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Audio-magnetotelluric and telluric profile data near the Mohawk Mountains and the Table Top Mountains, southwestern Arizona

by

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and

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Introduction

Data from 28 audio-magnetotelluric (AMT) stations (4.5-27,000 Hz) and an 8-km (5-mi) long E-field ratio telluric line (0.035 Hz) in southwestern Arizona are described here. Twenty-two of the AMT stations and the telluric line are located on the northeast flank of the central Mohawk Mountains (fig. 1). The six remaining AMT stations are northeast of the Table Top Mountains (fig. 3). Both areas are within the Ajo 1^{o} x 2^{o} topographic quadrangle in which geological and geophysical surveys are being performed under the Conterminous United States Mineral Assessment Program (CUSMAP).

The data presented here were measured and processed using equipment and procedures that have been described by Beyer (1977), for telluric profiling, and by Hoover and Long (1976) and Hoover and others (1976, 1978) for the AMT method.

Data presented in this report are in preliminary form. Interpretation of this data will be described in a separate report.

Mohawk Mountains Data

AMT station locations (fig. 1) are listed by latitude, longitude, and elevation in Table 1. At each station two orthogonal sets of magnetic (H) and electric (E) field amplitudes were recorded on chart paper for each of the 16 band-passed frequencies, logarithmically spaced from 4.5 to 27,000 Hz. Simultaneous peaks from each set of orthogonal E and H data were digitized and reduced to scalar resistivities (ohm-meters) for north-south (ρNS) and east-west (ρEW) orientations of the electric field dipoles. The two resulting orthogonal scalar sounding curves for each recording site are tabulated and plotted in Appendix A at the end of this report. Included with the data are the number of samples used for each estimate (the geometric average of several samples) and the standard error (ohm-m) for each estimate. At some frequencies, particularly in the range of 750 to 4,500 Hz, scattered or missing resistivity data are due to insufficient signal strength during the recording period.

The telluric line (fig. 1) observed using the E-field ratio method (Beyer, 1977), utilized E-fields in the frequency band of 0.05 to 0.025 Hz (0.035 Hz, geometric mean). Measurements of the E-fields were made across two consecutive 500-meter colinear dipoles moved in tandem along a straight line. Each measurement position was incremented by 500 meters. The measured signals from the two colinear dipoles are input as separate channels on an X-Y plotter and recorded as a Lissajous figure or ellipse.

TABLE 1

AMT STATION LOCATIONS

MOHAWK MOUNTAINS

STATION	LATITUDE NORTH	LONGITUDE WEST	ELEVATION (ft)*
M1	32°38'00"	113°31'46"	439'
M2	32°35'39"	113°32'30"	481'
M3	32°34'22"	113°34'15"	597'
M4	32°34'23"	113°35'06"	650'
M5	32°34'09"	113°36'04"	730'
M6	32°34'49"	113°33'07"	519'
M7	32°35'41"	113°35'12"	595'
M8	32°35'44"	113°33'54"	535'
M9	32°33'35"	113°33'07"	552'
M10	32°32'54"	113°34'29"	640'
M11	32°31'37"	113°34'50"	648'
M12	32°32'49"	113°35'36"	780'
M13	32°32'11"	113°35'00"	685'
M14	32°32'04"	113°34'25"	640'
M15	32°33'12"	113°33'27"	578'
M16	32°33'57"	113°33'40"	568'
M17	32°33'46"	113°34'42"	660'
M18	32°33'33"	113°35'34"	780'
M19	32°34'51"	113°33'59"	595'
M20	32°35'38"	113°35'52"	678'
M21	32°35'38"	113°35'59"	680'
M22	32°36'31"	113°36'00"	622'

TABLE TOP MOUNTAINS

T1	32°49'08"	112°07'48"	1912'
T2	32°46'52"	112°02'24"	1688'
T3	32°48'51"	112°02'26"	1560'
T4	32°50'54"	112°01'58"	1420'
T5	32°50'36"	112°03'54"	1518'
T6	32°51'21"	112°06'16"	1600'

*"NOTE" 500 feet = 152.4 meters

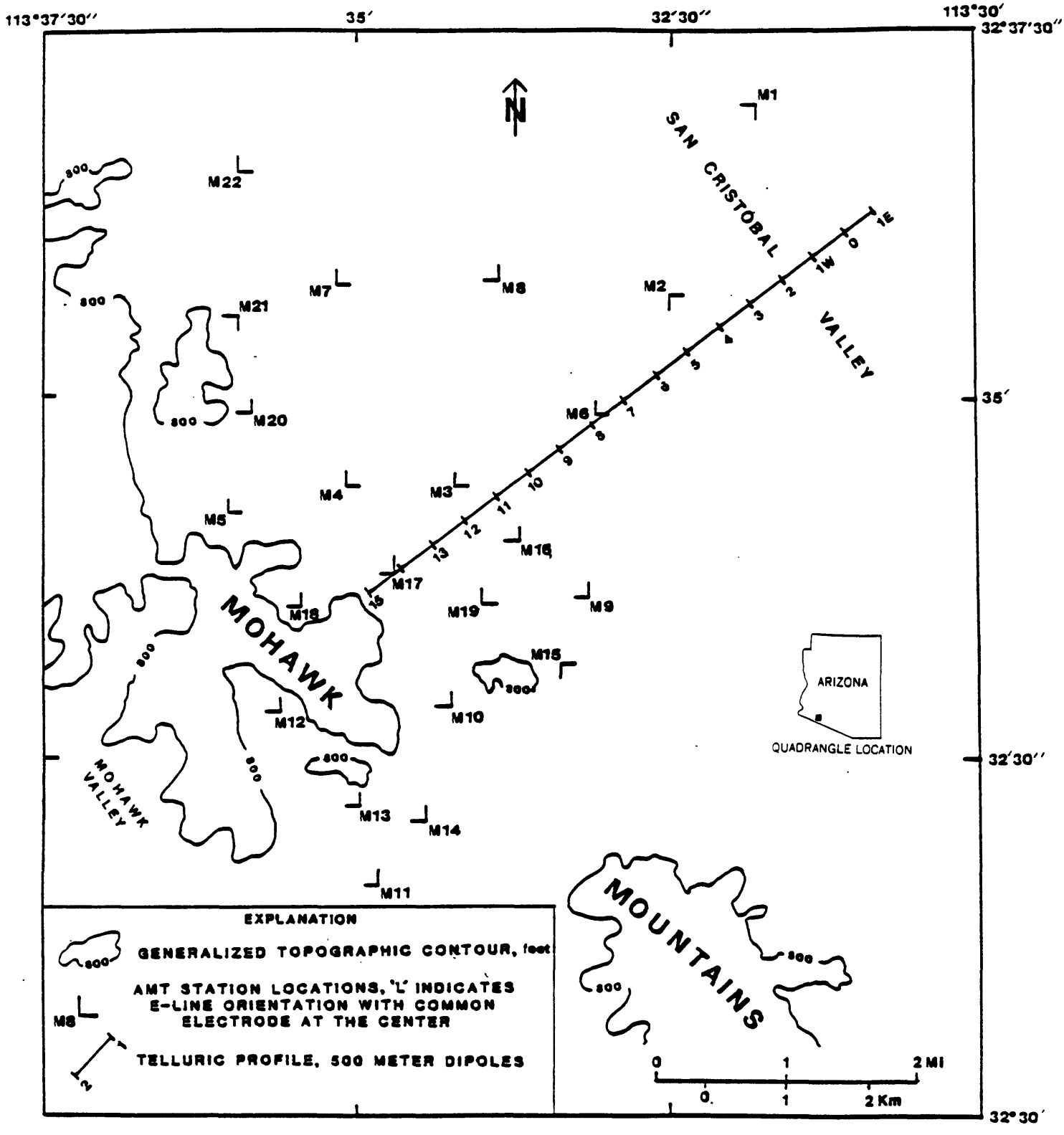

Fig. 1--AMT and telluric station location map for the Mohawk Mountains area, Arizona. The E-line symbols show the orientation of each dipole set but are not at true scale. The E-line dipole lengths were 25 m (82 ft). The base for this figure is the U.S. Geological Survey Mohawk Mts. 7 1/2 - minute topographic quadrangle, Arizona, 1965.

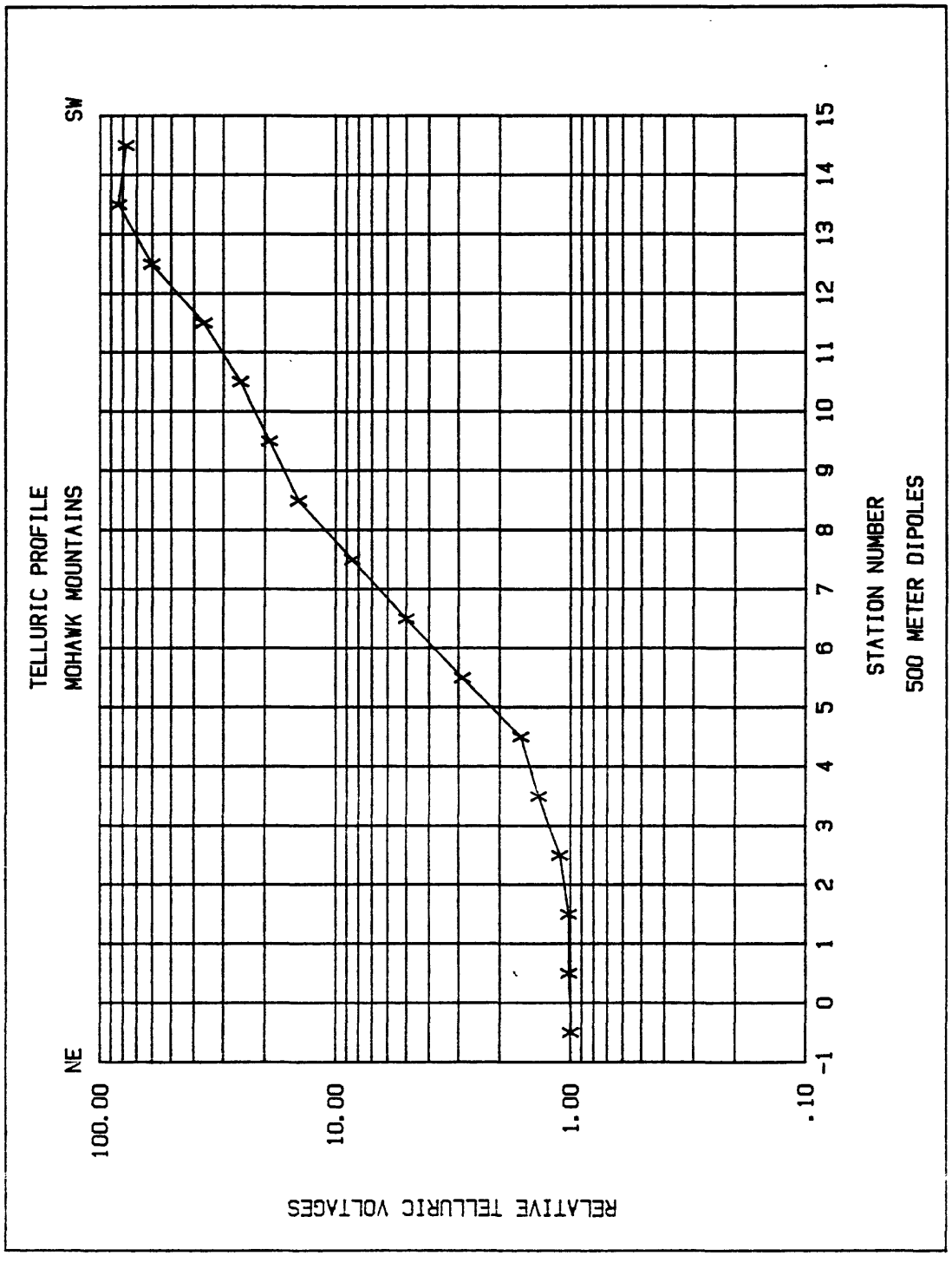

Fig. 2--Relative voltages along the telluric profile in the Mohawk Mountains area, Arizona. See fig. 1 for profile location.

A minimum of three Lissajous figures were recorded at each field station. In most cases the tangent of the angle of the major axis of the Lissajous ellipse gives the ratio of the telluric field magnitudes between each dipole. Three or more ratios are averaged to give an arithmetic mean for each station. The data accuracy is typically ±1 degree giving a 3-percent error in voltage ratio when the fields are equal (a 45-degree Lissajous figure). The traverse data are referenced to one of the dipoles on the line and the results are plotted as a variation in telluric voltage versus dipole position (fig. 2). These data are approximately proportional to the square-root of the apparent-resistivity.

Table Top Mountains Data

AMT data near Table Top Mountains (fig. 3) are listed by latitude, longitude, and elevation in Table 1. These data were obtained and reduced as described above. The two orthogonal scalar sounding curves are tabulated and plotted in Appendix B along with the number of samples used, and the standard error (ohm-m).

Acknowledgements

Field data were obtained with the assistance of Don Hoover, Charlie Tippens, Don McNair, Mike Greenhaus, Mike Broker, and Dale Duncan of the U.S. Geological Survey. The instrumentation was constructed, tested, and has been under continual developmental improvements primarily by Don Hoover, Charlie Tippens and the other employees of the U.S. Geological Survey in Denver. Carl Long of the U.S. Geological Survey provided data reduction programs for use on an Hewlett-Packard 85 computer.

The Mohawk Mountains are located in a Luke Air Force Base gunnery range and the authors gratefully acknowledge the assistance of the Base Commander and his operational personnel, particularly Major John Lewis, Mr. John Forrest and Senior Master Sergeant Broka in providing excellent coordination for access to this area.

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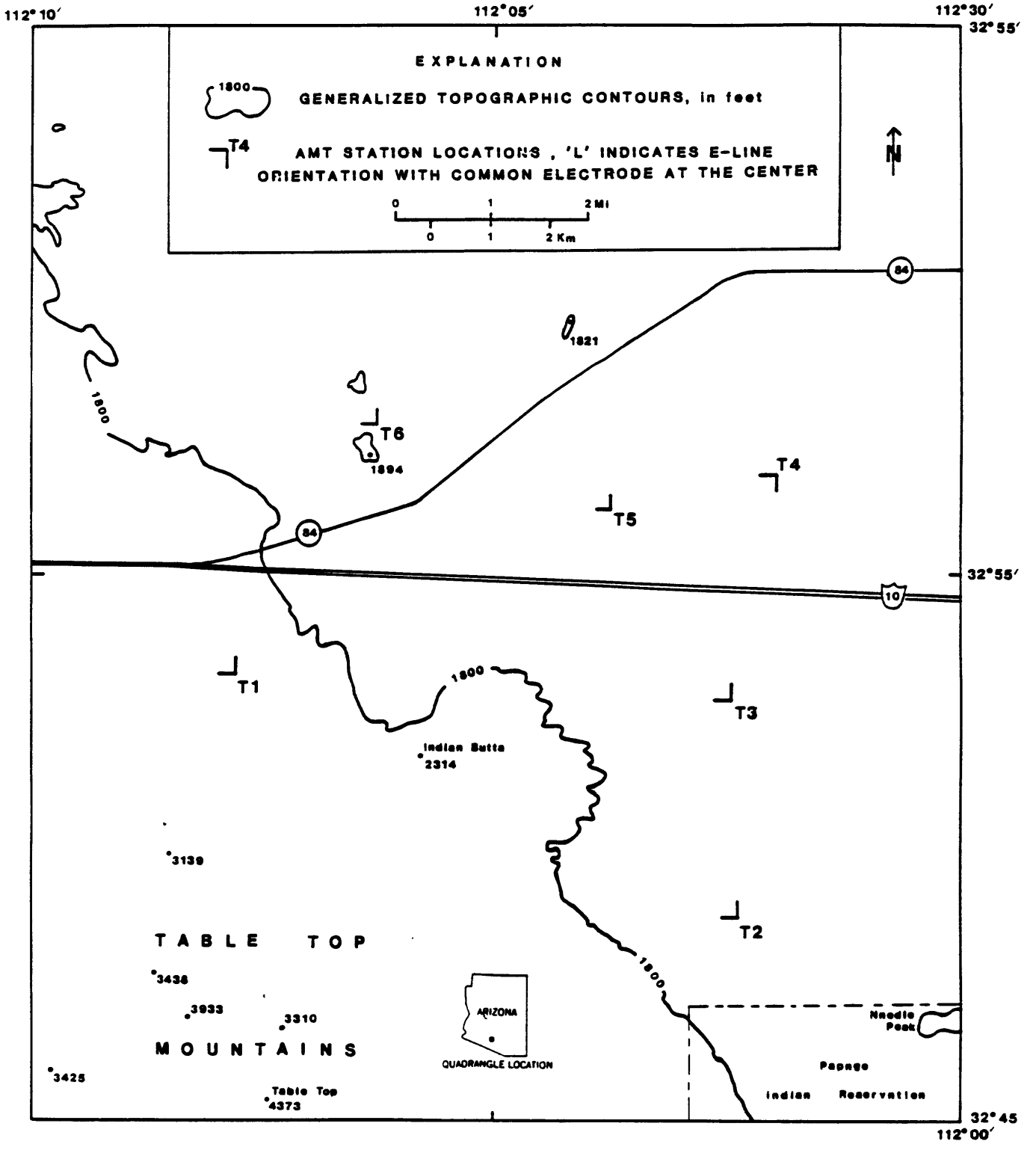


Fig. 3--AMT station location map for the Table Top Mountains area, Arizona. The E-line symbols show the orientation of each dipole set but are not at true scale. The E-line dipole lengths were 25 m (82 ft). The base for this figure is the U.S. Geological Survey Antelope Peak 15-minute topographic quadrangle, Arizona, 1963.

APPENDICES

Explanation of headings on Appendix A and B

STATION ID	AMT station name
NS or EW	Electric-dipole orientation
NO FREQ	Number of frequencies processed
FREQ	Frequency, in hertz
AP-RES	Observed apparent resistivity (ohm-meters)
N OBS	Number of signal peaks processed for each frequency
STD ERR	Standard error in units of ohm-meters

NOTE: The standard error is undefined for one observation but appears in appendices as 0.00.

APPENDIX A

AMT DATA, MOHAWK MOUNTAINS, ARIZONA

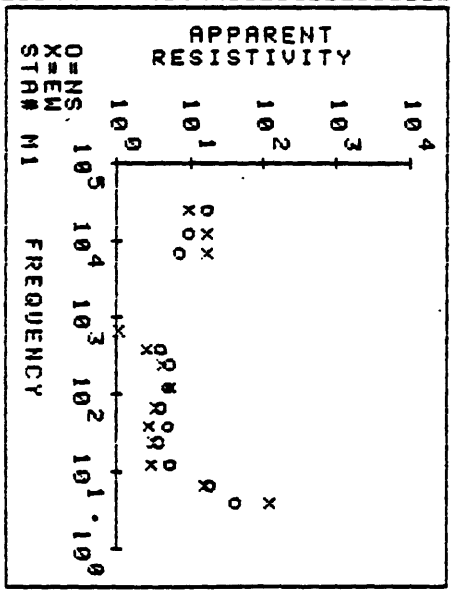
STATION ID_M1 NS NO FREQ= 12

FREQ	AP-RES	N OBS	STD ERR
4.5	31.92	4	18.00
7.5	14.83	5	3.81
14.0	4.21	6	1.07
27.0	2.98	6	.19
45.0	4.17	9	.44
75.0	3.24	10	.26
140.0	4.10	12	.53
270.0	4.32	11	.30
450.0	3.35	8	.58
7500.0	5.63	11	.16
14000.0	7.62	11	.42
27000.0	13.54	1	0.00

STATION ID_M1 EW NO FREQ= 13

FREQ	AP-RES	N OBS	STD ERR
4.5	93.83	5	40.74
7.5	12.53	6	4.27
14.0	2.47	14	.18
27.0	2.64	14	.34
45.0	2.28	11	.20
75.0	2.72	14	.15
140.0	4.18	13	.90
270.0	3.59	9	.16
450.0	2.05	8	.42
750.0	.90	4	.32
7500.0	14.10	11	.66
14000.0	14.12	9	.47
27000.0	7.48	1	0.00

OUTPUT FROM PLOT



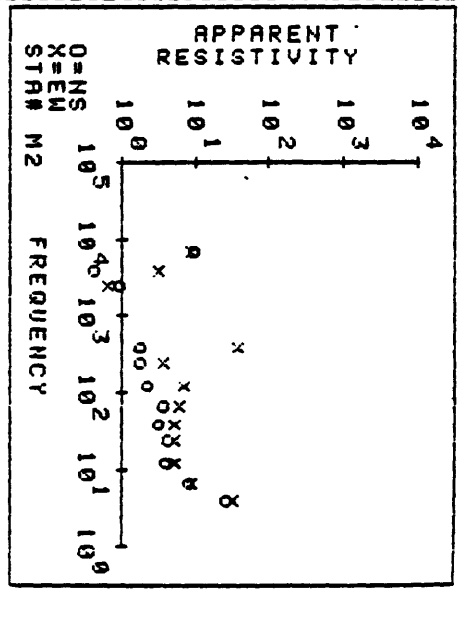
STATION ID_M2 NS NO FREQ= 12

FREQ	AP-RES	N OBS	STD ERR
4.5	20.89	8	5.16
7.5	6.87	8	1.52
14.0	3.24	12	.21
27.0	3.56	12	.46
45.0	2.56	12	.68
75.0	3.03	10	.77
140.0	1.82	15	.35
270.0	1.49	6	.59
450.0	1.50	9	.40
2700.0	.77	6	.06
4500.0	.34	1	0.00
7500.0	7.97	12	.54

STATION ID_M2 EW NO FREQ= 12

FREQ	AP-RES	N OBS	STD ERR
4.5	26.59	9	7.86
7.5	7.06	9	.90
14.0	4.29	15	.31
27.0	4.26	15	.21
45.0	4.40	11	.45
75.0	4.87	15	.73
140.0	5.68	14	.77
270.0	3.03	7	.94
450.0	29.51	4	8.26
2700.0	.55	1	0.00
4500.0	2.62	5	.51
7500.0	7.01	6	1.43

OUTPUT FROM PLOT



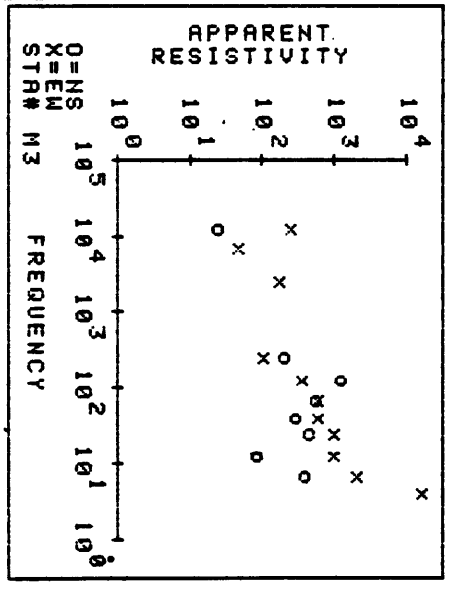
STATION ID_M3 NS NO FREQ= 8

FREQ	AP-RES	N OBS	STD ERR
7.5	304.87	10	81.10
14.0	68.61	10	22.13
27.0	360.18	10	50.54
45.0	227.59	1	0.00
75.0	438.94	6	38.28
140.0	965.34	5	196.09
270.0	155.85	2	6.08
14000.0	20.38	8	.59

STATION ID_M3 EW NO FREQ= 11

FREQ	AP-RES	N OBS	STD ERR
4.5	13654.00	5	2027.80
7.5	1609.30	14	306.53
14.0	791.70	10	62.41
27.0	764.97	7	85.54
45.0	463.20	12	62.37
75.0	488.74	17	26.82
140.0	290.14	13	42.53
270.0	82.95	4	11.86
2700.0	134.44	1	0.00
7500.0	37.88	6	12.49
14000.0	199.44	8	10.45

OUTPUT FROM PLOT



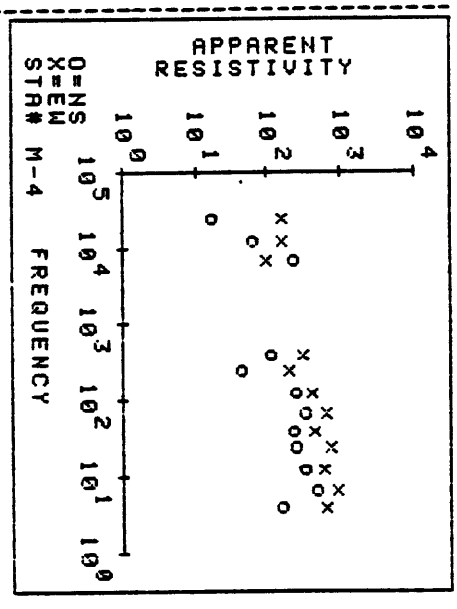
STATION ID_M-4 NS NO FREQ= 12

FREQ	AP-RES	N OBS	STD ERR
4.5	127.22	7	53.32
7.5	394.55	9	37.22
14.0	269.81	8	23.20
27.0	197.36	12	24.35
45.0	182.66	15	29.02
75.0	261.75	12	21.76
140.0	202.44	12	20.73
270.0	35.96	8	21.17
450.0	88.81	3	51.86
7500.0	190.80	9	29.90
14000.0	49.52	5	5.26
27000.0	13.83	1	0.00

STATION ID_M-4 EW NO FREQ= 12

FREQ	AP-RES	N OBS	STD ERR
4.5	508.81	9	130.73
7.5	718.73	10	60.37
14.0	484.19	11	67.99
27.0	606.25	10	55.71
45.0	362.86	8	79.95
75.0	515.94	10	25.23
140.0	334.63	10	34.86
270.0	165.06	6	30.35
450.0	240.69	1	0.00
7500.0	78.74	11	8.84
14000.0	125.73	9	6.08
27000.0	125.43	1	0.00

OUTPUT FROM PLOT



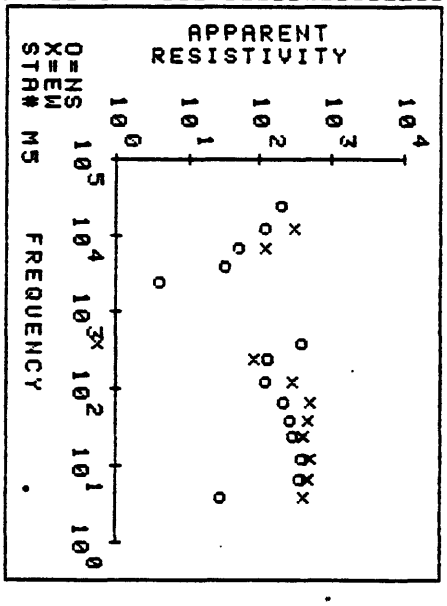
STATION ID_M5 NS NO FREQ= 14

FREQ	AP-RES	N OBS	STD ERR
4.5	22.31	4	5.05
7.5	290.31	8	55.81
14.0	314.55	8	25.84
27.0	224.54	10	17.53
45.0	216.74	11	23.70
75.0	167.29	9	32.56
140.0	95.01	8	18.26
270.0	101.79	6	24.69
450.0	302.92	1	0.00
2700.0	3.21	2	.30
4500.0	27.16	4	15.71
7500.0	39.30	10	5.46
14000.0	99.51	3	11.85
27000.0	161.21	1	0.00

STATION ID_M5 EW NO FREQ= 11

FREQ	AP-RES	N OBS	STD ERR
4.5	330.24	12	41.52
7.5	384.13	4	73.61
14.0	412.98	8	45.51
27.0	324.66	11	13.04
45.0	377.17	9	26.92
75.0	400.11	14	27.30
140.0	235.26	10	30.13
270.0	69.30	10	36.34
450.0	.45	3	.25
7500.0	97.74	10	7.56
14000.0	253.82	7	6.25

OUTPUT FROM PLOT



STATION ID_M6 NS NO FREQ= 14

FREQ	AP-RES	N OBS	STD ERR
4.5	52.19	8	17.18
7.5	40.41	15	3.42
14.0	33.53	10	2.44
27.0	24.03	11	1.60
45.0	12.85	8	1.59
75.0	21.77	10	1.73
140.0	14.50	10	1.79
270.0	10.18	9	1.27
450.0	8.64	6	2.36
750.0	58.99	4	15.94
2700.0	25.53	3	6.35
7500.0	7.10	12	.46
14000.0	14.12	6	.95
27000.0	17.79	1	0.00

STATION ID_M6 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	36.68	7	5.18
7.5	24.32	11	2.36
14.0	19.08	13	.96
27.0	14.55	12	1.04
45.0	11.51	10	1.60
75.0	9.88	12	1.24
140.0	5.62	14	.72
270.0	5.36	8	.64
450.0	2.00	3	.64
750.0	7.73	5	2.04
2700.0	3.51	5	.57
4500.0	2.24	3	.56
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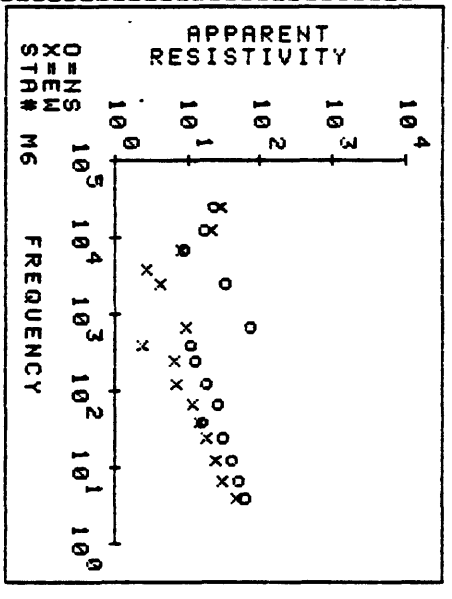
14000.0	17.02	3	1.09
27000.0	22.82	1	0.00

OUTPUT FROM PLOT



STATION ID_M7 NS NO FREQ= 13

FREQ	AP-RES	N OBS	STD ERR
4.5	16.30	3	3.28
7.5	97.04	13	8.71
14.0	65.40	12	3.19
27.0	55.04	9	8.33
45.0	32.71	10	3.83
75.0	33.77	9	3.54
140.0	28.19	5	2.90
270.0	8.71	10	1.63
450.0	9.79	6	2.88
4500.0	13.01	9	2.08
7500.0	6.44	11	.85
14000.0	12.55	5	1.21
27000.0	22.48	1	0.00

STATION ID_M7 EW NO FREQ= 13

FREQ	AP-RES	N OBS	STD ERR
4.5	124.62	6	30.47
14.0	94.36	10	11.61
27.0	65.07	20	4.08
45.0	61.45	10	4.83
75.0	47.73	8	6.25
140.0	30.07	13	2.77
270.0	13.93	8	4.08
450.0	5.09	5	1.46
2700.0	5.50	5	.43
4500.0	6.98	3	.87
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14000.0	24.35	3	1.18
27000.0	33.95	1	0.00

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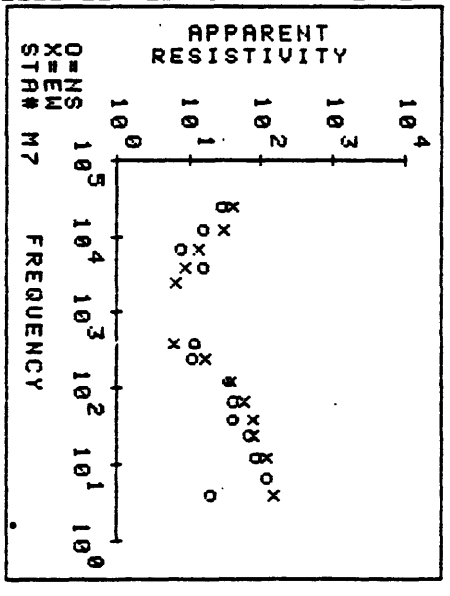


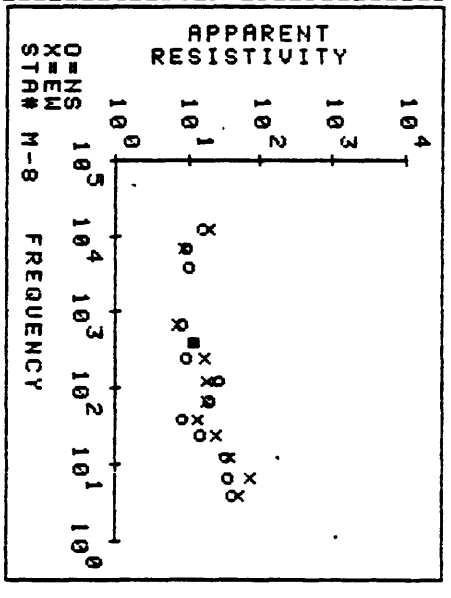
STATION ID_M-8 NS NO FREQ= 13

FREQ	AP-RES	N OBS	STD ERR
4.5	32.86	2	15.27
7.5	29.01	11	3.25
14.0	26.92	11	2.22
27.0	11.89	7	3.56
45.0	6.75	9	2.30
75.0	15.48	5	2.69
140.0	21.22	13	1.57
270.0	7.47	15	1.47
450.0	9.70	10	3.57
750.0	6.72	4	3.03
4500.0	8.57	6	1.79
7500.0	7.93	14	.78
14000.0	13.03	2	.24

STATION ID_M-8 EW NO FREQ= 12

FREQ	AP-RES	N OBS	STD ERR
4.5	41.81	2	13.66
7.5	59.83	10	5.19
14.0	30.95	13	2.78
27.0	20.05	12	2.21
45.0	11.25	7	2.17
75.0	14.56	15	.65
140.0	15.12	14	.89
270.0	14.03	11	1.86
450.0	9.52	5	3.25
750.0	5.90	5	1.41
7500.0	7.27	16	.53
14000.0	15.88	2	1.43

OUTPUT FROM PLOT



STATION ID_M9 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	80.72	5	12.92
7.5	92.27	10	9.57
14.0	54.51	10	3.83
27.0	36.19	11	2.52
45.0	24.88	13	2.31
75.0	32.99	13	1.68
140.0	23.99	13	1.32
270.0	15.75	11	1.13
450.0	18.58	12	1.42
750.0	19.93	11	2.65
1400.0	76.11	11	16.55
2700.0	36.49	10	4.02
4500.0	18.52	10	2.18
7500.0	24.92	13	.80
14000.0	21.27	10	1.26
27000.0	59.24	11	4.37

STATION ID_M9 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	87.94	7	12.24
7.5	17.22	9	1.13
14.0	41.22	11	1.29
27.0	32.48	12	1.02
45.0	26.48	13	1.21
75.0	22.64	13	.93
140.0	17.36	9	1.00
270.0	59.38	12	2.67
450.0	14.91	12	1.13
750.0	14.88	13	2.09
1400.0	24.43	11	2.62
2700.0	30.75	9	3.87
4500.0	20.73	12	2.03
7500.0	20.74	10	.88
14000.0	19.28	11	.80

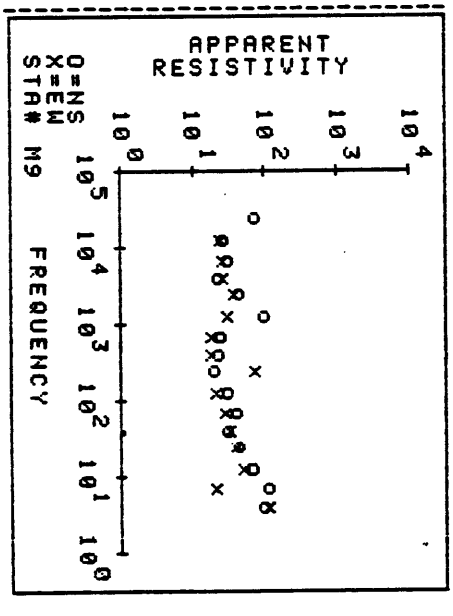
STATION ID_M10 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	789.71	3	64.98
7.5	872.74	7	89.72
14.0	642.91	11	28.38
27.0	408.46	11	22.74
45.0	404.29	10	23.30
75.0	380.15	9	15.92
140.0	287.78	11	37.30
270.0	195.01	10	21.80
450.0	234.48	7	38.41
750.0	252.51	6	18.04
1400.0	195.92	7	31.85
2700.0	64.89	8	10.45
4500.0	73.99	10	4.36
7500.0	48.65	13	2.09
14000.0	36.61	5	5.66
27000.0	64.67	4	1.54

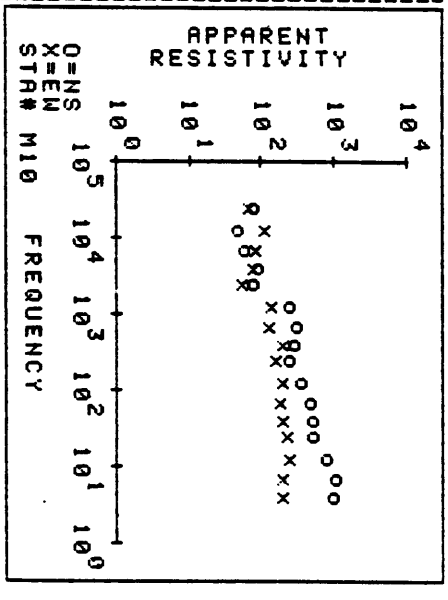
STATION ID_M10 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	155.66	7	19.88
7.5	155.33	9	24.22
14.0	202.45	11	26.03
27.0	188.20	9	24.24
45.0	165.57	6	24.40
75.0	148.63	5	16.09
140.0	166.33	13	34.96
270.0	125.40	10	3.87
450.0	161.39	11	17.05
750.0	106.14	7	21.17
1400.0	109.90	5	17.12
2700.0	43.85	7	7.42
4500.0	62.82	9	4.38
7500.0	68.27	9	4.98
14000.0	91.83	10	4.31
27000.0	56.16	7	2.96

OUTPUT FROM PLOT



OUTPUT FROM PLOT



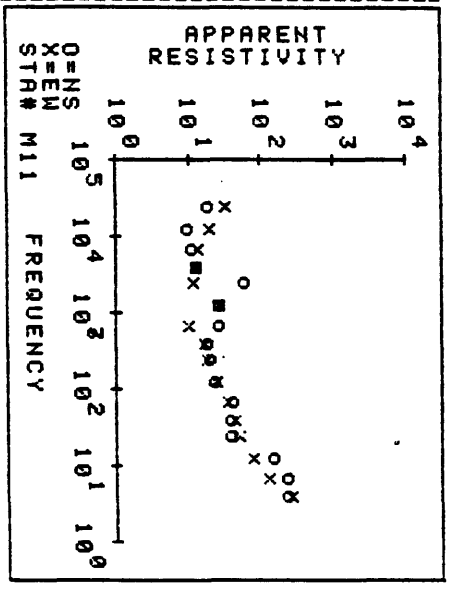
STATION ID_M11 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	180.12	5	56.55
7.5	189.97	9	19.96
14.0	124.79	8	15.48
27.0	31.44	7	4.23
45.0	29.84	7	3.34
75.0	33.99	9	1.65
140.0	18.20	12	.81
270.0	15.49	10	.80
450.0	14.43	10	1.49
750.0	20.55	8	1.89
1400.0	21.03	8	2.37
2700.0	48.37	6	4.96
4500.0	10.19	9	.77
7500.0	8.96	10	.41
14000.0	7.81	11	.35
27000.0	14.78	8	.66

STATION ID_M11 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	220.22	6	29.94
7.5	104.81	10	7.59
14.0	61.08	10	4.83
27.0	42.11	8	3.33
45.0	35.13	10	2.48
75.0	28.35	11	2.84
140.0	19.62	11	1.08
270.0	14.42	10	.34
450.0	13.35	10	1.34
750.0	8.59	9	1.10
1400.0	21.93	7	4.48
2700.0	9.66	7	.76
4500.0	10.12	9	.82
7500.0	10.99	10	.41
14000.0	15.58	9	1.07
27000.0	26.12	11	.86

OUTPUT FROM PLOT



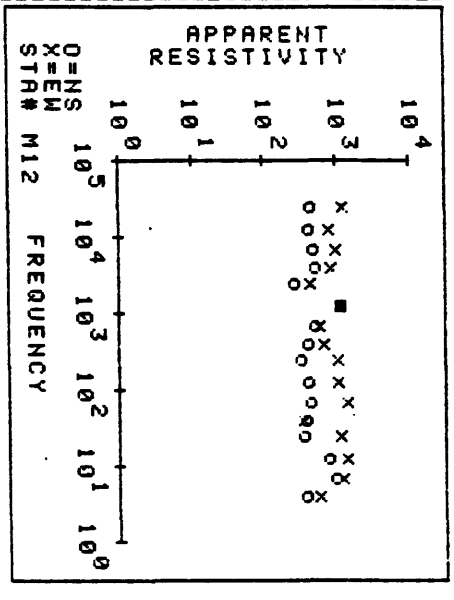
STATION ID_M12 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	301.90	4	80.24
7.5	790.65	6	128.66
14.0	624.35	12	41.13
27.0	283.09	9	26.65
45.0	309.88	12	26.99
75.0	364.33	9	40.79
140.0	337.70	12	18.35
270.0	276.16	14	11.25
450.0	328.24	13	13.10
750.0	414.65	10	28.27
1400.0	889.93	13	76.64
2700.0	212.74	10	18.54
4500.0	422.49	13	17.13
7500.0	396.37	13	12.85
14000.0	339.72	14	12.15
27000.0	361.14	11	8.60

STATION ID_M12 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	482.96	3	134.00
7.5	958.63	6	156.01
14.0	1133.60	6	84.06
27.0	908.37	10	92.62
45.0	294.41	7	69.54
75.0	1108.10	10	43.10
140.0	874.77	11	44.05
270.0	831.36	13	24.74
450.0	540.73	9	24.37
750.0	478.37	8	59.34
1400.0	896.39	10	71.53
2700.0	369.13	8	45.73
4500.0	688.87	12	48.30
7500.0	772.08	10	51.20
14000.0	625.89	10	25.44
27000.0	968.04	10	70.74

OUTPUT FROM PLOT



STATION ID_M13 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	720.13	6	128.37
7.5	1191.00	8	136.60
14.0	1013.60	9	60.47
27.0	609.21	9	27.13
45.0	277.11	6	55.72
75.0	434.31	13	14.57
140.0	265.25	13	9.64
270.0	228.29	11	8.05
450.0	306.29	12	11.16
750.0	349.96	11	20.28
1400.0	823.79	8	41.46
2700.0	134.21	12	12.22
4500.0	141.91	13	3.58
7500.0	.39	13	.01
14000.0	42.86	12	1.46
27000.0	69.06	11	1.06

STATION ID_M13 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	489.45	5	119.89
7.5	391.60	7	50.88
14.0	535.10	9	30.78
27.0	449.78	8	27.40
45.0	475.94	8	61.06
75.0	445.66	8	25.19
140.0	430.59	10	17.29
270.0	372.66	9	18.62
450.0	413.90	12	30.12
750.0	404.98	14	23.12
1400.0	567.39	8	51.46
2700.0	97.61	10	7.33
4500.0	114.30	8	7.90
7500.0	62.23	11	1.55
14000.0	43.06	13	1.05
27000.0	.34	11	.01

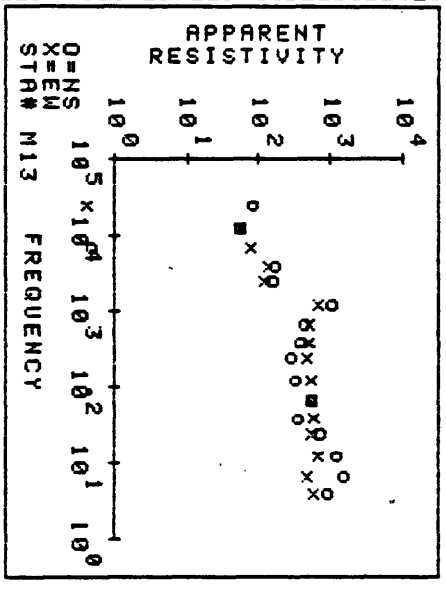
STATION ID_M14 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	982.63	7	104.32
7.5	944.27	7	126.36
14.0	321.45	8	76.75
27.0	199.91	4	25.24
45.0	947.66	4	115.27
75.0	442.10	9	101.88
140.0	337.30	5	34.00
270.0	497.25	4	49.54
450.0	203.54	10	44.67
750.0	153.84	7	80.04
1400.0	685.96	11	63.74
2700.0	186.21	12	12.61
4500.0	206.38	12	9.77
7500.0	152.59	11	6.69
14000.0	86.99	12	3.38
27000.0	139.69	10	4.08

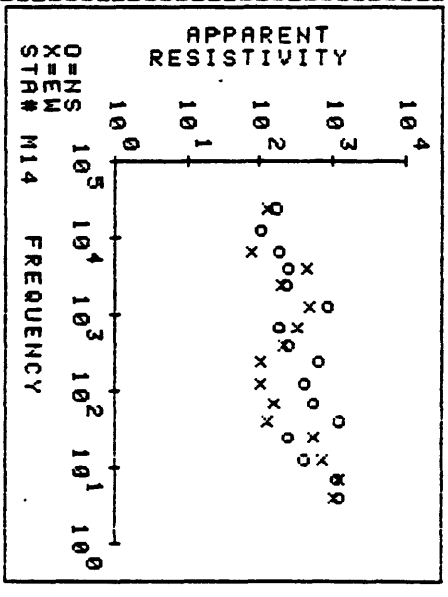
STATION ID_M14 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	829.25	6	310.10
7.5	956.45	4	176.41
14.0	587.68	6	106.41
27.0	434.74	7	65.32
45.0	105.22	4	40.69
75.0	129.04	7	20.97
140.0	85.78	6	34.80
270.0	85.46	8	15.84
450.0	174.02	8	52.71
750.0	270.16	10	24.62
1400.0	392.01	8	46.07
2700.0	158.49	7	25.51
4500.0	369.43	5	85.17
7500.0	64.25	9	5.18
27000.0	103.18	4	5.63

OUTPUT FROM PLOT



OUTPUT FROM PLOT



STATION ID_M15 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	250.51	7	38.52
7.5	93.11	7	8.71
14.0	89.40	10	11.39
27.0	97.28	11	5.56
45.0	97.22	10	9.13
75.0	124.72	11	9.13
140.0	97.16	11	5.77
270.0	97.24	11	5.41
450.0	64.77	6	12.18
750.0	98.59	6	21.14
1400.0	578.97	4	148.55
2700.0	241.33	5	19.46
4500.0	36.79	8	6.65
7500.0	31.04	11	1.26
14000.0	38.35	9	.60
27000.0	289.57	9	20.11

STATION ID_M15 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	134.34	5	27.01
7.5	151.01	7	17.51
14.0	82.49	13	9.86
27.0	63.58	11	9.50
45.0	41.81	12	3.46
75.0	35.31	12	2.54
140.0	28.41	12	2.48
270.0	35.06	13	5.32
450.0	22.85	10	2.94
750.0	99.78	8	42.89
1400.0	776.13	11	73.87
2700.0	208.59	6	23.79
4500.0	201.41	9	25.18
7500.0	51.95	8	3.16
14000.0	49.76	9	4.51
27000.0	156.25	8	8.09

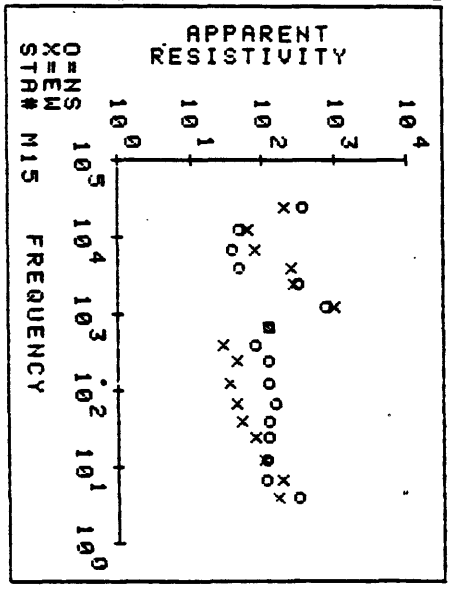
STATION ID_M16 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	189.86	5	11.48
7.5	169.31.	11	11.99
14.0	115.37	8	4.43
27.0	100.43	9	8.58
45.0	99.54	10	4.13
75.0	123.00	7	5.17
140.0	81.73	11	5.77
270.0	64.67	10	2.64
450.0	69.35	10	4.54
750.0	57.33	9	7.22
1400.0	43.50	10	5.14
2700.0	47.12	6	5.03
4500.0	36.94	11	2.84
7500.0	38.26	9	1.85
14000.0	32.76	12	1.27
27000.0	57.39	9	3.08

STATION ID_M16 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	278.55	9	17.84
7.5	268.11	9	28.64
14.0	192.02	8	9.34
27.0	171.85	12	3.47
45.0	126.03	9	9.96
75.0	115.68	13	5.31
140.0	86.03	10	3.97
270.0	60.32	12	2.96
450.0	14.49	11	2.15
750.0	11.20	7	3.24
1400.0	17.66	9	1.97
2700.0	4.17	8	.46
4500.0	36.53	7	3.04
7500.0	14.55	8	1.47
14000.0	34.98	11	1.73
27000.0	67.39	5	7.89

OUTPUT FROM PLOT



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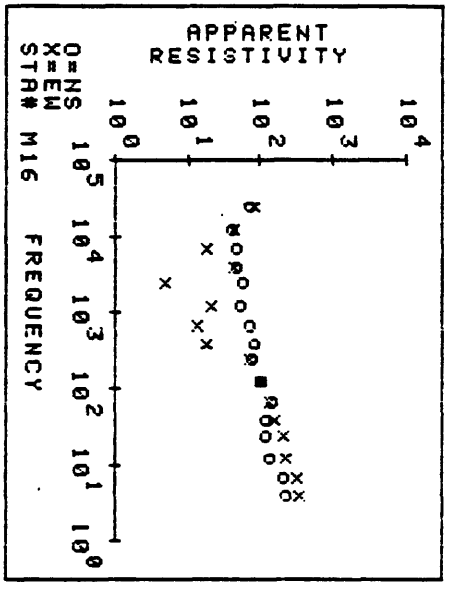


STATION ID_M17 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1256.20	7	244.90
7.5	1384.20	9	104.84
14.0	890.75	11	76.96
27.0	673.86	14	65.06
45.0	495.15	11	37.42
75.0	656.40	13	55.80
140.0	596.29	8	59.97
270.0	410.92	11	39.78
450.0	525.00	11	87.69
750.0	608.55	9	44.44
1400.0	788.31	11	72.92
2700.0	265.47	8	49.44
4500.0	488.14	12	21.75
7500.0	518.01	11	25.50
14000.0	429.61	12	18.73
27000.0	557.12	10	12.68

STATION ID_M17 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1115.10	9	183.54
7.5	723.24	10	69.73
14.0	569.17	10	34.06
27.0	554.06	10	19.34
45.0	533.47	13	23.17
75.0	407.69	12	22.88
140.0	366.48	10	22.95
270.0	333.64	10	18.52
450.0	302.36	9	48.58
750.0	173.70	5	30.32
1400.0	720.10	6	84.58
2700.0	651.39	7	33.16
4500.0	275.99	10	32.60
7500.0	258.81	13	18.83
14000.0	284.53	10	18.50
27000.0	435.03	8	21.84

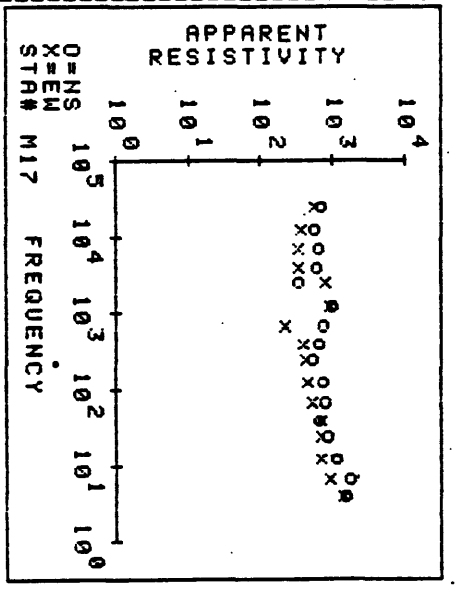
STATION ID_M18 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	239.57	5	61.81
7.5	299.43	10	33.63
14.0	335.76	9	30.25
27.0	168.20	11	7.85
45.0	129.57	9	15.39
75.0	231.45	11	23.85
140.0	220.52	13	22.48
270.0	172.97	11	15.77
450.0	227.09	12	32.72
750.0	317.12	14	33.02
1400.0	434.63	7	41.84
2700.0	145.25	5	53.21
4500.0	261.42	12	11.89
7500.0	211.60	15	3.81
14000.0	156.70	11	7.97
27000.0	206.48	14	7.06

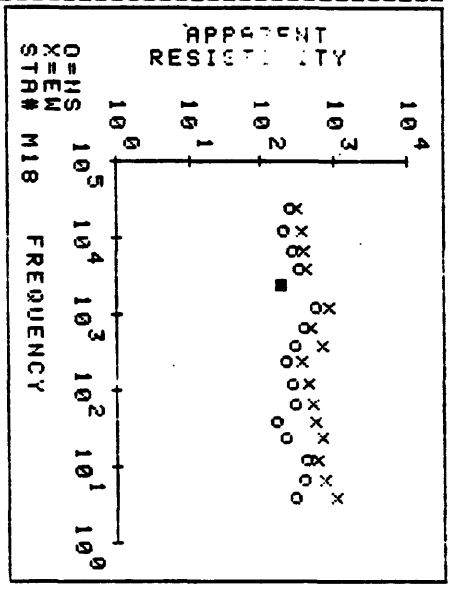
STATION ID_M18 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	851.43	8	122.57
7.5	602.95	10	38.05
14.0	490.81	12	28.02
27.0	531.69	10	31.34
45.0	441.36	14	21.01
75.0	406.34	12	12.50
140.0	360.46	11	25.70
270.0	284.45	9	12.96
450.0	559.35	14	22.75
750.0	372.26	9	59.64
1400.0	663.04	6	36.82
2700.0	146.76	7	27.45
4500.0	325.21	12	38.59
7500.0	313.23	11	23.50
14000.0	284.13	10	12.88
27000.0	254.19	10	12.01

OUTPUT FROM PLOT



OUTPUT FROM PLOT



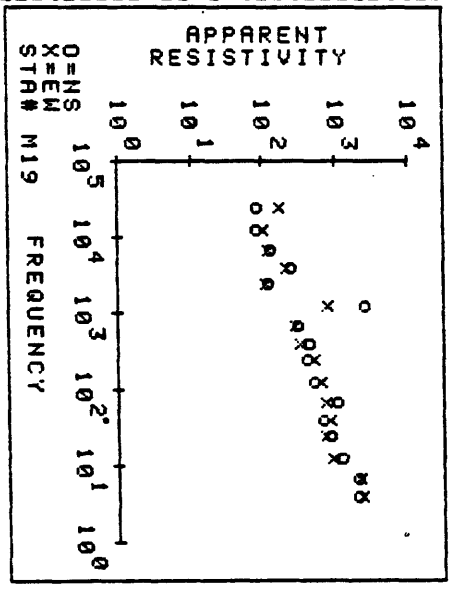
STATION ID_M19 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1635.90	9	244.87
7.5	1626.60	12	144.44
14.0	971.47	11	98.09
27.0	702.27	12	72.77
45.0	550.55	8	77.96
75.0	823.34	12	87.03
140.0	408.19	11	36.12
270.0	327.38	10	31.50
450.0	359.82	10	27.69
750.0	249.35	8	38.23
1400.0	2055.80	6	421.13
2700.0	100.48	11	11.99
4500.0	201.15	12	10.12
7500.0	103.64	12	2.92
14000.0	67.51	11	3.56
27000.0	66.98	11	2.91

STATION ID_M19 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1881.00	8	178.50
7.5	1706.70	10	74.76
14.0	741.05	9	72.92
27.0	587.22	10	61.28
45.0	679.75	9	61.87
75.0	598.56	10	55.96
140.0	499.31	8	23.15
270.0	403.83	10	37.78
450.0	272.90	11	19.99
750.0	235.88	10	24.63
1400.0	648.76	11	47.11
2700.0	92.81	6	6.72
4500.0	173.12	11	12.66
7500.0	96.17	13	3.34
14000.0	86.14	10	3.00
27000.0	137.20	7	7.03

OUTPUT FROM PLOT



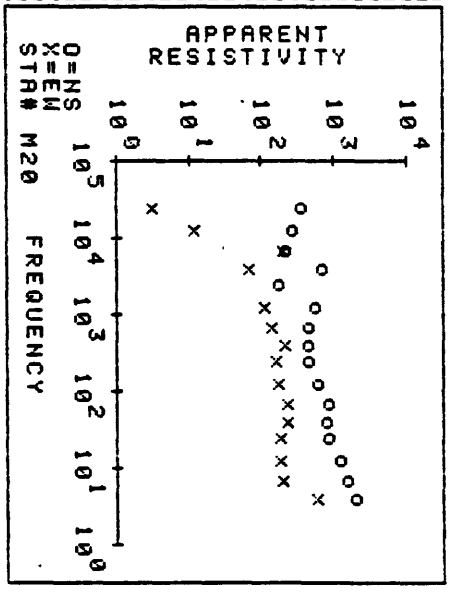
STATION ID_M20 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1617.70	7	528.86
7.5	1185.30	10	170.58
14.0	963.47	12	42.57
27.0	698.71	12	32.98
45.0	639.08	12	65.12
75.0	689.36	12	45.66
140.0	478.08	13	48.83
270.0	344.60	14	25.97
450.0	367.74	12	92.48
750.0	345.13	11	35.26
1400.0	456.46	7	74.26
2700.0	136.17	3	24.64
4500.0	532.41	11	75.92
7500.0	177.01	13	9.68
14000.0	221.03	11	6.65
27000.0	286.63	13	6.37

STATION ID_M20 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	473.52	7	84.37
7.5	157.47	11	16.99
14.0	145.20	12	4.14
27.0	148.09	12	6.39
45.0	181.93	12	6.37
75.0	187.06	10	12.86
140.0	140.06	11	8.85
270.0	126.16	11	10.01
450.0	173.91	9	15.40
750.0	110.76	10	17.02
1400.0	90.00	8	8.90
4500.0	56.05	9	10.16
7500.0	166.54	12	5.01
14000.0	9.35	10	.37
27000.0	2.65	8	.14

OUTPUT FROM PLOT



STATION ID_M21 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1152.80	6	102.28
7.5	1058.20	13	118.38
14.0	649.26	9	89.95
27.0	849.85	11	87.03
45.0	915.20	8	103.83
75.0	682.61	11	53.92
140.0	578.14	11	50.23
270.0	408.49	9	34.35
450.0	197.40	8	20.29
750.0	170.03	6	45.02
1400.0	1215.70	4	316.11
2700.0	314.73	7	37.74
4500.0	205.17	11	11.96
7500.0	191.82	12	13.20
14000.0	161.63	13	7.18
27000.0	238.86	11	6.22

STATION ID_M21 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	1044.50	8	171.55
7.5	1113.50	12	83.73
14.0	909.34	14	47.63
27.0	1619.50	13	76.58
45.0	724.55	10	31.77
75.0	563.84	10	40.39
140.0	551.25	14	34.22
270.0	533.52	15	24.35
450.0	542.97	8	99.29
750.0	175.47	4	29.38
1400.0	530.94	11	138.12
4500.0	159.89	9	17.31
7500.0	432.85	11	31.70
14000.0	233.18	11	7.44
27000.0	1.05	5	.10

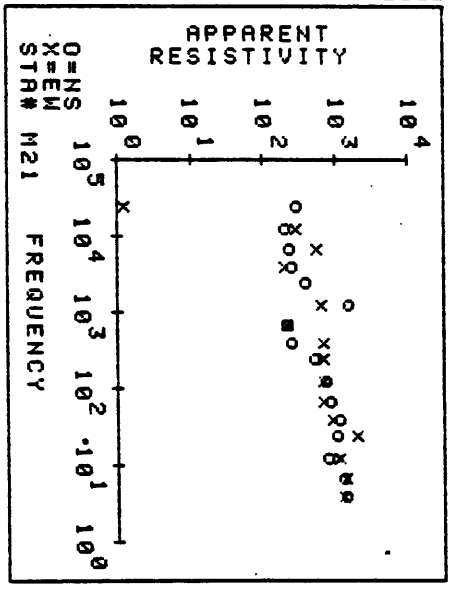
STATION ID_M22 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	58.00	8	6.00
7.5	68.13	10	7.89
14.0	55.56	13	4.83
27.0	41.53	14	3.51
45.0	27.30	11	3.88
75.0	55.99	7	8.83
140.0	53.31	9	7.00
270.0	36.07	7	4.72
450.0	36.44	9	5.60
750.0	14.48	9	2.78
1400.0	96.80	13	7.46
2700.0	9.46	6	1.76
4500.0	17.92	10	2.00
7500.0	37.21	12	1.06
14000.0	18.32	12	.91
27000.0	13.62	9	1.31

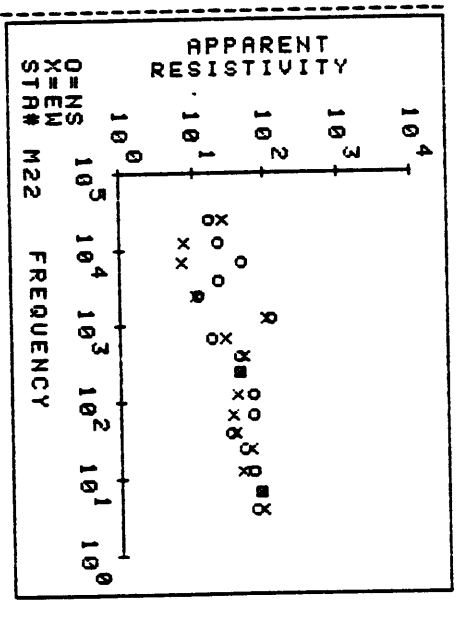
STATION ID_M22 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	74.63	8	14.80
7.5	65.85	6	14.30
14.0	39.04	9	3.45
27.0	50.00	10	3.43
45.0	31.38	10	3.05
75.0	27.79	11	4.08
140.0	33.72	11	3.44
270.0	35.75	10	2.62
450.0	41.61	7	8.32
750.0	22.81	11	5.01
1400.0	83.51	5	20.52
2700.0	8.72	3	1.81
7500.0	5.67	11	.68
14000.0	6.36	10	.36
27000.0	20.61	9	2.20

OUTPUT FROM PLOT



OUTPUT FROM PLOT



APPENDIX B

AMT DATA, TABLE TOP MOUNTAINS, ARIZONA

PROJECT=TABLE TOP AREA

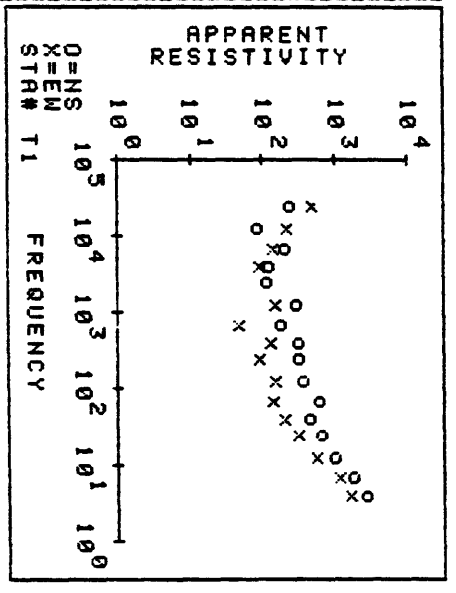
STATION ID_T1 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	2229.40	7	392.16
7.5	1422.20	7	323.33
14.0	804.36	9	121.78
27.0	505.00	10	77.14
45.0	346.85	6	75.88
75.0	472.60	10	87.63
140.0	293.55	9	48.96
270.0	247.41	9	57.09
450.0	241.44	8	23.91
750.0	141.09	6	51.33
1400.0	238.46	3	150.39
2700.0	91.77	3	49.17
4500.0	94.78	5	15.64
7500.0	156.63	12	7.94
14000.0	67.56	12	2.47
27000.0	191.43	9	8.75

STATION ID_T1 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	1267.00	9	221.22
7.5	908.96	8	71.61
14.0	455.46	14	27.19
27.0	254.52	10	13.92
45.0	165.04	10	6.23
75.0	113.29	10	7.16
140.0	120.19	10	24.06
270.0	75.30	9	10.10
450.0	101.04	8	12.96
750.0	38.42	4	14.15
1400.0	117.97	3	9.08
4500.0	72.39	6	9.50
7500.0	109.44	9	3.50
14000.0	178.56	7	16.80
27000.0	384.76	8	26.41

OUTPUT FROM PLOT



PROJECT=TABLE MOUNTAIN AREA

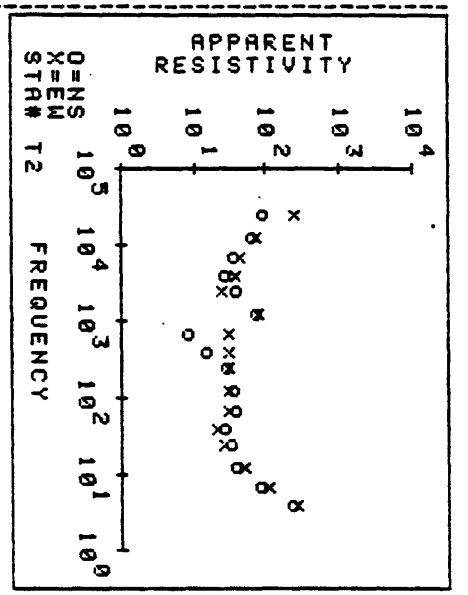
STATION ID_T2 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	183.25	8	38.36
7.5	67.40	7	9.43
14.0	31.14	11	4.50
27.0	25.52	10	1.86
45.0	21.95	10	2.81
75.0	31.42	11	5.33
140.0	28.71	10	2.10
270.0	22.48	10	3.22
450.0	12.32	9	2.01
750.0	6.49	5	.47
1400.0	57.58	11	5.48
2700.0	30.30	9	6.18
4500.0	21.07	10	3.44
7500.0	28.26	9	2.52
14000.0	52.18	8	1.55
27000.0	72.49	7	2.81

STATION ID_T2 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	214.16	10	36.36
7.5	89.93	10	7.09
14.0	40.58	10	3.58
27.0	21.67	12	1.08
45.0	17.11	9	1.49
75.0	24.55	15	1.20
140.0	23.85	14	1.07
270.0	24.86	13	1.73
450.0	23.82	11	1.49
750.0	23.73	11	3.55
1400.0	60.85	7	5.03
2700.0	20.47	6	4.31
4500.0	29.98	12	1.81
7500.0	35.75	12	1.73
14000.0	58.50	10	3.86
27000.0	193.57	9	8.53

OUTPUT FROM PLOT



PROJECT=TABLE MOUNTAIN AREA

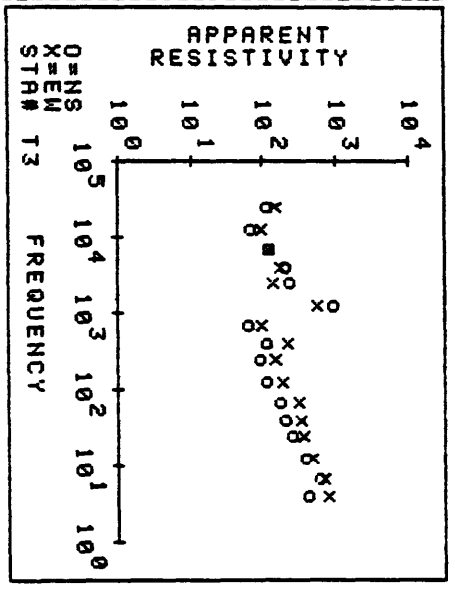
STATION ID_T3 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	337.25	7	73.39
7.5	487.65	10	39.77
14.0	298.94	12	37.01
27.0	198.39	11	21.53
45.0	161.35	11	19.41
75.0	142.36	11	9.93
140.0	88.29	9	5.71
270.0	74.46	12	5.73
450.0	91.06	9	8.01
750.0	51.82	9	6.72
1400.0	745.60	6	177.78
2700.0	188.70	9	19.11
4500.0	161.06	10	8.28
7500.0	93.73	11	4.89
14000.0	53.67	9	1.06
27000.0	89.72	9	2.27

STATION ID_T3 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	636.41	12	56.59
7.5	553.34	11	48.07
14.0	384.64	13	21.20
27.0	290.67	11	22.11
45.0	269.84	14	13.50
75.0	255.45	11	31.26
140.0	155.18	10	11.31
270.0	123.56	14	6.65
450.0	173.08	9	15.28
750.0	77.50	11	8.92
1400.0	429.81	11	32.79
2700.0	110.35	8	7.66
4500.0	139.17	11	4.88
7500.0	95.55	13	2.06
14000.0	75.83	13	3.40
27000.0	121.04	7	4.27

OUTPUT FROM PLOT



PROJECT=TABLE MOUNTAIN AREA

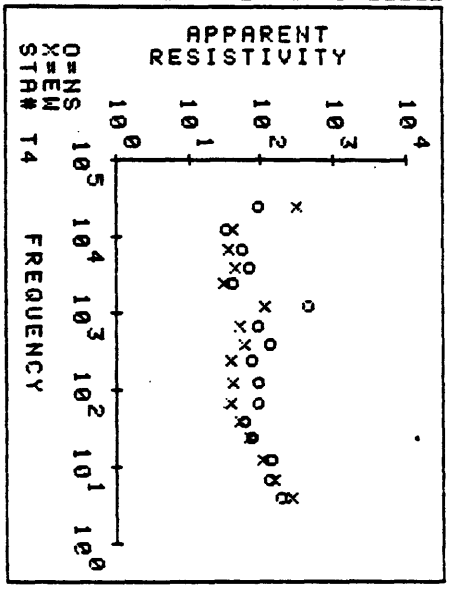
STATION ID_T4 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	144.66	4	16.80
7.5	105.33	6	18.15
14.0	115.78	9	12.26
27.0	59.09	10	5.14
45.0	48.43	9	11.70
75.0	74.75	11	9.57
140.0	71.40	10	4.16
270.0	58.24	9	3.47
450.0	101.67	13	5.74
750.0	70.19	8	7.72
1400.0	350.68	10	47.19
2700.0	32.95	11	3.31
4500.0	53.91	11	3.55
7500.0	45.12	10	3.55
14000.0	26.87	10	1.29
27000.0	74.46	7	2.69

STATION ID_T4 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	220.38	9	28.20
7.5	121.89	8	5.94
14.0	81.05	11	4.38
27.0	53.04	10	2.34
45.0	41.23	10	2.01
75.0	29.53	9	1.64
140.0	31.72	9	1.90
270.0	29.97	8	1.14
450.0	46.02	10	2.84
750.0	41.15	11	2.53
1400.0	92.37	9	7.69
2700.0	24.44	6	5.04
4500.0	35.17	12	.90
7500.0	28.24	9	.44
14000.0	32.94	10	.94
27000.0	247.54	6	15.88

OUTPUT FROM PLOT



PROJECT=TABLE MOUNTAIN AREA

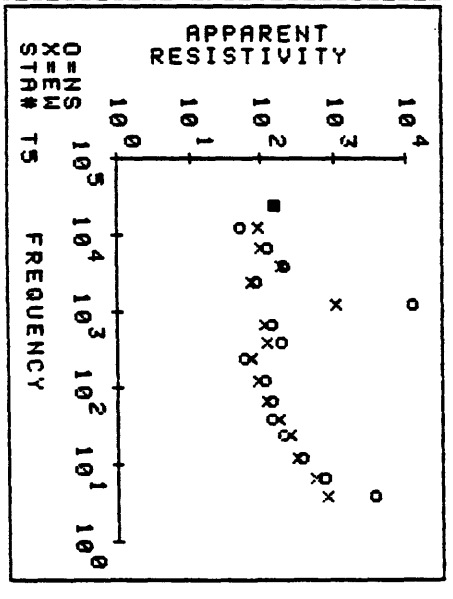
STATION ID_T5 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	2989.90	4	1162.50
7.5	605.22	5	100.36
14.0	286.07	9	52.23
27.0	166.74	10	31.64
45.0	110.33	11	21.41
75.0	112.09	11	12.89
140.0	88.57	8	9.67
270.0	46.91	9	5.41
450.0	144.59	8	43.14
750.0	110.35	7	24.44
1400.0	9597.80	3	5391.90
2700.0	68.71	6	10.12
4500.0	164.03	7	22.42
7500.0	95.00	11	5.64
14000.0	42.01	9	2.92
27000.0	121.14	6	8.63

STATION ID_T5 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	645.47	6	71.69
7.5	449.32	10	26.21
14.0	254.93	11	18.07
27.0	204.46	15	4.27
45.0	137.98	12	4.48
75.0	100.14	11	6.91
140.0	73.70	12	4.00
270.0	56.84	12	1.17
450.0	94.86	12	4.74
750.0	87.29	12	4.86
1400.0	874.10	7	147.31
2700.0	58.47	5	14.19
4500.0	147.87	9	4.60
7500.0	77.11	12	9.27
14000.0	74.97	8	2.27
27000.0	121.26	6	13.16

OUTPUT FROM PLOT



PROJECT=TABLE MOUNTAIN AREA

STATION ID_T6 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	670.14	5	192.71
7.5	383.81	9	43.24
14.0	369.35	11	34.89
27.0	291.53	11	19.55
45.0	262.15	9	17.78
75.0	330.03	7	61.50
140.0	236.01	11	23.05
270.0	190.63	12	21.89
450.0	295.02	8	45.93
750.0	272.29	10	36.27
1400.0	1942.00	7	243.55
2700.0	53.01	15	3.53
4500.0	151.15	12	13.01
7500.0	117.70	10	13.78
14000.0	61.55	9	4.53
27000.0	105.82	8	8.63

STATION ID_T6 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1101.40	6	166.68
7.5	1000.40	10	77.04
14.0	798.98	11	39.25
27.0	577.77	11	28.71
45.0	476.16	10	26.02
75.0	321.21	12	22.49
140.0	239.86	11	16.23
270.0	146.46	10	5.03
450.0	175.42	10	17.22
750.0	181.97	10	15.00
1400.0	634.90	9	78.15
2700.0	88.99	6	6.08
4500.0	166.82	10	5.40
7500.0	116.78	9	4.36
14000.0	117.64	12	3.08
27000.0	344.41	10	22.69

OUTPUT FROM PLOT