 | 0.4376382E-05 | 857.8473 | 8.065095 |
| 10 | 0.1340000E-01 | 0.2730500E-09 | 0.4010098E-05 | 882.3193 | 8.921044 |
| 11 | 0.1580000E-01 | 0.2295800E-09 | 0.3530161E-05 | 921.7391 | 12.55259 |
| 12 | 0.1900000E-01 | 0.1826600E-09 | 0.3005314E-05 | 974.2173 | 14.00583 |
| 13 | 0.2220000E-01 | 0.1509500E-09 | 0.2580575E-05 | 1025.208 | 16.43308 |
| 14 | 0.2540000E-01 | 0.1237000E-09 | 0.2230902E-05 | 1076.823 | 18.83848 |
| 15 | 0.2860000E-01 | 0.9944300E-10 | 0.1946805E-05 | 1127.420 | 20.60411 |
| 16 | 0.3340000E-01 | 0.8139800E-10 | 0.1601439E-05 | 1203.938 | 25.47372 |
| 17 | 0.3980000E-01 | 0.5755800E-10 | 0.1247601E-05 | 1309.468 | 32.47443 |
| 18 | 0.4620000E-01 | 0.4626800E-10 | 0.9832186E-06 | 1418.332 | 41.21947 |
| 19 | 0.5260000E-01 | 0.3370800E-10 | 0.7795678E-06 | 1533.279 | 51.93323 |
| 20 | 0.5900000E-01 | 0.2775000E-10 | 0.6230711E-06 | 1652.879 | 62.87865 |
| 21 | 0.6860000E-01 | 0.1669200E-10 | 0.4533187E-06 | 1838.580 | 74.76079 |
| 22 | 0.8140000E-01 | 0.1061700E-10 | 0.3142372E-06 | 2078.199 | 78.82114 |
| 23 | 0.9420000E-01 | 0.5424800E-11 | 0.2325383E-06 | 2298.527 | 69.49018 |
| 24 | 0.1070000 | 0.4066700E-11 | 0.1841992E-06 | 2484.622 | 58.59031 |
| 25 | 0.1198000 | 0.2216700E-11 | 0.1521987E-06 | 2647.856 | 45.40028 |
| 26 | 0.1390000 | 0.1383400E-11 | 0.1246962E-06 | 2830.281 | 29.92590 |

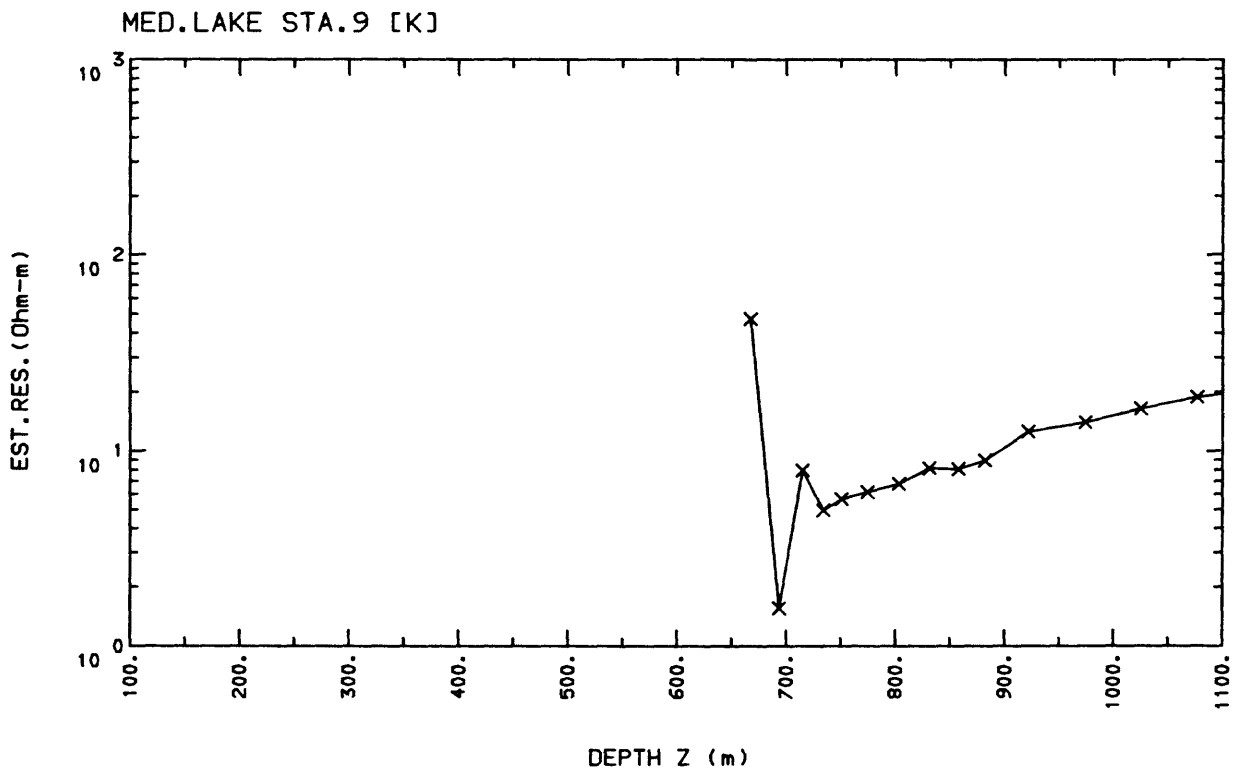





Fig. 17

MED.LAKE STA.10 [E]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.2217000E-07 | 0.3625473E-04 | 412.1177 | 84.79508 |
| 2 | 0.1200000E-02 | 0.1278500E-07 | 0.3069425E-04 | 436.5725 | 2.967944 |
| 3 | 0.1600000E-02 | 0.8389500E-08 | 0.2732590E-04 | 455.4407 | 5.000698 |
| 4 | 0.2000000E-02 | 0.6456500E-08 | 0.2496427E-04 | 470.3653 | 2.734694 |
| 5 | 0.2600000E-02 | 0.4827500E-08 | 0.2227131E-04 | 489.2208 | 3.036407 |
| 6 | 0.3400000E-02 | 0.3931800E-08 | 0.1948384E-04 | 513.1704 | 5.137183 |
| 7 | 0.4200000E-02 | 0.3184800E-08 | 0.1721912E-04 | 535.0676 | 7.238356 |
| 8 | 0.5000000E-02 | 0.2674800E-08 | 0.1535442E-04 | 557.2070 | 9.233355 |
| 9 | 0.5800000E-02 | 0.2268300E-08 | 0.1378137E-04 | 578.3032 | 10.20778 |
| 10 | 0.7000000E-02 | 0.1842700E-08 | 0.1181884E-04 | 609.8745 | 13.46572 |
| 11 | 0.8600000E-02 | 0.1401300E-08 | 0.9753904E-05 | 652.3083 | 16.14152 |
| 12 | 0.1020000E-01 | 0.1096300E-08 | 0.8164081E-05 | 692.8621 | 18.36036 |
| 13 | 0.1180000E-01 | 0.8609000E-09 | 0.6918244E-05 | 733.2995 | 21.01258 |
| 14 | 0.1340000E-01 | 0.6861800E-09 | 0.5933466E-05 | 772.6565 | 22.99426 |
| 15 | 0.1580000E-01 | 0.5060000E-09 | 0.4795113E-05 | 831.1733 | 26.47863 |
| 16 | 0.1900000E-01 | 0.3398800E-09 | 0.3718172E-05 | 906.0117 | 28.23651 |
| 17 | 0.2220000E-01 | 0.2359600E-09 | 0.2985036E-05 | 975.9218 | 28.50092 |
| 18 | 0.2540000E-01 | 0.1691000E-09 | 0.2469330E-05 | 1040.496 | 27.59805 |
| 19 | 0.2860000E-01 | 0.1246400E-09 | 0.2095352E-05 | 1099.829 | 26.37461 |
| 20 | 0.3340000E-01 | 0.8356800E-10 | 0.1697721E-05 | 1180.510 | 24.43021 |
| 21 | 0.3980000E-01 | 0.5135000E-10 | 0.1354165E-05 | 1273.774 | 20.31388 |
| 22 | 0.4620000E-01 | 0.3343500E-10 | 0.1138269E-05 | 1350.319 | 15.61081 |
| 23 | 0.5260000E-01 | 0.2330900E-10 | 0.9937760E-06 | 1413.477 | 12.72222 |
| 24 | 0.5900000E-01 | 0.1925800E-10 | 0.8853833E-06 | 1469.114 | 12.13558 |
| 25 | 0.6860000E-01 | 0.1372500E-10 | 0.7594002E-06 | 1546.814 | 11.75114 |
| 26 | 0.8140000E-01 | 0.9316800E-11 | 0.6420511E-06 | 1636.334 | 9.553926 |
| 27 | 0.9420000E-01 | 0.6683500E-11 | 0.5605635E-06 | 1712.294 | 8.954892 |
| 28 | 0.1070000 | 0.6783500E-11 | 0.4919776E-06 | 1788.924 | 13.45040 |
| 29 | 0.1198000 | 0.6450000E-11 | 0.4245810E-06 | 1879.340 | 18.20047 |
| 30 | 0.1390000 | 0.4600000E-11 | 0.3401661E-06 | 2024.012 | 29.73638 |
| 31 | 0.1646000 | 0.5433500E-11 | 0.2379665E-06 | 2280.802 | 56.10327 |

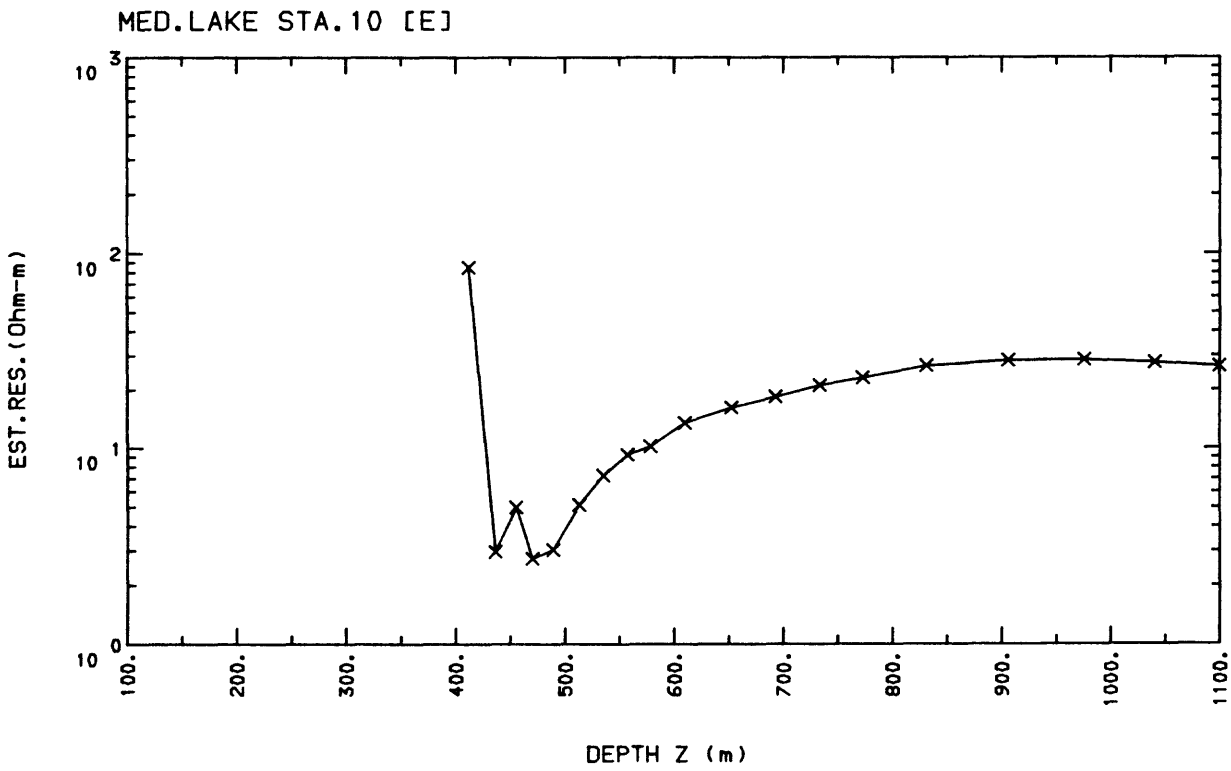





Fig. 18

MED.LAKE STA.11 [M]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.1200000E-02 | 0.1326000E-07 | 0.2492942E-04 | 470.1828 | 62.93102 |
| 2 | 0.1600000E-02 | 0.9103000E-08 | 0.2137202E-04 | 496.4091 | 3.646523 |
| 3 | 0.2000000E-02 | 0.6601000E-08 | 0.1887390E-04 | 519.0353 | 15.71813 |
| 4 | 0.2600000E-02 | 0.4538000E-08 | 0.1621554E-04 | 547.1472 | 9.158103 |
| 5 | 0.3400000E-02 | 0.3033000E-08 | 0.1380622E-04 | 578.1883 | 10.80714 |
| 6 | 0.4200000E-02 | 0.2238000E-08 | 0.1212883E-04 | 605.1194 | 9.983321 |
| 7 | 0.5000000E-02 | 0.1699000E-08 | 0.1087596E-04 | 628.4448 | 9.685381 |
| 8 | 0.5800000E-02 | 0.1398000E-08 | 0.9890397E-05 | 649.6826 | 9.423116 |
| 9 | 0.7000000E-02 | 0.1069000E-08 | 0.8712687E-05 | 677.8988 | 9.400166 |
| 10 | 0.8600000E-02 | 0.7937000E-09 | 0.7527004E-05 | 712.9489 | 9.946545 |
| 11 | 0.1020000E-01 | 0.6201999E-09 | 0.6627000E-05 | 744.2358 | 10.01993 |
| 12 | 0.1180000E-01 | 0.5055000E-09 | 0.5910447E-05 | 774.0724 | 10.72984 |
| 13 | 0.1340000E-01 | 0.4164000E-09 | 0.5323620E-05 | 802.0643 | 10.89475 |
| 14 | 0.1580000E-01 | 0.3280000E-09 | 0.4612830E-05 | 842.1027 | 11.91586 |
| 15 | 0.1900000E-01 | 0.2506000E-09 | 0.3876180E-05 | 893.2580 | 13.41230 |
| 16 | 0.2220000E-01 | 0.1957000E-09 | 0.3307968E-05 | 942.6722 | 14.45324 |
| 17 | 0.2540000E-01 | 0.1530000E-09 | 0.2864017E-05 | 989.6296 | 15.19909 |
| 18 | 0.2860000E-01 | 0.1265000E-09 | 0.2508169E-05 | 1035.011 | 15.96704 |
| 19 | 0.3340000E-01 | 0.9200000E-10 | 0.2090882E-05 | 1100.618 | 18.29398 |
| 20 | 0.3980000E-01 | 0.7960000E-10 | 0.1653920E-05 | 1190.916 | 23.96295 |
| 21 | 0.4620000E-01 | 0.4450000E-10 | 0.1337912E-05 | 1278.946 | 20.59425 |
| 22 | 0.5260000E-01 | 0.3360000E-10 | 0.1139038E-05 | 1350.126 | 17.86405 |
| 23 | 0.5900000E-01 | 0.2880000E-10 | 0.9801430E-06 | 1419.812 | 18.97100 |
| 24 | 0.6860000E-01 | 0.1620000E-10 | 0.8118005E-06 | 1512.131 | 16.87043 |

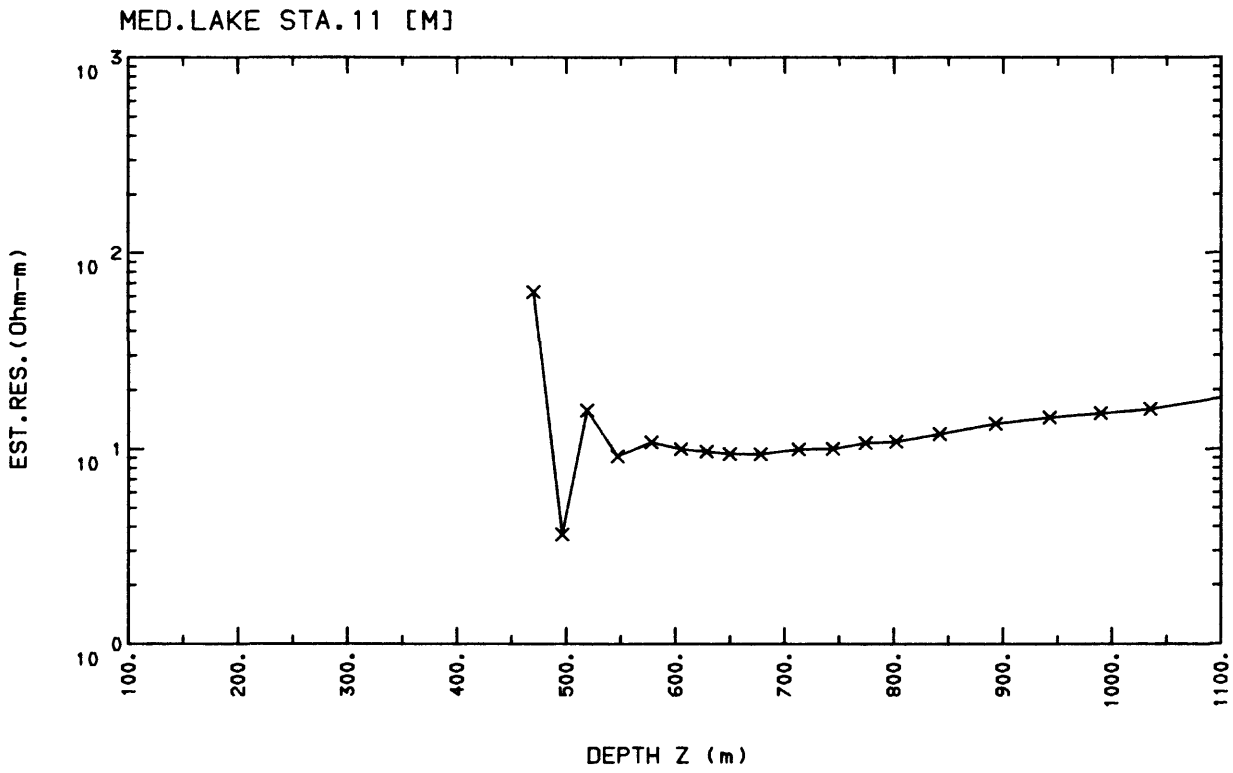





Fig. 19

MED.LAKE STA.12 [N]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.1600000E-02 | 0.3738000E-08 | 0.9972368E-05 | 647.3475 | 66.56281 |
| 2 | 0.2000000E-02 | 0.2525000E-08 | 0.8976080E-05 | 670.7229 | 3.001070 |
| 3 | 0.2600000E-02 | 0.1771000E-08 | 0.7950826E-05 | 699.5140 | 15.34151 |
| 4 | 0.3400000E-02 | 0.1186000E-08 | 0.7009819E-05 | 730.5680 | 8.058324 |
| 5 | 0.4200000E-02 | 0.8907000E-09 | 0.6348951E-05 | 755.1064 | 8.247600 |
| 6 | 0.5000000E-02 | 0.7202000E-09 | 0.5836313E-05 | 777.0686 | 8.717978 |
| 7 | 0.5800000E-02 | 0.5735000E-09 | 0.5424619E-05 | 797.3741 | 8.082579 |
| 8 | 0.7000000E-02 | 0.4503000E-09 | 0.4935872E-05 | 822.7005 | 6.993291 |
| 9 | 0.8600000E-02 | 0.3367000E-09 | 0.4434915E-05 | 853.7026 | 7.567904 |
| 10 | 0.1020000E-01 | 0.2843000E-09 | 0.4039623E-05 | 881.0212 | 7.126008 |
| 11 | 0.1180000E-01 | 0.2207000E-09 | 0.3718170E-05 | 906.0894 | 7.192736 |
| 12 | 0.1340000E-01 | 0.2004000E-09 | 0.3450123E-05 | 929.4061 | 7.540681 |
| 13 | 0.1580000E-01 | 0.1646000E-09 | 0.3101603E-05 | 963.4788 | 8.464409 |
| 14 | 0.1900000E-01 | 0.1280000E-09 | 0.2729076E-05 | 1005.935 | 8.628725 |
| 15 | 0.2220000E-01 | 0.1007000E-09 | 0.2437905E-05 | 1045.000 | 8.616103 |
| 16 | 0.2540000E-01 | 0.8530000E-10 | 0.2201097E-05 | 1081.639 | 9.423646 |
| 17 | 0.2860000E-01 | 0.7589999E-10 | 0.1995864E-05 | 1117.997 | 10.07024 |
| 18 | 0.3340000E-01 | 0.5190000E-10 | 0.1751794E-05 | 1168.118 | 9.412989 |
| 19 | 0.3980000E-01 | 0.4830000E-10 | 0.1496645E-05 | 1231.743 | 12.90780 |
| 20 | 0.4620000E-01 | 0.4530000E-10 | 0.1258302E-05 | 1305.597 | 20.07988 |
| 21 | 0.5260000E-01 | 0.3460000E-10 | 0.1054844E-05 | 1385.366 | 24.35511 |

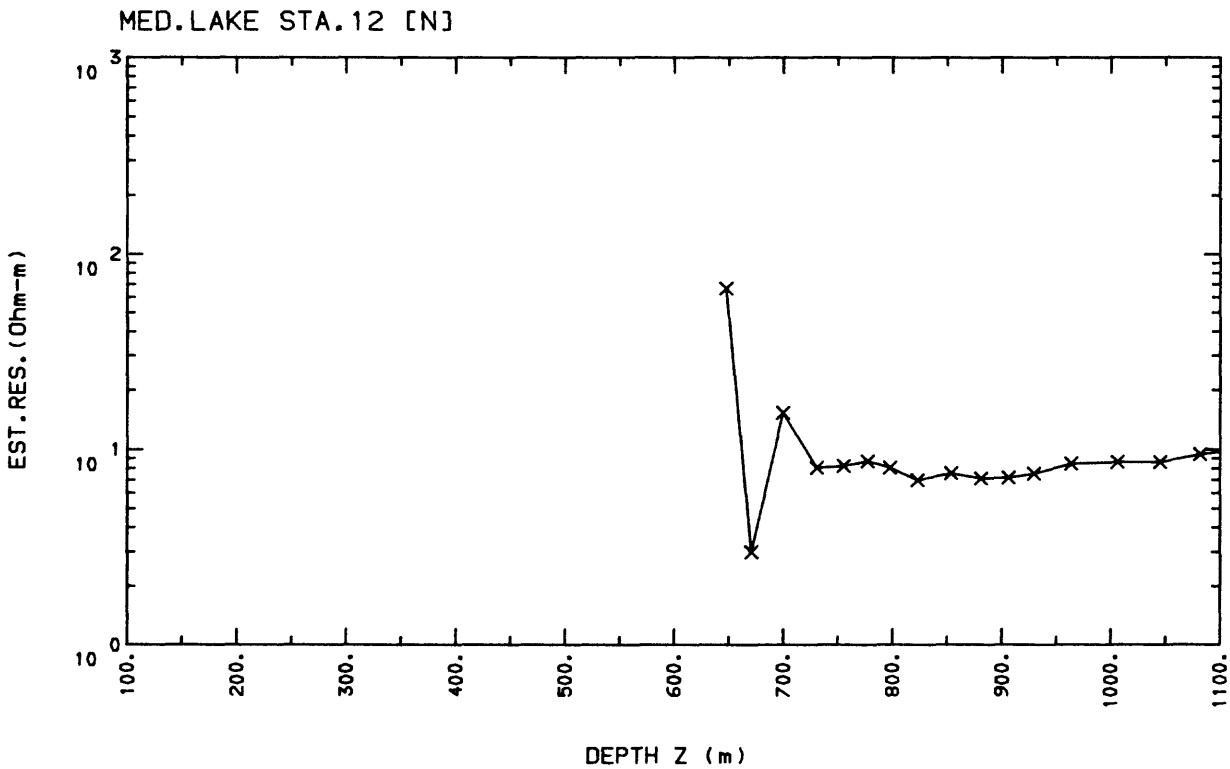





Fig. 20

MED.LAKE STA.13 [O]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.1200000E-02 | 0.1184000E-07 | 0.2761642E-04 | 453.1788 | 50.29772 |
| 2 | 0.1600000E-02 | 0.7810000E-08 | 0.2449059E-04 | 473.5800 | 2.726856 |
| 3 | 0.2000000E-02 | 0.5657000E-08 | 0.2234832E-04 | 488.4460 | 3.716872 |
| 4 | 0.2600000E-02 | 0.3759000E-08 | 0.2010116E-04 | 507.5777 | 2.341481 |
| 5 | 0.3400000E-02 | 0.2586000E-08 | 0.1808199E-04 | 526.8693 | 1.800733 |
| 6 | 0.4200000E-02 | 0.1981000E-08 | 0.1662863E-04 | 541.7841 | 1.628212 |
| 7 | 0.5000000E-02 | 0.1707000E-08 | 0.1545500E-04 | 556.3795 | 1.885540 |
| 8 | 0.5800000E-02 | 0.1398000E-08 | 0.1446689E-04 | 568.6870 | 1.781996 |
| 9 | 0.7000000E-02 | 0.1138000E-08 | 0.1325624E-04 | 586.6232 | 2.930171 |
| 10 | 0.8600000E-02 | 0.9327999E-09 | 0.1193809E-04 | 607.9420 | 3.108516 |
| 11 | 0.1020000E-01 | 0.7827000E-09 | 0.1084611E-04 | 628.3320 | 4.012757 |
| 12 | 0.1180000E-01 | 0.6635000E-09 | 0.9925545E-05 | 648.2504 | 4.398248 |
| 13 | 0.1340000E-01 | 0.5823000E-09 | 0.9132543E-05 | 667.0388 | 4.641901 |
| 14 | 0.1580000E-01 | 0.4726000E-09 | 0.8125271E-05 | 694.2614 | 5.256629 |
| 15 | 0.1900000E-01 | 0.3731000E-09 | 0.7048560E-05 | 728.8694 | 5.833419 |
| 16 | 0.2220000E-01 | 0.3056000E-09 | 0.6184467E-05 | 762.1322 | 6.526545 |
| 17 | 0.2540000E-01 | 0.2522000E-09 | 0.5474298E-05 | 794.5570 | 7.161190 |
| 18 | 0.2860000E-01 | 0.2136000E-09 | 0.4881260E-05 | 826.1470 | 7.786629 |
| 19 | 0.3340000E-01 | 0.1660000E-09 | 0.4156308E-05 | 872.5728 | 8.692839 |
| 20 | 0.3980000E-01 | 0.1241000E-09 | 0.3417597E-05 | 932.3332 | 9.667625 |
| 21 | 0.4620000E-01 | 0.9360000E-10 | 0.2863246E-05 | 989.8410 | 10.16130 |
| 22 | 0.5260000E-01 | 0.7120000E-10 | 0.2443599E-05 | 1044.159 | 10.65831 |
| 23 | 0.5900000E-01 | 0.6060000E-10 | 0.2107983E-05 | 1097.506 | 11.84706 |
| 24 | 0.6860000E-01 | 0.4140000E-10 | 0.1718380E-05 | 1175.818 | 12.44564 |
| 25 | 0.8140000E-01 | 0.2870000E-10 | 0.1361369E-05 | 1271.618 | 12.21307 |
| 26 | 0.9420000E-01 | 0.1920000E-10 | 0.1117420E-05 | 1358.729 | 10.84194 |
| 27 | 0.1070000 | 0.1370000E-10 | 0.9529070E-06 | 1433.334 | 9.794569 |

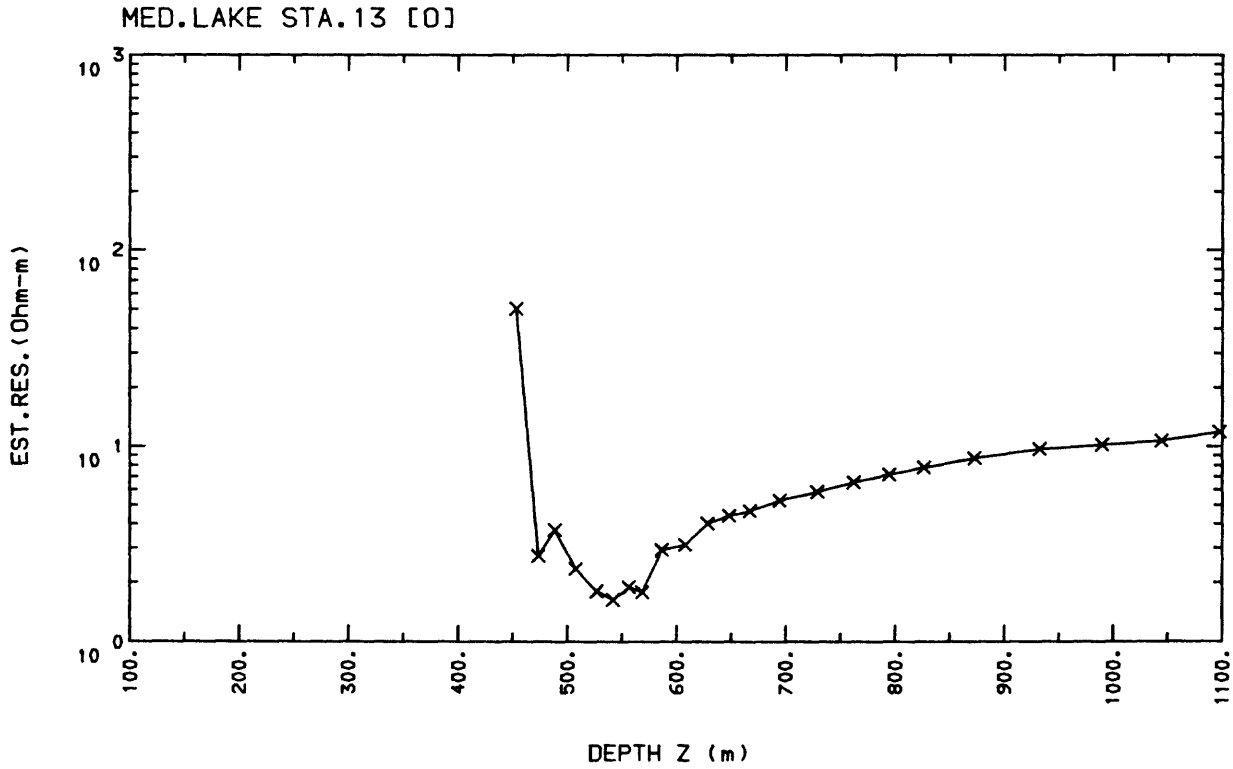





Fig. 21

MED.LAKE STA.14 [P]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.7353000E-07 | 0.5422081E-04 | 355.3916 | 114.3291 |
| 2 | 0.1200000E-02 | 0.3264000E-07 | 0.3733177E-04 | 406.9770 | 20.31812 |
| 3 | 0.1600000E-02 | 0.2095000E-07 | 0.2880692E-04 | 446.3636 | 40.03031 |
| 4 | 0.2000000E-02 | 0.1454000E-07 | 0.2316133E-04 | 482.3890 | 39.47138 |
| 5 | 0.2600000E-02 | 0.9019000E-08 | 0.1753891E-04 | 532.3307 | 44.82250 |
| 6 | 0.3400000E-02 | 0.5258000E-08 | 0.1299554E-04 | 590.3471 | 42.91560 |
| 7 | 0.4200000E-02 | 0.3351000E-08 | 0.1025589E-04 | 640.6571 | 40.22478 |
| 8 | 0.5000000E-02 | 0.2289000E-08 | 0.8461075E-05 | 684.2325 | 37.42860 |
| 9 | 0.5800000E-02 | 0.1619000E-08 | 0.7217431E-05 | 723.2643 | 34.05320 |
| 10 | 0.7000000E-02 | 0.1078000E-08 | 0.5929922E-05 | 772.8266 | 29.51373 |
| 11 | 0.8600000E-02 | 0.6836000E-09 | 0.4808594E-05 | 830.6588 | 26.70973 |
| 12 | 0.1020000E-01 | 0.4799000E-09 | 0.4067979E-05 | 878.8156 | 22.91643 |
| 13 | 0.1180000E-01 | 0.3598000E-09 | 0.3533476E-05 | 921.7826 | 21.92099 |
| 14 | 0.1340000E-01 | 0.2762000E-09 | 0.3128636E-05 | 960.5124 | 20.43431 |
| 15 | 0.1580000E-01 | 0.2004000E-09 | 0.2673555E-05 | 1012.941 | 19.54669 |
| 16 | 0.1900000E-01 | 0.1427000E-09 | 0.2236734E-05 | 1075.799 | 18.96334 |
| 17 | 0.2220000E-01 | 0.1051000E-09 | 0.1921244E-05 | 1132.444 | 18.10579 |
| 18 | 0.2540000E-01 | 0.8070000E-10 | 0.1684691E-05 | 1183.669 | 17.11152 |
| 19 | 0.2860000E-01 | 0.6500000E-10 | 0.1499192E-05 | 1230.920 | 17.25474 |
| 20 | 0.3340000E-01 | 0.5080000E-10 | 0.1278039E-05 | 1298.903 | 18.65279 |
| 21 | 0.3980000E-01 | 0.3590000E-10 | 0.1057267E-05 | 1384.192 | 18.58925 |
| 22 | 0.4620000E-01 | 0.2680000E-10 | 0.8976073E-06 | 1462.378 | 19.61906 |
| 23 | 0.5260000E-01 | 0.2420000E-10 | 0.7677409E-06 | 1541.183 | 24.53730 |
| 24 | 0.5900000E-01 | 0.1930000E-10 | 0.6569726E-06 | 1623.764 | 29.32733 |

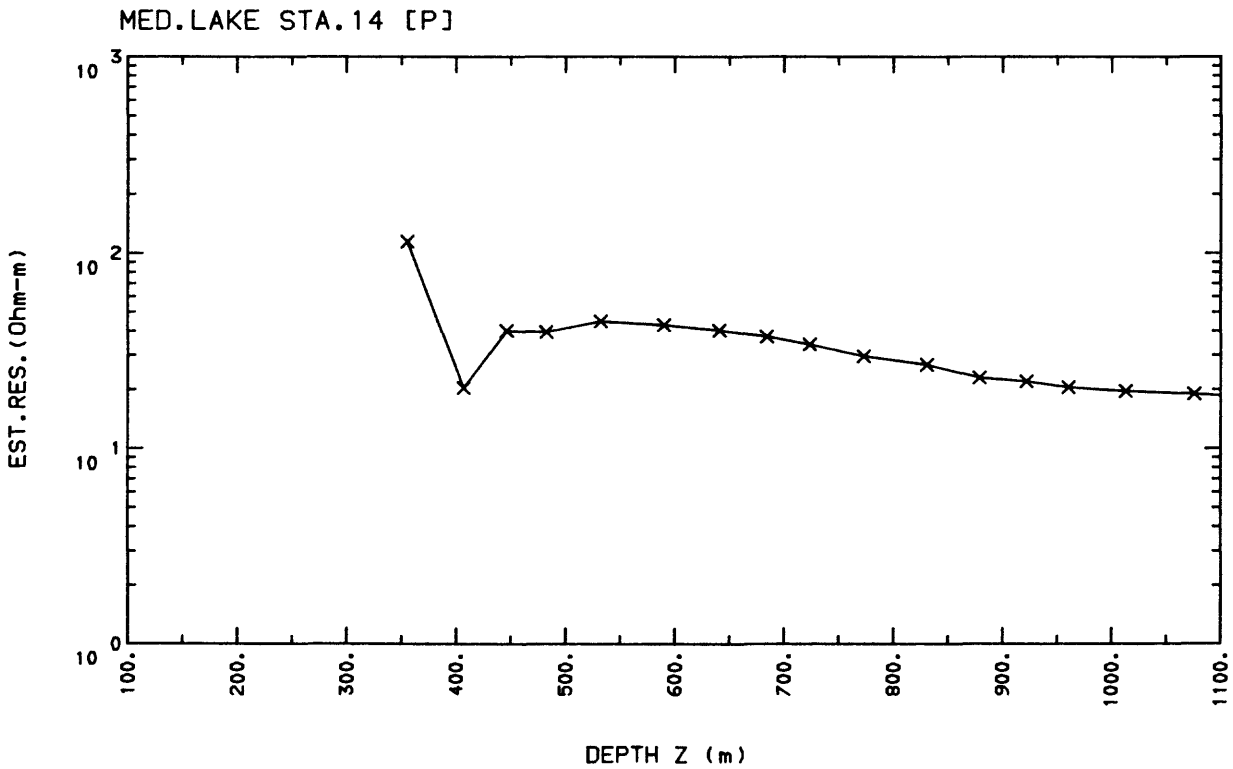





Fig. 22

MED.LAKE STA.15 [Q]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.7663000E-07 | 0.8128244E-04 | 305.6345 | 57.96859 |
| 2 | 0.1200000E-02 | 0.3369000E-07 | 0.6373324E-04 | 334.6840 | 3.810002 |
| 3 | 0.1600000E-02 | 0.2216000E-07 | 0.5484888E-04 | 354.1918 | 4.307415 |
| 4 | 0.2000000E-02 | 0.1615000E-07 | 0.4875470E-04 | 369.7424 | 2.955305 |
| 5 | 0.2600000E-02 | 0.1146000E-07 | 0.4216550E-04 | 389.5465 | 3.138431 |
| 6 | 0.3400000E-02 | 0.8092000E-08 | 0.3594346E-04 | 413.0502 | 4.490049 |
| 7 | 0.4200000E-02 | 0.6079000E-08 | 0.3143381E-04 | 433.3825 | 4.479114 |
| 8 | 0.5000000E-02 | 0.4767000E-08 | 0.2798229E-04 | 451.2231 | 5.531036 |
| 9 | 0.5800000E-02 | 0.3928000E-08 | 0.2521527E-04 | 468.9983 | 6.201785 |
| 10 | 0.7000000E-02 | 0.3022000E-08 | 0.2189745E-04 | 492.1467 | 5.977061 |
| 11 | 0.8600000E-02 | 0.2250000E-08 | 0.1854161E-04 | 522.1412 | 7.475430 |
| 12 | 0.1020000E-01 | 0.1752000E-08 | 0.1599417E-04 | 549.7739 | 7.471781 |
| 13 | 0.1180000E-01 | 0.1396000E-08 | 0.1399034E-04 | 575.6820 | 8.120035 |
| 14 | 0.1340000E-01 | 0.1141000E-08 | 0.1237544E-04 | 600.7249 | 8.745637 |
| 15 | 0.1580000E-01 | 0.8709000E-09 | 0.1045438E-04 | 636.6808 | 9.494335 |
| 16 | 0.1900000E-01 | 0.6302000E-09 | 0.8543237E-05 | 682.4169 | 10.43434 |
| 17 | 0.2220000E-01 | 0.4746999E-09 | 0.7136523E-05 | 725.8395 | 11.09817 |
| 18 | 0.2540000E-01 | 0.3650000E-09 | 0.6067449E-05 | 767.1927 | 11.56401 |
| 19 | 0.2860000E-01 | 0.2855000E-09 | 0.5239258E-05 | 806.5406 | 11.85043 |
| 20 | 0.3340000E-01 | 0.2069000E-09 | 0.4298883E-05 | 862.5043 | 12.50692 |
| 21 | 0.3980000E-01 | 0.1434000E-09 | 0.3406879E-05 | 933.3175 | 13.15909 |
| 22 | 0.4620000E-01 | 0.1018000E-09 | 0.2782502E-05 | 999.3574 | 13.49853 |
| 23 | 0.5260000E-01 | 0.7680000E-10 | 0.2327715E-05 | 1061.526 | 13.20830 |
| 24 | 0.5900000E-01 | 0.5370000E-10 | 0.1995410E-05 | 1117.997 | 12.13576 |
| 25 | 0.6860000E-01 | 0.3970000E-10 | 0.1638656E-05 | 1194.762 | 11.88619 |
| 26 | 0.8140000E-01 | 0.2530000E-10 | 0.1307619E-05 | 1288.827 | 11.04989 |
| 27 | 0.9420000E-01 | 0.1850000E-10 | 0.1089427E-05 | 1370.352 | 10.35706 |

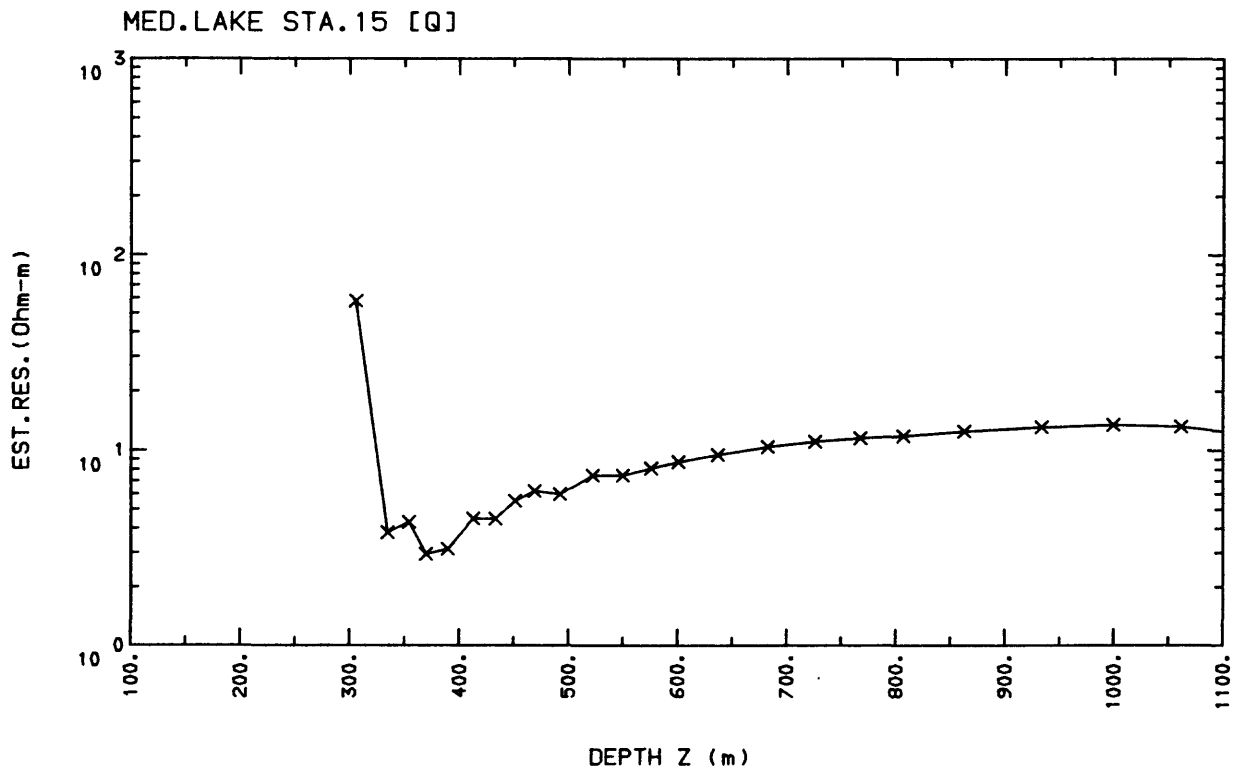





Fig. 23

MED.LAKE STA.16 [R]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.2309000E-07 | 0.1187015E-04 | 609.7198 | 431.5401 |
| 2 | 0.1200000E-02 | 0.3691000E-08 | 0.7609956E-05 | 709.6235 | 53.13816 |
| 3 | 0.1600000E-02 | 0.2936000E-08 | 0.6555763E-05 | 747.5214 | 25.17977 |
| 4 | 0.2000000E-02 | 0.2062000E-08 | 0.5760704E-05 | 780.5359 | 34.32156 |
| 5 | 0.2600000E-02 | 0.1430000E-08 | 0.4927328E-05 | 823.9598 | 29.29994 |
| 6 | 0.3400000E-02 | 0.9327000E-09 | 0.4175445E-05 | 870.6129 | 26.58674 |
| 7 | 0.4200000E-02 | 0.7201000E-09 | 0.3649474E-05 | 911.7487 | 28.26350 |
| 8 | 0.5000000E-02 | 0.5860000E-09 | 0.3233834E-05 | 949.9130 | 29.95273 |
| 9 | 0.5800000E-02 | 0.4558000E-09 | 0.2902302E-05 | 985.6667 | 29.90892 |
| 10 | 0.7000000E-02 | 0.3570000E-09 | 0.2514283E-05 | 1034.246 | 30.61142 |
| 11 | 0.8600000E-02 | 0.2638000E-09 | 0.2119118E-05 | 1095.655 | 33.64217 |
| 12 | 0.1020000E-01 | 0.1969000E-09 | 0.1825864E-05 | 1152.022 | 33.49497 |
| 13 | 0.1180000E-01 | 0.1591000E-09 | 0.1599256E-05 | 1204.483 | 34.75941 |
| 14 | 0.1340000E-01 | 0.1271000E-09 | 0.1417078E-05 | 1254.479 | 36.18158 |
| 15 | 0.1580000E-01 | 0.9696999E-10 | 0.1203125E-05 | 1325.401 | 37.60460 |
| 16 | 0.1900000E-01 | 0.6863000E-10 | 0.9922893E-06 | 1413.983 | 39.93478 |
| 17 | 0.2220000E-01 | 0.5476000E-10 | 0.8351941E-06 | 1498.128 | 43.01152 |
| 18 | 0.2540000E-01 | 0.3940000E-10 | 0.7153133E-06 | 1578.211 | 42.61615 |
| 19 | 0.2860000E-01 | 0.3280000E-10 | 0.6233911E-06 | 1652.624 | 44.83836 |
| 20 | 0.3340000E-01 | 0.2490000E-10 | 0.5131969E-06 | 1763.832 | 48.78032 |
| 21 | 0.3980000E-01 | 0.1630000E-10 | 0.4124433E-06 | 1897.469 | 47.27974 |

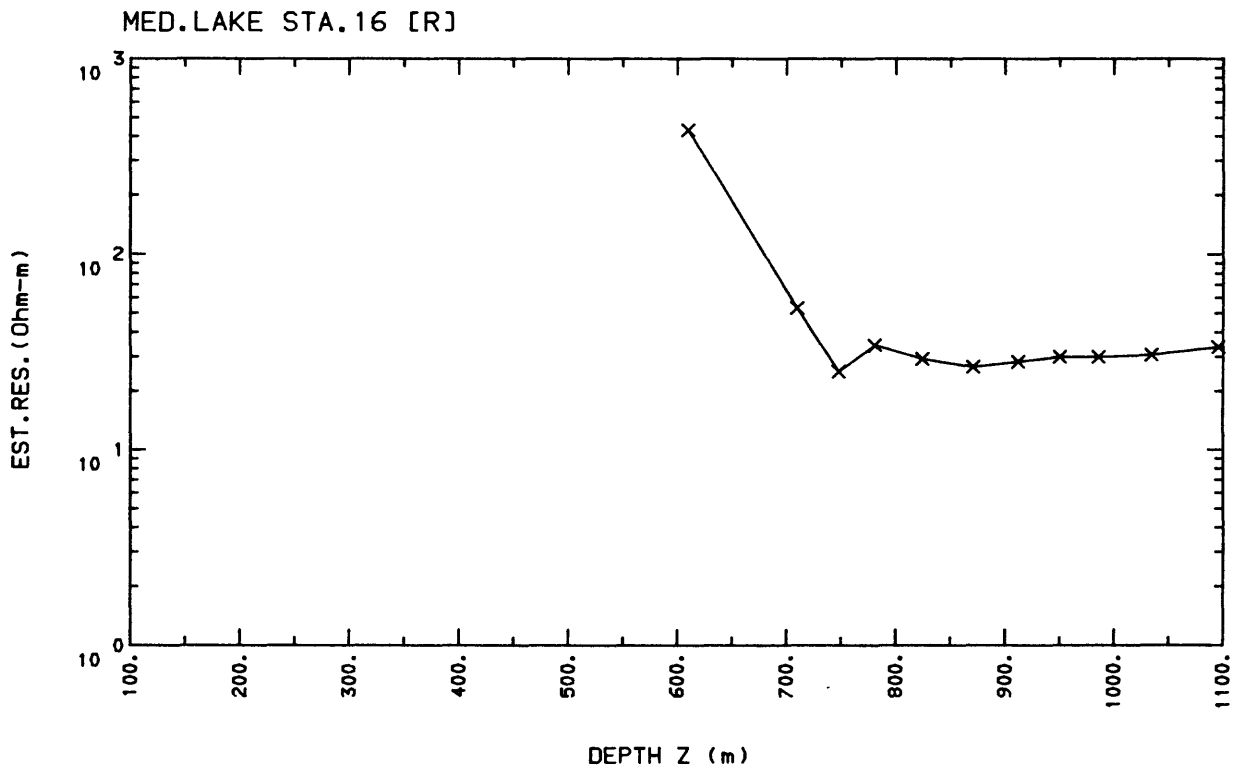





Fig. 24

MED.LAKE STA.17 [S]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.3577000E-07 | 0.2966160E-04 | 442.6546 | 150.0000 |
| 2 | 0.1200000E-02 | 0.1080000E-07 | 0.2225345E-04 | 489.8908 | 4.662457 |
| 3 | 0.1600000E-02 | 0.6839000E-08 | 0.1944753E-04 | 513.0786 | 7.728620 |
| 4 | 0.2000000E-02 | 0.5031000E-08 | 0.1755930E-04 | 532.2805 | 4.856769 |
| 5 | 0.2600000E-02 | 0.3331000E-08 | 0.1556368E-04 | 555.0223 | 4.160043 |
| 6 | 0.3400000E-02 | 0.2235000E-08 | 0.1379241E-04 | 578.1606 | 3.379519 |
| 7 | 0.4200000E-02 | 0.1669000E-08 | 0.1255004E-04 | 597.5426 | 4.130858 |
| 8 | 0.5000000E-02 | 0.1363000E-08 | 0.1158517E-04 | 614.8353 | 4.165435 |
| 9 | 0.5800000E-02 | 0.1112000E-08 | 0.1079755E-04 | 630.0598 | 4.014498 |
| 10 | 0.7000000E-02 | 0.9180999E-09 | 0.9828406E-05 | 650.6724 | 4.298924 |
| 11 | 0.8600000E-02 | 0.7214000E-09 | 0.8784799E-05 | 675.7064 | 4.780992 |
| 12 | 0.1020000E-01 | 0.5934000E-09 | 0.7947876E-05 | 699.2219 | 5.444242 |
| 13 | 0.1180000E-01 | 0.4981000E-09 | 0.7253092E-05 | 721.7729 | 5.845246 |
| 14 | 0.1340000E-01 | 0.4267000E-09 | 0.6664420E-05 | 743.0385 | 6.047518 |
| 15 | 0.1580000E-01 | 0.3481000E-09 | 0.5924602E-05 | 773.3890 | 6.621394 |
| 16 | 0.1900000E-01 | 0.2704000E-09 | 0.5137153E-05 | 811.8563 | 7.173029 |
| 17 | 0.2220000E-01 | 0.2156000E-09 | 0.4518397E-05 | 847.9855 | 7.558714 |
| 18 | 0.2540000E-01 | 0.1753000E-09 | 0.4020719E-05 | 882.3853 | 7.908171 |
| 19 | 0.2860000E-01 | 0.1492000E-09 | 0.3607579E-05 | 915.3165 | 8.486211 |
| 20 | 0.3340000E-01 | 0.1181000E-09 | 0.3097095E-05 | 963.8412 | 9.417371 |
| 21 | 0.3980000E-01 | 0.8290000E-10 | 0.2585268E-05 | 1024.578 | 9.403595 |
| 22 | 0.4620000E-01 | 0.6610000E-10 | 0.2205855E-05 | 1080.799 | 10.10153 |
| 23 | 0.5260000E-01 | 0.5250000E-10 | 0.1903852E-05 | 1135.930 | 10.68315 |
| 24 | 0.5900000E-01 | 0.3990000E-10 | 0.1668564E-05 | 1187.416 | 10.44348 |
| 25 | 0.6860000E-01 | 0.3160000E-10 | 0.1395460E-05 | 1260.980 | 11.50834 |
| 26 | 0.8140000E-01 | 0.2180000E-10 | 0.1123500E-05 | 1356.369 | 12.20879 |
| 27 | 0.9420000E-01 | 0.1600000E-10 | 0.9309893E-06 | 1444.568 | 12.52999 |

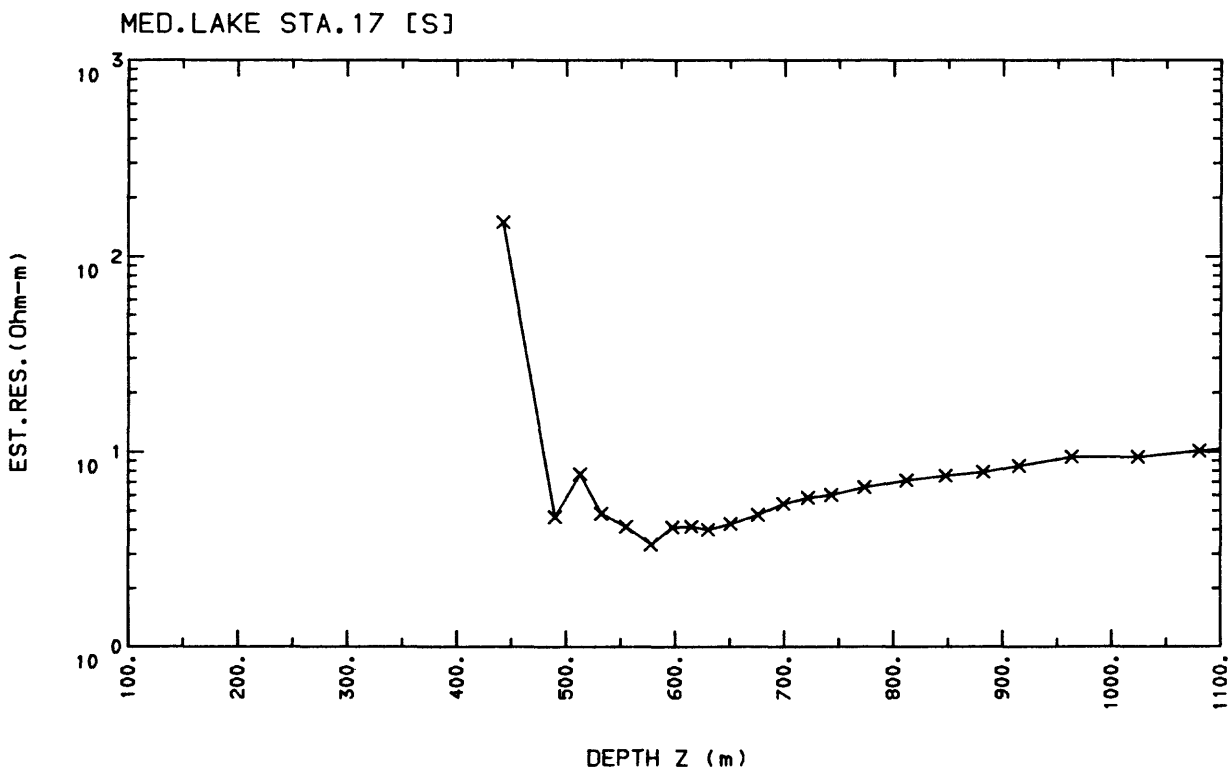





Fig. 25

MED.LAKE STA.18 [T]

| | TIME t (s) | V(t) | Hz(t) | Z (m) | RES.(Ohm-m) |
|---|---|---|---|---|---|
| 1 | 0.8000000E-03 | 0.3901000E-07 | 0.2821352E-04 | 449.7647 | 186.3023 |
| 2 | 0.1200000E-02 | 0.1608000E-07 | 0.1945006E-04 | 513.1085 | 30.70061 |
| 3 | 0.1600000E-02 | 0.1013000E-07 | 0.1528069E-04 | 557.8776 | 51.26362 |
| 4 | 0.2000000E-02 | 0.6866000E-08 | 0.1257704E-04 | 597.1714 | 44.20542 |
| 5 | 0.2600000E-02 | 0.4358000E-08 | 0.9898406E-05 | 648.0451 | 46.84744 |
| 6 | 0.3400000E-02 | 0.2690000E-08 | 0.7655517E-05 | 708.8748 | 47.10042 |
| 7 | 0.4200000E-02 | 0.1802000E-08 | 0.6226027E-05 | 760.7565 | 44.14721 |
| 8 | 0.5000000E-02 | 0.1335000E-08 | 0.5227739E-05 | 807.6205 | 44.73700 |
| 9 | 0.5800000E-02 | 0.9934000E-09 | 0.4486772E-05 | 850.6473 | 44.32577 |
| 10 | 0.7000000E-02 | 0.7038000E-09 | 0.3676553E-05 | 909.8961 | 45.09646 |
| 11 | 0.8600000E-02 | 0.4708000E-09 | 0.2928873E-05 | 982.1893 | 46.01771 |
| 12 | 0.1020000E-01 | 0.3323000E-09 | 0.2417667E-05 | 1048.010 | 45.63887 |
| 13 | 0.1180000E-01 | 0.2506000E-09 | 0.2046628E-05 | 1108.496 | 45.35099 |
| 14 | 0.1340000E-01 | 0.1915000E-09 | 0.1765213E-05 | 1164.927 | 45.59588 |
| 15 | 0.1580000E-01 | 0.1364000E-09 | 0.1452118E-05 | 1244.113 | 46.77203 |
| 16 | 0.1900000E-01 | 0.9317000E-10 | 0.1159839E-05 | 1341.826 | 46.84064 |
| 17 | 0.2220000E-01 | 0.6475000E-10 | 0.9587814E-06 | 1430.480 | 45.48583 |
| 18 | 0.2540000E-01 | 0.5104000E-10 | 0.8113622E-06 | 1512.674 | 46.65914 |
| 19 | 0.2860000E-01 | 0.3850000E-10 | 0.6973634E-06 | 1591.441 | 48.37150 |
| 20 | 0.3340000E-01 | 0.2800000E-10 | 0.5703631E-06 | 1702.383 | 48.06639 |
| 21 | 0.3980000E-01 | 0.1710000E-10 | 0.4555205E-06 | 1835.484 | 43.00566 |
| 22 | 0.4620000E-01 | 0.1260000E-10 | 0.3798924E-06 | 1950.405 | 39.94357 |
| 23 | 0.5260000E-01 | 0.9600000E-11 | 0.3230211E-06 | 2059.290 | 44.11131 |

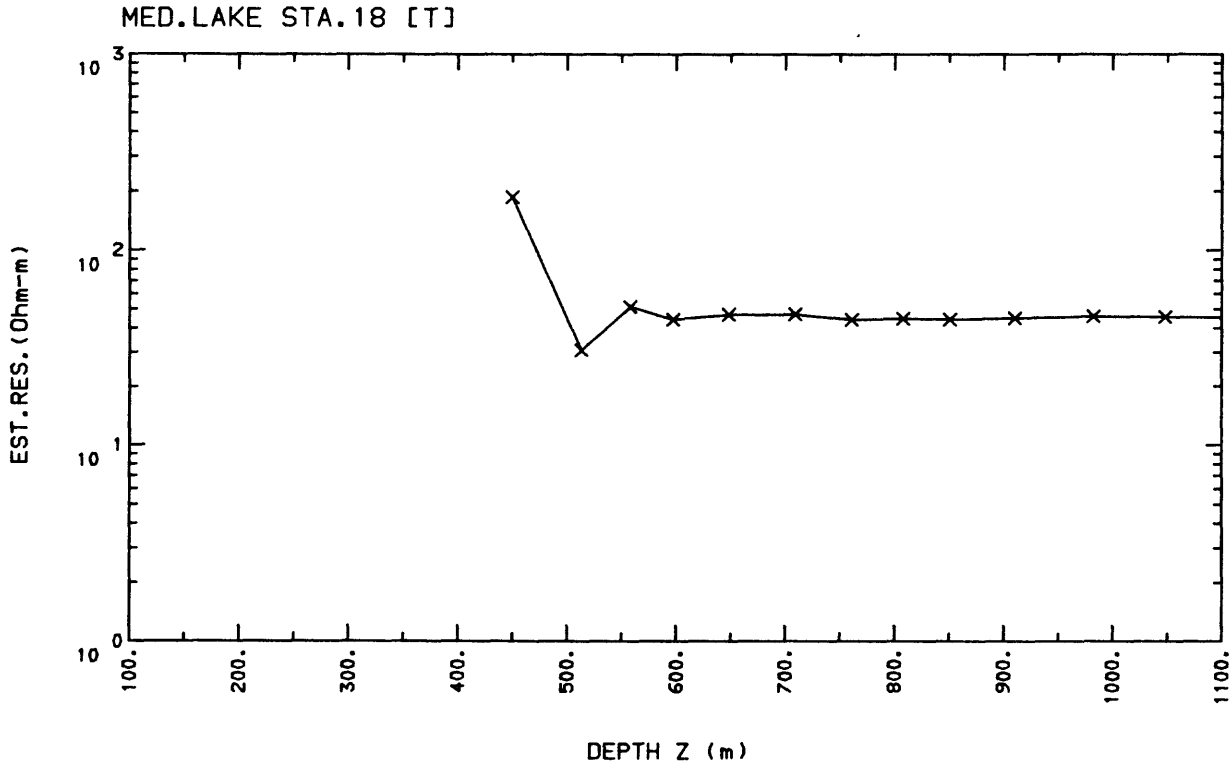





Fig. 26

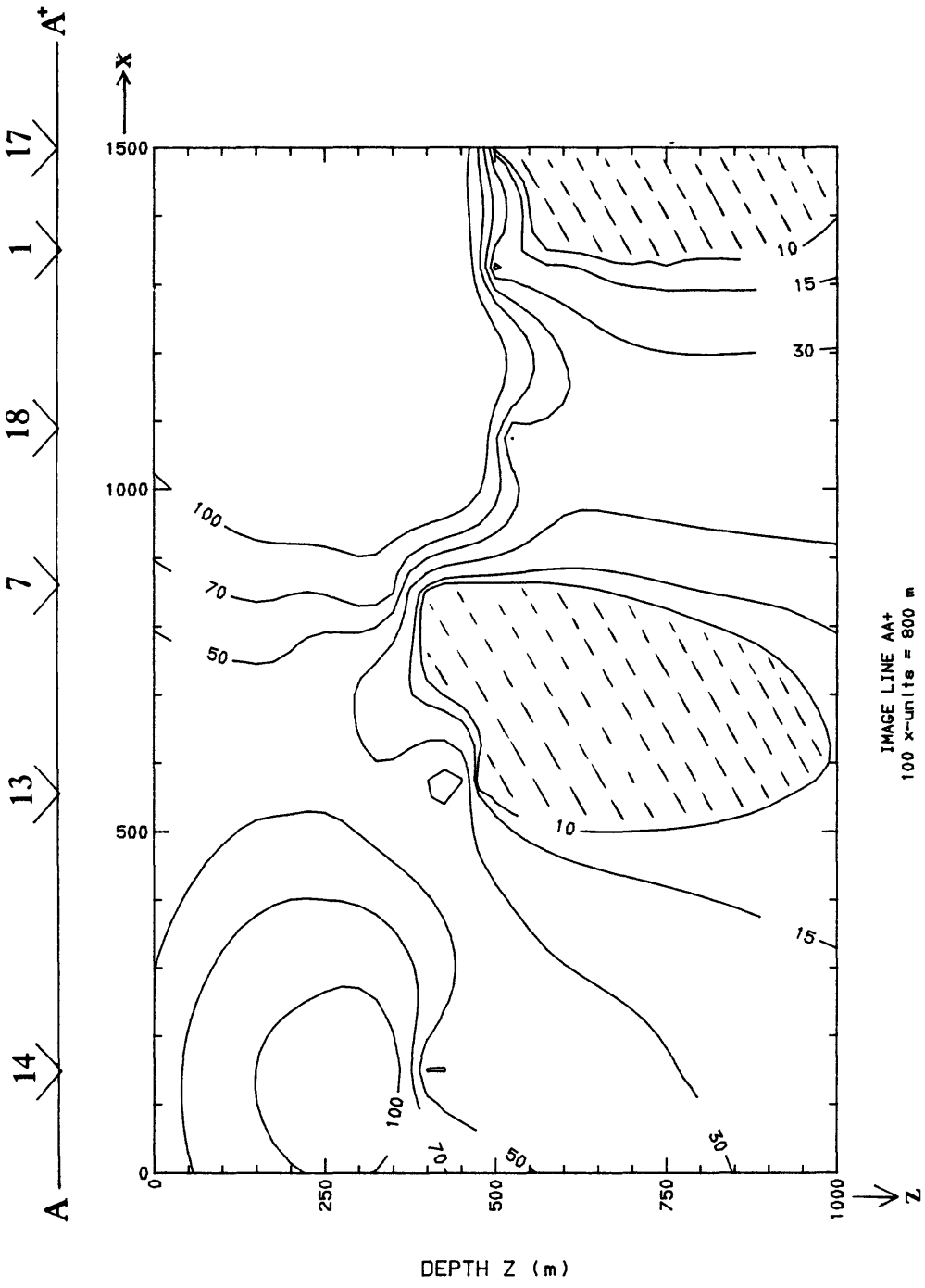

A
A+
14
13
7
18
1
17
x
z
1500
1000
500
0
0
250
500
750
1000
100
70
50
30
10
15
30
IMAGE LINE AA+
100 x-units = 800 m
DEPTH Z (m)

Fig. 27



Fig. 27

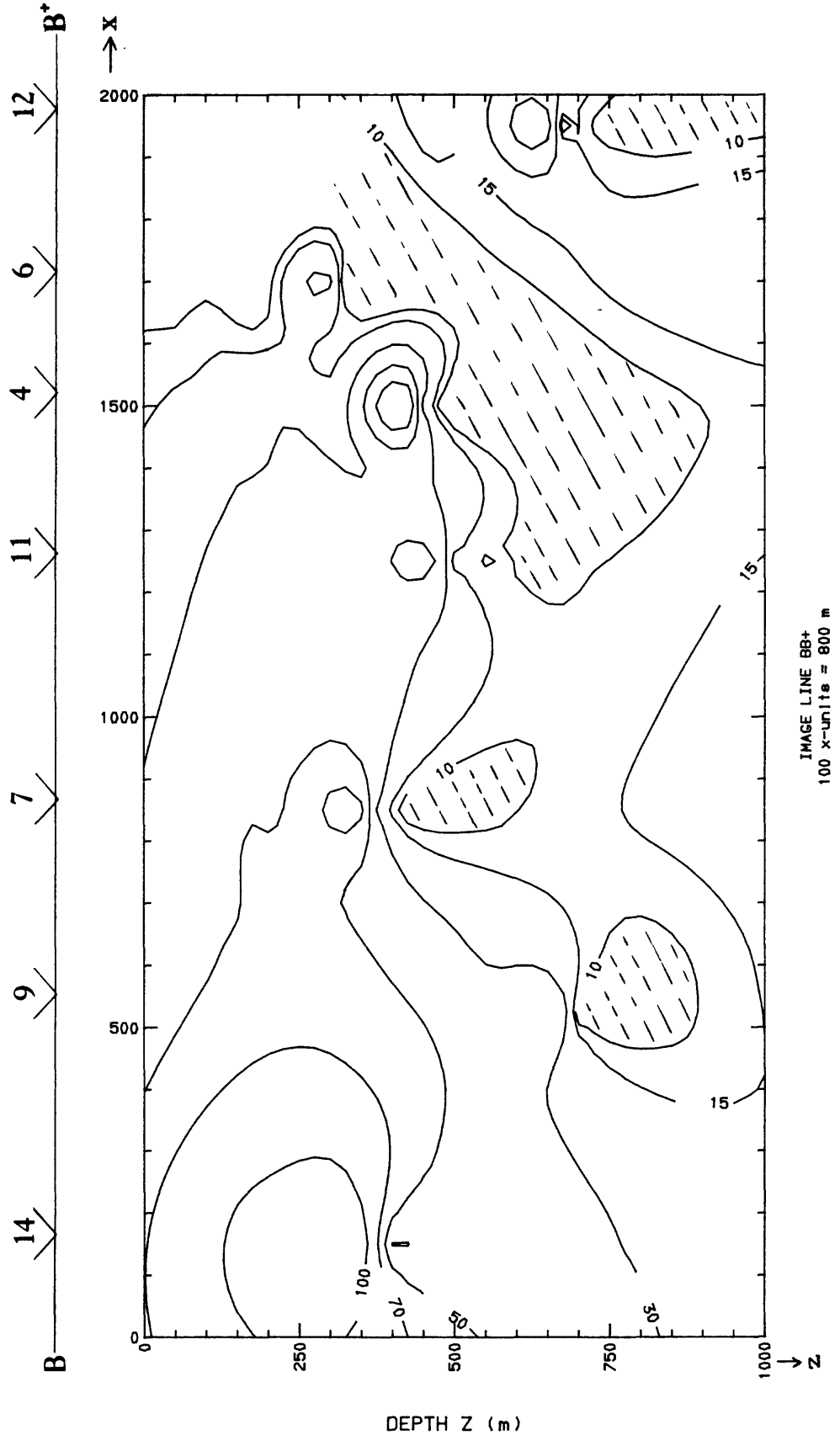

B
B'
12
6
4
11
7
9
14
x
2000
1500
1000
500
0
0
250
500
750
1000
z
10
15
100
70
50
30
IMAGE LINE BB+
100 x-units = 800 m
DEPTH Z (m)

Fig. 28



Fig. 28

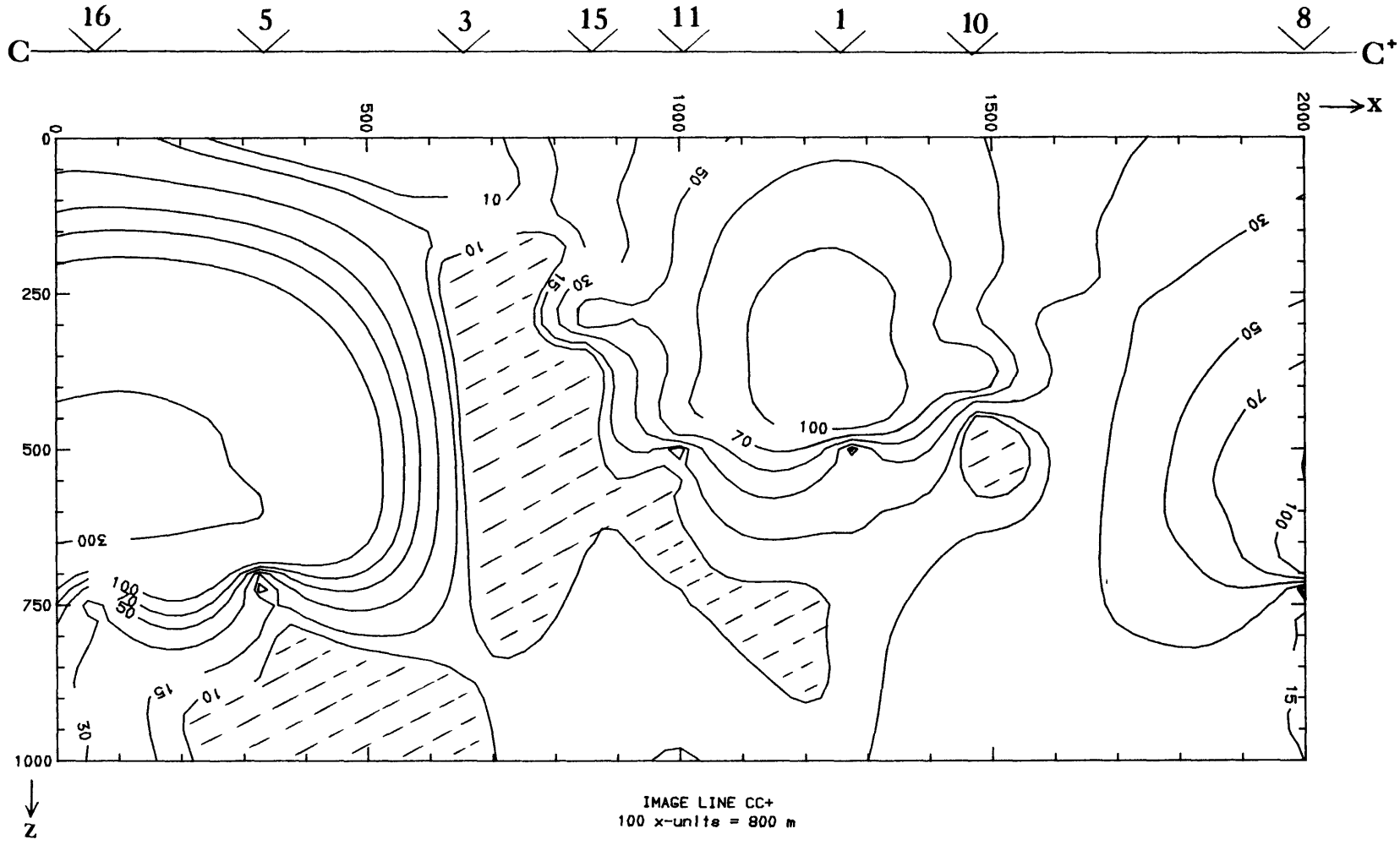

16
5
3
15
11
1
10
8
C
C+
0
500
1000
1500
2000
x
0
250
500
750
1000
DEPTH Z (m)
Z
IMAGE LINE CC+
100 x-units = 800 m

Fig. 29



Fig. 29