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Principal facts for gravity observations
in the Charles Sheldon Antelope Range, Nevada-Oregon

by

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This report is preliminary and has
not been edited or reviewed for
conformity with Geological Survey
standards and nomenclature.

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INTRODUCTION

Gravity observations were made at 269 locations in and near the Charles Sheldon Antelope Range (fig. 1). The fieldwork was done from September 28 to October 21, 1975 by Stephen L. Robbins and Kenneth D. Holden using LaCoste-Romberg Gravity Meters G-8N and G-192. The data are supplemented by 123 gravity observations obtained from the Department of Defense Gravity Library.

OBSERVED GRAVITY

The observed-gravity values at all stations established during 1975 were tied to a local base at the Duffurrena Sub-headquarters of the Charles Sheldon Antelope Range. Tide-corrected gravity drift plots (fig. 2) were used to determine a tie between the local base and the absolute observed gravity datum of the California base network (Chapman, 1966) via base stations in Auburn, California (979,953.27 mgal) and in Reno, Nevada (979,689.36 mgal). The accuracy of the tie between the local base and the California network is about 0.08 mgal. The California gravity station network is tied to the absolute gravity datum of Behrendt and Woollard (1961). The values of observed gravity also were tied to the International Gravity Standardization Net 1971 (IGSN 71), as described by Morelli (1974). The IGSN 71 value of observed gravity at one of the primary bases of the California network in Menlo Park, California is 979,944.22 mgal (written communication, Department of Defense Gravity Library, 1975), compared to a value of 979,958.74 mgal at the California network datum. Therefore, a constant difference of 14.52 mgal was assumed to exist between the two datums for use in this report.

The values of observed gravity at all stations of the 1975 survey were tied to a local base "CHS" at the Duffurrena Ranch Sub-headquarters of the Charles Sheldon Antelope Range. The gravity readings were taken on the northwest end

of the first concrete step to the middle trailer of three trailers. The trailer site is about 15 m west of a flagpole. The value of observed gravity at the datum of the California base network is $979,884.82 \pm 0.08$ mgal. The geographic coordinates are $41^{\circ}52.07'$ North Latitude and $119^{\circ}0.82'$ West Longitude.

In case the above site is destroyed or inaccessible, a single gravity reading was taken at the northeast corner of the base of the flagpole to provide an alternative reading location. The reading was taken over a chiselled square used as a reference mark on level line 1 of U.S. Geological Survey Quadrangle 501. The flagpole is located about 60 m east-southeast of an old stone barn used as an equipment shop. The gravity value there is $979,884.90 \pm 0.10$ mgal.

Nine gravity readings were taken during 1975 to establish a value at a base in Denio, Nevada. The station is located near a mailbox, in the southeast corner of the concrete porch, 1.6 m south of a door on the west wall of the Post Office, 50 m south of the Oregon-Nevada stateline. The value of observed gravity determined at the Denio base-- $979,946.70 \pm 0.08$ mgal--agrees with an average of two values determined independently by Andrew Griscom (written communication, 1975). The Denio station (ACIC 2352-1) has been tied to the IGSN 71 datum by Jablonski (1974), who obtained a value of 979,932.18 mgal. The difference between the two datums at Denio--14.52 mgal--exactly agrees with the difference at Menlo Park, California.

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GRAVITY ANOMALIES

The location, elevation, observed gravity (at the datum of the California base station net), free air anomaly, and complete Bouguer anomaly are listed in Table 1 for each of the 269 stations of the 1975 gravity survey. A four-digit accuracy code also is associated with every gravity station, so that the reliability of the value of the Bouguer anomaly at each station can be individually

evaluated. The first digit is used to concisely describe the location and type of elevation at the station (Table 2). The second digit provides an estimate of the elevation accuracy (Table 3), which relates to an appreciable source of error--0.06 mgal per foot--in calculating the Bouguer anomaly. Elevations are expressed in feet, to be consistent with the system of measurement used for elevations on the available topographic maps. The third digit indicates the accuracy of horizontal location (table 4). The fourth digit refers to the accuracy of the value of observed gravity (table 5); though a variation of only 0.1 mgal has little influence on the Bouguer anomaly, code 4 identifies the stations at which the gravity readings were not repeated, where a mis-reading possibly could have occurred.

Free-air gravity anomalies were determined by using the International Gravity Formula of 1930 for the normal gravity on the ellipsoid and Swick's (1942, p. 65) formula for the free-air correction. Bouguer, curvature, and terrain corrections were added to the free-air anomaly at each station to determine complete Bouguer anomalies at reduction densities of 2.50 and 2.67 g/cm³.

Terrain corrections between the station location and a distance of 0.9 km (2,936 feet) were determined by using hand methods with conventional cylindrical compartments. The hand terrain corrections probably are accurate to within ten percent of their value. Hand terrain corrections of less than 0.005 mgal arbitrarily were assigned a value of 0.01 mgal to confirm that an estimate was made. Terrain corrections in the distance interval from 0.9 to 166.7 km were determined with a computer program (Plouff, 1966) that used topography digitized on a 0.5-minute geographic grid. The terrain corrections listed in Table 1 pertain to an assumed rock density of 2.67 g/cm³.

SUPPLEMENTARY GRAVITY DATA

Principal facts for gravity stations previously established near the Charles Sheldon Antelope Range were obtained from the Department of Defense (DOD) Gravity Library (written communication, Defense Mapping Agency Aerospace Center, 1975). Table 6 lists the station designation, accuracy code, location, elevation, observed gravity, free-air anomaly, and complete Bouguer anomaly for 123 supplementary stations. The first letter of the station designation identifies the organization that supplied the data to the DOD Gravity Library (see pages 5 to 6 for definitions). A single-digit accuracy code to the right of the station designation is defined as in Table 2. The code merely identifies the type of elevation on the topographic map near the plotted location, because further information regarding station descriptions were not obtained from the contributors to the DOD Gravity Library. Seventy-one DOD stations were located near bench marks and 46 stations were located near spot elevations. The type of elevation is uncertain at only 6 accepted stations, where no accuracy code is indicated. Where elevations agreed, station locations were adjusted in case the DOD Gravity Library position did not agree with the location of a nearby spot elevation or bench mark.

A correction of 14.52 mgal first was added to the values of observed gravity in order to convert from the IGSN 71 datum to the datum of the California network. Small additional corrections were based on possible ties of the present gravity survey to stations from the DOD Gravity Library. In the following discussion related to determination of the additional corrections, the number in parentheses after the single-digit code refers to the original 4-digit source code used by the DOD Gravity Library to identify the contributing organization and year of the survey.

The additional corrections are the same as those used in the McDermitt area, Nevada (Plouff, 1976), except for the G(2179) series of stations from the U.S. Geological Survey Basin and Range Project. A correction of 0.1 mgal again was subtracted from the value of observed gravity at stations established by organizations related to the Department of Defense. Differences obtained from three possible direct ties of 0.09, 0.12, and -0.01 mgal to stations of the 1969 P(5130) series of the First Geodetic Survey Squadron and from four possible direct ties of 0.07, 0.12, 0.34, and 0.29 mgal to stations of the 1968 K(5116) series did not depart sufficiently from the previously determined average difference to justify a change. The 0.1-mgal difference also was applied to the 1972 D(3871) series of the Defense Mapping Agency Topographic Center and the 1972 V(5163) series of the First Geodetic Survey Squadron.

Based on 9 ties to stations in the McDermitt area (Plouff, 1976), a correction of 0.1 mgal was subtracted from values of the G(2179) series of the U.S. Geological Survey Basin and Range Project. No correction, however, was applied to values of observed gravity for G-stations in the Charles Sheldon Antelope Range, based on 12 apparent ties between the G-stations and stations of the K(5116) and of the P(5130) series. All station locations of the G-series had to be corrected to meet the standards of modern topographic maps. The values of observed gravity may be in error by as much as 0.3 mgal, because a Worden gravity meter was used and no tide corrections were made (D. R. Mabey, oral communication, 1976).

Only one station was used from the L(2713) series of the U.S. Geological Survey (LaFehr, 1965), because the locations of the 6 other L-stations did not agree with the locations of bench marks at the given station elevations. One-

tenth milligal was added to the gravity value at that station, based on 6 possible ties in the Crump Geyser area, Oregon (Plouff, 1975). No correction was needed for a station of the M(3382) series of the California Division of Mines and Geology.

There are no direct ties to the O(2531) series of Oregon State University. An indirect tie, however, was made by noting that the values of observed gravity of the O-series are exactly 1.25 mgal lower than 13 corresponding stations of the L-series. Therefore, 1.35 mgal was added to the gravity value of the O-series. The same correction was used for a station of the U(4464) series of Oregon State University.

MODIFIED COMPUTER TERRAIN CORRECTION

The locations and elevations of the stations in Oregon were not checked because of a lack of modern topographic maps. Therefore hand-terrain corrections to 0.9 km generally were not estimated. Hand terrain corrections were not done for a total of 30 stations near the edges of the area. A modification of the basic digital terrain correction program (Plouff, 1966) provided an estimate of the terrain correction in this interval for the gravity stations in Oregon and other peripheral stations obtained from the DOD Gravity Library. Those stations are identified in Table 6 with a zero value for the hand-terrain correction.

The method used is to determine the terrain effect of the half-minute compartment in which the station is located by averaging the effect related to the estimated elevation of the compartment with the effect related to the estimated elevations of the nearest 4 adjacent compartments. The accuracy of the computer method of determining hand-terrain corrections was tested by comparing hand-terrain corrections for 167 stations with the computer-equivalent corrections that exceed 0.1 mgal (fig. 3). The best least-squares fit provides a formula

$$H = 1.341C - 0.045,$$

where \underline{H} is the predicted hand terrain correction and \underline{C} is the computed equivalent of the hand terrain correction. The formula obtained for 89 stations in the McDermitt area (Plouff, 1976),

$$H = 1.372C - 0.085,$$

nearly gives the same result. Therefore the predicted correction, \underline{P} , to be added to the computer terrain correction--and to the Bouguer anomaly at 2.67 g/cm³--is given by

$$P = 0.341C - 0.045.$$

This correction, expressed in units of milligals, is indicated in Table 6 for those stations whose computer-equivalent of the hand terrain correction exceeds 0.1 mgal.

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TABLE 1. PRINCIPAL FACTS AND GRAVITY ANOMALIES, SHELDON ANTELOPE REFUGE, 1975.

STATION CODE	CODE	LATITUDE		LONGITUDE		ELEVATION FEET	OBSERVED GRAVITY MGAL	FREE AIR ANOMALY MGAL	TERRAIN HAND TOTAL MGAL	BOUGUER ANOMALY		
		DEG	MIN	DEG	MIN					2.67	2.50	
CHS	N331	41	52.07	119	0.82	4833.0	979884.82	-8.04	0.10	0.73	-173.53	-163.00
DEN10	C533	41	59.57	118	38.03	4216.0	979946.70	-15.37	0.01	2.14	-158.32	-149.22
CS 1	F434	41	55.64	119	9.85	5502.0	979840.37	5.05	0.05	0.64	-183.43	-171.43
CS 2	G634	41	58.06	119	10.95	5568.0	979834.28	1.54	0.11	0.63	-189.20	-177.05
CS 3	G534	41	58.83	119	10.93	5644.0	979833.19	6.44	0.02	0.45	-187.08	-174.76
CS 4	X434	41	59.62	119	9.80	5640.0	979835.79	7.49	0.01	0.41	-185.93	-173.62
CS 5	X424	41	59.61	119	7.47	5642.0	979831.94	3.84	0.04	0.53	-189.53	-177.22
CS 6	G623	41	59.63	119	5.13	6034.0	979801.52	10.23	0.10	0.93	-196.14	-183.00
CS 7	F434	42	1.04	119	8.47	5615.0	979839.89	7.11	0.01	0.50	-185.37	-173.12
CS 8	G534	41	55.88	118	53.43	4362.0	979906.98	-35.84	0.02	0.51	-185.42	-175.90
CS 9	G534	41	57.17	118	52.80	4458.0	979903.89	-31.84	0.07	0.53	-184.69	-174.96
CS 10	G534	41	57.95	118	52.25	4442.0	979907.96	-30.44	0.04	0.65	-182.69	-172.94
CS 11	G524	41	53.78	118	45.57	4245.0	979935.71	-14.97	0.03	0.57	-160.48	-151.22
CS 12	F424	41	55.01	118	47.03	4273.0	979930.53	-19.36	0.01	0.47	-165.93	-156.60
CS 13	F534	41	55.28	118	46.13	4379.0	979928.06	-12.27	0.07	0.59	-162.36	-152.80
CS 14	F434	41	57.32	118	44.27	5163.0	979894.13	24.44	0.35	1.63	-151.45	-140.25
CS 15	G534	41	58.97	118	62.38	5370.0	979889.48	36.78	0.16	1.92	-145.91	-134.27
CS 16	G534	41	58.28	118	47.35	4487.0	979912.88	-21.78	0.05	0.68	-175.48	-165.69
CS 17	G534	41	59.08	118	47.58	4483.0	979913.41	-22.83	0.05	0.76	-176.31	-166.54
CS 18	X434	41	59.58	118	47.72	4460.0	979915.41	-23.74	0.04	0.90	-176.29	-166.58
CS 19	F434	41	59.58	118	49.41	4515.0	979913.43	-20.55	0.06	0.73	-175.16	-165.31
CS 20	F434	41	58.02	118	48.55	4351.0	979917.70	-29.36	0.01	0.57	-178.50	-169.01
CS 21	F424	41	56.24	118	50.54	4340.0	979914.90	-30.53	0.01	0.41	-179.47	-169.98
CS 22	F434	41	54.36	118	51.90	4330.0	979908.41	-35.15	0.01	0.45	-183.70	-174.24
CS 23	F434	41	52.54	118	58.33	5224.0	979860.75	3.94	0.11	0.87	-174.80	-163.42
CS 24	G634	41	51.58	118	57.65	5334.0	979852.98	7.94	0.38	1.19	-174.24	-162.64
CS 25	G634	41	50.65	118	57.05	5721.0	979825.03	17.75	0.19	1.53	-177.32	-164.90
CS 26	F434	41	50.25	118	56.05	6059.0	979801.14	26.22	0.10	2.45	-179.48	-166.38
CS 27	G634	41	49.34	118	54.70	6126.0	979793.38	26.12	0.31	2.74	-181.58	-168.35
CS 28	G634	41	47.75	118	55.15	6195.0	979786.78	28.38	0.10	2.82	-181.59	-168.22
CS 29	F424	41	46.47	118	54.25	5251.0	979853.05	7.85	0.13	1.75	-170.93	-159.55
CS 30	G634	41	46.14	118	55.58	5556.0	979831.44	15.40	1.37	3.37	-172.19	-160.25
CS 31	N234	41	46.22	118	50.30	4371.6	979904.78	-22.70	0.02	1.18	-171.94	-162.44
CS 32	F434	41	46.92	118	45.82	4282.0	979910.59	-26.36	0.01	1.58	-172.14	-162.85
CS 33	X434	41	49.45	118	43.38	4309.0	979927.13	-11.06	0.02	1.91	-157.42	-148.11
CS 34	Q634	41	48.96	118	42.20	4630.0	979903.41	-3.88	0.98	4.75	-158.40	-148.56
CS 35	F434	41	49.95	118	42.40	4472.0	979918.57	-5.05	0.25	3.14	-155.77	-146.17
CS 36	F424	41	50.77	118	44.25	4221.0	979933.04	-15.40	0.01	0.99	-159.68	-150.49
CS 37	F434	41	50.72	118	45.45	4227.0	979928.96	-18.84	0.01	0.71	-163.60	-154.38
CS 38	F434	41	48.42	118	51.35	4642.0	979889.51	-15.84	0.13	1.49	-174.04	-163.97
CS 39	G634	41	49.95	118	50.05	4394.0	979903.59	-27.36	0.01	0.77	-177.78	-168.20
CS 40	G634	41	51.57	118	49.67	4314.0	979911.93	-28.96	0.01	0.53	-176.88	-167.46
CS 41	F434	41	51.82	118	48.08	4249.0	979920.60	-26.78	0.01	0.47	-172.53	-163.25
CS042	G434	41	48.32	118	59.50	4958.0	979864.70	-10.80	0.22	1.13	-180.18	-169.39
CS043	F334	41	45.70	118	59.50	5231.0	979840.38	-5.55	0.06	1.52	-183.87	-172.52
CS044	G434	41	44.23	119	0.75	5483.0	979821.34	1.29	1.46	3.45	-183.72	-171.94
CS045	G434	41	43.57	119	1.15	5546.0	979819.05	5.91	1.59	3.98	-180.73	-168.84
CS046	G434	41	41.73	119	2.63	5785.0	979803.56	15.63	0.10	1.32	-181.84	-169.27
CS047	G434	41	42.09	119	3.96	6281.0	979764.96	23.10	0.81	2.07	-190.56	-176.96
CS048	G434	41	40.43	119	1.08	5949.0	979797.32	26.74	0.18	1.33	-176.32	-163.39

TABLE 1--CONTINUED

STATION CODE		LATITUDE		LONGITUDE		ELEVATION FEET	OBSERVED	FREE AIR	TERRAIN	BOUGUER	ANOMALY	
		DEG	MIN	DEG	MIN		GRAVITY MGAL	ANOMALY MGAL	HAND TOTAL MGAL	2.67 MGAL	2.50	
CS049	G334	41	38.25	118	59.91	5991.0	979793.89	30.51	0.29	1.44	-173.87	-160.86
CS050	X334	41	38.31	119	1.61	6404.0	979766.03	41.38	0.02	1.37	-177.13	-163.26
CS051	X434	41	36.57	119	3.92	6408.0	979762.62	40.94	0.16	1.38	-177.74	-163.82
CS052	F334	41	34.50	119	1.60	6055.0	979773.50	21.74	0.16	1.27	-185.00	-171.84
CS053	B124	41	35.85	118	57.37	6070.2	979774.73	22.38	0.57	2.14	-184.01	-170.87
CS054	N234	41	39.50	118	54.66	4703.0	979867.71	-18.58	0.11	1.65	-178.70	-168.51
CS 55	V424	41	45.72	119	5.47	6161.0	979769.55	10.99	0.05	1.81	-198.83	-185.47
CS 56	F434	41	44.55	119	5.60	6266.0	979761.79	14.84	0.08	1.49	-198.89	-185.28
CS 57	B124	41	46.63	119	7.06	5004.4	979855.20	-13.42	0.46	2.68	-182.83	-172.04
CS 58	B124	41	45.57	119	8.33	5661.0	979813.73	8.41	0.33	1.51	-184.63	-172.34
CS 59	B124	41	43.72	119	8.62	5523.4	979820.01	4.52	0.17	1.47	-183.86	-171.87
CS 60	B134	41	43.08	119	9.03	5709.9	979807.30	10.29	0.40	1.66	-184.28	-171.89
CS 61	B134	41	42.37	119	9.35	5983.4	979786.60	16.36	0.21	1.21	-187.99	-174.98
CS 62	N124	41	41.80	119	10.08	5996.9	979784.41	16.29	0.06	1.06	-188.68	-175.63
CS 63	G634	41	39.96	119	9.83	6540.0	979744.51	30.17	0.92	2.26	-192.14	-177.99
CS 64	G634	41	40.26	119	6.98	5624.0	979807.86	6.99	1.96	4.79	-181.50	-169.50
CS 65	F434	41	53.92	119	5.67	5438.0	979837.70	-1.06	0.31	1.16	-186.83	-175.00
CS 66	G624	41	54.91	119	11.43	5524.0	979838.02	5.86	0.02	0.49	-183.52	-171.46
CS 67	G624	41	56.76	119	10.77	5517.0	979842.28	6.69	0.04	0.56	-182.38	-170.34
CS 68	G634	41	57.85	119	9.05	5645.0	979831.65	6.46	0.02	0.56	-186.98	-174.67
CS 69	F424	41	56.62	119	4.96	6241.0	979784.93	17.59	0.24	1.58	-195.19	-181.64
CS 70	X424	41	59.62	119	12.14	5717.0	979830.29	9.22	0.05	0.49	-186.76	-174.28
CS 71	G634	41	59.63	119	13.60	5931.0	979820.66	19.69	0.10	0.60	-183.49	-170.55
CS 72	G634	41	58.22	119	13.93	6040.0	979811.84	23.22	0.14	0.80	-183.48	-170.32
CS 73	G634	41	57.46	119	13.94	5911.0	979818.43	18.82	0.11	0.68	-183.60	-170.71
CS 74	X624	41	56.59	119	11.86	5547.0	979840.47	7.96	0.03	0.48	-182.21	-170.10
CS 75	G524	41	54.64	119	14.76	5721.0	979826.77	13.53	0.07	0.62	-182.45	-169.97
CS 76	G534	41	55.84	119	14.43	5764.0	979824.57	13.57	0.07	0.59	-183.91	-171.34
CS 77	G624	41	57.45	119	15.76	5930.0	979816.81	19.01	0.30	0.91	-183.83	-170.91
CS 78	G524	41	59.64	119	16.15	6033.0	979814.19	22.79	0.06	0.61	-183.87	-170.71
CS 79	G524	41	59.29	119	17.44	6011.0	979814.26	21.31	0.23	0.82	-184.38	-171.29
CS 80	B124	41	53.10	119	14.23	5668.7	979828.42	12.56	0.07	0.68	-181.58	-169.22
CS 81	B124	41	53.14	119	16.78	5946.0	979808.30	18.44	0.23	1.02	-184.83	-171.89
CS 82	B124	41	53.27	119	17.83	6255.7	979788.84	27.89	0.33	1.30	-185.68	-172.08
CS 83	G634	41	52.76	119	19.35	6768.0	979757.76	45.71	0.15	1.84	-184.80	-170.12
CS 84	V424	41	51.63	119	20.85	7272.0	979723.13	60.13	0.77	4.46	-184.94	-169.33
CS 85	G634	41	52.30	119	22.28	6642.0	979765.98	42.78	0.10	1.49	-183.78	-169.36
CS 86	G634	41	52.07	119	23.64	7148.0	979733.11	57.80	0.33	3.61	-183.89	-168.50
CS 87	B124	41	54.47	119	22.40	6347.3	979786.20	32.07	0.37	1.31	-184.61	-170.81
CS 88	B124	41	55.17	119	23.15	6225.5	979793.08	26.45	0.19	1.01	-186.37	-172.82
CS 89	B124	41	55.72	119	25.23	5974.9	979812.76	21.76	0.11	0.77	-182.75	-169.72
CS 90	B124	41	55.13	119	25.18	5974.3	979813.44	23.27	0.26	0.99	-180.99	-167.99
CS 91	B124	41	55.08	119	26.56	5814.8	979823.96	18.87	0.07	0.71	-180.23	-167.55
CS092	B124	41	54.77	119	27.55	5790.7	979825.44	18.55	0.06	0.65	-179.78	-167.15
CS 93	B124	41	54.26	119	28.42	5865.1	979817.40	18.27	0.16	0.68	-182.58	-169.79
CS 94	G534	41	59.86	119	21.17	6121.0	979808.60	25.14	0.06	0.69	-184.44	-171.09
CS 95	F424	41	58.86	119	26.57	6358.0	979792.25	32.56	0.23	1.36	-184.44	-170.62
CS 96	G534	41	58.14	119	27.37	6215.0	979797.30	25.25	0.01	0.94	-187.29	-173.76
CS 97	G534	41	57.75	119	25.66	6359.0	979785.49	27.55	0.09	1.07	-189.77	-175.93
CS 98	G534	41	56.92	119	25.84	6136.0	979800.23	22.58	0.23	0.97	-187.23	-173.87

TABLE 1--CONTINUED

STATION CODE	CODE	LATITUDE		LONGITUDE		ELEVATION FEET	OBSERVED GRAVITY MGAL	FREE AIR ANOMALY MGAL	TERRAIN		BOUGUER ANOMALY	
		DEG	MIN	DEG	MIN				HAND	TOTAL	2.67	2.50
											MGAL	
CS 99	G534	41	53.45	119	25.78	6039.0	979807.28	25.70	0.11	0.91	-180.85	-167.70
CS100	G534	41	51.66	119	26.28	6055.0	979804.24	26.84	0.07	0.88	-180.30	-167.11
CS101	B124	41	50.65	119	1.00	4838.5	979882.25	-7.97	0.14	0.80	-173.59	-163.04
CS102	B124	41	49.50	119	2.27	4861.9	979877.26	-9.04	0.11	1.02	-175.24	-164.66
CS103	B124	41	49.07	119	4.35	4914.4	979870.50	-10.22	0.23	1.53	-177.70	-167.04
CS104	B134	41	48.17	119	5.77	4944.6	979862.84	-13.70	0.12	1.85	-181.90	-171.19
CS105	B334	41	47.32	119	6.07	4975.7	979859.27	-13.08	0.18	2.12	-182.07	-171.31
CS106	B134	41	47.41	119	8.08	5585.4	979818.74	3.56	0.17	1.18	-187.23	-175.08
CS107	B134	41	47.98	119	9.73	5920.2	979800.47	15.90	0.22	1.03	-186.48	-173.59
CS108	B334	41	47.77	119	11.05	6003.7	979794.91	18.50	0.18	0.96	-186.80	-173.73
CS109	B134	41	47.32	119	12.00	6068.3	979791.18	21.52	0.70	1.50	-185.45	-172.27
CS110	B334	41	47.37	119	13.10	6255.0	979779.78	27.59	0.13	0.88	-186.37	-172.75
CS111	B134	41	47.10	119	14.10	6204.5	979781.81	25.28	0.04	0.72	-187.12	-173.59
CS112	B334	41	46.77	119	14.93	6127.8	979784.97	21.72	0.05	0.69	-188.09	-174.73
CS113	B124	41	47.03	119	15.90	6073.5	979788.65	19.91	0.05	0.70	-188.04	-174.80
CS114	B124	41	46.37	119	17.78	6247.1	979776.93	25.49	0.06	0.81	-188.27	-174.66
CS115	G534	41	50.63	119	25.78	5990.0	979805.64	23.67	0.11	0.99	-181.13	-168.09
CS116	G524	41	49.37	119	23.75	6194.0	979793.43	32.51	0.20	1.11	-179.14	-165.67
CS117	G524	41	49.91	119	22.93	6471.0	979777.39	41.70	0.23	1.50	-179.01	-164.96
CS118	G534	41	49.64	119	21.91	6446.0	979779.03	41.39	0.23	1.33	-178.64	-164.63
CS119	G534	41	48.44	119	25.25	5815.0	979815.24	20.10	0.08	0.71	-179.00	-166.33
CS120	G524	41	47.96	119	23.31	5956.0	979803.62	22.45	0.11	0.74	-181.44	-168.46
CS121	F434	41	51.71	119	14.17	6032.0	979802.24	22.60	0.14	0.78	-183.85	-170.71
CS122	G534	41	51.23	119	11.88	5982.0	979800.57	16.95	0.02	0.59	-187.98	-174.93
CS123	F434	41	51.68	119	12.50	6007.0	979799.59	17.65	0.02	0.60	-188.13	-175.03
CS124	G634	41	51.13	119	30.23	5685.0	979820.90	9.52	0.11	0.58	-185.28	-172.87
CS125	G634	41	50.14	119	33.08	5958.0	979805.22	20.98	0.04	0.60	-183.12	-170.13
CS126	G634	41	50.55	119	34.25	6110.0	979798.99	28.42	0.17	0.90	-180.57	-167.27
CS127	F434	41	51.35	119	35.75	6116.0	979799.54	28.34	0.02	0.75	-181.01	-167.68
CS128	G634	41	51.72	119	32.99	6014.0	979805.45	24.11	0.10	0.65	-181.85	-168.74
CS129	G634	41	49.39	119	36.41	6674.0	979765.73	49.89	0.43	2.18	-177.07	-162.62
CS130	H434	41	50.16	119	37.44	7187.0	979729.60	60.81	1.80	6.67	-179.15	-163.88
CS131	G624	41	50.58	119	38.26	6574.0	979772.21	45.20	0.17	1.80	-178.73	-164.48
CS132	F434	41	51.02	119	37.91	6543.0	979773.91	43.32	0.23	1.73	-179.63	-165.43
CS133	G634	41	52.08	119	39.16	6742.0	979757.15	43.68	1.42	5.02	-182.76	-168.35
CS134	G634	41	53.43	119	38.74	6298.0	979791.83	34.62	0.29	1.41	-180.28	-166.60
CS135	X534	41	54.07	119	38.12	6070.0	979807.83	28.24	0.43	1.25	-179.03	-165.84
CS136	G634	41	52.93	119	36.18	5918.0	979814.33	22.16	0.06	0.69	-180.49	-167.59
CS137	W644	41	53.88	119	34.87	5737.0	979827.69	17.09	0.05	0.51	-179.55	-167.03
CS138	G644	41	50.78	119	29.19	5635.0	979827.19	11.64	0.03	0.56	-181.46	-169.17
CS139	G624	41	52.18	119	29.58	5625.0	979829.25	10.66	0.05	0.61	-182.05	-169.78
CS140	N424	41	58.43	118	39.55	4220.0	979953.96	-6.03	0.05	2.50	-148.73	-139.67
CS141	G524	41	45.65	118	34.56	4590.0	979888.85	-17.25	0.01	2.02	-173.14	-163.21
CS143	Q734	41	46.93	118	38.03	5730.0	979824.14	23.27	2.20	5.65	-167.99	-155.81
CS144	Q734	41	47.39	118	39.68	6010.0	979814.80	39.55	0.30	3.19	-163.74	-150.79
CS145	G524	41	39.25	118	38.88	5451.0	979837.54	21.92	0.72	4.72	-160.73	-149.10
CS146	G524	41	39.13	118	40.94	6330.0	979772.87	40.04	0.54	6.64	-170.73	-157.31
CS147	C724	41	38.67	118	35.92	4385.0	979899.88	-15.06	0.81	4.97	-160.97	-151.68
CS148	F424	41	38.14	118	35.08	4174.0	979909.54	-24.44	0.02	2.78	-165.31	-156.34
CS149	X424	41	38.24	118	31.32	4162.0	979909.28	-25.98	0.01	0.61	-168.61	-159.53

TABLE 1--CONTINUED

STATION	CODE	LATITUDE		LONGITUDE		ELEVATION FEET	OBSERVED	FREE AIR	TERRAIN		BOUGUER ANOMALY	
		DEG	MIN	DEG	MIN		GRAVITY MGAL	ANOMALY MGAL	MGAL	HAND TOTAL MGAL	2.67 MGAL	2.50
CS150	B134	41	43.31	119	22.35	5887.0	979780.33	-0.38	0.16	0.76	-201.90	-189.07
CS151	B134	41	42.66	119	21.38	5896.2	979776.99	-1.88	0.04	0.64	-203.82	-190.97
CS152	B134	41	41.94	119	19.71	5911.3	979778.55	2.17	0.10	0.84	-200.09	-187.22
CS153	B134	41	40.78	119	18.18	5997.8	979773.47	6.96	0.06	0.76	-198.34	-185.27
CS154	B134	41	40.25	119	16.44	6099.5	979763.81	7.64	0.07	0.69	-201.20	-187.90
CS155	G634	41	41.93	119	15.71	6436.0	979752.79	25.74	0.03	1.00	-194.28	-180.27
CS156	N234	41	41.07	119	14.39	6195.5	979764.07	15.70	0.12	0.93	-196.19	-182.69
CS157	N234	41	41.50	119	13.45	6221.1	979762.24	15.63	0.10	0.99	-197.07	-183.53
CS158	N234	41	41.85	119	12.35	6088.6	979771.74	12.16	0.06	0.97	-196.03	-182.77
CS159	B134	41	41.66	119	11.28	6005.6	979779.15	12.05	0.13	1.12	-193.16	-180.09
CS160	F534	41	39.87	119	13.14	6326.0	979756.05	21.74	0.02	0.84	-194.69	-180.91
CS161	G644	41	38.85	119	14.19	6217.0	979759.93	16.90	0.11	0.80	-195.84	-182.30
CS162	B134	41	36.92	119	14.22	6032.4	979769.60	12.10	0.21	1.17	-193.97	-180.85
CS163	X534	41	36.58	119	12.03	6014.0	979773.09	14.37	0.24	1.19	-191.06	-177.98
CS164	X634	41	35.68	119	8.78	5866.0	979788.57	17.28	0.16	0.87	-183.41	-170.63
CS165	F434	41	34.57	119	5.46	5845.0	979790.09	18.49	0.01	0.80	-181.55	-168.81
CS166	G534	41	49.73	119	5.99	5619.0	979815.44	-0.05	0.57	1.65	-191.51	-179.32
CS167	G534	41	48.97	119	13.56	5998.0	979800.19	21.45	0.27	0.92	-183.70	-170.64
CS168	G534	41	49.02	119	12.53	5907.0	979807.11	19.75	0.29	1.01	-182.20	-169.34
CS169	G534	41	45.58	119	13.53	6246.0	979776.18	25.82	0.66	1.56	-187.16	-173.60
CS170	G534	41	44.50	119	10.74	5934.0	979795.64	17.57	0.87	1.86	-184.45	-171.59
CS171	G544	41	44.08	119	16.46	6903.0	979726.58	40.19	0.28	2.66	-194.11	-179.19
CS172	F433	41	44.65	119	12.75	5726.0	979808.04	10.20	0.12	1.66	-184.91	-172.49
CS173	F434	41	43.35	119	11.30	5881.0	979793.95	12.62	0.87	1.95	-187.50	-174.76
CS174	B134	41	39.50	119	17.13	6041.6	979766.78	6.29	0.06	0.81	-200.45	-187.29
CS175	B134	41	38.23	119	15.18	6086.9	979764.88	10.55	0.15	0.88	-197.67	-184.42
CS176	B134	41	33.78	119	7.49	5919.9	979787.45	24.07	0.10	0.89	-178.44	-165.54
CS177	B134	41	33.86	119	10.04	5973.8	979781.34	22.90	0.06	0.96	-181.38	-168.37
CS178	B134	41	33.33	119	13.75	6277.5	979748.68	19.57	0.26	1.29	-194.75	-181.11
CS179	B124	41	34.08	119	15.08	6128.9	979760.17	15.98	0.41	1.38	-193.18	-179.86
CS180	B134	41	34.92	119	14.95	6334.4	979747.94	21.81	0.40	1.35	-194.40	-180.63
CS181	F424	41	36.05	119	15.22	6113.0	979762.53	13.91	0.14	0.97	-195.11	-181.80
CS182	B124	41	36.14	119	16.18	6106.5	979756.97	7.60	0.13	1.10	-201.08	-187.79
CS183	D324	41	35.85	119	17.10	6163.4	979756.12	12.53	0.54	1.43	-197.76	-184.37
CS184	B124	41	35.55	119	17.95	6081.7	979762.03	11.21	0.15	1.10	-196.62	-183.39
CS185	D324	41	35.24	119	18.88	6090.0	979761.91	12.33	0.08	1.04	-195.84	-182.58
CS186	B124	41	35.34	119	19.90	6227.1	979754.65	17.81	0.13	1.30	-194.78	-181.24
CS187	B124	41	35.45	119	21.10	6001.4	979770.47	12.25	0.27	1.47	-192.46	-179.43
CS188	B124	41	35.63	119	22.15	5854.6	979786.72	14.44	0.13	1.13	-185.60	-172.86
CS189	D324	41	35.74	119	22.77	5683.0	979799.95	11.38	0.14	1.18	-182.74	-170.38
CS190	B124	41	35.89	119	23.67	5668.2	979801.62	11.43	0.17	1.09	-182.28	-169.95
CS191	B124	41	36.45	119	24.47	5757.2	979796.94	14.28	0.15	1.05	-182.51	-169.98
CS192	B124	41	37.18	119	25.06	5849.2	979789.27	14.17	0.26	1.02	-185.79	-173.06
CS193	B124	41	37.62	119	25.90	5975.4	979782.25	18.35	0.10	0.68	-186.27	-173.24
CS194	B124	41	37.67	119	26.96	6031.1	979784.27	25.53	0.15	0.69	-180.97	-167.83
CS195	B124	41	37.88	119	28.05	5962.2	979789.02	23.49	0.03	0.57	-180.79	-167.78
CS196	G534	41	39.59	119	22.77	6291.0	979755.55	18.37	0.34	1.28	-196.42	-182.74
CS197	G634	41	40.51	119	23.86	5916.0	979780.15	6.35	0.05	0.60	-196.31	-183.41
CS199	F444	41	37.52	119	17.85	6563.0	979732.14	23.61	0.15	1.28	-200.47	-186.20
CS200	F424	41	37.22	119	16.48	6657.0	979726.31	27.06	0.48	2.04	-199.47	-185.05

TABLE 1--CONTINUED

STATION CODE	CODE	LATITUDE		LONGITUDE		ELEVATION FEET	OBSERVED GRAVITY MGAL	FREE AIR ANOMALY MGAL	TERRAIN HAND TOTAL MGAL	BOUGUER ANOMALY		
		DEG	MIN	DEG	MIN					2.67 MGAL	2.50 MGAL	
CS201	G534	41	37.28	119	19.08	6843.0	979715.15	33.29	0.23	2.09	-199.52	-184.70
CS202	Q734	41	38.74	119	19.79	6350.0	979747.60	17.23	0.11	1.17	-199.68	-185.87
CS203	G534	41	38.00	119	21.11	6676.0	979729.11	30.48	0.19	1.65	-197.08	-182.59
CS204	G534	41	37.28	119	21.72	6319.0	979754.15	23.05	0.37	1.72	-192.26	-178.55
CS205	G534	41	36.87	119	21.93	6222.0	979759.04	19.43	0.87	2.16	-192.13	-178.66
CS206	B124	41	34.93	119	22.54	5585.8	979803.32	6.83	0.11	1.10	-184.05	-171.90
CS207	B124	41	34.05	119	22.28	5548.1	979804.87	6.14	0.51	1.44	-183.11	-171.06
CS208	B124	41	32.73	119	20.94	5503.6	979798.19	-2.75	0.17	0.87	-191.05	-179.06
CS209	G534	41	33.31	119	18.79	5752.0	979781.25	2.79	0.10	0.80	-194.07	-181.54
CS210	B124	41	31.17	119	20.75	5443.5	979799.03	-5.23	0.03	0.58	-191.77	-179.89
CS211	B124	41	33.30	119	21.84	5549.2	979801.69	4.19	0.17	0.98	-185.56	-173.48
CS212	G634	41	37.16	119	27.46	6024.0	979784.38	25.73	0.07	0.72	-180.50	-167.37
CS213	G634	41	36.25	119	26.58	6458.0	979756.89	40.39	0.30	1.50	-179.89	-165.86
CS214	X324	41	35.69	119	26.40	6479.0	979753.91	40.21	0.18	1.44	-180.84	-166.77
CS215	Q634	41	34.53	119	26.04	6230.0	979766.83	31.47	0.31	1.29	-181.23	-167.68
CS216	G634	41	39.20	119	29.57	6046.0	979785.91	26.28	0.19	0.77	-180.65	-167.48
CS217	G634	41	43.78	119	27.77	5762.0	979804.30	11.14	0.32	0.90	-185.96	-173.41
CS218	G634	41	43.17	119	30.28	6005.0	979790.34	20.93	0.07	0.56	-184.81	-171.71
CS219	G634	41	45.80	119	29.38	5812.0	979811.84	20.36	0.16	0.60	-178.75	-166.07
CS220	Q644	41	45.73	119	30.75	5965.0	979803.16	26.17	0.17	0.60	-178.17	-165.16
CS221	F544	41	47.15	119	31.94	5818.0	979807.01	14.08	0.02	0.46	-185.38	-172.68
CS222	G624	41	48.54	119	32.51	5776.0	979816.44	17.48	0.03	0.54	-180.46	-167.86
CS223	G634	41	49.36	119	32.95	5901.0	979809.56	21.13	0.08	0.65	-180.97	-168.10
CS224	Q644	41	48.56	119	34.39	5927.0	979808.25	23.45	0.45	1.25	-178.94	-166.05
CS225	Q634	41	48.44	119	36.47	6222.0	979794.38	37.49	0.29	1.18	-175.05	-161.52
CS226	Q624	41	48.00	119	38.18	6592.0	979766.10	44.63	0.16	1.73	-179.98	-165.68
CS227	B124	41	48.18	119	40.45	5585.1	979828.94	12.58	0.05	1.32	-178.06	-165.92
CS228	G634	41	48.32	119	42.27	5545.0	979830.67	10.34	0.06	0.78	-179.47	-167.38
CS229	B124	41	50.04	119	40.10	5579.8	979831.26	11.62	0.43	2.36	-177.80	-165.74
CS230	F424	42	0.89	119	28.61	6205.0	979803.85	26.74	0.10	2.29	-184.11	-170.68
CS231	C534	42	0.81	119	32.02	5210.0	979865.08	-5.42	0.01	0.47	-184.08	-172.70
CS232	C534	42	0.27	119	30.19	5213.0	979864.45	-4.96	0.01	0.98	-183.21	-171.86
CS233	G534	41	59.76	119	31.23	5225.0	979863.73	-3.79	0.01	0.61	-182.83	-171.43
CS234	G534	41	59.08	119	31.15	5237.0	979862.18	-3.19	0.01	0.67	-182.57	-171.15
CS235	B124	41	56.78	119	31.20	5290.3	979858.85	1.93	0.08	0.78	-179.16	-167.63
CS236	B124	41	56.13	119	30.11	5735.1	979827.70	13.55	0.31	1.01	-182.53	-170.04
CS237	B124	41	55.26	119	29.90	5735.9	979827.47	14.70	0.24	0.75	-181.66	-169.16
CS238	B124	41	56.86	119	32.48	5384.9	979851.43	3.28	0.05	0.51	-181.32	-169.57
CS239	X534	41	58.43	119	33.45	5341.0	979851.63	-2.99	0.04	0.57	-186.03	-174.38
CS240	B124	41	56.52	119	35.42	5793.1	979822.41	13.13	0.03	0.54	-185.39	-172.75
CS241	G644	41	55.57	119	36.89	5921.0	979819.84	24.00	0.05	0.63	-178.81	-165.89
CS242	B124	41	56.70	119	37.12	5927.9	979820.61	23.73	0.16	0.74	-179.21	-166.29
CS243	B124	41	56.77	119	38.75	5784.5	979829.38	18.92	0.13	0.69	-179.17	-166.55
CS244	B124	41	55.87	119	42.12	5810.3	979828.07	21.38	0.21	0.86	-177.41	-164.75
CS245	B124	41	54.33	119	41.03	5668.7	979834.66	16.97	0.43	1.32	-176.52	-164.20
CS246	V424	41	51.45	119	40.45	5544.0	979834.39	9.28	0.01	1.40	-179.87	-167.83
CS247	N324	41	54.07	119	20.83	6645.2	979766.46	40.92	0.16	1.38	-185.86	-171.42
CS248	G534	41	55.74	119	17.07	6281.0	979788.65	26.39	0.39	1.39	-187.95	-174.31
CS249	G544	41	56.86	119	17.84	6275.0	979788.90	24.40	0.12	0.98	-190.14	-176.48
CS250	B124	41	53.27	119	8.14	5514.4	979830.84	0.23	0.57	1.26	-188.05	-176.06

TABLE 1--CONTINUED

STATION CODE	CODE	LATITUDE		LONGITUDE		ELEVATION FEET	OBSERVED GRAVITY MGAL	FREE AIR ANOMALY MGAL	TERRAIN HAND TOTAL MGAL		BOUGUER ANOMALY 2.67 2.50 MGAL	
		DEG	MIN	DEG	MIN							
CS251	F424	41	56.86	118	48.59	4329.0	979920.09	-27.30	0.01	0.47	175.80	-166.34
CS252	F434	41	55.23	118	48.77	4342.0	979922.35	-21.38	0.01	0.34	170.45	-160.96
CS253	Q534	41	54.33	118	49.82	4338.0	979915.99	-26.77	0.01	0.34	175.70	-166.22
CS254	G524	41	55.48	118	48.26	4281.0	979929.03	-20.81	0.02	0.44	167.69	-158.34
CS255	G424	41	55.36	118	48.58	4327.0	979924.48	-20.86	0.02	0.37	169.38	-159.93
CS256	G434	41	55.26	118	47.60	4283.0	979930.37	-18.95	0.01	0.44	165.90	-156.54
CS257	G534	41	56.42	118	47.15	4406.0	979919.82	-19.68	0.02	0.48	170.80	-161.18
CS258	B134	41	50.45	118	46.55	4245.5	979920.51	-25.15	0.02	0.63	170.62	-161.36
CS259	B134	41	48.98	118	47.75	4280.9	979914.28	-25.85	0.02	0.73	172.43	-163.10
CS260	B124	41	44.75	118	51.65	4392.5	979899.03	-24.29	0.02	1.34	174.09	-164.55
CS261	N234	41	42.35	118	54.78	4473.3	979886.33	-25.81	0.02	1.76	177.96	-168.27
CS262	N234	41	40.53	118	54.83	4467.1	979877.38	-32.62	0.02	1.92	184.40	-174.74
CS264	G424	41	41.35	118	52.45	4561.0	979879.30	-23.10	0.01	1.59	178.43	-168.54
CS265	F424	41	52.65	118	42.27	4247.0	979950.51	1.70	0.13	1.49	142.96	-133.75
CS266	G634	41	51.90	118	40.92	5033.0	979900.81	27.00	1.58	3.23	142.85	-132.03
CS267	F424	41	50.89	118	39.13	4940.0	979889.93	8.89	0.57	3.35	157.65	-147.05
CS268	G424	41	49.87	118	36.90	5438.0	979843.28	10.57	0.43	3.34	173.01	-161.32
CS269	Q634	41	47.97	119	0.91	5028.0	979862.61	-5.79	0.17	1.15	177.54	-166.60

DUPLICATE

Table 2. Location description code (digit one).

[The number after the alphabetical code indicates the total number of gravity stations for which the code was used.]

B	75	On level-line bench mark or other permanent marks incorporated into U.S. Geological Survey vertical control system.
N	11	Near level-line bench mark.
V	3	On vertical angle bench mark.
H	1	Near vertical angle bench mark.
X	14	Near location markers such as section corners, wells, or windmills.
D	3	Near assumed location of any of the above markers that was destroyed or not found.
F	42	Near a location with or without a marker at which a surveyed elevation is indicated on a published topographic map.
G	103	Near a location (on a manuscript map or a published map) at which spot elevations are determined by photogrammetry or near a doubtful F-location.
W	1	Near edge of lake or reservoir, interpolated elevation or elevation given for water or dam frequently at unknown height relative to present level.
C	4	Topographic contour line interpolation not along stream.
Q	11	Topographic contour line interpolation along stream.

Table 3. Accuracy of elevations (digit two)

[The number after the numerical code indicates the total number of stations for which the code was used. Note that uncertainty of horizontal location tends to reduce the elevation accuracy.]

<u>Code</u>	<u>Number</u>	<u>Accuracy (feet)</u>	<u>Examples</u>
1	72	0.1	On bench mark
2	7	0.5	Elevation difference hand-leveled to nearby bench mark
3	14	1	Near bench mark
4	59	2	Near assumed location of bench mark that was not found
5	56	5	Surveyed spot elevation ("F" for digit one)
6	56	10	Photogrammetric elevation of precise location such as fence corner
7	4	20	Photogrammetric elevation on map with a 40-foot contour interval

Table 4. Accuracy of horizontal location (digit three)

[The number after the numerical code indicates the total number of stations for which the code was used.]

<u>Code</u>	<u>Number</u>	<u>Accuracy (feet)</u>	<u>Examples</u>
2	99	84	Near section corners, bench marks, road intersections, or stream crossings
3	159	210	Sharp road curve; uncertain spot elevation location
4	10	420	Broad road curve or gentle hillcrest

Table 5. Accuracy of observed gravity (digit four)

[The number after the numerical code indicates the total number of stations for which the code was used. Accuracies are relative to the value at the Duffurrena base station.]

<u>Code</u>	<u>Number</u>	<u>Accuracy (mgal)</u>	<u>Examples</u>
1	1	0.01	Principal base station
3	3	0.05	Repeated reading
4	264	0.10	Non-repeated reading

TABLE 6. PRINCIPAL FACTS FOR STATIONS FROM D. O. D. GRAVITY LIBRARY.

STATION CODE	LATITUDE		LONGITUDE		ELEVATION FEET	OBSERVED GRAVITY MGAL	FREE AIR ANOMALY MGAL	TERRAIN HAND TOTAL MGAL	BOUGUER ANOMALY		
	DEG	MIN	DEG	MIN					2.67 MGAL	2.50 MGAL	
D 67 N	42	12.31	119	1.02	5064.0	979905.33	3.90(a)0.00	0.70	-169.54	-158.49	
D 68 N	42	6.56	119	6.30	5596.0	979852.63	9.81	0.13	1.43	-181.09	-168.94
D 69 G	42	5.82	119	0.70	5605.0	979857.81	16.94	0.24	1.48	-174.21	-162.04
D 70 F	42	6.82	119	14.12	6086.0	979823.17	26.01	0.03	0.69	-182.37	-169.11
D 71 G	42	6.02	119	21.08	5821.0	979836.70	15.83	0.01	0.42	-183.77	-171.06
D 72 G	42	1.40	119	20.49	5892.0	979825.95	18.66	0.06	0.57	-183.21	-170.36
D 73 F	42	1.04	119	14.30	5862.0	979823.94	14.38	0.03	0.47	-186.57	-173.78
D 74 F	42	14.37	119	11.15	5172.0	979894.93	0.57	0.00	0.31	-176.95	-165.64
G1066 N	41	42.84	118	30.03	4337.0	979912.29	-13.39	0.01	0.72	-161.91	-152.45
G1067 N	41	44.30	118	31.42	4362.0	979899.38	-26.13	0.01	0.90	-175.33	-165.83
G1068 N	41	45.68	118	32.92	4458.0	979890.45	-28.10	0.01	1.17	-180.31	-170.62
G1077 F	41	52.44	118	45.17	4233.0	979931.73	-18.08	0.01	0.56	-163.19	-153.95
G1079 N	41	52.65	118	48.55	4254.0	979922.05	-26.10	0.02	0.44	-172.05	-162.76
G1080 N	41	53.49	118	50.94	4287.0	979913.51	-32.79	0.03	0.50	-179.82	-170.46
G1081 N	41	54.16	118	55.40	4350.0	979900.60	-40.78	0.02	0.85	-189.61	-180.13
G1082 N	41	54.51	118	57.65	4497.0	979894.52	-33.57	0.05	1.24	-187.05	-177.27
G1085 N	41	52.58	119	2.99	4924.0	979872.67	-12.40	0.13	0.95	-180.79	-170.07
G1086 N	41	53.27	119	6.21	5107.0	979858.97	-9.93	0.17	1.36	-184.18	-173.08
G1087 N	41	54.11	119	9.92	5584.0	979830.99	5.66	0.08	0.57	-185.68	-173.50
G1088 N	41	53.77	119	12.23	5605.0	979832.66	9.82	0.09	0.67	-182.15	-169.93
G1089 N	41	50.73	119	17.34	6287.0	979786.86	32.65	0.31	1.11	-182.17	-168.49
G1091 N	41	47.14	119	19.04	6145.0	979785.88	23.69	0.06	0.66	-186.73	-173.33
G1092 N	41	46.24	119	20.71	6086.0	979783.47	17.08	0.04	0.68	-191.31	-178.04
G1093 N	41	42.59	119	23.26	5848.0	979781.90	-1.40	0.04	0.57	-201.77	-189.01
G1095 N	41	40.14	119	25.52	5874.0	979787.11	9.92	0.07	0.59	-191.33	-178.51
G1097 N	41	38.08	119	29.05	6013.0	979784.55	23.50	0.03	0.53	-182.55	-169.44
G1099 N	41	36.06	119	31.91	5813.0	979796.09	19.24	0.11	0.65	-179.85	-167.17
G1100 N	41	35.99	119	35.79	5701.0	979802.91	15.66	0.01	0.40	-179.86	-167.41
G1102 N	41	34.92	119	42.18	5662.0	979806.20	16.88	0.01	0.41	-177.29	-164.93
G1103 N	41	34.94	119	44.58	5587.0	979809.83	13.43	0.01	0.32	-178.26	-166.06
G1104 N	41	34.97	119	47.01	5564.0	979813.32	14.72	0.01	0.34	-176.18	-164.02
G1105 N	41	34.98	119	49.33	5539.0	979809.05	8.08	0.00	0.44	-181.86	-169.76
G1106 N	41	34.38	119	50.88	5580.0	979804.39	8.17	0.00	0.89	-182.72	-170.57
G1235 N	41	31.00	118	43.20	4229.0	979908.91	-9.24	0.05	1.74	-153.04	-143.89
G1239 N	41	34.41	118	49.67	4997.0	979856.34	5.28	0.24	2.78	-163.78	-153.01
G1240 N	41	35.68	118	49.87	5061.0	979846.37	-0.57	0.11	2.65	-171.95	-161.03
G1241 N	41	35.91	118	51.47	4842.0	979852.85	-15.02	0.61	3.13	-178.42	-168.01
G1243 N	41	38.99	118	52.65	4617.0	979871.51	-22.10	0.05	2.11	-178.82	-168.85
G1244 N	41	37.41	118	56.42	5460.0	979819.43	7.41	0.80	2.40	-177.88	-166.08
G1246 N	41	35.51	119	0.38	5944.0	979784.78	21.08	0.15	1.24	-181.90	-168.98
G2241 H	41	32.75	119	3.02	5898.0	979777.22	13.32	0.01	1.01	-188.32	-175.48
K 309 N	41	52.39	118	46.68	4238.0	979921.73	-27.53	0.01	0.47	-172.91	-163.65
K 310 N	41	47.56	118	49.01	4304.0	979909.87	-25.97	0.03	0.98	-173.09	-163.72
K 311 F	41	42.29	118	52.45	4494.0	979885.87	-24.23	0.00	1.48	-177.37	-167.62
K 312 N	41	36.82	118	51.93	4784.0	979854.86	-19.82	0.35	3.02	-181.35	-171.06
K 313 N	41	32.58	118	49.92	5289.0	979843.22	22.34	0.51	2.52	-156.97	-145.55
K 314 N	41	30.22	118	47.05	4211.0	979908.99	-9.69	0.08	1.91	-152.70	-143.60
K 315 N	41	36.18	118	58.77	5972.0	979785.08	23.01	0.14	1.25	-180.92	-167.94
K 316 N	41	53.44	118	53.28	4318.0	979900.72	-42.59	0.07	0.80	-190.38	-180.97
K 317 N	41	53.49	118	59.96	4916.0	979878.77	-8.41	0.09	0.82	-176.66	-165.95

TABLE 6--CONTINUED

STATION CODE		LATITUDE		LONGITUDE		ELEVATION FEET	OBSERVED	FREE AIR	TERRAIN	BOUGUER ANOMALY		
		DEG	MIN	DEG	MIN		GRAVITY MGAL	ANOMALY MGAL	HAND TOTAL MGAL	2.67 MGAL	2.50 MGAL	
K 525	G	41	35.55	119	58.40	5439.0	979816.36	5.14	0.00	1.23	-180.59	-168.77
K 526	N	41	35.46	119	53.85	5990.0	979789.55	30.25(a.1)	0.00	1.63	-173.92	-160.92
K 528	F	41	34.96	119	45.95	5574.0	979814.01	16.36	0.00	0.32	-174.90	-162.72
K 529	N	41	35.04	119	39.95	5755.0	979799.46	18.70	0.05	0.45	-178.62	-166.06
K 530	F	41	35.85	119	36.18	5708.0	979803.04	16.65	0.01	0.40	-179.10	-166.64
K 532	N	41	38.94	119	27.21	5908.0	979788.74	16.54	0.01	0.55	-185.91	-173.02
K 533	N	41	41.88	119	25.18	5834.0	979786.45	2.90	0.06	0.54	-197.02	-184.30
K 534	G	41	30.84	119	50.81	5567.0	979800.55	8.39	0.00	1.13	-181.81	-169.70
K 535	N	41	38.00	119	52.09	5613.0	979809.67	11.14	0.01	0.79	-180.98	-168.74
K 536	N	41	41.58	119	52.04	5533.0	979817.82	6.43	0.00	0.60	-183.14	-171.07
K 537	H	41	45.11	119	52.04	5546.0	979823.38	7.94	0.00	0.95	-181.74	-169.66
K 538	G	41	48.00	119	49.68	5689.0	979823.59	17.27	0.01	0.63	-177.61	-165.21
K 539	G	41	50.37	119	48.90	5683.0	979830.98	20.55	0.00	0.55	-174.21	-161.81
K 540	F	41	54.68	119	54.06	5743.0	979829.69	18.45	0.00	0.75	-178.15	-165.63
K 541	G	41	53.20	119	59.04	5404.0	979853.90	13.02	0.00	0.46	-172.28	-160.48
K 542	N	41	40.03	119	47.97	5525.0	979818.62	8.79	0.01	0.42	-180.69	-168.62
K 543	N	41	43.26	119	44.99	5590.0	979814.28	5.73	0.24	1.40	-184.99	-172.84
K 544	G	41	45.93	119	41.80	5531.0	979823.99	5.91	0.32	2.04	-182.16	-170.18
K 545	N	41	49.12	119	40.18	5545.0	979831.92	10.39	0.78	2.86	-177.34	-165.38
K 546	N	41	52.83	119	40.63	5554.0	979838.17	11.94	0.08	1.18	-177.78	-165.70
K 547	N	41	56.47	119	40.95	5846.0	979827.62	23.39	0.09	0.66	-176.82	-164.08
K 548	G	41	59.24	119	38.87	5775.0	979830.87	15.82	0.01	0.53	-182.09	-169.49
K 549	N	41	57.25	119	44.62	5410.0	979852.63	6.26	1.02	2.91	-176.80	-165.15
K 550	G	41	59.04	119	46.32	4676.0	979896.68	-21.36	0.01	2.30	-179.91	-169.82
K 552	G	41	50.32	119	31.40	5809.0	979812.72	14.21	0.24	0.71	-184.70	-172.03
K 556	G	41	39.87	119	56.99	6025.0	979792.34	29.74(a.0)	0.00	1.33	-175.92	-162.83
K 557	F	41	30.80	119	59.36	4633.0	979862.89	-16.99	0.00	1.84	-174.52	-164.49
K 558	G	41	59.38	119	23.25	6268.0	979797.40	28.47	0.05	0.81	-186.01	-172.35
K 560	G	41	51.19	119	25.96	6097.0	979798.90	26.15	0.23	1.10	-182.20	-168.93
K 563	G	41	46.19	119	33.50	5931.0	979799.55	18.67	0.05	0.50	-184.60	-171.66
K 564	N	41	56.80	119	34.42	5697.0	979829.91	11.18	0.17	0.72	-183.88	-171.46
K 565	G	41	55.25	119	49.68	5901.0	979821.44	24.20	0.43	2.02	-176.53	-163.75
L0937	H	41	33.45	119	59.86	4863.0	979848.39	-13.83	0.00	1.32	-179.76	-169.20
MAB77	G	41	54.62	119	54.98	5721.0	979831.38	18.17	0.00	0.59	-177.84	-165.36
O 200		42	4.00	118	36.00	4230.0	979955.44	-11.94(a.0)	0.00	4.04	-153.46	-144.45
O 201		42	8.00	118	36.10	4179.0	979960.44	-17.72(a.0)	0.00	3.11	-158.43	-149.47
O 202		42	9.10	118	30.80	4259.0	979945.94	-26.34	0.00	0.56	-172.35	-163.05
O 204		42	11.90	118	38.10	4166.0	979964.84	-20.38(a.1)	0.00	1.74	-162.01	-153.00
O 470		42	12.83	118	36.95	4104.0	979964.00	-28.44	0.00	0.73	-168.95	-160.01
O 496	G	41	59.70	119	19.25	6050.0	979812.93	23.04	0.00	0.75	-184.06	-170.87
OA581	N	42	6.68	119	31.62	5194.0	979883.62	2.84	0.01	0.32	-175.42	-164.07
O 587	N	42	12.96	119	31.40	5197.0	979896.86	6.96	0.00	0.35	-171.37	-160.02
P 657	N	41	48.80	119	18.43	6187.0	979791.14	30.42	0.07	0.72	-181.38	-167.89
P 662	G	41	58.74	119	18.84	6192.0	979800.71	25.60	0.15	0.90	-186.20	-172.72
P 665	G	41	49.85	119	43.75	6086.0	979798.98	27.20	0.15	0.97	-180.91	-167.66
P 669	F	41	53.40	118	36.54	4544.0	979918.24	-3.77	0.09	0.82	-159.28	-149.37
P 675	F	41	46.70	118	43.80	4584.0	979909.04	0.81	0.24	2.47	-154.42	-144.54
P 676	N	41	56.59	118	40.96	4214.0	979962.02	4.22	0.01	1.52	-139.28	-130.14
P 685	G	41	57.02	118	34.60	4324.0	979927.39	-20.71	0.00	1.07	-168.44	-159.03
P 695	N	41	37.55	119	14.30	6066.0	979767.04	11.76	0.09	0.90	-195.73	-182.52

TABLE 6--CONTINUED

STATION CODE	LATITUDE		LONGITUDE		ELEVATION FEET	OBSERVED GRAVITY MGAL	FREE AIR ANOMALY MGAL	TERRAIN HAND TOTAL MGAL	ROUGHER ANOMALY	
	DEG	MIN	DEG	MIN					2.67 MGAL	2.50 MGAL
P 696	N	41 40.43	119 14.75		6127.0	979766.94	13.09	0.05 0.73	-196.66	-183.30
P 698	F	41 37.38	119 9.10		5698.0	979797.27	7.66	0.03 1.02	-187.14	-174.74
P 885	G	41 45.55	119 46.61		5578.0	979823.75	10.66	0.00 0.39	-180.67	-168.49
P 889	N	41 47.34	118 33.92		4599.0	979885.39	-22.39	0.01 1.55	-179.05	-169.08
P 890	N	41 53.87	119 18.82		6434.0	979777.74	32.65	0.17 1.24	-187.06	-173.07
P 891	F	41 32.84	119 4.00		5865.0	979780.98	13.84	0.01 0.87	-186.81	-174.03
P 892	N	41 33.83	119 11.86		6383.0	979748.40	28.46	0.12 1.18	-189.57	-175.68
U 482		42 2.45	118 30.63		4000.0	979947.84	-38.84(0.1)	0.00 2.06	-174.47	-165.83
V8031	F	41 57.95	118 53.65		5156.0	979852.81	-18.48	3.39 5.08	-190.68	-179.72
V8032	F	41 57.90	119 1.65		5612.0	979825.73	-2.63	0.48 1.02	-194.48	-182.27
V8033	F	41 58.11	119 7.40		6329.0	979780.97	19.67	3.43 5.49	-192.21	-178.72
V8034	F	41 44.05	119 3.75		6587.0	979740.91	24.88	0.97 3.11	-198.19	-183.99
V8035	F	41 39.10	119 5.45		6692.0	979731.48	32.71	5.89 8.38	-188.67	-174.57
V8036	H	41 43.40	118 59.35		6949.0	979730.54	49.49	0.98 6.99	-182.04	-167.30
V8037	F	41 40.55	118 58.30		6308.0	979758.49	21.47	2.21 5.84	-189.34	-175.92
V8217	H	41 30.30	118 57.75		7640.0	979661.26	64.70(0.1)	0.00 5.98	-191.38	-175.08
V8218	F	41 42.00	118 47.45		6947.0	979725.94	46.80	3.76 11.93	-179.72	-165.30
V8219	H	41 48.75	118 39.10		7939.0	979677.77	81.74	4.88 23.85	-166.66	-150.84
V8220	F	41 42.80	118 40.05		8086.0	979669.92	96.59	7.12 20.69	-159.97	-143.63
V8221	F	41 37.85	118 43.90		8153.0	979652.33	92.69	2.50 14.69	-172.15	-155.29
V8222	H	41 36.70	118 38.30		7472.0	979701.17	79.27	4.07 18.82	-158.25	-143.13
V8223	H	41 31.95	118 40.30		5839.0	979818.92	50.67	2.88 7.01	-142.95	-130.63
V8225	F	41 53.40	118 30.25		6091.0	979805.93	29.31(0.5)	0.00 5.51	-174.43	-161.46

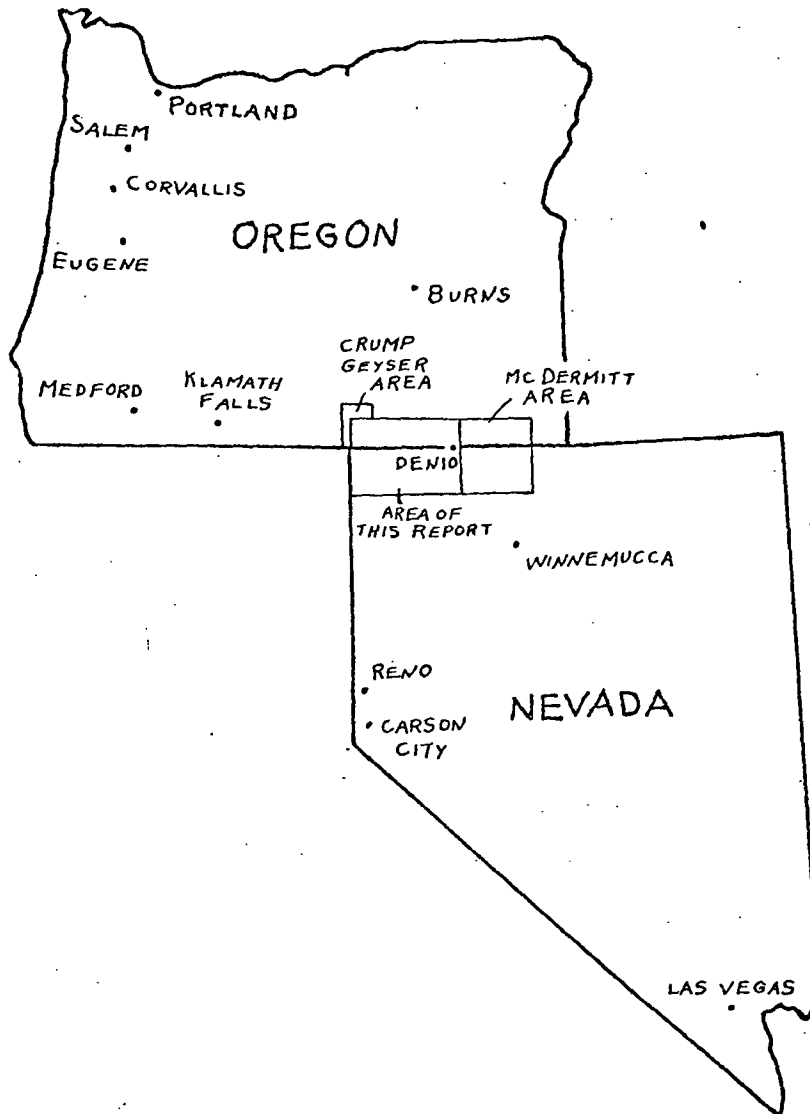


Figure 1. Location of gravity observations in and near the Charles Sheldon Antelope Range.

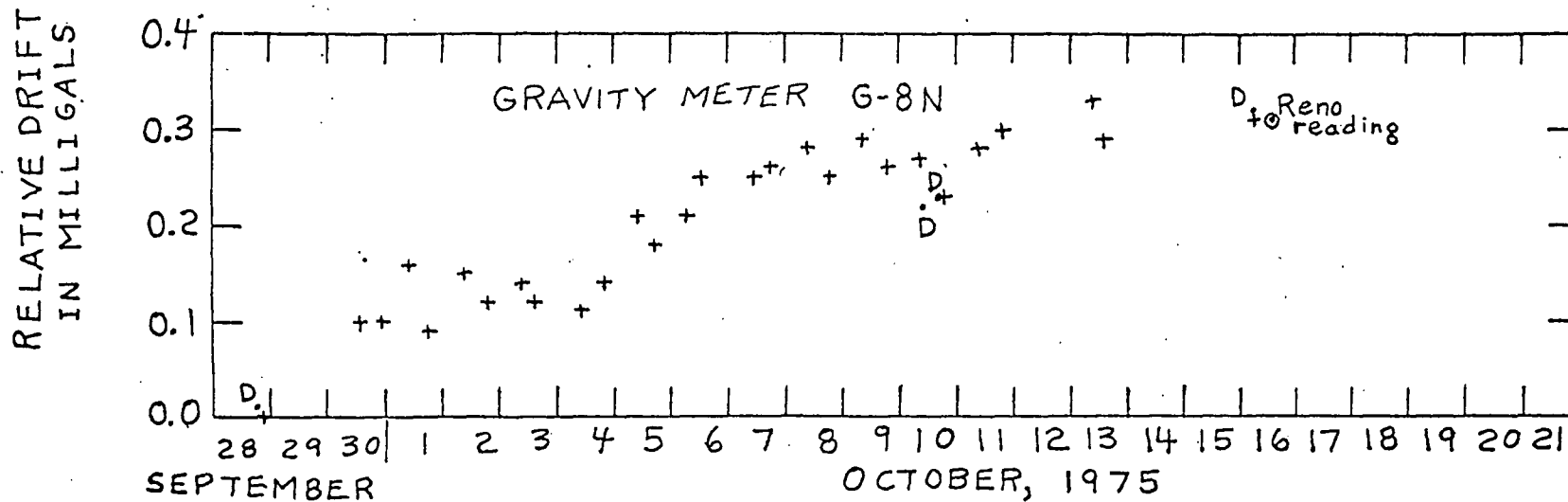
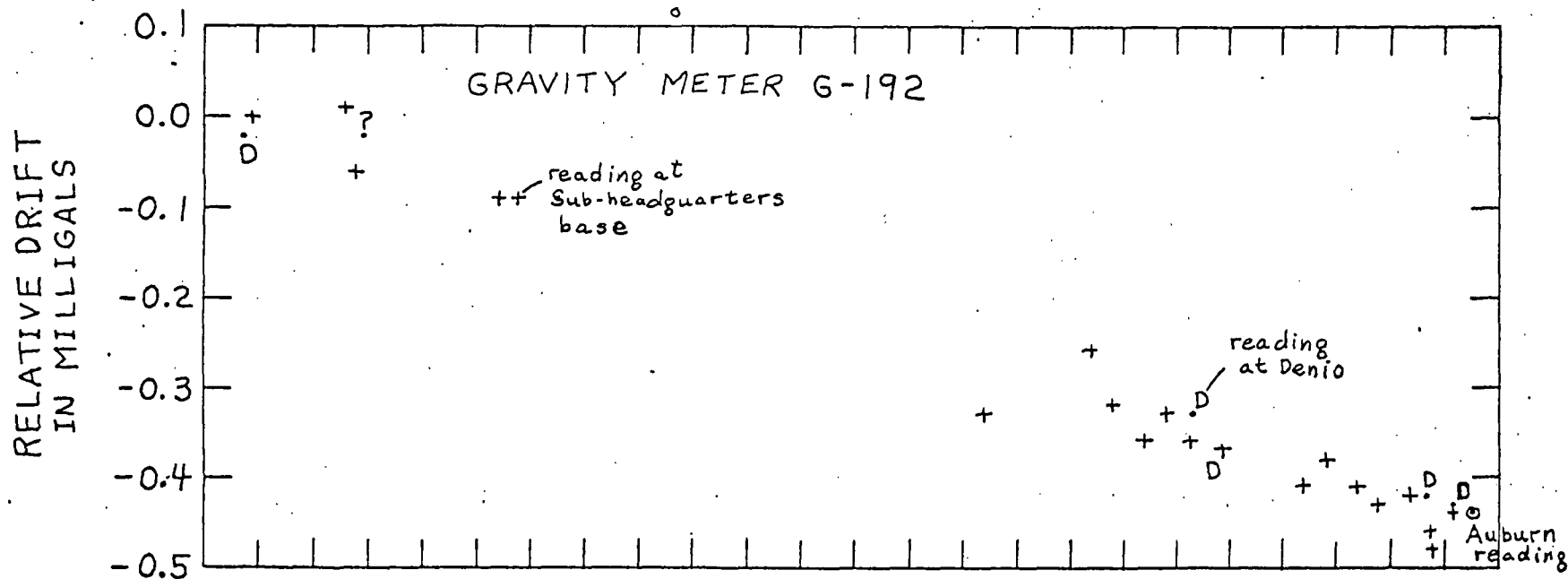
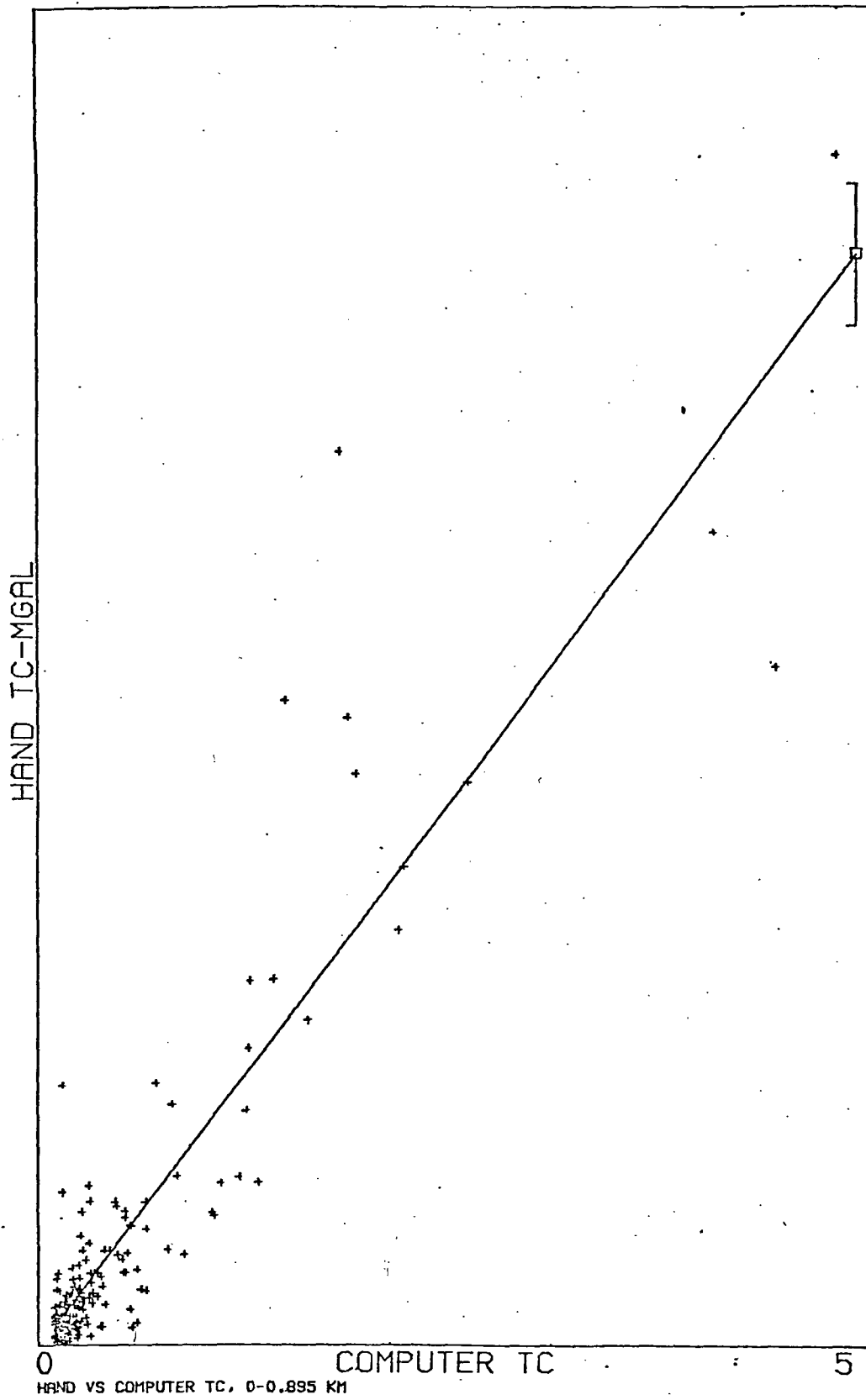


Figure 2. Gravity drift relative to base station at Duffurrena Sub-headquarters.



HAND VS COMPUTER TC, 0-0.895 KM

Figure 3. Test of computer terrain correction to 0.9 km from gravity station.