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ABSOLUTE GRAVITY MEASUREMENTS IN THE UNITED STATES OF AMERICA.(U)
MAY 78 I MARSON, F ALASIA AFOSR-78-3529
UNCLASSIFIED R-124 AFGL-TR-78-0126 NL

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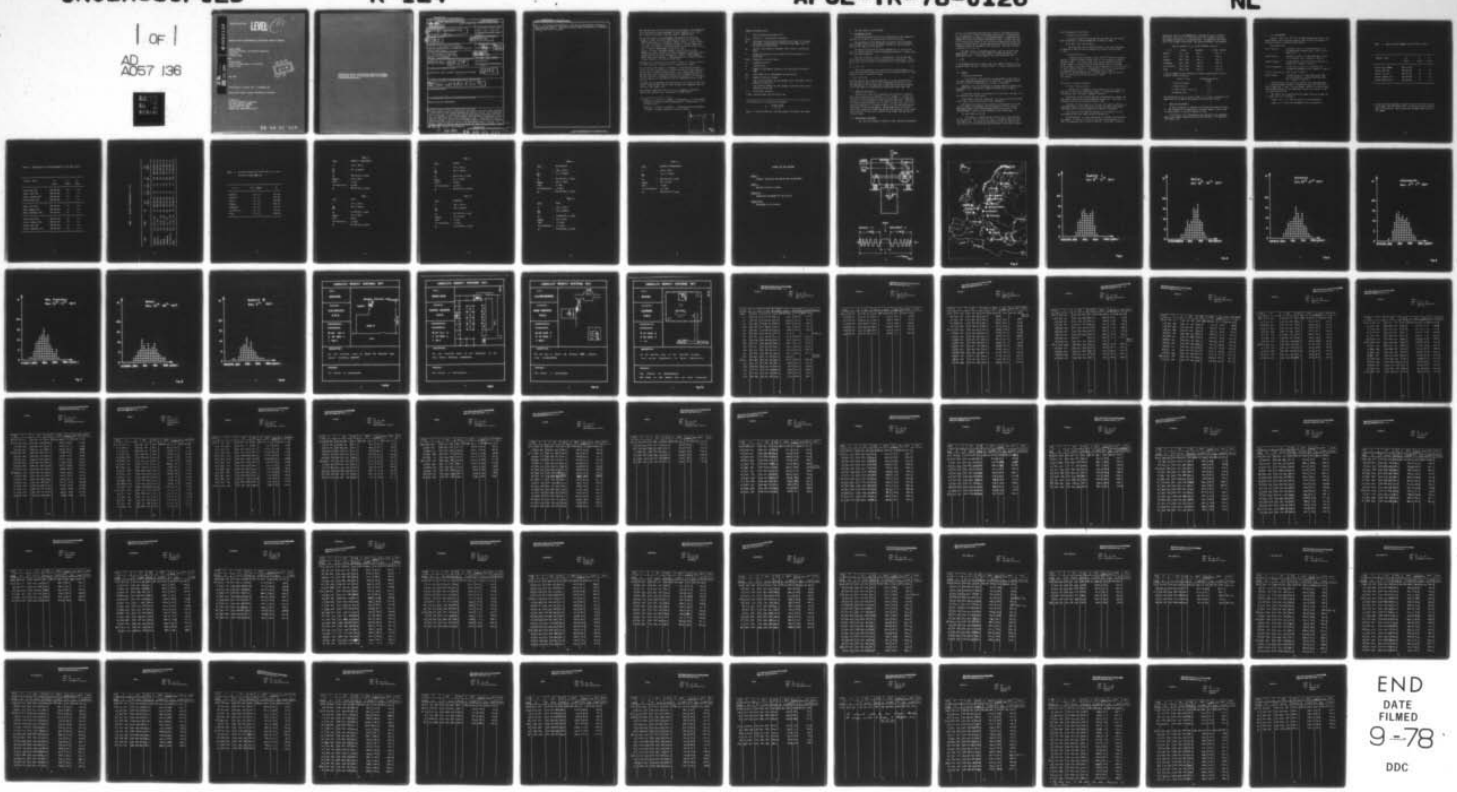

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LEVEL II

ABSOLUTE GRAVITY MEASUREMENTS IN THE UNITED STATES OF AMERICA

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Torino, Italy

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May 1978

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Prepared for
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AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
HANSCOM AFB, MASSACHUSETTS 01731

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Absolute gravity measurements

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The measurements of gravity acceleration described in the report were performed in 1977 within a grant program sponsored by the US Air Force. The introductory part of the report illustrates the transportable absolute gravimeter and ancillary instrumentation used in measurements, and describes the measurement method applied; uncertainty and errors are analysed as well. Measurements of gravity acceleration made in Europe prior to the USA program are also briefly considered before a detailed account is given of the measurements made in the USA. The numerous tables in the text and at the end of the report form an essential part

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of it. Six stations were observed in the USA and approximately 100 measurements made per station. The results show an overall uncertainty in g measurements of the order of 10 μGal.

The work described in this final report was developed in the framework of an international grant programme for basic research of the US Air Force Office of Scientific Research, grant n° AFOSR 78-3529.

For the realization of the programme contributions were given by
- Italy : A. Bray, contractor representative, Director of the Istituto di Metrologia "G. Colonnetti" (IMGC), Torino; G. Cerutti, physicist, main investigator, researcher at IMGC; I. Marson, physicist, principal investigator, assistant professor at the University of Trieste; F. Alasia, higher-grade technician at IMGC.
- U.S.A. : B. Szabo, programme manager, Senior Scientist at the Terrestrial Science Division, Air Force Geophysical Laboratory (AFSC), Hanscom AF Base; W. Spita, gravimetrist, Geodetic Survey Squadron, DMATC, Warren AFB, Wyoming; J. Hammond, physicist, Geodesy & Gravity Branch, Terrestrial Sciences Division AFGL.

Measurements in USA were carried out by I. Marson, F. Alasia, W. Spita. G. Cerutti gave his cooperation also in preparing the report.

The Istituto di Metrologia "G. Colonnetti" of the National Research Council of Italy, developed, in cooperation with the Bureau International des Poids et Mesures (BIPM), Sèvres, a new transportable absolute gravity meter, with 10 μGal uncertainty. This instrument was used in the past two years to determine the gravity acceleration in 17 European sites to improve the International Gravity Standardization Net (IGSN 71). (*)
In Autumn 1977 measurements were carried out in six sites in the United States : Bedford, MASS; Denver, COLO; Bismark, ND; Alamogordo, NM; San Francisco, CAL; Miami, FLO.

The work was supported by the US Air Force Geophysical Laboratory, Hanscom AFB, Bedford, Mass, under grant n° AFOSR 78-3529.

(*) Cerutti,G.; Cannizzo,L.; Sakuma,A. and Hostache,J.: "A transportable apparatus for absolute gravity measurements". VDI-Berichte n. 212, p. 49-51 (1974).

Cannizzo,L.; Cerutti,G.; Marson,I. : "Absolute gravity measurements in Europe", to appear shortly in Il Nuovo Cimento.

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Symbols and Abbreviations

g	value of gravity acceleration (*)
g_{corr}	value of g corrected for tide effect
g_f	final mean value of gravity acceleration at height h from pillar surface, normalized at a reference fringe number and corrected for electronic delay
g_r	gravity value reduced to reference level (floor or pillar surface)
h	height from ground or pillar surface of the point where g is determined
honk	Honkasalo's corrective term
m	standard deviation
M	standard error
N	number of interference fringes in the traiectory of projected body
N_m	total number of g measurements at each station
N_r	number of reference fringes
t	time interval between the two passages across the higher station during one trajectory
T	time interval between the two passages across the lower station during one trajectory
T.C.	Earth tides correction
U.Time	Greenwich mean time (Universal Time)

(*) The value of g is given by the formula

$$g = \frac{4\,\lambda(N - 0.25)}{T^2 - t^2}$$

where λ = 0.632 991 4156 µm is the wavelength of the He-Ne laser beam.

1. THE IMGC ABSOLUTE GRAVITY METER

1.1. Measurement method

The method adopted consists of the observation of the symmetrical free fall of a body in the gravitational field of the earth.

The advantages of this method are well known: relative freedom from residual air resistance and higher accuracy in time measurements, owing to the symmetry of the motion.

An object is projected vertically upwards and, in its rise and fall, it crosses twice two stations separated by distance L, whose value is accurately determined.

Two time intervals, T and t, corresponding to the two passages across the lower and upper stations respectively, are measured. The value of the acceleration due to the gravity force of the earth is given by

$$g = 8L/(T^2 - t^2) \qquad (1)$$

The vertical gradient of the gravity force being assumed as constant along the whole trajectory, the value of g obtained from (1) corresponds to a point situated at height

$$z = L/8 + l/3 \simeq H/6 \qquad (2)$$

from the apex of the trajectory downwards (l is the distance between the apex and the upper station and is negligible with respect to L). The repeatability of the trajectory at each station and the determination of the apex are obtained with an uncertainty lower than 1 mm.

1.2. Technical description

The essential parts of the apparatus are a Michelson interferometer and a long-period seismometer (~ 20 s) (Figure 1). On the inertial mass of the seismometer is placed a corner cube (cc1) forming one mirror of the interferometer and the reference fixed point. The radiation from a stabilized HeNe laser is used. A second corner cube (cc2) is projected vertically in a vacuum cylinder (~ 0.1 Pa) and forms the movable mirror of the interferometer. Two photodetectors (Ph a, Ph b) detect the interference fringes during the vertical motion of the corner cube and drive the electronic counters of the flight time and the trajectory length.

1.3. Measurement techniques

No physical standard of length is used, therefore measurements

start at a pre-determined but arbitrary instant on the upward trajectory. At that point, fringe counting begins by means of a bi-directional counter guided by the signals of two photomultipliers. Simultaneously, computation of the total flight time begins as well. Another time counter is reset by each fringe in the rise and is stopped only by the first fringe in the fall motion, owing to phase relation inversion of the photodetector signals at the apex of the trajectory. This time interval is quantity "t" in eq. (1).

The upper station is therefore placed at the last fringe in the upward motion. If N is the total number of fringes recorded in the upward motion and λ the wavelength of the laser radiation, then

$$L = N \frac{\lambda}{2} \qquad (3)$$

In the downward motion the counter counts the number of fringes in decreasing order, and when it reaches fringe 0, it stops counting of time T.

1.4. Errors

a) Distance measurement

It is directly connected with the measurement of the value of the laser light wavelength and with its stability. A maximum relative error of 5×10^{-9}, corresponding to $\pm$ 5 μGal, is expected.

Therefore, the laser wavelength is measured before and after each measurement trip. The use of a stabilized iodine laser of IMGC is planned.

Microseisms influence the determination of distance, as they alter the position of the fixed mirror.

These effects have been reduced by ~20 times by placing the fixed corner cube on the intertial mass of the seismometer.

The mechanical shocks of the catapult on the movable corner cube can be a source of disturbance for the experiment; for this reason, measurements begin with a pre-determined delay with respect to the STARTING POINT in order to avoid vibration of the corner cube.

b) Laser beam verticality

Verticality is obtained using a mercury pool. The error must be less than 10^{-4} rad in order that errors in "g" measurements can be less than 5 μGal. No correction was applied to the g value for this error, but a $\pm$ 5 μGal uncertainty was introduced in the overall evalua-

tion of measurement uncertainty.

c) Trajectory verticality

Deviation from verticality must be less than 10^{-4} rad over the whole trajectory, to obtain homogeneous visibility (> 80%).

d) Movable corner cube rotation

Rotations must be less than 0.03 rad/s. The corner cube must be adjusted so that the optical and gravity centres coincide within 0.1 mm.

e) Time determination

A rubidium time standard is used, with 10^{-10} stability approximately. A Hewlett-Packard counter, with $\pm$ 1 ns resolution is used to determine time T. The "start" and "stop" pulses, obtained from the fringe counter, are affected by the delay-time of the circuits used, which introduce a systematic error in the determination of T of 10 ns $\pm$0.5 ns. In total, the uncertainty in T measurements is of $\pm$1.5 ns corresponding to approwimately $\pm$ 6 μGal in g determination (see Table D).
The error in the determination of t is much higher, owing to the fact that a counter with $\pm$ 100 ns resolution is used.
Yet, being

$t << T$

the error on t becomes negligible.

f) Other influence factors

The presence of magnetic fields induce electrical currents in the metal of the corner cube during flight. To avoid this effect, all the metallic parts are made of amagnetic material.

The elastic of the catapult may have an electrostatic charge, and the movable corner cube may be charged by residual air. The elastic is therefore protected by a grounded metallic tube.

Moreover, if the trajectory is vertical, the tube is perfectly centred with respect to the corner cube, so that the capacitance between them keeps constant during flight and its effect is negligible.

No corrections were made for buoyancy or for reduction of the wavelength of the laser light caused by residual air.

g) The measured g value corresponds to a height of$\sim$0.8 m from the ground. To reduce it to this level, the vertical gradient of g has to be measured, and a correction applied. To do this, a relative

gravimeter, type La Coste-Ramberg D-17, was used (W. Spita, operator). The results obtained at the individual stations, together with their measurement uncertainties, are given below. Δh represents the difference in the heights at which the Δg gravity difference was measured.

Vertical gradient of g at the different stations

Site	Δh(m)	Δg(μGal)	$\Delta g/\Delta h$ (μGal/m)
Bedford	.677 $\pm$ .001	205 $\pm$ 2	302 $\pm$ 2
Denver	.830 $\pm$ .001	244 $\pm$ 2	294 $\pm$ 2
Bismark	.821 $\pm$ .001	209 $\pm$ 2	255 $\pm$ 2
Alamogordo	.829 $\pm$ .001	244 $\pm$ 4	296 $\pm$ 5
San Francisco	.829 $\pm$ .001	258 $\pm$ 3	311 $\pm$ 4
Miami	.855 $\pm$ .001	260 $\pm$ 3	304 $\pm$ 4

A typical example of the evaluation of errors is given below, as well as their overall evaluation.

Source of error	Estimated uncertainty (μGal)
1) Laser wavelength	$\pm$ 5
2) Beam direction	$\pm$ 5
3) Time interval T ($\pm$1.5 ns)	$\pm$ 6
4) Gradient of g	$\pm$ 2

The uncertainty in the g value is thus $\pm$ 10 μGal, calculated as the square root of the sum of the squares of the individual errors.

2. PREVIOUS MEASUREMENTS

As was said before, 17 European sites had been determined (Figure 2). The results will be pubblished in a special number of the review "Il Nuovo Cimento" in the first months of 1978.

At this point it is interesting to see how the Italian apparatus agrees with Sakuma's absolute gravity meter and what is its repeatability (Table A, B).

3. U.S. MEASUREMENTS

From Oct. 5th to Dec. 5th 1977 the IMGC apparatus was used in the United States. The sites were chosen in order to give the highest contribution to the U.S. portion of the IGSN 71.

The stations are:

15221 A Boston : situated on Pier n° 1 in the building 1111 of the HANSCOM AFB, Bedford, Mass. (IGSN 71 point. Table E, N)

11994 H Denver : situated in room n° 13, Boettcher West, University of Denver, Colo. (Figure 10, Table F)

15560 A Bismark : in the basement of the Post Office building in Bismark, ND. (Figure 11, Table G)

11926 A Alamogordo : on the pier in room n° 10, building 1256, Hollomon AFB Alamogordo, NM. (Figure 12, Table H)

12172 A San Francisco: IGSN 71 point. (Table L)

08150 C Miami : situated on the U.S. Naval Observatory Time Service Substation, Astrolab building, Miami, FLO. (Figure 13, Table M)

The microseism noise level was, usually, very high (amplitude $\lesssim 2 - 3$ μm and frequent changes in frequency) except for the station in Boston (amplitude < 1 μm). The environment conditions in Miami caused some problems because of the temperature and the air currents of the air conditioning system.

The effects are standard deviations higher than the average ones in Europe, but still acceptable.

Tables C and 1 + 47 show the results of the measurements.

Figures 3 - 9 report the hystograms of the recorded data.

TABLE A Comparison with Sakuma's value of "g" at Sèvres

Station, date	g_r (μGal)	m (μGal)	M (μGal)
Sèvres A_3 by Sakuma	980 925 900		
Sèvres, May 1976	980 925 892	20	2.0
Sèvres, June 1976	980 925 902	17	1.8
Sèvres, January 1977	980 925 896	19	2.1
Sèvres, March 1977 &	980 925 906	17	1.9

& Owing to the rainy weather, the water level of the Seine river was 4.5 m higher than the normal level. An increase in the g value is thus to be expected. This increase was estimated about 3 μGal by Dr. Sakuma.

TABLE B Repeatability of the measurements in the same station

Station, date	g_r μGal)	m (μGal)	M (μGal)
Sèvres, May 1976	980 925 892	20	2.0
Sèvres, June 1976	980 925 902	17	1.8
Sèvres, January 1977	980 925 896	19	2.1
Sèvres, March 1977	980 925 906	17	1.9
Gävle, July 1976	981 923 527	19	1.6
Gävle, August 1976	981 923 533	17	1.9
Gävle, September 1976	981 923 524	20	3.1
Torino, July 1976	980 534 256	26	3.1
Torino, October 1976	980 534 251	25	4.1
Torino, June 1977	980 534 259	25	2.6
Torino, September 1977	980 534 259	30	3.3

TABLE C Synopsis of measurements in U.S.A.

SITE	DATE	N_m	g_f (μGal)	m (μGal)	M (μGal)	h (mm)	g_r (μGal)
Bedford I	Oct., 8–11, 1977	92	980 378 419	24	2.4	787	980 378 671 ± 10
Bedford II	Dec., 3, 1977	64	980 378 454	29	3.6	682	980 378 675 ± 12
Denver	Oct., 16–19, 1977	101	979 598 033	27	2.7	797	979 598 275 ± 10
Bismark	Oct., 25–27, 1977	101	980 612 681	30	3.0	791	980 612 904 ± 10
Alamogordo	Nov., 3–7, 1977	106	979 139 276	29	2.8	801	979 139 509 ± 11
San Francisco	Nov., 15–17, 1977	103	979 971 810	30	3.0	805	979 972 065 ± 11
Miami	Nov., 21–26, 1977	90	979 004 070	37	3.9	819	979 004 303 ± 10

TABLE D Electronic delay time corrections (d.t.c.) and reference fringe number N_r

Site	d.t.c. (μGal)	N_r
Bedford I	- 42 ± 6	823 043
Bedford II	- 50 ± 8	600 585
Denver	- 41 ± 6	880 806
Bismark	- 42 ± 6	860 116
Alamogordo	- 41 ± 6	872 542
San Francisco	- 41 ± 6	872 621
Miami	- 37 ± 5	1048 096

TABLE E

Site :	Bedford I measurements
h	= .787 ± .001 m
$\frac{\partial g}{\partial h}$	= 302 ± 2 μGal/m
g_f	= 980 378 419 ± 2 μGal
Δg_{grad}	= 238 ± 2 μGal
honk	= 14 μGal
net uncertainty	= ±9 μGal
g_r	= 980 378 671 ± 10 μGal

TABLE F

Site :	Denver
h	= .797 ± .001 m
$\frac{\partial g}{\partial h}$	= 294 ± 2 μGal/m
g_f	= 979 598 033 ± 3 μGal
Δg_{grad}	= 234 ± 2 μGal
honk	= 8 μGal
net uncertainty	= ± 9 μGal
g_r	= 979 598 275 ± 10 μGal

TABLE G

Site :	Bismark
h	= .790 ± .001 m
$\frac{\partial g}{\partial h}$	= 255 ± 2 μGal/m
g_f	= 980 612 681 ± 3 μGal
Δg_{grad}	= 201 ± 2 μGal
honk	= 22 μGal
net uncertainty	= ± 9 μGal
g_r	= 980 612 904 ± 10 μGal

TABLE H

Site :	Alamogordo
h	= .801 ± .001 m
$\frac{\partial g}{\partial h}$	= 296 ± 5 μGal/m
g_f	= 979 139 276 ± 3 μGal
Δg_{grad}	= 237 ± 5 μGal
honk	= -4 μGal
net uncertainty	= ± 9 μGal
g_r	= 979 139 509 ± 11 μGal

TABLE L

Site :	San Francisco
h	= .805 ± .001 m
$\frac{\partial g}{\partial h}$	= 311 ± 4 μGal/m
g_f	= 979 971 810 ± 3 μGal
Δg_{grad}	= 250 ± 4 μGal
honk	= 5 μGal
net uncertainty	= ± 9 μGal
g_r	= 979 972 065 ± 11 μGal

TABLE M

Site :	Miami
h	= .819 ± .001 m
$\frac{\partial g}{\partial h}$	= 304 ± 4 μGal/m
g_f	= 979 004 070 ± 4 μGal
Δg_{grad}	= 249 ± 4 μGal
honk	= -16 μGal
net uncertainty	= ± 9 μGal
g_r	= 979 004 303 ± 10 μGal

TABLE N

Site :		Bedford II measurements
h	=	.684 ± .001 m
$\frac{\partial g}{\partial h}$	=	302 ± 2 μGal/m
g_f	=	980 378 454 ± 4 μGal
Δggrad	=	207 ± 2 μGal
honk	=	14 μGal
net uncertainty	=	± 11 μGal
g_r	=	980 378 675 ± 12 μGal

FIGURE LIST AND CAPTIONS

Figure 1

Schematic drawing of the optical part of gravimeter

Figure 2

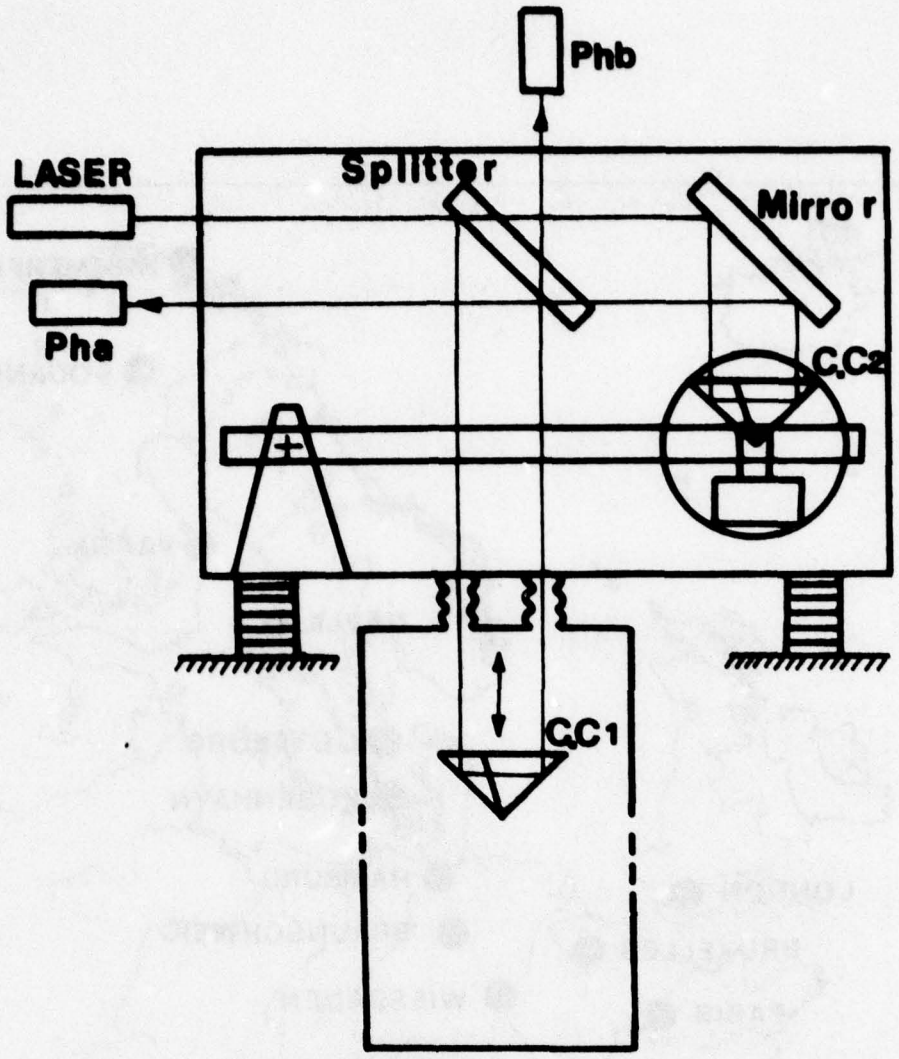
Absolute stations in Europe

Figures 3-9

Measurement hystograms for USA stations

Figures 10-13

Monographs of USA stations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LASER
Splitter
Mirror
Pha
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A)
CCc1

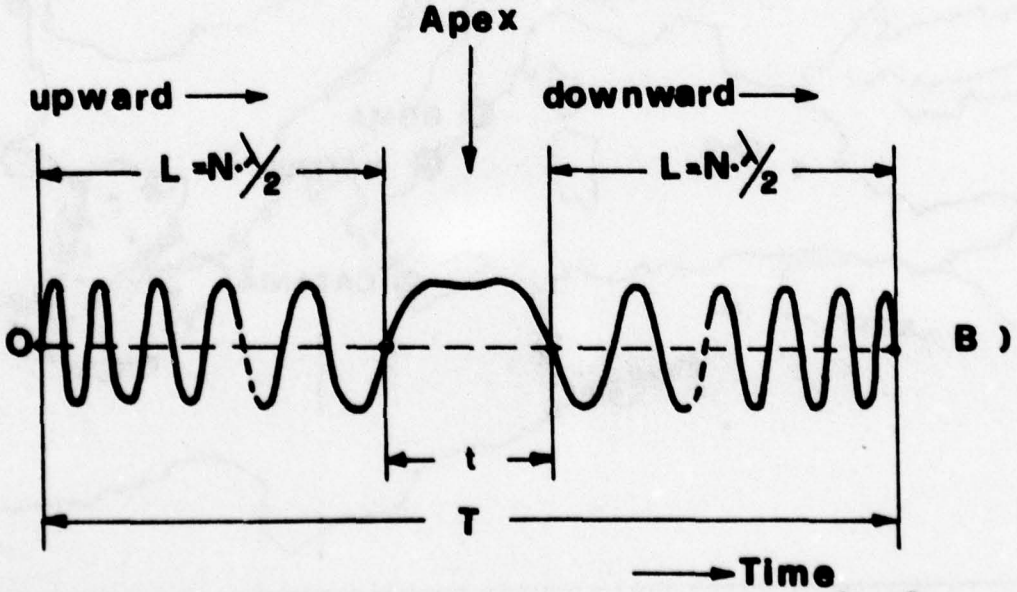

Apex
upward
downward
L = N · λ/2
L = N · λ/2
0
t
T
Time
B)

fig.1

HAMMERFEST
SODANKYLA
VAASA
GAVLE
GOTEBORG
KOBENHAVN
HAMBURG
LONDON
BRAUNSCHWEIG
BRUXELLES
WIESBADEN
PARIS
MUNCHEN
TORINO
ROMA
NAPOLI
CATANIA

fig. 2

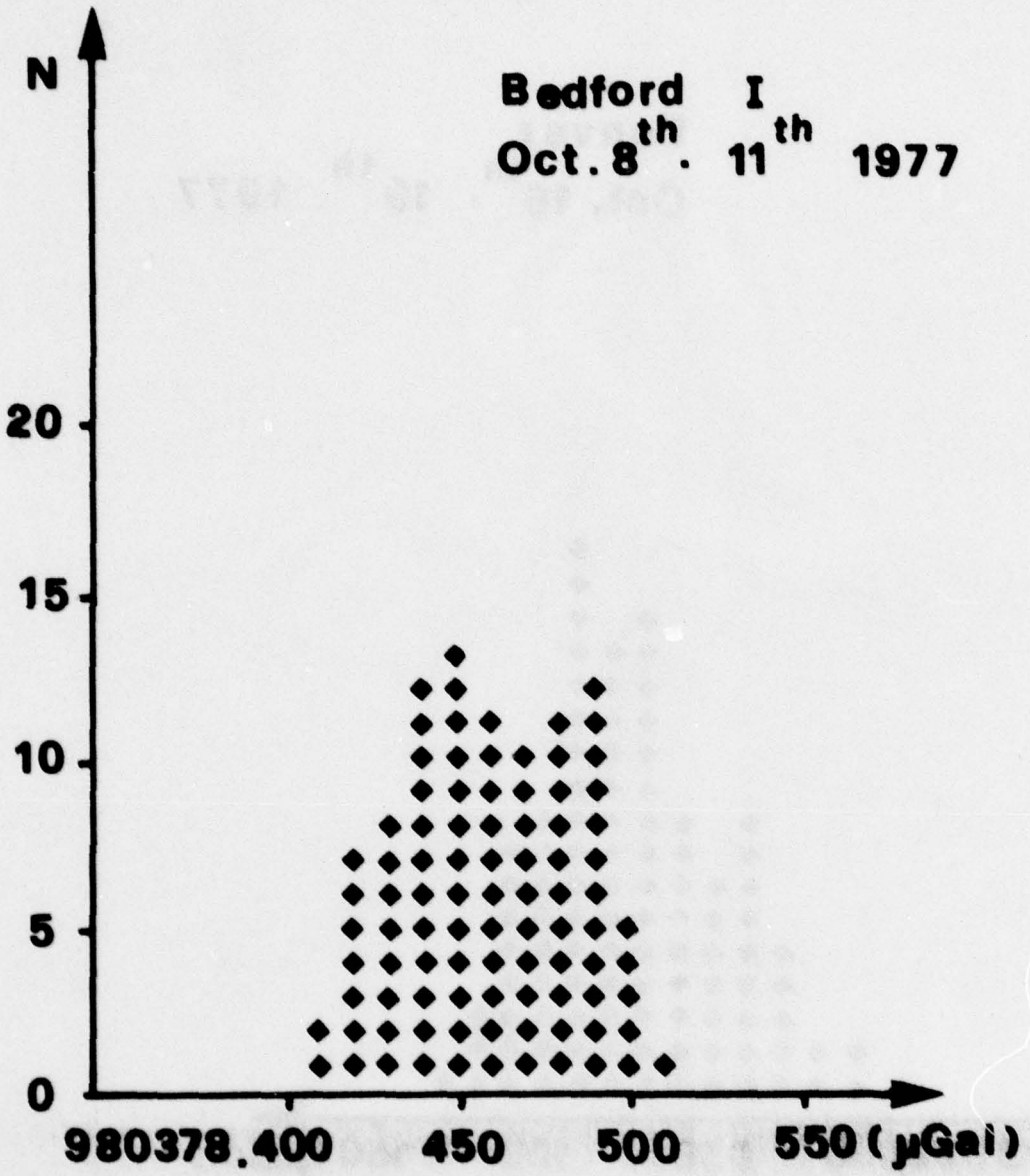
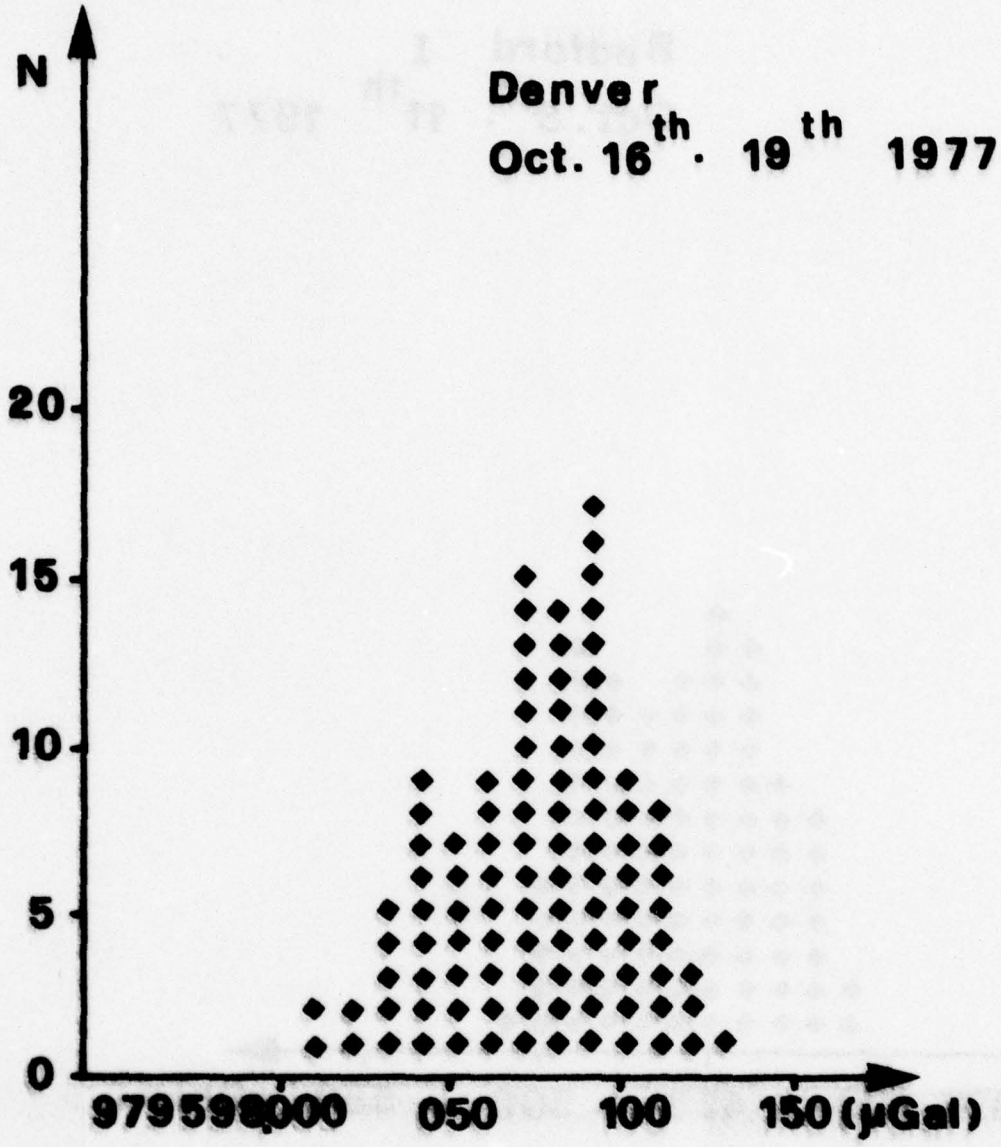

N
Bedford I
Oct. 8th. 11th 1977
20
15
10
5
0
980378.400
450
500
550 (μGal)

fig.3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Denver
Oct. 16th. 19th 1977
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15
10
5
0
979598000
050
100
150 (μGal)

fig.4

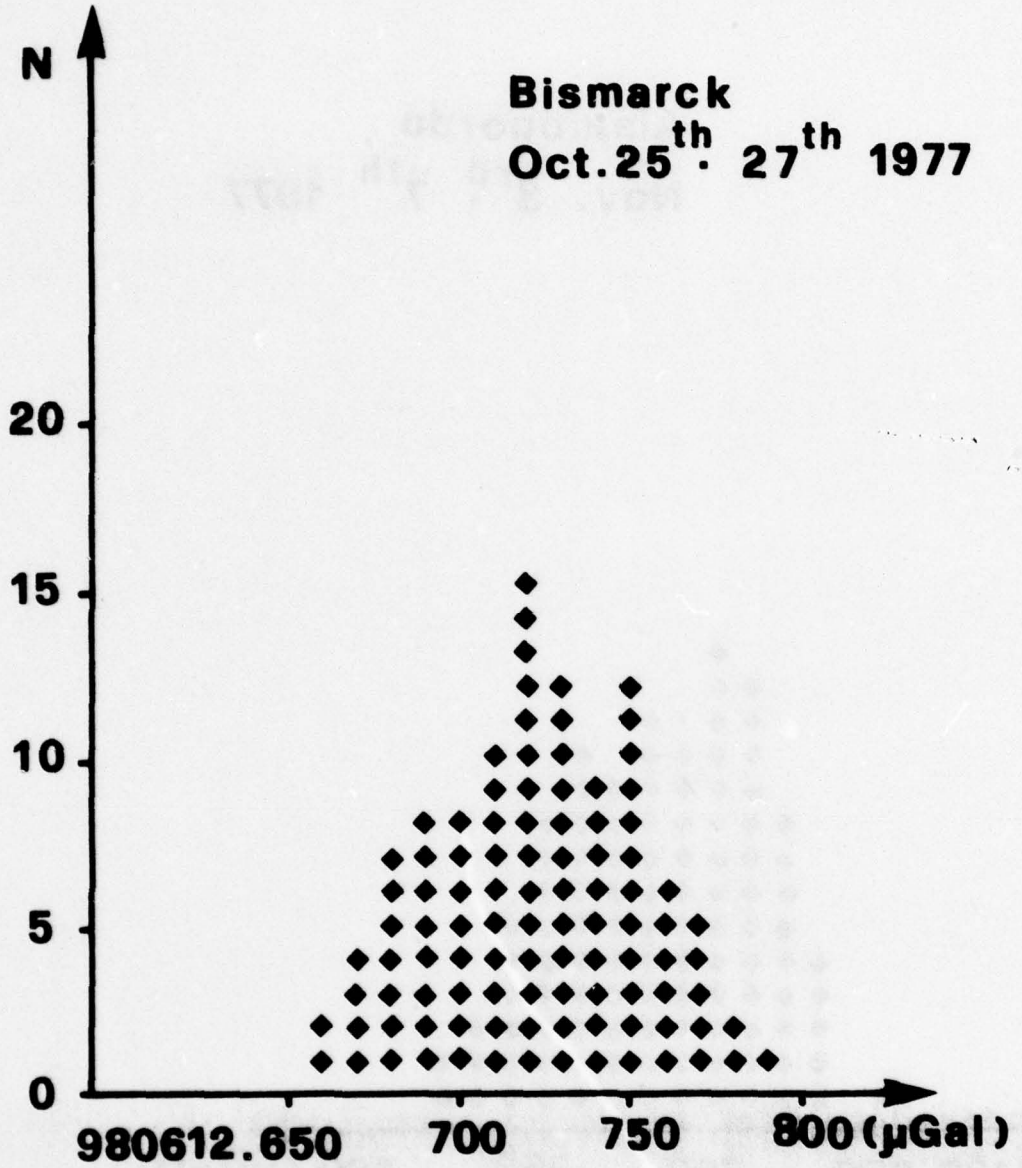

N
Bismarck
Oct.25th - 27th 1977
20
15
10
5
0
980612.650
700
750
800 (µGal)

fig.5

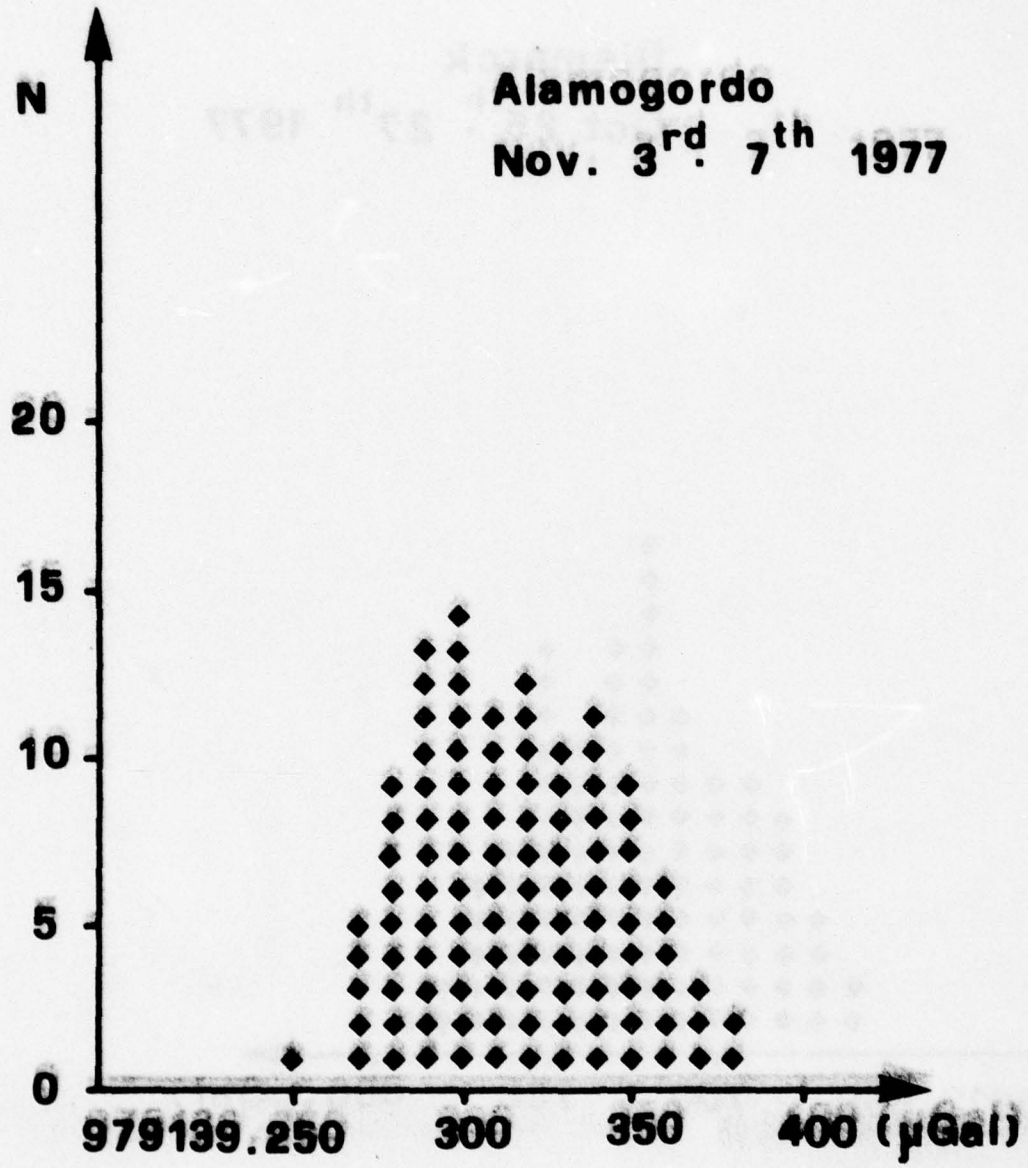
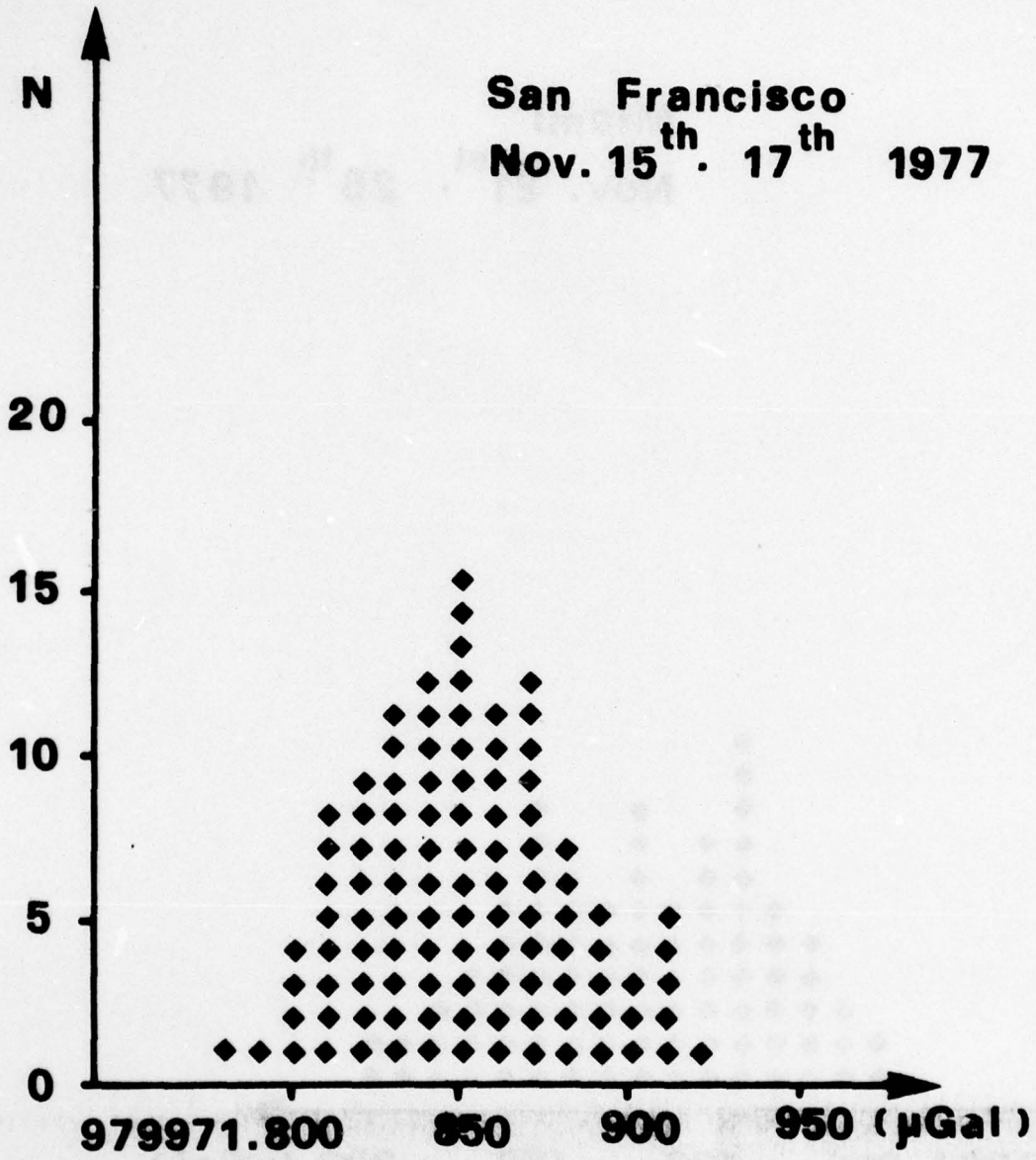

N
Alamogordo
Nov. 3rd - 7th 1977
20
15
10
5
0
979139.250
300
350
400 (μGal)

fig. 6


N
San Francisco
Nov. 15th. 17th 1977
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15
10
5
0
979971.800
850
900
950 (μGal)

fig.7

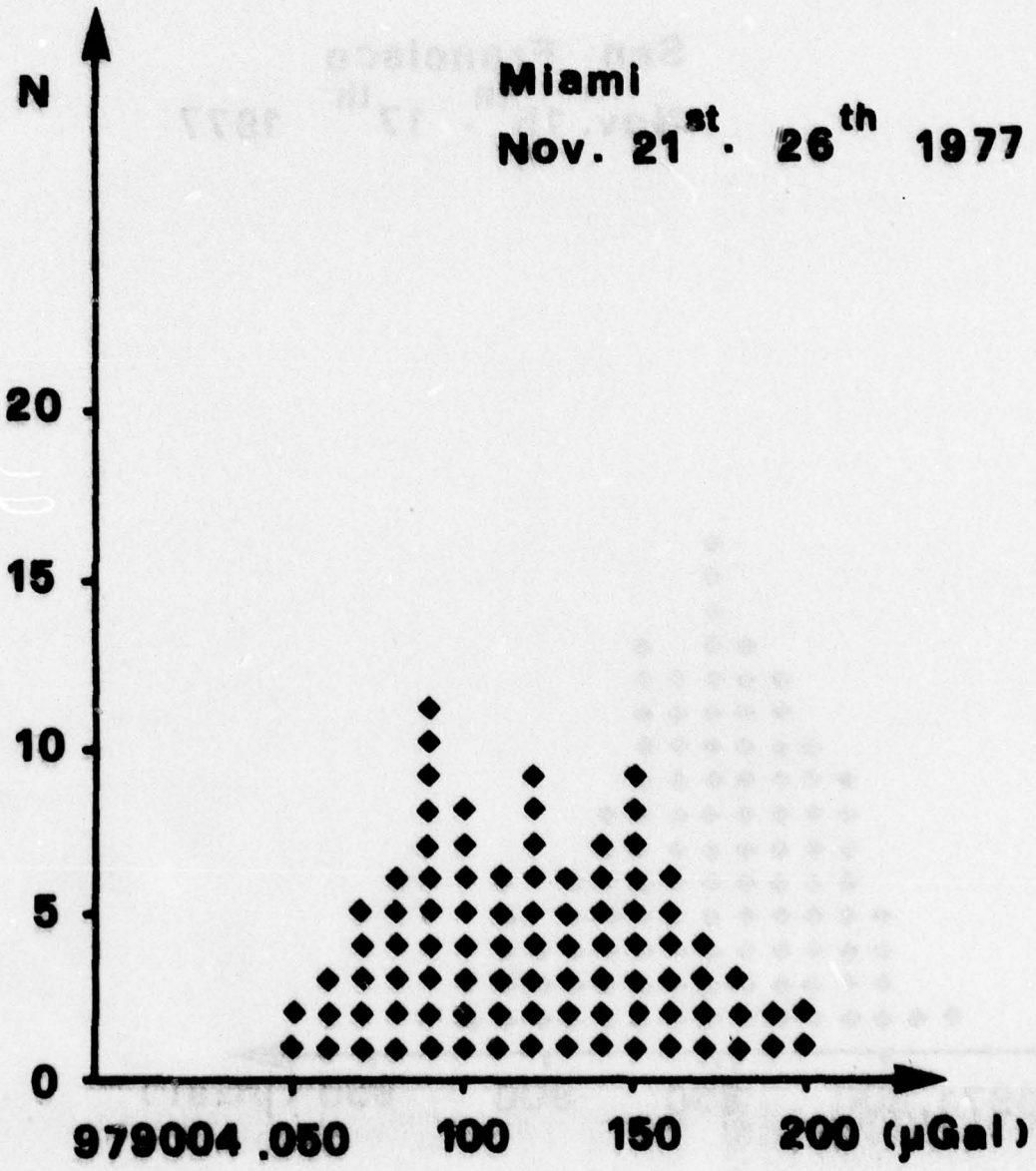

N
Miami
Nov. 21st. 26th 1977
20
15
10
5
0
979004 .050
100
150
200 (μGal)

fig.8

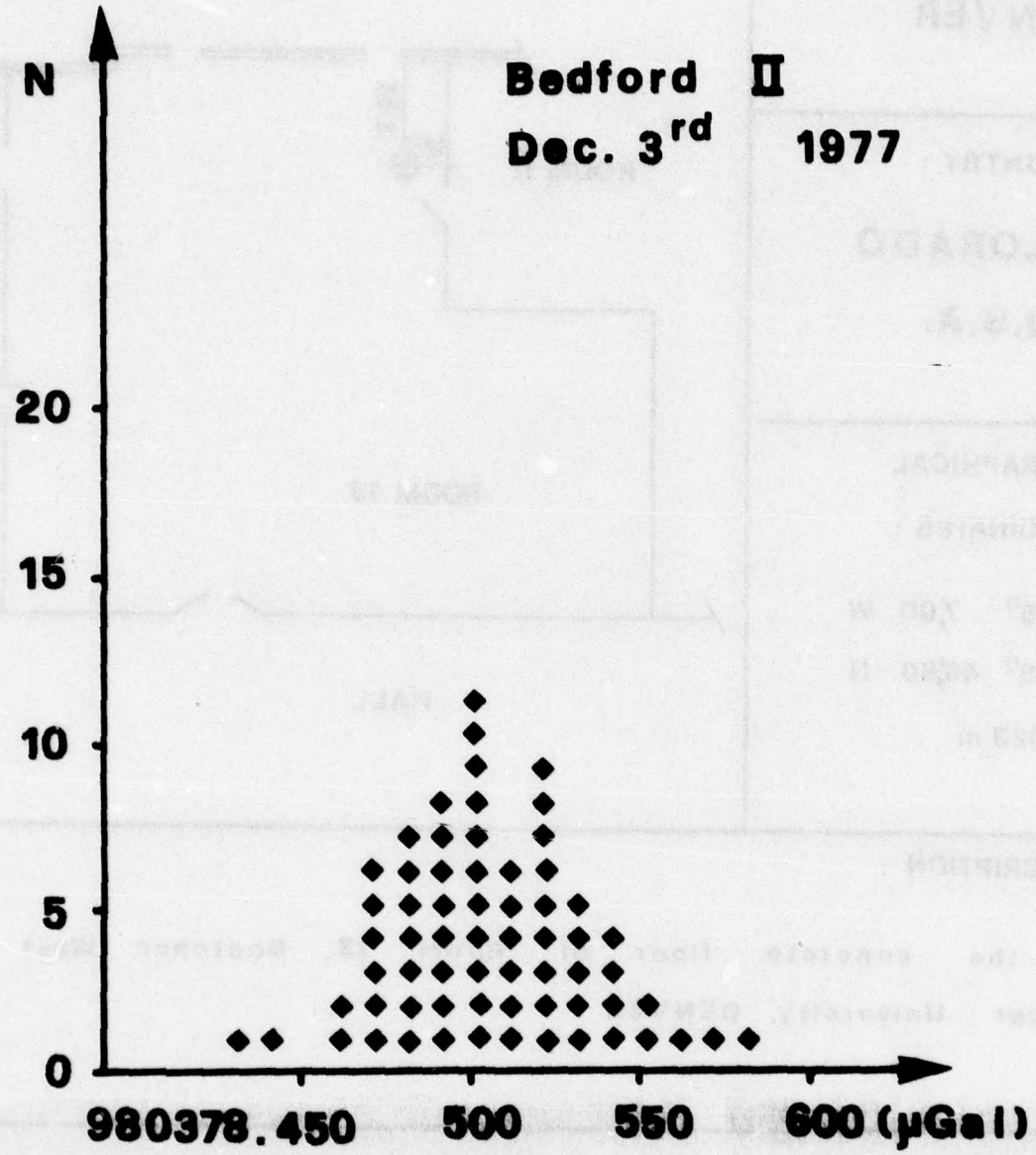

N
Bedford II
Dec. 3rd 1977
20
15
10
5
0
980378.450
500
550
600 (μGal)

fig.9

ABSOLUTE GRAVITY STATIONS 1977

SITE :

DENVER

COUNTRY :

COLORADO

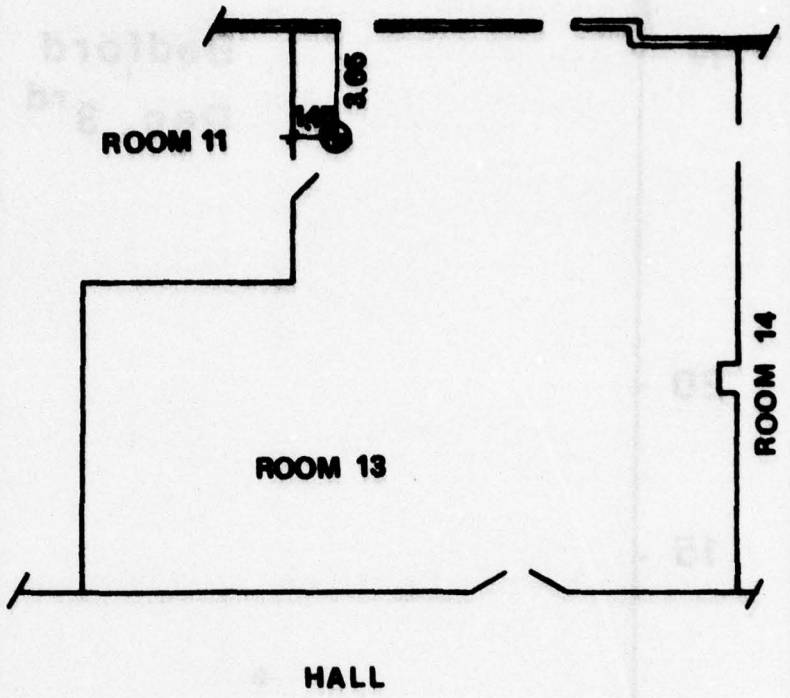
U.S.A.

GEOGRAPHICAL COORDINATES :

φ 105° 7,00 W

λ 39° 45,60 N

H 1623 m



DESCRIPTION :

On the concrete floor of Room 13, Boetcher West Denver University, DENVER

REMARKS :

The station is monumented

fig.10

ABSOLUTE GRAVITY STATIONS 1977

SITE :

BISMARCK

COUNTRY :

NORTH DAKOTA

U.S.A.

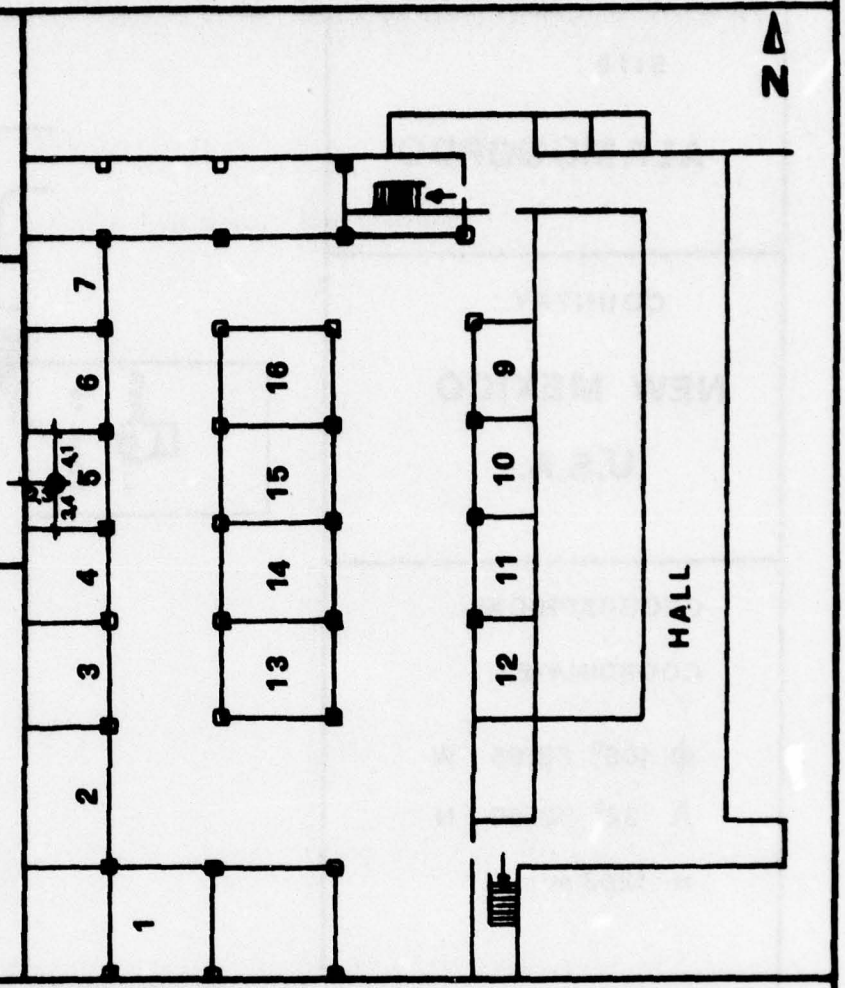
GEOGRAPHICAL

COORDINATES :

ϕ 101° 13',00 W

λ 46° 49',00 N

H 515 m



DESCRIPTION :

On the concrete floor of the basement of the Post Office Building, BISMARCK

REMARKS :

The station is monumented

fig.11

ABSOLUTE GRAVITY STATIONS 1977

SITE :

ALAMOGORDO

COUNTRY :

NEW MEXICO

U.S.A.

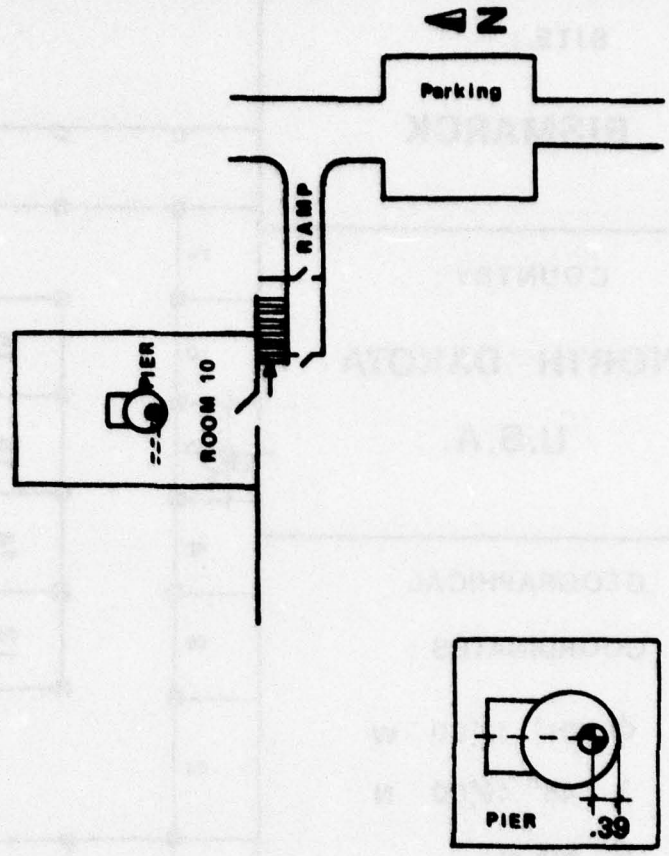
GEOGRAPHICAL

COORDINATES :

φ 106° 53',95 W

λ 32° 53',60 N

H 1253 m



DESCRIPTION :

On the pier in Room 10, Building 1256, Hollomon A.F.B. ALAMOGORDO

REMARKS :

The station is monumented.

fig.12

ABSOLUTE GRAVITY STATIONS 1977

SITE :

MIAMI

COUNTRY :

FLORIDA

U.S.A.

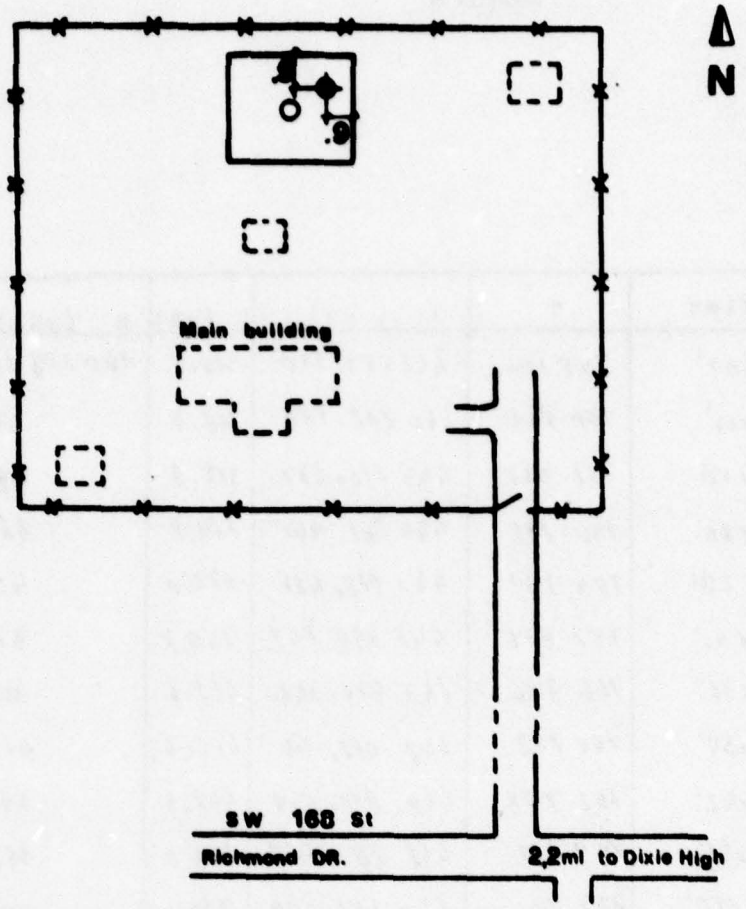
GEOGRAPHICAL

COORDINATES :

φ 81° 43',00 W

λ 25° 48',00 N

H 6 m



DESCRIPTION :

On the concrete floor of the Astrolab building.

Time service, Substation, u.s. Naval Observatory

REMARKS :

The station is monumented.

The scale in the sketch has not been respected.

fig.13

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BOSTON A

Table 1
Date Oct. 8, 1977
Site Bedford, Hanscom AFB
Bld 1111

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
14h07'	758 366	442 559.310	306.6	980 378 646.4	+57.4	980 378 533.8	
14'	750 549	440 272.572	368.3	458.1	+56.8	514.9	
17'	762 337	443 716.477	312.8	483.8	+56.4	510.2	
20'	766 178	444 861.910	279.2	444.4	+56.0	500.4	
28'	753 299	441 078.421	326.0	434.1	+54.8	493.9	
35'	757 816	442 398.742	149.7	372.0	+54.3	426.3	
36'	761 886	443 876.346	427.6	351.8			Bad leaj Rej
39'	756 232	442 088.3[illegible]	411.3	412.9	+52.6	465.5	
42'	762 798	443 850.769	442.3	394.9	+52.0	446.9	
45'	759 135	442 783.762	408.0	368.1	+51.4	419.5	
50'	771 741	446 444.959	343.1	394.6	+50.1	444.7	
52'	762 554	443 781.106	311.1	370.7	+49.6	420.3	
56'	762 978	443 903.069	328.4	423.0	+48.5	471.5	
59'	755 462	441 711.339	502.6	429.8			Bad leaj Rejected
15h02'	773 889	447 065.835	406.3	411.9	+46.9	458.8	
05'	763 051	443 924.186	286.1	398.8	+45.9	444.7	
07'	758 261	448 326.911	434.4	398.6	+45.3	434.9	
10'	772 255	446 593.490	227.0	403.6	+44.4	448.0	
13'	757 772	442 385.969	280.1	429.7	+43.4	473.1	
15'	750 178	440 163.776	394.0	415.3	+42.8	458.1	

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BOSTON A

Table 2
Date Oct. 8, 1977
Site Bedford, Hanscom AFB
Bld 1111

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
16h00'	785 060	450 281.035	446.0	980 378 420.2	+ 24.6	980 378 444.8	
+03'	799 821	454 508.565	346.5	404.5	+23.2	427.7	
+10'	779 613	448 716.063	328.3	422.5	+19.8	442.3	
+13'	772 595	446 691.746	128.0	441.3	+18.4	459.7	
+15'	787 810	451 068.883	387.0	426.8	+17.4	444.2	
+20'	778 256	448 325.434	404.3	430.4	+14.9	445.3	
+45'	788 932	451 391.241	115.3	483.7	+ 2.1	485.8	

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BOSTON A

Table 3
Date Oct. 10, 1977
Site Bedford, Hanscom AFB
Bld 1111

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
15h 45'	830 569	463 148.281	477.7	980 378 430.0	+48.3	980 378 478.3	
48'	843 870	466 675.949	430.5	483.2			Bad fm Rejecte
50'	816 049	459 081.963	379.1	439.3	+47.1	486.4	
53'	818 975	459 904.352	469.1	406.6	+46.4	453.0	
56'	793 499	452 694.215	506.0	441.1	+45.7	486.8	
16h 00'	819 448	460 037.000	310.0	437.0	+44.8	481.8	
03'	826 522	462 018.482	410.4	421.9	+43.4	465.8	
06'	833 844	464 060.368	334.1	445.5	+43.0	488.5	
12'	828 659	462 615.331	347.0	400.1	+41.2	441.3	
15'	832 581	463 708.683	92.5	408.6	+40.3	448.9	
18'	829 400	462 822.194	426.9	386.8	+39.2	426.0	
21'	820 851	460 430.755	435.7	435.0	+38.1	473.1	
24'	838 888	462 679.168	215.0	401.4	+37.0	438.4	
26'	833 307	463 911.045	471.4	414.2	+36.3	450.5	
28'	815 976	459 061.466	415.1	413.6	+35.5	449.1	
31'	799 889	454 513.664	338.6	443.0	+34.4	477.4	

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BOSTON A

Table 4
Date Oct. 10, 1977
Site Bedford, Hanscom AFB
Bld 1111

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
17h24'	827 478	462 285.550	361.7	980 378 469.4	+7.7	980 378 477.6	
"27'	839 171	465 540.427	462.3	495.3	+6.6	501.9	
"30'	820 724	460 395.136	450.2	499.8	+4.9	504.7	
"33'	830 293	464 741.365	358.6	421.1	+3.1	424.2	
"36'	825 158	461 637.077	418.9	496.7	+1.4	498.1	
"39'	820 661	460 377.508	492.1	492.1	-.4	491.7	
"42'	818 506	459 772.616	451.0	462.3	-2.1	460.2	
"47'	819 152	459 95.....	377.2	496.2	-5.1	491.1	
"56'	828 501	462 571.131	192.3	419.0			Bad to Reject.
18h01'	833.888	464 082.523	202.5	498.2	-13.6	484.6	
"04'	819 375	460 016.588	417.9	461.8	-15.5	446.3	
"09'	826 639	462 051.089	285.2	456.3	-18.6	437.7	
"12'	828 718	462 631.710	219.9	450.0	-20.4	429.6	
"15'	829 029	462 718.557	323.1	506.3	-22.3	484.0	

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BOSTON A

Table 5
Date Oct. 10, 1977
Site Bedford, Hanscom AFB
Bld 1111

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	gcorr (μGal)	Notes
19h07'	821 137	460 510.999	491.1	980 328 503.5	-53.1	980 328 450.4	
"10'	831 584	463 431 .107	449.2	543.5	-54.7	489.8	
"13'	825 864	461 839.951	177.1	546.3	-56.4	491.9	
"20'	831 728	463 471.077	167.5	516.6	-60.0	456.6	
"21'	828 348	462 528.370	134.4	532.5	-62.1	470.4	
"27'	828 650	462 612.878	449.4	522.9	-63.6	459.3	
"30'	825 945	461 852.134	380.1	526.8	-65.1	461.7	
"35'	832 854	463 784 .869	4330	513.1	-67.4	445.7	
"39'	837 311	465 024.040	2483	537.0	-69.2	467.8	
"51'	830 316	463 077.581	3433	581.4	-74.4	507.1	
"54'	833 382	463 931 .929	5083	505.2	-75.6	429.6	
20h00'	824 777	461 530.551	4434	568.8	-78.0	490.8	
"05'	832 176	463 545.876	1480	512.8	-79.7	433.1	

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BOSTON A

Table 6
Date Oct. 10, 1977
Site Bedford, Hanscom AFB
Bld 1111

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
21h05'	850 662	488 118. 452	265.0	980 378 586.1	-42.2	980 378 475.9	
08'	836 851	464 896. 891	266.1	555.3	-92.3	463.0	
13'	836 117	464 642. 289	69.6	522.8	-42.5	480.3	
20'	831 864	463 509. 082	385.7	562.6	-92.4	470.2	
29'	841 278	466 124. 261	81.5	525.6	-92.1	483.5	
31'	851 502	468 948. 128	266.7	528.8	-92.0	436.8	
55'	851 519	468 952. 837	239.7	561.1	-88.3	472.7	
58'	854 050	469 649. 242	188.5	548.6	-87.8	460.8	
22h 07'	826 455	461 999. 589	220.1	525.2	-85.5	489.7	
10'	834 076	464 124. 919	369.0	566.3	-86.7	479.2	
15'	836 524	464 805. 628	483.9	553.2	-83.3	469.9	
20'	842 177	466 323. 446	435.1	523.3	-81.6	441.7	
25'	834 824	464 332. 928	288.4	521.0	-79.9	441.1	

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BOSTON A

Table 7
Date Oct. 11, 1977
Site Bedford, Hanscom AFB
Bld 1111

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C (μGal)	g_{corr} (μGal)	Notes
13h 05'	821 138	460 511 . 126	301.1	980 378 460.8	-14.4	980 378 445.9	
08'	813 087	458 248 . 141	186.6	461.4	-13.1	448.8	
11'	800 725	454 751 . 057	237.3	431.5	-11.3	420.2	
17'	795 007	453 124 . 542	376.1	451.4	- 7.9	443.5	
31'	811 443	457 784 . 431	223.0	468.7	0.0	468.7	
38'	808 142	456 852 . 404	324.4	424.9	+ 3.8	428.7	
14h 07'	823 530	461 181 . 304	134.7	447.7	+18.2	465.9	
10'	815 901	459 040 . 341	383.0	411.4	+19.6	431.0	
13'	806 787	456 469 . 261	355.2	453.0	+21.0	474.0	
15'	805 168	456 010 . 930	185.7	436.7	+21.9	458.6	
20'	821 796	460 695 . 620	382.4	414.8	+23.9	438.7	
25'	818 095	459 656 . 965	59.5	399.4	+25.8	425.2	
29'	807 106	456 559 . 526	344.3	461.7	+27.4	489.1	
47'	794 811	454 491 . 398	147.5	455.0	-28.4	483.4	
50'	823 043	461 045 . 174	490.8	405.2	+29.5	434.7	
15h 00'	837 075	464 958 . 665	432.7	408.0	+32.9	441.9	

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Table 8
Date Oct. 16, 1977
Site University
Boettcher West, Room 13

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
20h 51'	896 317	481 322. 143	450.0	979 598 090.7	-47.8	979 598 042.9	
21h 07'	897 679	481 687 .598	234.8	090.7	-45.8	044.9	
16'	898 200	481 827. 346	213.5	107.5	-43.0	064.5	
19'	894 230	480 761 .364	281.3	152.0	-42.6	109.4	
22h 42'	917 297	486 922. 687	400.1	118.8	-39.6	073.2	
44'	901 398	483 487 .044	434.9	146.2	-39.6	106.6	
47'	894 663	480 877. 894	448.3	065.2	-39.6	025.6	
50'	899 672	482 222. 122	405.6	119.9	-39.7	080.2	
54'	896 283	481 312. 485	369.0	131.7	-39.8	091.9	
57'	899 160	482 084. 931	458.2	132.9	-39.8	093.1	
23h 00'	891 352	479 987. 195	410.5	130.5	-39.9	090.6	
03'	895 268	481 040. 457	455.5	100.5	-40.0	060.5	
07'	894 323	480 786. 484	438.3	137.6	-40.2	097.4	
07'	889 365	479 451 .855	325.1	061.1	-40.3	020.8	
10'	897 903	481 747. 868	459.0	115.2	-40.4	074.8	
13'	900 510	482 446. 574	299.1	123.3	-40.6	082.7	
15'	904 054	483 395. 151	502.5	144.1	-40.7	103.4	
18'	895 242	481 033. 404	392.0	149.2	-40.9	108.3	

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DENVER

Table 8 bis
Date Oct. 17, 1977
Site University
Boettcher West
Room 13

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Note
00h 05'	850 533	479 766 .682	462.3	979598 116.0	-45.4	979548 070.6	
08'	888 013	479 087. 224	387.3	106.0	-45.8	060.2	
11'	884 614	478 869. 501	308.5	093.8	-46.2	053.6	
13'	889 354	479 448. 940	396.6	026.4	-46.5	029.9	
17'	891 229	479 954.085	440.1	162.4	-46.9	115.5	
22'	889 255	479 422. 163	295.6	150.4	-47.6	102.8	
26'	888 162	479 127.560	434.4	087.7	-48.2	039.5	
29'	893 354	480 256.740	132.7	159.9	-48.6	111.3	
32'	893 739	480 629. 418	352.7	102.5	-49.0	053.5	
35'	886 424	478 658. 540	434.1	087.9	-49.4	038.5	
40'	893 071	480 449.765	359.1	134.1	-50.2	083.9	
44'	897 255	481 573. 906	365.5	100.9	-50.7	050.1	
47'	898 159	481 816. 402	310.9	102.4	-51.2	056.2	
50'	896 041	481 247. 983	327.9	084.7	-51.6	038.1	
01h 15'	902 803	482 632. 233	389.8	150.5	-55.4	095.1	
18'	913 372	485 879. 671	91.6	123.7	-55.8	062.9	
21'	900 336	482 400. 120	485.5	045.7	-56.2	039.5	
24'	900 262	482 324. 810	354.7	163.1	-56.9	106.2	
30'	902 245	482 911 . 286	504.7	111.2	-57.5	053.7	
34'	896 139	481 274. 323	355.9	111.1	-58.0	053.1	

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DENVER

Table 9
Date Oct. 18, 1977
Site University
Boettcher West, Room 13

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Note
14h06'	901 820	488 797.585	292.5	979 548 011.4	+47.0	979 543 058.4	
10'	884 987	478 220.311	298.4	031.8	+45.2	077.0	
13'	880 475	477 049.593	346.3	993.5	+43.8	013.7	
15'	877 403	476 216.666	385.4	8 038.5	+42.9	081.4	
28'	889 019	479 358.698	447.6	7993.1	+39.0	013.2	
33'	867 953	473 645.178	357.9	8028.8	+34.1	062.9	
37'	886 471	478 671.054	122.1	064.6	+32.1	096.7	
40'	882 150	477 503.269	493.5	006.3	+30.7	037.0	
45'	884 822	478 225.641	106.2	038.3	+28.2	066.5	
47'	877 850	476 337.981	409.1	020.1	+27.2	047.3	
51'	881 146	477 231.269	241.5	001.2	+25.2	026.4	
56'	884 514	478 142.496	327.8	058.5	+22.2	081.2	
59'	883 174	477 780.273	435.9	016.0	+21.2	037.2	
15h01'	878 086	476 401.866	223.8	088.3	+20.2	108.5	

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DENVER

Table 10
Date Oct. 18, 1977
Site University
Boettcher West, Room 13

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
15h43'	893 789	480 642.989	494.3	979 548 093.4	+.7	979 548 094.1	
46'	887 499	478 948.547	216.5	91.2	-2.2	89.0	
49'	879 931	476 902.080	171.0	88.3	-3.6	84.7	
52'	878 052	476 392.615	103.3	31.8	-5.0	26.8	
55'	882 595	477 623.634	461.7	112.9	-6.5	106.4	
58'	884 790	478 217.099	343.9	63.3	-7.9	55.4	
16h08'	877 303	476 189.563	451.7	131.6	-12.6	119.0	
11'	880 822	478 143.525	208.6	93.5	-14.0	79.5	
14'	877 867	476 342.634	459.0	39.3	-15.4	23.9	
19'	882 092	477 487.478	404.7	118.5	-17.7	100.8	
22'	879 496	476 784.341	420.7	86.3	-19.0	67.2	
24'	879 434	476 767.552	432.6	61.1	-19.9	41.2	

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DENVER

Table 11
Date Oct. 18, 1977
Site University
Boettcher West, Room 13

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	gcorr (μGal)	Notes
18h43'	884 484	478 134.398	370.3	979 598 141.6	-49.7	979 598 091.9	
48'	887 109	478 843.273	164.3	122.9	-50.7	072.2	
52'	882 054	477 477.269	487.9	135.0	-51.7	083.3	
56'	880 188	476 971.719	192.3	121.6	-52.8	068.8	
59'	868 113	473 688.825	372.6	105.8	-53.5	052.3	
19h02'	879 167	476 694.985	137.9	105.6	-54.3	051.3	
13'	874 806	475 511.452	496.1	139.7	-56.7	082.9	
17'	879 148	476 689.844	199.4	154.0	-57.6	096.4	
19'	882 036	477 472.280	369.0	095.9	-58.0	037.9	
22'	879 071	476 869.828	286.3	144.8	-58.6	086.2	
25'	881 886	477 431.692	398.5	138.0	-59.1	078.9	

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DENVER

Table 12
Date Oct. 19, 1977
Site University
Boettcher West, Room 13

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	gcorr (μGal)	Notes
14h46'	884 967	478 264.950	363.3	979 598 038.8	+53.6	979 598 092.4	
49'	890 884	479 861.266	486.7	034.0	+49.0	083.0	
15h03'	880 417	477 033.905	392.9	040.6	+47.3	087.9	
06'	865 517	472 979.953	224.1	064.9	+46.2	111.1	
09'	883 179	477 781.590	401.3	036.9	+45.0	081.9	
13'	880 651	477 091.207	257.2	020.6	+43.5	064.1	
16'	877 312	476 192.011	428.9	023.0	+42.3	065.3	
21'	854 258	469 893.736	493.5	038.2	+40.2	078.4	
24'	880 026	476 918.037	420.1	036.1	+39.0	075.1	
27'	874 100	475 369.340	456.5	084.5	+37.7	122.2	
30'	878 313	476 476.620	456.5	035.0	+36.5	071.5	
33'	866 139	473 149.922	313.2	060.5	+35.2	095.7	
35'	877 283	476 181.226	078.5	079.8	+34.3	114.1	
40'	878 384	476 482.621	113.9	041.0	+32.2	073.2	
44'	875 508	475 702.236	502.9	037.2	+30.4	067.6	
47'	878 024	476 385.038	149.1	004.0	+29.0	033.0	
50'	880.806	477 139.191	274.5	060.9	+27.6	088.5	
54'	893 392	480 536.245	498.8	059.9	+25.8	085.7	
57'	865 578	472 996 609	200.9	067.9	+24.5	092.4	

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DENVER

Table 13
Date Oct. 19, 1977
Site University
Boettcher West, Room 13

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
18h00'	899 850	426 880.359	506.9	979 598 186.0	-32.5	979 598 053.5	
03'	880 459	427 045.204	314.7	102.2	-33.7	053.5	
08'	902 789	483 056.725	374.1	125.3	-35.8	089.5	
11'	897 167	481 550.284	363.1	116.8	-37.0	079.7	
14'	894 739	480 898.342	494.1	131.2	-38.3	092.9	
16'	884 118	478 035.326	238.8	149.3	-39.1	110.2	
18'	885 235	478 337.314	343.1	126.0	-39.9	086.1	

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BISMARCK

Table 14
Date Oct. 25, 1977
Site Post Office Building
Bismarck

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
4' 57	888 448	478 956.535	140.1	980 612 246.1	-44.6	980 612 201.5	
15h 00'	886 504	478 432.456	465.8	251.9	-44.2	207.7	
03'	877 074	475 880.880	260.3	266.2	-43.0	223.2	
06'	871 075	474 250.718	390.5	252.7	-41.9	210.8	
09'	865 469	472 722.034	94.7	235.2	-40.7	694.5	
16'	877 742	476 062.068	241.6	219.0	-38.0	681.0	
30'	864 800	472 539.514	466.5	656.5	-32.8	623.7	Bad traj. Rejected
33'	872 865	474 574.566	412.5	267.3	-31.7	235.6	
36'	860 876	471 301.820	386.9	785.9	-30.6	755.3	
39'	855 646	470 031.898	437.7	720.3	-29.6	690.7	
41'	837 729	465 084.589	320.4	759.8	-28.8	731.0	
44'	852 134	469 066.214	371.7	772.4	-27.8	744.6	
47'	855 823	470 025.533	378.4	704.2	-26.7	677.5	
52'	850 365	468 573.491	219.7	757.5	-25.1	732.4	

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BISMARCK

Table 15
Date Oct. 25, 1977
Site Post Office
Bismarck

J.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
16'50'	893717	480 374.682	163.4	980 612 762.9	-9.0	980 612 753.9	
16'55'	870 032	473 966.736	412.3	705.2	-8.1	697.1	
58'	884 860	477 856.979	343.6	768.3	-7.5	754.8	
02'	881 453	477 067.392	286.2	756.8	-6.8	750.0	
05'	885 457	478 149.624	317.8	729.6	-6.4	723.2	
08'	880 012	476 627.254	252.4	774.5	-6.0	768.5	
15'	876 478	475 719.185	226.2	758.9	-5.0	753.9	
18'	870 413	474 070.402	277.2	718.0	-4.7	713.3	
23'	879 091	476 427.772	278.4	740.1	-4.3	735.8	
35'	865 649	472 771.364	417.2	736.3	-3.4	732.9	
40'	875 983	475 584.348	429.7	710.4	-3.2	707.2	
43'	874 792	475 261.450	336.5	737.9	-3.1	734.8	
45'	876 400	475 698.121	426.8	726.2	-3.0	723.2	
47'	875 521	475 472.907	117.5	742.0	-3.0	739.0	
50'	873 150	474 815.169	290.5	755.8	-3.0	752.8	

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BISMARCK

Table 16
Date Oct. 25, 1977
Site Post Office
Bismarck

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{corr} [μGal]	NOTES
1'10'	873461	474 899.755	336.3	980 612 748.8	-58.8	980 612 684.0	
21'15'	870 279	474 033.868	257.1	839.8	-60.0	779.8	
21'	861 169	472 913.258	351.6	857.9	-62.2	795.7	
24'	876 948	475 846.668	258.5	878.6	-63.3	815.3	
27'	878 924	476 382.517	309.3	817.1	-64.4	752.7	
30'	877 908	476 107.153	368.6	764.7	-65.6	699.1	
36'	872 506	474 640.027	302.6	818.2	-67.6	750.6	
41'	875 026	475 325.119	476.7	783.3	-69.3	714.0	
45'	876 375	475 691.259	354.1	818.7	-70.7	748.0	
48'	872 250	474 570.401	308.1	788.7	-71.7	717.0	
53'	868 771	473 623.152	461.5	820.8	-73.3	747.5	
2'00'	872 356	474 599.272	343.8	741.7	-75.5	666.2	

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BISMARCK

Table 17
Date Oct. 25, 1977
Site Post Office
Bismarck

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	gcorr (μGal)	Notes
TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	gcorr [μGal]	NOTES
3h00'	878 849	476 362.210	351.4	980 612 360.1	-87.4	980 612 272.7	
03'	879 705	476 594.275	481.1	773.7	-87.6	692.1	
06'	876 888	475 830.658	350.7	838.1	-87.8	750.3	
13'	870 600	471 121.383	408.0	864.1	-88.2	775.9	
15'	877 378	475 963.484	457.9	806.3	-88.3	718.0	
20'	879 295	476 483.116	400.1	817.8	-88.3	729.5	
23'	882 199	477 269.218	272.1	761.3	-88.2	673.1	
26'	871 252	474 298.766	172.5	766.8	-88.2	678.6	
29'	879 665	476 578.011	471.3	783.4	-88.2	695.2	
39'	874 944	475 302.800	440.7	833.4	-87.6	745.8	

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BISMARCK

Table 18
Date Oct. 26, 1977
Site Post Office
Bismarck

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C (μGal)	g_{corr} (μGal)	Notes
U.TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{cor} [μGal]	NOTES
14h43'	889 697	473 239.247	239.4	980 612 739.8	-68.0	980 612 661.7	
45'	880 356	471 770.517	406.9	783.6	-67.8	715.8	
55'	883 110	477 515.608	329.0	798.4	-66.4	725.9	
15h02'	870 808	474 177.982	321.5	734.2	-59.4	674.2	
12'	877 348	476 117.984	352.5	777.4	-58.5	718.9	
15'	861 947	471 759.298	360.2	814.2	-57.5	756.7	
18'	866 700	473 058.308	458.2	768.4	-56.4	712.0	
21'	859 790	471 168.720	428.8	744.6	-55.3	689.2	
30'	870 382	474 062.011	353.4	715.0	-52.1	662.9	
34'	873 355	474 599.002	353.3	762.2	-50.7	711.5	
37'	875 969	475 575.565	249.4	812.3	-49.6	762.7	
43'	877 545	476 008.818	481.0	782.4	-47.4	735.0	
47'	863 991	472 318.667	482.6	764.5	-46.0	718.5	
50'	870 719	474 153.665	143.3	806.5	-44.9	761.6	
53'	868 845	473 643.305	487.7	762.3	-43.8	718.5	
56'	862 586	471 934.164	364.7	786.1	-42.7	743.4	

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BISMARCK

Table 19
Date Oct. 26, 1977
Site Post Office
Bismarck

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	gcorr (μGal)	Notes
U.Time	N	T [μs]	t [μs]	g [μgal]	T.C.	g co. [μgal]	NOTES
17h05'	894 579	480 606 .453	466.5	980 612 824.6	-21.8	980 612 802.8	
08'	884 847	477 984 .881	81.4	815.2	-21.0	794.1	
12'	877 662	476 040.322	48.9	685.4	-20.0	665.3	
20'	879 018	476 407.948	229.0	805.2	-18.5	786.7	
23'	881 535	477 089.530	148.3	711.9	-17.9	694.0	
26'	886 068	478 314.580	134.7	753.9	-17.3	736.6	
30'	883 267	477 558.042	277.7	702.1	-16.6	685.5	
32'	878 077	476 153.084	475.3	712.7	-16.3	696.4	
35'	873 422	474 889.192	376.7	705.7	-15.9	689.8	
38'	874 102	475 074.043	458.3	691.3	-15.5	675.8	
43'	878 463	476 257.565	211.2	690.9	-14.8	676.1	
49'	869 824	473 911.489	466.8	706.2	-14.1	692.1	
52'	867 174	473 187.688	197.4	764.8	-13.8	751.0	
55'	878 218	476 191.207	359.5	728.4	-13.6	714.8	
58'	878 586	476 290.311	292.4	766.9	-13.3	751.6	
18h01'	873 789	474 988.825	194.5	779.8	-13.0	766.8	
03'	873 393	475 153.197	506.9	765.1	-12.8	752.3	

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BISMARCK

Table 20
Date Oct. 26, 1977
Site Post Office
Bismarck

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
I. Time	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{cor} [μGal]	NOTES
21'35	883 551	477 634.950	468.8	980 612 746.2	-60.7	980 612 685.5	
38'	888 973	479 098.181	429.7	817.3	-61.7	755.6	
41'	882 261	477 285.984	284.1	809.8	-62.7	747.1	
44'	874 595	475 208.068	483.3	788.1	-63.7	724.4	
47'	880 719	476 868.886	497.3	786.6	-64.9	721.7	
50'	877 581	476 018.324	200.1	767.7	-65.8	701.9	
52'	875 466	475 444.483	331.6	801.8	-66.5	735.3	
56'	873 481	474 905.067	107.2	816.8	-67.8	749.0	
59'	872 607	474 667.486	276.5	801.6	-68.8	732.8	
2'09'	870 208	474 014.548	267.8	794.4	-71.9	722.5	
12'	871 124	474 264.019	353.4	788.0	-72.8	715.2	
17'	870 507	474 095.934	179.7	775.1	-74.3	721.1	
21'	874 420	475 160.466	428.1	806.5	-75.3	729.2	

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BISMARCK

Table 21
Date Oct. 27,1977
Site Post Office
Bismarck

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	gcorr (μGal)	Notes
U.TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	gcor [μGal]	NOTE
13h58'	848 436	468 047.226	247.3	980 612 762.7	-85.6	980 612 877.1	
14h01'	840 151	465 756.567	504.2	818.3	-85.3	733.0	
04'	849 769	468 414.694	68.4	796.6	-85.0	711.6	
12'	848 738	468 130.626	463	791.6	-84.2	707.4	
15'	860 116	471 257.949	394.6	774.7	-83.9	690.8	
32'	863 727	472 246.117	298.4	813.1	-81.1	732.0	
40'	875 575	475 474.448	490.7	850.3	-79.6	770.7	

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ALAMOGORDO

Table 22
Date Nov. 3, 1977
Site Hollomon AFB
Alamogordo

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
H.Time	N	T [μGal]	t[μs]	g [μGal]	T.C.	g_{corr}	NOTE
17h13'	879 699	476 950.894	206.4	979 134 348.3	-23.7	979 134 324.6	
16'	864 835	472 904.268	141.3	369.0	-24.6	344.4	
19'	868 132	473 804.862	206.5	353.0	-25.5	327.4	
21'	869 530	474 186.170	79.1	341.4	-26.1	315.3	
24'	859 118	471 338.840	488.5	338.1	-27.1	311.0	
33'	859 784	471 521.488	469.9	324.5	-29.7	294.8	
40'	851 019	469 111 .886	473.0	353.3	-31.7	321.6	
43'	865 296	473 030.299	104.9	300.3	-32.3	268.0	
45'	854 355	470 030.306	293.6	330.1	-33.1	297.3	
48'	855 744	470 412.299	378.3	318.0	-33.8	284.2	
53'	851 489	469 379.086	373.3	324.7	-35.1	289.1	
56'	854 885	470 176.130	363.7	307.1	-35.8	271.3	
59'	861 770	472 065 .609	302.9	360.0	-36.6	323.4	
18h00'	852 110	469 412.289	181.9	338.1	-36.8	301.3	
06'	863 012	472 405.640	243.0	306.5	-38.1	268.4	

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ALAMOGORDO

Table 23
Date Nov. 3, 1977
Site Hollomon AFB
Alamogordo

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
4.Time	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{corr}	NOTES
19h57'	880 096	477 078.046	394.4	979 134 344.3	-48.8	979 134 300.5	
20h02'	872 198	475 076.305	307.0	351.6	-48.4	303.2	
05'	865 557	472 828.285	220.8	374.2	-48.3	325.9	
08'	844 133	467 210.127	467.5	341.9	-48.1	293.8	
10'	868 743	473 971.519	51.3	381.7	-48.0	333.7	
13'	863 304	472 485.560	262.9	324.0	-47.9	276.1	
16'	858 707	471 225.944	315.1	331.6	-47.7	283.9	
19'	854 254	470 002.644	457.2	372.1	-47.5	324.6	
21'	855 397	470 316.686	346.3	346.7	-47.3	299.4	
24'	861 511	471 994.705	349.7	334.9	-47.1	287.8	
26'	865 985	473 218.772	443.1	357.8	-46.9	310.9	
29'	862 072	472 148.662	456.6	361.0	-46.7	314.3	

ALAMOGORDO

Table 24
Date Nov. 3, 1977
Site Hollomon AFB
Alamogordo

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Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
4. Time	N	T [μs]	t [μs]	g [μGal]	T. c.	g_{cor}	NOTES
9h37'	860 555	471 732.755	333.1	979 139 819.6	-32.5	979 139 832.5	Bad traj.
40'	853 276	469 733.504	403.7	850.5	-36.9	913.6	" "
49'	866 898	473 457.122	253.2	259.7	-36.5	223.6	" "
49'	865 159	472 942.987	384.7	340.1	-35.1	305.0	
52'	876 189	475 998.567	395.1	323.6	-34.5	289.0	
55'	870 283	474 391.527	275.4	308.3	-34.0	274.3	
58'	857 886	471 000.641	360.6	331.7	-33.4	298.3	
22h00'	860 616	471 749.462	357.6	343.5	-33.0	310.5	
03'	864 256	472 745.967	180.9	311.9	-32.4	279.5	
06'	865 260	473 020.524	271.0	308.7	-31.8	276.9	
11'	857 593	470 920.193	333.6	348.2	-30.9	317.3	
13'	860 100	471 608.152	491.8	336.3	-30.5	305.8	
15'	846 068	467 545.044	155.2	360.8	-30.1	330.7	
18'	860 293	471 660.914	316.6	325.4	-29.4	296.0	
25'	861 316	471 941.186	183.9	355.9	-28.0	327.9	
27'	860 834	471 809.252	392.0	319.4	-27.6	292.3	
30'	855 409	470 320.272	640.5	303.9	-27.0	276.9	
33'	865 077	472 970.685	271.8	373.2	-26.5	346.6	
34'	856 669	470 666.371	486.2	322.6	-26.2	296.4	
37'	860 713	471 776.040	395.8	340.5	-25.6	314.9	
40'	865 362	473 042.963	327.7	351.3	-24.9	326.4	
44'	872 255	474 928.823	448.8	309.7	-24.1	285.6	
50'	866 947	473 481.463	330.8	301.0	-22.9	278.1	

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ALAMOGORDO

Table 25
Date Nov. 4, 1977
Site Hollomon AFB
Alamogordo

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.Time	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{cor} [μGal]	NOTES
16h28'	868 514	473 909.185	231.1	473 139 275.3	+15.6	473 139 290.9	
31'	865 364	473 049.007	359.2	314.7	+14.3	334.0	
34'	865 181	472 999.103	491.3	326.0	+13.0	339.0	
37'	833 522	464 264.202	269.6	338.1	+11.2	349.3	
43'	859 379	471 410.442	495.3	352.0	+9.1	361.1	
45'	861 045	471 867.008	314.5	341.5	+8.2	349.7	
48'	859501	471 443.291	379.9	368.3	+6.9	375.2	
50'	854 616	470 102.185	420.9	368.3	+6.0	374.3	
58'	861 763	472 063.875	503.8	316.8	+2.6	319.4	
17h00'	858 740	471 235.162	466.3	247.9	+1.7	249.6	
03'	850 184	470 533.288	468.5	246.6	+.4	247.0	
06'	854 200	469 787.837	485.2	287.4	-.9	286.5	
12'	862 300	472 210.936	497.9	278.9	-3.5	275.4	
15'	857 167	470 803.216	317.4	302.7	-4.8	297.9	

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ALAMOGORDO

Table 26
Date Nov. 4, 1977
Site Hollomon AFB
Alamogordo

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
18h16'	850 907	469 080.832	218.5	979 139 342.4	-29.3	979 139 313.1	
19'	864 469	472 804.276	247.5	319.0	-30.4	288.6	
24'	883 502	477 980.783	272.6	326.7	-32.1	294.6	
26'	864 938	474 297.540	364.1	340.2	-37.8	302.4	
34'	870 536	474 460.608	450.8	383.0	-35.5	347.5	
20h29'	874 548	476 923.536	242.2	391.4	-56.3	335.0	
31'	878 388	476 545.380	201.3	342.5	-58.4	284.1	
33'	877 919	476 468.204	361.3	402.9	-56.5	346.4	
37'	877 561	476 370.942	222.6	380.1	-56.4	323.7	
46'	870 307	474 397.985	142.8	410.4	-56.4	354.0	
48'	870 658	474 393.800	412.8	399.2	-56.3	342.9	
53'	862 627	472 300.197	97.5	335.4	-56.0	279.4	
55'	871 573	474 743.020	340.9	345.9	-55.9	290.0	
58'	858 126	471 066.620	467.4	365.4	-55.8	309.6	
21h00'	869 872	474 279.457	225.0	358.4	-55.7	302.7	
02'	870 765	474 522.989	440.7	365.2	-55.5	309.6	
04'	870 816	474 536.867	428.2	392.7	-55.3	337.4	
06'	865 088	472 973.525	336.3	408.4	-55.1	353.3	
09'	868 455	473 893.075	357.5	404.9	-54.9	350.0	

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ALAMOGORDO

Table 27
Date Nov. 4, 1977
Site Hollomon AFB
Alamogordo

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.Time	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{corr} [μGal]	NOTES
22h25'	894 481	480 941.421	195.9	979 139 380.1	-41.2	979 139 338.9	
27'	887 185	478 976.164	486.3	374.1	-40.7	333.4	
30'	881 017	477 308.045	161.5	380.2	-39.9	340.3	
32'	875 891	475 917.547	316.4	359.4	-39.4	320.0	
34'	881 881	477 542.147	372.3	391.5	-38.8	352.7	
37'	878 176	476 538.022	451.1	397.1	-38.0	359.1	
39'	880 795	477 531.134	349.9	336.7	-37.4	299.3	
42'	877 981	476 485.024	340.5	377.7	-36.6	341.1	
44'	875 155	475 173.734	422.1	391.0	-36.1	354.9	
47'	876 367	476 046.774	143.8	390.6	-35.3	355.3	
50'	874 332	475 493.720	92.0	354.1	-34.3	319.8	
52'	875 114	475 706.368	227.7	354.8	-33.7	321.1	
56'	877 890	476 460.351	368.1	376.9	-32.5	344.4	

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ALAMOGORDO

Table 28
Date Nov. 7, 1977
Site Hollomon AFB
Alamogordo

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.TIME	N	T [μs]	t [μs]	g [μ Gal]	T.C.	g_{corr} [μ Gal]	NOTES
16h45'	890 026	474 742.240	92.1	979 139 299.6	+60.4	979 139 360.0	
49'	884 118	478 147.436	336.6	281.0	+59.6	340.6	
52	873 559	475 283.585	296.8	269.3	+59.0	328.3	
56'	873 611	475 297.866	477.7	314.6	+58.1	372.7	
17h00'	872 435	474 977.666	201.7	266.3	+57.3	323.6	
03'	874 113	475 434.195	122.5	263.7	+56.5	320.2	
09	874 962	475 666.609	480.1	276.7	+56.8	331.5	
12'	872 850	475 090.716	345.5	217.6	+56.0	273.6	
15'	862 395	472 236.808	351.6	310.4	+53.2	363.6	
18'	868 267	473 841.810	357.7	261.3	+52.1	313.4	
21'	873 492	475 265.281	143.4	296.4	+51.1	345.5	
25'	872 542	475 006.883	368.5	304.0	+49.7	353.7	
28'	847 150	468 044.317	466.5	288.5	+48.7	337.2	

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SAN FRANCISCO

Table 29
Date Nov. 15, 1977
Site Accademy of Sciences

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{cor} [μGal]	NOTES
18h50'	892 889	480 131.754	505.5	479 971 955.5	-78.1	479 971 877.4	
54'	854 662	469 915.136	477.5	984.2	-78.0	906.2	
57'	880 840	477 057.506	454.1	946.4	-78.0	868.4	
19h00'	873 336	475 020.909	93.3	829.7	-78.0	801.7	Bad traj.
05'	872 376	474 759.916	406.4	907.1	-77.7	829.4	
08'	874 476	475 330.853	205.5	970.6	-77.6	893.0	
11'	868 974	473 833.224	316.5	949.1	-77.4	871.7	
13'	867 875	473 533.589	472.1	915.6	-77.3	838.3	
16'	836 061	464 773.283	385.3	927.9	-77.1	850.8	
20'	865 609	472 914.989	427.8	953.6	-76.7	876.9	
23'	858 060	470 848.290	391.6	955.9	-76.4	879.5	
26'	865 928	473 002.166	466.1	928.8	-76.1	852.7	
32'	871 569	474 540.145	278.4	950.8	-75.5	875.3	
35'	863 561	472 355.057	199.7	951.3	-75.1	876.2	
40'	864 903	472 722.087	340.5	930.8	-74.4	856.4	
45'	869 413	473 953.070	503.1	903.2	-73.8	829.4	
50'	868 664	473 743.305	379.8	891.3	-72.9	818.4	
58'	820 690	474 300.960	449.3	906.6	-71.5	835.1	
20h01'	871 767	474 594.038	207.3	935.9	-71.0	864.9	
03'	872 028	474 665.208	408.8	936.7	-70.6	866.1	

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Table 30
Date Nov. 15, 1977
Site Accademy of Sciences

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
4. Time	N	T [μs]	t [μs]	g [μ Gal]	T.C.	g_{cor} [μ Gal]	NOTES
21h 27'	879 426	474 787.118	446.4	979 921 925.7	-50.6	979 921 925.1	
30'	875 315	475 558.312	354.6	961.2	-49.8	911.9	
33'	872 806	474 876.815	263.9	874.6	-49.0	825.6	
36'	872 580	474 815.396	324.1	907.3	-48.3	859.0	
39'	874 453	475 324.657	315.1	991.3	-47.5	~~943.8~~	Bad traj.
43'	870 932	474 366.756	308.6	909.5	-46.5	863.0	
46'	872 312	474 742.427	335.4	982.9	-45.7	~~937.1~~	Bad traj.
49'	871 979	474 651.867	404.5	942.1	-45.0	897.1	
52'	868 526	473 911.053	274.7	894.8	-44.3	850.5	
54'	874 939	476 813.355	329.6	934.6	-43.8	890.8	
57'	876 284	475 822.148	443.1	938.5	-43.1	895.4	
22h 00'	863 706	472 394.865	389.1	888.2	-42.4	845.8	
03'	877 169	476 062.270	302.0	874.1	-41.7	832.4	
06'	871 980	474 652.241	503.8	913.7	-41.0	872.7	
09'	868 785	473 781.105	306.6	870.1	-40.4	829.7	
12'	868 984	473 835.401	300.4	891.7	-39.7	852.0	
19'	872 576	474 814.282	350.0	931.3	-38.2	893.1	

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Table 31
Date Nov. 15, 1977
Site Accademy of Sciences

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.TIME	N	T [μs]	t [ms]	g [μGal]	T.C.	g_{corr} [μGal]	NOTES
23h28'	883 806	477 860.062	488.5	974 971 888.8	-27.6	974 971 861.2	
31'	877 141	476 054.836	491.8	849.5	-27.3	822.2	
34'	869 163	473 884.770	309.4	847.5	-27.1	820.4	
44'	881 401	477 344.759	455.2	851.5	-26.5	825.0	
46'	880 125	476 863.815	398.7	824.0	-26.4	847.6	
49'	876 042	475 756.388	357.5	858.1	-26.3	831.8	
24h04'	878 781	476 499.431	117.9	849.5	-25.8	823.7	

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Table 32
Date Nov. 16, 1977
Site Accademy of Sciences

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.Time	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{corr} [μGal]	NOTES
7h46'	816 743	459 372.247	230.3	979 971 865.0	-48.5	979 971 817.5	Bad Trj.
48'	894 006	454 356.853	170.9	875.7	-48.2	827.5	
18h10'	820 848	460 585.396	425.3	904.4	-56.1	848.3	
26'	826 687	462 110.490	466.4	850.2	-61.5	788.7	Bad Trj
34'	819 028	460 014.510	351.9	896.0	-64.4	831.6	
48	824 512	461 552.057	344.7	841.1	-66.6	774.5	Bad Trj.

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Table 33
Date Nov. 16, 1977
Site Accademy of Sciences

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
H.TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{corr} [μGal]	NOTES
22h36'	893 151	480 379.654	361.3	979 971 881.0	-46.9	979 971 834.1	
38'	883 359	477 739.906	483.4	859.2	-46.1	813.1	
42'	880 024	476 836.287	111.5	923.4	-45.3	878.1	
45'	864 340	473 932.988	293.3	935.5	-44.5	890.8	
48'	873 788	475 143.902	326.0	957.3	-43.7	913.6	
51'	879 266	476 630.952	289.9	951.0	-42.9	908.1	
55'	874 813	475 422.478	237.6	852.1	-41.9	810.2	
57'	875 739	475 674.076	360.5	945.7	-41.4	954.3	Bad traj.
23h00'	870 883	474 516.791	505.6	900.8	-40.6	860.2	
03'	873 374	475 031.290	264.7	953.7	-39.8	913.9	
00h35'	889 728	479 458.242	347.0	844.1	-20.3	823.8	
46'	875 745	475 675.771	398.1	841.3	-18.7	822.6	
49'	876 686	475 931.177	272.6	828.3	-18.3	810.0	
52'	877 033	476 025.491	460.1	868.6	-17.9	850.7	
55'	877 803	476 234.407	447.8	835.8	-17.6	818.2	
57'	865 946	473 006.916	196.3	825.6	-17.4	808.2	
1h00'	866 881	473 262.418	500.3	892.3	-17.0	875.3	
04'	871 032	474 394.089	422.5	857.2	-16.7	840.5	
07'	873 809	475 149.559	188.3	821.7	-16.4	805.3	
10'	864 803	474 059.150	194.3	835.3	-16.1	819.2	

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Table 34
Date Nov. 17, 1977
Site Accademy of Sciences

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.Time	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{cor} [μGal]	NOTE
17h46'	892 210	480 126.584	436.1	979 971 898.5	-32.6	979 971 869.9	
50'	886 988	478 719.548	503.5	827.0	-24.4	802.6	
53'	885 562	478 334.474	408.8	881.7	-25.8	855.9	
57'	882 459	477 495.566	156.2	816.1	-27.6	788.5	
18h00'	878 250	476 355.697	271.8	906.2	-29.0	877.2	
03'	883 609	477 806.668	305.1	894.7	-30.3	864.4	
06'	880 501	476 965.516	142.5	889.0	-31.6	857.4	
09'	878 364	476 386.368	150.0	866.5	-33.0	833.5	
11'	874 037	475 211.608	311.3	871.3	-33.8	837.5	
15'	878 887	476 528.211	241.6	865.5	-35.6	829.9	
18'	875 627	475 643.613	252.0	883.3	-36.8	846.5	
23'	878 495	476 487.021	348.7	920.9	-38.9	882.0	
25'	878 164	476 332.263	392.9	885.8	-39.7	846.1	
28'	878 651	476 464.197	179.1	878.4	-41.0	837.4	
31'	879 570	476 713.520	444.5	927.3	-42.2	885.1	
34'	876 633	475 916.741	183.0	855.7	-43.3	812.4	
36'	876 163	475 789.278	422.0	931.0	-44.1	886.9	
38'	875 854	475 706.819	507.6	906.3	-44.9	861.4	
42'	877 378	476 173.303	394.3	911.0	-46.4	864.6	
45'	879 648	476 734.508	249.0	874.3	-47.6	826.7	

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Table 35
Date Nov. 17, 1977
Site Accademy of Sciences

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
Li.Time	N	T [μs]	t [μs]	g [μ Gal]	T.c	$g_{co.}$ [μ Gal]	NOTE
19h44'	814 836	480 832.603	348.8	979 971 897.7	-66.4	979 971 831.3	
55'	883 182	477 691.160	240.4	846.3	-62.5	778.8	
58'	881 049	477 114.113	466.3	937.8	-68.1	864.7	
20h01'	879 913	476 806.400	434.6	918.3	-68.7	849.6	
03'	875 304	475 556.027	458.1	901.8	-69.0	832.8	
06'	877 518	476 157.045	424.3	933.6	-69.4	864.2	
08'	872 142	474 696.154	289.4	903.3	-69.7	833.6	
11'	874 182	475 253.872	481.1	922.0	-70.2	851.8	
14'	874 412	475 313.590	400.1	940.7	-70.6	870.1	
17'	872 074	474 677.689	354.4	930.4	-71.0	859.4	
20'	868 853	473 800.171	181.5	914.1	-71.3	842.8	
23'	873 824	475 153.405	219.8	939.7	-71.6	868.1	
26'	873 702	475 120.622	434.1	889.4	-71.9	817.5	
28'	874 763	475 408.913	296.9	896.8	-72.1	824.7	
31'	875 366	475 572.879	470.7	911.9	-72.4	839.5	
34'	874 886	476 794.092	431.0	874.9	-72.5	801.6	
36'	881 641	477 247.153	251.4	901.0	-72.7	828.3	
40'	872 621	474 826.486	286.5	924.1	-72.9	851.2	
42'	874 738	475 402.163	375.2	944.2	-73.0	876.2	

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Table 36
Date Nov. 22, 1977
Site U.S. Naval Observatory

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{corr} [μGal]	NOTES
14h53'	925 172	484 156.584	285.2	979 004 110.5	+58.8	979 004 161.3	
15h00'	913 803	486 141.936	459.6	049.3	+57.8	107.1	
10'	424 944	489 096.471	500.2	142.6	+59.0	201.6	
13'	906 752	484 262.715	449.5	128.5	+57.3	187.8	
26'	910 078	485 150.047	417.1	017.0	+60.0	077.0	
35'	920 986	488 048.742	311.5	084.2	+60.0	144.2	
44'	912 138	485 698.728	311.5	048.7	+54.7	103.4	
47'	905 530	483 936.357	486.6	013.2	+59.5	072.7	
50'	906 118	484 093.423	511.0	084.2	+54.1	038.3	
53'	909 022	484 868.356	188.7	005.3	+58.7	064.0	
55'	902 786	483 202.960	297.4	070.3	+58.5	128.8	
54'	906 661	484 238.405	410.5	026.5	+58.0	084.5	
02'	901 910	482 967.842	88.6	028.2	+57.5	085.7	

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MIAMI

Table 37
Date Nov. 22, 1977
Site U.S. Naval Observatory

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	$g_{cor.}$ [μGal]	NOTE:
6h40'	920 346	487 849.269	472.7	979 004 079.4	+47.4	979 004 126.8	
43'	908 660	486 771.830	281.8	073.6	+46.4	120.0	
52'	904 936	483 777.386	218.0	76.4	+40.8	117.2	
55'	905 161	483 837.738	478.8	13.6	+41.6	055.2	
58'	899 476	482 315.774	278.3	26.4	+40.4	66.8	
17h00'	901 966	482 383.031	445.1	34.8	+39.6	74.4	
03'	913 818	486 145.943	471.7	27.1	+38.2	65.3	
17.57'	908 878	484 830.145	496.7	097.2	+9.0	106.2	
18.00'	903 628	483 427.738	344.1	139.8	+7.2	147.0	
03'	899 241	482 252.911	498.0	162.1	+5.3	167.4	
06'	896 935	481 634.106	408.7	94.7	+3.4	98.1	
08'	898 468	482 045.323	205.7	156.4	+2.2	158.6	
11'	895 078	481 135.105	56.1	49.0	+.3	49.3	
14'	894 303	480 926.943	425.9	80.2	-1.6	78.6	

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Table 38
Date Nov. 22, 1977
Site U.S. Naval Observatory

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
4.TIME	N	T [μs]	t [μs]	g [4 Gal]	T.C.	g_{cor} [4 Gal]	NOTES
18h52'	892 831	480 530.992	461.2	979 004 157.7	-25.5	979 004 132.2	
54'	891 985	480 300.461	287.3	122.3	-30.0	92.3	
19h05'	896 376	481 483.979	405.3	158.3	-33.5	124.8	
08'	899 242	482 253.117	445.0	203.9	-35.4	168.5	
11'	909 260	484 931.966	632.5	88.8	-37.2	51.6	
15'	901 110	482 753.810	481.3	103.0	-39.6	63.4	
18'	896 778	481 591.760	116.1	225.0	-41.3	183.7	
21'	896 053	481 397.180	353.4	163.7	-43.0	120.7	
23'	894 377	480 946.741	335.2	191.2	-44.1	147.1	
26'	892 068	480 325.605	459.1	235.1	-46.0	189.3	
30'	864 197	472 762.646	466.6	197.4	-48.0	149.4	
37'	902 288	483 069.128	344.8	137.2	-52.1	85.1	
40'	900 206	482 511.459	327.3	143.0	-53.5	89.5	
43'	905 590	483 952.110	76.6	178.3	-56.9	123.4	
45'	895 354	481 209.431	412.9	138.3	-55.8	82.5	
50'	896 260	481 452.691	219.0	206.1	-58.1	148.0	
55'	898 150	481 960.284	503.6	156.5	-60.5	96.0	
58'	896 365	481 482.134	452.6	186.6	-61.9	124.7	
20h02'	895 326	481 201.905	432.1	213.3	-63.6	149.7	
06'	890 494	479 901.495	189.9	187.9	-65.2	122.7	

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Table 39
Date Nov. 23, 1977
Site U.S. Naval Observatory

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
4. TIME	N	T [μs]	t [μs]	g [μGal]	T.C	g_{cor} [μGal]	NOTE
$16^h10'$	941 865	493 544.867	328.1	979 004 004.8	+56.2	979004 061.0	
$19^h50'$	970 015	500 870.920	135.4	179.7	−45.4	134.3	
$21^h10'$	1053 146	521 898.342	238.7	151.5	−79.7	071.8	
13'	971 190	501 174.326	420.6	251.2	−80.4	170.8	
16'	1052 171	521 650.829	435.3	154.3	−81.2	073.2	
25'	1034 980	517 371.625	228.0	156.8	−82.4	074.4	

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MIAMI

Table 40
Date Nov. 25, 1977
Site U.S. Naval Observatory

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
4.TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{corr} [μGal]	NOTE
14h52'	1043 109	519 431.441	476.9	979 004 154.6	-.3	979 004 154.3	
18h37'	1032 447	516 750.784	408.3	047.9	+26.3	074.2	
45'	1038 375	518 219.587	326.0	49.4	+22.7	72.1	
50'	1015 321	512 432.644	483.0	59.8	+20.2	80.0	
58'	992 193	506 566.614	459.3	121.2	+16.2	137.4	
19h06'	932 462	491 079.980	267.9	93.5	+11.9	105.4	
40'	1033 768	517 068.662	311.8	108.6	-7.7	100.9	
43'	995 244	507 342.897	492.3	100.0	-9.5	90.5	
53'	1036 420	517 731.500	374.5	167.5	-15.6	151.9	

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MIAMI

Table 41
Date Nov. 25, 1977
Site U.S. Naval Observatory

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Note
U Time	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{corr} [μGal]	NOT.
20h50'	1024343	515 961.463	495.7	979 004 155.3	-49.7	979 004 105.6	
59'	1033384	516 972.668	411.1	185.4	-54.2	130.2	
21h46'	1070278	521 305.256	195.0	150.6	-75.2	075.4	
22h25'	1059646	523 500.562	469.7	205.3	-83.6	121.7	
30'	1043203	519 423.002	484.1	199.6	-84.3	115.2	
52'	1068617	525 711.864	459.1	220.1	-84.1	135.9	
54'	1030843	516 336.619	346.3	219.4	-84.0	135.4	
58'	1065673	524 987.219	480.3	244.9	-83.6	161.3	
23h14'	1063182	524 373.175	307.0	166.3	-81.0	085.3	
42'	1075401	527 378.226	495.4	174.4	-72.3	102.1	
46'	1073389	526 884.427	508.0	143.2	-70.4	72.8	
50'	1063948	524 562.124	449.0	219.4	-68.5	150.9	
53'	1055766	522 541.844	456.7	217.2	-67.1	150.1	
56'	1049226	520 920.152	245.1	146.0	-65.6	080.4	
00h02'	1043342	519 470.007	435.1	210.8	-62.6	148.2	
04'	1043978	519 615.912	477.3	159.7	-61.4	098.3	
09'	967531	500 229.236	277.6	258.7	-58.5	200.2	
11'	1055191	522 398.767	133.4	141.2	-57.4	083.8	

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MIAMI

Table 42
Date Nov. 26, 1977
Site U.S. Naval Observatory

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.Time	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{corr} [μGal]	NOTES
00h38'	1069618	525 958.086	507.8	979 004	178.0 -39.8	979 004 138.2	
3h00'	1055 341	522 448.451	425.0		054.8 -92.4	147.2	
04'	1050 493	521 234.658	324.5		006.2 +96.0	102.2	
07'	1037 426	517 982.672	264.8		042.9 +98.6	141.5	
17h18'	1005190	509 871.460	211.5		147.3 -5.5	141.8	
26'	995 098	507 305.682	493.5		106.5 -.6	105.9	
29'	1048 046	520 634.606	300.6		101.9 +1.3	102.5	
55'	1014 171	512 144.368	505.8		104.1 +14.3	118.4	
58'	1014 774	512 281.279	272.8		98.3 +15.5	113.8	
16h04'	988 013	505 496.267	187.6		109.8 +18.2	128.0	

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BOSTON A

Table 43
Date Dec. 2, 1977
Site Hanscom AFB
Bedford

J.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Note
U.TIME	N	T' [μs]	t [μs]	g [μGal]	T.C.	g_{cor} [μGal]	NOT.
14h45'	807 736	456 737 .612	322.7	980 378 502.3	-62.3	980 378 440.0	
	The catapult system has been changed. Therefore the average number of fringes is changed. and Dec 3rd 1977						

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BOSTON A

Table 44
Date Dec. 3, 1977
Site Hanscom AFB
Bedford

Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.Time	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{cor} [μGal]	NOTES
19h46'	584 617	388 568.586	161.4	980 378 588.3	-46.4	980 378 541.9	
46'	488 607	355 231.853	314.7	575.7	-45.8	529.9	
57'	572 346	384 469.026	285.7	545.5	-42.5	503.0	
10h06'	554 879	380 256.349	351.2	521.7	-39.8	481.9	
12'	558 543	379 804.635	182.4	571.0	-38.0	533.0	
14'	564 139	381 702.242	274.0	494.2	-32.4	461.8	
24'	558 485	379 784.920	178.2	533.5	-34.3	499.2	
29'	571 474	384 176.086	346.3	538.3	-32.8	505.5	
31'	465 296	346 654.542	434.1	522.7	-32.2	490.5	
42'	550 595	377 092.888	454.0	602.3	-28.8	573.5	
45'	552 495	377 742.842	324.2	548.3	-27.9	520.4	
47'	541 875	374 094.757	316.5	534.9	-27.3	507.6	
49'	548 345	376 338.572	212.7	488.0	-26.7	461.3	
54'	431 041	333 669.706	481.7	691.5	-25.7	~~660.3~~	Bad traj.
56'	543 237	374 584.580	280.9	513.6	-24.6	489.0	
20h00'	551 679	377 463.852	387.6	500.2	-23.4	476.8	
05'	554 374	378 384.670	349.5	490.6	-21.9	468.7	
09'	564 436	381 972.204	398.5	597.2	-20.8	576.4	

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BOSTON A

Table 45
Date Dec. 3, 1977
Site Hanscom AFB
Bedford

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{cor} [μGal]	NOTES
22'10'	468 182	347 277.916	420.3	980 378 574.3	-4.8	980 378 ~~569.5~~	*
16'	599 345	393 449.096	278.0	528.0	-3.5	524.5	
18'	609 625	396 292.459	272.4	519.7	-3.1	516.6	
22'	605 681	395 506.265	38.3	544.1	-2.3	541.8	
25'	546 964	392 650.357	397.7	506.7	-1.6	504.6	
27'	601 073	393 999.562	376.7	480.1	-1.2	488.9	
30'	592 867	391 300.742	268.2	473.8	-.6	473.2	
32'	592 140	391 060.732	243.1	498.2	-.2	498.0	
35'	597 946	392 973.395	408.3	472.0	+.3	472.3	
38'	596 126	392 374.944	477.1	552.8	+.8	553.6	
40'	591 600	390 888.499	396.1	519.6	+1.2	520.8	
45'	585 765	388 949.924	197.0	490.4	+2.1	492.5	
49'	603 389	394 757.944	477.1	495.9	+2.7	498.6	
52'	590 916	390 656.367	240.9	486.9	+3.2	490.1	
58'	582 143	387 745.791	467.7	440.8	+4.2	444.4	
23'01'	593 424	391 484.685	458.2	494.4	+4.7	499.1	
04'	600 207	393 715.724	464.1	482.8	+5.0	487.8	
06'	591 726	390 923.943	113.7	494.0	+5.3	499.3	
10'	604 881	395 245.522	191.3	459.3	+5.8	465.1	
15'	610 535	347 088.583	302.8	508.2	+6.5	514.7	
17'	600 820	393 916.551	272.3	461.9	+6.7	468.6	

* The delay time at the start has been changed at this point

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BOSTON A

Table 46
Date Dec. 3, 1977
Site Hanscom AFB
Bedford

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)	Notes
U.Time	N	T' [μs]	t [μs]	g [μGal]	T.C.	g_{corr} [μGal]	NOTE
23h 19'	539 765	373 365.714	318.0	980 378 496.6	+6.9	980 378 503.3	
21'	612 071	397 587.789	381.9	464.3	+7.1	471.4	
23'	591 527	390 858.487	489.2	520.7	+7.4	528.1	
25'	592 296	391 112.235	237.6	513.2	+7.6	520.8	
27'	602 845	394 580.014	485.5	514.0	+7.8	521.8	
24h 05'	605 369	395 404.843	138.2	980 378 513.6	+10.3	980 378 523.9	
07'	525 705	368 470.756	186.6	488.0	+10.4	498.4	
10'	553 998	378 256.184	119.3	507.8	+10.5	518.3	
13'	617 677	399 404.232	131.0	522.2	+10.5	532.7	
15'	610 761	347 162.192	470.7	420.9	+10.6	431.5	
17'	566 383	382 462.658	252.5	491.4	+10.6	502.0	
19'	584 540	388 542.959	87.9	540.9	+10.6	551.5	
22'	582 186	387 760.044	464.5	482.6	+10.7	493.3	
24'	598 085	393 019.087	439.7	546.8	+10.7	557.5	
26'	604 477	398 744.217	101.3	487.4	+10.7	498.1	
28'	538 569	372 952.027	488.5	465.7	+10.7	476.4	
30'	584 333	390 134.524	408.5	473.6	+10.7	484.3	
32'	596 503	392 498.797	258.7	527.0	+10.7	537.7	
35'	529 520	346 805.368	257.7	466.0	+10.6	476.6	
37'	591 391	390 813.533	464.7	469.5	+10.5	480.0	

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BOSTON A

Table 47
Date Dec. 3, 1977
Site Hanscom AFB
Bedford

U.Time	N	T (μs)	t (μs)	g (μGal)	T.C. (μGal)	g_{corr} (μGal)
U.TIME	N	T [μs]	t [μs]	g [μGal]	T.C.	g_{corr} [μGal]
24h 40'	566 260	382 419.596	367.0	980 378 518.6	+10.5	980 378 529.1
42'	589 678	390 247.007	373.0	520.4	+10.5	530.9
45'	388 432	389 834.392	248.9	495.0	+10.4	505.4
48'	600 585	393 839.481	243.1	495.6	+10.3	505.9
50'	532 595	370 877.814	499.7	485.9	+10.3	496.2
54'	583 650	388 247.135	249.3	493.5	+10.2	503.7
57'	592 861	391 298.818	344.3	513.5	+10.1	523.6