U. S. Department of Commerce
Sinclair Weeks, *Secretary*

Coast and Geodetic Survey
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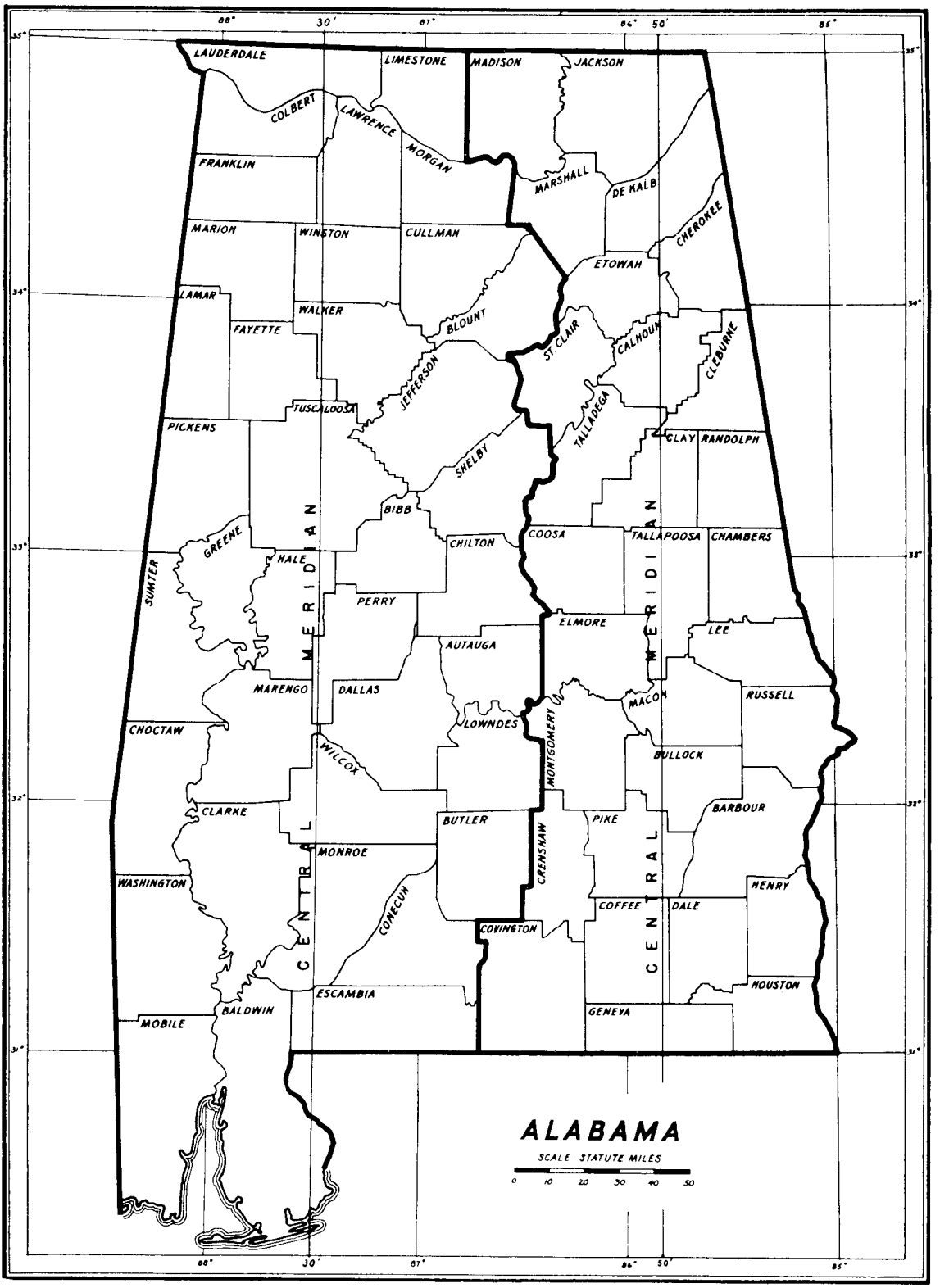
PLANE COORDINATE PROJECTION TABLES
ALABAMA



STATE PLANE-COORDINATE ZONES

Foreword

The plane coordinate system used in this State is based on the transverse Mercator projection using a reduced scale for the central meridian of the zone. The tables in this publication are to be used for the conversion of geographic positions to plane coordinates or plane coordinates to geographic positions. The constants of the projection are listed with the tables.

The methods of computation have been designed for machine calculation. All of the functions that are required are given in this publication.

The formulas and sample computations which follow show the general methods for computing either type of coordinates.

Plane coordinates from geographic positions

$$x = x' + 500{,}000$$

$$x' = H \cdot \Delta\lambda'' \pm a\,b$$

$$y = y_o + V \left(\frac{\Delta\lambda''}{100}\right)^2 \pm c$$

Grid azimuth = geodetic azimuth $- \Delta\alpha -$ second term

$$\Delta\alpha'' = \Delta\lambda'' \sin \phi + g$$

where

y_o, H, V, and <u>a</u> are based on the latitude of the geographic position,

and

b, c, and g are based on $\Delta\lambda''$.

$$\Delta\lambda'' = \text{Central Meridian} - \lambda$$

and

$\Delta\alpha''$ is the convergence of the meridian at the station with respect to the Central Meridian.

The second term for the reduction of geodetic to grid azimuths may be neglected for most work. However, for lines five miles or more in length if the same degree of accuracy is desired as is obtained by geographic computations, this term should be evaluated and used.

$$\text{Second term} = \frac{(y_2 - y_1)\ (2x_1' + x_2')}{(6\rho_o^2 \ \sin 1'')_g}$$

<u>Geographic positions from plane coordinates</u>

$$P\ (x'/10{,}000)^2 + d = V\ (\Delta\lambda''/100)^2 + c$$

$$y_o = y - P\ (x'/10{,}000)^2 - d$$

Obtain the latitude from the table of y_o.

Use latitude to obtain H from the table.

$$x' = x - 500{,}000$$

approximate $\Delta\lambda'' = x' \div H$.

Determine <u>a</u> from latitude and <u>b</u> from approximate $\Delta\lambda$

then

$$\Delta\lambda'' = (x' \mp a\ b\ ) \div H$$

$$\Delta\alpha'' = Mx' - e$$

M is based on the y and e on the x and y of the plane coordinates.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form No. 744b

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION

(Condensed form for calculating-machine computation)

State Alabama Zone East Central meridian 85° 50′ 00.″000

Station	Flint, 1930	Smithers, 1878			
ϕ	32° 38′ 57.″737	34° 48′ 58.″708			
λ	85 12 41.738	86 36 58.670			
$\Delta\lambda$ = Central mer. − λ	+0° 37′ 18.″262	−0° 46′ 58.″670			
$\Delta\lambda''$	+ 2238.″262	− 2818.″670			
$\left(\frac{\Delta\lambda''}{100}\right)^2$	500.982	794.490			
H	85.504 846	83.381 517			
V	1.118 410	1.154 219			
a | b	−0.795 | +7.139	−0.645 | +7.536			
$x' = H \cdot \Delta\lambda \pm ab$	+ 191,376.57	− 235,020.12			
$V\left(\frac{\Delta\lambda''}{100}\right)^2 \pm c$	560.21	916.89			
Tabular y	781,834.59	1,570,332.80			
x	691,376.57	264,979.88			
y	782,394.80	1,571,249.69			
$\Delta\alpha''$	+1,207.″56	−1,609.″38			
$\Delta\alpha$	+0° 20′ 07.″6	−0° 26′ 49.″4			
Geod. Az. to Az. Mk.	13 30 59.9	176 01 30.2			
Grid Az. to Az. Mk.	13 10 52	176 28 20			

$x = x' + 500{,}000$

$y = \text{Tab. } y + V\left(\frac{\Delta\lambda''}{100}\right)^2 \pm c$

$\Delta\alpha'' = \Delta\lambda'' \cdot \sin\phi + g$

Grid Az. = Geod. Az. − $\Delta\alpha$

H and V = Tab. H and Tab. V.

When ab is $-$, decrease / $+$, increase $H \cdot \Delta\lambda$ numerically.

g increases $\Delta\lambda'' \cdot \sin\phi$ numerically.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form No. 743a

GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

(CALCULATING MACHINE COMPUTATION)

STATE – ZONE Alabama - East

Station Flint, 1930

X	691,376.57	Y	782,394.80
C	– 500,000.00	$P(\frac{X'}{10,000})^2 + d$	– 560.21
X'	+ 191,376.57	Y_o	781,834.59
P	1.52951	Approx. $\Delta\lambda = X' \div H$	+ 2238"
d	+ 0.03	$\Delta\lambda = (X' \mp ab) \div H$	+ 2238".262
H	85.504 846	$\Delta\lambda$	+ 0° 37' 18".262
a | b	– 0.795 | + 7.139	Central Meridian	85 50 00.000
ϕ	32° 38' 57".737	λ = C.M. – $\Delta\lambda$	85° 12' 41".738

Station Smithers, 1878

X	264,979.88	Y	1,571,249.69
C	– 500,000.00	$P(\frac{X'}{10,000})^2 + d$	– 916.89
X'	– 235,020.12	Y_o	1,570,332.80
P	1.65994	Approx. $\Delta\lambda = X' \div H$	– 2819"
d	+ 0.03	$\Delta\lambda = (X' \mp ab) \div H$	– 2818".670
H	83.381 517	$\Delta\lambda$	– 0° 46' 58".670
a | b	– 0.645 | + 7.536	Central Meridian	85 50 00.000
ϕ	34° 48' 58".708	λ = C.M. – $\Delta\lambda$	86° 36' 58".670

Station

X		Y	
C	–	$P(\frac{X'}{10,000})^2 + d$	–
X'		Y_o	
P		Approx. $\Delta\lambda = X' \div H$	"
d		$\Delta\lambda = (X' \mp ab) \div H$	"
H		$\Delta\lambda$	° ' "
a | b	|	Central Meridian	
ϕ	° ' "	λ = C.M. – $\Delta\lambda$	° ' "

Station

X		Y	
C	–	$P(\frac{X'}{10,000})^2 + d$	–
X'		Y_o	
P		Approx. $\Delta\lambda = X' \div H$	"
d		$\Delta\lambda = (X' \mp ab) \div H$	"
H		$\Delta\lambda$	° ' "
a | b	|	Central Meridian	
ϕ	° ' "	λ = C.M. – $\Delta\lambda$	° "

When a b is $\frac{+, \text{ decrease}}{-, \text{ increase}}$ X' numerically

Constants for Alabama

Constant	Zone	
	East	West
Central Meridian	85° 50' 00".000	87° 30' 00".000
log R	-173.7	-289.5
Scale reduction (Central Meridian)	1 : 25,000	1 : 15,000
$\log\left(\frac{1}{6\rho_0^2}\right)_g$	4.581 7296 -20	4.581 7764 -20
$\log\left(\frac{1}{6\rho_0^2 \sin 1''}\right)_g$	9.896 1547 -20	9.896 2015 -20
$\left(\frac{1}{6\rho_0^2 \sin 1''}\right)_g$	0.7873×10^{-10}	0.7874×10^{-10}

TRANSVERSE MERCATOR PROJECTION
ALABAMA
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
30 30	0.00	101.024 83	87.490 048	248.71	1.076 589	5.80	-.943
30 31	6 061.49	101.025 00	87.475 125	248.85	1.076 937	5.78	-.942
30 32	12 122.99	101.025 33	87.460 194	248.96	1.077 284	5.78	-.941
30 33	18 184.51	101.025 67	87.445 256	249.10	1.077 631	5.78	-.939
30 34	24 246.05	101.025 83	87.430 310	249.20	1.077 978	5.78	-.938
30 35	30 307.60	101.026 17	87.415 358	249.35	1.078 325	5.76	-.937
30 36	36 369.17	101.026 33	87.400 397	249.45	1.078 671	5.75	-.936
30 37	42 430.75	101.026 67	87.385 430	249.60	1.079 016	5.75	-.935
30 38	48 492.35	101.026 83	87.370 454	249.70	1.079 361	5.75	-.933
30 39	54 553.96	101.027 17	87.355 472	249.83	1.079 706	5.75	-.932
30 40	60 615.59	101.027 50	87.340 482	249.95	1.080 051	5.73	-.931
30 41	66 677.24	101.027 67	87.325 485	250.08	1.080 395	5.73	-.930
30 42	72 738.90	101.028 00	87.310 480	250.20	1.080 739	5.73	-.929
30 43	78 800.58	101.028 17	87.295 468	250.33	1.081 083	5.71	-.928
30 44	84 862.27	101.028 50	87.280 448	250.45	1.081 426	5.71	-.927
30 45	90 923.98	101.028 67	87.265 421	250.56	1.081 769	5.70	-.926
30 46	96 985.70	101.029 00	87.250 387	250.70	1.082 111	5.70	-.924
30 47	103 047.44	101.029 33	87.235 345	250.81	1.082 453	5.70	-.923
30 48	109 109.20	101.029 50	87.220 296	250.93	1.082 795	5.68	-.922
30 49	115 170.97	101.029 83	87.205 240	251.06	1.083 136	5.68	-.921
30 50	121 232.76	101.030 00	87.190 176	251.18	1.083 477	5.68	-.920
30 51	127 294.56	101.030 33	87.175 105	251.31	1.083 818	5.66	-.919
30 52	133 356.38	101.030 50	87.160 026	251.41	1.084 158	5.66	-.918
30 53	139 418.21	101.030 83	87.144 941	251.56	1.084 498	5.65	-.916
30 54	145 480.06	101.031 17	87.129 847	251.66	1.084 837	5.65	-.915
30 55	151 541.93	101.031 33	87.114 747	251.80	1.085 176	5.65	-.914
30 56	157 603.81	101.031 67	87.099 639	251.93	1.085 515	5.63	-.913
30 57	163 665.71	101.032 00	87.084 523	252.03	1.085 853	5.63	-.912
30 58	169 727.63	101.032 17	87.069 401	252.16	1.086 191	5.63	-.910
30 59	175 789.56	101.032 33	87.054 271	252.30	1.086 529	5.61	-.909
31 00	181 851.50		87.039 133		1.086 866		-.908

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TRANSVERSE MERCATOR PROJECTION
ALABAMA
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
31 00	181 851.50	101.032 67	87.039 133	252.41	1.086 866	5.61	-.908
31 01	187 913.46	101.033 00	87.023 988	252.53	1.087 203	5.60	-.907
31 02	193 975.44	101.033 17	87.008 836	252.66	1.087 539	5.60	-.906
31 03	200 037.43	101.033 50	86.993 676	252.78	1.087 875	5.60	-.905
31 04	206 099.44	101.033 83	86.978 509	252.91	1.088 211	5.60	-.904
31 05	212 161.47	101.034 00	86.963 334	253.01	1.088 547	5.58	-.903
31 06	218 223.51	101.034 17	86.948 153	253.16	1.088 882	5.56	-.901
31 07	224 285.56	101.034 67	86.932 963	253.26	1.089 216	5.56	-.900
31 08	230 347.64	101.034 83	86.917 767	253.40	1.089 550	5.56	-.899
31 09	236 409.73	101.035 00	86.902 563	253.51	1.089 884	5.56	-.898
31 10	242 471.83	101.035 33	86.887 352	253.65	1.090 218	5.55	-.897
31 11	248 533.95	101.035 67	86.872 133	253.75	1.090 551	5.55	-.896
31 12	254 596.09	101.035 83	86.856 908	253.90	1.090 884	5.55	-.895
31 13	260 658.24	101.036 17	86.841 674	254.00	1.091 217	5.53	-.893
31 14	266 720.41	101.036 33	86.826 434	254.13	1.091 549	5.53	-.892
31 15	272 782.59	101.036 67	86.811 186	254.26	1.091 881	5.51	-.891
31 16	278 844.79	101.036 83	86.795 930	254.36	1.092 212	5.51	-.890
31 17	284 907.00	101.037 17	86.780 668	254.50	1.092 543	5.51	-.889
31 18	290 969.23	101.037 50	86.765 398	254.61	1.092 874	5.50	-.887
31 19	297 031.48	101.037 83	86.750 121	254.75	1.093 204	5.50	-.886
31 20	303 093.75	101.038 00	86.734 836	254.86	1.093 534	5.50	-.885
31 21	309 156.03	101.038 17	86.719 544	254.98	1.093 864	5.48	-.884
31 22	315 218.32	101.038 50	86.704 245	255.11	1.094 193	5.48	-.883
31 23	321 280.63	101.038 83	86.688 938	255.23	1.094 522	5.46	-.882
31 24	327 342.96	101.039 00	86.673 624	255.35	1.094 850	5.46	-.881
31 25	333 405.30	101.039 33	86.658 303	255.48	1.095 178	5.46	-.880
31 26	339 467.66	101.039 67	86.642 974	255.60	1.095 506	5.45	-.878
31 27	345 530.04	101.039 83	86.627 638	255.71	1.095 833	5.45	-.877
31 28	351 592.43	101.040 00	86.612 295	255.85	1.096 160	5.45	-.876
31 29	357 654.83	101.040 50	86.596 944	255.96	1.096 487	5.43	-.875
31 30	363 717.26	101.040 67	86.581 586	256.08	1.096 813	5.43	-.874
31 31	369 779.70	101.040 83	86.566 221	256.21	1.097 139	5.41	-.873
31 32	375 842.15	101.041 17	86.550 848	256.33	1.097 464	5.41	-.872
31 33	381 904.62	101.041 50	86.535 468	256.45	1.097 789	5.41	-.871
31 34	387 967.11	101.041 67	86.520 081	256.58	1.098 114	5.40	-.870
31 35	394 029.61	101.042 00	86.504 686	256.70	1.098 438	5.40	-.869
31 36	400 092.13	101.042 17	86.489 284	256.81	1.098 762	5.38	-.867
31 37	406 154.66	101.042 50	86.473 875	256.95	1.099 085	5.40	-.866
31 38	412 217.21	101.042 83	86.458 458	257.06	1.099 409	5.38	-.865
31 39	418 279.78	101.043 00	86.443 034	257.18	1.099 732	5.36	-.864
31 40	424 342.36	101.043 33	86.427 603	257.31	1.100 054	5.36	-.863
31 41	430 404.96	101.043 67	86.412 164	257.43	1.100 376	5.36	-.862
31 42	436 467.58	101.043 83	86.396 718	257.55	1.100 698	5.35	-.861
31 43	442 530.21	101.044 17	86.381 265	257.68	1.101 019	5.36	-.859
31 44	448 592.86	101.044 33	86.365 804	257.80	1.101 341	5.33	-.858
31 45	454 655.52	101.044 67	86.350 336	257.91	1.101 661	5.35	-.857
31 46	460 718.20	101.044 83	86.334 861	258.05	1.101 982	5.31	-.856
31 47	466 780.89	101.045 17	86.319 378	258.15	1.102 301	5.33	-.855
31 48	472 843.60	101.045 50	86.303 889	258.30	1.102 621	5.31	-.853
31 49	478 906.33	101.045 67	36.288 391	258.40	1.102 940	5.31	-.852
31 50	484 969.07	101.046 00	86.272 887	258.53	1.103 259	5.30	-.851
31 51	491 031.83	101.046 33	86.257 375	258.65	1.103 577	5.30	-.850
31 52	497 094.61	101.046 50	86.241 856	258.76	1.103 895	5.30	-.849
31 53	503 157.40	101.046 83	86.226 330	258.88	1.104 213	5.28	-.848
31 54	509 220.21	101.047 00	86.210 797	259.01	1.104 530	5.28	-.847
31 55	515 283.03	101.047 33	86.195 256	259.13	1.104 847	5.28	-.846
31 56	521 345.87	101.047 67	86.179 708	259.26	1.105 164	5.26	-.844
31 57	527 408.73	101.047 83	86.164 152	259.38	1.105 480	5.26	-.843
31 58	533 471.60	101.048 17	86.148 589	259.50	1.105 796	5.25	-.842
31 59	539 534.49	101.048 33	86.133 019	259.61	1.106 111	5.25	-.841
32 00	545 597.39		86.117 442		1.106 426		-.840

TRANSVERSE MERCATOR PROJECTION
ALABAMA
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
32 00	545 597.39	101.048 67	86.117 442	259.75	1.106 426	5.25	-.840
32 01	551 660.31	101.049 00	86.101 857	259.86	1.106 741	5.23	-.839
32 02	557 723.25	101.049 17	86.086 265	259.98	1.107 055	5.23	-.838
32 03	563 786.20	101.049 50	86.070 666	260.11	1.107 369	5.21	-.836
32 04	569 849.17	101.049 83	86.055 059	260.21	1.107 682	5.23	-.835
32 05	575 912.16	101.050 00	86.039 446	260.36	1.107 996	5.20	-.834
32 06	581 975.16	101.050 17	86.023 824	260.46	1.108 308	5.21	-.833
32 07	588 038.17	101.050 67	86.008 196	260.60	1.108 621	5.20	-.832
32 08	594 101.21	101.050 83	85.992 560	260.71	1.108 933	5.20	-.830
32 09	600 164.26	101.051 17	85.976 917	260.83	1.109 245	5.18	-.829
32 10	606 227.33	101.051 33	85.961 267	260.96	1.109 556	5.18	-.828
32 11	612 290.41	101.051 67	85.945 609	261.08	1.109 867	5.18	-.827
32 12	618 353.51	101.051 83	85.929 944	261.20	1.110 178	5.16	-.826
32 13	624 416.62	101.052 17	85.914 272	261.31	1.110 488	5.16	-.825
32 14	630 479.75	101.052 50	85.898 593	261.45	1.110 798	5.15	-.824
32 15	636 542.90	101.052 67	85.882 906	261.56	1.111 107	5.15	-.823
32 16	642 606.06	101.053 00	85.867 212	261.68	1.111 416	5.15	-.821
32 17	648 669.24	101.053 33	85.851 511	261.80	1.111 725	5.13	-.820
32 18	654 732.44	101.053 50	85.835 803	261.93	1.112 033	5.13	-.819
32 19	660 795.65	101.053 67	85.820 087	262.05	1.112 341	5.13	-.818
32 20	666 858.87	101.054 17	85.804 364	262.16	1.112 649	5.11	-.817
32 21	672 922.12	101.054 33	85.788 634	262.30	1.112 956	5.11	-.816
32 22	678 985.38	101.054 50	85.772 896	262.40	1.113 263	5.10	-.815
32 23	685 048.65	101.055 00	85.757 152	262.53	1.113 569	5.11	-.813
32 24	691 111.95	101.055 17	85.741 400	262.66	1.113 876	5.08	-.812
32 25	697 175.26	101.055 33	85.725 640	262.76	1.114 181	5.10	-.811
32 26	703 238.58	101.055 67	85.709 874	262.90	1.114 487	5.06	-.810
32 27	709 301.92	101.056 00	85.694 100	263.01	1.114 791	5.08	-.809
32 28	715 365.28	101.056 17	85.678 319	263.13	1.115 096	5.06	-.807
32 29	721 428.65	101.056 50	85.662 531	263.26	1.115 400	5.06	-.806
32 30	727 492.04	101.056 83	85.646 735	263.38	1.115 704	5.05	-.805
32 31	733 555.45	101.057 00	85.630 932	263.50	1.116 007	5.05	-.804
32 32	739 618.87	101.057 33	85.615 122	263.63	1.116 310	5.05	-.803
32 33	745 682.31	101.057 67	85.599 304	263.75	1.116 613	5.03	-.802
32 34	751 745.77	101.057 83	85.583 480	263.86	1.116 915	5.03	-.801
32 35	757 809.24	101.058 00	85.567 648	263.98	1.117 217	5.03	-.800
32 36	763 872.72	101.058 50	85.551 809	264.11	1.117 519	5.01	-.798
32 37	769 936.23	101.058 67	85.535 962	264.21	1.117 820	5.01	-.797
32 38	775 999.75	101.059 00	85.520 109	264.35	1.118 121	5.00	-.796
32 39	782 063.29	101.059 17	85.504 248	264.46	1.118 421	5.00	-.795
32 40	788 126.84	101.059 50	85.488 380	264.58	1.118 721	5.00	-.794
32 41	794 190.41	101.059 83	85.472 505	264.71	1.119 021	4.98	-.793
32 42	800 254.00	101.060 00	85.456 622	264.81	1.119 320	4.98	-.792
32 43	806 317.60	101.060 33	85.440 733	264.95	1.119 619	4.98	-.790
32 44	812 381.22	101.060 50	85.424 836	265.06	1.119 918	4.96	-.789
32 45	818 444.85	101.060 83	85.408 932	265.20	1.120 216	4.96	-.788
32 46	824 508.50	101.061 17	85.393 020	265.31	1.120 514	4.95	-.787
32 47	830 572.17	101.061 33	85.377 101	265.41	1.120 811	4.95	-.786
32 48	836 635.85	101.061 67	85.361 176	265.56	1.121 108	4.95	-.784
32 49	842 699.55	101.062 00	85.345 242	265.66	1.121 405	4.93	-.783
32 50	848 763.27	101.062 17	85.329 302	265.80	1.121 701	4.93	-.782
32 51	854 827.00	101.062 50	85.313 354	265.91	1.121 997	4.91	-.781
32 52	860 890.75	101.062 67	85.297 399	266.03	1.122 292	4.93	-.780
32 53	866 954.51	101.063 00	85.281 437	266.15	1.122 588	4.90	-.778
32 54	873 018.29	101.063 33	85.265 468	266.28	1.122 882	4.91	-.777
32 55	879 082.09	101.063 67	85.249 491	266.40	1.123 177	4.90	-.775
32 56	885 145.91	101.063 83	85.233 507	266.51	1.123 471	4.88	-.775
32 57	891 209.74	101.064 17	85.217 516	266.63	1.123 764	4.90	-.774
32 58	897 273.59	101.064 33	85.201 518	266.75	1.124 058	4.88	-.772
32 59	903 337.45	101.064 67	85.185 513	266.88	1.124 351	4.86	-.771
33 00	909 401.33		85.169 500		1.124 643		-.770

TRANSVERSE MERCATOR PROJECTION
ALABAMA
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
33 00	909 401.33	101.065 00	85.169 500	267.00	1.124 643	4.86	-.770
33 01	915 465.23	101.065 17	85.153 480	267.11	1.124 935	4.86	-.769
33 02	921 529.14	101.065 50	85.137 453	267.23	1.125 227	4.85	-.768
33 03	927 593.07	101.065 67	85.121 419	267.36	1.125 518	4.85	-.766
33 04	933 657.01	101.066 00	85.105 377	267.46	1.125 809	4.85	-.765
33 05	939 720.97	101.066 33	85.089 329	267.60	1.126 100	4.83	-.764
33 06	945 784.95	101.066 67	85.073 273	267.71	1.126 390	4.83	-.763
33 07	951 848.95	101.066 83	85.057 210	267.85	1.126 680	4.81	-.762
33 08	957 912.96	101.067 17	85.041 139	267.95	1.126 969	4.81	-.760
33 09	963 976.99	101.067 33	85.025 062	268.08	1.127 258	4.81	-.759
33 10	970 041.03	101.067 67	85.008 977	268.20	1.127 547	4.80	-.758
33 11	976 105.09	101.068 00	84.992 885	268.31	1.127 835	4.80	-.757
33 12	982 169.17	101.068 17	84.976 786	268.43	1.128 123	4.78	-.756
33 13	988 233.26	101.068 50	84.960 680	268.56	1.128 410	4.78	-.755
33 14	994. 297.37	101.068 83	84.944 566	268.68	1.128 697	4.78	-.754
33 15	1 000 361.50	101.069 00	84.928 445	268.80	1.128 984	4.76	-.753
33 16	1 006 425.64	101.069 33	84.912 317	268.91	1.129 270	4.76	-.751
33 17	1 012 489.80	101.069 50	84.896 182	269.03	1.129 556	4.76	-.750
33 18	1 018 553.97	101.070 00	84.880 040	269.15	1.129 842	4.75	-.749
33 19	1 024 618.17	101.070 17	84.863 891	269.28	1.130 127	4.75	-.748
33 20	1 030 682.38	101.070 33	84.847 734	269.40	1.130 412	4.75	-.747
33 21	1 036 746.60	101.070 67	84.831 570	269.51	1.130 697	4.73	-.746
33 22	1 042 810.84	101.071 00	84.815 399	269.63	1.130 981	4.71	-.745
33 23	1 048 875.10	101.071 17	84.799 221	269.76	1.131 264	4.73	-.743
33 24	1 054 939.37	101.071 50	84.783 035	269.86	1.131 548	4.71	-.742
33 25	1 061 003.66	101.071 83	84.766 843	270.00	1.131 831	4.70	-.741
33 26	1 067 067.97	101.072 17	84.750 643	270.11	1.132 113	4.71	-.740
33 27	1 073 132.30	101.072 33	84.734 436	270.23	1.132 396	4.68	-.739
33 28	1 079 196.64	101.072 50	84.718 222	270.36	1.132 677	4.70	-.737
33 29	1 085 260.99	101.073 00	84.702 000	270.46	1.132 959	4.68	-.736
33 30	1 091 325.37	101.073 17	84.685 772	270.60	1.133 240	4.68	-.735
33 31	1 097 389.76	101.073 33	84.669 536	270.70	1.133 521	4.66	-.734
33 32	1 103 454.16	101.073 83	84.653 294	270.83	1.133 801	4.66	-.733
33 33	1 109 518.59	101.074 00	84.637 044	270.96	1.134 081	4.66	-.732
33 34	1 115 583.03	101.074 17	84.620 786	271.06	1.134 361	4.65	-.731
33 35	1 121 647.48	101.074 50	84.604 522	271.18	1.134 640	4.65	-.730
33 36	1 127 711.95	101.074 83	84.588 251	271.31	1.134 919	4.63	-.728
33 37	1 133 776.44	101.075 17	84.571 972	271.43	1.135 197	4.63	-.727
33 38	1 139 840.95	101.075 33	84.555 686	271.55	1.135 475	4.63	-.726
33 39	1 145 905.47	101.075 67	84.539 393	271.66	1.135 753	4.61	-.725
33 40	1 151 970.01	101.076 00	84.523 093	271.78	1.136 030	4.61	-.724
33 41	1 158 034.57	101.076 17	84.506 786	271.91	1.136 307	4.60	-.723
33 42	1 164 099.14	101.076 50	84.490 471	272.03	1.136 583	4.60	-.722
33 43	1 170 163.73	101.076 67	84.474 149	272.15	1.136 859	4.60	-.721
33 44	1 176 228.33	101.077 00	84.457 820	272.26	1.137 135	4.58	-.720
33 45	1 182 292.95	101.077 33	84.441 484	272.38	1.137 410	4.58	-.719
33 46	1 188 357.59	101.077 67	84.425 141	272.50	1.137 685	4.58	-.717
33 47	1 194 422.25	101.077 83	84.408 791	272.63	1.137 960	4.56	-.716
33 48	1 200 486.92	101.078 17	84.392 433	272.73	1.138 234	4.56	-.715
33 49	1 206 551.61	101.078 33	84.376 069	272.86	1.138 508	4.55	-.714
33 50	1 212 616.31	101.078 67	84.359 697	272.98	1.138 781	4.55	-.713
33 51	1 218 681.03	101.079 00	84.343 318	273.10	1.139 054	4.53	-.712
33 52	1 224 745.77	101.079 33	84.326 932	273.21	1.139 326	4.55	-.711
33 53	1 230 810.53	101.079 50	84.310 539	273.35	1.139 599	4.51	-.709
33 54	1 236 875.30	101.079 83	84.294 138	273.45	1.139 870	4.53	-.708
33 55	1 242 940.09	101.080 00	84.277 731	273.58	1.140 142	4.51	-.707
33 56	1 249 004.89	101.080 33	84.261 316	273.70	1.140 413	4.50	-.706
33 57	1 255 069.71	101.080 67	84.244 894	273.81	1.140 683	4.51	-.705
33 58	1 261 134.55	101.080 83	84.228 465	273.93	1.140 954	4.50	-.703
33 59	1 267 199.40	101.081 17	84.212 029	274.05	1.141 224	4.48	-.702
34 00	1 273 264.27		84.195 586		1.141 493		-.701

TRANSVERSE MERCATOR PROJECTION
ALABAMA
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
34 00	1 273 264.27	101.081 50	84.195 586	274.16	1.141 493	4.48	-.701
34 01	1 279 329.16	101.081 83	84.179 136	274.30	1.141 762	4.48	-.700
34 02	1 285 394.07	101.082 00	84.162 678	274.40	1.142 031	4.46	-.699
34 03	1 291 458.99	101.082 33	84.146 214	274.53	1.142 299	4.46	-.698
34 04	1 297 523.93	101.082 50	84.129 742	274.65	1.142 567	4.46	-.697
34 05	1 303 588.88	101.082 83	84.113 263	274.76	1.142 835	4.45	-.696
34 06	1 309 653.85	101.083 17	84.096 777	274.88	1.143 102	4.45	-.694
34 07	1 315 718.84	101.083 33	84.080 284	275.00	1.143 369	4.43	-.693
34 08	1 321 783.84	101.083 67	84.063 784	275.13	1.143 635	4.43	-.692
34 09	1 327 848.86	101.084 00	84.047 276	275.23	1.143 901	4.43	-.691
34 10	1 333 913.90	101.084 17	84.030 762	275.36	1.144 167	4.41	-.690
34 11	1 339 978.95	101.084 50	84.014 240	275.46	1.144 432	4.41	-.689
34 12	1 346 044.02	101.084 83	83.997 712	275.60	1.144 697	4.40	-.688
34 13	1 352 109.11	101.085 17	83.981 176	275.71	1.144 961	4.41	-.687
34 14	1 358 174.22	101.085 33	83.964 633	275.83	1.145 226	4.38	-.686
34 15	1 364 239.34	101.085 67	83.948 083	275.95	1.145 489	4.40	-.685
34 16	1 370 304.48	101.085 83	83.931 526	276.08	1.145 753	4.36	-.683
34 17	1 376 369.63	101.086 17	83.914 961	276.18	1.146 015	4.38	-.682
34 18	1 382 434.80	101.086 50	83.898 390	276.30	1.146 278	4.36	-.681
34 19	1 388 499.99	101.086 67	83.881 812	276.43	1.146 540	4.36	-.680
34 20	1 394 565.19	101.087 00	83.865 226	276.55	1.146 802	4.35	-.679
34 21	1 400 630.41	101.087 33	83.848 633	276.66	1.147 063	4.36	-.678
34 22	1 406 695.65	101.087 67	83.832 033	276.78	1.147 325	4.33	-.677
34 23	1 412 760.91	101.087 83	83.815 426	276.90	1.147 585	4.33	-.676
34 24	1 418 826.18	101.088 17	83.798 812	277.01	1.147 845	4.33	-.675
34 25	1 424 891.47	101.088 33	83.782 191	277.13	1.148 105	4.33	-.674
34 26	1 430 956.77	101.088 67	83.765 563	277.25	1.148 365	4.31	-.672
34 27	1 437 022.09	101.089 00	83.748 928	277.38	1.148 624	4.31	-.671
34 28	1 443 087.43	101.089 33	83.732 285	277.48	1.148 883	4.30	-.670
34 29	1 449 152.79	101.089 50	83.715 636	277.61	1.149 141	4.30	-.669
34 30	1 455 218.16	101.089 83	83.698 979	277.73	1.149 399	4.30	-.668
34 31	1 461 283.55	101.090 00	83.682 315	277.85	1.149 657	4.28	-.667
34 32	1 467 348.95	101.090 50	83.665 644	277.96	1.149 914	4.28	-.666
34 33	1 473 414.38	101.090 67	83.648 966	278.08	1.150 171	4.26	-.664
34 34	1 479 479.82	101.090 83	83.632 281	278.20	1.150 427	4.26	-.663
34 35	1 485 545.27	101.091 17	83.615 589	278.31	1.150 683	4.26	-.662
34 36	1 491 610.74	101.091 50	83.598 890	278.45	1.150 939	4.25	-.661
34 37	1 497 676.23	101.091 83	83.582 183	278.55	1.151 194	4.25	-.660
34 38	1 503 741.74	101.092 00	83.565 470	278.66	1.151 449	4.23	-.658
34 39	1 509 807.26	101.092 33	83.548 750	278.80	1.151 703	4.23	-.657
34 40	1 515 872.80	101.092 67	83.532 022	278.91	1.151 957	4.23	-.656
34 41	1 521 938.36	101.092 83	83.515 287	279.01	1.152 211	4.21	-.655
34 42	1 528 003.93	101.093 17	83.498 546	279.15	1.152 464	4.20	-.654
34 43	1 534 069.52	101.093 50	83.481 797	279.26	1.152 716	4.21	-.652
34 44	1 540 135.13	101.093 67	83.465 041	279.38	1.152 969	4.20	-.651
34 45	1 546 200.75	101.094 00	83.448 278	279.50	1.153 221	4.18	-.650
34 46	1 552 266.39	101.094 33	83.431 508	279.61	1.153 472	4.20	-.649
34 47	1 558 332.05	101.094 50	83.414 731	279.73	1.153 724	4.16	-.648
34 48	1 564 397.72	101.094 83	83.397 947	279.86	1.153 974	4.18	-.646
34 49	1 570 463.41	101.095 17	83.381 155	279.96	1.154 225	4.16	-.645
34 50	1 576 529.12	101.095 50	83.364 357	280.08	1.154 475	4.16	-.644
34 51	1 582 594.85	101.095 67	83.347 552	280.21	1.154 725	4.15	-.643
34 52	1 588 660.59	101.096 00	83.330 739	280.33	1.154 974	4.15	-.642
34 53	1 594 726.35	101.096 17	83.313 919	280.45	1.155 223	4.15	-.641
34 54	1 600 792.12	101.096 50	83.297 093	280.56	1.155 472	4.13	-.640
34 55	1 606 857.91	101.096 83	83.280 259	280.68	1.155 720	4.13	-.639
34 56	1 612 923.72	101.097 17	83.263 418	280.78	1.155 968	4.11	-.637
34 57	1 618 989.55	101.097 33	83.246 571	280.91	1.156 215	4.11	-.636
34 58	1 625 055.39	101.097 67	83.229 716	281.03	1.156 462	4.11	-.635
34 59	1 631 121.25	101.098 00	83.212 854	281.15	1.156 709	4.10	-.634
35 00	1 637 187.13		83.195 985		1.156 955		-.633

TRANSVERSE MERCATOR PROJECTION
ALABAMA
EAST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
35 00	1 637 187.13	101.098 17	83.195 985	281.26	1.156 955	4.10	-.633
35 01	1 643 253.02	101.098 50	83.179 109	281.38	1.157 201	4.08	-.632
35 02	1 649 318.93	101.098 83	83.162 226	281.50	1.157 446	4.08	-.631
35 03	1 655 384.86	101.099 00	83.145 336	281.61	1.157 691	4.08	-.629
35 04	1 661 450.80	101.099 33	83.128 439	281.73	1.157 936	4.06	-.628
35 05	1 667 516.76	101.099 67	83.111 535	281.86	1.158 180	4.06	-.627
35 06	1 673 582.74	101.100 00	83.094 623	281.96	1.158 424	4.05	-.626
35 07	1 679 648.74	101.100 17	83.077 705	282.08	1.158 667	4.05	-.625
35 08	1 685 714.75	101.100 50	83.060 780	282.21	1.158 910	4.05	.623
35 09	1 691 780.78	101.100 67	83.043 847	282.31	1.159 153	4.03	-.622
35 10	1 697 846.82	101.101 00	83.026 908	282.43	1.159 395	4.03	-.621
35 11	1 703 912.88	101.101 33	83.009 962	282.56	1.159 637	4.01	-.620
35 12	1 709 978.96	101.101 67	82.993 008	282.68	1.159 878	4.03	-.619
35 13	1 716 045.06	101.101 83	82.976 047	282.78	1.160 120	4.00	-.618
35 14	1 722 111.17	101.102 17	82.959 080	282.91	1.160 360	4.01	-.617
35 15	1 728 177.30	101.102 50	82.942 105	283.03	1.160 601	3.98	-.616
35 16	1 734 243.45	101.102 67	82.925 123	283.13	1.160 840	4.00	-.614
35 17	1 740 309.61	101.103 00	82.908 135	283.26	1.161 080	3.98	-.613
35 18	1 746 375.79	101.103 33	82.891 139	283.38	1.161 319	3.98	-.612
35 19	1 752 441.99	101.103 50	82.874 136	283.50	1.161 558	3.96	-.611
35 20	1 758 508.20		82.857 126		1.161 796		-.610

TRANSVERSE MERCATOR PROJECTION

ALABAMA
WEST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
30 00	0.00	101.014 33	87.931 950	245.00	1.065 956	5.98	-.977
30 01	6 060.86	101.014 50	87.917 250	245.13	1.066 315	5.96	-.976
30 02	12 121.73	101.014 83	87.902 542	245.25	1.066 673	5.96	-.975
30 03	18 182.62	101.015 17	87.887 827	245.36	1.067 031	5.95	-.974
30 04	24 243.53	101.015 33	87.873 105	245.50	1.067 388	5.95	-.973
30 05	30 304.45	101.015 67	87.858 375	245.61	1.067 745	5.95	-.972
30 06	36 365.39	101.015 83	87.843 638	245.75	1.068 102	5.95	-.970
30 07	42 426.34	101.016 00	87.828 893	245.86	1.068 459	5.93	-.969
30 08	48 487.30	101.016 50	87.814 141	246.00	1.068 815	5.93	-.968
30 09	54 548.29	101.016 67	87.799 381	246.11	1.069 171	5.91	-.967
30 10	60 609.29	101.016 83	87.784 614	246.25	1.069 526	5.91	-.966
30 11	66 670.30	101.017 17	87.769 839	246.36	1.069 881	5.91	-.965
30 12	72 731.33	101.017 33	87.755 057	246.48	1.070 236	5.90	-.964
30 13	78 792.37	101.017 83	87.740 268	246.61	1.070 590	5.90	-.963
30 14	84 853.44	101.017 83	87.725 471	246.73	1.070 944	5.90	-.962
30 15	90 914.51	101.018 17	87.710 667	246.86	1.071 298	5.88	-.961
30 16	96 975.60	101.018 50	87.695 855	246.98	1.071 651	5.88	-.959
30 17	103 036.71	101.018 83	87.681 036	247.11	1.072 004	5.88	-.958
30 18	109 097.84	101.019 00	87.666 209	247.23	1.072 357	5.86	-.957
30 19	115 158.98	101.019 17	87.651 375	247.35	1.072 709	5.86	-.956
30 20	121 220.13	101.019 50	87.636 534	247.48	1.073 061	5.86	-.955
30 21	127 281.30	101.019 83	87.621 685	247.60	1.073 413	5.85	-.954
30 22	133 342.49	101.020 00	87.606 829	247.73	1.073 764	5.85	-.953
30 23	139 403.69	101.020 33	87.591 965	247.85	1.074 115	5.83	-.951
30 24	145 464.91	101.020 50	87.577 094	247.96	1.074 465	5.83	-.950
30 25	151 526.14	101.020 83	87.562 216	248.10	1.074 815	5.83	-.949
30 26	157 587.39	101.021 00	87.547 330	248.23	1.075 165	5.81	-.948
30 27	163 648.65	101.021 33	87.532 436	248.33	1.075 514	5.81	-.947
30 28	169 709.93	101.021 50	87.517 536	248.46	1.075 863	5.81	-.945
30 29	175 771.22	101.022 00	87.502 628	248.60	1.076 212	5.80	-.944
30 30	181 832.54	101.022 17	87.487 712	248.71	1.076 560	5.80	-.943
30 31	187 893.87	101.022 33	87.472 789	248.83	1.076 908	5.78	-.942
30 32	193 955.21	101.022 50	87.457 859	248.96	1.077 255	5.78	-.941
30 33	200 016.56	101.023 00	87.442 921	249.08	1.077 602	5.78	-.939
30 34	206 077.94	101.023 17	87.427 976	249.20	1.077 949	5.78	-.938
30 35	212 139.33	101.023 33	87.413 024	249.33	1.078 296	5.76	-.937
30 36	218 200.73	101.023 83	87.398 064	249.46	1.078 642	5.75	-.936
30 37	224 262.16	101.023 83	87.383 096	249.56	1.078 987	5.75	-.935
30 38	230 323.59	101.024 17	87.368 122	249.70	1.079 332	5.75	-.933
30 39	236 385.04	101.024 50	87.353 140	249.83	1.079 677	5.75	-.932
30 40	242 446.51	101.024 83	87.338 150	249.95	1.080 022	5.73	-.931
30 41	248 508.00	101.025 00	87.323 153	250.06	1.080 366	5.73	-.930
30 42	254 569.50	101.025 17	87.308 149	250.20	1.080 710	5.73	-.929
30 43	260 631.01	101.025 50	87.293 137	250.31	1.081 054	5.71	-.928
30 44	266 692.54	101.025 83	87.278 118	250.45	1.081 397	5.71	-.927
30 45	272 754.09	101.026 00	87.263 091	250.56	1.081 740	5.70	-.926
30 46	278 815.65	101.026 33	87.248 057	250.68	1.082 082	5.70	-.924
30 47	284 877.23	101.026 67	87.233 016	250.81	1.082 424	5.70	-.923
30 48	290 938.83	101.026 83	87.217 967	250.93	1.082 766	5.68	-.922
30 49	297 000.44	101.027 00	87.202 911	251.05	1.083 107	5.68	-.921
30 50	303 062.06	101.027 33	87.187 848	251.18	1.083 448	5.66	-.920
30 51	309 123.70	101.027 67	87.172 777	251.30	1.083 788	5.66	-.919
30 52	315 185.36	101.027 83	87.157 699	251.41	1.084 128	5.66	-.918
30 53	321 247.03	101.028 17	87.142 614	251.55	1.084 468	5.65	-.916
30 54	327 308.72	101.028 50	87.127 521	251.66	1.084 807	5.65	-.915
30 55	333 370.43	101.028 67	87.112 421	251.80	1.085 146	5.65	-.914
30 56	339 432.15	101.028 83	87.097 313	251.91	1.085 485	5.63	-.913
30 57	345 493.88	101.029 33	87.082 198	252.03	1.085 823	5.63	-.912
30 58	351 555.64	101.029 50	87.067 076	252.16	1.086 161	5.63	-.910
30 59	357 617.41	101.029 67	87.051 946	252.28	1.086 499	5.61	-.909
31 00	363 679.19		87.036 809		1.086 836		-.908

TRANSVERSE MERCATOR PROJECTION
ALABAMA
WEST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
31 00	363 679.19	101.030 00	87.036 809	252.41	1.086 836	5.61	-.908
31 01	369 740.99	101.030 17	87.021 664	252.53	1.087 173	5.61	-.907
31 02	375 802.80	101.030 50	87.006 512	252.65	1.087 510	5.60	-.906
31 03	381 864.63	101.030 83	86.991 353	252.78	1.087 846	5.60	-.905
31 04	387 926.48	101.031 00	86.976 186	252.90	1.088 182	5.58	-.904
31 05	393 988.34	101.031 33	86.961 012	253.01	1.088 517	5.58	-.903
31 06	400 050.22	101.031 67	86.945 831	253.15	1.088 852	5.58	-.901
31 07	406 112.12	101.031 83	86.930 642	253.26	1.089 187	5.56	-.900
31 08	412 174.03	101.032 17	86.915 446	253.38	1.089 521	5.56	-.899
31 09	418 235.96	101.032 33	86.900 243	253.51	1.089 855	5.56	-.898
31 10	424 297.90	101.032 67	86.885 032	253.63	1.090 189	5.55	-.897
31 11	430 359.86	101.032 83	86.869 814	253.76	1.090 522	5.55	-.896
31 12	436 421.83	101.033 17	86.854 588	253.88	1.090 855	5.55	-.895
31 13	442 483.82	101.033 50	86.839 355	254.00	1.091 188	5.53	-.893
31 14	448 545.83	101.033 67	86.824 115	254.11	1.091 520	5.53	-.892
31 15	454 607.85	101.034 00	86.808 868	254.25	1.091 852	5.51	-.891
31 16	460 669.89	101.034 17	86.793 613	254.36	1.092 183	5.51	-.890
31 17	466 731.94	101.034 50	86.778 351	254.50	1.092 514	5.51	-.889
31 18	472 794.01	101.034 83	86.763 081	254.61	1.092 845	5.50	-.887
31 19	478 856.10	101.035 00	86.747 804	254.73	1.093 175	5.50	-.886
31 20	484 918.20	101.035 33	86.732 520	254.86	1.093 505	5.50	-.885
31 21	490 980.32	101.035 50	86.717 228	254.98	1.093 835	5.48	-.884
31 22	497 042.45	101.035 83	86.701 929	255.10	1.094 164	5.48	-.883
31 23	503 104.60	101.036 17	86.686 623	255.21	1.094 493	5.46	-.882
31 24	509 166.77	101.036 33	86.671 310	255.35	1.094 821	5.46	-.881
31 25	515 228.95	101.036 50	86.655 989	255.48	1.095 149	5.46	-.880
31 26	521 291.14	101.037 00	86.640 660	255.58	1.095 477	5.45	-.878
31 27	527 353.36	101.037 17	86.625 325	255.71	1.095 804	5.45	-.877
31 28	533 415.59	101.037 33	86.609 982	255.83	1.096 131	5.45	-.876
31 29	539 477.83	101.037 67	86.594 632	255.96	1.096 458	5.43	-.875
31 30	545 540.09	101.038 00	86.579 274	256.08	1.096 784	5.43	-.874
31 31	551 602.37	101.038 13	86.563 909	256.20	1.097 110	5.41	-.873
31 32	557 664.66	101.038 50	86.548 537	256.33	1.097 435	5.41	-.872
31 33	563 726.97	101.038 83	86.533 157	256.45	1.097 760	5.41	-.871
31 34	569 789.30	101.039 00	86.517 770	256.56	1.098 085	5.40	-.870
31 35	575 851.64	101.039 33	86.502 376	256.68	1.098 409	5.40	-.869
31 36	581 914.00	101.039 50	86.486 975	256.81	1.098 733	5.38	-.867
31 37	587 976.37	101.039 83	86.471 566	256.95	1.099 056	5.40	-.866
31 38	594 038.76	101.040 00	86.456 149	257.05	1.099 380	5.38	-.865
31 39	600 101.16	101.040 33	86.440 726	257.18	1.099 703	5.36	-.864
31 40	606 163.58	101.040 67	86.425 295	257.30	1.100 025	5.36	-.863
31 41	612 226.02	101.041 00	86.409 857	257.43	1.100 347	5.36	-.862
31 42	618 288.48	101.041 17	86.394 411	257.55	1.100 669	5.36	-.861
31 43	624 350.95	101.041 33	86.378 958	257.66	1.100 991	5.35	-.859
31 44	630 413.43	101.041 67	86.363 498	257.80	1.101 312	5.33	-.858
31 45	636 475.93	101.042 00	86.348 030	257.91	1.101 632	5.35	-.857
31 46	642 538.45	101.042 17	86.332 555	258.03	1.101 953	5.33	-.856
31 47	648 600.98	101.042 50	86.317 073	258.15	1.102 273	5.31	-.855
31 48	654 663.53	101.042 83	86.301 584	258.28	1.102 592	5.31	-.853
31 49	660 726.10	101.043 00	86.286 087	258.40	1.102 911	5.31	-.852
31 50	666 788.68	101.043 33	86.270 583	258.51	1.103 230	5.30	-.851
31 51	672 851.28	101.043 50	86.255 072	258.65	1.103 548	5.30	-.850
31 52	678 913.89	101.043 83	86.239 553	258.75	1.103 866	5.30	-.849
31 53	684 976.52	101.044 17	86.224 028	258.88	1.104 184	5.28	-.848
31 54	691 039.17	101.044 33	86.208 495	259.01	1.104 501	5.28	-.847
31 55	697 101.83	101.044 67	86.192 954	259.11	1.104 818	5.26	-.846
31 56	703 164.51	101.044 83	86.177 407	259.25	1.105 134	5.26	-.844
31 57	709 227.20	101.045 17	86.161 852	259.38	1.105 450	5.26	-.843
31 58	715 289.91	101.045 50	86.146 289	259.48	1.105 766	5.25	-.842
31 59	721 352.64	101.045 67	86.130 720	259.61	1.106 081	5.25	-.841
32 00	727 415.38		86.115 143		1.106 396		-.840

TRANSVERSE MERCATOR PROJECTION
ALABAMA
WEST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
32 00	727 415.38	101.046 00	86.115 143	259.73	1.106 396	5.25	-.840
32 01	733 478.14	101.046 17	86.099 559	259.86	1.106 711	5.23	-.839
32 02	739 540.91	101.046 50	86.083 967	259.98	1.107 025	5.23	-.838
32 03	745 603.70	101.046 83	86.068 368	260.10	1.107 339	5.21	-.836
32 04	751 666.51	101.047 17	86.052 762	260.21	1.107 652	5.23	-.835
32 05	757 729.34	101.047 33	86.037 149	260.35	1.107 966	5.20	-.834
32 06	763 792.18	101.047 50	86.021 528	260.46	1.108 279	5.21	-.833
32 07	769 855.03	101.047 83	86.005 900	260.60	1.108 591	5.20	-.832
32 08	775 917.90	101.048 17	85.990 264	260.70	1.108 903	5.20	-.830
32 09	781 980.79	101.048 50	85.974 622	260.83	1.109 215	5.18	-.829
32 10	788 043.70	101.048 67	85.958 972	260.95	1.109 526	5.18	-.828
32 11	794 106.62	101.048 83	85.943 315	261.08	1.109 837	5.18	-.827
32 12	800 169.55	101.049 17	85.927 650	261.18	1.110 148	5.16	-.826
32 13	806 232.50	101.049 50	85.911 979	261.31	1.110 458	5.16	-.825
32 14	812 295.47	101.049 83	85.896 300	261.45	1.110 768	5.15	-.824
32 15	818 358.46	101.050 00	85.880 613	261.55	1.111 077	5.15	-.823
32 16	824 421.46	101.050 33	85.864 920	261.68	1.111 386	5.15	-.821
32 17	830 484.48	101.050 50	85.849 219	261.80	1.111 695	5.13	-.820
32 18	836 547.51	101.050 83	85.833 511	261.91	1.112 003	5.13	-.819
32 19	842 610.56	101.051 17	85.817 796	262.05	1.112 311	5.13	-.818
32 20	848 673.63	101.051 33	85.802 073	262.16	1.112 619	5.11	-.817
32 21	854 736.71	101.051 67	85.786 343	262.28	1.112 926	5.11	-.816
32 22	860 799.81	101.051 83	85.770 606	262.40	1.113 233	5.10	-.815
32 23	866 862.92	101.052 17	85.754 862	262.53	1.113 539	5.11	-.813
32 24	872 926.05	101.052 50	85.739 110	262.65	1.113 846	5.08	-.812
32 25	878 989.20	101.052 67	85.723 351	262.76	1.114 151	5.10	-.811
32 26	885 052.36	101.053 00	85.707 585	262.88	1.114 457	5.06	-.810
32 27	891 115.54	101.053 33	85.691 812	263.01	1.114 761	5.08	-.809
32 28	897 178.74	101.053 50	85.676 031	263.13	1.115 066	5.06	-.807
32 29	903 241.95	101.053 83	85.660 243	263.25	1.115 370	5.06	-.806
32 30	909 305.18	101.054 00	85.644 448	263.38	1.115 674	5.05	-.805
32 31	915 368.42	101.054 33	85.628 645	263.48	1.115 977	5.05	-.804
32 32	921 431.68	101.054 67	85.612 836	263.61	1.116 280	5.05	-.803
32 33	927 494.96	101.055 00	85.597 019	263.75	1.116 583	5.03	-.802
32 34	933 558.26	101.055 17	85.581 194	263.85	1.116 885	5.03	-.801
32 35	939 621.57	101.055 33	85.565 363	263.98	1.117 187	5.03	-.800
32 36	945 684.89	101.055 67	85.549 524	264.10	1.117 489	5.01	-.798
32 37	951 748.23	101.056 00	85.533 678	264.21	1.117 790	5.01	-.797
32 38	957 811.59	101.056 33	85.517 825	264.33	1.118 091	5.00	-.796
32 39	963 874.97	101.056 50	85.501 965	264.46	1.118 391	5.00	-.795
32 40	969 938.36	101.056 83	85.486 097	264.58	1.118 691	5.00	-.794
32 41	976 001.77	101.057 00	85.470 222	264.70	1.118 991	4.98	-.793
32 42	982 065.19	101.057 33	85.454 340	264.81	1.119 290	4.98	-.792
32 43	988 128.63	101.057 67	85.438 451	264.93	1.119 589	4.98	-.790
32 44	994 192.09	101.057 83	85.422 555	265.06	1.119 888	4.96	-.789
32 45	1 000 255.56	101.058 17	85.406 651	265.18	1.120 186	4.96	-.788
32 46	1 006 319.05	101.058 50	85.390 740	265.30	1.120 484	4.95	-.787
32 47	1 012 382.56	101.058 67	85.374 822	265.41	1.120 781	4.95	-.786
32 48	1 018 446.08	101.059 00	85.358 897	265.55	1.121 078	4.95	-.784
32 49	1 024 509.62	101.059 17	85.342 964	265.66	1.121 375	4.93	-.783
32 50	1 030 573.17	101.059 50	85.327 024	265.78	1.121 671	4.93	-.782
32 51	1 036 636.74	101.059 83	85.311 077	265.91	1.121 967	4.91	-.781
32 52	1 042 700.33	101.060 00	85.295 122	266.03	1.122 262	4.93	-.780
32 53	1 048 763.93	101.060 33	85.279 160	266.15	1.122 558	4.90	-.778
32 54	1 054 827.55	101.060 67	85.263 191	266.26	1.122 852	4.91	-.777
32 55	1 060 891.19	101.060 83	85.247 215	266.38	1.123 147	4.90	-.776
32 56	1 066 954.84	101.061 17	85.231 232	266.51	1.123 441	4.88	-.775
32 57	1 073 018.51	101.061 33	85.215 241	266.63	1.123 734	4.90	-.774
32 58	1 079 082.19	101.061 67	85.199 243	266.75	1.124 028	4.88	-.772
32 59	1 085 145.89	101.062 00	85.183 238	266.86	1.124 321	4.86	-.771
33 00	1 091 209.61		85.167 226		1.124 613		-.770

TRANSVERSE MERCATOR PROJECTION
ALABAMA
WEST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
33 00	1 091 209.61	101.062 33	85.167 226	266.98	1.124 513	4.86	-.770
33 01	1 097 273.35	101.062 50	85.151 207	267.11	1.124 905	4.86	-.769
33 02	1 103 337.10	101.062 83	85.135 180	267.23	1.125 197	4.85	-.768
33 03	1 109 400.87	101.063 00	85.119 146	267.35	1.125 488	4.85	-.766
33 04	1 115 464.65	101.063 33	85.103 105	267.46	1.125 779	4.85	-.765
33 05	1 121 528.45	101.063 67	85.087 057	267.60	1.126 070	4.83	-.764
33 06	1 127 592.27	101.063 83	85.071 001	267.71	1.126 360	4.83	-.763
33 07	1 133 656.10	101.064 17	85.054 938	267.83	1.126 650	4.81	-.762
33 08	1 139 719.95	101.064 50	85.038 868	267.95	1.126 939	4.81	-.760
33 09	1 145 783.82	101.064 67	85.022 791	268.06	1.127 228	4.81	-.759
33 10	1 151 847.70	101.065 00	85.006 707	268.20	1.127 517	4.80	-.758
33 11	1 157 911.60	101.065 17	84.990 615	268.30	1.127 805	4.80	-.757
33 12	1 163 975.51	101.065 50	84.974 517	268.43	1.128 093	4.78	-.756
33 13	1 170 039.44	101.065 83	84.958 411	268.55	1.128 380	4.78	-.755
33 14	1 176 103.39	101.066 17	84.942 298	268.68	1.128 667	4.78	-.754
33 15	1 182 167.36	101.066 33	84.926 177	268.78	1.128 954	4.76	-.753
33 16	1 188 231.34	101.066 50	84.910 050	268.91	1.129 240	4.76	-.751
33 17	1 194 295.33	101.067 00	84.893 915	269.03	1.129 526	4.76	-.750
33 18	1 200 359.35	101.067 17	84.877 773	269.15	1.129 812	4.75	-.749
33 19	1 206 423.38	101.067 50	84.861 624	269.26	1.130 097	4.75	-.748
33 20	1 212 487.43	101.067 67	84.845 468	269.38	1.130 382	4.75	-.747
33 21	1 218 551.49	101.068 00	84.829 305	269.51	1.130 667	4.73	-.746
33 22	1 224 615.57	101.068 17	84.813 134	269.63	1.130 951	4.71	-.745
33 23	1 230 679.66	101.068 67	84.796 956	269.75	1.131 234	4.73	-.743
33 24	1 236 743.78	101.068 83	84.780 771	269.86	1.131 518	4.71	-.742
33 25	1 242 807.91	101.069 00	84.764 579	269.98	1.131 801	4.70	-.741
33 26	1 248 872.05	101.069 33	84.748 380	270.11	1.132 083	4.71	-.740
33 27	1 254 936.21	101.069 67	84.732 173	270.21	1.132 366	4.68	-.739
33 28	1 261 000.39	101.070 00	84.715 960	270.35	1.132 647	4.70	-.737
33 29	1 267 064.59	101.070 17	84.699 739	270.46	1.132 929	4.68	-.736
33 30	1 273 128.80	101.070 50	84.683 511	270.58	1.133 210	4.68	-.735
33 31	1 279 193.03	101.070 67	84.667 276	270.71	1.133 491	4.66	-.734
33 32	1 285 257.27	101.071 00	84.651 033	270.81	1.133 771	4.66	-.733
33 33	1 291 321.53	101.071 33	84.634 784	270.95	1.134 051	4.66	-.732
33 34	1 297 385.81	101.071 67	84.618 527	271.06	1.134 331	4.65	-.731
33 35	1 303 450.11	101.071 83	84.602 263	271.18	1.134 610	4.65	-.730
33 36	1 309 514.42	101.072 17	84.585 992	271.30	1.134 889	4.63	-.728
33 37	1 315 578.75	101.072 33	84.569 714	271.43	1.135 167	4.63	-.727
33 38	1 321 643.09	101.072 67	84.553 428	271.53	1.135 445	4.63	-.726
33 39	1 327 707.45	101.073 00	84.537 136	271.66	1.135 723	4.61	-.725
33 40	1 333 771.83	101.073 17	84.520 836	271.78	1.136 000	4.61	-.724
33 41	1 339 836.22	101.073 50	84.504 529	271.90	1.136 277	4.60	-.723
33 42	1 345 900.63	101.073 83	84.488 215	272.01	1.136 553	4.60	-.722
33 43	1 351 965.06	101.074 00	84.471 894	272.13	1.136 829	4.60	-.721
33 44	1 358 029.50	101.074 33	84.455 566	272.26	1.137 105	4.58	-.720
33 45	1 364 093.96	101.074 67	84.439 230	272.38	1.137 380	4.58	-.719
33 46	1 370 158.44	101.074 83	84.422 887	272.50	1.137 655	4.58	-.717
33 47	1 376 222.93	101.075 17	84.406 537	272.61	1.137 930	4.56	-.716
33 48	1 382 287.44	101.075 50	84.390 180	272.73	1.138 204	4.56	-.715
33 49	1 388 351.97	101.075 67	84.373 816	272.85	1.138 478	4.55	-.714
33 50	1 394 416.51	101.076 00	84.357 445	272.98	1.138 751	4.55	-.713
33 51	1 400 481.07	101.076 33	84.341 066	273.08	1.139 024	4.55	-.712
33 52	1 406 545.65	101.076 50	84.324 681	273.21	1.139 297	4.53	-.711
33 53	1 412 610.24	101.076 83	84.308 288	273.33	1.139 569	4.51	-.709
33 54	1 418 674.85	101.077 17	84.291 888	273.45	1.139 840	4.53	-.708
33 55	1 424 739.48	101.077 33	84.275 481	273.58	1.140 112	4.51	-.707
33 56	1 430 804.12	101.077 67	84.259 066	273.68	1.140 383	4.50	-.706
33 57	1 436 868.78	101.078 00	84.242 645	273.81	1.140 653	4.51	-.705
33 58	1 442 933.46	101.078 17	84.226 216	273.91	1.140 924	4.50	-.703
33 59	1 448 998.15	101.078 50	84.209 781	274.05	1.141 194	4.48	-.702
34 00	1 455 062.86		84.193 338		1.141 463		-.701

TRANSVERSE MERCATOR PROJECTION
ALABAMA
WEST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
34 00	1 455 062.86	101.078 67	84.193 338	274.16	1.141 463	4.48	-.701
34 01	1 461 127.58	101.079 00	84.176 888	274.28	1.141 732	4.48	-.700
34 02	1 467 192.32	101.079 33	84.160 431	274.40	1.142 001	4.46	-.699
34 03	1 473 257.08	101.079 67	84.143 967	274.53	1.142 269	4.46	-.698
34 04	1 479 321.86	101.079 83	84.127 495	274.63	1.142 537	4.45	-.697
34 05	1 485 386.65	101.080 17	84.111 017	274.76	1.142 804	4.45	-.696
34 06	1 491 451.46	101.080 50	84.094 531	274.86	1.143 071	4.45	-.694
34 07	1 497 516.29	101.080 67	84.078 039	275.00	1.143 338	4.43	-.693
34 08	1 503 581.13	101.081 00	84.061 539	275.11	1.143 604	4.43	-.692
34 09	1 509 645.99	101.081 33	84.045 032	275.23	1.143 870	4.43	-.691
34 10	1 515 710.87	101.081 50	84.028 518	275.35	1.144 136	4.41	-.690
34 11	1 521 775.76	101.081 83	84.011 997	275.46	1.144 401	4.41	-.689
34 12	1 527 840.67	101.082 00	83.995 469	275.60	1.144 666	4.40	-.688
34 13	1 533 905.59	101.082 33	83.978 933	275.70	1.144 930	4.41	-.687
34 14	1 539 970.53	101.082 67	83.962 391	275.81	1.145 195	4.38	-.686
34 15	1 546 035.49	101.083 00	83.945 842	275.95	1.145 458	4.40	-.685
34 16	1 552 100.47	101.083 17	83.929 285	276.06	1.145 722	4.36	-.683
34 17	1 558 165.46	101.083 50	83.912 721	276.18	1.145 984	4.38	-.682
34 18	1 564 230.47	101.083 83	83.896 150	276.30	1.146 247	4.36	-.681
34 19	1 570 295.50	101.084 00	83.879 572	276.41	1.146 509	4.36	-.680
34 20	1 576 360.54	101.084 33	83.862 987	276.53	1.146 771	4.35	-.679
34 21	1 582 425.60	101.084 67	83.846 395	276.66	1.147 032	4.36	-.678
34 22	1 588 490.68	101.084 83	83.829 795	276.76	1.147 294	4.33	-.677
34 23	1 594 555.77	101.085 17	83.813 189	276.90	1.147 554	4.33	-.676
34 24	1 600 620.88	101.085 50	83.796 575	277.01	1.147 814	4.33	-.675
34 25	1 606 686.01	101.085 67	83.779 954	277.13	1.148 074	4.33	-.674
34 26	1 612 751.15	101.086 00	83.763 326	277.25	1.148 334	4.31	-.672
34 27	1 618 816.31	101.086 33	83.746 691	277.36	1.148 593	4.31	-.671
34 28	1 624 881.49	101.086 50	83.730 049	277.48	1.148 852	4.30	-.670
34 29	1 630 946.68	101.086 83	83.713 400	277.60	1.149 110	4.30	-.669
34 30	1 637 011.89	101.087 17	83.696 744	277.71	1.149 368	4.30	-.668
34 31	1 643 077.12	101.087 33	83.680 081	277.85	1.149 626	4.28	-.667
34 32	1 649 142.36	101.087 67	83.663 410	277.95	1.149 883	4.28	-.666
34 33	1 655 207.62	101.088 00	83.646 733	278.08	1.150 140	4.26	-.664
34 34	1 661 272.90	101.088 17	83.630 048	278.18	1.150 396	4.26	-.663
34 35	1 667 338.19	101.088 50	83.613 357	278.31	1.150 652	4.26	-.662
34 36	1 673 403.50	101.088 83	83.596 658	278.43	1.150 908	4.25	-.661
34 37	1 679 468.83	101.089 00	83.579 952	278.55	1.151 163	4.25	-.660
34 38	1 685 534.17	101.089 33	83.563 239	278.66	1.151 418	4.23	-.658
34 39	1 691 599.53	101.089 67	83.546 519	278.78	1.151 672	4.23	-.657
34 40	1 697 664.91	101.090 00	83.529 792	278.90	1.151 926	4.23	-.656
34 41	1 703 730.31	101.090 17	83.513 058	279.03	1.152 180	4.21	-.655
34 42	1 709 795.72	101.090 50	83.496 316	279.13	1.152 433	4.20	-.654
34 43	1 715 861.15	101.090 67	83.479 568	279.26	1.152 685	4.21	-.652
34 44	1 721 926.59	101.091 00	83.462 812	279.36	1.152 938	4.20	-.651
34 45	1 727 992.05	101.091 33	83.446 050	279.50	1.153 190	4.18	-.650
34 46	1 734 057.53	101.091 67	83.429 280	279.61	1.153 441	4.20	-.649
34 47	1 740 123.03	101.091 83	83.412 503	279.71	1.153 693	4.16	-.648
34 48	1 746 188.54	101.092 17	83.395 720	279.85	1.153 943	4.18	-.646
34 49	1 752 254.07	101.092 50	83.378 929	279.96	1.154 194	4.16	-.645
34 50	1 758 319.62	101.092 67	83.362 131	280.08	1.154 444	4.16	-.644
34 51	1 764 385.18	101.093 00	83.345 326	280.20	1.154 694	4.15	-.643
34 52	1 770 450.76	101.093 33	83.328 514	280.31	1.154 943	4.15	-.642
34 53	1 776 516.36	101.093 50	83.311 695	280.43	1.155 192	4.15	-.641
34 54	1 782 581.97	101.093 83	83.294 869	280.55	1.155 441	4.13	-.640
34 55	1 788 647.60	101.094 17	83.278 036	280.66	1.155 689	4.13	-.639
34 56	1 794 713.25	101.094 33	83.261 196	280.80	1.155 937	4.11	-.637
34 57	1 800 778.91	101.094 67	83.244 348	280.90	1.156 184	4.11	-.636
34 58	1 806 844.59	101.095 00	83.227 494	281.03	1.156 431	4.11	-.635
34 59	1 812 910.29	101.095 33	83.210 632	281.15	1.156 678	4.10	-.634
35 00	1 818 976.01	--	83.193 764		1.156 924		-.633

TRANSVERSE MERCATOR PROJECTION
ALABAMA
WEST ZONE

Lat.	y_o feet	Δy_o per second	H	ΔH per second	V	ΔV per second	a
35 00	1 818 976.01	101.095 50	83.193 764	281.26	1.156 924	4.10	-.633
35 01	1 825 041.74	101.095 83	83.176 888	281.36	1.157 170	4.08	-.632
35 02	1 831 107.49	101.096 00	83.160 006	281.50	1.157 415	4.08	-.631
35 03	1 837 173.25	101.096 33	83.143 116	281.61	1.157 660	4.08	-.629
35 04	1 843 239.03	101.096 67	83.126 219	281.71	1.157 905	4.06	-.628
35 05	1 849 304.83	101.097 00	83.109 316	281.85	1.158 149	4.05	-.627
35 06	1 855 370.65	101.097 17	83.092 405	281.96	1.158 393	4.05	-.626
35 07	1 861 436.48	101.097 50	83.075 487	282.08	1.158 636	4.05	-.625
35 08	1 867 502.33	101.097 83	83.058 562	282.20	1.158 879	4.05	-.623
35 09	1 873 568.20	101.098 00	83.041 630	282.31	1.159 122	4.03	-.622
35 10	1 879 634.08	101.098 33	83.024 691	282.43	1.159 364	4.03	-.621
35 11	1 885 699.98	101.098 67	83.007 745	282.55	1.159 606	4.01	-.620
35 12	1 891 765.90	101.098 83	82.990 792	282.66	1.159 847	4.03	-.619
35 13	1 897 831.83	101.099 17	82.973 832	282.78	1.160 089	4.00	-.618
35 14	1 903 897.78	101.099 50	82.956 865	282.90	1.160 329	4.01	-.617
35 15	1 909 963.75	101.099 83	82.939 891	283.03	1.160 570	3.98	-.616
35 16	1 916 029.74	101.100 00	82.922 909	283.15	1.160 809	4.00	-.614
35 17	1 922 095.74	101.100 33	82.905 921	283.25	1.161 049	3.98	-.613
35 18	1 928 161.76	101.100 50	82.888 926	283.38	1.161 288	3.98	-.612
35 19	1 934 227.79	101.100 83	82.871 923	283.48	1.161 527	3.96	-.611
35 20	1 940 293.84		82.854 914		1.161 765		-.610

TRANSVERSE MERCATOR PROJECTION

ALABAMA

Both zones

$\Delta\lambda''$	b	Δb	c	$\Delta\lambda''$	b	Δb	c
0	0.000	+0.408	0.000				
100	+0.408	+0.407	0.000	3100	+ 7.375	-0.121	-0.133
200	+0.815	+0.404	-0.001	3200	+ 7.254	-0.155	-0.135
300	+1.219	+0.401	-0.002	3300	+ 7.099	-0.190	-0.136
400	+1.620	+0.397	-0.003	3400	+ 6.909	-0.226	-0.135
500	+2.017	+0.391	-0.005	3500	+ 6.683	-0.263	-0.133
600	+2.408	+0.385	-0.007	3600	+ 6.420	-0.301	-0.131
700	+2.793	+0.378	-0.010	3700	+ 6.119	-0.340	-0.128
800	+3.171	+0.369	-0.014	3800	+ 5.779	-0.381	-0.124
900	+3.540	+0.359	-0.018	3900	+ 5.398	-0.421	-0.120
1000	+3.899	+0.347	-0.022	4000	+ 4.977	-0.465	-0.115
1100	+4.246	+0.336	-0.027	4100	+ 4.512	-0.509	-0.109
1200	+4.582	+0.323	-0.032	4200	+ 4.003	-0.554	-0.101
1300	+4.905	+0.311	-0.038	4300	+ 3.449	-0.599	-0.091
1400	+5.216	+0.295	-0.043	4400	+ 2.850	-0.644	-0.078
1500	+5.511	+0.281	-0.049	4500	+ 2.206	-0.689	-0.063
1600	+5.792	+0.263	-0.055	4600	+ 1.517	-0.735	-0.045
1700	+6.055	+0.246	-0.061	4700	+ 0.782	-0.782	-0.025
1800	+6.301	+0.227	-0.067	4800	0.000	-0.832	0.000
1900	+6.528	+0.207	-0.073	4900	- 0.832	-0.888	+0.026
2000	+6.735	+0.186	-0.079	5000	- 1.720	-0.947	+0.053
2100	+6.921	+0.164	-0.085	5100	- 2.667	-1.004	+0.084
2200	+7.085	+0.141	-0.091	5200	- 3.671	-1.057	+0.117
2300	+7.226	+0.116	-0.096	5300	- 4.728	-1.117	+0.153
2400	+7.342	+0.090	-0.101	5400	- 5.845	-1.175	+0.191
2500	+7.432	+0.064	-0.106	5500	- 7.020	-1.233	+0.232
2600	+7.496	+0.036	-0.111	5600	- 8.253	-1.291	+0.275
2700	+7.532	+0.008	-0.116	5700	- 9.544	-1.349	+0.321
2800	+7.540	-0.023	-0.121	5800	-10.893	-1.407	+0.371
2900	+7.517	-0.054	-0.125	5900	-12.300	-1.465	+0.426
3000	+7.463	-0.088	-0.130	6000	-13.765		+0.487

$F = 7.42 \times 10^{-13}$

TRANSVERSE MERCATOR PROJECTION

TABLE FOR g

$$\Delta\alpha'' = \sin\phi\,(\Delta\lambda'') + g$$

Latitude	$\Delta\lambda''$						
	0"	1000"	2000"	3000"	4000"	5000"	6000"
24°	0".00	0".00	0".02	0".07	0".17	0".33	0".58
25	0	0	0.02	0.07	0.17	0.34	0.59
26°	0.00	0.00	0.02	0.08	0.18	0.35	0.60
27	0	0	0.02	0.08	0.18	0.35	0.61
28	0	0	0.02	0.08	0.18	0.36	0.62
29	0	0	0.02	0.08	0.19	0.37	0.63
30	0	0	0.02	0.08	0.19	0.37	0.64
31°	0.00	0.00	0.02	0.08	0.19	0.37	0.64
32	0	0	0.02	0.08	0.19	0.38	0.65
33	0	0	0.02	0.08	0.19	0.38	0.65
34	0	0	0.02	0.08	0.19	0.38	0.65
35	0	0	0.02	0.08	0.19	0.38	0.65
36°	0.00	0.00	0.02	0.08	0.19	0.38	0.65
37	0	0	0.02	0.08	0.19	0.38	0.65
38	0	0	0.02	0.08	0.19	0.38	0.65
39	0	0	0.02	0.08	0.19	0.37	0.64
40	0	0	0.02	0.08	0.19	0.37	0.64
41°	0.00	0.00	0.02	0.08	0.19	0.37	0.63
42	0	0	0.02	0.08	0.18	0.36	0.63
43	0	0	0.02	0.08	0.18	0.36	0.62
44	0	0	0.02	0.08	0.18	0.35	0.61
45	0	0	0.02	0.08	0.18	0.35	0.60
46°	0.00	0.00	0.02	0.07	0.17	0.34	0.59
47	0	0	0.02	0.07	0.17	0.33	0.58
48	0	0	0.02	0.07	0.17	0.33	0.56
49	0	0	0.02	0.07	0.16	0.32	0.55
50	0.00	0.00	0.02	0.07	0.16	0.31	0.54

$$g = \left[\frac{C\,(\sin 1'')\,\cos^3\phi}{2A^2} + F\right](\Delta\lambda'')^3$$

A, C and F are position factors.

Y CORRECTION FOR COMPUTATION OF GEOGRAPHIC POSITIONS FROM PLANE COORDINATES TRANSVERSE MERCATOR PROJECTION, ALABAMA-EAST ZONE

$$P(x'/10{,}000)^2 + d = V(\Delta y/100)^2 + c$$

P taken out for y-coordinate
d taken out for x'

y	P	ΔP	x'	d
0	1.40618	1545	0	0.00
100,000	1.42163	1554	50,000	0.00
200,000	1.43717	1563	100,000	+ 0.01
300,000	1.45280	1572	150,000	+ 0.01
400,000	1.46852	1582	200,000	+ 0.04
500,000	1.48434	1590	250,000	+ 0.03
600,000	1.50024	1600	300,000	+ 0.02
700,000	1.51624	1610	350,000	- 0.03
800,000	1.53234	1620	400,000	- 0.12
900,000	1.54854	1630		
1,000,000	1.56484	1639		
1,100,000	1.58123	1651		
1,200,000	1.59774	1660		
1,300,000	1.61434	1672		
1,400,000	1.63106	1682		
1,500,000	1.64788	1693		
1,600,000	1.66481	1705		
1,700,000	1.68186			

Y CORRECTION FOR COMPUTATION OF GEOGRAPHIC
POSITIONS FROM PLANE COORDINATES
TRANSVERSE MERCATOR PROJECTION, ALABAMA-WEST ZONE

$$P(x'/10{,}000)^2 + d = V(\Delta y/100)^2 + c$$

P taken out for y-coordinate
d taken out for x'

y	P	ΔP	x'	d
0	1.37830	1529	0	0.00
100,000	1.39359	1539	50,000	+ 0.01
200,000	1.40898	1547	100,000	+ 0.02
300,000	1.42445	1555	150,000	+ 0.03
400,000	1.44000	1565	200,000	+ 0.05
500,000	1.45565	1574	250,000	+ 0.06
600,000	1.47139	1583	300,000	+ 0.06
700,000	1.48722	1593	350,000	+ 0.02
800,000	1.50315	1601	400,000	- 0.04
900,000	1.51916	1612	450,000	- 0.16
1,000,000	1.53528	1622		
1,100,000	1.55150	1631		
1,200,000	1.56781	1642		
1,300,000	1.58423	1653		
1,400,000	1.60076	1662		
1,500,000	1.61738	1674		
1,600,000	1.63412	1684		
1,700,000	1.65096	1695		
1,800,000	1.66791	1707		
1,900,000	1.68498			

TRANSVERSE MERCATOR PROJECTION

Alabama

$$\Delta\alpha = Mx' - e$$

y	East zone M	East zone ΔM	West zone M	West zone ΔM
0	0.005 8011	637	0.005 6862	631
100,000	0.005 8648	642	0.005 7493	635
200,000	0.005 9290	645	0.005 8128	638
300,000	0.005 9935	648	0.005 8766	642
400,000	0.006 0583	653	0.005 9408	646
500,000	0.006 1236	656	0.006 0054	649
600,000	0.006 1892	660	0.006 0703	653
700,000	0.006 2552	664	0.006 1356	657
800,000	0.006 3216	668	0.006 2013	661
900,000	0.006 3884	673	0.006 2674	665
1,000,000	0.006 4557	677	0.006 3339	669
1,100,000	0.006 5234	680	0.006 4008	673
1,200,000	0.006 5914	685	0.006 4681	678
1,300,000	0.006 6599	690	0.006 5359	682
1,400,000	0.006 7289	694	0.006 6041	686
1,500,000	0.006 7983	699	0.006 6727	690
1,600,000	0.006 8682	703	0.006 7417	695
1,700,000	0.006 9385	708	0.006 8112	699
1,800,000	0.007 0093		0.006 8811	704
1,900,000			0.006 9515	709
2,000,000			0.007 0224	

e

y \ x'	200,000	300,000	400,000	500,000
0	0.0	0.1	0.3	0.6
1,000,000	0.0	0.1	0.3	0.7
2,000,000	0.0	0.1	0.4	0.9

TRANSVERSE MERCATOR PROJECTION

ALABAMA

East Zone

x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio	x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio
0	-173.7	0.9999600	175,000	-21.4	0.9999951
5,000	-173.6	0.9999600	180,000	-12.5	0.9999971
10,000	-173.2	0.9999601	185,000	- 3.5	0.9999992
15,000	-172.6	0.9999602	190,000	+ 5.8	1.0000013
20,000	-171.7	0.9999604	195,000	+15.4	1.0000035
25,000	-170.6	0.9999607	200,000	+25.2	1.0000058
30,000	-169.2	0.9999610	205,000	+35.3	1.0000081
35,000	-167.6	0.9999614	210,000	+45.6	1.0000105
40,000	-165.8	0.9999618	215,000	+56.2	1.0000129
45,000	-163.7	0.9999623	220,000	+67.0	1.0000154
50,000	-161.3	0.9999628	225,000	+78.0	1.0000180
55,000	-158.7	0.9999634	230,000	+89.3	1.0000206
60,000	-155.8	0.9999641	235,000	+100.9	1.0000232
65,000	-152.7	0.9999648	240,000	+112.7	1.0000259
70,000	-149.4	0.9999655	245,000	+124.8	1.0000287
75,000	-145.8	0.9999664	250,000	+137.1	1.0000316
80,000	-141.9	0.9999673	255,000	+149.7	1.0000345
85,000	-137.8	0.9999683	260,000	+162.5	1.0000374
90,000	-133.5	0.9999693	265,000	+175.5	1.0000404
95,000	-128.9	0.9999703	270,000	+188.8	1.0000435
100,000	-124.0	0.9999714	275,000	+202.4	1.0000466
105,000	-118.9	0.9999726	280,000	+216.2	1.0000498
110,000	-113.5	0.9999738	285,000	+230.3	1.0000530
115,000	-107.9	0.9999751	290,000	+244.6	1.0000563
120,000	-102.1	0.9999764	295,000	+259.1	1.0000597
125,000	-96.0	0.9999779	300,000	+273.9	1.0000631
130,000	-89.7	0.9999793	305,000	+288.9	1.0000665
135,000	-83.1	0.9999809	310,000	+304.2	1.0000700
140,000	-76.2	0.9999824	315,000	+319.8	1.0000736
145,000	-69.1	0.9999841	320,000	+335.6	1.0000773
150,000	-61.8	0.9999858	325,000	+351.6	1.0000810
155,000	-54.2	0.9999875	330,000	+367.9	1.0000847
160,000	-46.4	0.9999893	335,000	+384.4	1.0000885
165,000	-38.3	0.9999912	340,000	+401.2	1.0000924
170,000	-30.0	0.9999931	345,000	+418.2	1.0000963

TRANSVERSE MERCATOR PROJECTION

ALABAMA

East Zone

x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio
350,000	+435.5	1.0001003
355,000	+453.0	1.0001043
360,000	+470.8	1.0001084
365,000	+488.8	1.0001126
370,000	+507.1	1.0001168
375,000	+525.6	1.0001210
380,000	+544.4	1.0001253
385,000	+563.4	1.0001297
390,000	+582.7	1.0001342
395,000	+602.2	1.0001387
400,000	+622.0	1.0001432

TRANSVERSE MERCATOR PROJECTION

ALABAMA

West Zone

x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio	x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio
0	-289.5	0.9999333	175,000	-137.2	0.9999684
5,000	-289.4	0.9999334	180,000	-128.4	0.9999704
10,000	-289.0	0.9999335	185,000	-119.3	0.9999725
15,000	-288.4	0.9999336	190,000	-110.0	0.9999747
20,000	-287.5	0.9999338	195,000	-100.4	0.9999769
25,000	-286.4	0.9999341	200,000	-90.6	0.9999791
30,000	-285.0	0.9999344	205,000	-80.5	0.9999815
35,000	-283.4	0.9999347	210,000	-70.2	0.9999838
40,000	-281.6	0.9999352	215,000	-59.6	0.9999863
45,000	-279.5	0.9999356	220,000	-48.8	0.9999888
50,000	-277.1	0.9999362	225,000	-37.8	0.9999913
55,000	-274.5	0.9999368	230,000	-26.4	0.9999939
60,000	-271.6	0.9999375	235,000	-14.9	0.9999966
65,000	-268.5	0.9999382	240,000	-3.1	0.9999993
70,000	-265.2	0.9999389	245,000	+9.0	1.0000021
75,000	-261.6	0.9999398	250,000	+21.3	1.0000049
80,000	-257.7	0.9999407	255,000	+33.9	1.0000078
85,000	-253.6	0.9999416	260,000	+46.7	1.0000108
90,000	-249.2	0.9999426	265,000	+59.7	1.0000137
95,000	-244.6	0.9999437	270,000	+73.0	1.0000168
100,000	-239.8	0.9999448	275,000	+86.6	1.0000199
105,000	-234.7	0.9999460	280,000	+100.4	1.0000231
110,000	-229.3	0.9999472	285,000	+114.4	1.0000263
115,000	-223.7	0.9999485	290,000	+128.7	1.0000296
120,000	-217.9	0.9999498	295,000	+143.3	1.0000330
125,000	-211.8	0.9999512	300,000	+158.1	1.0000364
130,000	-205.5	0.9999527	305,000	+173.1	1.0000399
135,000	-198.9	0.9999542	310,000	+188.4	1.0000434
140,000	-192.0	0.9999558	315,000	+204.0	1.0000470
145,000	-184.9	0.9999574	320,000	+219.8	1.0000506
150,000	-177.6	0.9999591	325,000	+235.8	1.0000543
155,000	-170.0	0.9999609	330,000	+252.1	1.0000580
160,000	-162.2	0.9999627	335,000	+268.6	1.0000618
165,000	-154.1	0.9999645	340,000	+285.4	1.0000657
170,000	-145.8	0.9999664	345,000	+302.4	1.0000696

TRANSVERSE MERCATOR PROJECTION

ALABAMA

West Zone

x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio
350,000	+319.7	1.0000736
355,000	+337.2	1.0000776
360,000	+355.0	1.0000817
365,000	+373.0	1.0000859
370,000	+391.3	1.0000901
375,000	+409.8	1.0000944
380,000	+428.6	1.0000987
385,000	+447.6	1.0001031
390,000	+466.9	1.0001075
395,000	+486.4	1.0001120
400,000	+506.2	1.0001166
405,000	+526.2	1.0001212
410,000	+546.5	1.0001258
415,000	+567.0	1.0001306
420,000	+587.7	1.0001353
425,000	+608.8	1.0001402
430,000	+630.0	1.0001451
435,000	+651.5	1.0001500
440,000	+673.3	1.0001550
445,000	+695.2	1.0001601
450,000	+717.5	1.0001652

CORRECTIONS TO NATURAL SCALE RATIOS*
(in units of the 7th decimal place)

For Lambert Projection

Δφ' as argument

Δφ'	Corr'n (Plus)	Δφ'	Corr'n (Plus)
1	0	31	34
2	0	32	36
3	0	33	38
4	1	34	40
5	1	35	43
6	1	36	45
7	2	37	48
8	2	38	51
9	3	39	53
10	4	40	56
11	4	41	59
12	5	42	62
13	6	43	65
14	7	44	68
15	8	45	71
16	9	46	74
17	10	47	77
18	11	48	81
19	13	49	84
20	14	50	88
21	15	51	91
22	17	52	95
23	19	53	98
24	20	54	102
25	22	55	106
26	24	56	110
27	26	57	114
28	27	58	118
29	29	59	122
30	32	60	126

Δφ' is the difference in latitude in minutes of the ends of the line.

For Lambert or transverse Mercator Projection

Δy or Δx	Corr'n (Plus)
10,000	0
20,000	0
30,000	1
40,000	2
50,000	2
60,000	3
70,000	5
80,000	6
90,000	8
100,000	10
110,000	11
120,000	14
130,000	16
140,000	19
150,000	21
160,000	24
170,000	27
180,000	31
190,000	34
200,000	38
210,000	42
220,000	46
230,000	50
240,000	55
250,000	59
260,000	64
270,000	69
280,000	74
290,000	80
300,000	86
310,000	91
320,000	97
330,000	103
340,000	110
350,000	116

*Scale ratio interpolated for mean latitude or mean x' of the ends of a line and corrected by the above table is a true mean value accurate to within one in the seventh decimal place.