

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Gravity base station network and descriptions for the Greenville
1° by 2° Quadrangle, Georgia and South Carolina

by

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This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards. Any use of trade names is for descriptive purposes only and does not imply endorsement by the U.S.G.S.

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Table of Contents

	Page
Introduction.....	1
Base Station Data Acquisition.....	1
References.....	2

Illustration

Figure 1. --Map showing locations of the base stations within the Greenville 1° by 2° quadrangle described within this report.....	2
--	---

Table

Table 1. Summary of the base station information.....	3
---	---

Appendix

Appendix A: Gravity base station descriptions.....	4
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Introduction

During 1984 and 1985, gravity stations were acquired and compiled by the U.S. Geological Survey from a variety of sources, including direct field acquisition by USGS personnel, in the Greenville 1° x 2° quadrangle, Georgia and South Carolina, as part of the Conterminous United States Mineral Assessment Program (CUSMAP). The objectives of the geophysical component of this program are to provide three-dimensional information about rock structures that might control the emplacement of mineralization and energy resources within the quadrangle. In order to facilitate the field gravity data acquisition, a network of base stations was set up, anchored to the only two remaining of five original Defense Mapping Agency (DMA) base stations.

Base station data acquisition

Locations for base stations were chosen strategically around the quadrangle, consideration being weighted by 1) easy access from major highways at any time of the day or night, and 2) any point within the quadrangle had to be located within 100 minutes driving time from at least one base. Once the sites were chosen, the stations were repeatedly occupied as close in time as possible to an occupation of one of the two remaining reference bases of the DMA Gravity Reference Network (DMAAC, 1974).

The original base stations of the DMA Gravity Reference Network within the Greenville 1° by 2° sheet were in Gainesville, Clayton, and Elberton, Georgia, and in Pickens and Greenwood, South Carolina. Subsequent to the 1974 release of the base station list, three stations within the quadrangle were rendered unuseable by building modifications or demolition, and only the DMA bases at the Pickens County courthouse, Pickens, South Carolina, and the Elberton courthouse, in Elberton, Georgia, remained. These latter two are the DMA reference bases used to anchor the bases of this open-file report.

The apparent observed gravity of each new base station in the net was acquired at least three, and usually four to six times, by making short-time-interval occupations of the new base and one of the two DMA "anchor" bases within a closed station-measurement loop. The data were then reduced taking into account tidal corrections, followed by meter drift. The resulting apparent observed gravity from each base occupation pair was averaged with only two exceptions, each case being where one station pair gave a value more than twice the standard deviation from the mean of all other occupation pairs. The results are listed in Appendix A, where most parts of the description are self-explanatory. The estimated accuracy in all cases is equal to or greater than that of the two DMA "anchor" bases, no matter how close the grouping of observed gravity values.

References

Defense Mapping Agency Aerospace Center, 1974, World relative gravity reference network, North America, Part 2: DMAAC Reference Publication No. 25, with supplement updating gravity values to the International Gravity Standardization Net 1971, 1635 p.

GREENVILLE 1° x 2° QUADRANGLE

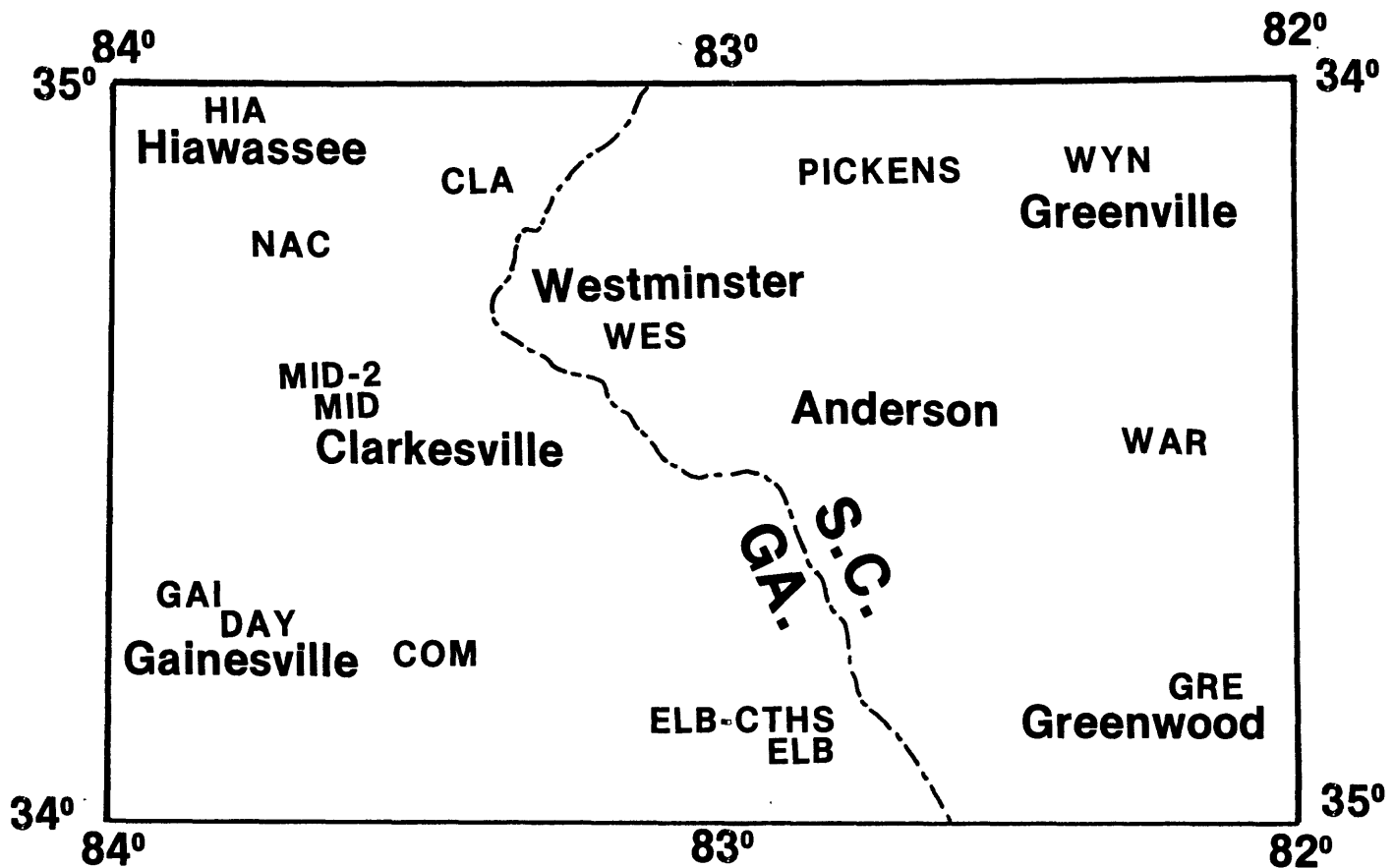


Figure 1. --Map showing locations of the base stations within the Greenville 1° by 2° quadrangle described within this report.

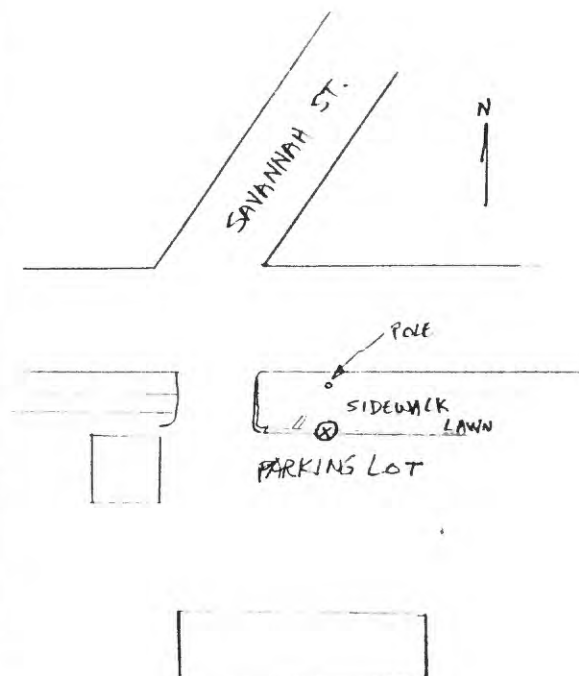
Table 1. --Summary of the base station information.

STATION	LATITUDE:	LONGITUDE:	OBSGRAV	ELEV	NEAREST CITY
CLA	34° 52.80N	83° 24.30W	979,533.58	1896 feet 577.9 m.	Clayton, Ga.
COM	34° 13.64N	83° 29.79W	979,572.58	879 feet 267.9 m.	Commerce, Ga.
DAY	34° 17.01N	83° 47.92W	979,549.07	1270 feet 387.1 m.	Gainesville, Ga
ELB	34° 05.19N	82° 52.80W	979,604.30	680 feet 207.3 m.	Elberton, Ga.
ELB Crt	34° 06.06N	82° 52.00W	979,603.74	699 feet 213.1 m.	Elberton, Ga.
GAI	34° 18.00N	83° 49.60W	979,546.46	1272 feet 387.7 m.	Gainesville, Ga
GRE	34° 11.40N	82° 09.60W	979,626.93	661 feet 201.5 m.	Greenwood, S.C.
HIA	34° 57.83N	83° 47.24W	979,565.29	1996 feet 608.4 m.	Hiawassee, Ga.
MID	34° 32.50N	83° 32.43W	979,551.73	1436 feet 437.7 m.	Clarkesville Ga
MID-2	34° 32.50N	83° 32.60W	979,551.30	1452 feet 442.6 m.	Clarkesville Ga
NAC	34° 41.11N	83° 42.65W	979,568.34	1375 feet 419.1 m.	Helen, Ga.
PICKENS	34° 53.00N	82° 42.50W	979,585.83	1113.5 ft. 339.4 m.	Pickens, S.C.
WAR	34° 14.99N	82° 16.48W	979,621.41	718 feet 218.9 m.	Princeton, S.C.
WES	34° 39.74N	83° 04.50W	979,576.15	924 feet 281.6 m.	Westminster, SC
WYN	34° 53.48N	82° 22.30W	979,606.53	1060 feet 323.1 m.	Greenville, SC

GRAVITY BASE STATION

LATITUDE: 34° 52.80N	STATION DESIGNATION: CLA	
LONGITUDE: 83° 24.30W	STATE: Georgia	
ELEVATION: 1896 feet	ADOPTED GRAVITY VALUE: 979,533.58	
577.9 meters	ESTIMATED ACCURACY +- .10	
Reference Base:	Value:	Date:
PICKENS COURTHOUSE	979533.69	23 Jun 1984
PICKENS COURTHOUSE	979533.69	13 Apr 1984
GAI	979533.48	11 Apr 1984
HIA	979533.52	19 Jan 1985
PICKENS COURTHOUSE	979533.50	15 Jan 1985

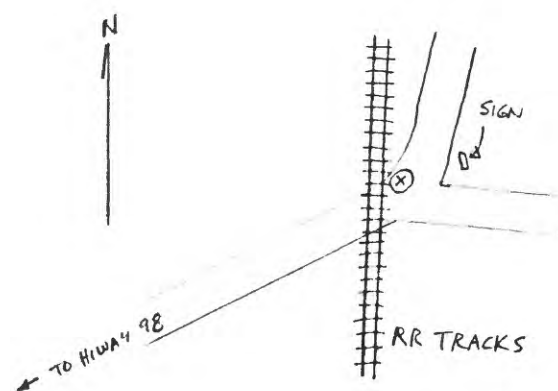
DESCRIPTION/PHOTO: This is a reestablished station, located in the southeastern corner of the Dillard, Ga. Quadrangle. The original Rabun County High School and Bell where the Clayton DMA base station once stood has been converted into a parking lot, and the main building razed. The new station is located in approximately the same location as the original station, only now is located in a curb/gutter of the new parking lot, approximately 3 meters east of the east edge of the entrance of the parking lot, and about 5 meters south of a telephone pole. This telephone pole is located adjacent to a sidewalk, on the south edge of Ga Highway 76 to Hiawassee. Savannah Street runs into Highway 76 across the street from the station. The station is identified by a separation in the poured concrete, and a black circle with "CLAY" in the center. Photo view is to the north.



GRAVITY BASE STATION

LATITUDE: 34° 13.64N		STATION DESIGNATION: COM	
LONGITUDE: 83° 29.79W		STATE: Georgia	
ELEVATION: 879 feet		ADOPTED GRAVITY VALUE: 979,572.58	
267.9 meters		ESTIMATED ACCURACY +- .10	
Reference Base:		Value:	Date:
_PICKENS COURTHOUSE		979572.60	23 Jun 1984
_PICKENS COURTHOUSE		979572.65	13 Apr 1984
_PICKENS COURTHOUSE		979572.54	15 Jan 1985
_ELBERTON COURTHOUSE		979572.51	07 Nov 1985

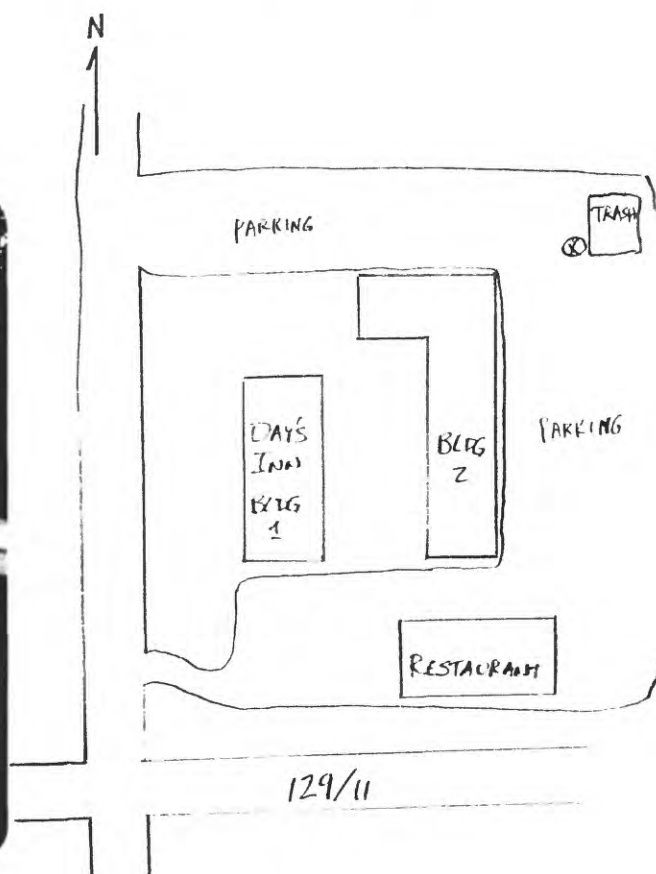
DESCRIPTION/PHOTO: The station is in the northwestern corner of the Commerce Ga. Quadrangle, 200 meters northeast on an unpaved road that extends NNE from Georgia Highway 98. The city of Commerce lies SE along Highway 98 from the intersection with this unnamed road; the unpaved road leads to a railroad crossing, where pavement starts, and a "State Highway Dept. Resident Engineer Office" sign can be seen. This sign is prominently displayed northeast of the intersection with the railroad tracks in the fork of the (now paved) road. The station itself lies about 3 meters northeast of the railroad tracks, on the northwest side of the road, at the beginning of the fork described above. A red circle is painted in the pavement, with a faint black "COM" in the center. View in the photo is to the northeast.



GRAVITY BASE STATION

LATITUDE: 34° 17.01N		STATION DESIGNATION: DAY	
LONGITUDE: 83° 47.92W		-----	
		STATE: Georgia	
ELEVATION: 1270 feet		ADOPTED GRAVITY VALUE: 979,549.07	
387.1 meters		ESTIMATED ACCURACY +- .16	
Reference Base:		Value:	Date:
PICKENS COURTHOUSE		979549.24	23 Jun 1984
GAI		979549.04	23 Jun 1984
GAI		979549.07	11 Apr 1984
ATLANTA-D		979548.92	21 Jan 1985

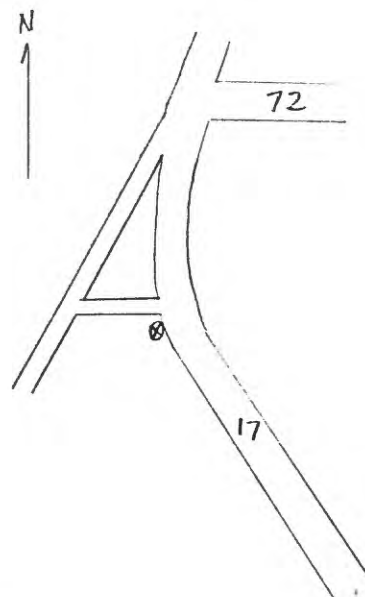
DESCRIPTION/PHOTO: The station is located at the Day's Inn, two miles east of Gainesville Ga. on Highway 129/11. The station is located at the southwest corner of the trashbins of the motel, on a concrete slab that is in the northeastern corner of the Motel complex, on the edge of the parking lot, and the highest topographic point of the property. The station is marked with a black circle with the letters "DAY" in the center. Photo view is to the southeast.



GRAVITY BASE STATION

LATITUDE: 34° 05.19N		STATION DESIGNATION: ELB	
LONGITUDE: 82° 52.80W		-----	
ELEVATION: 680 feet		STATE: Georgia	
207.3 meters		ADOPTED GRAVITY VALUE: 979,604.30	
		ESTIMATED ACCURACY +- .10	
Reference Base:		Value:	Date:
PICKENS COURTHOUSE		979604.39	23 Jun 1984
PICKENS COURTHOUSE		979604.19	13 Apr 1984
PICKENS COURTHOUSE		979604.27	15 Jan 1985
ELBERTON COURTHOUSE		979604.31	15 Jan 1985
ELBERTON COURTHOUSE		979604.30	23 Jun 1984
ELBERTON COURTHOUSE		979604.34	07 Nov 1985

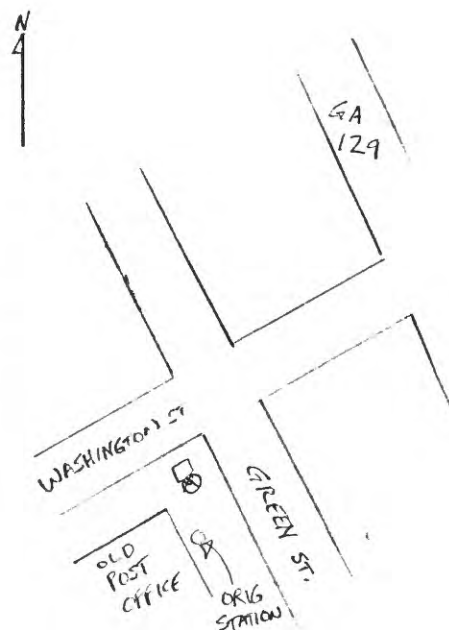
DESCRIPTION/PHOTO: The station is located in the Elberton East Quadrangle, approximately 2 miles SSE of Elberton, Georgia, at BM 680 (no longer found), located about 500 meters south of the Highway 72/Highway 17 intersection, and 200 meters northwest of Falling Creek School on Highway 17. The station is marked by a black circle on the sidewalk with "ELB" in it. It is about 2 meters west of Highway 17 and about 2 meters south of an unnamed, 100 meter-long, east-west paved road that takes off to the west from Highway 17. View in the photo is to the south.



GRAVITY BASE STATION

LATITUDE: 34° 18.00N	STATION DESIGNATION: GAI
LONGITUDE: 83° 49.60W	STATE: Georgia
ELEVATION: 1272 feet	ADOPTED GRAVITY VALUE: 979,546.46
387.7 meters	ESTIMATED ACCURACY +- .18
Reference Base:	Value: Date:
GAI-OLD	979546.46 11 Apr 1984
GAI-OLD	979546.46 11 Apr 1984
GAI-OLD	979546.47 12 Apr 1984
PICKENS COURTHOUSE	979546.64 13 Apr 1984

DESCRIPTION/PHOTO: The station is located in the City of Gainesville, Georgia. This is a reestablished station; the location of the steps where the previous Gainesville DMA base station was located had been removed and replaced with a hedge. The reference location was reconstructed using a tape measure and old building blueprints. The new station is located about 5 meters north of this original station, called here GAI-OLD; both are on the northern corner of the Old Post Office Bldg. on the corner of Washington and Green Streets, (The original DMA station diagram has these two streets reversed) one block SW of the intersection of Washington St. and Ga. Highway 129. The station is on a black circle on the southeastern tongue of the concrete pad that the flagpole is located on, about 1 meter SE of the flagpole. View in the photo is to the north, towards the center of the intersection described above. The road crossing from left to right in the photo is Washington St., and it continues one block further right to Ga. Highway 129.

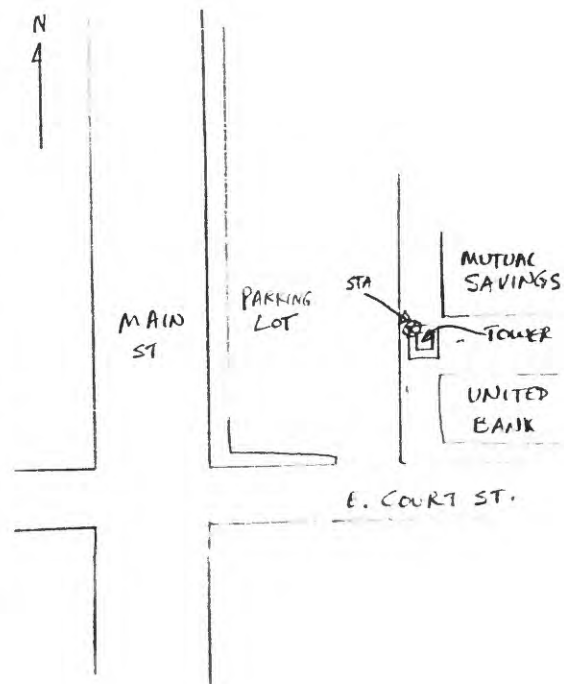


GRAVITY BASE STATION

LATITUDE: 34° 11.40N		STATION DESIGNATION: GRE	
LONGITUDE: 82° 09.60W		-----	
ELEVATION: 661 feet		STATE: South Carolina	
201.5 meters		ADOPTED GRAVITY VALUE: 979,626.93	
-----		ESTIMATED ACCURACY +- .10	
Reference Base:		Value:	Date:
PICKENS COURTHOUSE		979627.04	23 Jun 1984
PICKENS COURTHOUSE		979626.86	13 Apr 1984
PICKENS COURTHOUSE		979626.88	15 Jan 1985
ELBERTON COURTHOUSE		979626.92	15 Jan 1985

DESCRIPTION/PHOTO: The station is located in the center of Greenwood, South Carolina. This is a reestablished station, since the original Greenwood DMA base was located on a benchmark at the base of the Old City Hall, which has since been converted into a parking lot. The new station is located nearby, about one-half meter above the ground level on the northwest corner of a brick bench constituting the base of a new (1983) belltower, in front of the Mutual Savings and Loan Building. The east edge of Main Street lies about 40 meters to the west. The nearest orthogonal streets (which bracket the parking lot in front of the Mutual Savings and Loan) are E. Court and Magnolia Streets (which both run east-west). The station is marked by a red circle designed to color-coordinate with the brick of the bench. The view in the photo is to the east.

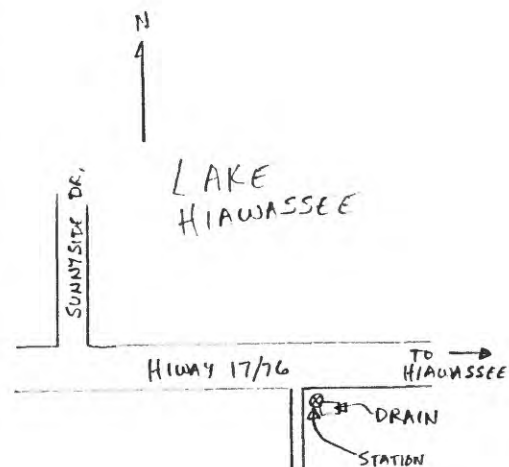
[NOTE: The original DMA Greenwood base station location was found 24 meters WNW of this bench, on the edge of a manhole cover on the original sidewalk, now an island in the middle of the parking lot on the east side of Main Street. It was not used because the building immediately adjacent to it no longer exists.]



GRAVITY BASE STATION

LATITUDE: 34° 57.83N	STATION DESIGNATION: HIA	
LONGITUDE: 83° 47.24W	STATE: Georgia	
ELEVATION: 1996 feet	ADOPTED GRAVITY VALUE: 979,565.29	
608.4 meters	ESTIMATED ACCURACY: +0.11	
Reference Base:	Value:	Date:
GAI	979565.16	11 Apr 1984
PICKENS COURTHOUSE	979565.37	13 Apr 1984
GAI	979565.38	13 Apr 1984
PICKENS COURTHOUSE	979565.23	23 Jun 1984

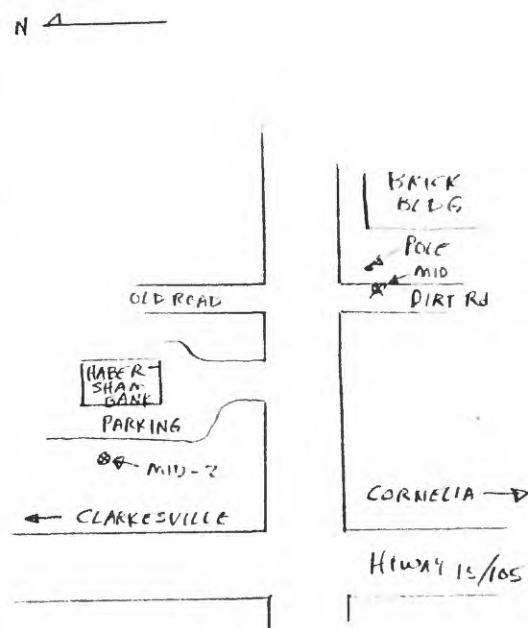
DESCRIPTION/PHOTO: The station is located in the Hiawassee quadrangle, at BM IP 61A, 2 miles NW of the center of the town of Hiawassee on Ga. Highway 17/76. The location is on the south side of the highway, about 8 meters east of a paved driveway taking off south and up the hillside from the highway, on the northwest corner of an iron/concrete storm drain about 3 meters south of 17/76. This storm drain is slightly below the ground surface of the road shoulder in which it has been placed. The unmarked paved driveway is located about 200 meters east of the intersection of Sunnyside Drive with Highway 17/76. View in the photo is towards the east.



GRAVITY BASE STATION

LATITUDE: 34° 32.50N		STATION DESIGNATION: MID-2	
LONGITUDE: 83° 32.60W		-----	
		STATE: Georgia	
ELEVATION: 1452 feet		ADOPTED GRAVITY VALUE: 979,551.30	
442.6 meters		ESTIMATED ACCURACY +- .10	
Reference Base:		Value:	Date:
PICKENS COURTHOUSE		979551.29	23 Jun 1984
HIA		979551.38	18 Jun 1984
PICKENS COURTHOUSE		979551.28	05 Nov 1985

DESCRIPTION/PHOTO: The station is in the Clarkesville quadrangle, approximately 100 meters north of the original base MID, in the middle of the lawn in front of the Habersham Bank, 2 miles north of the center of Cornelia, Georgia, on the east side of Highway 15/23/105. Station is taken on the east side of a concrete (railroad) benchmark about 40 meters west of the front door of the bank. Photo looks east towards the Bank and the benchmark is in the lawn on the near side of the left-most vehicle.

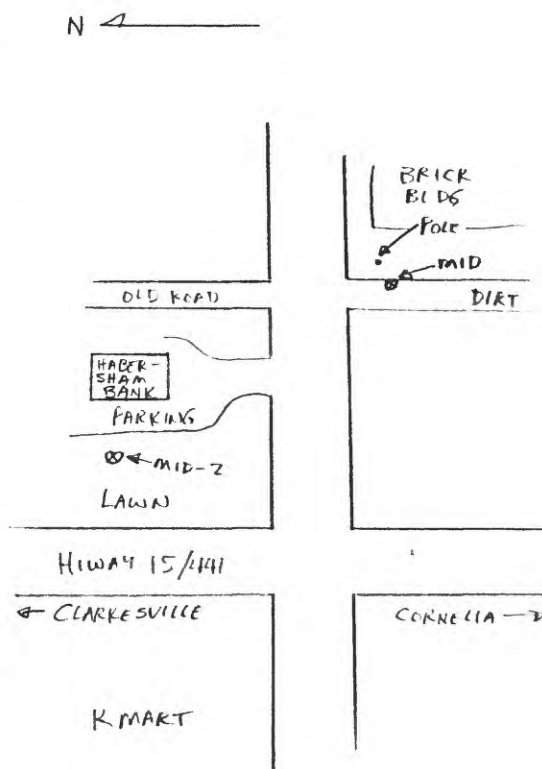


KMART

GRAVITY BASE STATION

LATITUDE: 34° 32.50N		STATION DESIGNATION: MID	
LONGITUDE: 83° 32.43W		-----	
		STATE: Georgia	
ELEVATION: 1436 feet		ADOPTED GRAVITY VALUE: 979,551.73	
437.7 meters		ESTIMATED ACCURACY +- .10	
Reference Base:		Value:	Date:
PICKENS COURTHOUSE		979551.73	23 Jun 1984
HIA		979551.72	18 Jun 1984
GAI		979551.62	11 Apr 1984
_PICKENS COURTHOUSE		979551.74	05 Nov 1985

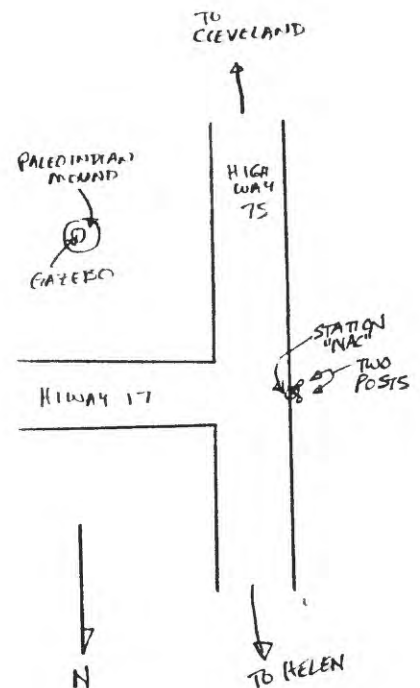
DESCRIPTION/PHOTO: Station is along Georgia Highway 15/441, at the town/intersection designated "Midway" on the USGS Clarkesville Topographic map. Station is on the east edge of an old railroad grade crossing the dirt/paved road leading around the north side of Miller's Pond, at a benchmark indicated only by a post (the latter disappeared sometime in 1985). This benchmark is 20 meters west of an abandoned red brick warehouse, and about 100 meters southeast of the Habersham Bank, several miles north of Clarkesville, South Carolina, and about 3 meters SW of a telephone pole. What looks like a gravel road in the photo is the old railroad grade, and the old warehouse is behind this; photo looks east. Note that Highway 15/441 now lies about 20 meters farther west than the old Highway 441 shown on the USGS Topographic map.



GRAVITY BASE STATION

LATITUDE: 34° 41.11N		STATION DESIGNATION: NAC	
LONGITUDE: 83° 42.65W		STATE: Georgia	
ELEVATION: 1375 feet		ADOPTED GRAVITY VALUE: 979,568.34	
419.1 meters		ESTIMATED ACCURACY +- .10	
Reference Base:	Value:	Date:	
PICKENS COURTHOUSE	979568.35	23 Jun 1984	
PICKENS COURTHOUSE	979568.34	15 Jan 1985	
HIA	979568.34	19 Jan 1985	

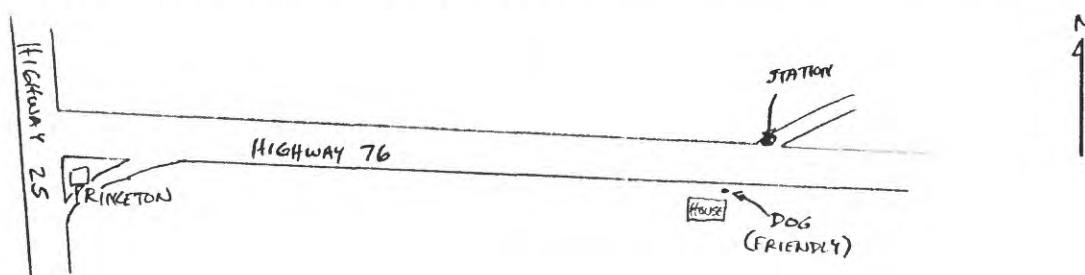
DESCRIPTION/PHOTO: The station is in the Helen Quadrangle, at the road intersection of Highways 17 and 75, west of Nacoochee, Georgia, 150 meters NW of a palaeoindian mound with a bizarre gazebo on top. Station is just off the edge of the asphalt, on a line bisecting two road sign posts. It is approximately between the two posts, one meter east of the southern of the two posts, both of which have the letters "NAC" painted on them in black. These posts are on the west side of Highway 75, across the street from the point where Highway 17 intersects it and terminates. On the asphalt, a large red arrow (not shown in the photo, which looks south) also points to the location.



GRAVITY BASE STATION

LATITUDE: 34° 14.99N	STATION DESIGNATION: WAR	
LONGITUDE: 82° 16.48W	STATE: South Carolina	
ELEVATION: 718 feet	ADOPTED GRAVITY VALUE: 979,621.41	
218.9 meters	ESTIMATED ACCURACY +- .10	
Reference Base:	Value:	Date:
PICKENS COURTHOUSE	979621.42	23 Jun 1984
PICKENS COURTHOUSE	979621.45	13 Apr 1984
PICKENS COURTHOUSE	979621.33	15 Jan 1985
GRE	979621.43	09 Nov 1985

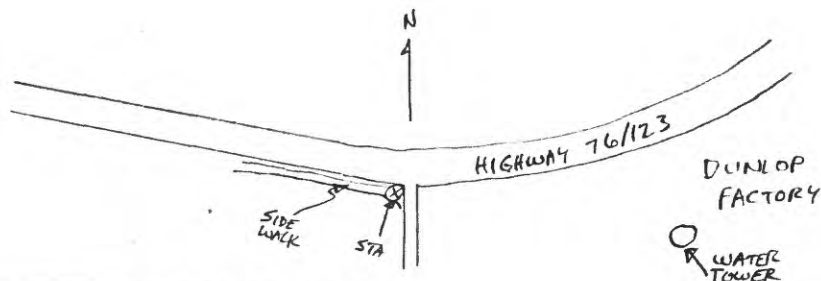
DESCRIPTION/PHOTO: The station lies in the Ware Shoals quadrangle, one mile east of Princeton, South Carolina and the intersection of highway 25 and highway 76. Station is at the top edge of the quadrangle, at the intersection of a small unnamed paved road on the north side of highway 76, about 2.5 meters ENE of the stop sign, on a red circle painted on the asphalt. View in the photo is toward a house SW of the gravity station, which is located beneath the baseplate.



GRAVITY BASE STATION

LATITUDE: 34° 39.74N		STATION DESIGNATION: WES	
LONGITUDE: 83° 04.50W		-----	
		STATE: Georgia	
ELEVATION: 924 feet		ADOPTED GRAVITY VALUE: 979,576.15	
281.6 meters		ESTIMATED ACCURACY +- .13	
Reference Base:		Value:	Date:
_PICKENS COURTHOUSE-----		979576.15-----	17 Jan 1985-----
_PICKENS COURTHOUSE-----		979575.95-----	15 Jan 1985-----
_PICKENS COURTHOUSE-----		979576.21-----	13 Apr 1984-----
_PICKENS COURTHOUSE-----		979576.18-----	23 Jun 1984-----
_PICKENS COURTHOUSE-----		979576.15-----	05 Nov 1985-----

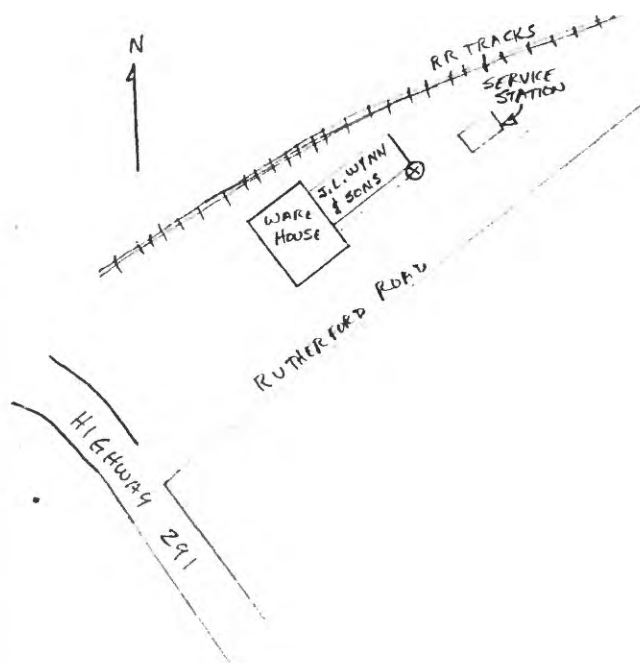
DESCRIPTION/PHOTO: The station lies in the Westminster quadrangle, approximately one mile east of the town of Westminster Georgia, along Highway 76/123, at the intersection of an unnamed road, (which takes off south from the highway) about 400 meters west of the Dunlop Maxfli golfball factory water tower. The station is on a prominent red circle with a faint black "WES" in it, painted on the east end of a sidewalk that parallels Highway 76/123 on its south side. The circle is about 2 meters west of the intersection of this sidewalk with the unnamed road. Photo is toward the Dunlop factory, and looks east along the south edge of Highway 76/123.



GRAVITY BASE STATION

LATITUDE: 34° 53.48N		STATION DESIGNATION: WYN	
LONGITUDE: 82° 22.30W		-----	
ELEVATION: 1060 feet		STATE: South Carolina	
323.1 meters		ADOPTED GRAVITY VALUE: 979606.53	
		ESTIMATED ACCURACY +- .10	
Reference Base:		Value:	Date:
PICKENS COURTHOUSE-----		979606.50-----	15 Jan 1985-----
PICKENS COURTHOUSE-----		979606.61-----	17 Jan 1985-----
PICKENS COURTHOUSE-----		979606.41-----	05 Nov 1985-----
PICKENS COURTHOUSE-----		979606.60-----	11 Nov 1985-----

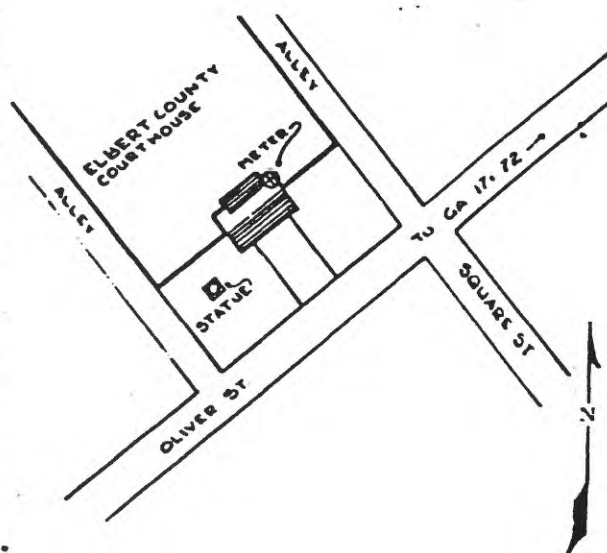
DESCRIPTION/PHOTO: The station is in the Taylors, S.C. quadrangle, northern edge of the City of Greenville, South Carolina, about 0.35 km north of Highway 291 (Pleasantburg Road) on the NW side of Rutherford Road beyond the intersection. The station is located on the northern edge of the sidewalk that fronts the "J.L. Wynn & Sons" air-conditioning equipment store in Greenville. The station is marked by a red painted circle with a faint black "WYN" in the center, just outside and to the right (going in) of the door leading to the northeastern-most office of the complex.



GRAVITY BASE STATION

LATITUDE: 34° 06.06N		STATION DESIGNATION: ELBERTON Crths
LONGITUDE: 82° 52.00W		STATE: Georgia
ELEVATION: 699 feet	ADOPTED GRAVITY VALUE: 979603.74	
213.1 meters	ESTIMATED ACCURACY ±.014	
Reference Base:	Value:	Date:
DMAAC BASE		

DESCRIPTION/PHOTO: 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.)



GRAVITY BASE STATION

LATITUDE: 34° 53.00N	STATION DESIGNATION: PICKENS Crths	
LONGITUDE: 82° 42.50W	STATE: South Carolina	
ELEVATION: 1113.5 feet	ADOPTED GRAVITY VALUE: 979585.83	
339.4 meters	ESTIMATED ACCURACY: +- .10	
Reference Base:	Value:	Date:
DMAAC BASE		

DESCRIPTION/PHOTO: "Gravity base station is at Pickens County Courthouse in Pickens, S.C. along S.C. 8 (East Main Street) at the intersection of Pendleton Street (U.S. 178) and East Main Street (S.C. 8) at the main entrance about 1 foot west of the door, and IBM is about 60 ft NW of gravity station, in the concrete porch area." (Description by J.F. Lambert, Army Map Service, dated 9 Sep 1968. "IBM" refers to the Pickens Courthouse bench mark.)

