UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Audio-magnetotelluric investigation at Turkey Creek Caldera, Chiricahua Mountains, southeastern Arizona: location map and data report

by

R.M. Senterfit[1] and W.D. Heran[1]

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Thirty-two audio-magnetotelluric (AMT) soundings were made in the summer of 1989 as part of a study of the Coronado National Forest. The work was done with the objective of aiding in the geologic mapping of the structural and lithologic relationships in the area by providing information on electrical structure of the subsurface.

The study area included the Turkey Creek caldera, located in the Coronado National Forest about 10 kilometers south of the Chiricahua National Monument. Locations of the soundings are shown in figure 1. The sounding curve for each station along with its corresponding data set is shown in Appendix 1.

Electromagnetic induction soundings were made using distant field sources, mostly natural sources in the frequency range from 4.5 hertz (Hz) to 27,000 Hz. The data for each station consist of scalar measurements of discrete frequencies for two-orthogonal magnetic and electric field pairs.

The basic principles of the AMT method correspond to those of the magnetotelluric (MT) method (Cagniard, 1953; Vozoff, 1972; Vozoff and others, 1963). AMT signals, however, occur at higher frequencies and originate mainly from atmospheric electrical disturbances (spherics) rather than the lower frequencies used in MT (typically in the range of .001 to 1 Hz) which originate from ionospheric or magnetospheric phenomena.

Previous AMT or MT work applied to investigate the structure and lithologic relations in various volcanic areas include that by Hoover and others, 1978; Hermance and others, 1984; Leary and Phinney, 1974; Stanley, 1982; Long, 1985; and Fitterman and others, 1988.

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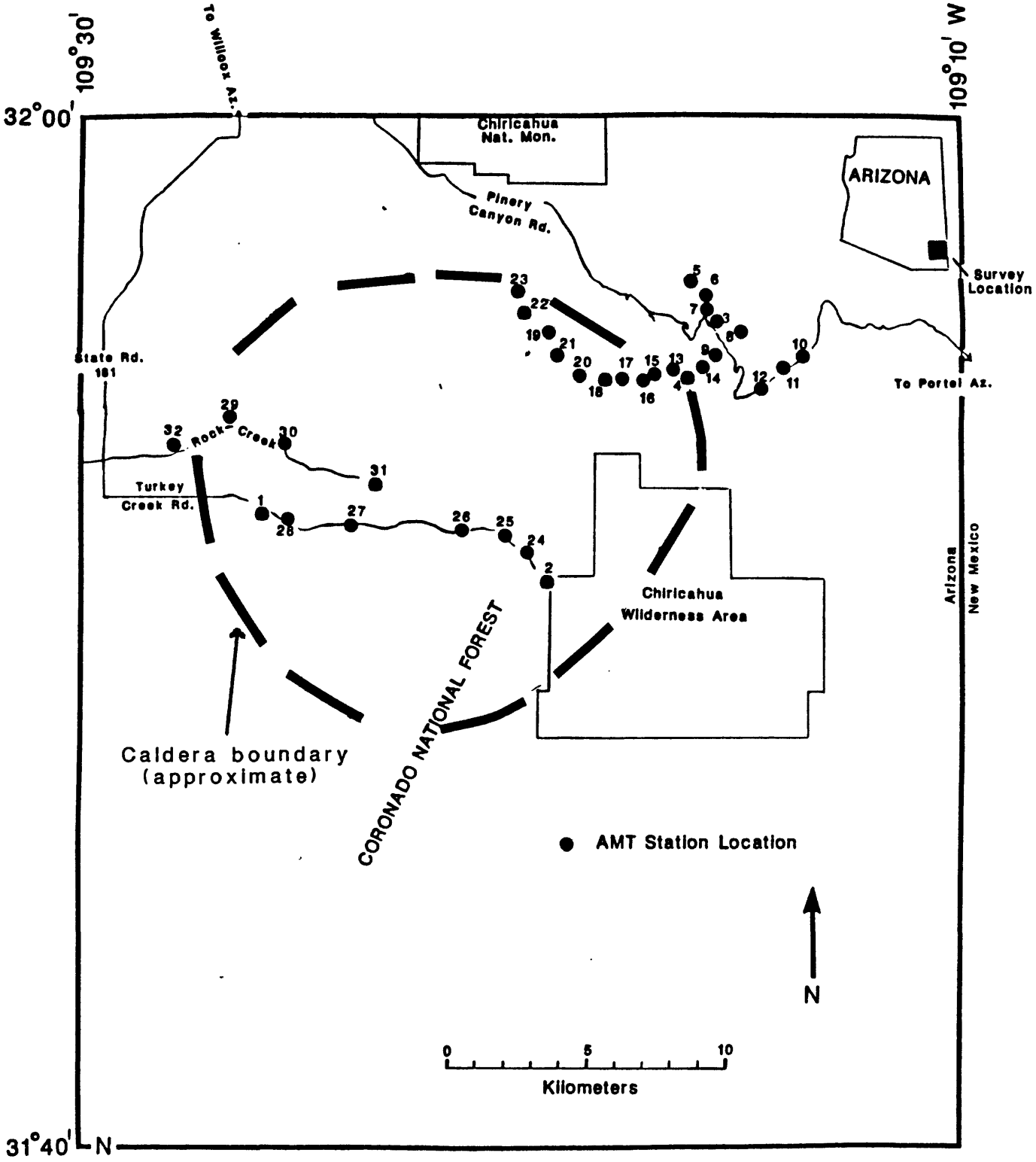


Figure 1 Map showing locations of AMT stations in Turkey Creek caldera area, Chiricahua Mountains, southeastern Arizona.

Appendix 1

Sounding curve for every station recorded at Turkey Creek caldera, along with corresponding data set.

Key to abbreviations:

Sta. ID	Station identification
Freq.	Frequency (Hz)
No Freq	Number of frequencies recorded
Ap Res	Apparent resistivity (ohm-meters)
N Obs	Number of observations taken
Std Err	Standard error (ohm-meters)
Plotting Symbols	
O=NS	North-south E-field measurement
X=EW	East-west E-field measurement

CM 1

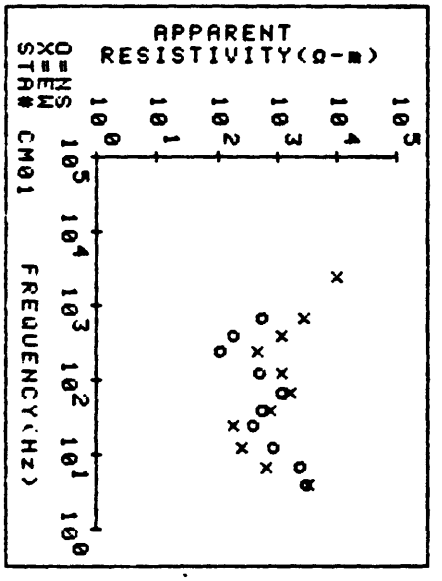
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM01 NS NO FREQ= 10

FREQ	AP-RES	N OBS	STD ERR
4.5	2311.60	2	117.71
7.5	1896.40	7	583.33
14.0	656.57	5	238.64
27.0	321.18	6	85.94
45.0	423.91	2	332.32
75.0	959.20	6	397.09
140.0	410.04	3	133.66
270.0	90.21	6	5.59
450.0	148.02	2	85.19
750.0	431.02	5	103.01

STA. ID_CM01 EW NO FREQ= 11

FREQ	AP-RES	N OBS	STD ERR
4.5	2491.30	2	19.80
7.5	532.83	3	130.97
14.0	203.50	3	79.56
27.0	145.67	5	43.64
45.0	634.67	3	263.90
75.0	1315.60	5	646.14
140.0	934.72	2	47.02
270.0	371.80	3	286.25
450.0	917.17	1	0.00
750.0	2261.10	2	165.39
2700.0	7420.10	3	3576.50



CM 2

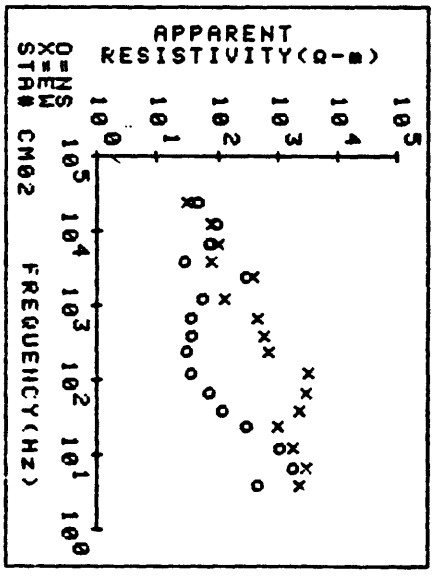
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM02 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	360.42	4	148.18
7.5	1439.50	5	320.22
14.0	830.20	9	91.28
27.0	245.87	6	28.20
45.0	92.32	8	4.94
75.0	59.07	8	8.91
140.0	28.34	8	2.28
270.0	24.56	8	1.91
450.0	28.27	8	1.99
750.0	30.55	10	4.31
1400.0	45.73	8	3.62
2700.0	238.42	8	34.02
4500.0	23.32	4	4.57
7500.0	58.23	7	9.15
14000.0	76.12	6	4.87
27000.0	36.70	4	3.48

STA. ID_CM02 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1880.80	5	579.03
7.5	2340.60	8	178.28
14.0	1469.50	10	100.67
27.0	822.02	5	198.16
45.0	1857.20	4	1084.40
75.0	2361.60	4	381.00
140.0	2472.60	5	786.89
270.0	568.77	9	96.05
450.0	458.57	8	82.51
750.0	373.26	12	111.79
1400.0	102.70	5	35.71
2700.0	313.59	8	44.21
4500.0	61.22	8	4.20
7500.0	83.95	8	4.45
14000.0	60.56	4	4.26
27000.0	23.94	2	10.98



CM 3

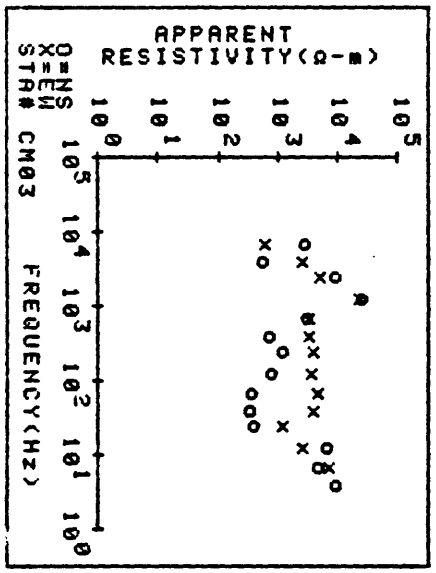
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM03 NS NO FREQ= 14

FREQ	AP-RES	N OBS	STD ERR
4.5	6846.70	1	0.00
7.5	3727.70	5	1766.90
14.0	4995.90	5	1056.10
27.0	315.00	3	111.40
45.0	272.35	5	62.67
75.0	294.60	5	86.14
140.0	632.07	6	52.01
270.0	951.22	6	103.84
450.0	552.04	10	87.33
750.0	2315.20	7	395.12
1400.0	19032.00	4	1225.50
2700.0	6895.30	5	1534.60
4500.0	447.04	5	130.12
7500.0	2119.20	8	156.37

STA. ID_CM03 EW NO FREQ= 13

FREQ	AP-RES	N OBS	STD ERR
7.5	5451.60	2	897.33
14.0	1920.00	6	239.78
27.0	927.57	5	375.54
45.0	3136.80	9	527.51
75.0	3697.30	6	394.21
140.0	2820.50	7	414.34
270.0	3135.90	9	396.50
450.0	2557.80	11	554.61
750.0	2568.70	8	636.79
1400.0	17435.00	5	7929.00
2700.0	3956.30	9	1213.00
4500.0	1994.50	7	315.76
7500.0	496.41	7	119.43



CM 4

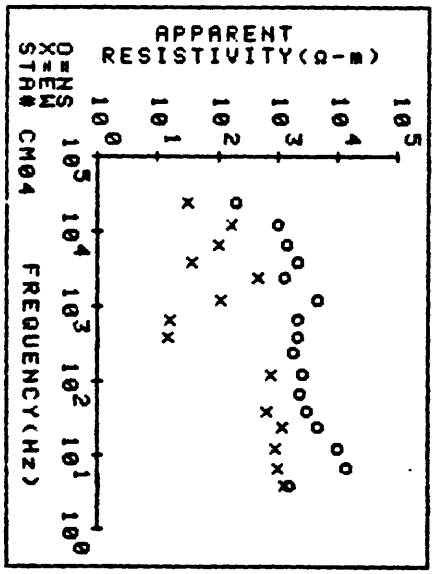
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM04 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1254.90	2	812.45
7.5	11281.00	7	827.24
14.0	7592.30	7	1278.50
27.0	3487.90	8	182.14
45.0	2416.60	8	216.62
75.0	1774.80	11	227.17
140.0	2010.50	7	340.63
270.0	1416.00	8	90.30
450.0	1653.10	10	200.99
750.0	1679.00	13	108.89
1400.0	3612.30	8	468.98
2700.0	1047.90	4	226.88
4500.0	1739.80	10	207.20
7500.0	1136.50	7	134.10
14000.0	773.59	10	52.70
27000.0	157.25	3	14.70

STA. ID_CM04 EW NO FREQ= 14

FREQ	AP-RES	N OBS	STD ERR
4.5	981.59	2	604.53
7.5	797.81	6	157.65
14.0	703.31	5	68.44
27.0	954.39	5	111.30
45.0	508.33	9	82.28
140.0	600.81	5	137.86
450.0	12.12	6	2.96
750.0	12.95	4	8.19
1400.0	87.06	8	29.17
2700.0	369.74	8	76.08
4500.0	29.29	9	5.96
7500.0	79.15	7	28.78
14000.0	137.84	3	4.64
27000.0	24.15	4	.97



CM 5

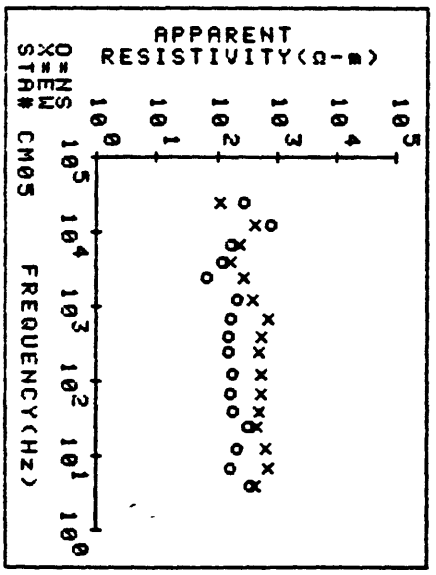
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM05 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	299.22	5	96.68
7.5	138.36	6	40.98
14.0	173.92	7	34.58
27.0	264.85	10	59.52
45.0	145.33	7	22.47
75.0	131.57	9	14.85
140.0	142.65	9	13.87
270.0	118.48	9	16.01
450.0	127.10	10	11.32
750.0	131.55	10	14.27
1400.0	170.67	5	29.67
2700.0	52.14	3	13.07
4500.0	92.37	5	20.88
7500.0	134.39	5	17.24
14000.0	619.14	2	86.35
27000.0	218.13	3	17.20

STA. ID_CM05 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	336.04	5	57.44
7.5	578.40	8	64.08
14.0	507.73	9	23.74
27.0	373.19	10	19.89
45.0	392.94	11	26.71
75.0	420.48	9	23.92
140.0	424.64	12	14.05
270.0	419.68	12	20.64
450.0	426.80	11	17.47
750.0	573.13	10	33.73
1400.0	319.75	8	63.02
2700.0	229.61	6	72.30
4500.0	137.86	7	23.76
7500.0	192.74	8	20.22
14000.0	346.41	7	15.86
27000.0	86.40	4	11.31



CM 6

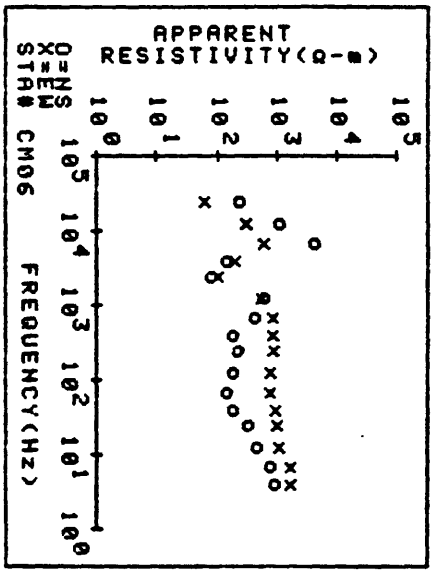
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM06 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	752.16	7	111.25
7.5	638.03	10	58.14
14.0	377.77	10	18.97
27.0	254.84	9	9.20
45.0	150.18	11	24.32
75.0	117.50	10	4.99
140.0	141.78	13	12.05
270.0	173.97	12	16.93
450.0	151.08	10	26.98
750.0	353.97	12	22.85
1400.0	494.70	8	84.09
2700.0	64.65	4	13.17
4500.0	109.40	5	17.72
7500.0	3226.70	8	329.12
14000.0	846.24	6	93.46
27000.0	193.86	8	12.49

STA. ID_CM06 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1345.20	4	298.22
7.5	1268.30	8	124.86
14.0	840.19	11	37.30
27.0	801.45	11	41.37
45.0	741.89	10	29.75
75.0	606.71	10	26.31
140.0	616.62	12	23.54
270.0	648.32	11	49.74
450.0	673.98	10	30.56
750.0	673.20	11	54.95
1400.0	428.20	11	40.45
2700.0	83.57	8	12.00
4500.0	164.91	4	24.85
7500.0	461.21	8	43.36
14000.0	250.16	5	4.17
27000.0	47.38	7	3.29



CM 7

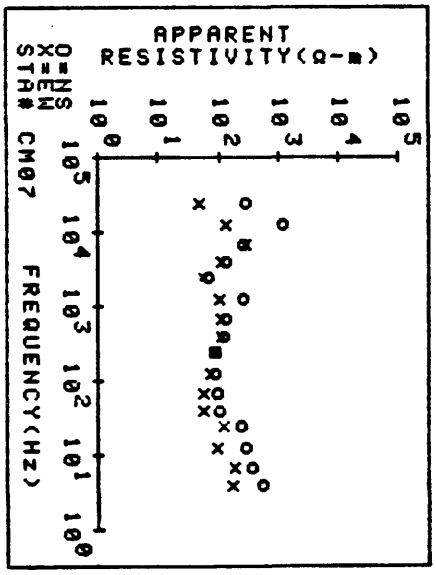
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM07 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	439.82	6	117.36
7.5	280.35	8	20.48
14.0	226.33	12	30.73
27.0	189.92	9	12.12
45.0	82.76	9	5.30
75.0	76.76	11	7.05
140.0	67.55	10	6.14
270.0	70.97	13	5.97
450.0	97.51	11	4.42
750.0	103.43	11	5.68
1400 0	207.33	12	43.21
2700.0	51.60	4	7.35
4500.0	103.57	6	9.16
7500.0	211.64	11	14.50
14000.0	963.73	5	137.02
27000.0	220.31	5	11.49

STA. ID_CM07 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	134.91	4	56.18
7.5	143.73	6	39.14
14.0	76.57	9	8.72
27.0	98.59	7	17.06
45.0	44.47	13	6.65
75.0	45.99	12	2.96
140.0	60.21	13	6.68
270.0	67.74	13	6.32
450.0	86.90	11	6.32
750.0	87.67	14	5.37
1400.0	80.87	12	8.21
2700.0	46.39	5	4.93
4500.0	88.05	6	9.51
7500.0	226.74	9	25 13
14000.0	103.98	8	6.58
27000.0	38.92	3	5.98



CM 8

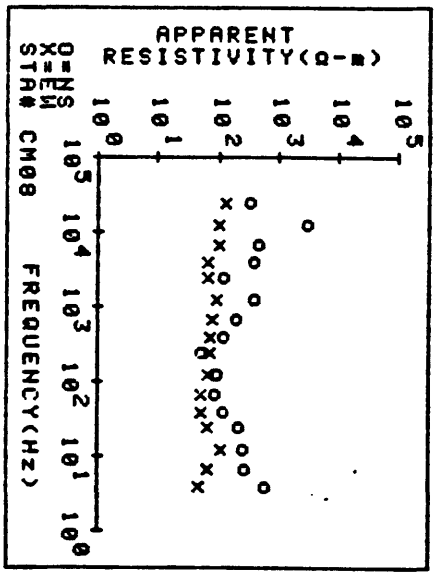
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM08 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	473.83	10	94.74
7.5	229.47	10	38.33
14.0	199.87	11	10.00
27.0	166.54	11	5.55
45.0	97.94	14	17.14
75.0	67.89	12	4.84
140.0	75.22	13	4.90
270.0	42.59	8	4.60
450.0	93.72	11	5.68
750.0	162.46	11	10.95
1400.0	308.77	9	56.18
2700.0	99.39	4	17.55
4500.0	309.54	6	49.77
7500.0	362.78	7	41.96
14000.0	2408.80	6	337.15
27000.0	259.11	4	13.57

STA. ID_CM08 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	38.20	2	12.23
7.5	54.46	4	22.75
14.0	85.77	10	10.74
27.0	51.25	7	3.71
45.0	41.57	11	3.25
75.0	42.77	14	3.50
140.0	54.77	14	3.79
270.0	60.14	11	3.80
450.0	58.07	11	4.22
750.0	60.95	13	7.08
1400.0	77.06	7	16.71
2700.0	52.99	6	6.03
4500.0	54.56	9	3.67
7500.0	77.94	7	9.08
14000.0	81.73	4	5.08
27000.0	100.45	5	1.31



CM 9

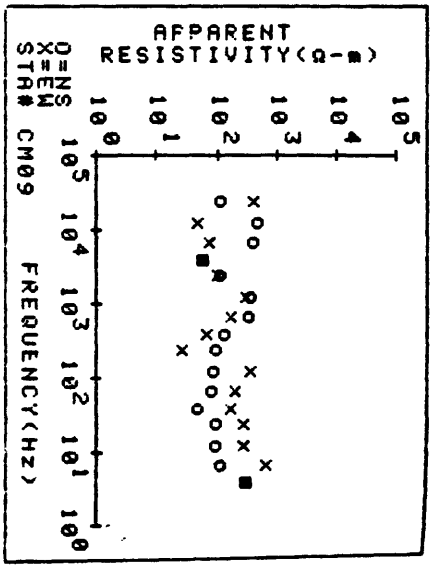
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM09 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	243.52	5	62.46
7.5	89.16	7	10.68
14.0	71.64	4	16.78
27.0	73.24	5	12.59
45.0	37.10	11	3.93
75.0	61.72	7	8.79
140.0	69.19	6	10.35
270.0	75.19	6	20.37
450.0	102.84	8	17.43
750.0	258.21	5	41.45
1400.0	294.76	5	27.35
2700.0	86.85	7	5.89
4500.0	45.97	5	10.97
7500.0	305.04	6	12.27
14000.0	374.60	5	42.11
27000.0	88.81	8	5.77

STA. ID_CM09 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	234.60	4	65.86
7.5	520.77	5	102.60
14.0	217.12	5	76.77
27.0	230.16	4	73.11
45.0	134.06	7	20.64
75.0	156.68	4	24.45
140.0	275.78	5	45.37
270.0	20.52	6	5.08
450.0	53.49	12	15.41
750.0	130.54	11	35.42
1400.0	235.34	10	32.87
2700.0	84.28	3	25.61
4500.0	45.76	5	7.48
7500.0	58.52	7	8.54
14000.0	37.14	3	1.65
27000.0	307.77	2	56.15



CM 10

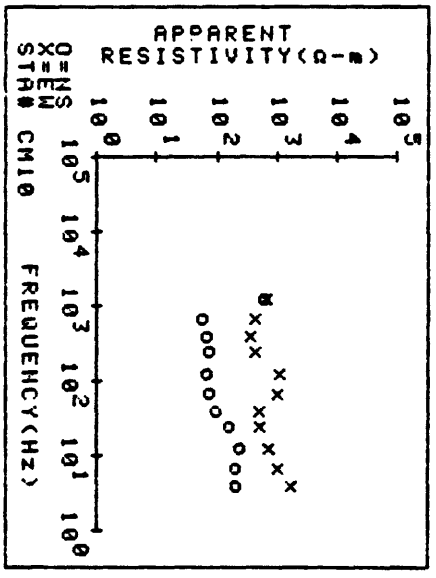
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM10 NS NO FREQ= 11

FREQ	AP-RES	N OBS	STD ERR
4.5	155.96	5	22.54
7.5	164.43	10	24.09
14.0	193.27	10	44.69
27.0	126.54	12	7.15
45.0	71.75	8	6.63
75.0	60.08	8	7.25
140.0	55.12	11	7.24
270.0	57.32	8	7.11
450.0	52.80	11	8.39
750.0	46.53	8	11.47
1400.0	460.42	2	41.63

STA. ID_CM10 EW NO FREQ= 11

FREQ	AP-RES	N OBS	STD ERR
4.5	1281.70	4	318.35
7.5	787.31	4	18.40
14.0	555.34	8	52.65
27.0	411.77	14	22.75
45.0	396.96	9	30.51
75.0	779.21	4	203.77
140.0	860.20	9	248.45
270.0	344.22	8	35.20
450.0	291.29	10	47.56
750.0	331.31	9	35.80
1400.0	507.37	2	30.85



CM 11

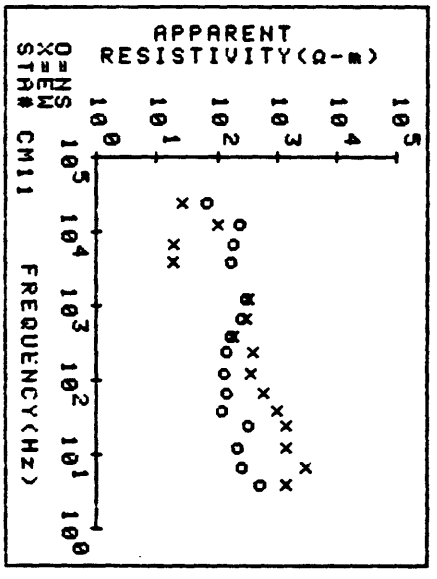
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM11 NS NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	418.70	9	82.20
7.5	207.11	7	31.27
14.0	179.88	8	17.21
27.0	273.53	7	37.61
45.0	95.85	14	5.46
75.0	110.84	12	9.85
140.0	100.96	11	6.18
270.0	111.01	13	6.41
450.0	133.80	14	7.07
750.0	199.58	12	14.69
1400.0	245.31	7	43.90
4500.0	135.07	9	19.64
7500.0	150.16	5	15.71
14000.0	181.70	9	11.25
27000.0	52.27	5	7.41

STA. ID_CM11 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	1128.00	4	128.69
7.5	2418.10	9	124.13
14.0	1115.40	12	126.04
27.0	1153.70	13	95.55
45.0	822.39	11	82.84
75.0	493.23	7	43.51
140.0	276.22	10	23.94
270.0	301.96	10	56.38
450.0	151.35	7	45.96
750.0	240.65	11	90.69
1400.0	269.43	6	68.69
4500.0	14.76	7	3.56
7500.0	15.46	4	1.61
14000.0	77.66	3	21.11
27000.0	21.41	3	2.34



CM 12

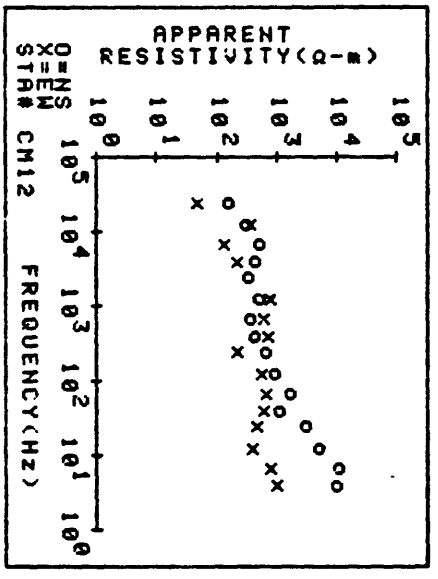
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM12 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	8047.10	6	1507.20
7.5	8146.20	14	351.56
14.0	3954.70	10	115.41
27.0	2306.40	13	126.89
45.0	833.68	8	53.38
75.0	1351.60	10	98.37
140.0	737.43	14	18.26
270.0	530.61	12	29.55
450.0	341.28	13	42.21
750.0	281.85	14	14.37
1400.0	412.97	8	33.06
2700.0	272.35	7	33.08
4500.0	347.37	11	91.50
7500.0	393.92	10	38.12
14000.0	245.46	7	19.32
27000.0	125.19	3	26.26

STA. ID_CM12 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	800.01	2	910.35
7.5	639.27	6	129.58
14.0	318.56	7	46.85
27.0	377.43	10	68.88
45.0	489.21	7	82.79
75.0	501.45	6	122.46
140.0	433.13	4	55.75
270.0	174.85	5	72.92
450.0	550.44	12	55.34
750.0	468.29	14	33.78
1400.0	616.95	6	68.26
4500.0	177.84	7	28.37
7500.0	104.84	8	15.65
14000.0	286.28	5	30.26
27000.0	37.51	2	4.40



CM 13

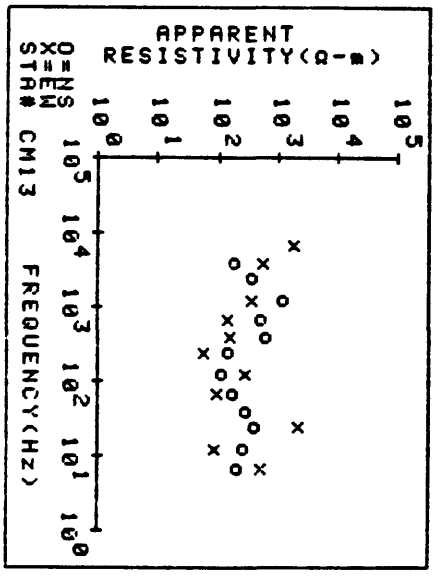
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM13 NS NO FREQ= 12

FREQ	AP-RES	N OBS	STD ERR
7.5	154.15	5	15.49
14.0	208.40	4	118.28
27.0	318.44	4	28.52
45.0	215.45	7	117.19
75.0	133.52	9	52.63
140.0	85.47	11	7.41
270.0	115.36	13	39.03
450.0	472.89	10	99.66
750.0	392.81	8	81.23
1400.0	963.61	6	275.97
2700.0	293.69	6	67.84
4500.0	142.06	11	35.09

STA. ID_CM13 EW NO FREQ= 11

FREQ	AP-RES	N OBS	STD ERR
7.5	390.89	4	157.64
14.0	66.69	6	8.04
27.0	1687.70	6	426.59
75.0	75.54	9	16.16
140.0	215.00	5	52.31
270.0	44.08	12	11.45
450.0	121.77	8	11.79
750.0	116.21	12	64.01
1400.0	292.61	7	35.00
4500.0	429.52	8	81.17
7500.0	1416.00	2	188.67



CM 14

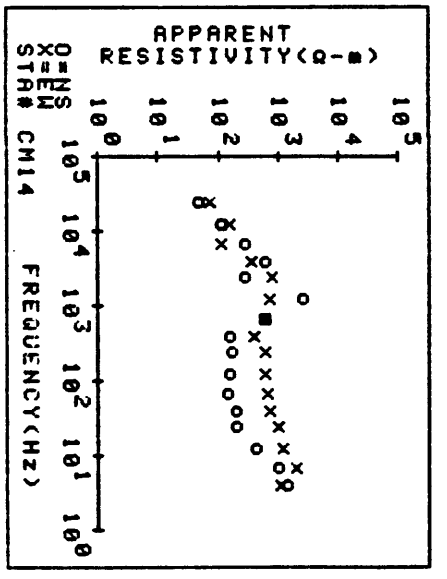
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM14 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1127.60	5	557.49
7.5	821.65	12	109.80
14.0	354.15	8	34.63
27.0	152.64	6	15.04
45.0	156.35	10	16.67
75.0	110.07	12	14.33
140.0	123.27	7	24.19
270.0	132.68	8	25.40
450.0	124.51	10	21.62
750.0	469.52	6	125.80
1400.0	1956.00	5	437.54
2700.0	215.98	9	26.16
4500.0	457.11	10	55.48
7500.0	213.92	10	13.51
14000.0	91.27	5	17.34
27000.0	36.34	3	10.20

STA. ID_CM14 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	836.04	9	108.03
7.5	1488.70	14	138.70
14.0	937.18	11	54.64
27.0	767.25	14	36.27
45.0	541.85	10	27.42
75.0	502.60	12	15.46
140.0	490.89	12	23.65
270.0	480.03	12	10.78
450.0	303.46	12	16.81
750.0	479.20	14	24.93
1400.0	559.58	12	33.28
2700.0	610.86	17	57.94
4500.0	286.55	14	26.10
7500.0	85.65	14	8.01
14000.0	123.49	8	2.19
27000.0	56.85	5	4.40



CM 15

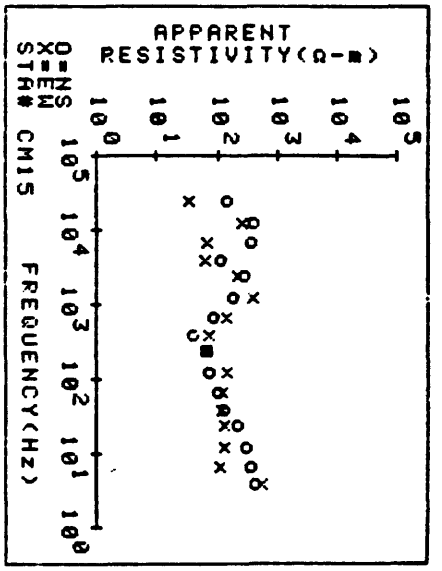
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM15 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	336.68	2	6.23
7.5	285.81	8	19.34
14.0	237.21	10	9.00
27.0	172.27	15	5.77
45.0	100.13	14	6.86
75.0	81.22	11	3.75
140.0	55.45	13	2.35
270.0	51.32	14	3.31
450.0	31.37	12	1.94
750.0	66.85	13	12.78
1400.0	146.53	7	55.57
2700.0	223.79	4	32.96
4500.0	86.82	8	9.85
7500.0	278.76	16	23.70
14000.0	324.67	7	54.63
27000.0	111.54	4	6.45

STA. ID_CM15 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	447.66	3	41.40
7.5	87.75	7	27.35
14.0	108.14	9	12.85
27.0	103.50	14	27.12
45.0	92.31	15	8.44
75.0	99.07	9	14.84
140.0	115.12	10	7.79
270.0	55.07	10	11.81
450.0	57.86	15	3.79
750.0	118.32	10	24.33
1400.0	300.25	10	29.65
2700.0	167.79	6	28.96
4500.0	47.47	5	6.96
7500.0	52.98	7	5.47
14000.0	201.65	6	32.57
27000.0	26.48	3	.86



CM 16

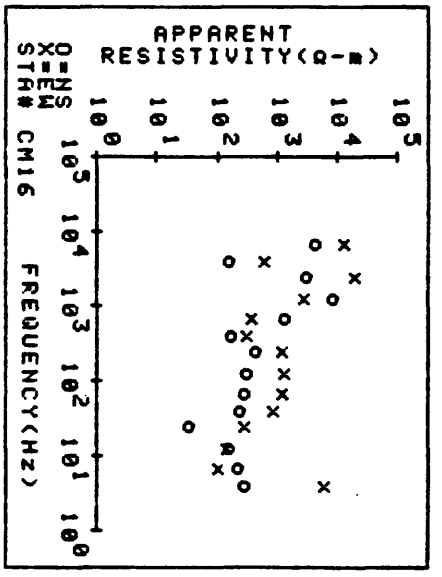
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM16 NS NO FREQ= 14

FREQ	AP-RES	N OBS	STD ERR
4.5	228.54	2	2.59
7.5	166.75	4	8.74
14.0	122.82	2	45.24
27.0	25.96	6	5.55
45.0	187.43	7	47.00
75.0	224.98	9	31.00
140.0	247.97	9	63.87
270.0	335.98	8	52.60
450.0	135.46	14	24.11
750.0	988.30	5	239.47
1400.0	6766.80	8	2966.00
2700.0	2459.90	6	709.86
4500.0	118.50	8	26.97
7500.0	3245.80	9	280.33

STA. ID_CM16 EW NO FREQ= 14

FREQ	AP-RES	N OBS	STD ERR
4.5	4524.40	3	935.59
7.5	83.30	5	24.09
14.0	117.00	6	35.97
27.0	220.43	9	34.14
45.0	670.70	9	120.58
75.0	913.34	9	216.62
140.0	1002.60	3	410.08
270.0	934.43	8	51.79
450.0	236.73	5	171.21
750.0	291.64	7	149.23
1400.0	2144.00	7	1902.90
2700.0	14881.00	6	5275.40
4500.0	488.98	8	140.48
7500.0	9842.90	4	1274.80



CM 17

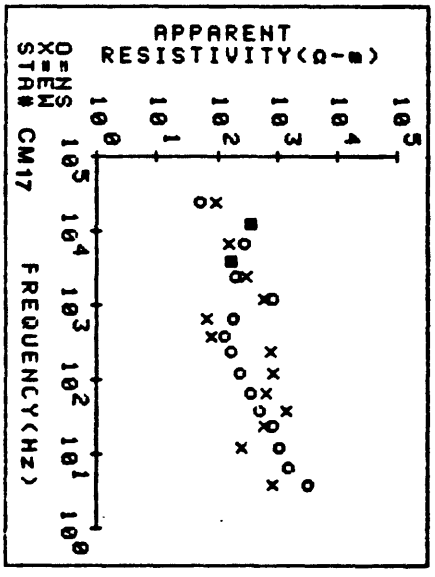
PROJECT=CHIR MTNS AMR 5/89

STA. ID_17 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	2531.90	12	480.26
7.5	1155.70	9	144.43
14.0	881.53	12	37.65
27.0	648.95	12	19.20
45.0	388.99	12	44.48
75.0	275.86	14	20.38
140.0	196.09	15	7.66
270.0	138.38	14	7.01
450.0	106.42	10	6.94
750.0	149.86	17	5.96
1400.0	676.82	11	218.29
2700.0	160.31	12	16.70
4500.0	136.89	10	16.22
7500.0	225.41	13	26.74
14000.0	283.64	8	18.95
27000.0	39.80	4	3.07

STA. ID_17 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	677.43	6	520.11
14.0	205.77	9	61.84
27.0	482.02	10	97.72
45.0	1154.30	6	108.45
75.0	532.03	5	103.60
140.0	686.17	11	72.35
270.0	605.58	8	82.53
450.0	62.03	11	5.93
750.0	53.46	8	3.88
1400.0	467.06	6	102.23
2700.0	237.38	11	24.70
4500.0	136.64	12	23.67
7500.0	127.76	15	6.52
14000.0	283.60	5	13.33
27000.0	73.38	6	2.13



CM 18

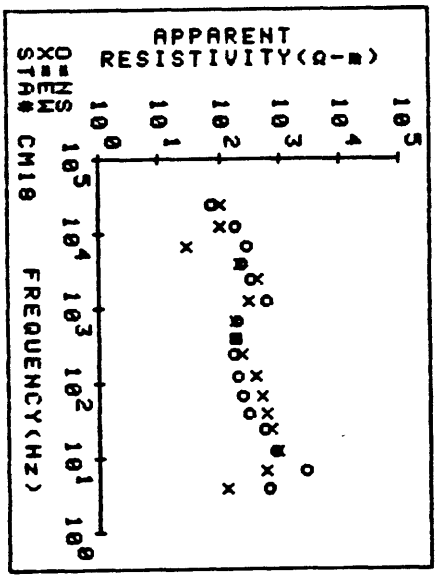
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM18 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	504.23	6	185.07
7.5	2122.10	8	278.53
14.0	669.71	10	81.63
27.0	435.47	11	44.41
45.0	247.92	13	17.29
75.0	194.04	15	10.30
140.0	160.89	12	7.84
270.0	137.15	12	7.26
450.0	144.58	12	7.73
750.0	158.89	12	14.29
1400.0	465.49	12	25.34
2700.0	255.98	9	29.72
4500.0	190.59	10	8.95
7500.0	229.29	11	19.21
14000.0	141.01	5	24.22
27000.0	57.51	5	7.00

STA. ID_CM18 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	101.29	4	28.22
7.5	474.55	7	119.30
14.0	723.92	12	179.70
27.0	571.51	12	43.53
45.0	469.25	13	30.46
75.0	418.02	14	23.77
140.0	324.49	12	15.63
270.0	181.33	12	7.56
450.0	146.59	12	9.69
750.0	150.08	12	11.56
1400.0	236.53	12	88.80
2700.0	350.51	12	41.28
4500.0	179.72	14	18.92
7500.0	23.28	6	5.60
14000.0	84.19	3	8.25
27000.0	82.00	7	3.61



CM 19

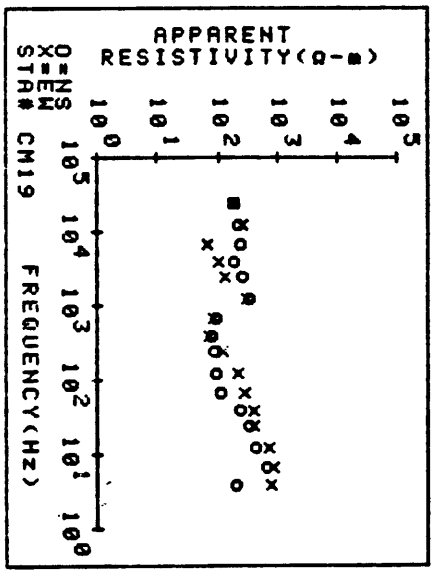
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM19 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	163.58	8	14.54
7.5	521.38	15	31.05
14.0	351.89	12	28.89
27.0	260.48	13	36.93
45.0	187.50	11	14.81
75.0	86.64	9	4.76
140.0	73.64	12	3.43
270.0	66.01	14	4.51
450.0	63.00	11	8.12
750.0	74.71	13	3.99
1400.0	254.10	10	34.99
2700.0	207.98	9	14.63
4500.0	147.66	11	5.69
7500.0	190.58	10	11.51
14000.0	175.94	11	8.09
27000.0	142.86	3	11.11

STA. ID_CM19 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	602.09	8	192.02
7.5	653.73	14	52.87
14.0	586.63	13	63.06
27.0	325.57	11	46.09
45.0	302.49	14	13.71
75.0	224.48	14	5.70
140.0	167.71	14	5.78
270.0	96.22	15	7.31
450.0	58.93	11	7.91
750.0	71.22	13	4.03
1400.0	237.41	12	38.07
2700.0	105.53	15	6.18
4500.0	79.79	15	5.32
7500.0	55.25	12	6.97
14000.0	211.95	6	6.83
27000.0	145.53	6	20.54



CM 20

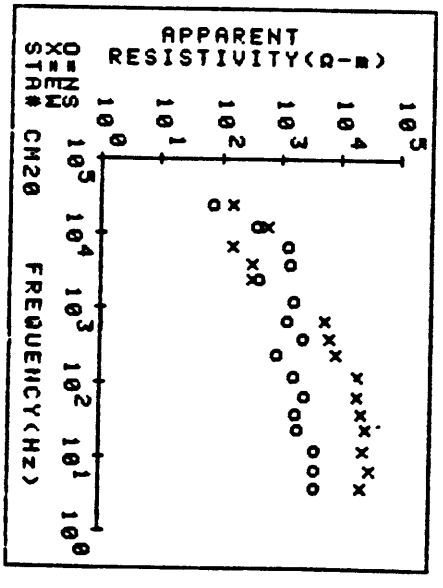
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM20 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	3098.20	7	581.42
7.5	3153.60	14	235.16
14.0	3032.40	12	383.87
27.0	1553.20	7	280.04
45.0	1381.30	10	320.52
75.0	1921.80	8	268.78
140.0	1331.70	8	343.43
270.0	695.53	8	101.79
450.0	1775.30	7	500.89
750.0	991.43	9	225.70
1400.0	1345.50	4	314.64
2700.0	345.25	5	32.72
4500.0	1148.70	8	406.99
7500.0	1002.40	5	262.02
14000.0	299.90	7	35.90
27000.0	55.41	5	3.90

STA. ID_CM20 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.517598.00		10	4542.70
7.526192.00		14	2011.80
14.018905.00		14	1945.90
27.020996.00		14	1084.40
45.017313.00		13	1065.80
75 015608.00		13	713.35
140.015732.00		13	732.11
270.0	6765.80	15	691.68
450.0	5217.60	14	403.24
750.0	4286.20	11	353.90
2700.0	258.80	3	28.52
4500.0	263.90	11	59.70
7500.0	128.75	9	24.34
14000.0	467.94	7	17.94
27000.0	124.30	7	8.23



CM 21

PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM21 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	421.96	5	86.85
7.5	435.56	5	64.04
14.0	286.56	14	24.10
27.0	400.06	10	62.26
45.0	187.33	9	62.72
75.0	127.89	9	31.58
140.0	172.66	7	32.36
270.0	72.33	10	15.55
450.0	159.23	8	42.36
750.0	936.09	6	351.74
1400.0	563.30	2	104.48
2700.0	894.93	4	303.92
4500.0	22.06	7	8.00
7500.0	54.66	7	15.16
14000.0	80.40	6	5.08
27000.0	71.88	4	9.20

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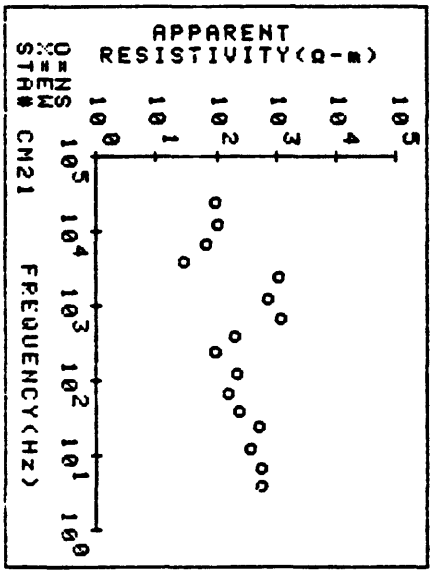


CM 22

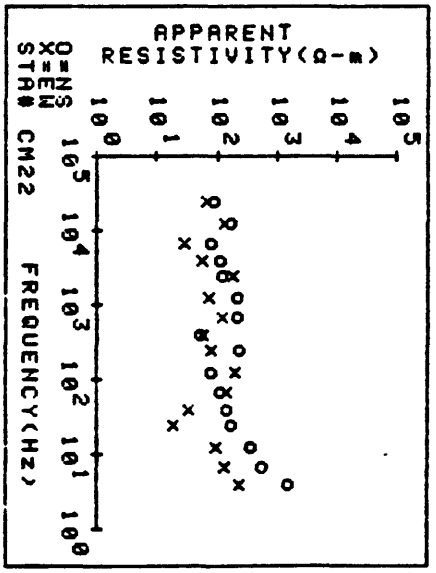
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM22 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1205.00	8	252.43
7.5	439.46	11	55.43
14.0	295.50	9	29.53
27.0	130.89	8	7.44
45.0	116.59	6	21.94
75.0	91.22	9	8.54
140.0	64.93	7	8.12
270.0	181.10	3	21.06
450.0	42.78	5	2.50
750.0	166.21	4	36.37
1400.0	167.06	2	16.67
2700.0	94.86	3	41.47
4500.0	90.33	6	8.06
7500.0	60.76	4	3.04
14000.0	133.58	8	4.32
27000.0	66.38	3	1.82

STA. ID_CM22 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	195.62	4	129.87
7.5	106.27	13	7.98
14.0	75.98	9	11.66
27.0	14.64	9	2.62
45.0	26.62	8	2.87
75.0	111.31	8	21.25
140.0	162.03	6	6.99
270.0	64.13	5	6.43
450.0	43.97	2	15.31
750.0	97.35	3	14.91
1400.0	56.60	1	0.00
2700.0	142.77	5	4.71
4500.0	44.28	11	3.25
7500.0	21.94	3	4.15
14000.0	103.10	6	7.55
27000.0	51.73	5	4.51



CM 23

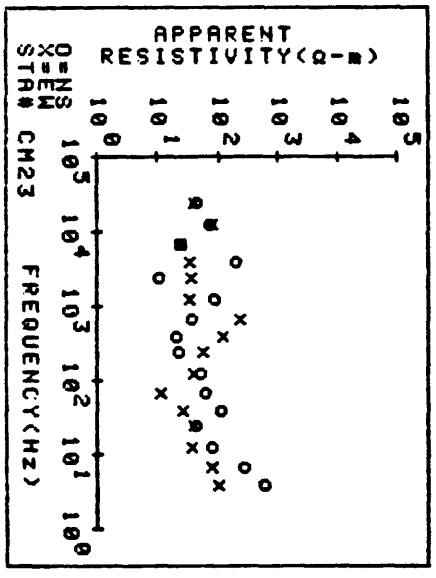
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM23 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	490.25	5	76.75
7.5	219.56	8	23.70
14.0	61.88	4	18.73
27.0	35.69	10	6.37
45.0	87.45	11	20.24
75.0	50.14	13	10.04
140.0	40.58	10	9.24
270.0	17.69	13	1.83
450.0	16.24	8	2.59
750.0	30.47	10	3.35
1400.0	68.62	10	9.41
2700.0	8.53	2	.37
4500.0	164.67	6	28.95
7500.0	18.90	8	2.78
14000.0	59.19	10	6.01
27000.0	33.78	6	3.14

STA. ID_CM23 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	82.84	3	65.93
7.5	62.78	7	10.01
14.0	29.44	13	3.91
27.0	33.03	9	7.64
45.0	21.21	7	3.15
75.0	8.92	4	1.39
140.0	32.97	8	4.92
270.0	43.21	9	4.27
450.0	96.56	10	11.55
750.0	181.57	11	71.41
1400.0	26.90	10	6.24
2700.0	30.27	3	6.33
4500.0	27.26	9	4.07
7500.0	19.59	12	2.12
14000.0	61.34	10	4.15
27000.0	32.92	9	2.75



CM 24

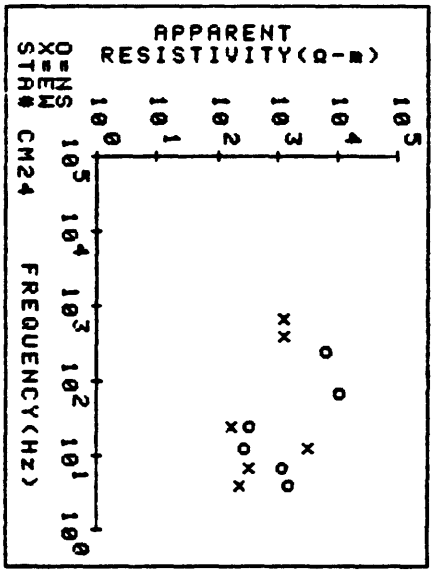
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM24 NS NO FREQ= 6

FREQ	AP-RES	N OBS	STD ERR
4.5	1182.50	3	168.60
7.5	924.45	5	244.01
14.0	221.37	6	54.54
27.0	257.55	10	47.77
75.0	8199.80	10	2897.50
270.0	4881.40	7	630.58

STA. ID_CM24 EW NO FREQ= 6

FREQ	AP-RES	N OBS	STD ERR
4.5	194.42	2	105.17
7.5	255.46	6	85.39
14.0	2643.30	6	884.31
27.0	134.44	9	52.80
450.0	1022.50	6	192.19
750.0	983.99	5	302.95



CM 25

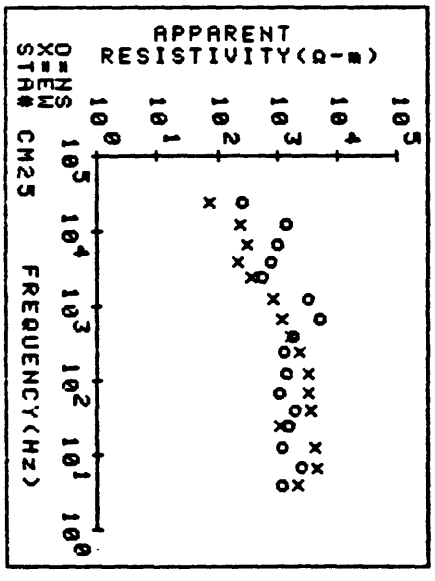
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM25 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	948.13	2	169.51
7.5	2030.80	9	346.90
14.0	969.63	11	82.95
27.0	1207.70	8	423.27
45.0	1533.90	11	321.28
75.0	835.87	9	131.86
140.0	1071.90	6	122.23
270.0	1035.40	10	104.36
450.0	1383.20	4	140.14
750.0	3877.10	5	2398.90
1400.0	2518.40	5	290.60
2700.0	430.97	9	42.77
4500.0	631.19	5	158.48
7500.0	798.55	4	111.76
14000.0	1127.10	7	148.26
27000.0	200.81	5	15.48

STA. ID_CM25 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1676.30	13	203.65
7.5	3600.60	12	243.14
14.0	3362.70	15	274.99
27.0	641.89	14	48.09
45.0	2703.30	14	343.57
75.0	2671.50	14	212.11
140.0	2488.30	14	182.93
270.0	1815.10	13	90.88
450.0	1300.60	16	50.39
750.0	907.16	16	45.02
1400.0	684.61	15	49.62
2700.0	286.50	12	18.07
4500.0	179.58	14	19.22
7500.0	237.60	15	20.30
14000.0	184.77	15	12.52
27000.0	56.36	15	1.38



CM 26

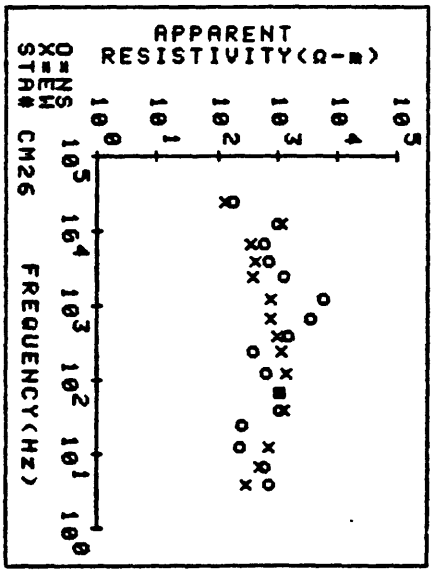
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM26 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	550.73	2	8.36
7.5	459.42	1	0.00
14.0	187.76	3	56.73
27.0	208.00	8	43.00
45.0	834.00	8	70.00
75.0	876.94	9	123.83
140.0	508.38	8	59.54
270.0	311.00	12	31.00
450.0	1201.00	10	374.00
750.0	2692.00	7	612.00
1400.0	4464.00	4	1482.00
2700.0	1012.20	10	55.87
4500.0	550.69	7	56.92
7500.0	464.51	6	83.49
14000.0	784.00	6	40.00
27000.0	146.00	4	3.00

STA. ID_CM26 EW NO FREQ= 15

FREQ	AP-RES	N OBS	STD ERR
4.5	232.95	3	80.50
7.5	405.56	6	67.64
14.0	558.26	4	65.30
45.0	990.24	10	109.88
75.0	858.24	14	80.51
140.0	1107.30	18	69.63
270.0	948.28	12	37.01
450.0	787.33	12	73.50
750.0	596.10	12	90.55
1400.0	615.66	12	76.87
2700.0	319.16	8	67.93
4500.0	334.52	15	30.54
7500.0	281.92	15	25.23
14000.0	974.00	15	29.00
27000.0	108.00	6	3.00



CM 27

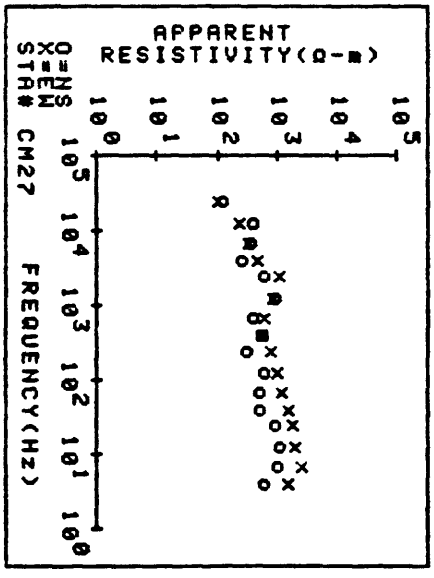
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM27 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	481.06	6	156.38
7.5	818.96	12	144.84
14.0	890.79	11	302.94
27.0	753.26	13	116.35
45.0	400.58	14	51.81
75.0	418.64	15	37.56
140.0	470.08	14	39.60
270.0	246.51	10	26.65
450.0	421.91	13	79.45
750.0	325.52	11	55.31
1400.0	713.07	11	70.96
2700.0	462.53	12	35.91
4500.0	209.15	5	47.34
7500.0	280.45	10	40.77
14000.0	300.12	9	5.67
27000.0	92.04	6	3.17

STA. ID_CM27 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	1176.40	5	277.90
7.5	2004.30	11	115.55
14.0	1564.60	12	101.62
27.0	1377.00	14	59.17
45.0	1235.10	14	59.57
75.0	975.74	15	40.16
140.0	784.77	14	30.34
270.0	594.47	15	12.25
450.0	453.69	14	28.75
750.0	481.35	15	37.57
1400.0	691.86	8	64.13
2700.0	883.79	7	132.65
4500.0	378.87	16	12.52
7500.0	274.98	9	18.55
14000.0	184.72	6	32.54
27000.0	83.30	9	4.34



CM 28

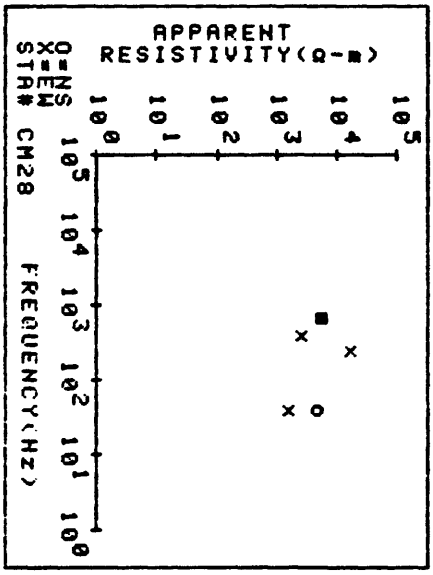
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM28 NS NO FREQ= 2

FREQ	AP-RES	N OBS	STD ERR
45.0	3500.40	2	1390.00
750 0	4424.90	3	2228.70

STA. ID_CM28 EW NO FREQ= 4

FREQ	AP-RES	N OBS	STD ERR
45.0	1182.00	2	44.86
270.0	13349.00	4	2485.10
450.0	1980.40	3	74.62
750.0	4109.10	4	645.99



CM 29

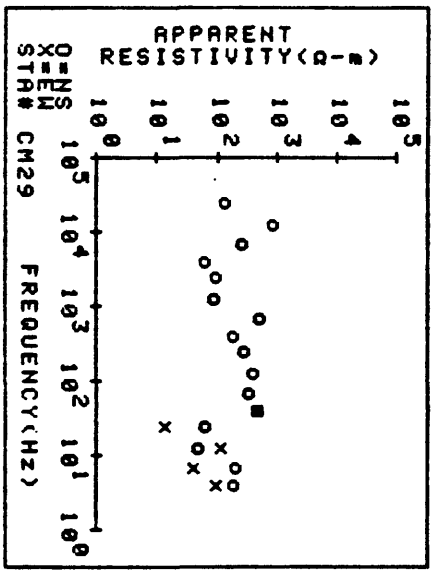
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM29 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	149.66	3	133.29
7.5	164.10	8	30.26
14.0	38.06	4	19.24
27.0	46.98	12	5.22
45.0	356.96	9	99.27
75.0	273.26	11	49.10
140.0	317.05	7	126.03
270.0	226.29	8	69.66
450.0	143.58	6	59.48
750.0	414.42	6	113.26
1400.0	66.40	8	11.25
2700.0	75.09	2	20.48
4500.0	48.47	5	9.92
7500.0	207.26	4	105.83
14000.0	641.06	4	63.77
27000.0	106.14	6	3.59

STA. ID_CM29 EW NO FREQ= 5

FREQ	AP-RES	N OBS	STD ERR
4.5	71.99	5	24.12
7.5	33.31	4	11.87
14.0	90.09	8	14.19
27.0	10.97	7	2.68
45.0	380.55	9	170.54



CM 30

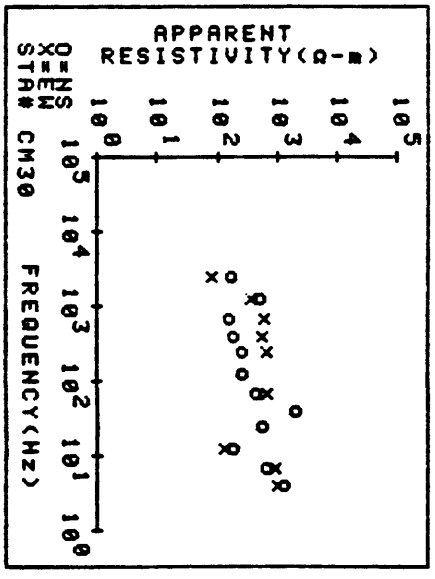
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM30 NS NO FREQ= 12

FREQ	AP-RES	N OBS	STD ERR
4.5	1030.30	1	0.00
7.5	501.90	4	165.00
14.0	140.44	3	81.52
27.0	448.93	3	100.81
45.0	1522.30	5	390.51
75.0	329.16	7	172.01
140.0	211.32	8	104.00
270.0	202.54	9	38.47
450.0	141.76	16	18.24
750.0	125.48	12	28.86
1400.0	408.36	15	53.49
2700.0	139.06	5	41.98

STA. ID_CM30 EW NO FREQ= 9

FREQ	AP-RES	N OBS	STD ERR
4.5	785.16	4	404.61
7.5	756.41	12	84.79
14.0	100.39	9	18.11
75.0	518.79	14	45.80
270.0	505.67	8	103.28
450.0	439.88	13	59.53
750.0	478.35	11	51.14
1400.0	287.98	5	63.38
2700.0	63.35	8	4.78



CM 31

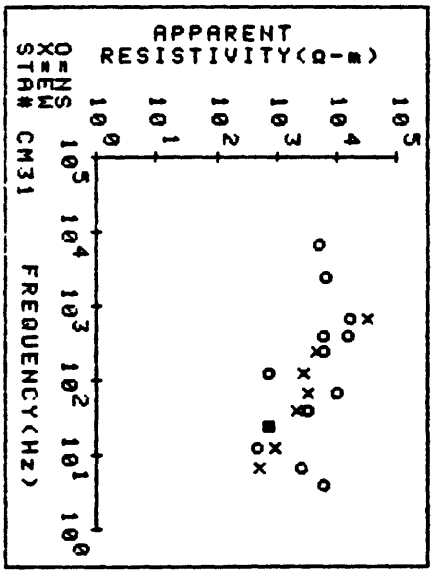
PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM31 NS NO FREQ= 13

FREQ	AP-RES	N OBS	STD ERR
4.5	4591.30	3	1709.40
7.5	2048.90	3	226.02
14.0	370.98	3	158.06
27.0	574.89	4	141.51
45.0	2596.70	5	563.95
75.0	7941.00	5	2424.10
140.0	580.39	5	274.25
270.0	4613.10	6	1430.20
450.0	4760.90	3	1248.30
456.0	11977.00	5	2929.20
750.0	12714.00	1	0.00
2700.0	5003.10	3	1061.80
7500.0	4843.70	1	0.00

STA. ID_CM31 EW NO FREQ= 8

FREQ	AP-RES	N OBS	STD ERR
7.5	391.03	1	0.00
14.0	736.17	4	364.01
27.0	583.72	4	177.96
45.0	1638.00	4	225.09
75.0	2679.70	7	233.12
140.0	2148.50	7	216.94
270.0	3695.20	5	864.41
750.0	24346.00	1	0.00



CM 32

PROJECT=CHIR MTNS AMT 5/89

STA. ID_CM32 NS NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	76.40	3	34.34
7.5	237.01	4	86.40
14.0	91.17	7	5.01
27.0	40.71	8	5.58
45.0	41.28	7	10.04
75.0	23.19	9	1.94
140.0	32.77	12	3.53
270.0	26.03	14	2.04
450.0	48.60	11	6.19
750.0	47.55	16	3.13
1400.0	199.06	8	31.85
2700.0	327.07	8	73.64
4500.0	36.67	15	3.82
7500.0	16.09	8	3.17
14000.0	299.86	8	15.40
27000.0	94.80	7	4.31

STA. ID_CM32 EW NO FREQ= 16

FREQ	AP-RES	N OBS	STD ERR
4.5	412.19	3	153.52
7.5	323.08	4	63.61
14.0	211.22	4	69.04
27.0	57.57	7	11.16
45.0	59.70	9	8.67
75.0	53.57	15	3.05
140.0	76.87	15	4.27
270.0	75.47	15	2.50
450.0	94.24	14	5.31
750.0	90.62	14	4.51
1400.0	140.89	13	16.78
2700.0	340.34	9	20.38
4500.0	39.80	15	2.57
7500.0	26.16	9	1.71
14000.0	71.41	4	5.84
27000.0	88.76	7	1.62