

**THE GEORGIA
GRAVITY BASE NET**

by
Robert E. Ziegler and LeRoy M. Dorman



**STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES**

Joe D. Tanner, Commissioner

**EARTH AND WATER DIVISION
THE GEOLOGICAL SURVEY OF GEORGIA**

Sam M. Pickering, State Geologist and Division Director

ATLANTA
1976

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CONTENTS

	Page
Abstract	1
Introduction	1
Methods and Results	1
Comparison with Previous Work	2
Acknowledgments	2
References	2

FIGURES

Figure 1. Location of gravity base stations in Georgia	3
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TABLES

Table 1. Results from adjustments	3
2. Adjusted gravity values for base stations	4

APPENDIX

Base station descriptions	6
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THE GEORGIA GRAVITY BASE NET

Robert E. Ziegler¹

and

LeRoy M. Dorman²

ABSTRACT

Station descriptions and values, along with data reduction and adjustment methods, are given for 58 gravity base stations. Older values in the area are compared with these results.

INTRODUCTION

The need for gravity base stations stems from the fact that the gravimeters used for field surveys are generally instruments of the spring balance type and are used to measure relative gravity, the difference in the gravitational field between one place and another. These instruments are much lighter, more sensitive, and more convenient to use than the pendulum or falling-body instruments used to measure the gravity field absolutely, but suffer from the drawbacks that they drift and must be compared with some absolute reference every few hours or days, depending on the quality of the instrument used and the survey accuracy desired. In practice this is done by making a measurement at a base station at the beginning and end of every series of field observations. The base station then serves two purposes. First, the comparison of the values obtained at the beginning and end of the survey line yields the instrumental drift over the time period taken by survey line. Abnormally large drift is an indication of a possible "tare", an abrupt shift in the reference level of the instrument. Second, when the value of gravity at the base station is known, the absolute value of gravity at the field stations can be computed. See Jakosky (1950) for elaboration on gravity exploration field methods.

For local surveys used for geological purposes, a "floating" datum or arbitrary base level is often used, since only the variation of gravity over the survey area is of interest. Much work done by mineral exploration companies is done in this manner. Although a "floating" survey can satisfy

the local and immediate needs, it is difficult or impossible to combine the results of surveys done at different times when it is desirable to increase the density or the area of the survey. When the gravity data are to be used for geodetic purposes such as calculation of the shape of the earth, deflections of the apparent vertical or monitoring of crustal movements, the absolute values are required.

The base station descriptions are taken from "Description of Gravity Station" forms on file at the Georgia Geological Survey. The information provided is essentially complete. All the base stations are located in Georgia. Most of the base stations were established in the summer of 1968 by the Army Map Service. Five were established during the summer of 1966 by Georgia Tech and one each in 1963 and 1964 by the Army Map Service.

In summary, the use of base stations such as the ones described here, instead of arbitrary bases, makes the data useful for more varied purposes and increases their long-term value.

The Georgia Geological Survey would appreciate any information concerning the inaccessibility, destruction or pending destruction of any of these base stations. In such cases the base station could be reestablished in a nearby location and information on the new location could be made available by means of an open file report.

METHODS AND RESULTS

Straley and Husted (1967) observed a gravimetric base net of 13 stations in the state of Georgia in 1966. This net was strengthened and an additional 43 stations established in 1968 by the Defense Mapping Agency Topographic Center (then Army Map Service). This report covers the adjustment of these 56 stations to the U. S. National Gravity Base Net (Schwimmer and Rice, 1969). The general locations of the stations are shown in Figure 1, and detailed descriptions are in the appendix.

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Transportation for the survey was by automobile. One gravimeter was utilized in the 1967 survey and each loop was observed twice, while two gravimeters were utilized concurrently in the 1968 survey. The loop stations were observed in ladder sequence (A-B-C-B-A). Three LaCoste and Romberg geodetic model gravimeters (serial numbers 12, 116, and 120) were utilized.

The data were reduced by the Defense Mapping Agency Topographic Center utilizing program GRASS on a UNIVAC 1108. The observations are corrected for gravimeter calibration. A scale correction of 0.99606 was applied to the observations made with gravimeter No. 12. This correction was derived from a previous base net survey in Utah. Theoretical earth tides including the 1.2 elasticity coefficient were computed and applied to each observation. A linear least-squares drift solution based on reoccupations was derived for and applied to each loop. A least-squares network adjustment of the observation-equation type was performed on the reduced observations. An unknown for each station value and error and a scale correction and error for each gravimeter are included. Datum and scale were imposed on the adjustment by holding the values of Jacksonville J (979384.738) and Atlanta J (979520.062) fixed. A summary of results from the adjustment is presented in Table 1, and the adjusted gravity values and their propagated errors with respect to the fixed stations are given in Table 2.

COMPARISON WITH PREVIOUS WORK

Six of the stations in this report had been occupied by Woollard and Rose (1963), and we are able to compare the results. The stations are Atlanta A (WU 36), Atlanta C (WU 37), Atlanta J (WA 469), Atlanta D (WU 9), Macon (WA 20), Savannah (WA 99), and St. Simons (WA 485). The station designations used by Woollard and Rose are in parentheses. The mean of the differences between the values of this paper and the 1963 values is 0.97 mgal. The older values are higher, since Woollard and Rose used 980118.8 mgal for the Commerce Department base in Washington (Washington A), while that assumed in the National Gravity Base Net is 980118.0 mgal. The standard deviation about the mean is ± 0.25 mgal, which is approximately the accuracy of the Worden gravimeters predominantly used in the early work.

ACKNOWLEDGMENTS

The authors thank the following persons who performed the field work: John Wilbanks and Colen Bright of Georgia Institute of Technology, and Edward Crawford and Justin Lambert of Defense Mapping Agency Topographic Center, Washington, D. C.

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- Schwimmer, Philip M., and Rice, Donald A., 1969, U. S. national gravity base net, *in* Barnes, David F., editor, *Symposium on gravity surveys in western North America*: EOS, v. 50, n. 10, p. 527-528.
- Straley, H. W., III, and Husted, John E., 1967, Georgia gravity project, final report: Ga. Institute of Technology, Engineering Experiment Station Proj. A-943.
- Woollard, George P., and Rose, John C., 1963, *International gravity measurements*: Madison, Wis., Univ. Wisconsin, Geophys. and Polar Research Center, 518 p.

TABLE 1. RESULTS FROM ADJUSTMENT

Number of Stations	58	
Number of Loops	40	
Number of Observations	375	
R.M.S. error of a single observation	±0.021 Mgal	
Mean of the R.M.S. propagated station error	±0.018 Mgal	
Maximum R.M.S. propagated station error	±0.031 Mgal	
Corrections to gravimeter scale factors:		
LRG 12	-0.00106	±.00014
LRG 116	+0.00021	±.00005
LRG 120	-0.00016	±.00005

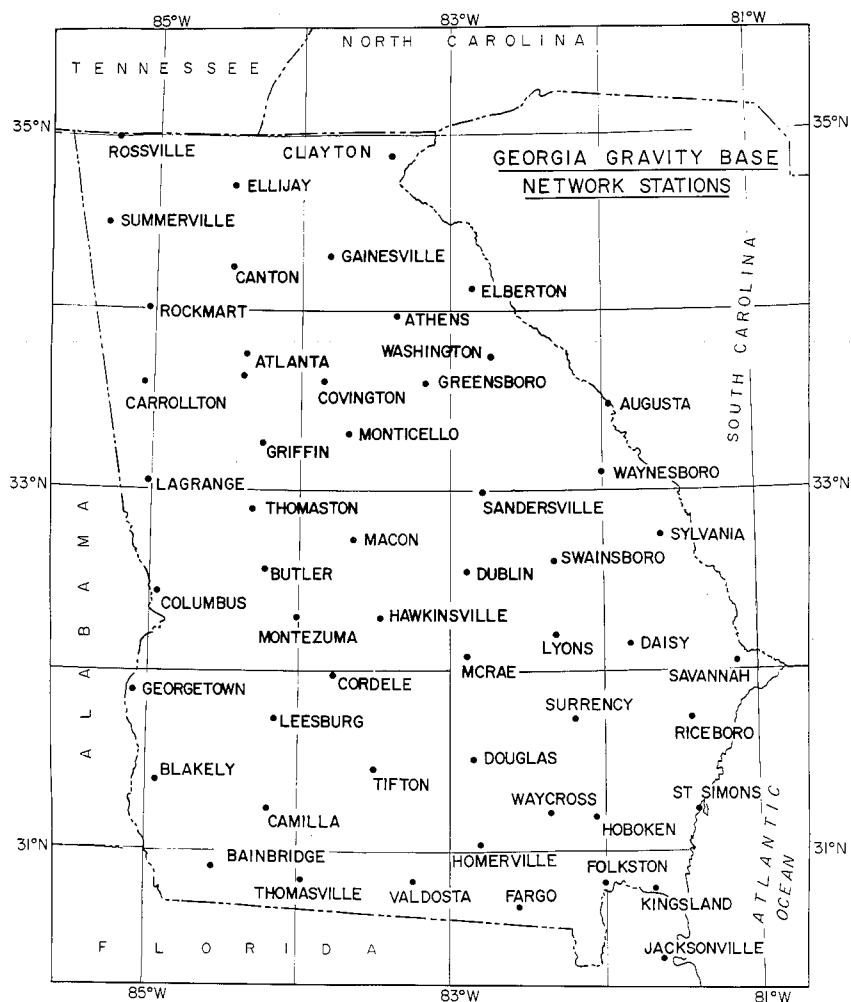


Figure 1. Location of gravity base stations in Georgia.

TABLE 2. ADJUSTED GRAVITY VALUES

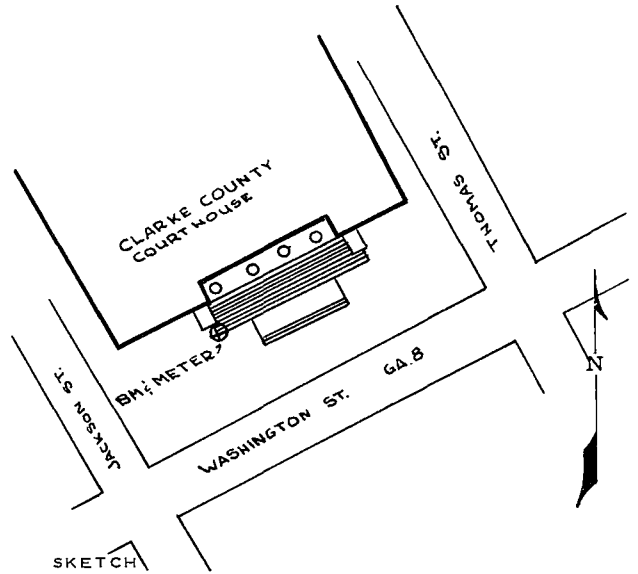
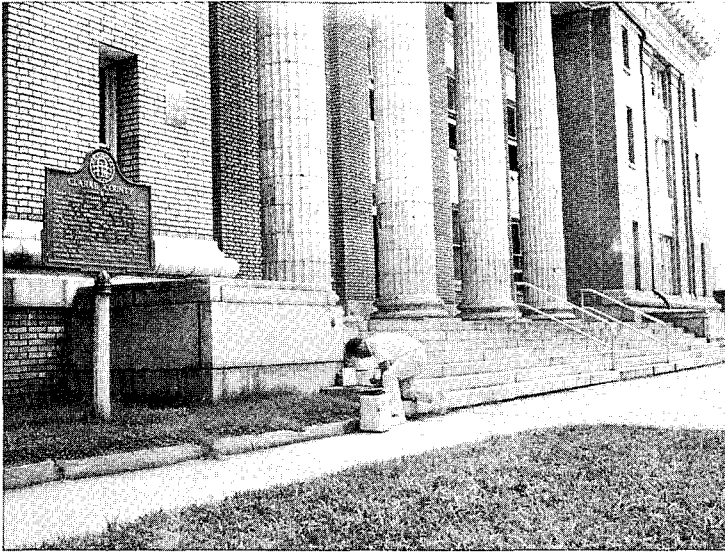
Station	Value, Mgal	Propagated Error
Athens	979 596.38	±0.014
Atlanta A	537.28	0.027*
Atlanta C	538.22	0.015*
Atlanta D	527.37	0.023
Atlanta J	520.06	0.000*
Augusta	600.29	0.011
Bainbridge	387.31	0.013
Blakely	425.47	0.015
Butler	524.41	0.014
Camilla	416.09	0.014
Canton	580.92	0.014
Carrollton	521.88	0.014
Clayton	547.22	0.023
Columbus	523.45	0.011
Cordele	473.73	0.015
Covington	552.34	0.010
Daisy	486.16	0.014
Douglas	469.10	0.014
Dublin	521.04	0.014
Elberton	617.44	0.014
Ellijay	598.70	0.012
Fargo	383.20	0.013
Folkston	405.48	0.010
Gainesville	560.19	0.014
Georgetown	489.41	0.012
Greensboro	591.84	0.011
Griffin	505.68	0.014
Hawkinsville	500.43	0.010
Hoboken	431.70	0.011
Homerville	399.02	0.010
Jacksonville	384.74	0.000*
Kingsland	405.92	0.014
LaGrange	484.42	0.014
Leesburg B	462.68	0.014
Leesburg C	463.07	0.012
Lyons	494.47	0.017
McRae B	484.28	0.018
McRae C	489.35	0.012
Macon J	530.76	0.013
Macon K	530.63	0.015
Montezuma	520.33	0.010
Monticello	563.03	0.014
Riceboro	454.02	0.019
Rockmart	580.04	0.014
Rossville	648.10	0.015
Sandersville	634.69	0.015
Savannah	496.82	0.012
St. Simons	448.45	0.013
Summerville	634.69	0.015
Surrency	459.76	0.018

Table 2 (Continued)

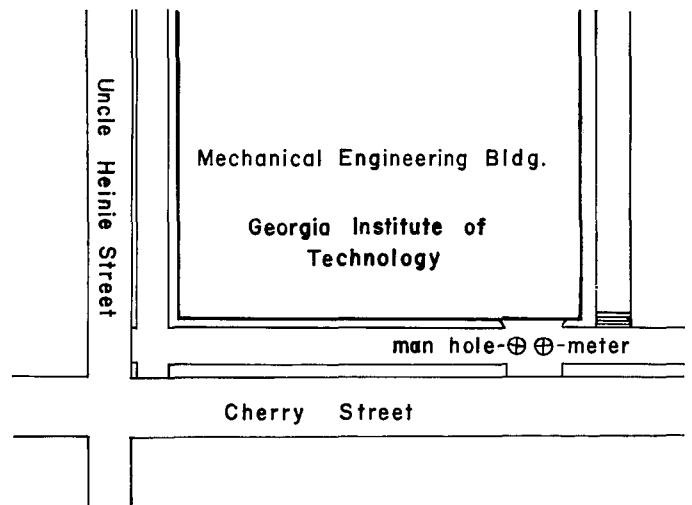
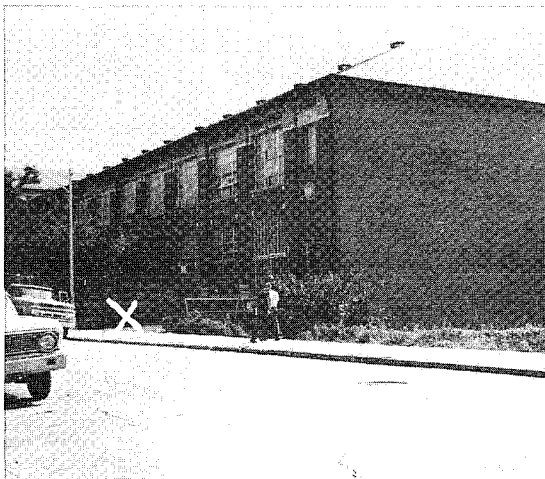
Station	Value, Mgal	Propagated Error
Swainsboro	527.18	0.017
Sylvania	539.73	0.017
Thomaston	529.27	0.014
Thomasville	382.75	0.011
Tifton	472.75	0.015
Valdosta B	381.17	0.008
Valdosta C	380.67	0.013
Washington	601.69	0.014
Waycross	431.26	0.011
Waynesboro	553.06	0.015

*U.S. National Base Stations

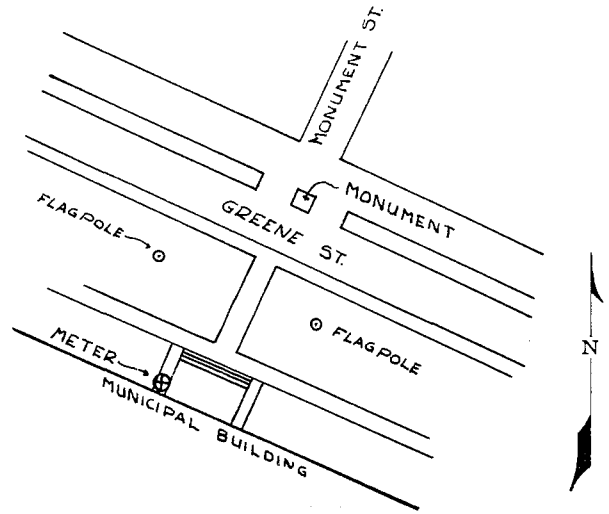
ATHENS — $33^{\circ}57'06''N$, $83^{\circ}22'05''W$; elevation 761.5 ft. Value: 979,596.38 mgal; propagated error: ± 0.014 . Gravity base station is located in Athens, Georgia, at the Clarke County Courthouse, intersection of Jackson and Washington Streets, on the southwest end of the second step from the bottom of the steps leading to the main entrance, and directly below BM-C 61. USC&GS BM elev. = 763.548 ft., 1933. (Described by E. D. Crawford, Army Map Service, 18 Jun 1968.)



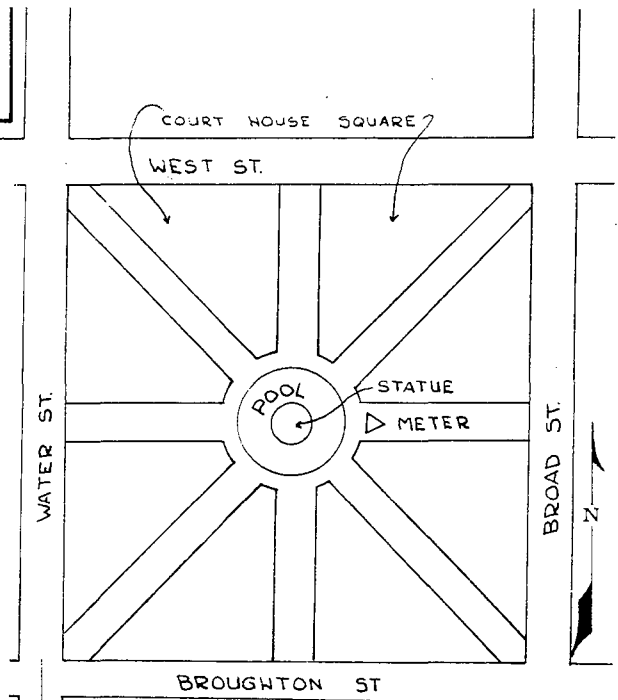
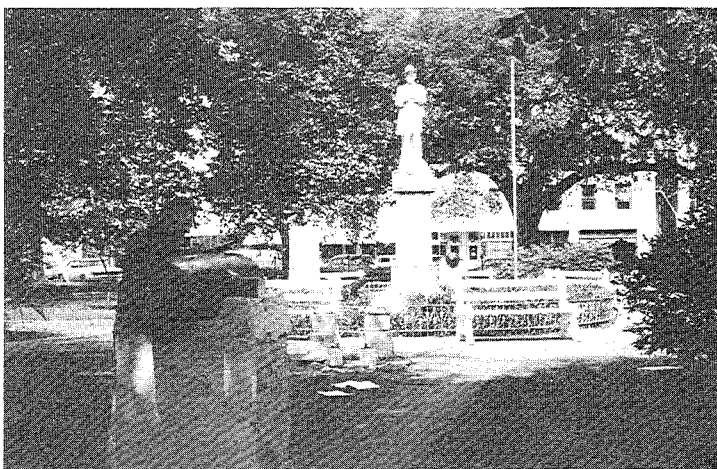
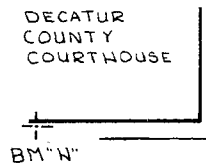
*ATLANTA-D — $33^{\circ}46'04''N$, $84^{\circ}23'07''W$; elev. 979 ft. Value: 979,527.37 mgal; propagated error: ± 0.023 . Station located on east side of Mechanical Engineering Building, Georgia Institute of Technology, on the sidewalk beside a manhole cover on the north edge of driveway. Woollard & Rose WU-9 = Atlanta-D. (Recovered by C. M. Dorman, Georgia Tech., Jul 1966.)



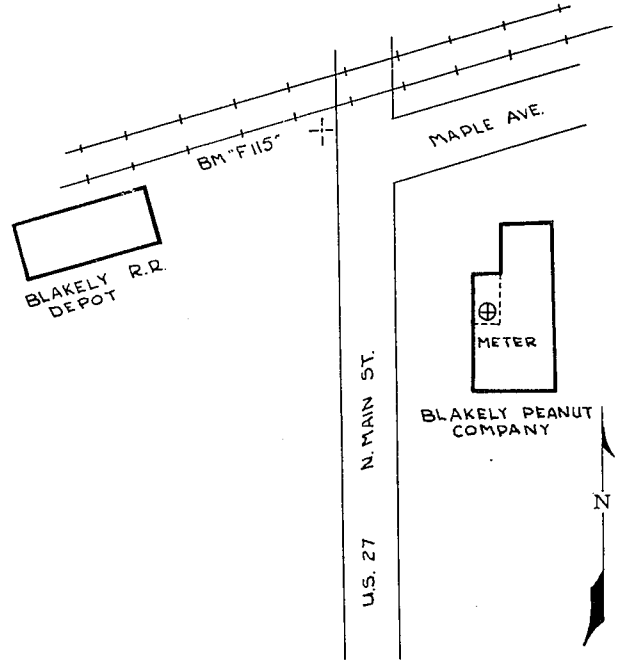
AUGUSTA — $33^{\circ}28'04''N$, $81^{\circ}37'07''W$; elev. 120 ft. Value: 979,600.39 mgal; propagated error: ± 0.011 . Gravity base station is at Augusta-Richmond Co. Municipal Building on Green Street at intersection of Green and Monument Streets; at the main entrance, about 10 feet northwest of the door, on the marble area, one foot from the exterior of the building. Elevation determined from USGS 15' quad "Augusta". (Described by J. F. Lambert, Army Map Service, 17 Apr 1968.)



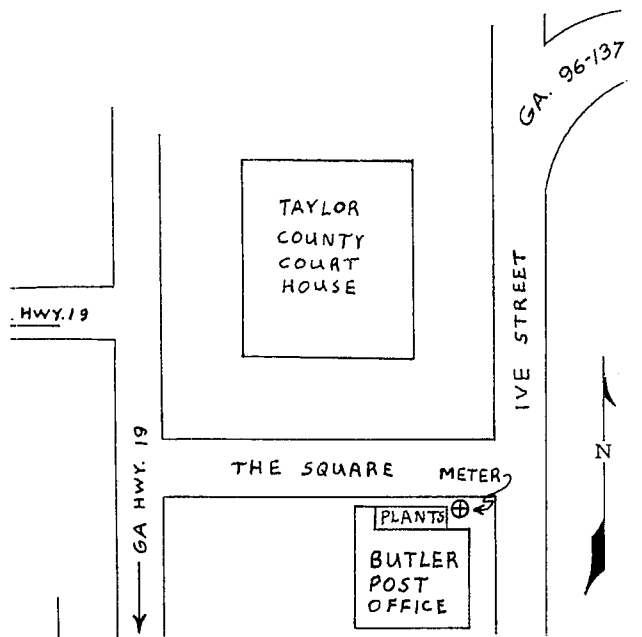
BAINBRIDGE — $30^{\circ}45'04''N$, $84^{\circ}34'06''W$; elev. 130.353 ft. Value: 979,387.31 mgal; propagated error: ± 0.013 . Gravity base station is located in Bainbridge, Georgia, in the center of town at the center of "Courthouse Square", 12 ft. east of monument, inside the triangular area on a 2 ft. x 2 ft. concrete foundation beside the sidewalk. USC&GS BM "H", elev. 133.353 ft. (Recovered by E. C. Crawford, Army Map Service, 3 Jun 1968.)



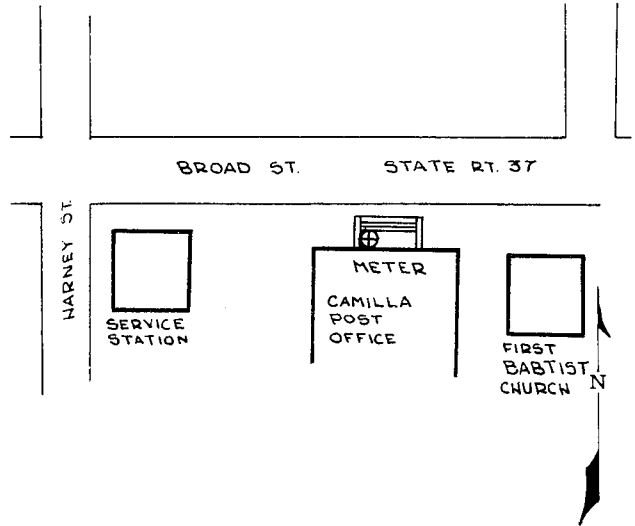
BLAKELY — $33^{\circ}22'09''N$, $84^{\circ}56'00''W$; elev. 259.124 ft. Value: 979,425.47 mgal; propagated error: ± 0.015 . Gravity base station is located in Blakely, Georgia, on U.S. Highway 27, at the intersection of N. Main Street and Maple Avenue; at the Blakely Peanut Co. office building; on the porch at the southeast corner. USC&GS BM "F 115", elev. 260.125 ft., 1934. (Described by E. D. Crawford, Army Map Service, 3 Jun 1968.)



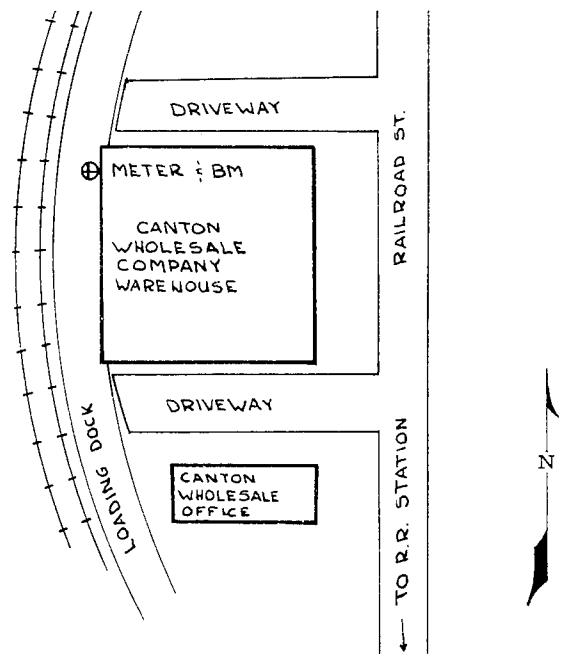
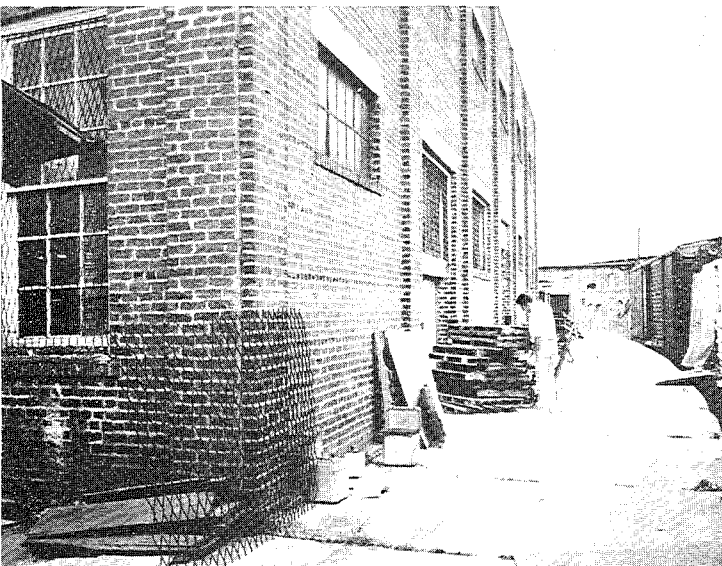
BUTLER — $32^{\circ}33'03''N$, $84^{\circ}14'03''W$; elev. 633.98 ft. Value: 979,524.41 mgal; propagated error: ± 0.014 . The gravity base station is located in Butler, Georgia, at the U.S. Post Office Building at the intersection of Ire Street and "The Square" Street at the north entrance of the building, on the sidewalk at the northeast corner of a 1½ ft. high brick wall around a flower bed. USC&GS BM 5227, elev. 627.978 ft., 1958. (Described by E. D. Crawford, Army Map Service, 11 Jun 1968.)



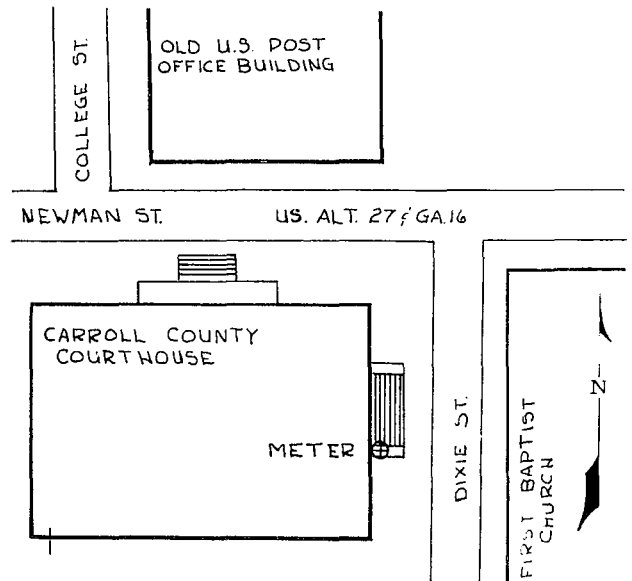
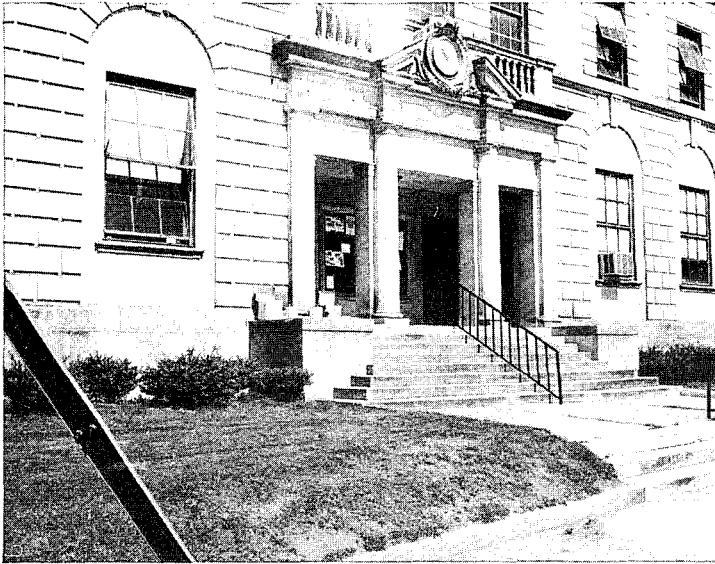
CAMILLA — $31^{\circ}13'08''\text{N}$, $84^{\circ}12'04''\text{W}$; elev. 178.0 ft. Value: 979,416.09 mgal; propagated error: ± 0.14 . Gravity station is located in Camilla, Georgia; on Broad Street, east of Harney Street, at the Camilla Post Office, on the porch on the west side of the pilaster west of the main entrance. USC&GS BM destroyed. (Described by E. D. Crawford, Army Map Service, 4 Jun 1968.)



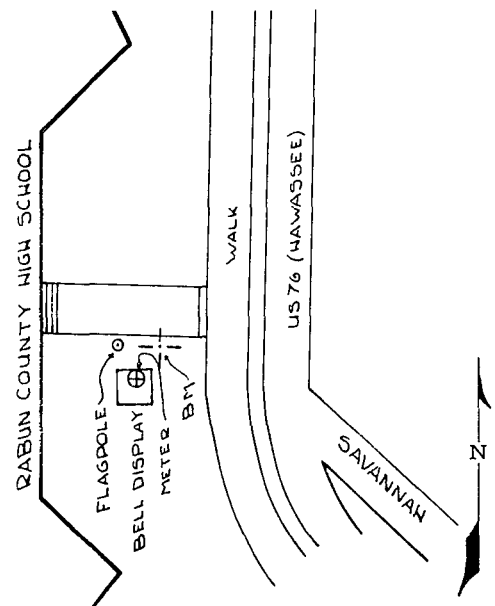
CANTON — $34^{\circ}14'02''\text{N}$, $84^{\circ}29'07''\text{W}$; elev. 876.04 ft. Value: 979,580.92 mgal; propagated error: ± 0.14 . Gravity base station is located in Canton, Georgia, along Railroad Street, 0.4 mi. north of the railroad station at the Canton Wholesale Co. building, on the loading platform at the northwest corner of the building and directly below BM F57, elev. 877.045 ft. (Described by Army Map Service, 17 Jun 1968.)



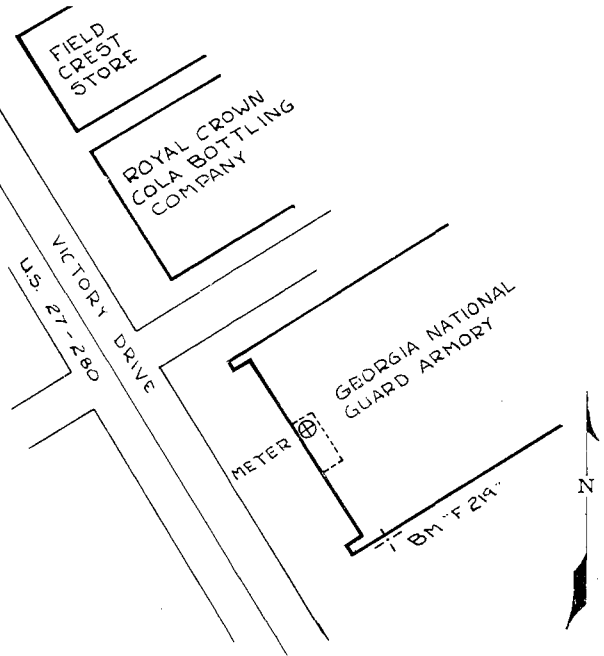
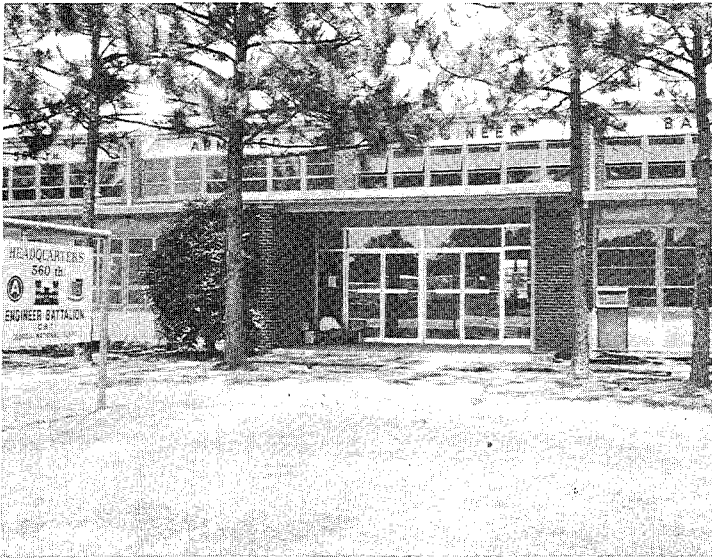
CARROLLTON — $33^{\circ}34'08''N$, $85^{\circ}04'04''W$; Value: 979,521.88 mgal; propagated error: ± 0.014 . Gravity base station is located in Carrollton, Ga., along U.S. Alt. Rt. 27 and Ga. Hwy. 16 at the Carroll County Courthouse, at the intersection of Newnan and Dixie Streets, at the east entrance of the building, on the south coping at the west edge, beside the pilaster. (Described by E. D. Crawford, Army Map Service, 13 Jun 1968.)



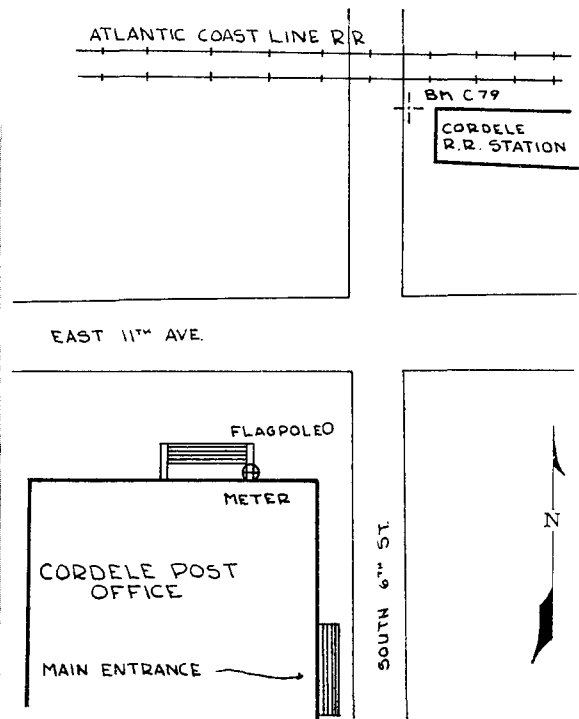
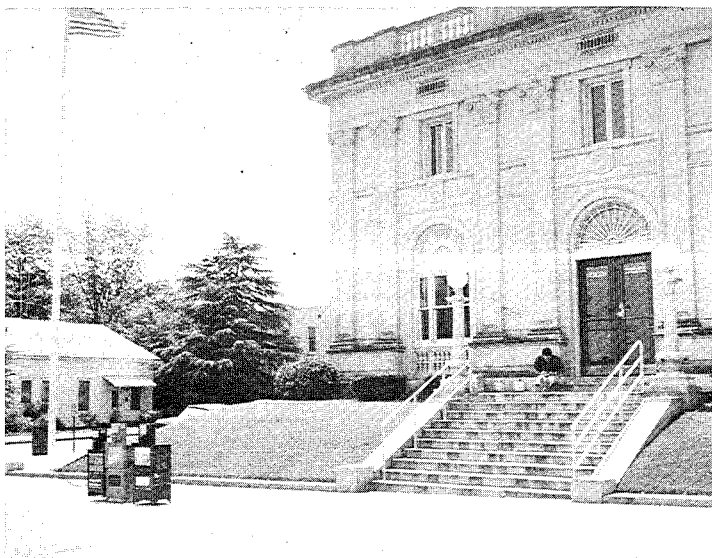
CLAYTON — $34^{\circ}52'08''N$, $83^{\circ}24'03''W$; elevation 1896.954 ft. Value: 979,547.22 mgal; propagated error: ± 0.023 . Gravity base station is at Rabun County High School, in Clayton, Ga.; 0.3 mile west-northwest along U.S. Hwy. 76 (Hiawassee St.) from the junction of U.S. Hwy. 23, at Hiawassee and Savannah Sts.; on the base of the Bell Display Foundation, 43.5 ft. northeast of the main entrance to school; 8 ft. east and 2 ft. above USC&GS BM A-124; elevation = 1894.954 ft., 1934. (Described by J. F. Lambert, Army Map Service, 26 March 1968.)



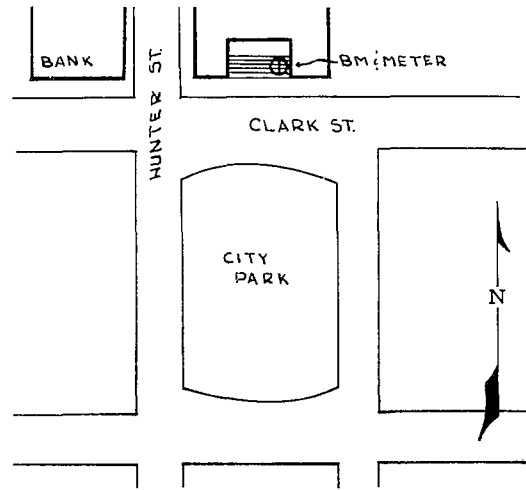
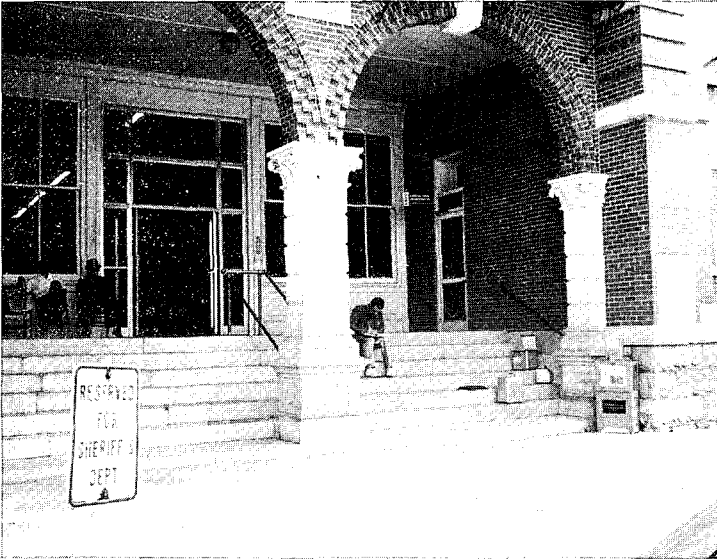
COLUMBUS — $32^{\circ}26'04''N$, $84^{\circ}57'08''W$; elevation 236.73 ft. Value: 979,523.45 mgal; propagated error: $\pm .011$. Gravity base station is located in Columbus, Ga., along Victory Drive (U.S. Hwy. 27-280), at the southeast end of the Municipal Airport at the Georgia National Guard Armory, in the area at the main entrance, at the northwest corner. USC&GS BM F 219-1958, elevation 238.733 ft. (Described by E. D. Crawford, Army Map Service, 8 Jun 1968.)



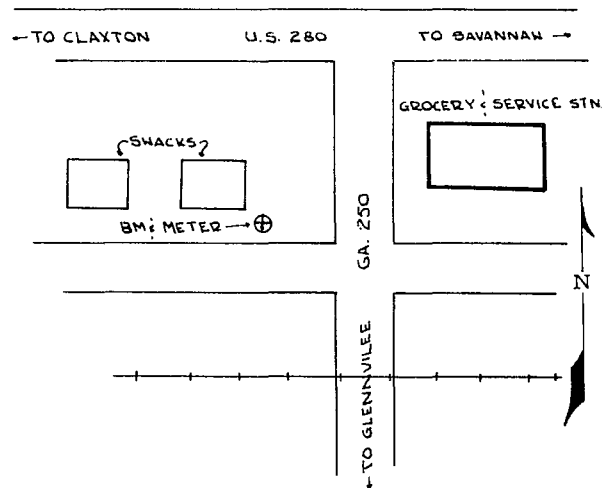
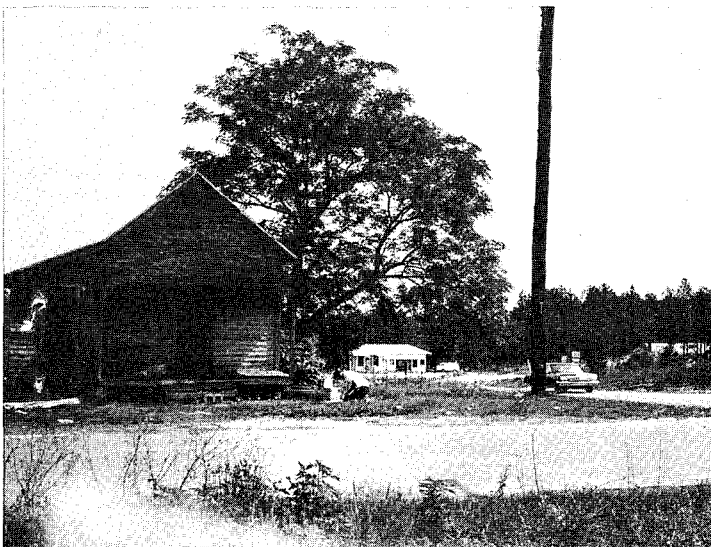
CORDELE — $31^{\circ}58'01''N$, $83^{\circ}47'00''W$, elevation 338.828 ft. Value: 979,473.73 mgal; propagated error: $\pm .015$. Gravity base station is located in Cordele, Ga., at the intersection of East 11th Avenue and South 6th Street at the Post Office Building, at the north entrance at the northeast corner of the porch. USGS BM "C" 79-1934, elevation 318.828 ft. (Described by E. D. Crawford, Army Map Service, 1 June 1968.)



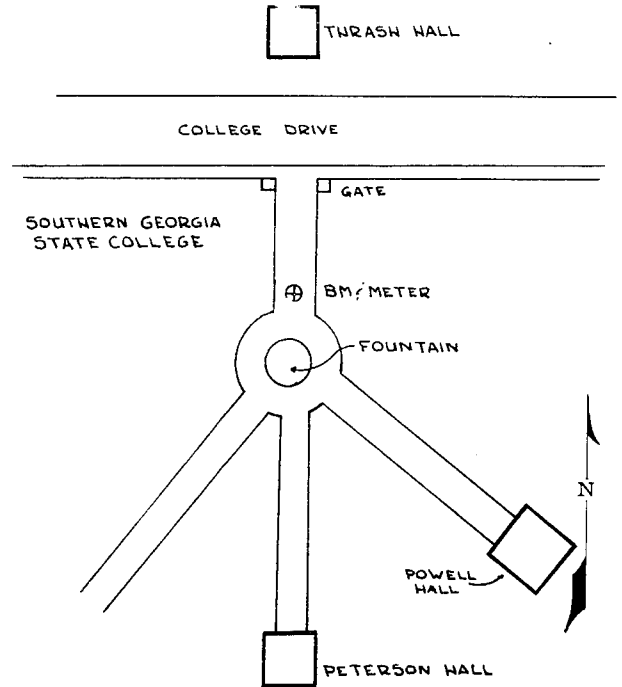
COVINGTON — $33^{\circ}36'02''N$, $83^{\circ}52'00''W$, elevation 746.764 ft. Value: 979,552.34 mgal.; propagated error: ± 0.10 . Gravity base station is located in Covington, Ga., at the Newton County Courthouse, at the intersection of Clark and Hunter Streets, at the south entrance and in the top of the east end of the third step from the bottom. Meters were read over BM N 119-1930, elevation 746.764 ft. (Described by E. D. Crawford, Army Map Service, 10 June 1968.)



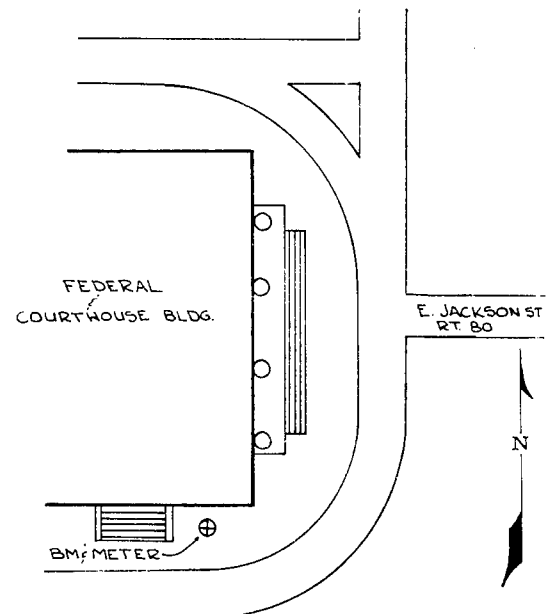
DAISY — $32^{\circ}09'01''N$, $81^{\circ}50'02''W$; elevation 176.613 ft. Value: 979,486.16 mgal; propagated error: ± 0.14 . Gravity base station is at Daisy, Ga., along Ga. Hwy. 250 at the intersection of U.S. Hwy. 280 and Ga. Hwy. 250, at the northwest corner of old shack house, on the concrete post projecting about the level of ground. Meter read on USGS BM 177 "Reset 1962", elevation 176.613 ft. USG&GS quad 320813. (Described by J. F. Lambert, Army Map Service, 17 May 1968.)



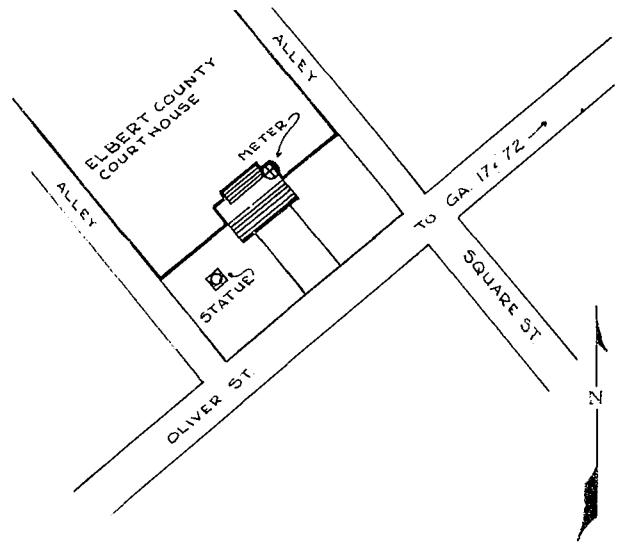
DOUGLAS — $31^{\circ} 29'08''N$, $82^{\circ} 51'05''W$; elevation 251,532 ft. Value: 979,469.10 mgal; propagated error: ± 0.014 . Gravity station is located in Douglas, Ga., at the South Georgia State College Campus, 0.25 mile west along College Drive from its junction with U.S. Hwy. 441, about 94 ft. south on the walk that leads between Thrash Hall and Peterson Hall, 4 ft. north of fountain. Meters were read beside USC&GS BM "College 1935". (Described by E. D. Crawford, Army Map Service, 31 May 1968.)



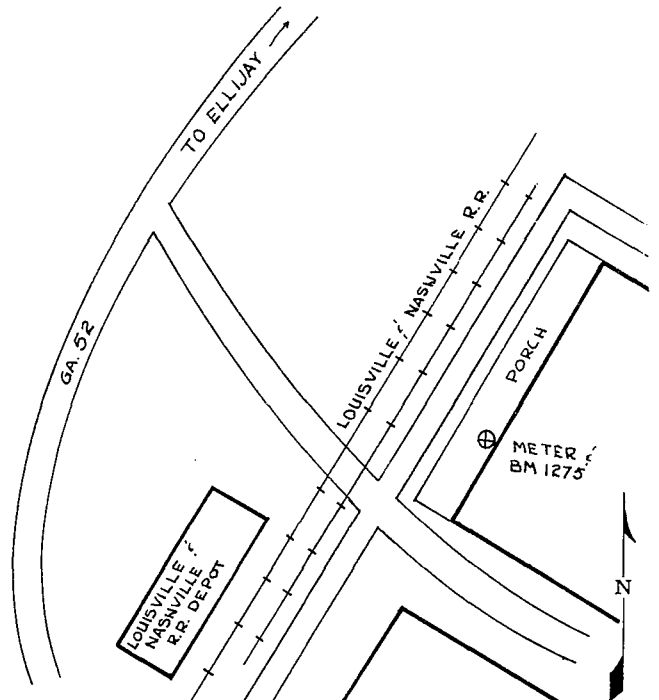
DUBLIN — $32^{\circ} 33'00''N$, $82^{\circ} 54'05''W$; elevation 227.611 ft. Value: 979,521.04 mgal; propagated error: ± 0.014 . Gravity base station is at the post office in Dublin, Ga., in the traffic circle, on East Jackson Street; at the south entrance of the Federal and Courthouse Building, on top of a concrete wall around the basement window 8.6 ft. southwest of the southeast corner of the building, 0.4 ft. northwest of the southeast corner of the concrete wall and 0.5 ft. above the level of the ground. USC&GS BM "G 284 1962", USC&GS Quad 320824. (Described by E. D. Crawford, Army Map Service, 20 May 1968.)



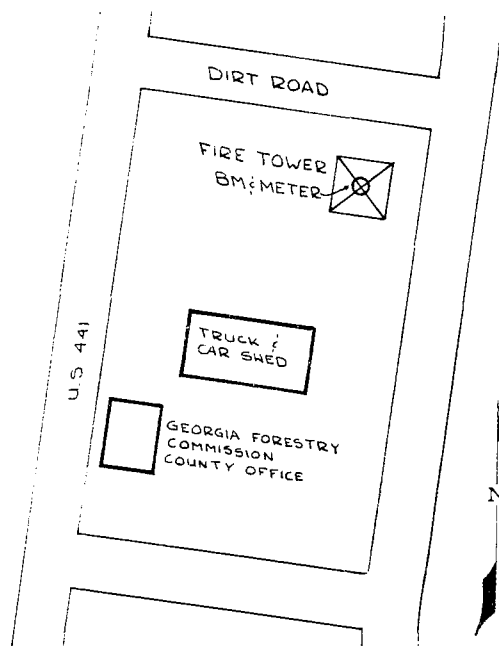
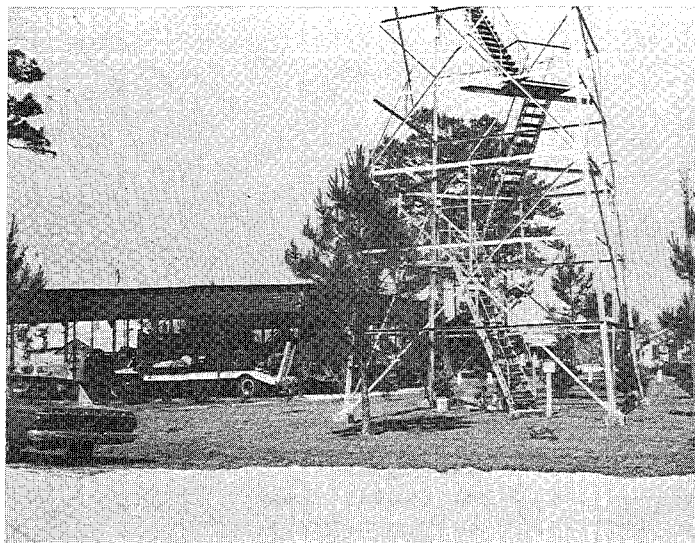
ELBERTON — $34^{\circ}06'06''\text{N}$, $82^{\circ}52'00''\text{W}$; elevation 698.99 ft. Value: 979,617.44 mgal; propagated error: ± 0.14 . Gravity base station is located in Elberton, Ga., about one city block from Ga. Hwy. 72-17, southwest along Oliver Street just off the town square at the intersection of Oliver and Square Sts., at the Elbert County Courthouse at the front entrance in the areaway northeast of the steps, and between the steps and the corner of the two walls. USC&GS BM T61-1933, elevation 700.986 ft. (Described by E. D. Crawford, Army Map Service, 18 June 1968.)



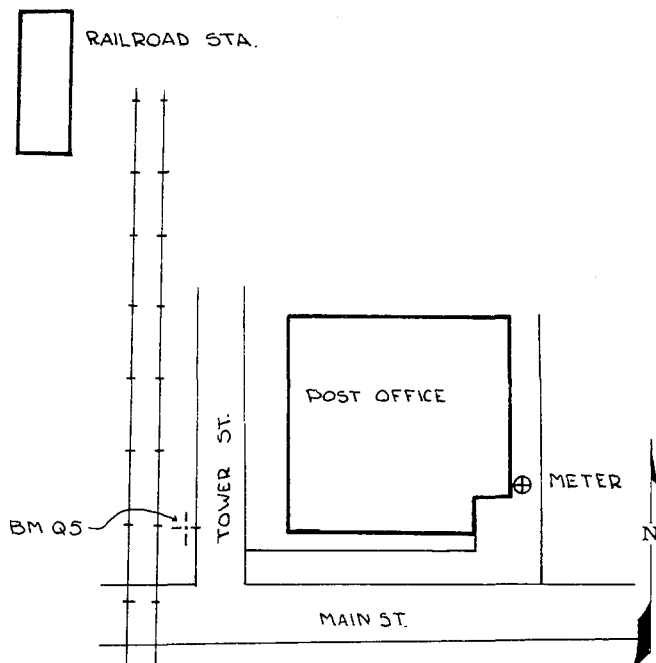
ELLIJAY — $34^{\circ}41'05''\text{N}$, $84^{\circ}28'04''\text{W}$; elevation 1276.249 ft. Value: 979,598.70 mgal; propagated error: ± 0.12 . Gravity base station is located in Ellijay, Ga., about 0.5 mi. southeast from the center of town along Ga. Hwy. 52, at a building 200 ft. east of the Louisville and Nashville Railroad Depot, on the porch directly under USGS BM 1275, elevation 1276.749 ft. (Described by E. D. Crawford, Army Map Service, 14 June 1968.)



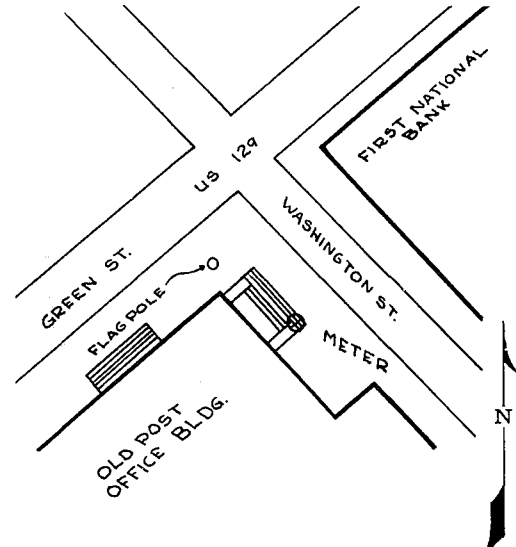
FARGO — $30^{\circ}41'00''N$, $82^{\circ}34'00''W$, elevation 114.363 ft. Value: 979,383.20 mgal; propagated error: ± 0.013 . Gravity base station is located in Fargo, Ga., at the St. Regis Paper Co. fire tower, directly beneath the tower. Meter read atop USC&GS BM C 154-1957, elevation 114.363, USC&GS quad 300824. (Described by E. D. Crawford, Army Map Service, 23 May 1968.)



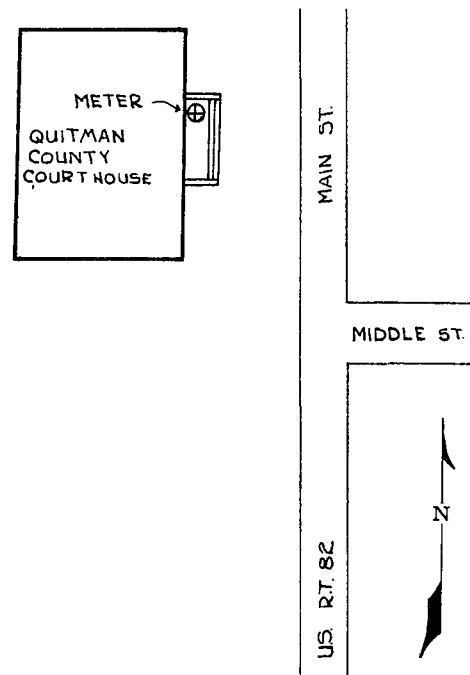
FOLKSTON — $82^{\circ}04'05''N$, $30^{\circ}49'08''W$; elevation 79.665 ft. Value: 979,405.48 mgal; propagated error: ± 0.010 . Gravity base station is located in Folkston, Ga., at the New Post Office Building at the intersection of Main and Tower Streets, at the front entrance of the building, at the southeast corner of the building on the sidewalk leading to the back of the building. USC&GS BM Q 5, elevation 81.165 ft. (Described by E. D. Crawford, Army Map Service, 5 September 1968.)



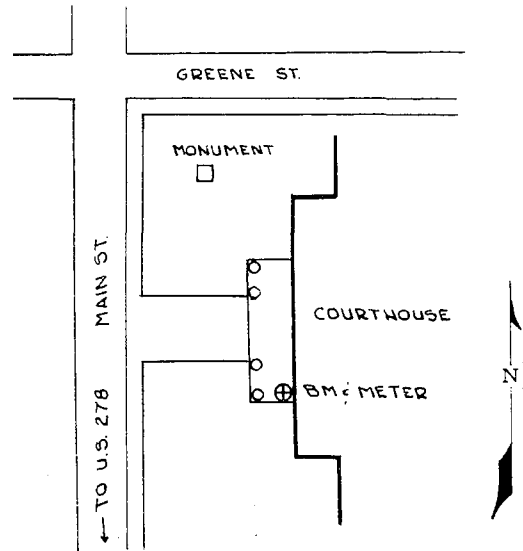
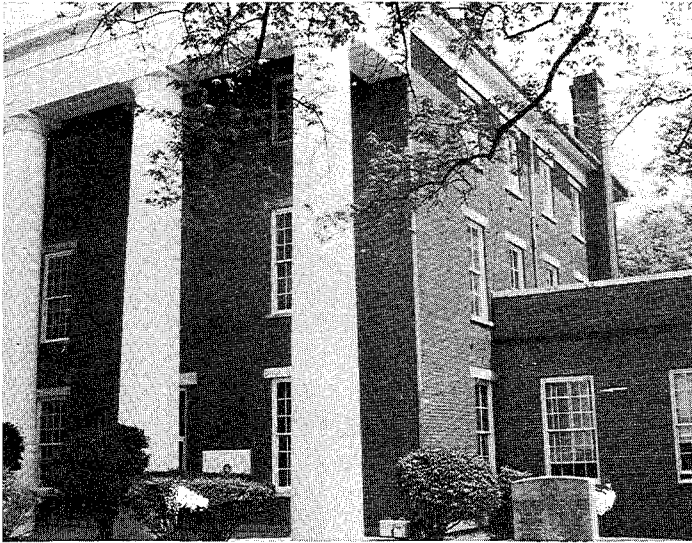
GAINESVILLE — $34^{\circ}18'00''\text{N}$, $83^{\circ}49'06''\text{W}$; elevation 1272.55 ft. Value: 979,560.19 mgal; propagated error: ± 0.014 . Gravity base station is located in Gainesville, Ga., along U.S. Hwy. 129, at the Old Post Office Building at the intersection of Green and Washington Streets, at the north-northeast entrance, on top of the east-southeast end of the bottom step. USGS BM "Outlined Square", elevation 1272.553 ft. (Described by E. D. Crawford, Army Map Service, 18 June 1968.)



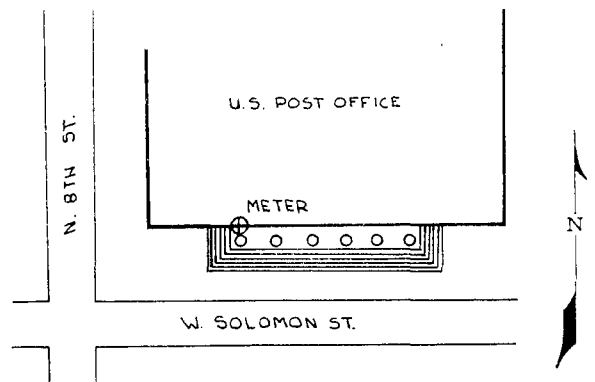
GEORGETOWN — $31^{\circ}54'06''\text{N}$, $85^{\circ}06'05''\text{W}$; elevation 255.0 ft. Value: 979,489.42 mgal; propagated error: ± 0.012 . Gravity base station is located in Georgetown, Ga., along U.S. Hwy. 82, at the Quitman County Courthouse, on the porch in the middle of the recessed wall north of the main entrance. Elevation interpolated from contours. (Described by E.D. Crawford, Army Map Service, 3 June 1968.)



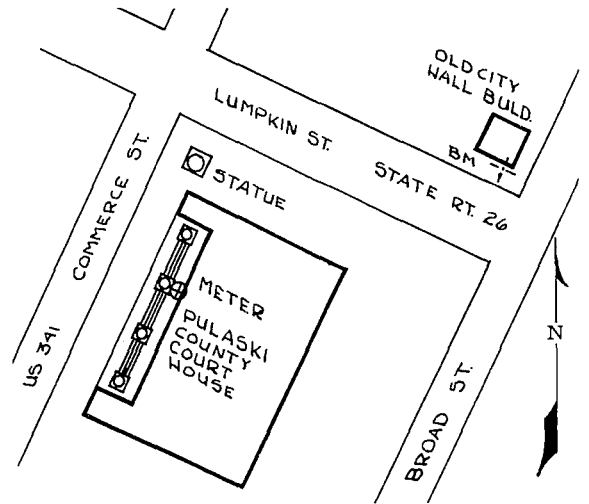
GREENSBORO — $33^{\circ}34'08''\text{N}$, $83^{\circ}11'00''\text{W}$; elevation 646.445 ft. Value: 979,591.84 mgal; propagated error: $\pm .011$. Gravity base station is at the Greene County Courthouse in Greensboro, Ga., along Main Street at the intersection of Main and Greene Streets; about 0.1 mile south of U.S. Hwy. 278 and Ga. Hwy. 44-15; at the main entrance, on the south side of the concrete porch area, 4 ft. directly below the BM. USGS BM "Prim. Trav. Station No. 8, 1903-1906, Atlanta, Ga.", elevation 650.445 ft. (Described by J. F. Lambert, Army Map Service, 17 April 1968.)



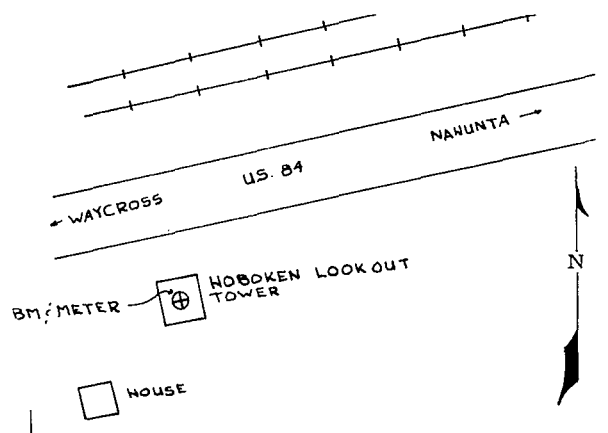
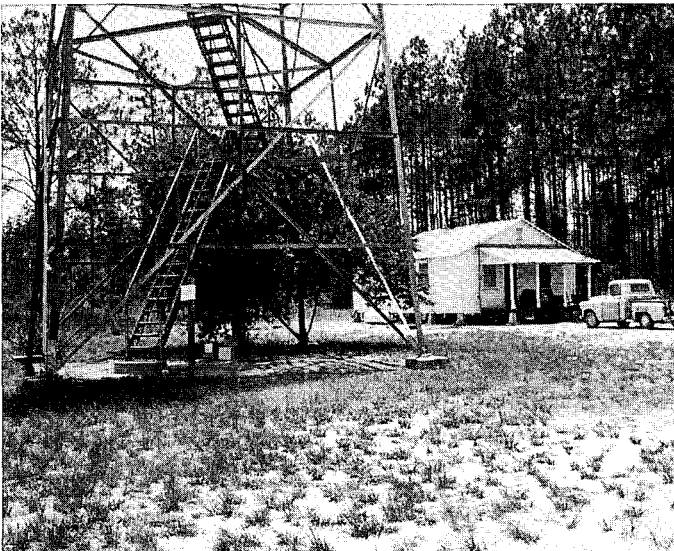
GRIFFIN — $33^{\circ}15'00''\text{N}$, $84^{\circ}15'07''\text{W}$; elevation 978.339 ft. Value: 979,505.68 mgal; propagated error: $\pm .014$. Gravity base station is located in Griffin, Ga., at the U.S. Post Office Building at the intersection of North 8th and West Solomon Streets, on the west end of the porch behind the far west column and next to the pilaster, on the south face of the building. USC&GS BM J3-1916, elevation 979.339 ft. (Described by E. D. Crawford, Army Map Service, 27 May 1968.)



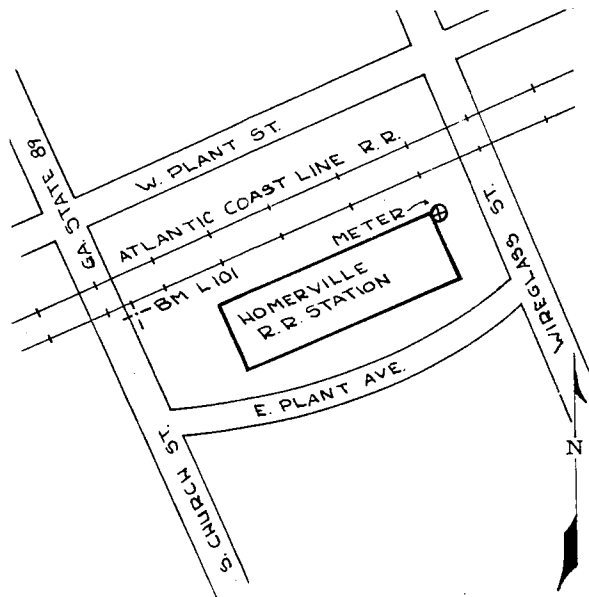
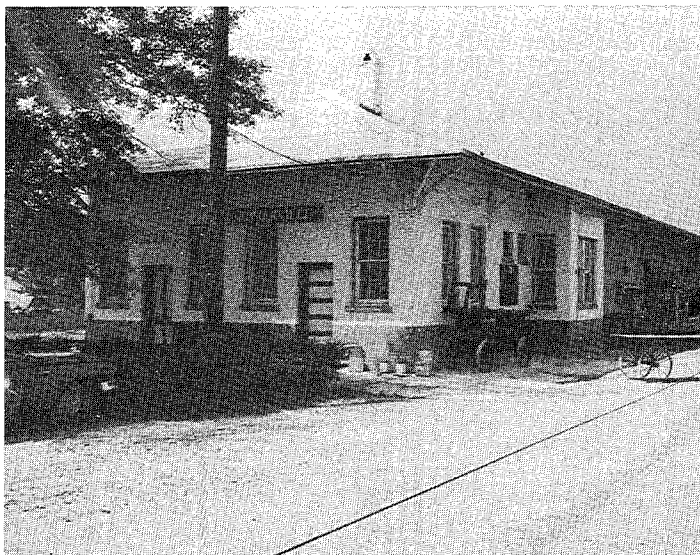
HAWKINSVILLE — $32^{\circ}17'00''N$, $83^{\circ}28'03''W$; elevation 249.049 ft. Value: 979,500.43 mgal; propagated error: ± 0.010 . Gravity base station is located in Hawkinsville, Ga., along U.S. Hwy. 341 at the intersection of Commerce and Lumpkin Streets, at the Pulaski County Courthouse on the porch 2 ft. north of the main entrance, six inches from the wall. USC&GS BM Hawkinsville 1934, elevation 241.049 ft. (Described by E. D. Crawford, Army Map Service, 31 May 1968.)



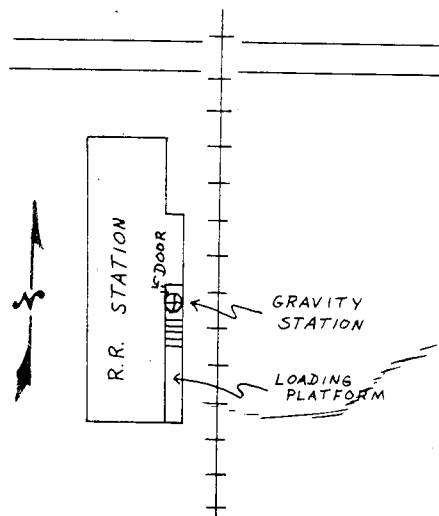
HOBOKEN — $31^{\circ}11'02''N$, $82^{\circ}05'00''W$; elevation 139.220 ft. Value: 979,431.70 mgal; propagated error: ± 0.011 . The gravity base station is located southwest along U.S. Hwy. 84, 6 mi. from U.S. Hwy. 301 in Nahunta, at the Hoboken Lookout Tower 7 miles from the center of Hoboken northeast along U.S. Hwy. 84. The meters were read over USGS BM "Hoboken 1963", which is located directly beneath the tower. Ga. Tech G-6 = Hoboken. (Recovered by E. D. Crawford, Army Map Service, 27 May 1968.)



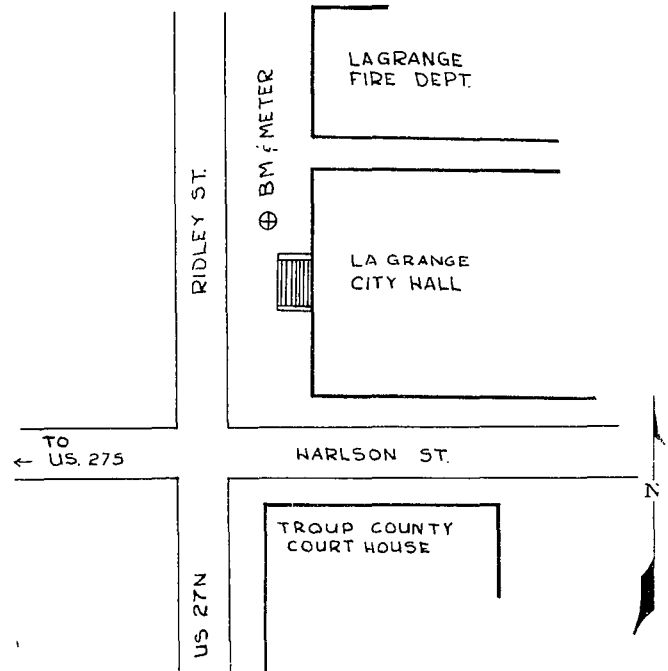
HOMERVILLE — $31^{\circ} 02'03''N$, $82^{\circ} 49'07''W$; elevation 176,393 ft. Value: 979,399.02 mgal; propagated error: $\pm .010$. Gravity base station is located in Homerville, Ga., at the Atlantic Coast Line Railroad Station, one block south of U.S. Hwy. 84 on Ga. Hwy. 89 at the intersection of S. Church and E. Plant Streets, at the northwest corner of the building, one foot south of the corner. USC&GS BM L101 1934, not located, elevation 177.893 ft. (Described by E. D. Crawford, Army Map Service, 9 May 1968.)



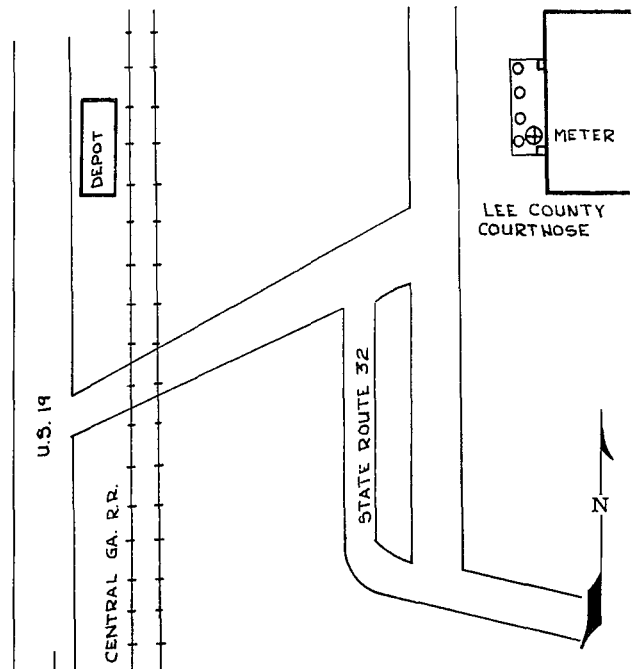
KINGSLAND — $30^{\circ} 48'00''N$, $81^{\circ} 41'25''W$; elevation 41 ft. Value: 979,405.92; propagated error: $\pm .014$. Station located at Kingsland Railroad Station on first step of doorway on east side of station. (Described by J. Sureddin, Army Map Service, April 1963.)



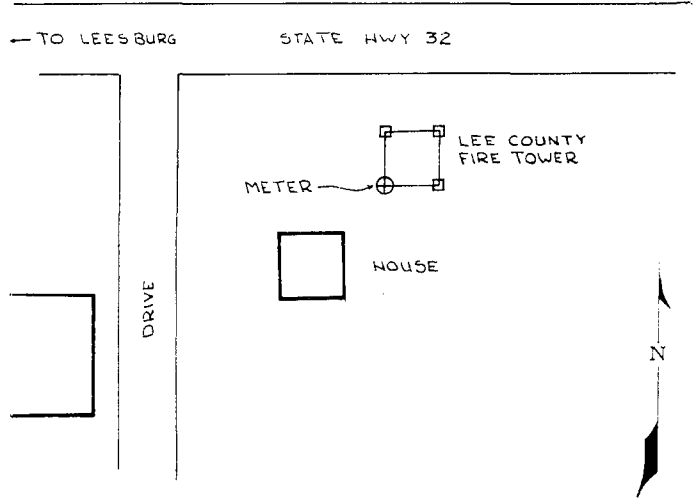
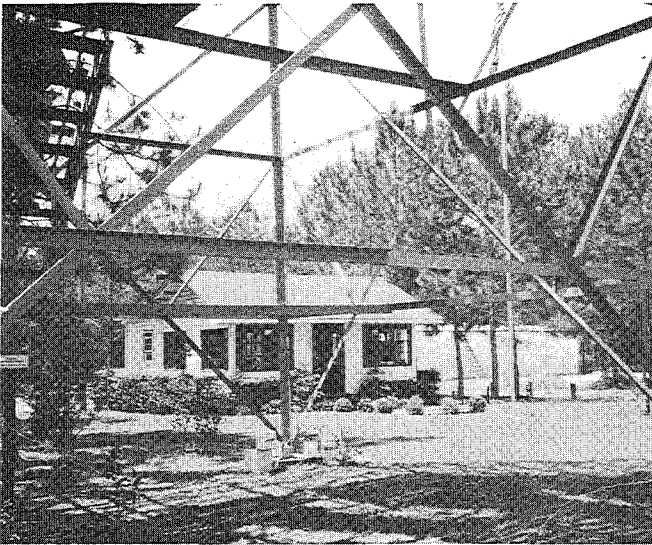
LAGRANGE — $33^{\circ} 02'04''N$, $85^{\circ} 01'08''W$; elevation 771.865 ft. Value: 979,484.42 mgal; propagated error: $\pm .014$. Gravity base station is located in LaGrange, Ga., at the City Hall one city block from U.S. Hwy. 27, southeast along Haralson Street at its intersection with Ridley Street, on the front lawn 14 ft. north of centerline of sidewalk 8 feet west of the west face of the building. Meter was read on concrete benchmark USC&GS BM "LaGrange No. 2 - 1933", elevation 771.865 ft. (Described by E. D. Crawford, Army Map Service, 13 June 1968.)



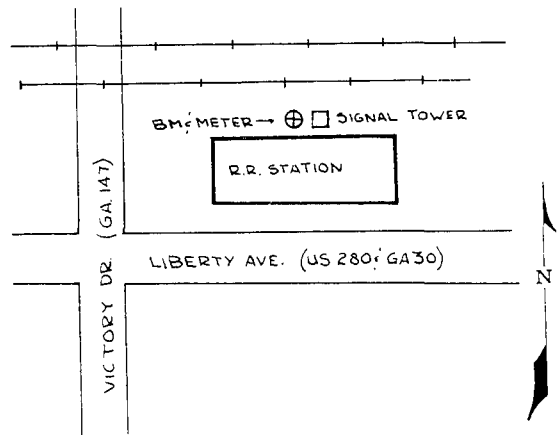
LEESBURG B — $31^{\circ} 43'09''N$, $84^{\circ} 10'03''W$; elevation 260.0 ft. Value: 979,462.68 mgal; propagated error: $\pm .014$. Gravity base station is located in Leesburg, Ga., along U.S. Hwy. 19 at the Lee County Courthouse at the junction of Ga. Hwy. 32 and U.S. Hwy. 19, on the porch south of the main entrance in the corner formed by the south pilaster and the wall. Elevation interpolated from contours of USGS 15' quad "Albany". (Described by E. D. Crawford, Army Map Service, 4 June 1968.)



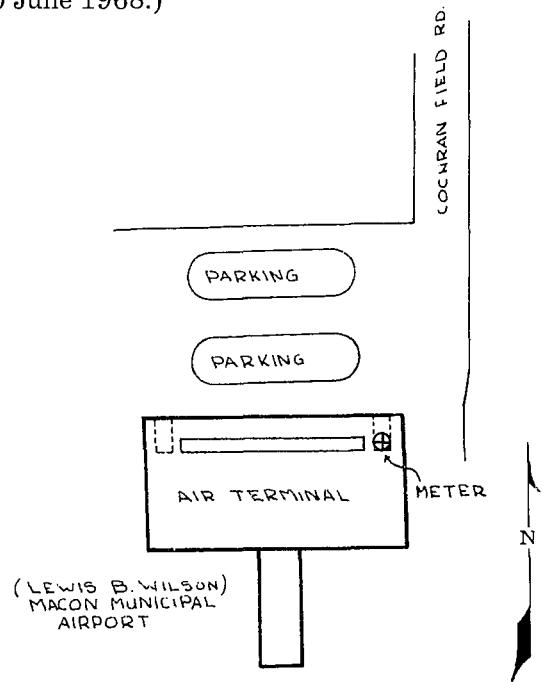
LEESBURG C — $31^{\circ} 43'09''N$, $84^{\circ} 10'03''W$; elevation 260.0 ft. Value: 979,463.07 mgal; propagated error: $\pm .012$. Gravity base station is located at the Lee County Forestry Commission Headquarters along Ga. Hwy. 32, 1.2 miles east of Leesburg, Ga., on concrete pier at southwest corner of lookout tower. Elevation interpolated from contours of USGS 15' quad "Albany". Ga. Tech G-2 = Leesburg C. (Recovered by E. D. Crawford, Army Map Service, 4 June 1968.)



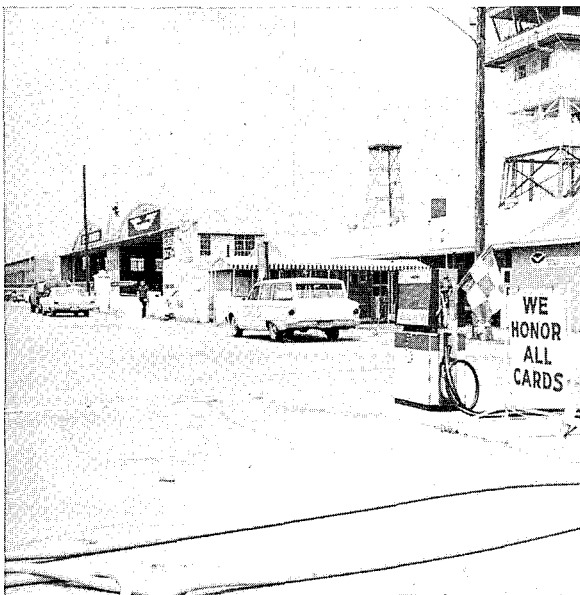
LYONS — $32^{\circ} 12'03''N$, $82^{\circ} 19'02''W$; elevation 254.409 ft. Value: 979,494.47 mgal; propagated error: $\pm .017$. Gravity base station is at railroad station in Lyons, Ga., along U.S. Hwy. 280, between the railroad station and the tracks, two feet west of the base of the signal tower, and three feet north of the north side of the station. Meter is read on top of USC&GS BM "R-74-1934", USC&GS quad 320822. (Described by J. F. Lambert, Army Map Service, 17 May 1968.)



MACON J — $32^{\circ} 41'06''N$, $83^{\circ} 38'08''W$; elevation 357.6 ft. Value: 979,530.76 mgal; propagated error: $\pm .013$. Gravity base station is located 5 miles south of Macon, Ga. at the Lewis B. Wilson (Macon Municipal) Airport (formerly Cochran Field), at the east entrance on concrete floor, about 2 feet east of door and under bronze dedication plaque hung on building wall. Ga. Tech. G-1 = Macon J. USC&GS BM J-186-1944, elevation 356.453 ft. (Recovered by E. D. Crawford, Army Map Service, 10 June 1968.)

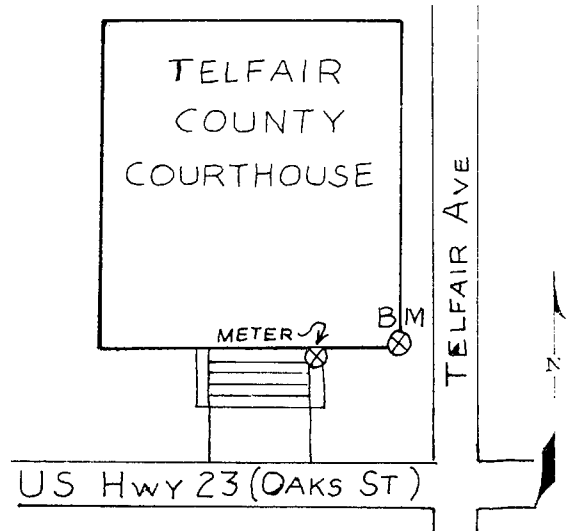
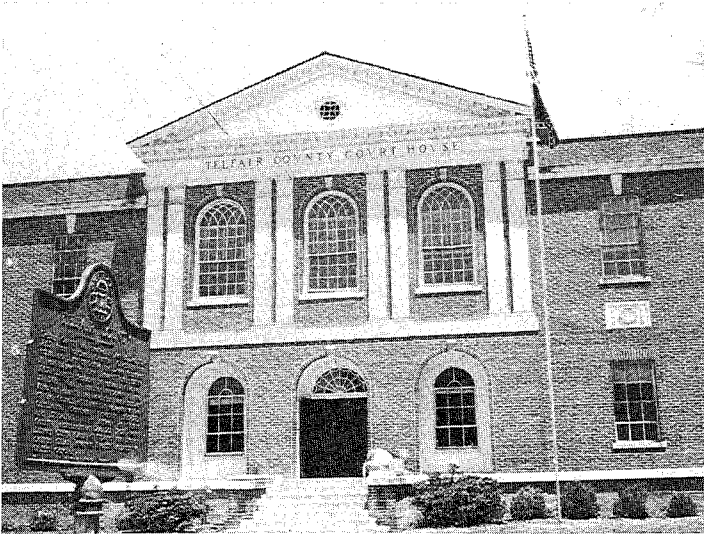


MACON K — $32^{\circ} 42'00''N$, $83^{\circ} 38'05''W$; elevation 354 ft. Value: 979,530.63 mgal; propagated error: $\pm .015$. Gravity base station is located at Macon Municipal Airport at abandoned passenger terminal now occupied by the Weather Bureau and FAA. Woollard and Rose WA-20 = Macon K. (Described by L. M. Dorman, Ga. Tech., July 1966.)

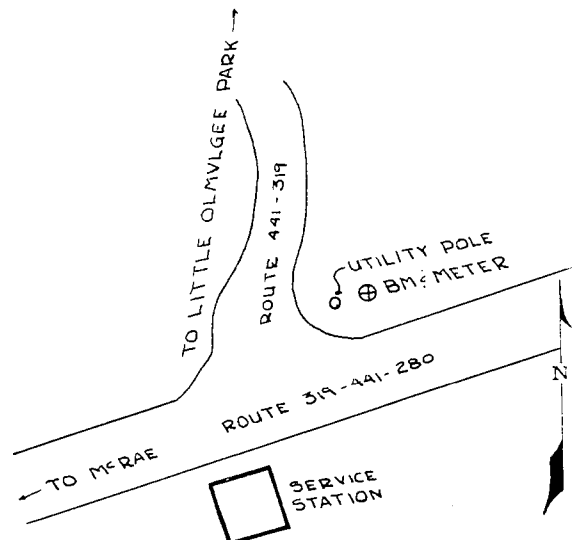
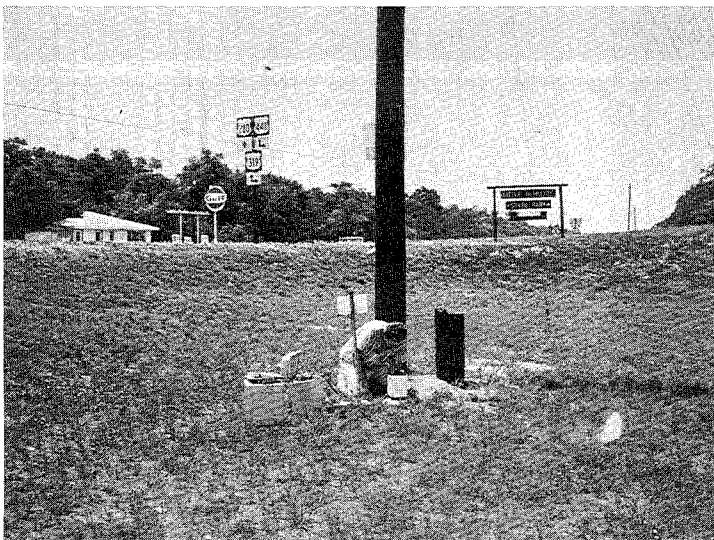


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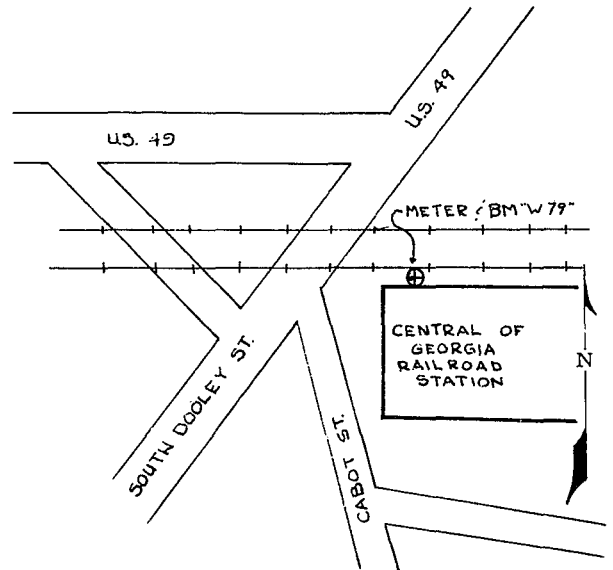
MCRAE B — $32^{\circ}04'00''N$, $82^{\circ}54'00''W$; elevation 261.546 ft. Value: 979,484.28 mgal; propagated error: ± 0.018 . Gravity base station is at Telfair County Courthouse in McRae, Ga., at the intersection of Oak Street (U.S. Hwy. 23) and Telfair Avenue, at the main entrance to the courthouse, on the extreme back of the east coping. BM F-242-1959, elevation 258.546 ft., USC&GS quad 320823. (Described by E. D. Crawford, Army Map Service 31 May 1968.)



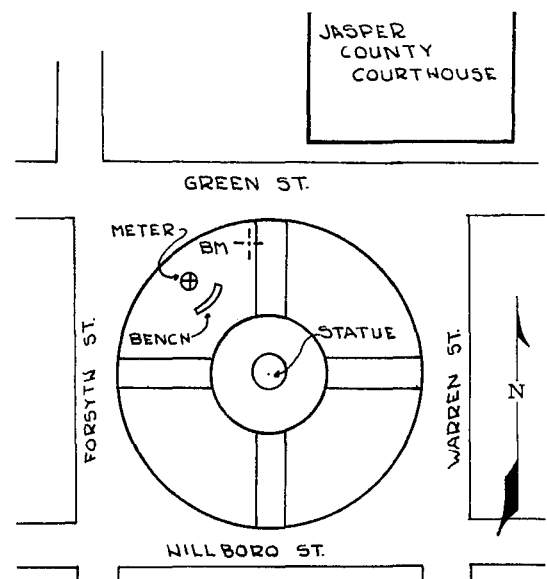
MCRAE C — $32^{\circ}05'00''N$, $82^{\circ}52'09''W$; elevation 170.577 ft. Value: 979,489.35 mgal; propagated error: ± 0.012 . Gravity base station is located about 1.6 miles northeast along U.S. Hwy. 280 from the intersection of Oak and Third Streets in downtown McRae, at the junction of U.S. Hwys. 441-319 and 280, about 40 feet south of and about 7 feet below the level of the road. Ga. Tech. G-7 = McRae C. Meters were read over USC&GS BM S 244-1959. (Recovered by E. D. Crawford, Army Map Service, 31 May 1968.)



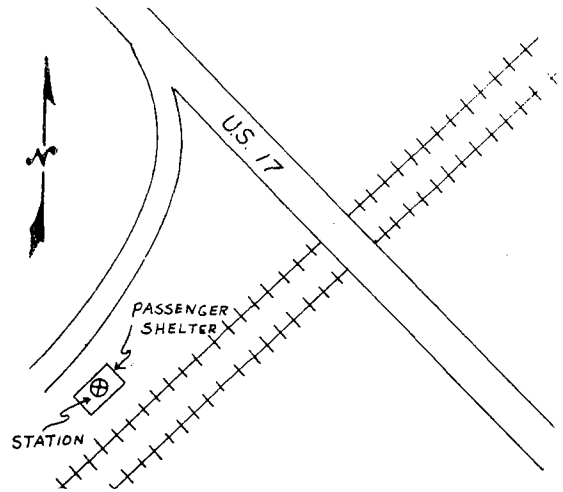
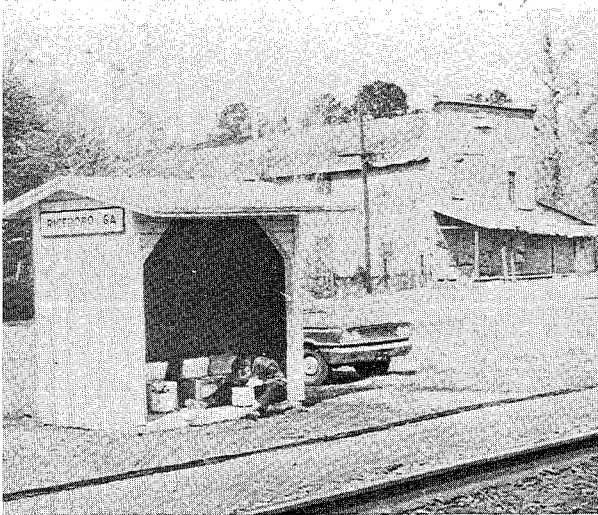
MONTEZUMA — $32^{\circ}15'09''\text{N}$, $84^{\circ}01'02''\text{W}$; elevation 288.221 ft. Value: 979,520.33 mgal; propagated error: ± 0.010 . Gravity base station is located in Montezuma, Ga., at the Central of Georgia Railroad Station and Montezuma Police Dept., at the intersection of South Dooley and Cabot Streets, at the north side of the station, about 9 feet east from the northwest corner on the walk, directly below USC&GS BM W79-1934, elevation 292.221 ft (Described by E. D. Crawford, Army Map Service, 4 June 1968.)



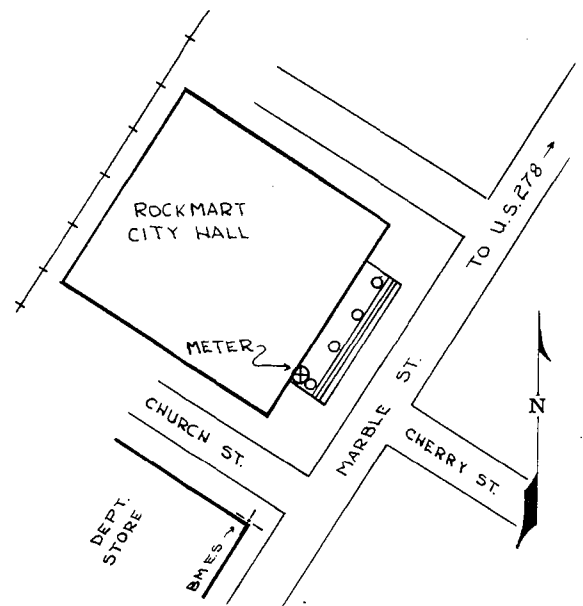
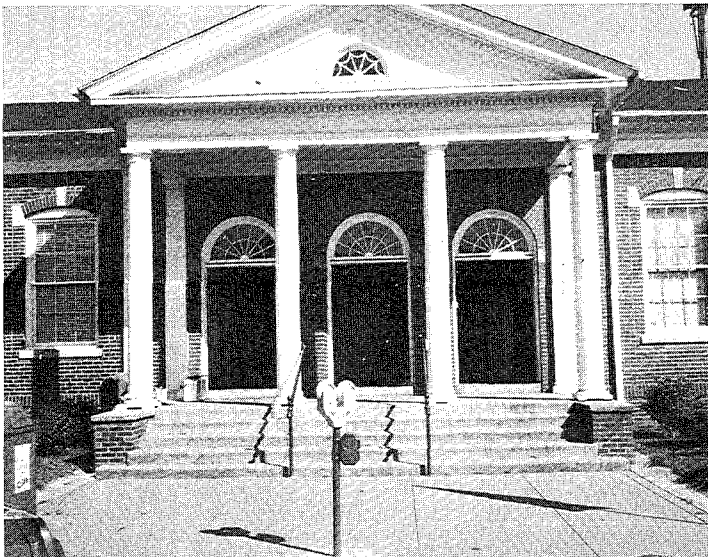
MONTICELLO — $33^{\circ}18'02''\text{N}$, $83^{\circ}40'09''\text{W}$; elevation 683.23 ft. Value: 979,563.03 mgal; propagated error: ± 0.014 . Gravity base station is located in Monticello, Ga., at the park in the city square about 9 feet northwest of a marble bench inscribed "In memory Henry Mortimer Jordan", on a round marble disk (1½ ft. diameter) set flush with the ground. USGS BM TTS K 51 1934, elevation 683.227 ft. (Described by E. D. Crawford, Army Map Service, 10 June 1968.)



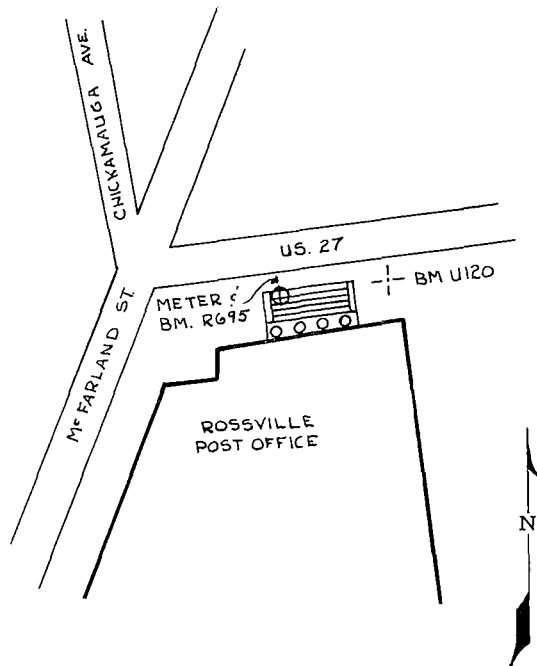
RICEBORO — $31^{\circ} 44'25''\text{N}$, $81^{\circ} 25'75''\text{W}$. Value: 979,454.02 mgal; propagated error: $\pm .019$. The station is the concrete foundation of the passenger shelter which bears a sign "Riceboro, Ga." It is located on the northwest side of the tracks. The station can be reached by taking U.S. Hwy. 17 South out of Riceboro, Ga., and turning right off the highway just before reaching the railroad overpass. (Described by H. N. Caddess, Army Map Service, March 1964.)



ROCKMART — $34^{\circ} 00'00''\text{N}$, $85^{\circ} 02'09''\text{W}$; elevation 753.460 ft. Value: 979,580.04 mgal; propagated error: $\pm .014$. Gravity base station is located in Rockmart, Ga., at the City Hall Building on city block from U.S. Hwy. 278, southwest along Marble Street at its intersection with Cherry Street, on the southwest corner of the porch in front of the false pilaster. USC&GS BM E5, elevation 753.460. (Described by E. D. Crawford, Army Map Service, 14 June 1968.)



ROSSVILLE — $34^{\circ}48'09''N$, $85^{\circ}17'01''W$; elevation 695 ft. Value: 979,648.10 mgal; propagated error: ± 0.015 . Gravity base station is located in Rossville, Ga., along U.S. Hwy. 27 at the Post Office Building, at the intersection of Chickamauga Avenue and McFarland Street, at the north entrance and on top of the west end of the first concrete step, directly over USGS BM R-693-1934, USC&GS BM U120. (Described by E. D. Crawford, Army Map Service, 14 June 1968.)

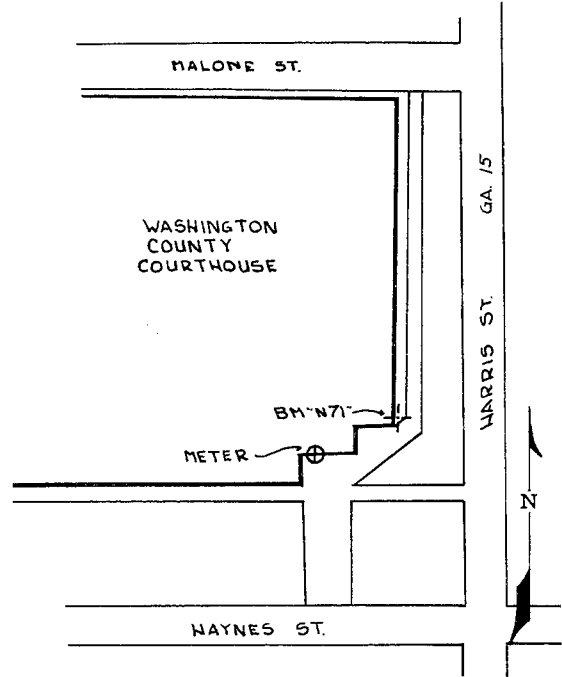


ST. SIMONS — $31^{\circ}09'03''N$, $81^{\circ}23'02''W$; elevation 17 ft. Value: 979,448.45 mgal; propagated error: ± 0.013 . Station located at St. Simons Airport, on concrete walk next to the ramp, north of the passenger gate which is directly in front of passenger lounge. Woollard & Rose WA-485 = St. Simons. (Described by L. M. Dorman, Ga. Tech., July 1966.)

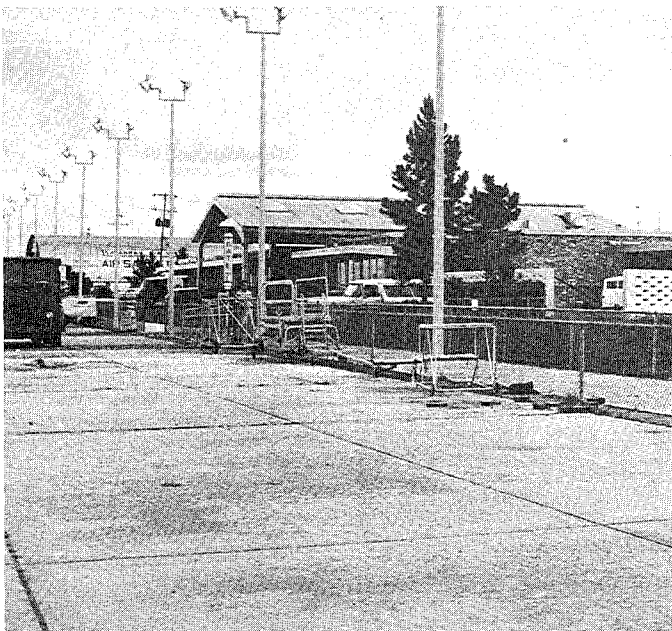


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SANDERSVILLE — $32^{\circ}59'00''N$, $82^{\circ}48'07''W$; elevation 457.57 ft. Value: 979,634.69 mgal; propagated error: $\pm.015$. Gravity base station is located in Sandersville, Ga., along Ga. Hwy. 15 and 24 (Harris Street) at the intersection of Harris and Haynes Streets, at the Washington County Courthouse, at the southeast entrance in the archway, on the west side on the door sill, next to the pilaster supporting the arch. USC&GS BM N 71 1934, elevation 458.867 ft. (Described by E. D. Crawford, Army Map Service, 19 June 1968.)

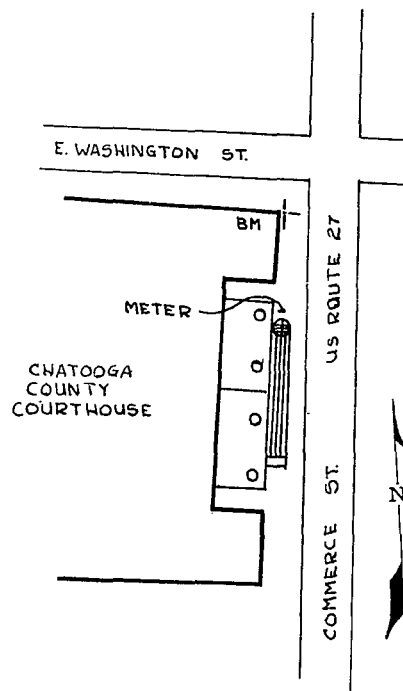
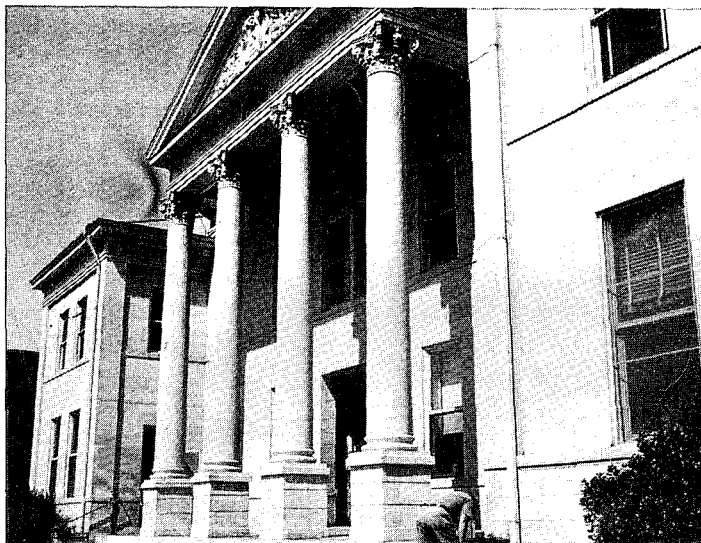


SAVANNAH — $32^{\circ}02'07''N$, $82^{\circ}08'00''W$; elevation 40 ft. Value: 979,496.82 mgal; propagated error: $\pm.012$. The station is located at Gate 2, Travis Field. Woollard & Rose WA-99 = Savannah. (Described by L. M. Dorman, Ga. Tech., July 1966.)

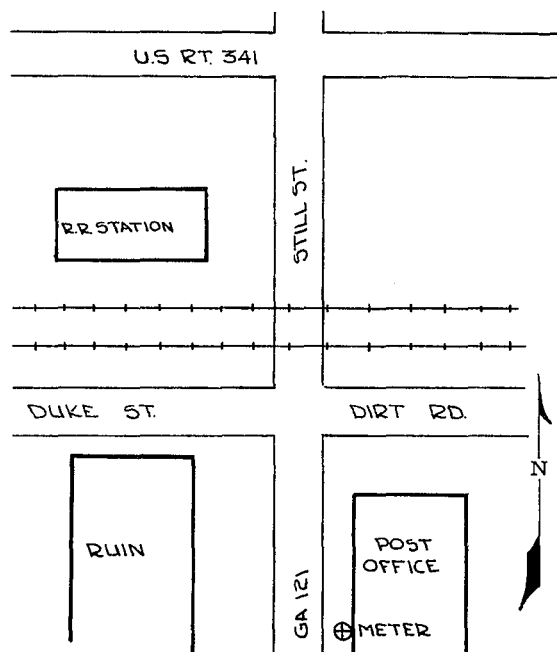
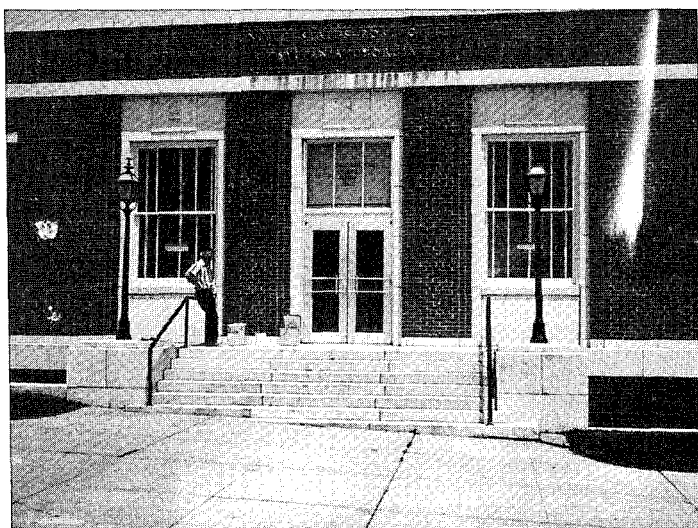


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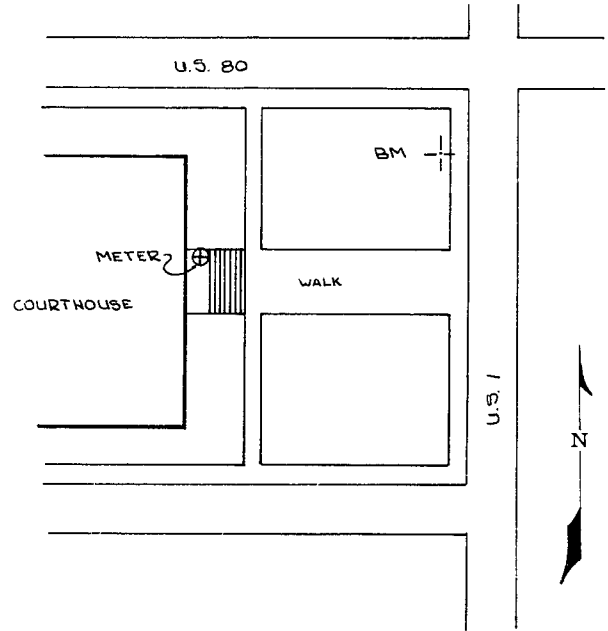
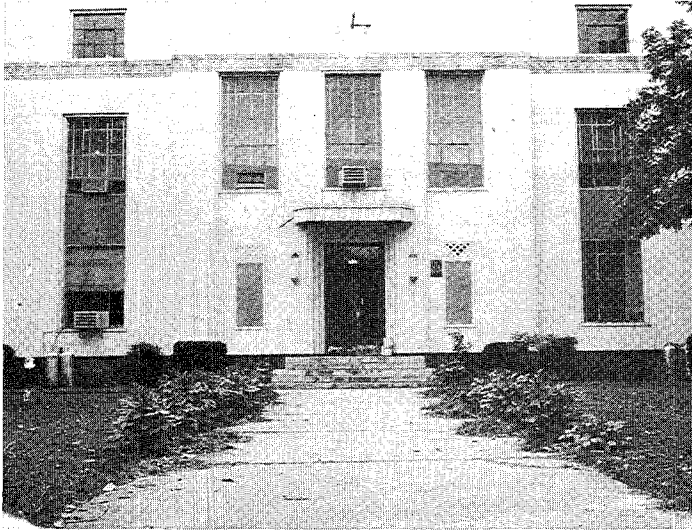
SUMMERVILLE — $34^{\circ}28'08''\text{N}$, $85^{\circ}20'07''\text{W}$; elevation 652.42 ft. Value: 979,634.69 mgal; propagated error: ± 0.015 . Gravity base station is located in Summerville, Ga., at the intersection of E. Washington and Commerce Streets (U.S. Hwy. 27). USGS BM 668, elevation 916 ft. (Described by E. D. Crawford, Army Map Service, 14 June 1968.)



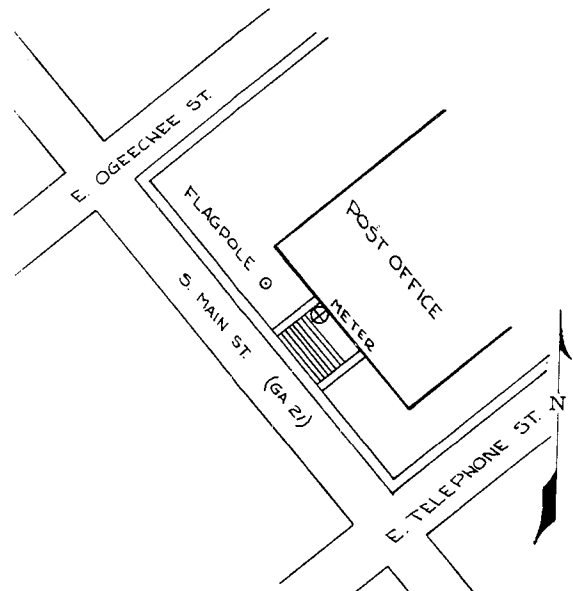
SURRENCY — $31^{\circ}43'00''\text{N}$, $82^{\circ}12'00''\text{W}$; elevation 188 ft. Value: 979,459.76 mgal; propagated error: ± 0.018 . Gravity base station is at new post office in Surrency, Ga., along Still Street about 400 feet south of U.S. Hwy. 341, at the main entrance to the post office, two feet north of the door on the concrete walk, level with the ground. Elevation source: USC&GS quad 310821 - 1st - 1929. (Described by E. D. Crawford, Army Map Service, 20 May 1968.)



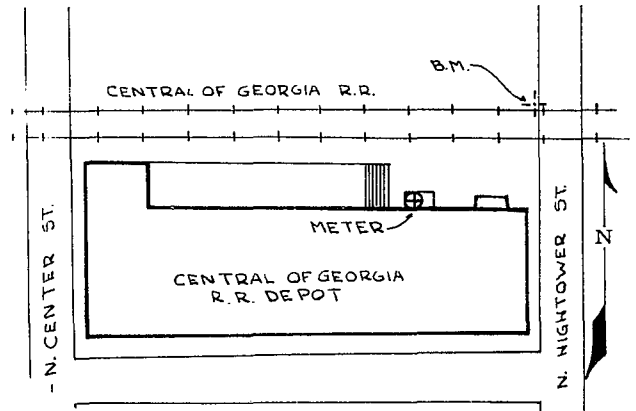
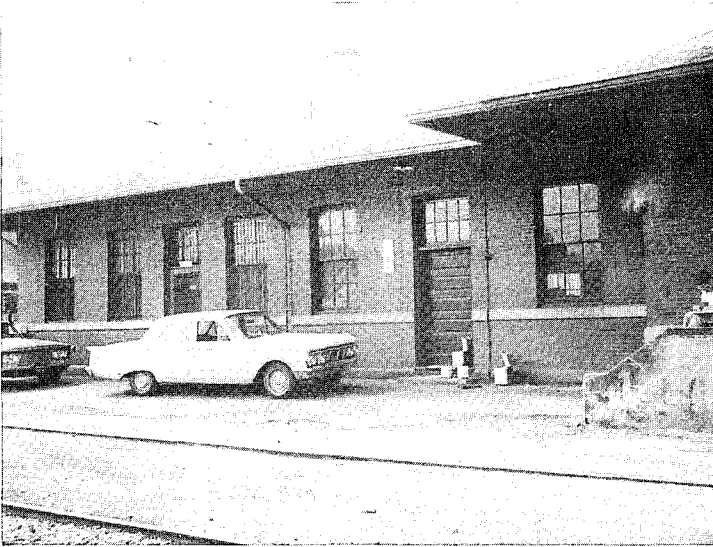
SWAINSBORO — $32^{\circ}35'06''\text{N}$, $82^{\circ}20'00''\text{W}$; elevation 335.604 ft. Value: 979,527.18 mgal; propagated error: ± 0.017 . Gravity base station is at Emanuel County Courthouse in Swainsboro, Ga., along U.S. Hwy. 1, at intersection of U.S. Hwy. 1 and U.S. Hwy. 80, at the main entrance, about 2 feet north of the door, on the concrete area, about 1 foot away from the exterior of the building. Meter is about 4 feet above USC&GS BM "Swainsboro - 1934", BM elevation 331.604 ft. (Described by J. F. Lambert, Army Map Service, 17 May 1968.)



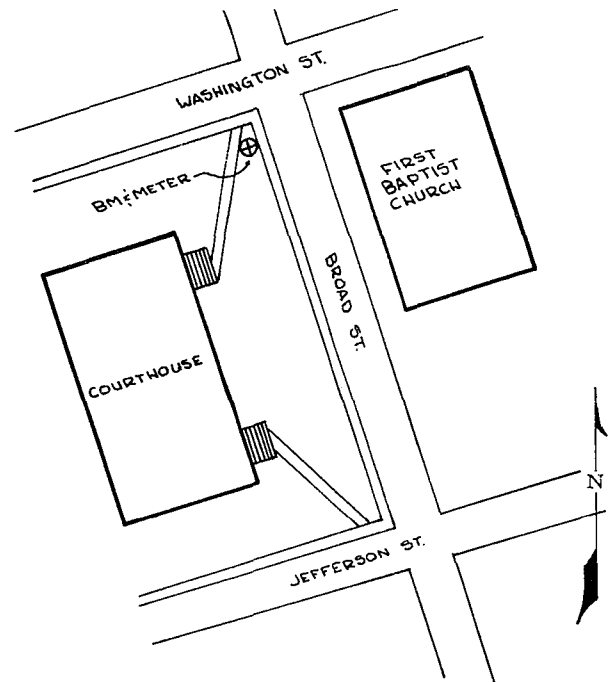
SYLVANIA — $38^{\circ}45'00''\text{N}$, $81^{\circ}38'03''\text{W}$; elevation 236.2 ft. Value: 979,539.73 mgal; propagated error: ± 0.017 . Gravity base station is at Post Office in Sylvania, Ga., along Ga. Hwy. 21 (South Main Street), at the intersection of South Main and East Telephone Streets, at the main entrance, on the northwest corner of the concrete area, about 2 feet from the door, 1 foot from the exterior of the building. Elevation source USGS quad "Hilltonia". BM K-136, elevation 236.190 ft. (Described by J. F. Lambert, Army Map Service, 16 May 1968.)



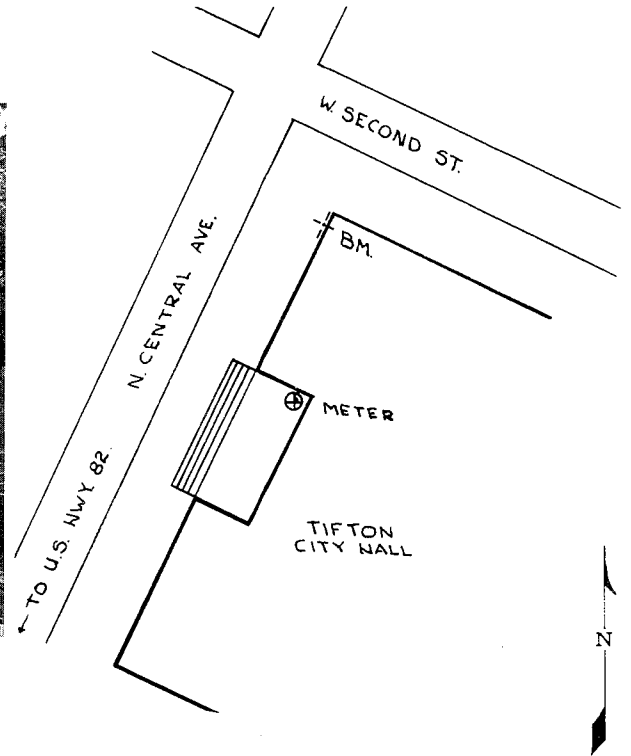
THOMASTON — $32^{\circ}53'04''\text{N}$, $84^{\circ}19'05''\text{W}$; elevation 735.53 ft. Value: 979,529.27 mgal; propagated error: ± 0.014 . Gravity base station is located in Thomaston, Ga., along the Central of Georgia Railroad between N. Center and N. Hightower Streets at the Central of Georgia Railroad Depot, on the north side of the depot at second door from the east end of the building, at the west edge of the concrete stoop (step) in front of the door. USC&GS BM N 104-1934, elevation 734.542 ft. (Described by E. D. Crawford, Army Map Service, 11 June 1968.)



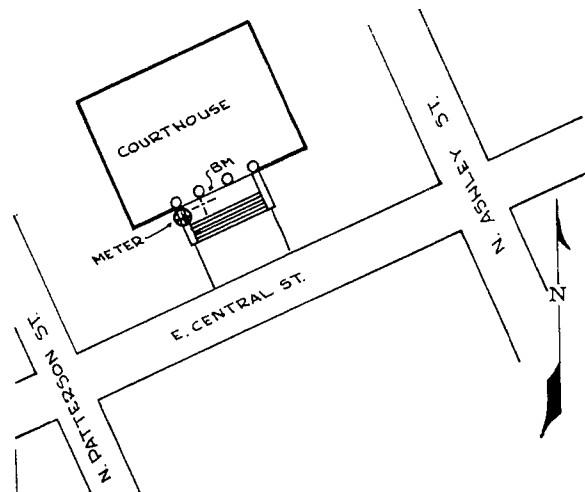
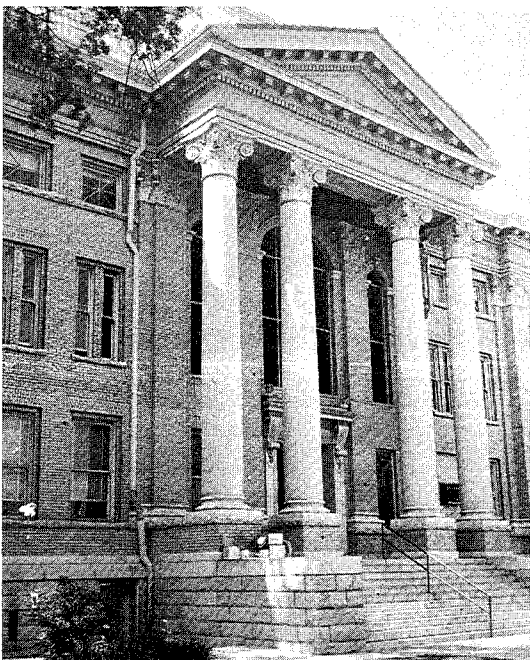
THOMASVILLE — $33^{\circ}50'03''\text{N}$, $83^{\circ}59'00''\text{W}$; elevation 284.527 ft. Value: 979,382.75 mgal; propagated error: ± 0.011 . The gravity base station is located in Thomasville, Ga., at the Thomas County Courthouse, at the northeast corner of the courthouse square. The meter is read on top of USC&GS BM "Thomasville" 1933, USC&GS quad 300834. (Described by E. D. Crawford, Army Service, 23 May 1968.)



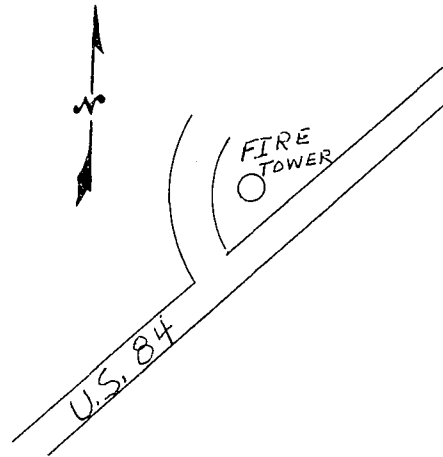
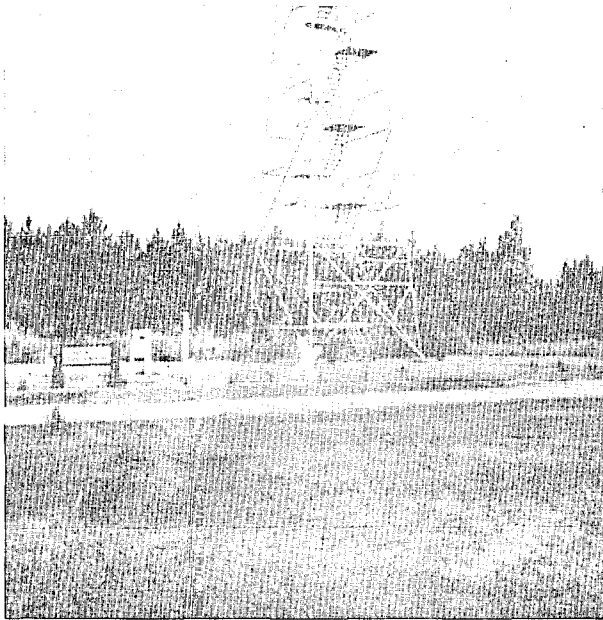
TIFTON — $31^{\circ}27'03''\text{N}$, $83^{\circ}30'06''\text{W}$; elevation 370.573 ft. Value: 979,472.75 mgal; propagated error: ± 0.015 . Gravity base station is located in Tifton, Ga., at the intersection of N. Central Avenue and W. 2nd Street, at Tifton City Hall, at the northwest corner of the porch USC&GS BM C-157-1957, elevation 370.573 ft. (Described by E. D. Crawford, Army Map Service, 1 June 1968.)



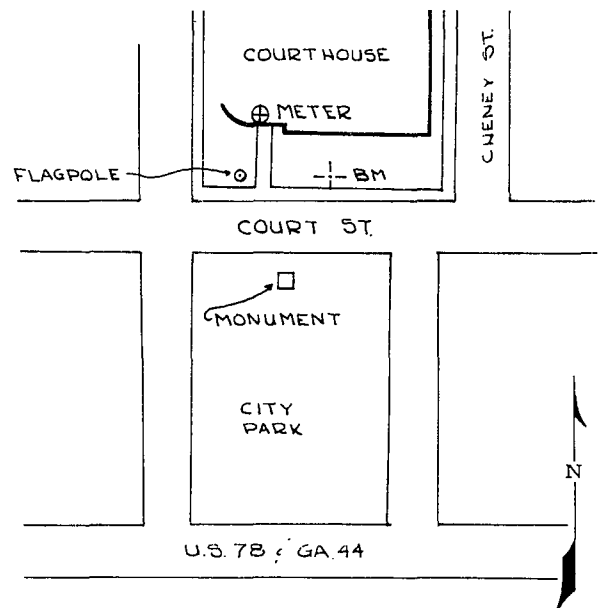
VALDOSTA B — $30^{\circ}49'08''\text{N}$, $83^{\circ}16'07''\text{W}$; elevation 226.699 ft. Value: 979,381.17 mgal; propagated error: ± 0.008 . Gravity base station is located in Valdosta, Ga., at the Lowndes County Courthouse on East Central Street between North Patterson Street and North Ashley Street, on the extreme back of the southwest coping. USC&GS BM Q 32-1917, USC&GS quad 300831 - 1st - 1929, elevation 229.199 ft. (Described by E. D. Crawford, Army Map Service, 23 May 1968.)



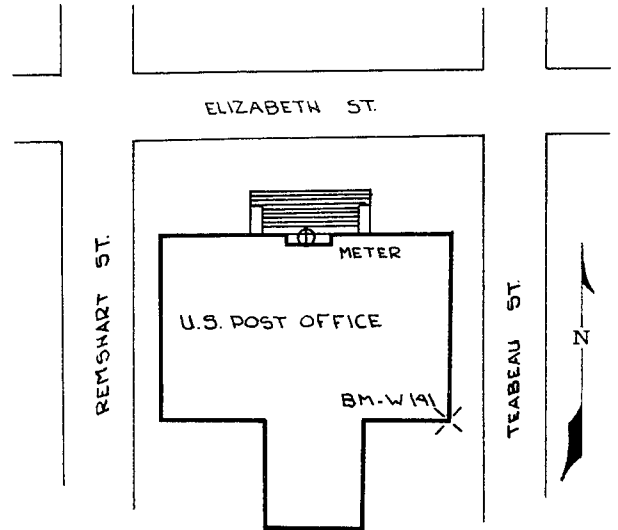
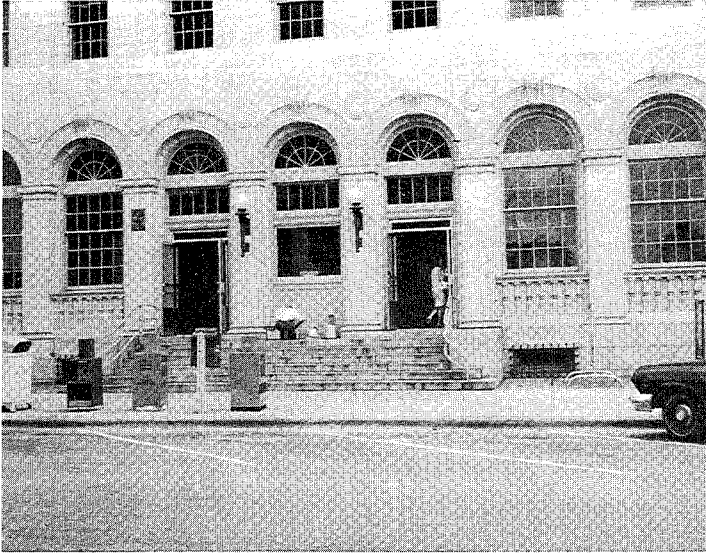
VALDOSTA C — $30^{\circ}51'05''\text{N}$, $83^{\circ}12'05''\text{W}$; elevation 216 ft. Value: 979,380.67 mgal; propagated error: ± 0.013 . Station located at southwest corner of concrete pier at base of fire tower at Lowndes County Forestry Headquarters. The station is 4.7 miles northeast of Valdosta on U.S. Hwy. 84. Georgia Tech. G-4 = Valdosta C. (Described by L. M. Dorman, Ga. Tech., July 1966.)



WASHINGTON — $33^{\circ}44'03''\text{N}$, $82^{\circ}44'05''\text{W}$; elevation 621.831 ft. Value: 979,601.69 mgal; propagated error: ± 0.014 . Gravity base station is at county courthouse in Washington, Ga., along Court Street, about 0.2 mile north of U.S. Hwy. 78 and Ga. Hwy. 44, at the main entrance, about 3 feet west of the door on the concrete porch area. USC&GS BM "618.831-P-129-1934" is about 70 feet southeast of and 3 feet below the level of the meter. (Described by J. F. Lambert, Army Map Service, 17 April 1968.)



WAYCROSS — $31^{\circ}13'01''N$, $82^{\circ}21'06''W$; elevation 139.359 ft. Value: 979,431.26 mgal; propagated error: ± 0.011 . The gravity base station is located in Waycross, Ga., at the main Post Office Building, at Elizabeth and Tebeau Streets, at the main entrance, set on the porch in the middle of the recessed area between the main entrance doors. USC&GS BM "W141 1956", elevation 138.359 ft. (Described by E. D. Crawford, Army Map Service, 27 May 1968.)



WAYNESBORO — $33^{\circ}05'04''N$, $82^{\circ}00'08''W$; elevation 294.7 ft. Value: 979,553.06 mgal; propagated error: ± 0.015 . Gravity base station is at newer part of county courthouse in Waynesboro, Ga., at intersection of U.S. Hwy. 24 (Liberty Street) and 6th Street at the main entrance, about one foot northwest of the door, on the concrete porch area. USC&GS BM "T 259-1960", elevation 293,700 ft. (Described by J. F. Lambert, Army Map Service, 16 May 1968.)

