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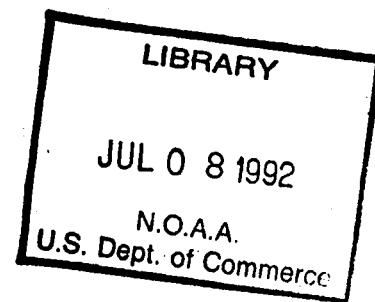
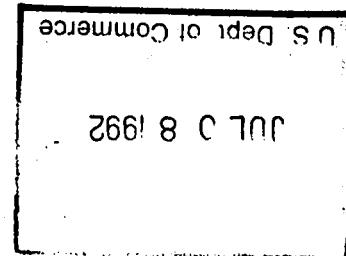
Sinclair Weeks, Secretary

Coast and Geodetic Survey

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Special Publication No. 318

PLANE COORDINATE PROJECTION TABLES
NEVADA



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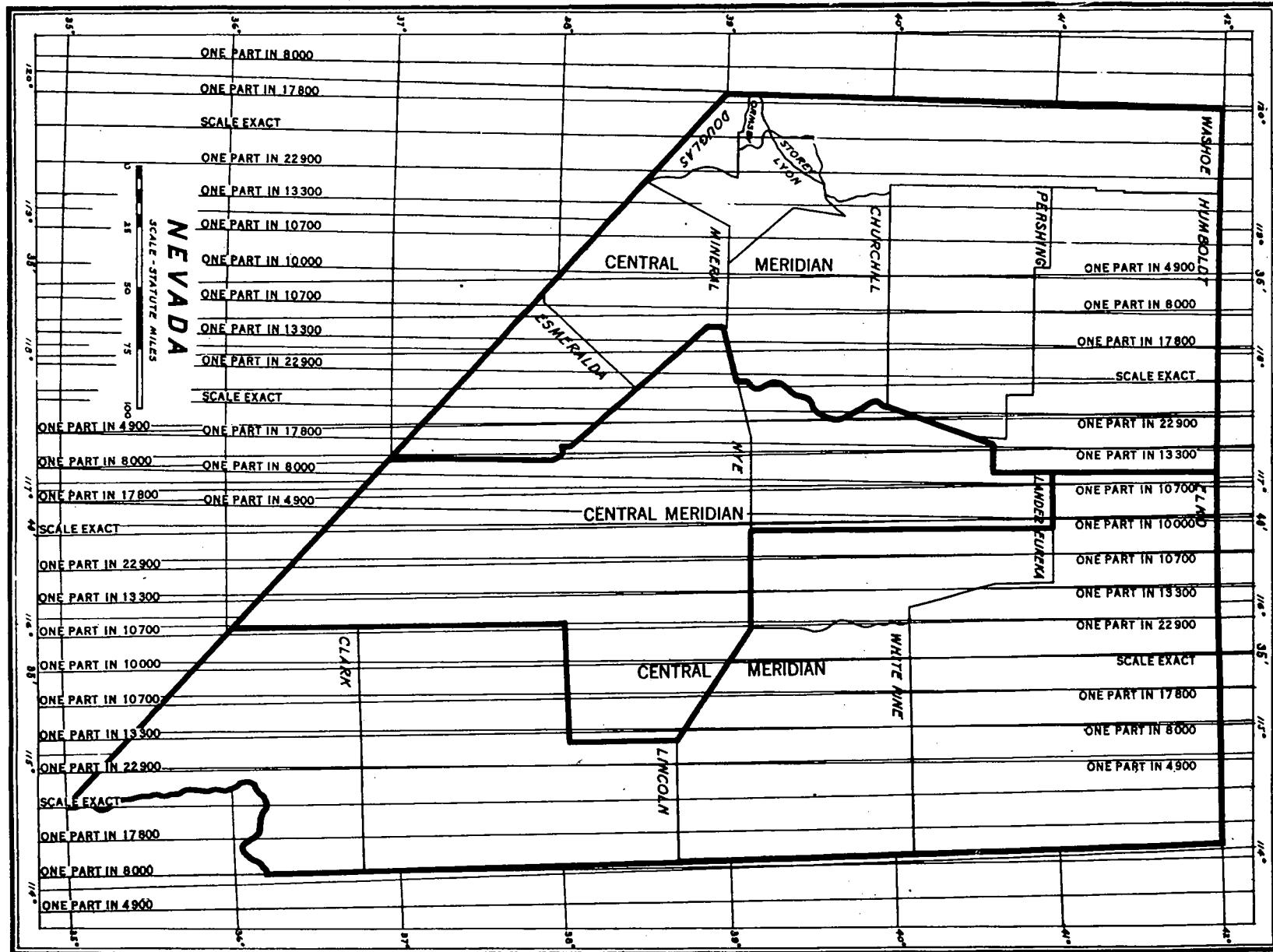
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STATE PLANE-COORDINATE ZONES AND SCALE FACTORS



MAY 5 1954 X-9006

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

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

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

$$y = y_0 + v \left(\frac{\Delta \lambda''}{100} \right)^2 \pm c$$

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

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

where

y_0 , H , V , and a 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.

$$\text{Second term} = \frac{(y_2 - y_1) (2x'_1 + x'_2)}{(6\rho_0^2 \sin l'') g}$$

Geographic positions from plane coordinates

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

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

Obtain the latitude from the table of y_o .

Use latitude to obtain H from the table.

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

$$\text{approximate } \Delta\lambda'' = x' \div H.$$

Determine a from latitude and b from approximate $\Delta\lambda$
then

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

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

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

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION
(Condensed form for calculating-machine computation)

State Nevada Zone East Central meridian $115^{\circ} 35' 00''$

Station	<u>Nelson, 1934</u>	<u>Flat, 1934</u>			
ϕ	<u>$35^{\circ} 43' 09.299$</u>	<u>$41^{\circ} 30' 37.869$</u>			
λ	<u>$114^{\circ} 49' 09.337$</u>	<u>$116^{\circ} 50' 32.766$</u>			
$\Delta\lambda = \text{Central mer.} - \lambda$	<u>$+0^{\circ} 45' 50.663$</u>	<u>$-1^{\circ} 15' 32.766$</u>			
$\Delta\lambda''$	<u>$+2,750.663$</u>	<u>$-4,532.766$</u>			
$\left(\frac{\Delta\lambda''}{100}\right)^2$	<u>756.615</u>	<u>2,054.597</u>			
H	<u>82.456 345</u>	<u>76.076 610</u>			
V	<u>1.167 131</u>	<u>1.222 448</u>			
a	<u>-0.891</u>	<u>+4.941</u>	<u>-0.316</u>	<u>+1.298</u>	
$x' = H \cdot \Delta\lambda \pm ab$	<u>+226,805.22</u>	<u>-344,837.06</u>			
$V \left(\frac{\Delta\lambda''}{100}\right)^2 \pm c$	<u>882.95</u>	<u>2,511.58</u>			
Tabular y	<u>352,754.12</u>	<u>2,461,680.19</u>			
x	<u>726,805.22</u>	<u>155,162.94</u>			
y	<u>353,637.07</u>	<u>2,464,191.77</u>			
$\Delta\alpha''$	<u>$+1,605.95$</u>	<u>$-3,004.40$</u>			
$\Delta\alpha$	<u>$+0^{\circ} 26' 45.9$</u>	<u>$-0^{\circ} 50' 04.4$</u>			
Geod. Az. to Az. Mk.	<u>$126^{\circ} 05' 55.5$</u>	<u>$193^{\circ} 26' 33.6$</u>			
Grid Az. to Az. Mk.	<u>$125^{\circ} 39' 10$</u>	<u>$194^{\circ} 16' 38$</u>			

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

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

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

$$\text{Grid Az.} = \text{Geod. Az.} - \Delta\alpha$$

H and $V = \text{Tab. } H$ and $\text{Tab. } V$.

When ab is $\begin{cases} -, & \text{decrease} \\ +, & \text{increase} \end{cases}$ $H \cdot \Delta\lambda$ numerically.

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

GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES
(CALCULATING MACHINE COMPUTATION)

STATE - ZONE Nevada - East

station Nelson, 1934

X	726,805.22	Y	353,637.07
C	- 500,000.00	$P(\frac{X}{10,000})^2 + d$	- 882.95
X'	+ 226,805.22	Y _o	352,754.12
P	1.71628	Approx. $\Delta\lambda = X' \div H$	+ 2,751"
d	+ 0.09	$\Delta\lambda = (X' + ab) \div H$	+ 2,750.663
H	82.456 345	$\Delta\lambda$	+ 0° 45' 50.663"
a b	- 0.891 + 4.94!	Central Meridian	115° 35' 00.000
φ	35° 43' 09.299	$\lambda = C.M. - \Delta\lambda$	114° 49' 09.337"

station Flat, 1934

X	155,162.94	Y	2,464,191.77
C	- 500,000.00	$P(\frac{X}{10,000})^2 + d$	- 2,511.56
X'	- 344,837.06	Y _o	2,461,680.21
P	2.11205	Approx. $\Delta\lambda = X' \div H$	- 4,533"
d	+ 0.07	$\Delta\lambda = (X' + ab) \div H$	- 4,532.766
H	76.076 610	$\Delta\lambda$	- 1° 15' 32.766"
a b	- 0.316 + 1.2978	Central Meridian	115° 35' 00.000
φ	41° 30' 37.869	$\lambda = C.M. - \Delta\lambda$	116° 50' 32.766"

Station

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

Station

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

When ab is $\frac{+}{-}$, decrease X' numerically

Constants for Nevada

Constant	Zone		
	East	Central.	West
Central Meridian	115° 35' 00":000	116° 40' 00":000	118° 35' 00":000
log R	-434.3	-434.3	-434.3
Scale reduction (Central Meridian)	1 : 10,000	1 : 10,000	1 : 10,000
$\log \left(\frac{1}{2} \right) g$	4.581 1883 -20	4.581 1883 -20	4.581 1883 -20
$\log \left(\frac{1}{2} \right) g$	9.895 6134 -20	9.895 6134 -20	9.895 6134 -20
$\left(\frac{1}{2} \right) g$	0.7863×10^{-10}	0.7863×10^{-10}	0.7863×10^{-10}

TRANSVERSE MERCATOR PROJECTION
NEVADA
ALL ZONES

Lat.	y _o feet	Δy _o per second	H	ΔH per second	V	ΔV per second	a
34 45		0 . 90	101.088 00	83.443 265	279.48	1.153 146	4 . 18 -. 991
34 46	6 065 .28	101.088 17	83.426 496	279.60	1.153 397	4 . 20 -. 989	
34 47	12 130 .57	101.088 50	83.409 720	279.72	1.153 649	4 . 17 -. 987	
34 48	18 195 .88	101.088 83	83.392 937	279.85	1.153 899	4 . 18 -. 986	
34 49	24 261 .21	101.089 00	83.376 146	279.95	1.154 150	4 . 17 -. 984	
34 50	30 326 .55	101.089 33	83.359 349	280.07	1.154 400	4 . 17 -. 982	
34 51	36 391 .91	101.089 67	83.342 545	280.20	1.154 650	4 . 15 -. 980	
34 52	42 457 .29	101.089 83	83.325 733	280.30	1.154 899	4 . 15 -. 979	
34 53	48 522 .68	101.090 17	83.308 915	280.43	1.155 148	4 . 13 -. 977	
34 54	54 588 .09	101.090 50	83.292 089	280.55	1.155 396	4 . 13 -. 975	
34 55	60 653 .52	101.090 83	83.275 256	280.65	1.155 644	4 . 13 -. 974	
34 56	66 718 .97	101.091 00	83.258 417	280.78	1.155 892	4 . 12 -. 972	
34 57	72 784 .43	101.091 33	83.241 570	280.90	1.156 139	4 . 12 -. 970	
34 58	78 849 .91	101.091 67	83.224 716	281.02	1.156 386	4 . 12 -. 968	
34 59	84 915 .41	101.091 83	83.207 855	281.13	1.156 633	4 . 10 -. 967	
35 00	90 980 .92		83.190 987		1.156 879		1 -. 965

TRANSVERSE MERCATOR PROJECTION

NEVADA
ALL ZONES

Lat.		y _o feet	Δy _o per second	h	ΔH per second	V	ΔV per second	a
42 00	2	640 025.32	101.214 33	75.500 684	328.47	1.224 859	1.27	-.269
42 01	2	646 098.18	101.214 83	75.480 976	328.57	1.224 935	1.25	-.267
42 02	2	652 171.07	101.215 00	75.461 262	328.68	1.225 010	1.25	-.266
42 03	2	658 243.97	101.215 33	75.441 541	328.78	1.225 085	1.23	-.264
42 04	2	664 316.89	101.215 67	75.421 814	328.90	1.225 159	1.23	-.263
42 05	2	670 389.83	101.215 83	75.402 080	329.00	1.225 233	1.23	-.261
42 06	2	676 462.78	101.216 17	75.382 340	329.10	1.225 307	1.22	-.259
42 07	2	682 535.75	101.216 67	75.362 594	329.22	1.225 380	1.22	-.258
42 08	2	688 608.75	101.216 83	75.342 841	329.32	1.225 453	1.20	-.256
42 09	2	694 681.76	101.217 00	75.323 082	329.43	1.225 525	1.20	-.255
42 10	2	700 754.78	101.217 50	75.303 316	329.53	1.225 597	1.20	-.253
42 11	2	706 827.83	101.217 67	75.283 544	329.63	1.225 669	1.18	-.251
42 12	2	712 900.89	101.218 00	75.263 766	329.75	1.225 740	1.18	-.250
42 13	2	718 973.97	101.218 33	75.243 981	329.85	1.225 811	1.17	-.248
42 14	2	725 047.07	101.218 67	75.224 190	329.97	1.225 881	1.17	-.247
42 15	2	731 120.19	101.218 83	75.204 392	330.07	1.225 951	1.17	-.245
42 16	2	737 193.32	101.219 33	75.184 588	330.17	1.226 021	1.15	-.243
42 17	2	743 266.48	101.219 50	75.164 778	330.28	1.226 090	1.15	-.242
42 18	2	749 339.65	101.219 67	75.144 961	330.38	1.226 159	1.13	-.240
42 19	2	755 412.83	101.220 17	75.125 138	330.50	1.226 227	1.13	-.239
42 20	2	761 486.04		75.105 308		1.226 295		-.237

TRANSVERSE MERCATOR PROJECTION

NEVADA

All Zones

$\Delta \lambda''$	b	Δb	c	$\Delta \lambda''$	b	Δb	c
0	0.000	+0.267	0.000	3100	+4.835	-0.079	-0.133
100	+0.267	+0.267	0.000	3200	+4.756	-0.102	-0.135
200	+0.534	+0.265	-0.001	3300	+4.654	-0.125	-0.136
300	+0.799	+0.263	-0.002	3400	+4.529	-0.148	-0.135
400	+1.062	+0.260	-0.003	3500	+4.381	-0.172	-0.133
500	+1.322	+0.256	-0.005	3600	+4.209	-0.198	-0.131
600	+1.578	+0.253	-0.007	3700	+4.011	-0.223	-0.128
700	+1.831	+0.248	-0.010	3800	+3.788	-0.249	-0.124
800	+2.079	+0.242	-0.014	3900	+3.539	-0.276	-0.120
900	+2.321	+0.235	-0.018	4000	+3.263	-0.305	-0.115
1000	+2.556	+0.227	-0.022	4100	+2.958	-0.334	-0.109
1100	+2.783	+0.221	-0.027	4200	+2.624	-0.363	-0.101
1200	+3.004	+0.212	-0.032	4300	+2.261	-0.392	-0.091
1300	+3.216	+0.203	-0.038	4400	+1.869	-0.423	-0.078
1400	+3.419	+0.194	-0.043	4500	+1.446	-0.452	-0.063
1500	+3.613	+0.184	-0.049	4600	+0.994	-0.481	-0.045
1600	+3.797	+0.173	-0.055	4700	+0.513	-0.513	-0.025
1700	+3.970	+0.161	-0.061	4800	0.000	-0.545	0.000
1800	+4.131	+0.148	-0.067	4900	-0.545	-0.583	+0.026
1900	+4.279	+0.136	-0.073	5000	-1.128	-0.621	+0.053
2000	+4.415	+0.122	-0.079	5100	-1.749	-0.657	+0.084
2100	+4.537	+0.108	-0.085	5200	-2.406	-0.694	+0.117
2200	+4.645	+0.092	-0.091	5300	-3.100	-0.732	+0.153
2300	+4.737	+0.076	-0.096	5400	-3.832	-0.770	+0.191
2400	+4.813	+0.059	-0.101	5500	-4.602	-0.809	+0.232
2500	+4.872	+0.042	-0.106	5600	-5.411	-0.846	+0.275
2600	+4.914	+0.024	-0.111	5700	-6.257	-0.884	+0.321
2700	+4.938	+0.005	-0.116	5800	-7.141	-0.922	+0.371
2800	+4.943	-0.015	-0.121	5900	-8.063	-0.961	+0.426
2900	+4.928	-0.036	-0.125	6000	-9.024		+0.487
3000	+4.892	-0.057	-0.130				

$$F = 7.37 \times 10^{-13}$$

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

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

A, C and F are position factors.

Y CORRECTION FOR COMPUTATION OF GEOGRAPHIC
POSITIONS FROM PLANE COORDINATES
TRANSVERSE MERCATOR PROJECTION, NEVADA-E-W-C ZONES

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

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

<u>y</u>	<u>P</u>	<u>ΔP</u>	<u>x'</u>	<u>d</u>
0	1.65568	1699	0	0.00
100,000	1.67267	1709	50,000	+ 0.01
200,000	1.68976	1722	100,000	+ 0.02
300,000	1.70698	1733	150,000	+ 0.05
400,000	1.72431	1745	200,000	+ 0.08
500,000	1.74176	1758	250,000	+ 0.10
600,000	1.75934	1769	300,000	+ 0.11
700,000	1.77703	1783	350,000	+ 0.07
800,000	1.79486	1794	400,000	+ 0.03
900,000	1.81280	1808	450,000	- 0.08
1,000,000	1.83088	1822	500,000	- 0.25
1,100,000	1.84910	1834	<u>y</u>	<u>P</u>
1,200,000	1.86744	1848	2,000,000	2.01934
1,300,000	1.88592	1863	2,100,000	2.03901
1,400,000	1.90455	1876	2,200,000	2.05885
1,500,000	1.92331	1891	2,300,000	2.07884
1,600,000	1.94222	1905	2,400,000	2.09900
1,700,000	1.96127	1921	2,500,000	2.11933
1,800,000	1.98048	1935	2,600,000	2.13983
1,900,000	1.99983	1951	2,700,000	2.16050

TRANSVERSE MERCATOR PROJECTION

Nevada

All zones

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

y	M	ΔM	y	M	ΔM
0	0.006 8309	701	1,500,000	0.007 9352	780
100,000	0.006 9010	706	1,600,000	0.008 0132	786
200,000	0.006 9716	710	1,700,000	0.008 0918	793
300,000	0.007 0426	715	1,800,000	0.008 1711	798
400,000	0.007 1141	720	1,900,000	0.008 2509	805
500,000	0.007 1861	725	2,000,000	0.008 3314	812
600,000	0.007 2586	730	2,100,000	0.008 4126	818
700,000	0.007 3316	736	2,200,000	0.008 4944	825
800,000	0.007 4052	740	2,300,000	0.008 5769	832
900,000	0.007 4792	746	2,400,000	0.008 6601	838
1,000,000	0.007 5538	752	2,500,000	0.008 7439	846
1,100,000	0.007 6290	757	2,600,000	0.008 8285	853
1,200,000	0.007 7047	762	2,700,000	0.008 9138	861
1,300,000	0.007 7809	769	2,800,000	0.008 9999	
1,400,000	0.007 8578	774			

e

$y \backslash x'$	100,000	200,000	300,000	400,000	500,000
0	0.0	0.0	0.1	0.4	0.5
500,000	0.0	0.0	0.2	0.4	0.9
1,000,000	0.0	0.0	0.2	0.5	1.0
1,500,000	0.0	0.0	0.2	0.6	1.2
2,000,000	0.0	0.1	0.2	0.6	1.3
2,500,000	0.0	0.1	0.3	0.7	1.4

TRANSVERSE MERCATOR PROJECTION

NEVADA

All Zones

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	-434.3	0.9999000	175,000	-282.2	0.9999350
5,000	-434.2	0.9999000	180,000	-273.4	0.9999370
10,000	-433.8	0.9999001	185,000	-264.3	0.9999391
15,000	-433.2	0.9999003	190,000	-255.0	0.9999413
20,000	-432.3	0.9999005	195,000	-245.5	0.9999435
25,000	-431.2	0.9999007	200,000	-235.7	0.9999457
30,000	-429.8	0.9999010	205,000	-225.6	0.9999481
35,000	-428.2	0.9999014	210,000	-215.3	0.9999504
40,000	-426.4	0.9999018	215,000	-204.7	0.9999529
45,000	-424.2	0.9999023	220,000	-193.9	0.9999554
50,000	-421.9	0.9999029	225,000	-182.9	0.9999579
55,000	-419.3	0.9999035	230,000	-171.6	0.9999605
60,000	-416.4	0.9999041	235,000	-160.1	0.9999631
65,000	-413.3	0.9999048	240,000	-148.3	0.9999659
70,000	-410.0	0.9999056	245,000	-136.2	0.9999686
75,000	-406.4	0.9999064	250,000	-123.9	0.9999715
80,000	-402.5	0.9999073	255,000	-111.4	0.9999743
85,000	-398.4	0.9999083	260,000	-98.6	0.9999773
90,000	-394.1	0.9999093	265,000	-85.6	0.9999803
95,000	-389.5	0.9999103	270,000	-72.3	0.9999834
100,000	-384.6	0.9999114	275,000	-58.7	0.9999865
105,000	-379.5	0.9999126	280,000	-45.0	0.9999896
110,000	-374.2	0.9999138	285,000	-30.9	0.9999929
115,000	-368.6	0.9999151	290,000	-16.7	0.9999962
120,000	-362.8	0.9999165	295,000	-2.1	0.9999995
125,000	-356.7	0.9999179	300,000	+12.6	1.0000029
130,000	-350.4	0.9999193	305,000	+27.7	1.0000064
135,000	-343.8	0.9999208	310,000	+42.9	1.0000099
140,000	-337.0	0.9999224	315,000	+58.5	1.0000135
145,000	-329.9	0.9999240	320,000	+74.2	1.0000171
150,000	-322.6	0.9999257	325,000	+90.2	1.0000208
155,000	-315.0	0.9999275	330,000	+106.5	1.0000245
160,000	-307.2	0.9999293	335,000	+123.0	1.0000283
165,000	-299.1	0.9999311	340,000	+139.8	1.0000322
170,000	-290.8	0.9999330	345,000	+156.8	1.0000361

TRANSVERSE MERCATOR PROJECTION

NEVADA

All Zones

x' (feet)	Scale in units of 7th place of logs	Scale expressed as a ratio
350,000	+174.0	1.0000401
355,000	+191.5	1.0000441
360,000	+209.3	1.0000482
365,000	+227.3	1.0000523
370,000	+245.5	1.0000565
375,000	+264.0	1.0000608
380,000	+282.8	1.0000651
385,000	+301.8	1.0000695
390,000	+321.0	1.0000739
395,000	+340.5	1.0000784
400,000	+360.3	1.0000830
405,000	+380.2	1.0000875
410,000	+400.5	1.0000922
415,000	+421.0	1.0000969
420,000	+441.7	1.0001017
425,000	+462.7	1.0001065
430,000	+483.9	1.0001114
435,000	+505.4	1.0001164
440,000	+527.1	1.0001214
445,000	+549.1	1.0001264
450,000	+571.3	1.0001315
455,000	+593.8	1.0001367
460,000	+616.5	1.0001420
465,000	+639.5	1.0001473
470,000	+662.7	1.0001526
475,000	+686.2	1.0001580
480,000	+709.9	1.0001635
485,000	+733.8	1.0001690
490,000	+758.0	1.0001745
495,000	+782.5	1.0001802
500,000	+807.2	1.0001859
505,000	+832.2	1.0001916
510,000	+857.4	1.0001974
515,000	+882.8	1.0002033
520,000	+908.5	1.0002092
525,000	+934.5	1.0002152

CORRECTIONS TO NATURAL SCALE RATIOS*

(in units of the 7th decimal place)

For Lambert Projection

$\Delta\phi'$ as argument	Corr'n (Plus)	$\Delta\phi'$	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

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

$\Delta\phi'$ is the difference in
latitude in minutes
of the ends of the line.

*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.