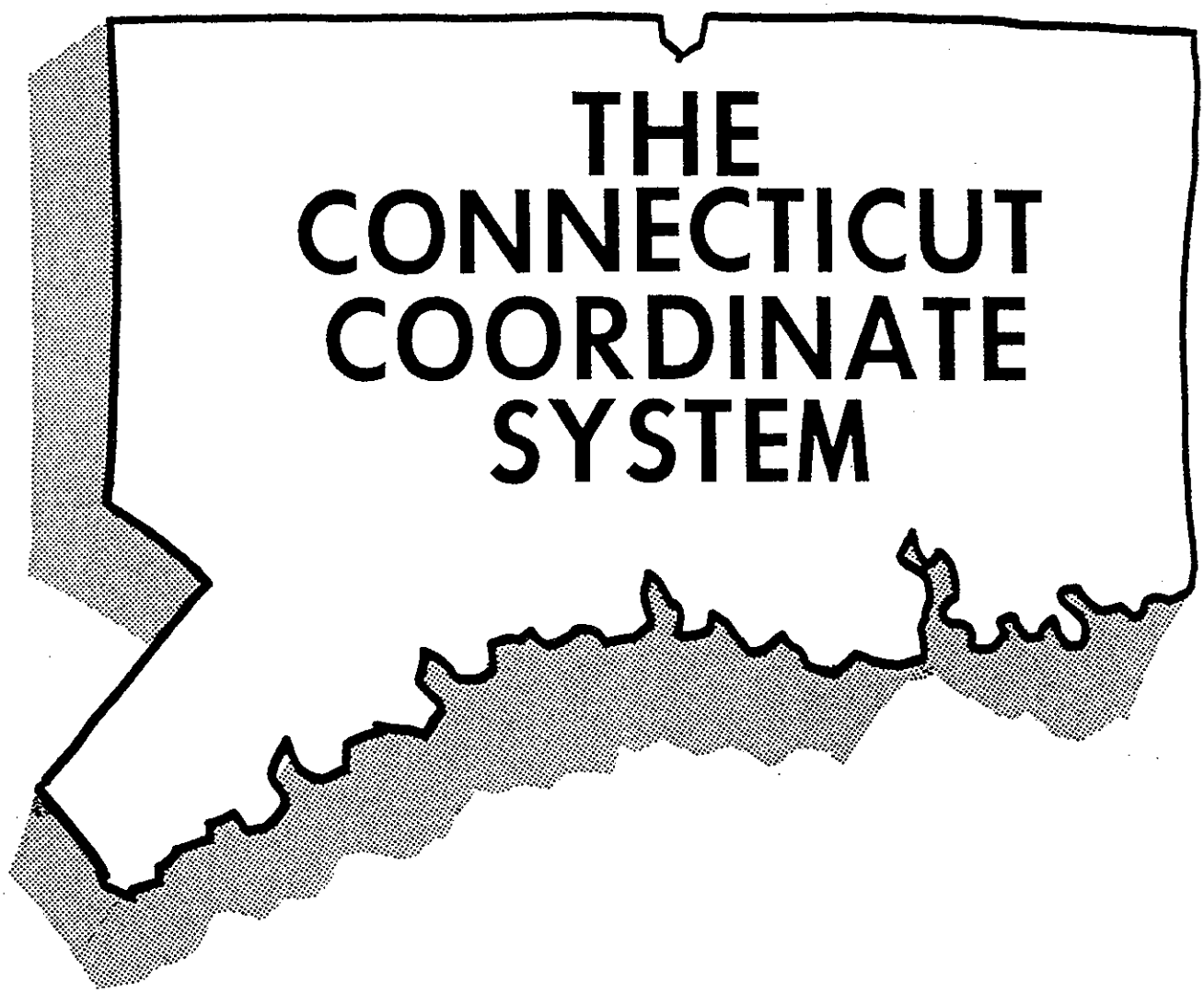

THE
CONNECTICUT
COORDINATE
SYSTEM

TABLE OF CONTENTS

STATE PLANE COORDINATE SYSTEM (SPCS)

DEFINITIONS:

Lambert Projection = the SPCS used in those states whose major dimensions are primarily east to west. The Long Island zone of the New York SPCS, the north zone of Florida system and zone 10 in Alaska (Aleutian Islands) are also on this projection.

Transverse Mercator Projection = the SPCS used in those states extending primarily north to south.

Zone = a subdivision of the SPCS within a State. With one exception, these subdivisions follow county boundaries. In order to maintain a maximum scale reduction in the center of a particular system at 1:10,000, the limits cannot exceed 158 miles north to south for the Lambert projection and east to west for the transverse Mercator projection. The Lambert projection bands can be extended around the world and the transverse Mercator zones to within a few degrees of the north pole. The published tables, of course, provide some overlap outside a zone or beyond a State boundary but not to the extend as just noted.

There are a small number of zones where for one reason or another the maximum range is larger than 158 miles and therefore the scale reduction is worse than 1:10,000 at their centers. In many more instances the areas included within the zones are less than 158 miles wide in the pertinent dimension and in these cases the scale reductions at the center are better than 1:10,000.

X = the plane coordinate value in feet perpendicular to the "Y" or north-south axis (center) of the system. In land surveying terms, "X" would be the Easting or "E" and consist of C ± X' where "C" is a constant of sufficient numerical size to keep the "X" values positive. The definition of "X'" follows.

X' = the distance in feet east or west of the "Y" or north-south axis of the system. When east of the "Y" axis the values are added to "C" and subtracted from "C" when west of the "Y" axis. This value may be considered the Departure measured from the "Y" axis.

Y = the plane coordinate value in feet along the "Y" or north-south axis, north from the origin to its intersection with the "X" coordinate. In plane surveying terminology, this quantity may be considered the Northing or "N", or the Latitude measured from the origin.

C.M. = Central Meridian = the meridian (Longitude) or "Y" (north-south) axis usually located near the center of the

plane coordinate system which separates the positive and negative "X'" quantities.

In a local system, it is the meridian through the point selected as the origin.

θ = theta = the so called mapping angle in the Lambert projection. This value is applied to grid azimuths to obtain very close approximations to geodetic azimuths or bearings. The angle is considered positive when the point is east of the "Y" axis and negative west of this axis. When the sign of "θ" is positive, it is always added to the grid azimuths or to those bearings in the N-E and S-W quadrants and subtracted from bearings in the S-E and N-W quadrants. When the sign of "θ" is negative, it is applied the opposite to that just described. On those occasions when grid azimuths are to be determined from geodetic azimuths, the sign of "θ" is considered opposite to that shown and applied in that fashion.

Δα = delta alpha = the so called mapping angle in the transverse Mercator projection. The remainder of the definition is exactly the same as that given for the "θ" angle, except, of course, that "Δα" replaces "θ".

This term is also used to describe the difference between forward and backward geodetic azimuths. It is often used as well in plane surveying to define the difference (convergence) between "true" and grid or plane bearings which occurs at all points not on the same meridian as the origin in a local system.

Scale Factor = a multiplier which when applied to horizontal measured distances produce distances at the average elevation of the points involved which have been corrected for the distortions due to the projecting of a line measured over a curved surface (the earth) onto a plane through the means of a particular map projection. A single scale factor can only be used over a finite range, but rarely will this range be exceeded in surveys envisioned in this paper.

In the Lambert projection, the scale factor is a function of latitude. For the transverse Mercator projection the scale factor is based on the distances in feet (X') that the points are east or west of the central meridian. Values of the scale factors are given for each minute of latitude in the projection tables for those states which use the Lambert projection and at 5,000 feet intervals in the tables compiled for those states where the transverse Mercator projection is employed.

Sea Level Factor = a multiplier which reduced horizontal distances at the mean elevations of the points to the sea

level reference surface. Such distances are referred to as geodetic distances. The multiplier is derived from the mean elevation of the two points involved or, as is the case on many occasions, a single multiplier for an entire survey may be employed.

When combined with the scale factor into a single multiplier, the resulting reduced horizontal distances are grid distances. It is these values which should be used in computing surveys on the SPCS. This combined factor can be used to derive adjusted ground level lengths or to rise the State plane coordinates to the mean elevation of the points. Furthermore, the mean scale factor has also been eliminated in these instances and the distances computed from these coordinates are essentially ground level values.

NOTE: All SPCS are at the sea level reference (except the Michigan Lambert system which is compiled at an elevation of 800 feet above sea level.

Azimuth = the compass direction between two points expressed as the total number of degrees, minutes, and seconds taken clockwise from the origin. In the United States, South is considered the origin and hence azimuths between 0°-90° are in the SW quadrant, 90°-180° the NW quadrant, 180°-270° the NE quadrant and 270°-360° (0°) the SE quadrant.

By applying 180°00'00" to any geodetic or grid azimuth published by the NGS or from other sources where South was used as the origin the azimuths are now referenced to north as the origin. The sign conventions usually used in plane surveying computations where bearing are employed are then identical.

Bearing = the compass direction between two points expressed in degrees, minutes, and seconds within a particular quadrant, that is NE, SE, SW, and NW. The relationship of azimuths and bearings will be discussed later.

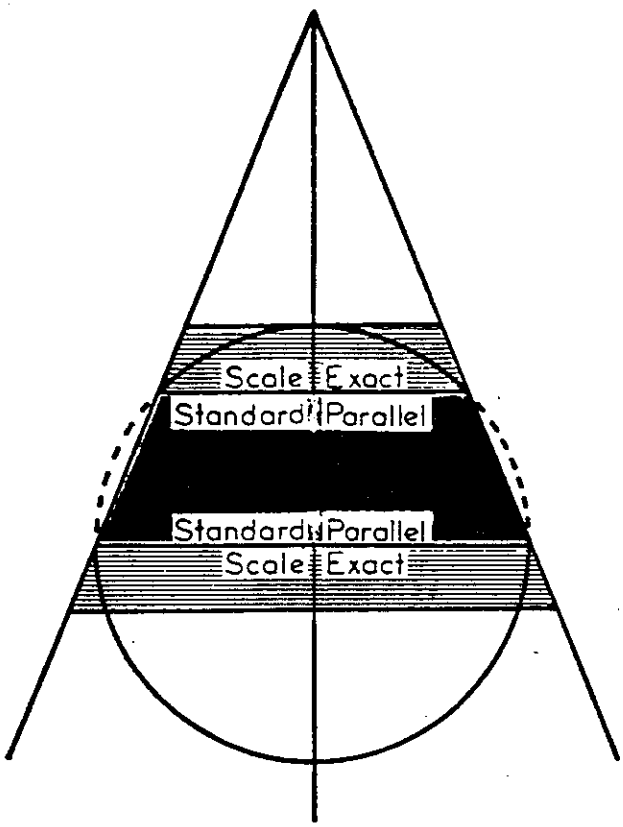


Figure 8 - Lambert Projection - Cone Secant to Sphere

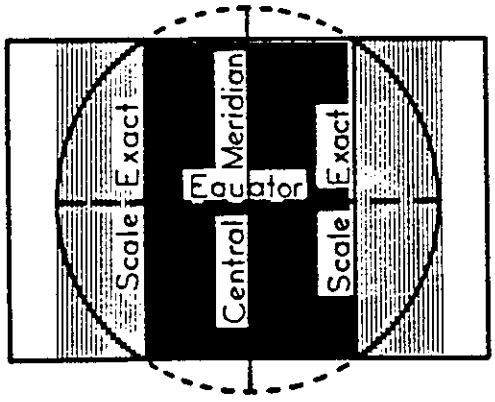
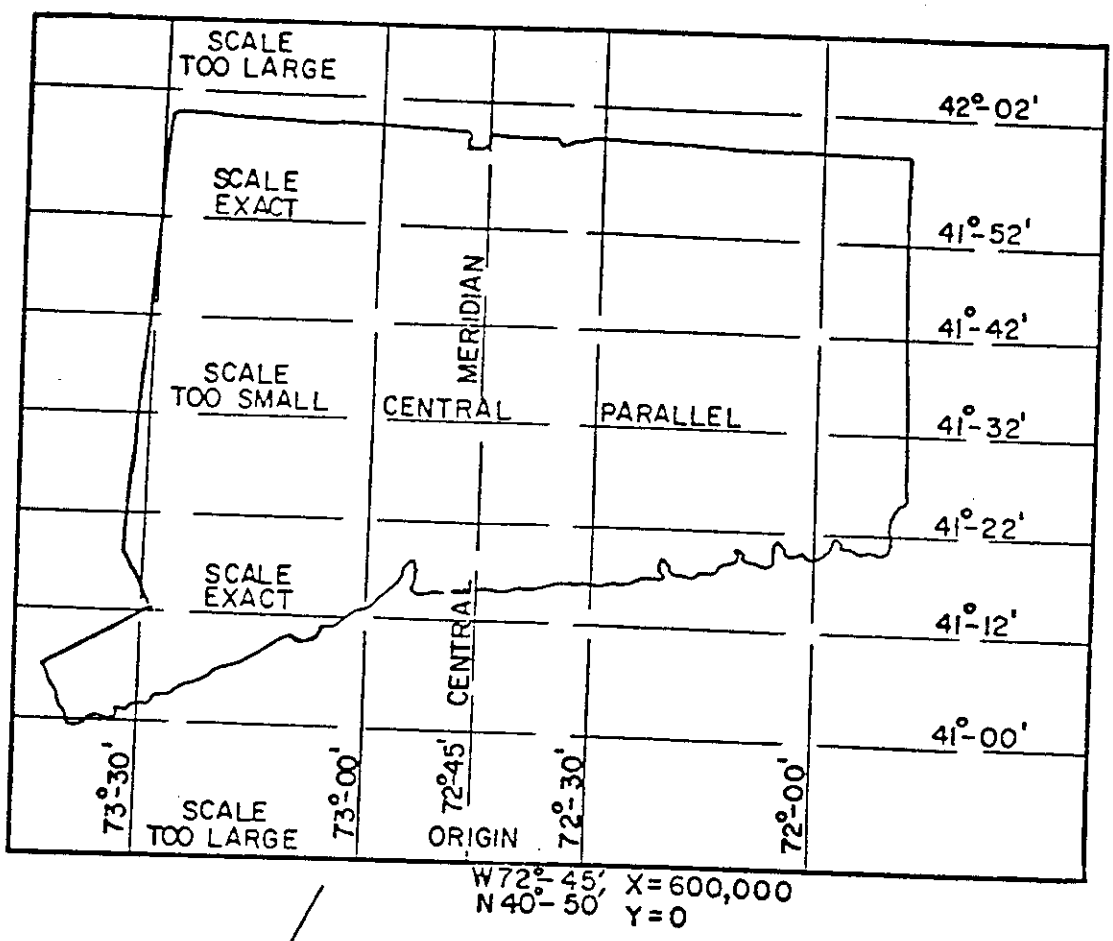
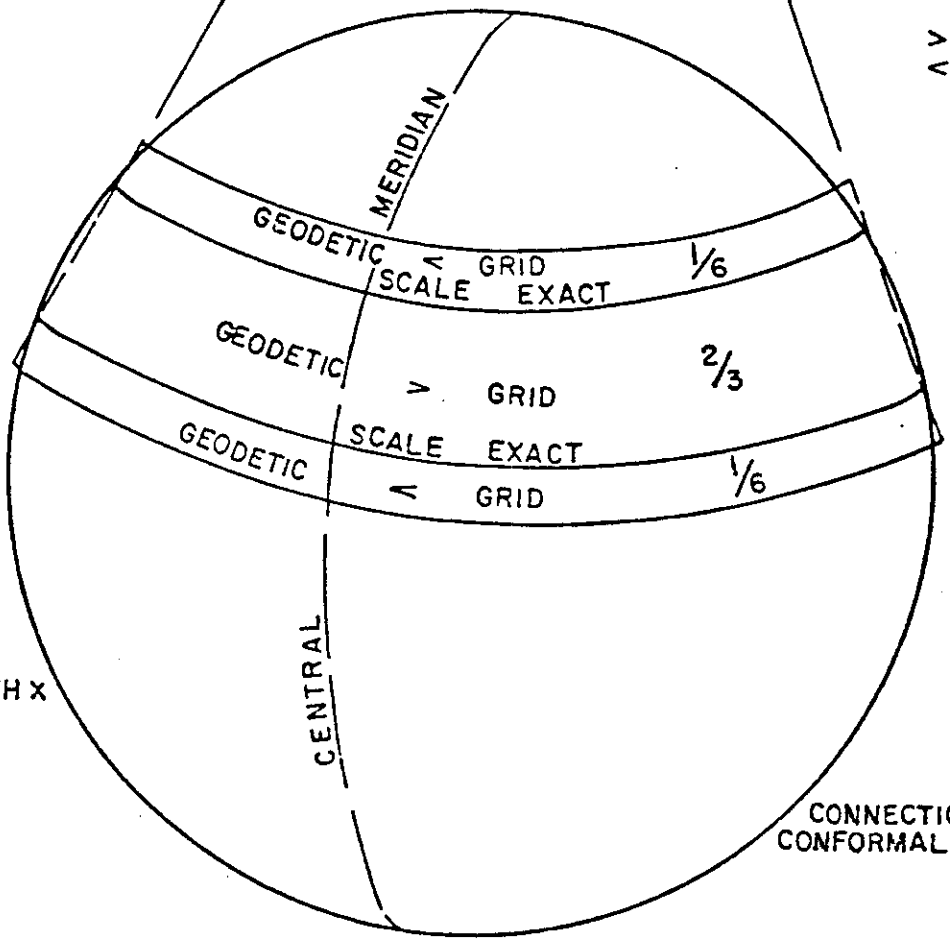


Figure 9 - Transverse Mercator Projection - Cylinder Secant to Sphere



> GREATER THAN
< LESS THAN



GEODETIC LENGTH X GRID FACTOR = GRID LENGTH

CONNECTICUT LAMBERT CONFORMAL PROJECTION

Sec. 13a-255. Establishment of a Connecticut coordinate system. (a) Completion. The system of plane rectangular coordinates which has been partially established by the United States coast and geodetic survey and the Connecticut geodetic survey for defining and stating the positions or locations of points on the earth's surface within this state shall be completed, and a detailed description thereof published, by the highway commissioner.

(b) Designation. Maintenance. Said system, after being so established and such description published by said commissioner, shall be designated as the Connecticut coordinate system, and said commissioner shall be responsible for its extension, revision and maintenance.

(c) Definition. The following definition by the United States coast and geodetic survey is adopted: The Connecticut coordinate system is a Lambert conformal conic projection of the Clarke spheroid of 1866 having standard parallels at north latitudes 41° 51' and 41° 12' along which parallels the scale shall be exact. The origin of coordinates is at the intersection of the meridian 72° 45' west longitude and the parallel 40° 50' north latitude. This origin is given the coordinates: X-600,000 feet and Y-0 feet.

(d) Use of name. The use of the term "Connecticut coordinate system" on any map, report of survey or other document shall be limited to coordinates based on the Connecticut coordinate system, as defined in subsection (c).

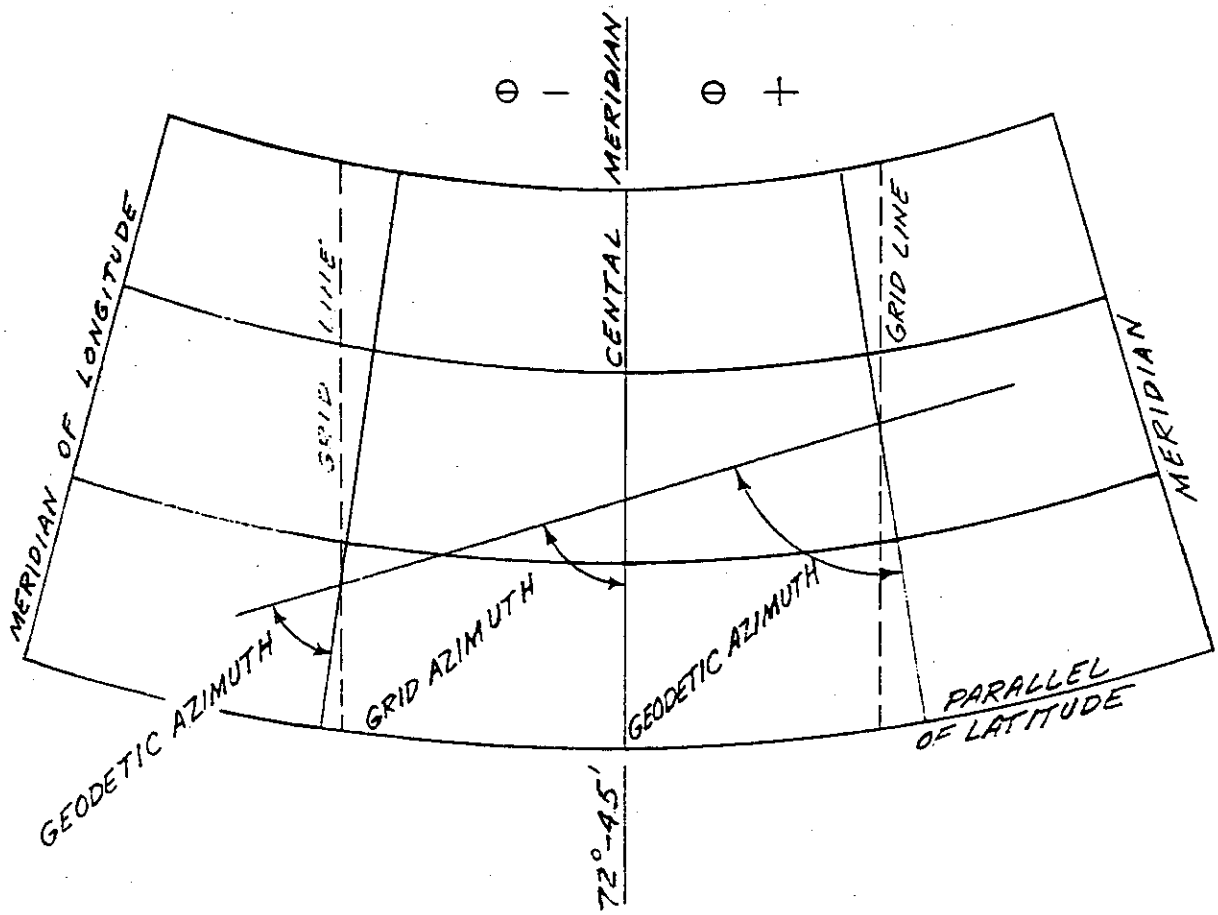
(e) Description. For the purposes of describing the location of any survey station or land boundary corner in this state, it shall be considered a complete, legal and satisfactory description of such location to give the position of such survey station or land boundary corner on the system of plane rectangular coordinates as defined in this section.

(f) Interpretation. Nothing contained in this section shall be interpreted as in conflict with, or as prohibiting, the further extension and use of other existing legal coordinate systems, nor shall this section be interpreted as requiring descriptions of real estate to be based only upon said system.

(g) Entry upon private property. Said Commissioner or his agent or agents may enter upon private property for the purpose of surveying, establishing or maintaining the survey. He shall use care so that no unnecessary damage shall result to any private property and the state shall be liable to the owner of such property for any damage so caused.

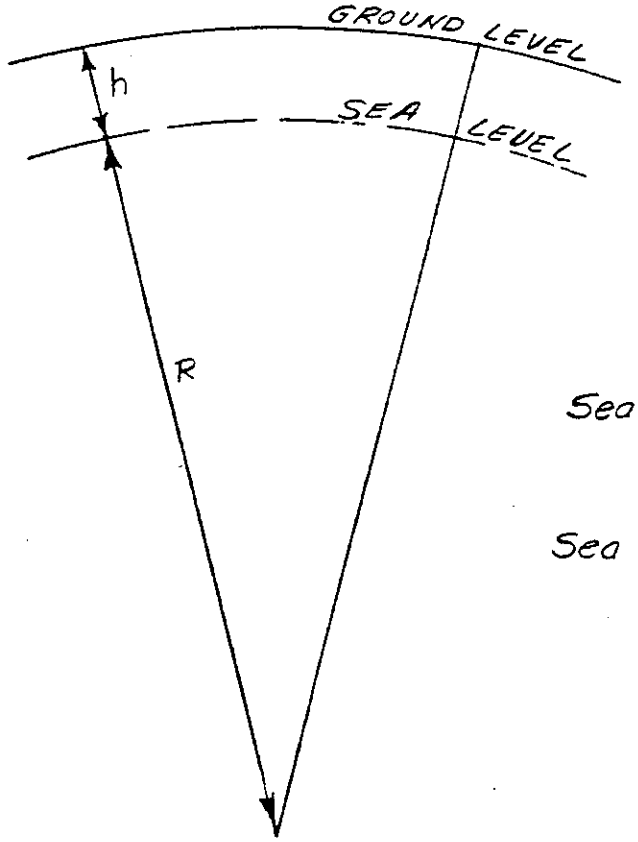
(1949 Rev., S. 2212; 1958 Rev., S. 13-97; 1963, P.A. 226, S. 255)

CONVERGENCE OF MERIDIANS



GRID AZIMUTH = GEODETIC AZIMUTH - θ

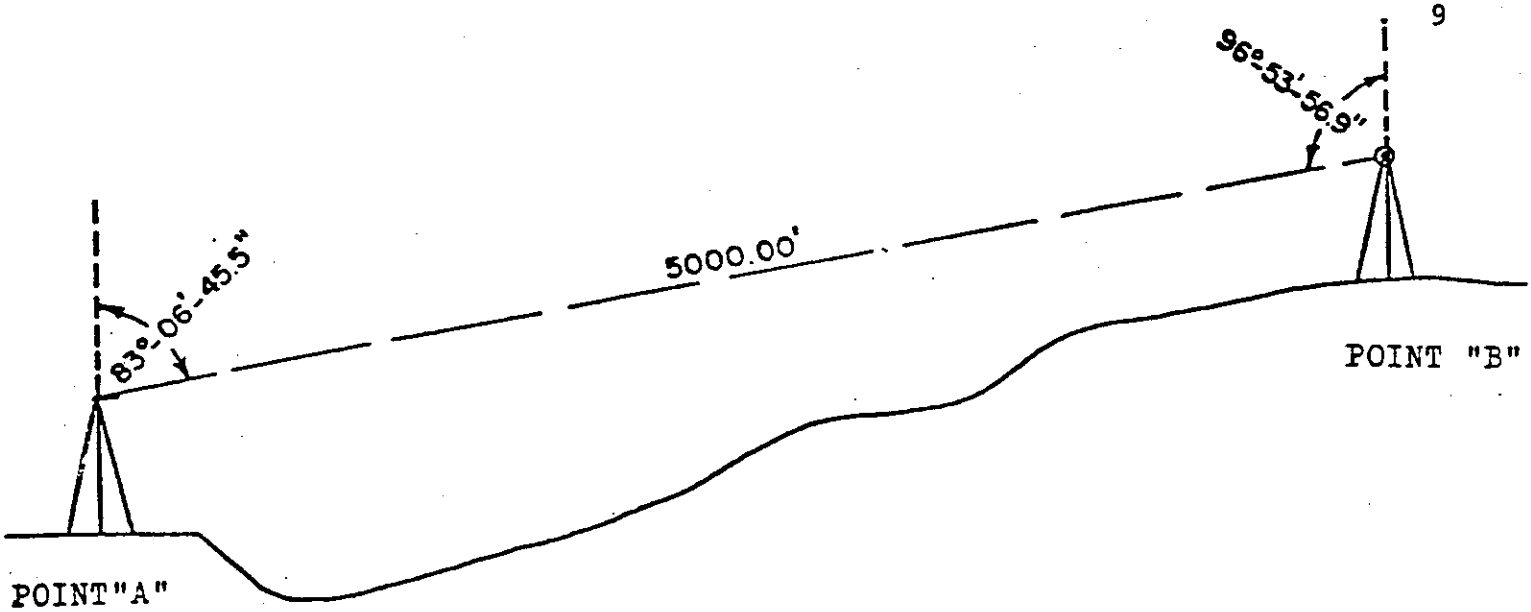
REDUCTION TO SEA LEVEL



R = 20,906,000 feet
mean radius of the earth's spheroid
over the United States

Sea Level Correction = Dist. $\left(\frac{h}{20,906,000}\right)$

Sea Level Factor = $\left(1 - \frac{h}{20,906,000}\right)$



Elevation of instrument at Point "A"		400.5 ft.
Elevation of target at Point "B"		1000.6 ft.
Slope distance Point "A" to Point "B"		5000.00 ft.
Zenith distance at Point "A" to Point "B"	83° 06' 45.5"	
Zenith distance at Point "B" to Point "A"	96° 53' 56.9"	
Mean Latitude of line Point "A" to Point "B"	41° 31' 30"	

EXACT FORMULA FOR SLOPE REDUCTION:

Horizontal distance = $\sqrt{\text{slope distance}^2 - (\text{diff. in elev.})^2}$

Horizontal distance = $\sqrt{5000.00^2 - 600.1^2}$

Horizontal distance = 4963.857 Ft.

USUAL PROCEDURE:

Horizontal distance = Sin. of Zenith angle X slope distance

Horizontal distance = Sin. 83° 06'45.5" X 5000.00

Horizontal distance = 4963.919 Ft.

Actual " distance = 4963.857

Error = 0.062 Ft.

" K " FACTOR FOR CURVATURE (correction in seconds) =
0.004231 X Distance (distance in <u>feet</u>).

Subtract correction from Zenith <u>OR</u> add correction to plus vertical angles and subtract from depression angles.

0.004231 X 5000. = 21.2"

83° 06' 45.5"- 21.2" = 83° 06' 24.3"

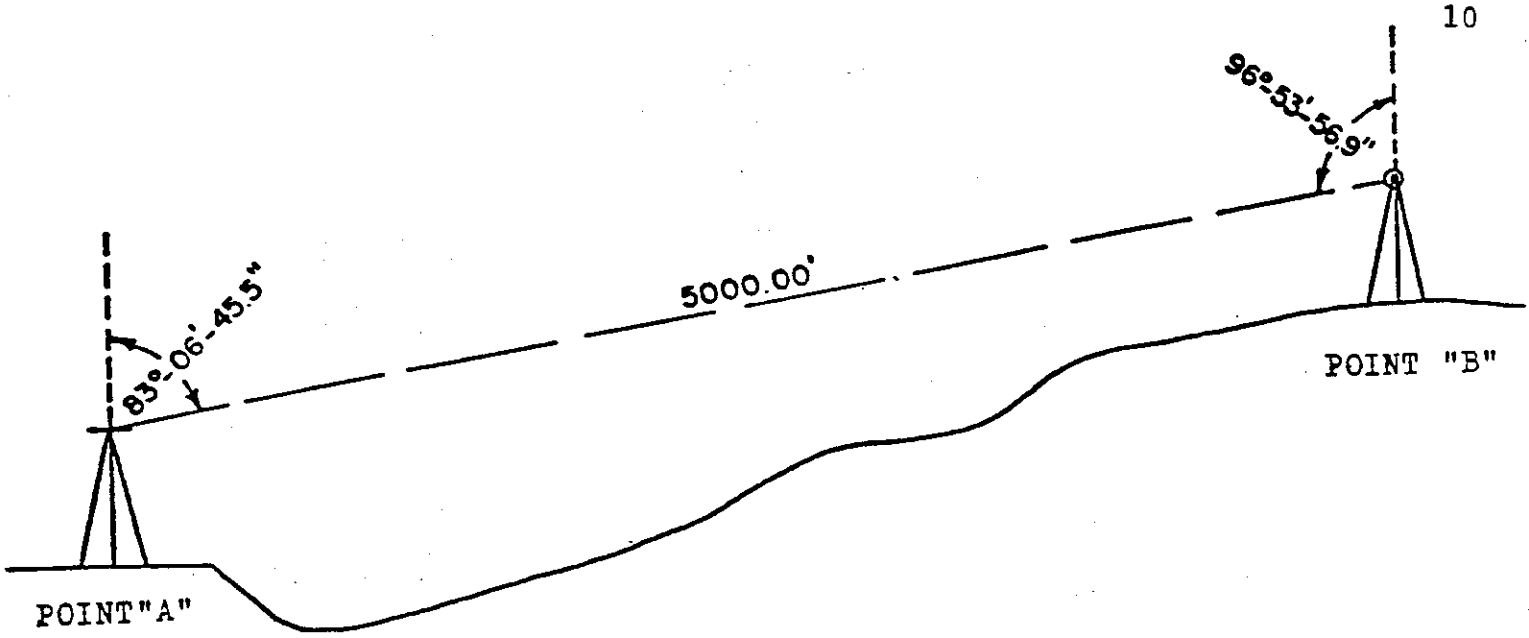
Horizontal distance = Sin. 83° 06'24.3" X 5000.00

Horizontal distance = 4963.857 Ft. <u>OR</u>

96° 53'56.9"- 21.2" = 96° 53' 35.7"

Horizontal distance = Sin. 96° 53'35.7" X 5000.00

Horizontal distance = 4963.857 Ft.



Elevation of instrument at Point "A"		400.5 ft.
Elevation of target at Point "B"		1000.6 ft.
Slope distance Point "A" to Point "B"		5000.00 ft.
Zenith distance at Point "A" to Point "B"	83° 06' 45.5"	
Zenith distance at Point "B" to Point "A"	96° 53' 56.9"	
Mean Latitude of line Point "A" to Point "B"	41° 31' 30"	

SEA LEVEL FACTOR

$$\text{Sea level factor} = 1 - \left(\frac{\text{mean elev.}}{20{,}906{,}000}\right)$$

Mean elevation of line above sea level: 700.5 FEET

$$\text{Sea level factor} = 1 - \left(\frac{700.5}{20{,}906{,}000}\right)$$

Sea level factor = 0.9999665

Geodetic distance = Horizontal distance X Sea level factor

Geodetic distance = 4963.857 X .9999665 = 4963.691 Ft.

SCALE FACTOR (Correction per foot) for CONNECTICUT

$$\text{Scale factor} = \frac{-0.0169 + ((.0000421)(\Delta\phi^2))}{1000} + 1 \text{ (CONNECTICUT ONLY)}$$

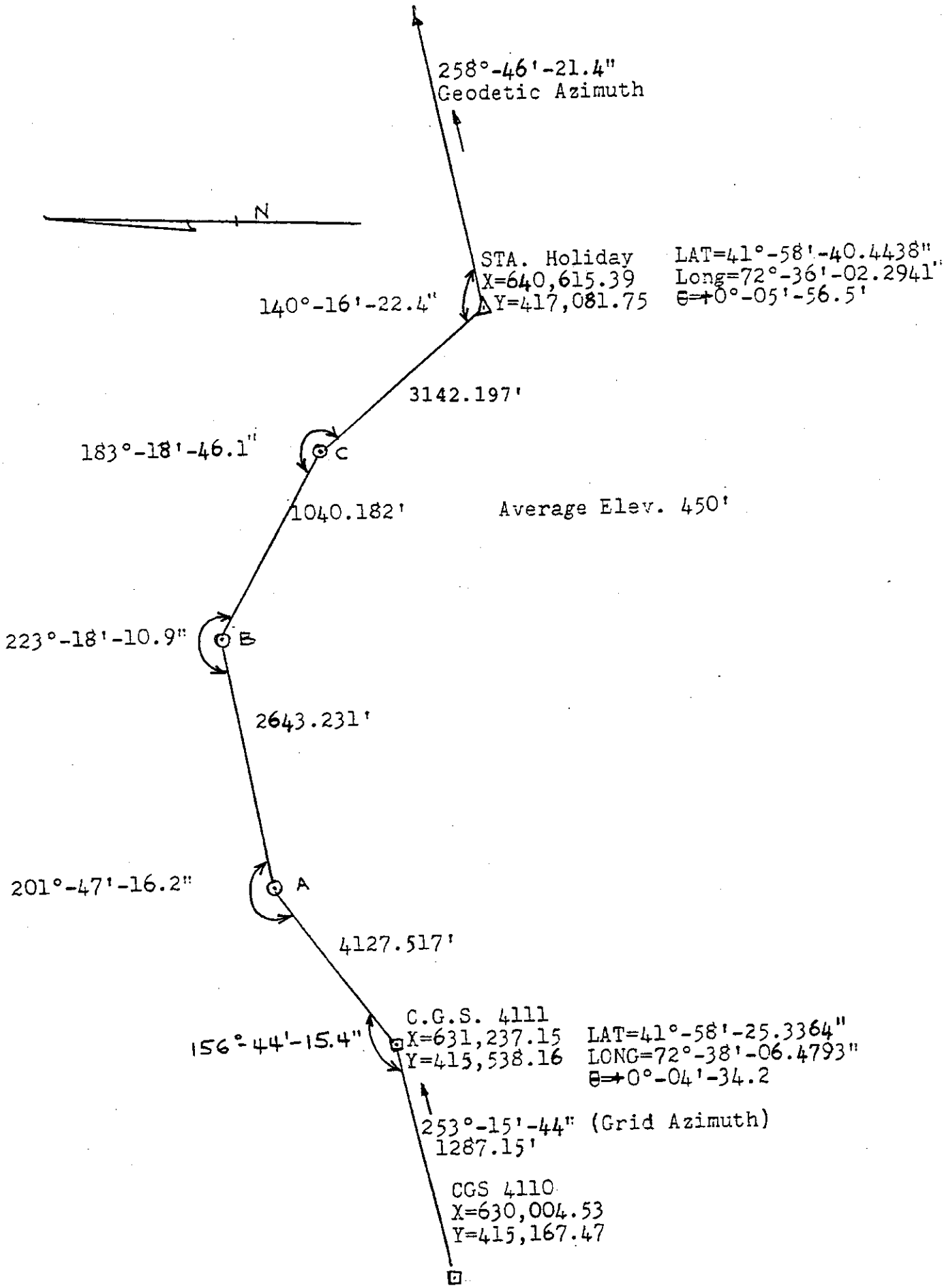
$\Delta\phi$ = Difference in latitude (in minutes) from the mean latitude of the line measured to the Central Parallel (41° 32')

$$\text{Scale factor} = \frac{-0.0169 + ((.0000421)(0.5^2))}{1000} + 1$$

Scale factor = 0.9999831

Grid distance = Geodetic distance X scale factor

Grid distance = 4963.691 X .9999831 = 4963.607 Ft.


258°-46'-21.4"
Geodetic Azimuth
N
STA. Holiday
X=640,615.39
Y=417,081.75
LAT=41°-58'-40.4438"
Long=72°-36'-02.2941"
θ=+0°-05'-56.5'
140°-16'-22.4"
3142.197'
183°-18'-46.1"
C
1040.182'
Average Elev. 450'
223°-18'-10.9"
B
2643.231'
201°-47'-16.2"
A
4127.517'
C.G.S. 4111
X=631,237.15
Y=415,538.16
LAT=41°-58'-25.3364"
LONG=72°-38'-06.4793"
θ=+0°-04'-34.2
156°-44'-15.4"
253°-15'-44" (Grid Azimuth)
1287.15'
CGS 4110
X=630,004.53
Y=415,167.47

TRAVERSE PROBLEM

Conversion of Ground Distances to Grid Distances

LINE	GROUND DISTANCE	LATITUDE (From USGS Map)	SCALE FACTOR	ELEVATION FACTOR	COMBINED FACTOR	GRID DISTANCE
4111-A	4127.517	41°-58'-40"	1.0000132	.9999783	.9999915	4127.482'
A - B	2643.231	41°-58'-50"	1.0000135	.9999783	.9999918	2643.209'
B - C	1040.182'	41°-59'-00"	1.0000139	.9999783	.9999922	1040.174'
C-Holiday	3142.197	41°-58'-50"	1.0000135	.9999783	.9999918	3142.171'

See Page 40 - Latitude 41-32 .02/1000)
Page 44 - Elevation 1000 .05/1000) Combined .07/1000 = 1/14,000

Convert Geodetic Azimuth Holiday ⟶ Azimuth Mark

See Page 8 - Grid Azimuth = Geodetic Azimuth - ⊖
Grid Azimuth = 258°-46'-21.4" - 0°-05'-56.5

Grid Azimuth = Holiday ⟶ Azimuth Mark = 258°-40'-24.9"

DATE Sept. 1989

COMPUTER R.C.J.

CHECKER W.D.B.

FORM NO. CGS-7
STATE HIGHWAY DEPARTMENT
STATE OF CONNECTICUT

LIST OF GRID AZIMUTHS

SHEET NO. 1/1

LINE) Workshop

LOOP) Holiday

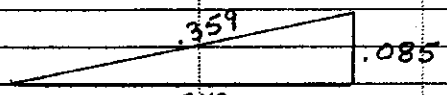
LINE STATION	STATION	PRELIMINARY AZIMUTH ° ' "	CORRECTION "FOR CLOSURE"	CORRECTED AZIMUTHS ° ' "
◁				
4110	4111	253-15-44.0		
4111	4110	73-15-44.0		
◁	4111	156-44-15.4		
4111	A	229-59-59.4	-2.0"	229-59-57.4
A	4111	49-59-59.4		
◁	A	201-47-16.2		
A	B	251-47-15.6	-4.0"	251-47-11.6
B	A	71-47-15.6		
◁	B	223-18-10.9		
B	C	295-05-26.5	-6.0"	295-05-20.5
C	B	115-05-26.5		
◁	C	183-18-46.1		
C	Holiday	298-24-12.6	-8.0"	298-24-04.6
Holiday	C	118-24-12.6		
◁	Holiday	140-16-22.4		
		258-40-35.0	-10.1"	258-40-24.9
◁				
◁				
◁				
◁				
◁				

Nat. Functions By _____ Date _____
Log. Functions By _____ Date _____
Coords. Comp. By _____ Date _____
Coords. Chkd. By _____ Date _____
Coords. Listed By _____ Date _____

Form No. CGS-3 ED. 6-47
STATE HIGHWAY DEPARTMENT
State of Connecticut
Coordinate Computation Sheet
Computation of Plane Coordinates

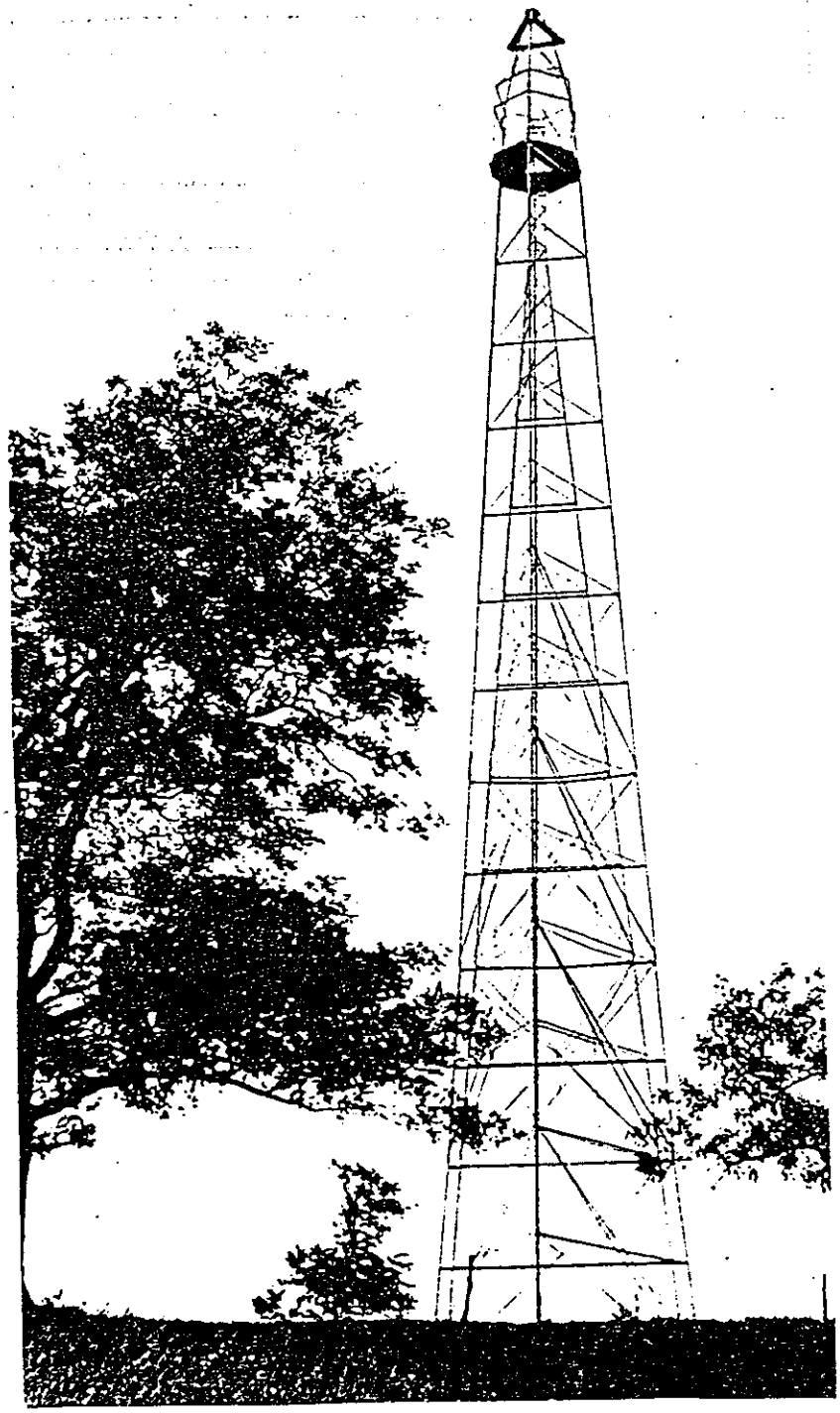
Traverse Line 4111 - Holiday
Sheet 1 of 1
Loop Holiday
Town Meriden
County Hartford

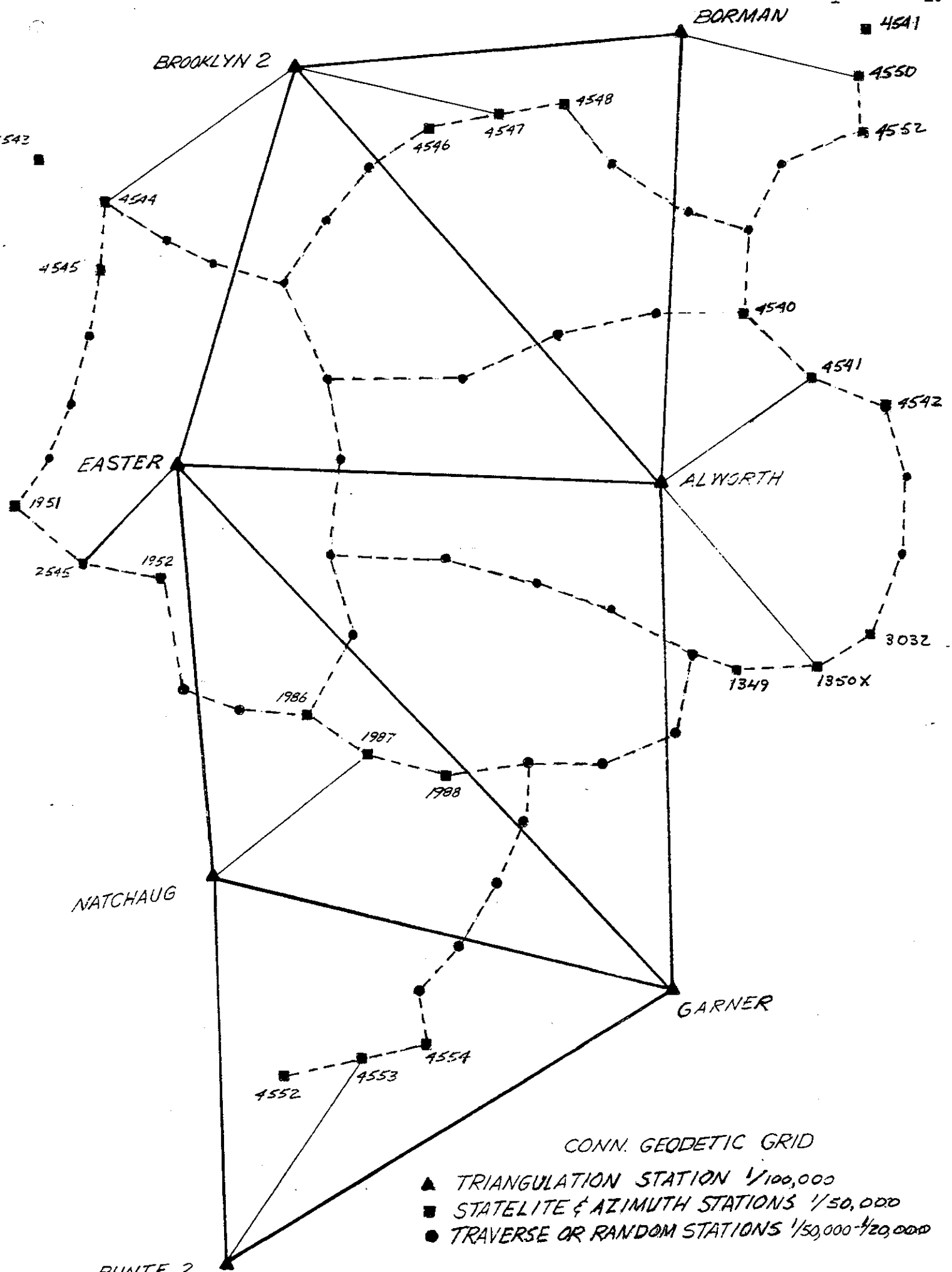
Station	Naturals	Azimuth ° ' "	Distance Feet	Logarithms	Departure	Latitude	Coordinates X	Coordinates Y
4111							631237.150	415538.160
							+3161.801	+2653.134
		229-59-57.4	4127.482		+3161.801	+2653.134	634398.951	418191.294
							-.132	-.032
A			4127				634398.819	418191.262
							+2510.781	+826.156
		251-47-11.6	2643.209		+2510.781	+826.156	636909.732	419017.450
							-.216	-.052
B			6770				636909.516	419017.398
							+942.034	-441.061
		295-05-20.5	1040.174		+942.034	-441.061	637851.766	418576.389
							-.249	-.061
C			7810				637851.517	418576.328
							+2763.973	-1494.554
		298-24-04.6	3142.171		+2763.973	-1494.554	640615.739	417081.835
							-.349	-.085
Holiday			10952				640615.390	417081.750



$\frac{.359}{10952} = \frac{1}{30,507}$

x corr = 3.187×10^{-5}
y corr = 7.761×10^{-6}




BORMAN
4541
BROOKLYN 2
4550
4548
4547
4546
4552
543
4544
4545
4540
4541
4542
EASTER
ALWORTH
1951
2545
1952
3032
1349
1350X
1986
1987
1988
NATCHAUG
GARNER
4554
4553
4552
CONN. GEODETIC GRID
▲ TRIANGULATION STATION 1/100,000
■ STATELITE & AZIMUTH STATIONS 1/50,000
● TRAVERSE OR RANDOM STATIONS 1/50,000-1/20,000

DATE 4-4-84
COMPUTER A.B.C.
CHECKER C.B.A.

DEPARTMENT OF TRANSPORTATION
STATE OF CONNECTICUT
MEAN JUNCTION - POINT COORDINATE COMPUTATION

SHEET No. 1
LINE

TRAVERSE LINE	ORIGIN OF TRAVERSE LINE	LENGTH OF LINE IN FEET - L	20,000 / L WEIGHT OF LINE = W	EAST COORDINATE = X	VALUE OF WX	NORTH COORDINATE = Y	VALUE OF WY
1	4552	5079.1	3.9377	169,756.79	26.7370	526,893.91	15.3964
2	4540	13535.2	1.4776	169,757.53	11.1263	526,894.91	7.2550
3	4548	12,369.7	1.6168	169,756.35	10.2667	526894.89	7.9061
		EW=	7.0321	EWX	48.1300	EWY=	30.5575

EWX / EW = 48.1300 / 7.0321 = 6.84

EWY / EW = 30.5575 / 7.0321 = 4.35

X = 169,756.84

Y = 526,894.35

TRAVERSE LINE	ORIGIN OF TRAVERSE LINE	LENGTH OF LINE IN FEET=L	100,000 / L WEIGHT OF LINE=W	EAST COORDINATE = X	VALUE OF WX	NORTH COORDINATE = Y	VALUE OF WY

THE WEIGHT OF THE LINE IS AN ARBITRARY NUMBER LARGER THAN THE LONGEST LENGTH OF TRAVERSE, TRAVERSE LINE 2 WAS 13,535 FEET LONG SO 20,000 WAS CHOSEN.

DATE 4-4-84
COMPUTER A.B.C.
CHECKER C.B.A.

DEPARTMENT OF TRANSPORTATION
STATE OF CONNECTICUT
MEAN JUNCTION - POINT AZIMUTH COMPUTATIONS

LOOP
SHEET NO. 1
LINE A-3817-A3818

TRAVERSE LINE NO.	ORIGIN of TRAVERSE LINE	COMPUTED AZIMUTH FOR JUNCTION - POINT COURSE - A ° ' "	NO. OF INST'NT STATIONS N.	W = 1120/N	VALUE OF W × A "
1	4552	271 — 08 - 58.1	7	160	9296.0
2	4540	271 — 08 — 59.4	10	112	6652.8
3	4548	271 — 08 — 31.6	16	70	2212.0
			ΣW = 342		
				ΣWA = 18160.8	
		$\frac{\Sigma WA}{\Sigma W} = \frac{18160.8}{342} = 53.1$			
	AZ. OF A-3817-A-3818 = 271° - 08' - 53".1				
	W CAN BE ANY NUMBER WHICH IS DIVISIBLE BY 7, 10 & 16				

MAR 1972
U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

HORIZONTAL CONTROL DATA

by the
Coast and Geodetic Survey
NORTH AMERICAN 1927 DATUM

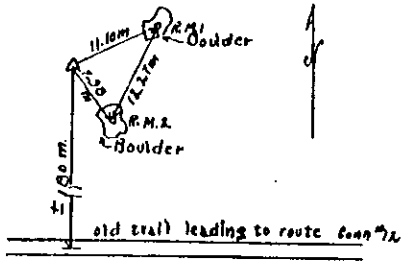
CONNECTICUT VOL II PAGE 128
QUAD 410722 STATION
CONN-NY
LATITUDE 41 °00 ' TO 41 °30 '
LONGITUDE 72 °00 ' TO 72 °30 '
DIAGRAM NK 18-9 HARTFORD

HOLMBURG (New London County,Conn.,G.C.M.,1934)--The station is reached from the Preston-Ledyard town line at the bridge, on State Highway No.12, over Poquetanuck Cove. Go S 0.1 mile to a dirt road leading up a very steep hill, continue up this hill 0.75 mile through the property of H. and H. Holmburg to the top of Avery Hill. Beyond the Holmburg home the road is a farm road through the field, then becoming a wood road leading through the woods. The top of the hill is level and clear of large timber. The station is about in the center of the level ground and set in a boulder flush with the ground.

Reference marks No.1 and No.2 are standard disks set in boulders NE (magnetic) and SE (magnetic) of the station respectively.

OBJECT	DISTANCE	DIRECTION
VINEGAR HILL	meters	0°00'00"0
Norwich State Hosp. Tall Stack		128 10 39.
R.M.No.1	11.10	239 49 28.
R.M.No.2	7.98	317 56 28.
R.M.No.1 to R.M.No.2	12.27	

Height of light above station mark - 13 meters.
Height of telescope above station mark - 11 meters.



HOLMBURG (New London County,Conn.,G.C.M.,1934;Conn.Geod.S., 1940)--The station was recovered as described and in good condition. By going due E from the Holmburg house, a truck can be driven to the station.

(11-6-66)

RECOVERY NOTE, TRIANGULATION STATION R

Name of Station: HOLMBURG
Established by G.C.M. Year: 1934 State: Conn.
Recovered by: G.F.W. Year: 1961 County: New London

Detailed statement as to the items of the original description; including marks found, stampings, changes made, and other pertinent facts:

Station and reference marks 1 and 2 were recovered in good condition as described by G.C.M. in 1934. Station is stamped "HOLMBERG 1934" and the reference marks are stamped "HOLMBERG NO 1 1934" and "HOLMBERG NO 2 1934".

(11-6-66)

RECOVERY NOTE, TRIANGULATION STATION 410722 R

Name of Station: HOLMBURG
Established by: USC&GS Year: 1934 State: Connecticut
Recovered by: Conn. D.O.T. Year: 1971 County: New London

Detailed statement as to the items of the original description; including marks found, stampings, changes made, and other pertinent facts:

The station and reference marks were found in good condition. To reach the station from Ledyard at the intersection of Route 12 and Route 214 (Stoddards wharf Road) go east on Route 214 for 1.1 miles to Avery Hill Road, turn left, north and go 1.0 mile to Marlene Dr., turn left and go 0.2 mile northwest to Naomi Drive, turn left and go 0.15 mile west to Cul-de-sac. The station is about 830 feet northwest of the centerline of Naomi Drive along the stonewall, and 106 feet west of the same stonewall.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION HOLMBURG
STATE CONNECTICUT YEAR 1934 SECOND ORDER
LOCALITY EASTERN CONNECTICUT
SOURCE G-6081 FIELD SHEETS CONN 34

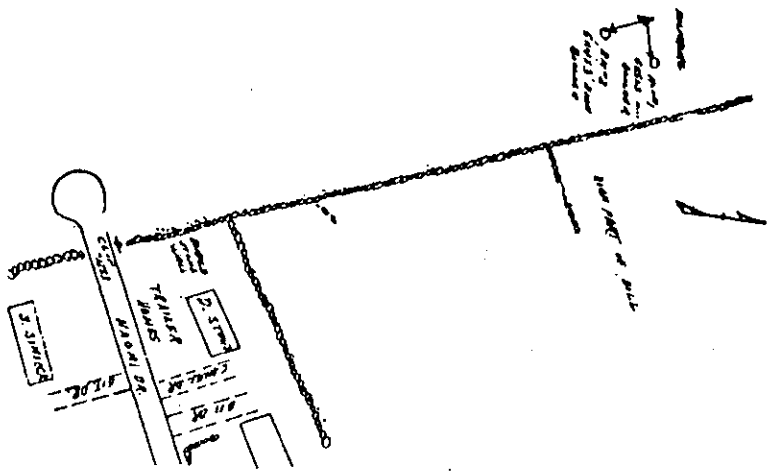
GEODETIC LATITUDE	41 28 02.21412	ELEVATION	METERS
GEODETIC LONGITUDE	72 02 57.72737		FEET

STATE COORDINATES (FEET)				
STATE & ZONE	CODE	X	Y	β ION Δ or ANGLE *
CONN.	0600	792,025.42	231,762.04	+ 0 27 52

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE β ION Δ 81 FORMULA NEGLECTING THE SECOND TERM

TO STATION OR OBJECT	GEODETIC AZIMUTH (FROM SOUTH)	PLANE AZIMUTH * (FROM SOUTH)	CODE
VINEGAR HILL	6 37 08.5	6 09 16	0600
WHEELER	182 34 32.6	182 06 40	0600

HOLMBURG (contd)



MAR 1977
U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

HORIZONTAL CONTROL DATA

by the
Coast and Geodetic Survey
NORTH AMERICAN 1927 DATUM

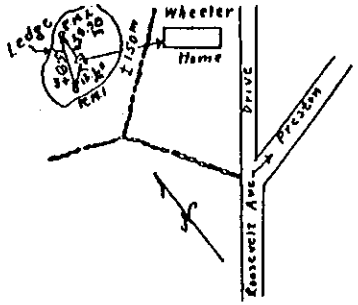
CONNECTICUT VOL II PAGE 126
QUAD 410721 STATION
CONN
LATITUDE 41 °30 ' TO 42 °00 '
LONGITUDE 72 °00 ' TO 72 °30 '
DIAGRAM NK 18-9 HARTFORD

WHEELER (New London County,Conn.,G.C.M.,1934)--The station is on the highest part of the hill W of the junction of Roosevelt Avenue and the drive to Wheeler's house. The station is a standard disk set in an outcropping ledge on the southern extremity of the highest part of the hill and about 150 meters westerly of George Wheeler's house. There are no trees or brush on the top of the hill.

Reference mark No.1 is a standard disk set in ledge 12.20 meters SW of the station. Reference mark No.2 is a standard disk set in ledge 24.98 meters northerly of the station. Reference mark No.1 to reference mark No.2 is 35.84 meters.

OBJECT	DISTANCE	DIRECTION
HOLMBURG	meters	0°00'00"0
R.M.No.1	12.20	34 47 55.
Norwich St. Patrick's Ch. Spire		56 13 42.
R.M.No.2	24.98	180 21 15
R.M.No.1 to R.M.No.2	35.84	

Height of light above station mark - 5 meters.
Height of telescope above station mark - 1.7 meters.



WHEELER (New London County,Conn.,G.C.M.,1934;Conn.Geod.S., 1940)--The station was recovered as described and in good condition.

Form 336
(11-6-65)

U.S. DEPARTMENT OF COMMERCE - COAST AND GEODETIC SURVEY
RECOVERY NOTE, TRIANGULATION STATION

R

Name of Station: WHEELER
Established by: G.C.H. Year: 1934 State: CONN.
Recovered by:* G.F.W. Year: 1961 County: NEW LONDON

Detailed statement as to the items of the original description, including marks found, stampings, changes made, and other pertinent facts:

Station and reference marks were recovered in good condition. Station is stamped "WHEELER 1934" and the reference marks are stamped "WHEELER NO.1 1934" and "WHEELER NO 2 1934". Distances were checked and found correct as previously published. The description by G.C.H. in 1934 is complete and adequate.

G.H.B.

* Name of chief of party should be inserted here. The officer in the actually visited the station should sign his name at the end of the recovery note.
Note.—One of these forms must be used for every station recovered.

ADJUSTED HORIZONTAL CONTROL DATA

NAME OF STATION WHEELER

STATE CONNECTICUT YEAR 1934 SECOND ORDER

LOCALITY EASTERN CONNECTICUT

SOURCE G-6081 FIELD SHEETS CONN 34

GEODETIC LATITUDE	41 °32 '45."86693	ELEVATION	METERS
GEODETIC LONGITUDE	72 02 40.74281		FEET

STATE COORDINATES (FEET)

STATE & ZONE	CODE	x	y	ϕ FROM Δ TO ANGLE
CONN.	0600	793,084.12	260,481.22	+ 0 °28 '04 "

* PLANE AZIMUTH HAS BEEN COMPUTED BY THE ϕ FROM Δ TO FORMULA NEGLECTING THE SECOND TERM

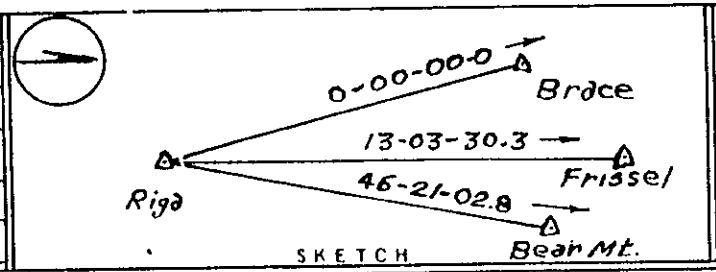
TO STATION OR OBJECT	GEODETIC AZIMUTH (FROM SOUTH)	PLANE AZIMUTH * (FROM SOUTH)	CODE
HOLMBURG	2 °34 '43."9	2 °06 '40 "	0600
ELIZABETH	51 37 25.5	51 09 22	0600

01 914

FORM NO. CGS
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

DIRECTIONAL SHEET

DATE 26 November 1973
INSTRUMENT NAME Wild # 280186 MODEL T-2
OBSERVER B Wazer
OBSERVER
RECORDER A. Kaczynski
CHECKER J. Puglisi DATE 11/28/73



SKETCH

TOWN Salisbury PROJ. State Line
LOOP Triangulation ROUTE
SHEET 1 OF 2 SHEETS
AIR CONDITIONS STILL * WINDY
VISIBILITY: GOOD * FAIR POOR
HUMIDITY: DRY DAMP * WET

STATIONS OBSERVED	POS.	TEL.	HORIZONTAL CIRCLE READINGS DEG.	MIN.	1st SEC.	2nd SEC.	SUM	MEAN	MEAN D&R	DIRECTIONS DEG.	MIN.	SEC.	REMARKS
Brace	1	D	0	00	21	22		21.5					
		R	180	00	13	12		12.5	17.0	00	00	00.0	
Frissel		D	13	03	49	47		48.0					
		R	193	03	43	45		44.0	46.0	13	03	29.0	
Bear Mt.		D	46	21	19	19		19.0					
		R	226	21	18	18		18.0	18.5	46	21	01.5	
Brace	2	R	225	02	51	53		52.0					
		D	45	02	59	59		59.0	55.5	00	00	00.0	
Frissel		R	238	06	21	23		22.0					
		D	58	06	27	29		28.0	25.0	13	03	29.5	
Bear Mt.		R	271	23	53	56		54.5					
		D	91	23	56	59		57.5	56.0	46	21	00.5	
Brace	3	D	90	00	55	57		56.0					Inst. Releveled
		R	270	01	00	02		01.0	58.5	00	00	00.0	
Frissel		D	103	04	30	31		30.5					
		R	283	04	32	33		32.5	31.5	13	03	33.0	
Bear Mt.		D	136	22	04	04		04.0					
		R.	316	22	06	08		07.0	05.5	46	21	07.0	

INSTRUMENT AT STATION Riga
APPROVED
CHIEF OF PARTY

JAM 11/73

FORM NO. CGS
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

DIRECTIONAL SHEET

DATE 26 November 1973
INSTRUMENT NAME Wild # 28018 MODEL T-2
OBSERVER B. Wazer
OBSERVER
RECORDER A. Kaczynski
CHECKER J. Puglisi DATE 11/28/73

SKETCH

TOWN Salisbury PROJ. State Line
LOOP Triangulation ROUTE
SHEET 2 OF 2 SHEETS
AIR CONDITIONS STILL * WINDY
VISIBILITY: GOOD * FAIR POOR
HUMIDITY: DRY DAMP * WET

STATIONS OBSERVED	POS.	TEL.	HORIZONTAL CIRCLE READINGS DEG.	MIN.	1st SEC.	2nd SEC.	SUM	MEAN	MEAN D & R	DIRECTIONS DEG.	MIN	SEC.	REMARKS
Brace	4	R	315	01	56	57		56.5					
		D	135	01	54	55		54.5	55.5	00	00	00.0	
Frissel		R	328	05	25	25		25.0					
		D	148	05	24	27		25.5	25.2	13	03	29.7	
Bear Mt.		R	01	23	00	59		59.5					
		D	181	22	55	56		55.5	57.5	46	21	02.0	
													1. 29.0 01.5
													2. 29.5 00.5
													3. 33.0 07.0
													4. 29.7 02.0
													121.2 11.0
													Mean: 30.3" 2.8
													ADOPTED
												Brace	00-00-00.0
												Frissel	13-03-30.3
												Bear Mt.	46-21-02.8

INSTRUMENT AT STATION Riga APPROVED
CHIEF OF PARTY

JAM 11/73

Form CGS 13A Ed. 4/73
Hewlett-Packard E.D.M.
Model 3800A. Ser.# 1118A01317

Atmospheric Corr.	Temp.	Press.	PpmCorr
Instrument	77F	30.4	
Reflector	75F	30.4	
Mean	76F	30.4	+3

Date Sept. 11, 1974
Observer B. Wazer
Recorder A. Kaczynski
Computer B. Jordan
Date Sept. 12, 1974
Checker J. Puglisi
Date Sept. 12, 1974

Town Wethersfield
Project Local Control
Loop CGS 1304 - Ran. C-728
Inst. Sta. Drill Hole "A"
Reflector Sta. Old Random "B"
Reflector Type 3-P

	Elev.	Latitude	H.I.
Instrument	40	41 41 27	4.2
Reflector	110	41 41 08	4.8
Mean	75	41 41 18	

Visibility ☐ Good ☒ Fair ☐ Poor
Humidity ☒ Dry ☐ Damp ☐ Wet
Air Cond. ☐ Still ☒ Breezy ☐ Windy

Stability
Return Signal Reading 70

~~Vertical~~ Angle

	Zenith
*	D 88 34 46
	R 271 25 33
	360 00 19
*	
Mean	88 34 36

Distance Reading	2850804 *
X.P.P.M. Corr. =	+0 0 9
−Reflector Corr.	
=Slope Distance	2 8 5 0 8 1 3 *
XCos Vertical Angle	99969001
=Horizontal Distance	2849929
XSea Level	9999964
=Geodetic Distance	2 8 4 9 9 1 9
XScale Factor	9999869
=Grid Distance	2849881

Attenuator Used ☐ Yes ☒ No

Remarks:

88 34 36
K Factor -12
Zenith= 88 34 24

Sheets

Form CGS 13A Ed. 4/73
Hewlett-Packard E.D.M.
Model 3800A. Ser.#

Atmospheric Corr.	Temp.	Press.	PpmCorr
Instrument			
Reflector			
Mean			

Date
Observer
Recorder
Computer
Date
Checker
Date

Town
Project
Loop
Inst. Sta.
Reflector Sta.
Reflector Type

	Elev.	Latitude	H.I.
Instrument			
Reflector			
Mean			

Visibility ☐ Good ☐ Fair ☐ Poor
Humidity ☐ Dry ☐ Damp ☐ Wet
Air Cond. ☐ Still ☐ Breezy ☐ Windy

Stability
Return Signal Reading

Vertical Angle

*	
*	
Mean	

Distance Reading	
X.P.P.M. Corr. =	
−Reflector Corr.	
=Slope Distance	
XCos Vertical Angle	
=Horizontal Distance	
XSea Level	
=Geodetic Distance	
XScale Factor	
=Grid Distance	

Attenuator Used ☐ Yes ☐ No

Remarks:

Sheet _____ Of _____ Sheets

U. S. Department of Commerce
Charles Sawyer, *Secretary*

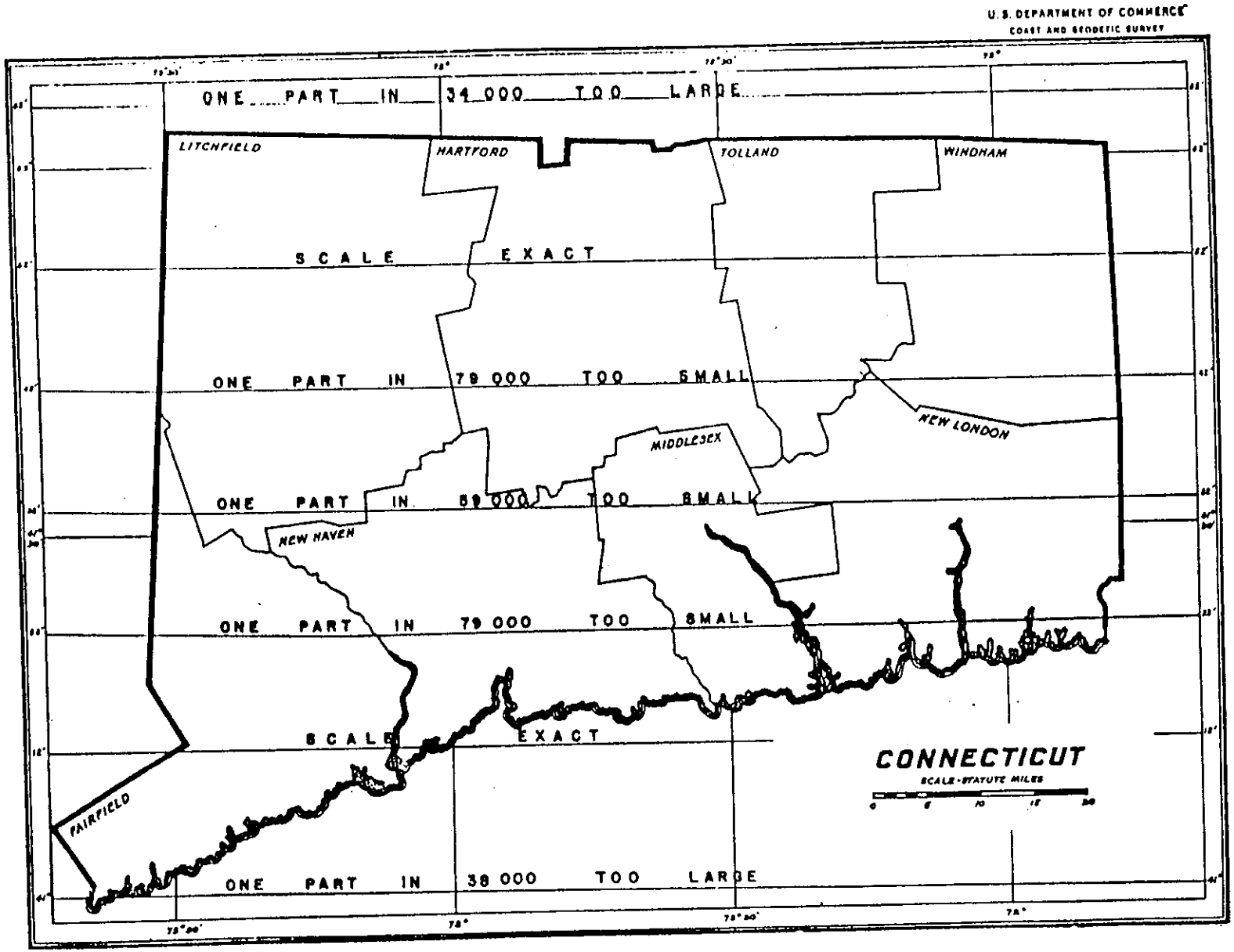
Coast and Geodetic Survey
Robert F. A. Studds, *Director*

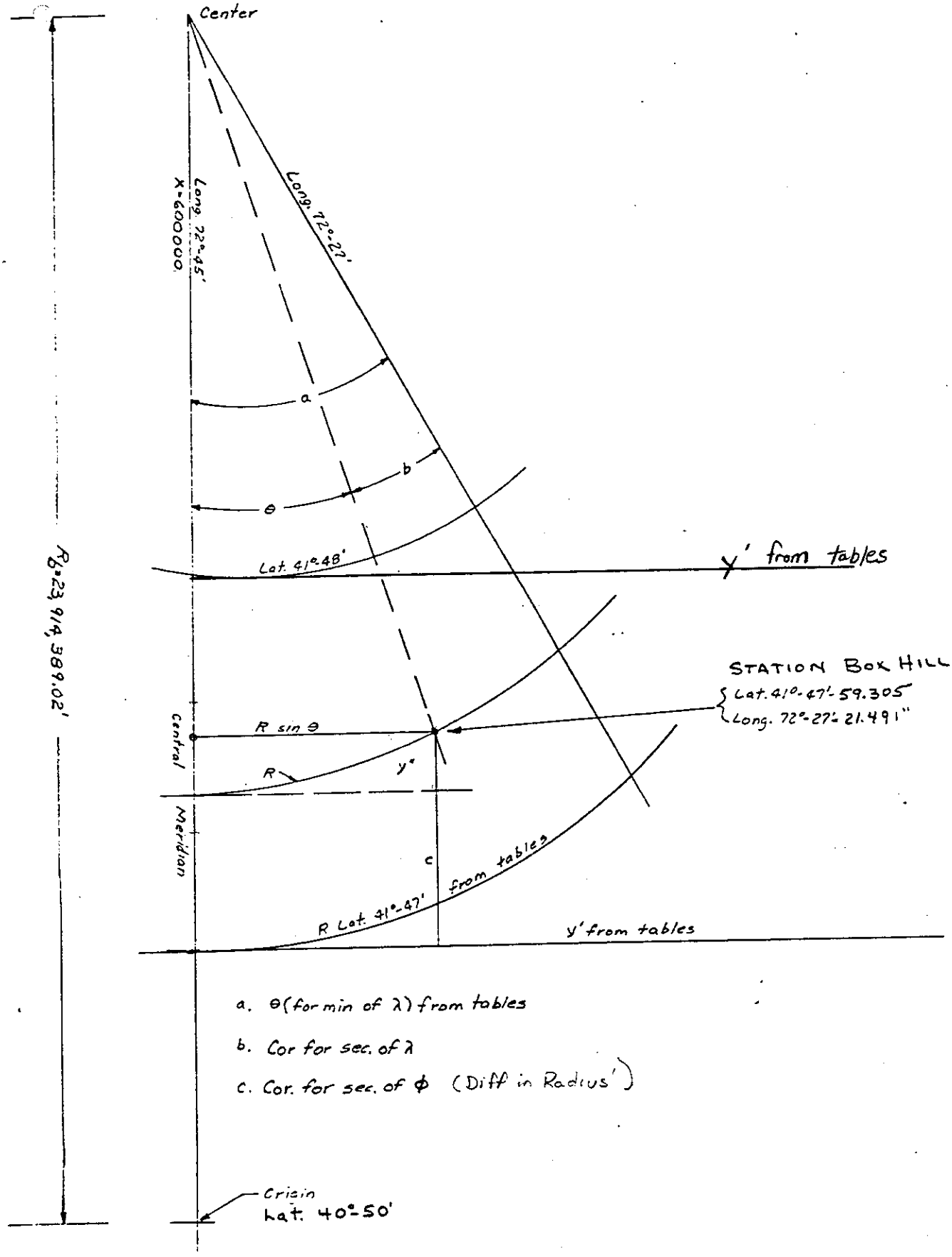
Special Publication No. 266

PLANE COORDINATE PROJECTION TABLES
CONNECTICUT

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1952

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price 15 cents


U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
ONE PART IN 34 000 TOO LARGE
LITCHFIELD
HARTFORD
TOLLAND
WINDHAM
SCALE EXACT
ONE PART IN 79 000 TOO SMALL
NEW LONDON
MIDDLESEX
ONE PART IN 59 000 TOO SMALL
NEW HAVEN
ONE PART IN 79 000 TOO SMALL
SCALE EXACT
CONNECTICUT
SCALE - STATUTE MILES
FAIRFIELD
ONE PART IN 38 000 TOO LARGE



a. θ (for min of λ) from tables

b. Cor for sec. of λ

c. Cor. for sec. of φ (Diff in Radius')

FIGURE 3 Diagram illustrating how coordinates are computed on Lambert projection

Foreword

The plane coordinate system used in this State is based on the Lambert conformal conic projection with two standard parallels for each 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, using tables of natural trigonometric functions. A table of these functions has been published by the Coast and Geodetic Survey to ten decimal places with ten-second intervals for 0° to 6° in Special Publication No. 246 and is sold for a nominal sum by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

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

Plane Coordinates from Geographic Positions

$$x = R \sin \theta + C$$

$$y = R_b - R \cos \theta$$

Grid azimuth = geodetic azimuth - θ + second term

where

R is the radius for the latitude of the station,

R_b is a constant for a zone,

θ is the mapping angle for the longitude of the station,

and

C is the value of x assigned to the Central Meridian for a zone.

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.

$$\text{Second term} = \frac{x_2 - x_1}{2\rho_0^2 \sin 1''} \left(y_1 - y_o + \frac{y_2 - y_1}{3} \right)$$

Geographic Positions from Plane Coordinates

The formulas show the method of computing R and θ from which the latitude and longitude may be obtained.

$$x' = x - C$$

$$\tan \theta = x' \div (R_b - y)$$

$$R = (R_b - y) \div \cos \theta$$

$$\Delta\lambda = \theta \div \ell$$

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

where

R, R_b, θ, and C are the same as previously defined

and

ℓ is a constant for a zone.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 736 4

PLANE COORDINATES ON LAMBERT PROJECTION

(Condensed form for calculating-machine computation)

$X = R \sin\theta + C$ $\quad Y = R_b - R\cos\theta$ $\quad$ State-Zone Connecticut

$C =$ 600,000.00 $\quad R_b =$ 23,914,389.02 $\quad$ Grid Az. = Geod. Az. $- \theta$

Station	Latitude / Longitude	R / θ	sin θ / cos θ	X / Y
1 Winer, 1932, r. 1942	41 16 55.847	23,750,849.79	+0.00028 76584	606,832.13
	72 43 30.515	+0 00 59.3338	0.99999 99587	163,540.21
	Grid azimuth to azimuth mark R.M. No. 2			317 17 03
2 Milford 2, 1871, r. 1947	41 13 25.985	23,772,090.04	-0.00313 61901	525,446.21
	73 01 15.609	-0 10 46.8867	0.99999 50822	142,415.89
	Grid azimuth to azimuth mark R.M. No. 2			124 46 04
3				
	Grid azimuth to azimuth mark			
4				
	Grid azimuth to azimuth mark			

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 743 b

GEODETIC POSITIONS FROM LAMBERT COORDINATES

(CALCULATING MACHINE COMPUTATION)

STATE – ZONE Connecticut — $\quad \ell =$ 0.66305 94147

Station Winer, 1932, r. 1942

C	− 600,000.00	R_b	23,914,389.02
X	606,832.13	Y	− 163,540.21
$X' = X - C$	+ 6,832.13	$R_b - Y$	23,750,848.81
$\tan\theta = X' \div (R_b - Y)$	+0.00028 76584	θ	+59.3338
θ	+ 0 00 59.3338	$\Delta\lambda = \theta \div \ell$	+89.485
cos θ	0.99999 99587	Δλ	+0 01 29.485
$R = (R_b - Y) \div \cos\theta$	23,750,849.79	Central Meridian	72 45 00.000
φ	41 16 55.847	$\lambda = C.M. - \Delta\lambda$	72 43 30.515

Station Milford 2, 1871, r. 1947

C	− 600,000.00	R_b	23,914,389.02
X	525,446.21	Y	− 142,415.89
$X' = X - C$	− 74,553.79	$R_b - Y$	23,771,973.13
$\tan\theta = X' \div (R_b - Y)$	-0.00313 62054	θ	-646.8867
θ	− 0 10 46.8867	$\Delta\lambda = \theta \div \ell$	-975.609
cos θ	0.99999 50822	Δλ	− 0 16 15.609
$R = (R_b - Y) \div \cos\theta$	23,772,090.04	Central Meridian	72 45 00.000
φ	41 13 25.985	$\lambda = C.M. - \Delta\lambda$	73 01 15.609

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 726 a

PLANE COORDINATES ON LAMBERT PROJECTION

(Condensed form for calculating machine computation)

$X = R \sin\theta + C$ $\quad C = 600{,}000.00$ $\quad Y = R_b - R\cos\theta$ $\quad R_b = 23{,}914{,}389.02$ $\quad$ State-Zone Connecticut $\quad$ Grid Az. = Geod. Az. $- \theta$

Station	Latitude / Longitude	R / θ	sin θ / cos θ	X / Y
1				
	Grid azimuth to azimuth mark			
2				
	Grid azimuth to azimuth mark			
3				
	Grid azimuth to azimuth mark			° ' "
4				
	Grid azimuth to azimuth mark			° ' "

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 743 b

GEODETIC POSITIONS FROM LAMBERT COORDINATES

(CALCULATING MACHINE COMPUTATION)

STATE – ZONE Connecticut — $\quad \ell = 0.66305\ 94147$

Station

C		R_b	
X		Y	
$X' = X - C$		$R_b - Y$	
$\tan\theta = X' \div (R_b - Y)$		θ	
θ		$\Delta\lambda = \theta \div \ell$	
$\cos\theta$		$\Delta\lambda$	
$R = (R_b - Y) \div \cos\theta$		Central Meridian	
ϕ		$\lambda = \text{C.M.} - \Delta\lambda$	

Station

C		R_b	
X		Y	
$X' = X - C$		$R_b - Y$	
$\tan\theta = X' \div (R_b - Y)$		θ	
θ		$\Delta\lambda = \theta \div \ell$	
$\cos\theta$		$\Delta\lambda$	
$R = (R_b - Y) \div \cos\theta$		Central Meridian	
ϕ		$\lambda = \text{C.M.} - \Delta\lambda$	

Constants for Connecticut

C	600,000.00 ft.
Central Meridian	72° 45' 00".000
R_b	23,914,389.02 ft.
y_o	255,155.48 ft.
ℓ	0.66305 94147
$\frac{1}{2\rho_o^2 \sin 1''}$	2.357×10^{-10}
$\log \frac{1}{2\rho_o^2 \sin 1''}$	0.372 3907 - 10
$\log \ell$	9.82155 24459 - 10
log K	7.60257 45968

STATE OF CONNECTICUT

DEPARTMENT OF TRANSPORATICN
LAMBERT PROJECTION - COORDINATE TRANSFORMATIONS

STATION = BRACE LAT = 42 2 39.5870 LONG = 73 29 35.3230

X COORD = 393153.889 Y COORD = 442132.233

THETA = - 0 29 33.6992

CALCULATED LAT = 42 2 39.88700 LONG = 73 20 35.02300

STATION = TRI-STATE LAT = 42 1 24.2900 LONG = 71 48 4.1000

X COORD = 857924.618 Y COORD = 435047.685

THETA = 0 37 44.8850

CALCULATED LAT = 42 1 24.29000 LONG = 71 48 4.19000

STATION = MT. TOM X COORD = 456943.860 Y COORD = 313782.089

LAT = 41 41 35.97404 LONG = 73 16 25.60490

THETA = - 0 20 50.2881

CALCULATED X COORD = 456943.869 Y COORD = 313782.989

STATION = MOHEGAN X COORD = 778801.770 Y COORD = 190784.930

LAT = 41 21 18.38683 LONG = 72 5 55.47090

THETA = 0 25 54.5620

CALCULATED X COORD = 778801.770 Y COORD = 190784.930

LAMBERT PROJECTION FOR CONNECTICUT

Table I.

Lat.	R feet	y' y value on central meridian feet	Tabular difference for 1 sec. of lat. feet	Scale in units of 7th place of logs	Scale expressed as a ratio
40° 50'	23,914,389.02	0	101.20933	+248.7	1.0000573
51	23,908,316.46	6,072.56	101.20933	+233.6	1.0000538
52	23,902,243.90	12,145.12	101.20917	+218.9	1.0000504
53	23,896,171.35	18,217.67	101.20933	+204.5	1.0000471
54	23,890,098.79	24,290.23	101.20917	+190.4	1.0000438
55	23,884,026.24	30,362.78	101.20917	+176.8	1.0000407
40° 56'	23,877,953.69	36,435.33	101.20917	+163.5	1.0000376
57	23,871,881.14	42,507.88	101.20917	+150.5	1.0000347
58	23,865,808.59	48,580.43	101.20917	+138.0	1.0000318
59	23,859,736.04	54,652.98	101.20917	+125.8	1.0000290
41° 00	23,853,663.49	60,725.53	101.20933	+113.9	1.0000262
41° 01'	23,847,590.93	66,798.09	101.20917	+102.4	1.0000236
02	23,841,518.38	72,870.64	101.20933	+ 91.3	1.0000210
03	23,835,445.82	78,943.20	101.20933	+ 80.5	1.0000185
04	23,829,373.26	85,015.76	101.20950	+ 70.1	1.0000161
05	23,823,300.69	91,088.33	101.20950	+ 60.1	1.0000138
41° 06'	23,817,228.12	97,160.90	101.20950	+ 50.5	1.0000116
07	23,811,155.55	103,233.47	101.20967	+ 41.1	1.0000095
08	23,805,082.97	109,306.05	101.20967	+ 32.2	1.0000074
09	23,799,010.39	115,378.63	101.20983	+ 23.6	1.0000054
10	23,792,937.80	121,451.22	101.21000	+ 15.4	1.0000035
41° 11'	23,786,865.20	127,523.82	101.21000	+ 7.5	1.0000017
12	23,780,792.60	133,596.42	101.21017	0.0	1.0000000
13	23,774,719.99	139,669.03	101.21033	- 7.1	0.9999984
14	23,768,647.37	145,741.65	101.21050	- 13.8	0.9999968
15	23,762,574.74	151,814.28	101.21050	- 20.2	0.9999953
41° 16'	23,756,502.11	157,886.91	101.21083	- 26.3	0.9999939
17	23,750,429.46	163,959.56	101.21100	- 32.0	0.9999926
18	23,744,356.80	170,032.22	101.21117	- 37.3	0.9999914
19	23,738,284.13	176,104.89	101.21117	- 42.2	0.9999903
20	23,732,211.46	182,177.56	101.21167	- 46.8	0.9999892
41° 21'	23,726,138.76	188,250.26	101.21167	- 51.0	0.9999883
22	23,720,066.06	194,322.96	101.21183	- 54.8	0.9999874
23	23,713,993.35	200,395.67	101.21217	- 58.3	0.9999866
24	23,707,920.62	206,468.40	101.21233	- 61.4	0.9999859
25	23,701,847.88	212,541.14	101.21267	- 64.2	0.9999852

LAMBERT PROJECTION FOR CONNECTICUT

Table 1 (Cont'd).

Lat.	R feet	y' y value on central meridian feet	Tabular difference for 1 sec. of lat. feet	Scale in units of 7th place of logs	Scale expressed as a ratio
41° 26'	23,695,775.12	218,613.90	101.21283	- 66.6	0.9999847
27	23,689,702.35	224,686.67	101.21317	- 68.6	0.9999842
28	23,683,629.56	230,759.46	101.21333	- 70.3	0.9999838
29	23,677,556.76	236,832.26	101.21367	- 71.6	0.9999835
30	23,671,483.94	242,905.08	101.21400	- 72.5	0.9999833
41° 31'	23,665,411.10	248,977.92	101.21417	- 73.0	0.9999832
32	23,659,338.25	255,050.77	101.21450	- 73.2	0.9999831
33	23,653,265.38	261,123.64	101.21483	- 73.0	0.9999832
34	23,647,192.49	267,196.53	101.21517	- 72.5	0.9999833
35	23,641,119.58	273,269.44	101.21533	- 71.6	0.9999835
41° 36'	23,635,046.66	279,342.36	101.21583	- 70.3	0.9999838
37	23,628,973.71	285,415.31	101.21617	- 68.6	0.9999842
38	23,622,900.74	291,488.28	101.21650	- 66.6	0.9999847
39	23,616,827.75	297,561.27	101.21683	- 64.2	0.9999852
40	23,610,754.74	303,634.28	101.21717	- 61.5	0.9999858
41° 41'	23,604,681.71	309,707.31	101.21750	- 58.4	0.9999866
42	23,598,608.66	315,780.36	101.21800	- 54.9	0.9999874
43	23,592,535.58	321,853.44	101.21833	- 51.0	0.9999883
44	23,586,462.48	327,926.54	101.21883	- 46.8	0.9999892
45	23,580,389.35	333,999.67	101.21917	- 42.2	0.9999903
41° 46'	23,574,316.20	340,072.82	101.21950	- 37.3	0.9999914
47	23,568,243.03	346,145.99	101.22000	- 32.0	0.9999926
48	23,562,169.83	352,219.19	101.22050	- 26.3	0.9999939
49	23,556,096.60	358,292.42	101.22083	- 20.3	0.9999953
50	23,550,023.35	364,365.67	101.22133	- 13.9	0.9999968
41° 51'	23,543,950.07	370,438.95	101.22183	- 7.1	0.9999984
52	23,537,876.76	376,512.26	101.22217	0.0	1.0000000
53	23,531,803.43	382,585.59	101.22283	+ 7.5	1.0000017
54	23,525,730.06	388,658.96	101.22317	+ 15.4	1.0000035
55	23,519,656.67	394,732.35	101.22367	+ 23.7	1.0000055
41° 56'	23,513,583.25	400,805.77	101.22433	+ 32.3	1.0000074
57	23,507,509.79	406,879.23	101.22467	+ 41.3	1.0000095
58	23,501,436.31	412,952.71	101.22533	+ 50.7	1.0000117
59	23,495,362.79	419,026.23	101.22567	+ 60.4	1.0000139
42° 00	23,489,289.25	425,099.77	101.22633	+ 70.5	1.0000162

LAMBERT PROJECTION FOR CONNECTICUT

Table I (Cont'd).

Lat.	R feet	y' y value on central meridian feet	Tabular difference for 1 sec. of lat. feet	Scale in units of 7th place of logs	Scale expressed as a ratio
42° 01'	23,483,215.67	431,173.35	101.22700	+ 81.0	1.0000187
02	23,477,142.05	437,246.97	101.22733	+ 91.8	1.0000211
03	23,471,068.41	443,320.61	101.22800	+103.0	1.0000237
04	23,464,994.73	449,394.29	101.22850	+114.6	1.0000264
05	23,458,921.02	455,468.00	101.22917	+126.5	1.0000291
42° 06'	23,452,847.27	461,541.75	101.22983	+138.8	1.0000320
07	23,446,773.48	467,615.54	101.23033	+151.5	1.0000349
08	23,440,699.66	473,689.36	101.23083	+164.6	1.0000379
09	23,434,625.81	479,763.21	101.23167	+178.0	1.0000410
10	23,428,551.91	485,837.11	101.23217	+191.8	1.0000442
42° 11'	23,422,477.98	491,911.04	101.23283	+206.0	1.0000474
12	23,416,404.01	497,985.01	101.23333	+220.5	1.0000508
13	23,410,330.01	504,059.01	101.23417	+235.4	1.0000542
14	23,404,255.96	510,133.06	101.23483	+250.7	1.0000577
15	23,398,181.87	516,207.15	101.23533	+266.3	1.0000613
42° 16'	23,392,107.75	522,281.27	101.23617	+282.3	1.0000650
17	23,386,033.58	528,355.44	101.23667	+298.7	1.0000688
18	23,379,959.38	534,429.64	101.23750	+315.4	1.0000726
19	23,373,885.13	540,503.89	101.23817	+332.5	1.0000766
20	23,367,810.84	546,578.18		+350.0	1.0000806

LAMBERT PROJECTION FOR CONNECTICUT

Table II.

1" of long. = 0".6630594147 of θ

Long.	θ	Long.	θ	Long.	θ
71° 30'	+0° 49' 43".7674	72° 06'	+0° 25' 51".5590	72° 41'	+0° 02' 39".1343
31	+0 49 03.9838	07	+0 25 11.7755	42	+0 01 59.3507
32	+0 48 24.2002	08	+0 24 31.9919	43	+0 01 19.5671
33	+0 47 44.4167	09	+0 23 52.2083	44	+0 00 39.7836
34	+0 47 04.6331	10	+0 23 12.4248	45	0 00 00.0000
35	+0 46 24.8495				
71° 36'	+0 45 45.0660	72° 11'	+0 22 32.6412	72° 46'	-0 00 39.7836
37	+0 45 05.2824	12	+0 21 52.8576	47	-0 01 19.5671
38	+0 44 25.4988	13	+0 21 13.0741	48	-0 01 59.3507
39	+0 43 45.7153	14	+0 20 33.2905	49	-0 02 39.1343
40	+0 43 05.9317	15	+0 19 53.5069	50	-0 03 18.9178
71° 41'	+0 42 26.1482	72° 16'	+0 19 13.7234	72° 51'	-0 03 58.7014
42	+0 41 46.3646	17	+0 18 33.9398	52	-0 04 38.4850
43	+0 41 06.5810	18	+0 17 54.1562	53	-0 05 18.2685
44	+0 40 26.7975	19	+0 17 14.3727	54	-0 05 58.0521
45	+0 39 47.0139	20	+0 16 34.5891	55	-0 06 37.8356
71° 46'	+0 39 07.2303	72° 21'	+0 15 54.8056	72° 56'	-0 07 17.6192
47	+0 38 27.4468	22	+0 15 15.0220	57	-0 07 57.4028
48	+0 37 47.6632	23	+0 14 35.2384	58	-0 08 37.1863
49	+0 37 07.8796	24	+0 13 55.4549	59	-0 09 16.9699
50	+0 36 28.0961	25	+0 13 15.6713	73° 00	-0 09 56.7535
71° 51'	+0 35 48.3125	72° 26'	+0 12 35.8877	73° 01'	-0 10 36.5370
52	+0 35 08.5289	27	+0 11 56.1042	02	-0 11 16.3206
53	+0 34 28.7454	28	+0 11 16.3206	03	-0 11 56.1042
54	+0 33 48.9618	29	+0 10 36.5370	04	-0 12 35.8877
55	+0 33 09.1782	30	+0 09 56.7535	05	-0 13 15.6713
71° 56'	+0 32 29.3947	72° 31'	+0 09 16.9699	73° 06'	-0 13 55.4549
57	+0 31 49.6111	32	+0 08 37.1863	07	-0 14 35.2384
58	+0 31 09.8275	33	+0 07 57.4028	08	-0 15 15.0220
59	+0 30 30.0440	34	+0 07 17.6192	09	-0 15 54.8056
72° 00	+0 29 50.2604	35	+0 06 37.8356	10	-0 16 34.5891
72° 01'	+0 29 10.4769	72° 36'	+0 05 58.0521	73° 11'	-0 17 14.3727
02	+0 28 30.6933	37	+0 05 18.2685	12	-0 17 54.1562
03	+0 27 50.9097	38	+0 04 38.4850	13	-0 18 33.9398
04	+0 27 11.1262	39	+0 03 58.7014	14	-0 19 13.7234
05	+0 26 31.3426	40	+0 03 18.9178	15	-0 19 53.5069

LAMBERT PROJECTION FOR CONNECTICUT

Table II (Cont'd).

1" of long. = 0".6630594147 of θ

Long.		θ			Long.		θ		
73°	16'	-0°	20'	33".2905	73°	51'	-0°	43'	45".7153
	17	-0	21	13.0741		52	-0	44	25.4988
	18	-0	21	52.8576		53	-0	45	05.2824
	19	-0	22	32.6412		54	-0	45	45.0660
	20	-0	23	12.4248		55	-0	46	24.8495
73°	21'	-0	23	52.2083	73°	56'	-0	47	04.6331
	22	-0	24	31.9919		57	-0	47	44.4167
	23	-0	25	11.7755		58	-0	48	24.2002
	24	-0	25	51.5590		59	-0	49	03.9838
	25	-0	26	31.3426	74°	00	-0	49	43.7674
73°	26'	-0	27	11.1262					
	27	-0	27	50.9097					
	28	-0	28	30.6933					
	29	-0	29	10.4769					
	30	-0	29	50.2604					
73°	31'	-0	30	30.0440					
	32	-0	31	09.8275					
	33	-0	31	49.6111					
	34	-0	32	29.3947					
	35	-0	33	09.1782					
73°	36'	-0	33	48.9618					
	37	-0	34	28.7454					
	38	-0	35	08.5289					
	39	-0	35	48.3125					
	40	-0	36	28.0961					
73°	41'	-0	37	07.8796					
	42	-0	37	47.6632					
	43	-0	38	27.4468					
	44	-0	39	07.2303					
	45	-0	39	47.0139					
73°	46'	-0	40	26.7975					
	47	-0	41	06.5810					
	48	-0	41	46.3646					
	49	-0	42	26.1482					
	50	-0	43	05.9317					

GRID FACTORS

LAMBERT PROJECTION FOR CONNECTICUT

LATITUDE	FACTOR	LATITUDE	FACTOR	LATITUDE	FACTOR
40-50-00	1.0000573	40-57-00	1.0000347	41-04-00	1.0000161
10	1.0000567	10	1.0000342	10	1.0000157
20	1.0000561	20	1.0000337	20	1.0000153
30	1.0000555	30	1.0000333	30	1.0000150
40	1.0000550	40	1.0000328	40	1.0000146
50	1.0000544	50	1.0000323	50	1.0000142
40-51-00	1.0000538	40-58-00	1.0000318	41-05-00	1.0000138
10	1.0000532	10	1.0000313	10	1.0000134
20	1.0000527	20	1.0000309	20	1.0000131
30	1.0000521	30	1.0000304	30	1.0000127
40	1.0000515	40	1.0000299	40	1.0000123
50	1.0000510	50	1.0000295	50	1.0000120
40-52-00	1.0000504	40-59-00	1.0000290	41-06-00	1.0000116
10	1.0000498	10	1.0000285	10	1.0000112
20	1.0000493	20	1.0000281	20	1.0000109
30	1.0000487	30	1.0000276	30	1.0000105
40	1.0000482	40	1.0000271	40	1.0000102
50	1.0000476	50	1.0000267	50	1.0000098
40-53-00	1.0000471	41-00-00	1.0000262	41-07-00	1.0000095
10	1.0000465	10	1.0000258	10	1.0000091
20	1.0000460	20	1.0000253	20	1.0000088
30	1.0000454	30	1.0000249	30	1.0000084
40	1.0000449	40	1.0000245	40	1.0000081
50	1.0000443	50	1.0000240	50	1.0000077
40-54-00	1.0000438	41-01-00	1.0000236	41-08-00	1.0000074
10	1.0000433	10	1.0000232	10	1.0000071
20	1.0000428	20	1.0000227	20	1.0000067
30	1.0000423	30	1.0000223	30	1.0000064
40	1.0000417	40	1.0000219	40	1.0000061
50	1.0000412	50	1.0000214	50	1.0000057
40-55-00	1.0000407	41-02-00	1.0000210	41-09-00	1.0000054
10	1.0000402	10	1.0000206	10	1.0000051
20	1.0000397	20	1.0000202	20	1.0000048
30	1.0000392	30	1.0000198	30	1.0000045
40	1.0000386	40	1.0000193	40	1.0000041
50	1.0000381	50	1.0000189	50	1.0000038
40-56-00	1.0000376	41-03-00	1.0000185	41-10-00	1.0000035
10	1.0000371	10	1.0000181	10	1.0000032
20	1.0000366	20	1.0000177	20	1.0000029
30	1.0000362	30	1.0000173	30	1.0000026
40	1.0000357	40	1.0000169	40	1.0000023
50	1.0000352	50	1.0000165	50	1.0000020

GRID FACTORS

LAMBERT PROJECTION FOR CONNECTICUT

LATITUDE	FACTOR	LATITUDE	FACTOR	LATITUDE	FACTOR
41-11-00	1.0000017	41-18-00	0.9999914	41-25-00	0.9999852
10	1.0000014	10	0.9999912	10	0.9999851
20	1.0000011	20	0.9999910	20	0.9999850
30	1.0000009	30	0.9999909	30	0.9999850
40	1.0000006	40	0.9999907	40	0.9999849
50	1.0000003	50	0.9999905	50	0.9999848
41-12-00	1.0000000	41-19-00	0.9999903	41-26-00	0.9999847
10	0.9999997	10	0.9999901	10	0.9999846
20	0.9999995	20	0.9999899	20	0.9999845
30	0.9999992	30	0.9999898	30	0.9999845
40	0.9999989	40	0.9999896	40	0.9999844
50	0.9999987	50	0.9999894	50	0.9999843
41-13-00	0.9999984	41-20-00	0.9999892	41-27-00	0.9999842
10	0.9999981	10	0.9999890	10	0.9999841
20	0.0000079	20	0.9999889	20	0.9999841
30	0.9999976	30	0.9999887	30	0.9999840
40	0.9999973	40	0.9999886	40	0.9999839
50	0.9999971	50	0.9999884	50	0.9999839
41-14-00	0.9999968	41-21-00	0.9999883	41-28-00	0.9999838
10	0.9999965	10	0.9999881	10	0.9999838
20	0.9999963	20	0.9999880	20	0.9999837
30	0.9999960	30	0.9999878	30	0.9999837
40	0.9999958	40	0.9999877	40	0.9999836
50	0.9999955	50	0.9999875	50	0.9999835
41-15-00	0.9999953	41-22-00	0.9999874	41-29-00	0.9999835
10	0.9999951	10	0.9999873	10	0.9999835
20	0.9999948	20	0.9999871	20	0.9999834
30	0.9999946	30	0.9999870	30	0.9999834
40	0.9999944	40	0.9999869	40	0.9999834
50	0.9999941	50	0.9999867	50	0.9999833
41-16-00	0.9999939	41-23-00	0.9999866	41-30-00	0.9999833
10	0.9999937	10	0.9999865	10	0.9999833
20	0.9999935	20	0.9999864	20	0.9999833
30	0.9999933	30	0.9999863	30	0.9999833
40	0.9999930	40	0.9999861	40	0.9999832
50	0.9999928	50	0.9999860	50	0.9999832
41-17-00	0.9999926	41-24-00	0.9999859	41-31-00	0.9999832
10	0.9999924	10	0.9999858	10	0.9999832
20	0.9999922	20	0.9999857	20	0.9999832
30	0.9999920	30	0.9999856	30	0.9999831
40	0.9999918	40	0.9999854	40	0.9999831
50	0.9999916	50	0.9999853	50	0.9999831

GRID FACTORS

LAMBERT PROJECTION FOR CONNECTICUT

LATITUDE	FACTOR	LATITUDE	FACTOR	LATITUDE	FACTOR
41-32-00	0.9999831	41-39-00	0.9999852	41-46-00	0.9999914
10	0.9999831	10	0.9999853	10	0.9999916
20	0.9999831	20	0.9999854	20	0.9999918
30	0.9999832	30	0.9999855	30	0.9999920
40	0.9999832	40	0.9999856	40	0.9999922
50	0.9999832	50	0.9999857	50	0.9999924
41-33-00	0.9999832	41-40-00	0.9999858	41-47-00	0.9999926
10	0.9999832	10	0.9999859	10	0.9999928
20	0.9999832	20	0.9999861	20	0.9999930
30	0.9999833	30	0.9999862	30	0.9999933
40	0.9999833	40	0.9999863	40	0.9999935
50	0.9999833	50	0.9999865	50	0.9999937
41-34-00	0.9999833	41-41-00	0.9999866	41-48-00	0.9999939
10	0.9999833	10	0.9999867	10	0.9999941
20	0.9999834	20	0.9999869	20	0.9999944
30	0.9999834	30	0.9999870	30	0.9999946
40	0.9999834	40	0.9999871	40	0.9999948
50	0.9999835	50	0.9999872	50	0.9999951
41-35-00	0.9999835	41-42-00	0.9999874	41-49-00	0.9999953
10	0.9999836	10	0.9999876	10	0.9999956
20	0.9999836	20	0.9999877	20	0.9999958
30	0.9999837	30	0.9999879	30	0.9999961
40	0.9999837	40	0.9999880	40	0.9999963
50	0.9999838	50	0.9999882	50	0.9999966
41-36-00	0.9999838	41-43-00	0.9999883	41-50-00	0.9999968
10	0.9999839	10	0.9999885	10	0.9999971
20	0.9999839	20	0.9999886	20	0.9999973
30	0.9999840	30	0.9999888	30	0.9999976
40	0.9999841	40	0.9999889	40	0.9999979
50	0.9999841	50	0.9999891	50	0.9999981
41-37-00	0.9999842	41-44-00	0.9999892	41-51-00	0.9999984
10	0.9999843	10	0.9999894	10	0.9999987
20	0.9999844	20	0.9999896	20	0.9999989
30	0.9999845	30	0.9999897	30	0.9999992
40	0.9999845	40	0.9999899	40	0.9999995
50	0.9999846	50	0.9999901	50	0.9999997
41-38-00	0.9999847	41-45-00	0.9999903	41-52-00	1.0000000
10	0.9999848	10	0.9999905	10	1.0000003
20	0.9999849	20	0.9999907	20	1.0000006
30	0.9999850	30	0.9999908	30	1.0000009
40	0.9999850	40	0.9999910	40	1.0000011
50	0.9999851	50	0.9999912	50	1.0000014

GRID FACTORS

LAMBERT PROJECTION FOR CONNECTICUT

LATITUDE	FACTOR	LATITUDE	FACTOR	LATITUDE	FACTOR
41-53-00	1.0000017	42-00-00	1.0000162	42-07-00	1.0000349
10	1.0000020	10	1.0000166	10	1.0000354
20	1.0000023	20	1.0000170	20	1.0000359
30	1.0000026	30	1.0000175	30	1.0000364
40	1.0000029	40	1.0000179	40	1.0000369
50	1.0000032	50	1.0000183	50	1.0000374
41-54-00	1.0000035	42-01-00	1.0000187	42-08-00	1.0000379
10	1.0000038	10	1.0000191	10	1.0000384
20	1.0000042	20	1.0000195	20	1.0000389
30	1.0000045	30	1.0000199	30	1.0000395
40	1.0000048	40	1.0000203	40	1.0000400
50	1.0000052	50	1.0000207	50	1.0000406
41-55-00	1.0000055	42-02-00	1.0000211	42-09-00	1.0000410
10	1.0000058	10	1.0000215	10	1.0000415
20	1.0000061	20	1.0000220	20	1.0000421
30	1.0000064	30	1.0000224	30	1.0000426
40	1.0000068	40	1.0000228	40	1.0000431
50	1.0000071	50	1.0000233	50	1.0000437
41-56-00	1.0000074	42-03-00	1.0000237	42-10-00	1.0000442
10	1.0000078	10	1.0000242	10	1.0000447
20	1.0000081	20	1.0000246	20	1.0000453
30	1.0000085	30	1.0000251	30	1.0000458
40	1.0000088	40	1.0000255	40	1.0000463
50	1.0000092	50	1.0000260	50	1.0000469
41-57-00	1.0000095	42-04-00	1.0000264	42-11-00	1.0000474
10	1.0000099	10	1.0000269	10	1.0000480
20	1.0000102	20	1.0000273	20	1.0000485
30	1.0000106	30	1.0000278	30	1.0000491
40	1.0000109	40	1.0000282	40	1.0000497
50	1.0000113	50	1.0000287	50	1.0000502
41-58-00	1.0000117	42-05-00	1.0000291	42-12-00	1.0000508
10	1.0000121	10	1.0000296	10	1.0000514
20	1.0000124	20	1.0000301	20	1.0000519
30	1.0000128	30	1.0000306	30	1.0000525
40	1.0000132	40	1.0000310	40	1.0000531
50	1.0000135	50	1.0000315	50	1.0000536
41-59-00	1.0000139	42-06-00	1.0000320	42-13-00	1.0000542
10	1.0000143	10	1.0000325	10	1.0000548
20	1.0000147	20	1.0000330	20	1.0000554
30	1.0000151	30	1.0000335	30	1.0000560
40	1.0000154	40	1.0000339	40	1.0000565
50	1.0000158	50	1.0000344	50	1.0000571

GRID FACTORS

LAMBERT PROJECTION FOR CONNECTICUT

LATITUDE	FACTOR	LATITUDE	FACTOR	LATITUDE	FACTOR
42-14-00	1.0000577	42-16-00	1.0000650	42-18-00	1.0000726
10	1.0000583	10	1.0000656	10	1.0000733
20	1.0000589	20	1.0000663	20	1.0000739
30	1.0000595	30	1.0000669	30	1.0000746
40	1.0000601	40	1.0000675	40	1.0000753
50	1.0000607	50	1.0000682	50	1.0000759
42-15-00	1.0000613	42-17-00	1.0000688	42-19-00	1.0000766
10	1.0000619	10	1.0000694	10	1.0000773
20	1.0000625	20	1.0000701	20	1.0000779
30	1.0000632	30	1.0000707	30	1.0000786
40	1.0000638	40	1.0000713	40	1.0000793
50	1.0000644	50	1.0000720	50	1.0000799
				42-20-00	1.0000806

CONN. GEODETIC SURVEY

ELEVATION FACTORS

1	1.0000	000	250	0.9999	880	500	0.9999	760	750	0.9999	641
10	0.9999	993	260		876	510		756	760		636
20		989	270		871	520		751	770		631
30		984	280		866	530		747	780		626
40		980	290		861	540		742	790		621
50		976	300		856	550		737	800		617
60		971	310		852	560		732	810		612
70		966	320		847	570		727	820		607
80		961	330		842	580		723	830		602
90		956	340		837	590		718	840		597
100		952	350		832	600		713	850		593
110		948	360		828	610		708	860		588
120		943	370		823	620		703	870		583
130		938	380		818	630		698	880		578
140		933	390		813	640		693	890		573
150		928	400		808	650		689	900		569
160		923	410		803	660		684	910		564
170		918	420		798	670		679	920		559
180		913	430		793	680		674	930		554
190		908	440		788	690		669	940		549
200		903	450		783	700		665	950		545
210		899	460		778	710		660	960		540
220		894	470		773	720		655	970		535
230		890	480		769	730		650	980		530
240	0.9999	885	490	.9999	764	740	0.9999	645	990	0.9999	525

CONN. GEODETIC SURVEY

ELEVATION FACTORS

1000	0.9999	521	1230	0.9999	411	1460	0.9999	301
1010		516	1240		406	1470		296
1020		511	1250		402	1480		291
1030		506	1260		397	1490		286
1040		501	1270		392	1500		282
1050		497	1280		387			
1060		492	1290		382			
1070		487	1300		378			
1080		482	1310		373			
1090		477	1320		368			
1100		473	1330		363			
1110		468	1340		358			
1120		463	1350		354			
1130		458	1360		349			
1140		453	1370		344			
1150		449	1380		339			
1160		444	1390		334			
1170		439	1400		330			
1180		434	1410		325			
1190		430	1420		320			
1200		426	1430		315			
1210		421	1440		310			
1220	0.9999	416	1450	0.9999	306			

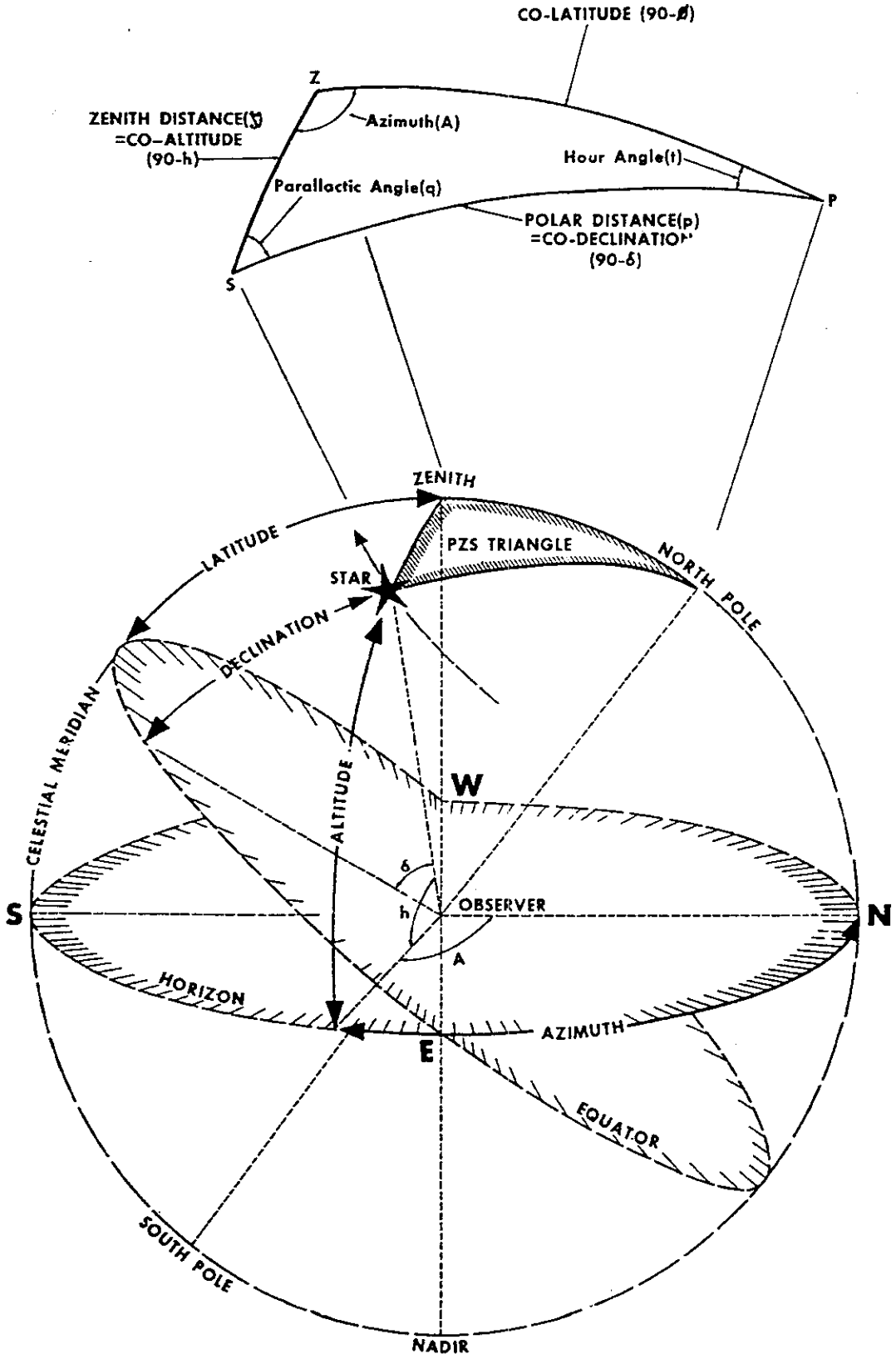


Figure 6. PZS triangle.

DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Form 605
(Rev. June 1946)

COMPARISON OF CHRONOMETER AND RADIO SIGNALS

Station: W.T.I.C. Latitude: 41° 46' 13.3230" Longitude 72° 47' 55.6800"

Chief of party: L. Whittlesey Observer: B. Wazer

Year: 1973 Chronometer No.: Watch (mean, ~~sidereal~~) (Strike out one)

Local date	1-17-73	1-18-73	
Standard time of signal, ... Mer.			
Chronometer time of signal	22-25-40.900	1-01-47.9	Convenient time before and after
Transmitting station	WWV		
Frequency of signal	10 meg.		
G. C. T. of signal — Date	1-17-73	1-18-73	
G. C. T. of signal — Time	22-26-00.0	1-02-00.0	Time from radio
Sidereal time of 0h G. C. T.	7-45-04.626	7-49-01.181	*Ephemeris Pg 480 for date
Cor., mean solar to sidereal time	0-03-41.114	0-00-10.185	Conv. Solar to Sidereal for 22-26-00
Δ Transmission time			from *Ephemeris table
Correction to signal			U.S.N.O. bulletin of corrections can be disregarded.
G. S. T. of signal	30-14-45.740	8-51-11.366	total from above
Longitude of station	4-51-11.705	4-51-11.705	Long. conv. to time (Long in deg / 15°)
Local sidereal time	25-23-34.035	3-59-59.661	Subtract from above
Chronometer time of signal	22-25 40.900	1-01-47.900	from field book (watch)
Chronometer correction	+2-57-53.135	+2-58-11.761	difference
Rate per minute		+0.1193 sec.	(see below)
Rate per hour			

2-57-53.135 Chron Corr 1-01-47.9

2-58-11.761 " " 22-25-40.9

+ 0-00-16.626 diff. 2-36-07.0 = 156.12 min

$\frac{18.626}{156.12} = +0.1193$ Sec/min rate

* American Ephemeris and Nautical Almanac

Station: W.T.I.C.		FORM C&GS-380c (12-65)		
State: CONN.		COMPUTATION OF AZIMUTH, DIRECTION METHOD (Machine Computation)		
Mark: WTIC Az. Mk.	Chronometer No. -------			
Instrument: Number - 68077 T2		Position of station, ° ' " ° ' "		
Level Value (d): 19.57"		φ: 41-46-13.323 λ: 72-47-55.568		
Eccentric*: Instrument no		Observer: B. Wazer		
Light no		Greenwich Civil Day: Jan. 17.96 (mean time ÷ 24)		

Date, 1973 position,	1	2	3	4
Chronometer reading,	22-48-56.5	From field bk	mean of D&R	
Chronometer correction,	2-57-55.9	Initial from Comparison sheet with rate factor applied		
Sidereal time, (L.S.T.)	25-46-52.4	Sum of above (Local sidereal time)		
α of Polaris	2-06-06.2	From Rt. ascension tables N.G.S. (Note 1)		
t of Polaris (time),	23-40-46.2	Subtracted from above		
t of Polaris (arc),	355°11'33.0"	Time to	arc	
δ of Polaris,	89°08'53.7"	From Rt. ascension tables NGS (Note 1)		
Constants	Sin φ (4 decimals) 0.6661	Cos φ (6 decimals) 0.745822	Tan δ (4 decimals) 67.2634	Cos φ Tan δ (4 decimals) 50.1665
Sin t (7 decimals)	-.0838083	watch sign	If t is ≤ 180° sign is + ; ≥ 180° sign is -	
Cos t (4 decimals)	.9965			
Sin φ cos t (4 decimals)	.6638			
Cos φ tan δ - Sin φ cos t (4 decimals)	49.5027			
(7 decimals) - Tan A = sin t / (Cos φ tan δ - sin φ cos t)	-.00169300	watch signs		
A = Azimuth of Polaris, from north, †	0°05'49.2"			
Difference in time between D. and R.,				
Curvature correction,				
Altitude of Polaris = h,	42°33'43"	Mean Vertical angle from Field Bk.		
$\frac{d}{4}$ tan h = level factor,	4.5	$\frac{\text{Level value}}{4}$ x Tan h	$\frac{19.57}{4}$ x .9183226	
Inclination,	+0.4	Grad's level from field Bk.	West + East -	
Level correction,	+ 1.8	Incl. times	level factor	
Circle reads on Polaris,	262°28'22"	From field bk.		
Corrected reading on Polaris,	262°28'23.5"	Sum of above, watch sign		
Circle reads on Mark,	00°00'40.5"	From field bk.		
Difference, Mark - Polaris,	97°32'16.7"	Mark minus Polaris		
Corrected azimuth of Polaris, from north, †	+ 0°05'49.2"	Azimuth of Polaris from above		
	180 00 00.0	180 00 00.0	180 00 00.0	180 00 00.0
Azimuth of WTIC Az. Mk. (Clockwise from south)	277°38'05.9"	Sum		

To the mean result from the above centricity (if any) of station and r

*Give volume and page of record fc

Note 1 - Also Apparent Place of Polaris Tables (state library)

APPARENT PLACE OF POLARIS

1973

January			February			March		
GCD	R.A.	DEC.	GCD	R.A.	DEC.	GCD	R.A.	DEC.
	$02^h\ 05^m$	89° 08'		$02^h\ 05^m$	89° 08'		$02^h\ 04^m$	89° 08'
.81	88.43	51.49	.72	46.76	54.06	.65	70.29	51.02
1.81	87.34	51.67	1.72	45.29	54.07	1.64	69.07	50.86
2.80	86.21	51.86	2.72	43.76	54.07	2.64	67.82	50.69
3.80	85.01	52.05	3.72	42.19	54.05	3.64	66.55	50.49
4.80	83.72	52.24	4.71	40.59	54.00	4.64	65.29	50.28
5.80	82.36	52.42	5.71	39.02	53.94	5.63	64.11	50.04
6.79	80.93	52.59	6.71	37.51	53.85	6.63	63.01	49.78
7.79	79.45	52.74	7.70	36.10	53.74	7.63	62.04	49.52
8.79	77.95	52.87	8.70	34.79	53.63	8.63	61.20	49.25
9.78	76.47	52.97	9.70	33.57	53.52	9.62	60.43	49.00
10.78	75.05	53.06	10.70	32.43	53.42	10.62	59.73	48.76
11.78	73.71	53.13	11.69	31.30	53.33	11.62	59.01	48.55
12.78	72.46	53.19	12.69	30.16	53.27	12.61	58.25	48.34
13.77	71.29	53.26	13.69	28.93	53.21	13.61	57.41	48.14
14.77	70.17	53.35	14.69	27.61	53.15	14.61	56.50	47.94
15.77	69.03	53.45	15.68	26.20	53.08	15.61	55.52	47.71
16.77	67.84	53.58	16.68	24.73	52.99	16.60	54.54	47.47
17.76	66.53	53.70	17.68	23.25	52.87	17.60	53.58	47.20
18.76	65.10	53.82	18.67	21.81	52.73	18.60	52.69	46.91
19.76	63.57	53.92	19.67	20.44	52.56	19.59	51.89	46.61
20.75	61.99	54.00	20.67	19.16	52.37	20.59	51.19	46.30
21.75	60.42	54.04	21.67	17.95	52.19	21.59	50.58	45.99
22.75	58.88	54.06	22.66	16.83	52.00	22.59	50.04	45.68
23.75	57.40	54.06	23.66	15.75	51.82	23.58	49.54	45.39
24.74	55.99	54.05	24.66	14.70	51.65	24.58	49.07	45.11
25.74	54.64	54.04	25.66	13.64	51.49	25.58	48.60	44.84
26.74	53.34	54.02	26.65	12.57	51.33	26.58	48.10	44.58
27.73	52.07	54.02	27.65	11.45	51.18	27.57	47.56	44.32
28.73	50.80	54.02	28.65	10.29	51.02	28.57	46.98	44.06
29.73	49.51	54.03	29.64	9.07	50.86	29.57	46.36	43.79
30.73	48.17	54.04				30.56	45.73	43.51
31.72	46.76	54.06				31.56	45.10	43.21
32.72	45.29	54.07				32.56	44.53	42.89

TABLE II, 1973

SIDEREAL TIME AT 0^h U.T.

Date	Sidereal Time		Equation of Equinoxes		Date	Sidereal Time		Equation of Equinoxes	
	Apparent	Mean	Long-Period	Short-Period		Apparent	Mean	Long-Period	Short-Period
			(0ˢ.001)					(0ˢ.001)	
Jan. 0	$6^h\ 38^m 04^s.199$	03ˢ.185	−1025	−10	Feb. 15	$9^h\ 39^m 25^s.837$	24ˢ.731	+1092	+14
1	6 41 60.759	59.740	+1025	− 9	16	9 43 22.395	21.287	+1091	+17
2	6 45 57.321	56.295	+1031	− 6	17	9 47 18.949	17.842	+1091	+16
3	6 49 53.883	52.851	+1034	− 1	18	9 51 15.499	14.397	+1090	+12
4	6 53 50.446	40.406	+1037	+ 3	19	9 55 12.048	10.953	+1089	+ 7
5	6 57 47.008	45.961	+1040	+ 7	20	9 59 08.596	07.508	+1088	+ 1
6	7 01 43.569	42.517	+1043	+ 9	21	10 03 05.145	04.064	+1086	− 5
7	7 05 40.127	39.072	+1046	+ 9	22	10 07 01.695	00.619	+1085	− 9
8	7 09 36.683	35.628	+1048	+ 7	23	10 10 58.248	57.174	+1084	−11
9	7 13 33.237	32.183	+1051	+ 3	24	10 14 54.802	53.730	+1082	−10
10	7 17 29.789	28.738	+1054	− 3	25	10 18 51.358	50.285	+1081	− 8
11	7 21 26.341	25.294	+1056	− 9	26	10 22 47.916	46.840	+1079	− 4
12	7 25 22.894	21.849	+1059	−14	27	10 26 44.474	43.396	+1078	0
13	7 29 19.449	18.404	+1061	−17	28	10 30 41.032	39.951	+1076	+ 5
14	7 33 16.007	14.960	+1064	−16	Mar. 1	10 34 37.589	36.507	+1074	+ 8
15	7 37 12.569	11.515	+1066	−12	2	10 38 34.144	33.062	+1073	+10
16	7 41 09.133	08.070	+1068	− 5	3	10 42 30.697	29.617	+1071	+ 9
17	7 45 05.699	04.626	+1070	+ 3	4	10 46 27.248	26.173	+1069	+ 7
18	7 49 02.265	01.181	+1073	+11	5	10 50 23.796	22.728	+1067	+ 2
19	7 52 58.827	57.737	+1075	+16	6	10 54 20.344	19.283	+1065	− 4
20	7 56 55.386	54.292	+1076	+18	7	10 58 16.891	15.839	+1063	−10
21	8 00 51.941	50.847	+1078	+16	8	11 02 13.440	12.394	+1061	−14
22	8 04 48.494	47.403	+1080	+11	9	11 06 09.992	08.949	+1058	−15
23	8 08 45.045	43.958	+1082	+ 5	10	11 10 06.548	05.505	+1056	−13
24	8 12 41.596	40.513	+1083	− 1	11	11 14 03.106	02.060	+1054	− 8
25	8 16 38.147	37.069	+1085	− 6	12	11 17 59.666	58.615	+1052	− 1
26	8 20 34.701	33.624	+1086	− 9	13	11 21 56.227	55.171	+1049	+ 6
27	8 24 31.256	30.180	+1087	−10	14	11 25 52.786	51.726	+1047	+12
28	8 28 27.814	26.735	+1088	− 9	15	11 29 49.342	48.282	+1045	+16
29	8 32 24.373	23.290	+1089	− 6	16	11 33 45.895	44.837	+1042	+16
30	8 36 20.933	19.846	+1090	− 3	17	11 37 42.446	41.392	+1040	+13
31	8 40 17.494	16.401	+1091	+ 2	18	11 41 38.993	37.948	+1037	+ 8
Feb. 1	8 44 14.054	12.956	+1092	+ 6	19	11 45 35.540	34.503	+1035	+ 2
2	8 48 10.613	09.512	+1093	+ 9	20	11 49 32.088	31.058	+1033	− 3
3	8 52 07.170	06.067	+1093	+10	21	11 53 28.636	27.614	+1030	− 8
4	8 56 03.725	02.622	+1094	+ 9	22	11 57 25.186	24.169	+1028	−10
5	8 59 60.277	59.178	+1094	+ 5	23	12 01 21.739	20.724	+1025	−11
6	9 03 56.827	55.733	+1094	0	24	12 05 18.293	17.280	+1023	− 9
7	9 07 53.376	52.288	+1094	− 6	25	12 09 14.850	13.835	+1020	− 6
8	9 11 49.926	48.844	+1094	−12	26	12 13 11.407	10.391	+1018	− 2
9	9 15 46.478	45.399	+1094	−15	27	12 17 07.964	06.946	+1016	+ 3
10	9 19 43.033	41.955	+1094	−16	28	12 21 04.521	03.501	+1013	+ 6
11	9 23 39.591	38.510	+1094	−13	29	12 25 01.076	00.057	+1011	+ 9
12	9 27 36.152	35.065	+1094	− 7	30	12 28 57.630	56.612	+1008	+ 9
13	9 31 32.714	31.621	+1093	0	31	12 32 54.181	53.167	+1006	+ 7
14	9 35 29.277	28.176	+1093	− 8	Apr. 1	12 36 50.730	49.723	+1004	+ 3
15	9 39 25.837	24.731	+1092	+14	2	12 40 47.277	46.278	+1002	− 3

TABLE III

CONVERSION OF MEAN SOLAR TO SIDEREAL TIME

CORRECTION TO BE ADDED TO A MEAN TIME INTERVAL

	16h	17h	18h	19h	20h	21h	22h	23h	For Seconds	
0m	2m37s704	2m47s360	2m57s417	3m07s273	3m17s129	3m26s986	3m36s842	3m46s699	0s	0s000
1	37.868	47.724	57.581	07.437	17.294	27.150	37.007	46.863	1	.003
2	38.032	47.889	57.745	07.602	17.458	27.314	37.171	47.027	2	.005
3	38.196	48.053	57.909	07.766	17.622	27.479	37.335	47.192	3	.008
4	38.361	48.217	58.074	07.930	17.787	27.643	37.500	47.356	4	.011
5	2 38.525	2 48.381	2 58.238	3 08.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	38.689	48.546	58.402	08.259	18.115	27.972	37.828	47.685	6	.016
7	38.853	48.710	58.566	08.423	18.279	28.136	37.992	47.849	7	.019
8	39.018	48.874	58.731	08.587	18.444	28.300	38.157	48.013	8	.022
9	39.182	49.039	58.895	08.751	18.608	28.464	38.321	48.177	9	.025
10	2 39.346	2 49.203	2 59.059	3 08.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	39.511	49.367	59.224	09.080	18.936	28.793	38.649	48.506	11	.030
12	39.675	49.531	59.388	09.244	19.101	28.957	38.814	48.670	12	.033
13	39.839	49.696	59.552	09.409	19.265	29.122	38.978	48.834	13	.036
14	40.003	49.860	59.716	09.573	19.429	29.286	39.142	48.999	14	.038
15	2 40.168	2 50.024	2 59.881	3 09.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	40.332	50.188	3 00.045	09.901	19.758	29.614	39.471	49.327	16	.044
17	40.496	50.353	00.209	10.066	19.922	29.779	39.635	49.492	17	.047
18	40.661	50.517	00.373	10.230	20.086	29.943	39.799	49.656	18	.049
19	40.825	50.681	00.538	10.394	20.251	30.107	39.964	49.820	19	.052
20	2 40.989	2 50.846	3 00.702	3 10.558	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	41.153	51.010	00.866	10.723	20.579	30.436	40.292	50.149	21	.057
22	41.318	51.174	01.031	10.887	20.744	30.600	40.456	50.313	22	.060
23	41.482	51.338	01.195	11.051	20.908	30.764	40.621	50.477	23	063
24	41.646	51.503	01.359	11.216	21.072	30.929	40.785	50.641	24	.066
25	2 41.810	2 51.667	3 01.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	41.975	51.831	01.688	11.544	21.401	31.257	41.114	50.970	26	.071
27	42.139	51.995	01.852	11.708	21.565	31.421	41.278	51.134	27	.074
28	42.303	52.160	02.016	11.873	21.729	31.586	41.442	51.299	28	.077
29	42.468	52.324	02.180	12.037	21.893	31.750	41.606	51.463	29	079
30	2 42.632	2 52.488	3 02.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	42.796	52.653	02.509	12.366	22.222	32.078	41.935	51.791	31	.085
32	42.960	52.817	02.673	12.530	22.386	32.243	42.099	51.956	32	.088
33	43.125	52.981	02.838	12.694	22.551	32.407	42.263	52.120	33	.090
34	43.289	53.145	03.002	12.858	22.715	32.571	42.428	52.284	34	.093
35	2 43.453	2 53.310	3 03.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.448	35	0.096
36	43.617	53.474	03.330	13.187	23.043	32.900	42.756	52.613	36	.099
37	43.782	53.638	03.495	13.351	23.208	33.064	42.921	52.777	37	.101
38	43.946	53.802	03.659	13.515	23.372	33.228	43.085	52.941	38	.104
39	44.110	53.967	03.823	13.680	23.536	33.393	43.249	53.106	39	.107
40	2 44.275	2 54.131	3 03.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	44.439	54.295	04.152	14.008	23.865	33.721	43.578	53.434	41	.112
42	44.603	54.460	04.316	14.173	24.029	33.885	43.742	53.598	42	.115
43	44.767	54.624	04.480	14.337	24.193	34.050	43.906	53.763	43	.118
44	44.932	54.788	04.645	14.501	24.358	34.214	44.070	53.927	44	.120
45	2 45.096	2 54.952	3 04.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	45.260	55.117	04.973	14.830	24.686	34.543	44.399	54.256	46	.126
47	45.424	55.281	05.137	14.994	24.850	34.707	44.563	54.420	47	.129
48	45.589	55.445	05.302	15.158	25.015	34.871	44.728	54.584	48	.131
49	45.753	55.610	05.466	15.322	25.179	35.035	44.892	54.748	49	.134
50	2 45.917	2 55.774	3 05.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	46.082	55.938	05.795	15.651	25.507	35.364	45.220	55.077	51	.140
52	46.246	56.102	05.959	15.815	25.672	35.528	45.385	55.241	52	.142
53	46.410	56.267	06.123	15.980	25.836	35.692	45.549	55.405	53	.145
54	46.574	56.431	06.287	16.144	26.000	35.857	45.713	55.570	54	.148
55	2 46.739	2 56.595	3 06.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	46.903	56.759	06.616	16.472	26.329	36.185	46.042	55.898	56	.153
57	47.067	56.924	06.780	16.637	26.493	36.350	46.206	56.063	57	.156
58	47.231	57.088	06.944	16.801	26.657	36.514	46.370	56.227	58	.159
59	2 47.396	2 57.252	3 07.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162

(The argument is Mean Solar Time)

TOWN New Britain | COUNTY Hartford | STATION 6322

DATE SET June 1988 | QUADRANGLE 410724 Meriden | ORDER OF ACCURACY Horizontal 3rd-Class 1(1:10,000)

DATE DESCRIBED June 1988 | U.S.G.S MAP New Britain | Vertical

COMPUTATION VOLUME Town Misc. Rte 72NB NAD 83 | BOOKS A-1, U | R.O.W. MAP 88-01, Shs 2 & 3

1927 NORTH AMERICAN DATUM (N.A.D. 27)

STATE PLANE COORDINATES (FEET)

X = 584,430.40
Y = 303,469.08
DATE: June 1988

STATE PLANE COORDINATES (FEET)

X =
Y =
DATE:

(METERS)

X = 178,134.742
Y = 92,497.561
DATE: June 1988

(METERS)

X =
Y =
DATE:

GEOGRAPHIC POSITION

LAT 41 39 58.3172
LONG. 72 48 25.1338
θ = -00 02 16.0159
DATE: June 1988

GEOGRAPHIC POSITION

LAT.
LONG.
θ =
DATE:

OBJECT	DISTANCE FT.	DIRECTION	PLANE AZIMUTH (0° South)
CTGS 3215	772.64	00 00 00	103 30 09.0
TM 45	640.56	73 40 30	177 10 40.2
RM 1	43.56	160 09 57	
RM 2	54.66	218 10 15	
RM 3	55.66	280 01 48	

ELEV. 1929 NATIONAL GEODETIC VERTICAL DATUM (N.G.V.D 29)

FEET 255.049
METERS 77.7391
DATE: June 1988

FEET
METERS
DATE:

1983 NORTH AMERICAN DATUM (N.A.D. 83)

STATE PLANE COORDINATES (FEET)

NORTHING = 803,509.33
EASTING = 984,556.57
DATE: February 1989

STATE PLANE COORDINATES (FEET)

NORTHING =
EASTING =
DATE:

(METERS)

NORTHING = 244,910.134
EASTING = 300,093.443
DATE: February 1989

(METERS)

NORTHING =
EASTING =
DATE:

GEOGRAPHIC POSITION

LAT. 41 39 58.6696
LONG. 72 48 23.4773
θ = -00 02 14.9175
DATE: February 1989

GEOGRAPHIC POSITION

LAT.
LONG.
θ =
DATE:

OBJECT	DISTANCE FT	DIRECTION	PLANE AZIMUTH (0° North)
CTGS 3215	772.69	00 00 00	283 30 09.0
T.M. 45	640.56	73 40 30	357 10 37.8
RM 1	43.56	160 09 57	
RM 2	54.66	218 10 15	
RM 3	55.66	280 01 48	

ELEV. 1988 NORTH AMERICAN VERTICAL DATUM (N.A.V.D 88)

FEET
METERS
DATE:

METRIC CONVERSION FACTOR USING THE U.S. SURVEY FOOT
1 Meter equals (Exactly) 39.37 inches
P – Indicates Preliminary Value

JAM:2/88

TOWN New Britain STATION 6322

DESCRIPTION: The Station Mark is a Connecticut Geodetic Survey brass disk stamped 6322 set in the top of a reinforced concrete post, the top set flush with the ground.

To reach the station in New Britain from the intersection of Conn. 72 and Conn. Route 372 (Corbin Ave.) go northwesterly along Conn. Route 372 for 0.19 mile to the intersection of West Main St. and the station on the right.

The station is 99.6 feet west of SNET 6034, 41.5 feet east of the centerline of Conn. Route 372, 31.5 feet south of the centerline of West Main St. and 13.7 feet south of a concrete curb.

RM 1: East of Station: A drill hole in a hex head brass bolt set in a ¼ inch drill hole in the concrete curb on the east side of a driveway. It is 60.6 feet NE of the NE brick corner of the Texaco gas station, 82.5 feet east of the centerline of Corbin Ave., 58.5 feet west of SNET 6034 and 19.5 feet south of the centerline of West Main St.

RM 2: Southeast of Station: A drill hole in a hex head brass bolt in a ¼ inch drill hole in the NW corner of the most easterly concrete gas pump island. It is 68.0 feet south of the centerline of West Main St., 70.7 feet SW of SNET 6034 and 4.5 feet south of the north edge of a concrete apron.

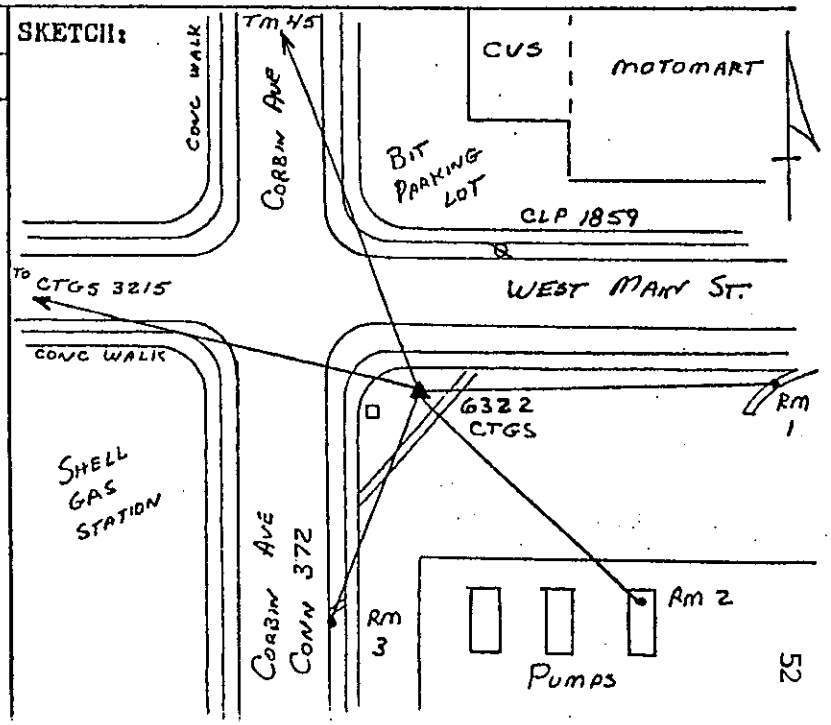
RM 3: Southwest of Station: A drill hole in a hex head brass bolt set ina ¼ inch drill hole in the concrete curb on the south side of an entrance to the Texaco gas station. It is 87 feet south of the centerline of West Main St., 22.5 feet east of the centerline of Corbin Ave. and 10 feet south of the north range of the brick gas station.

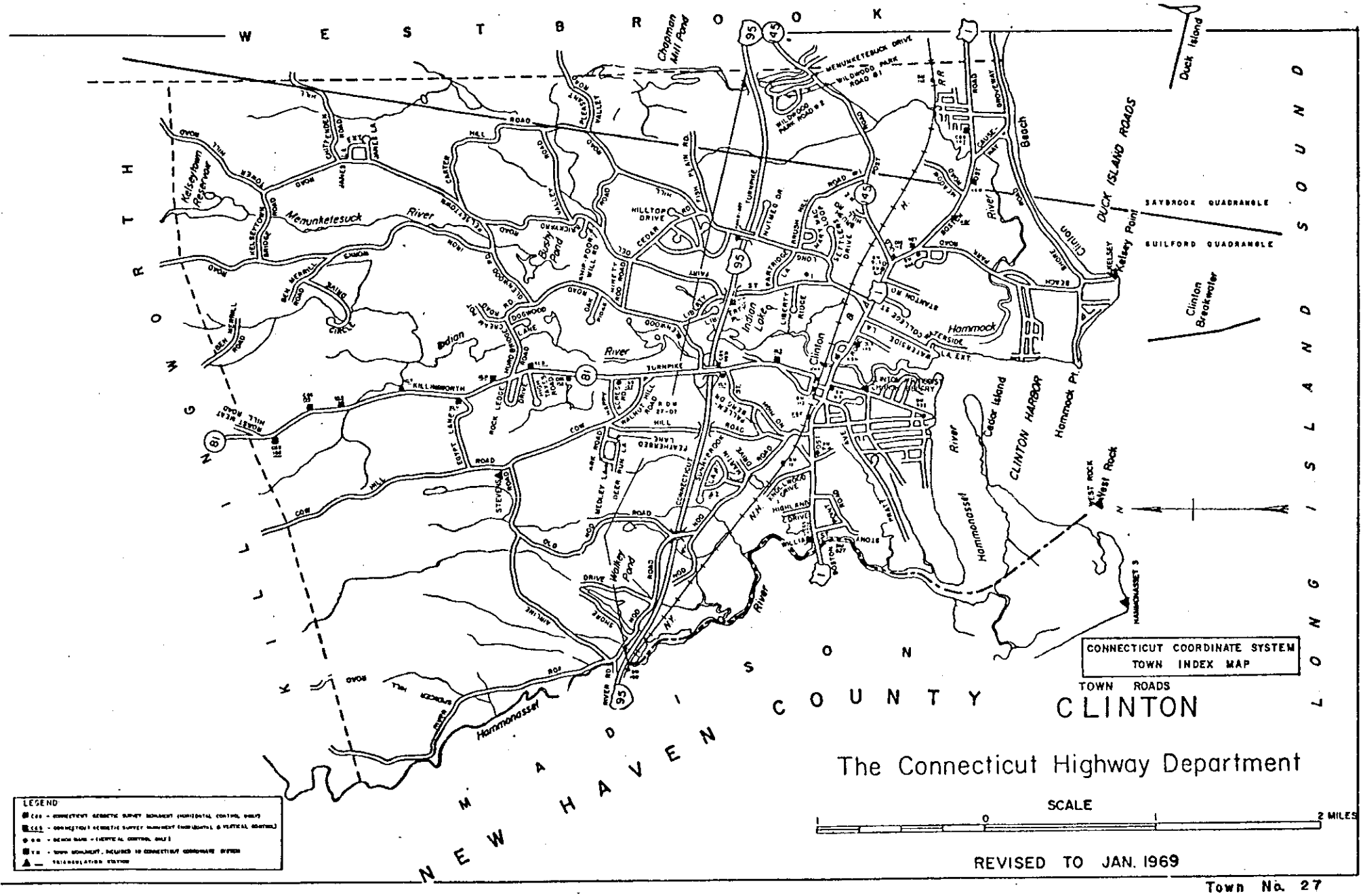
NOTES:

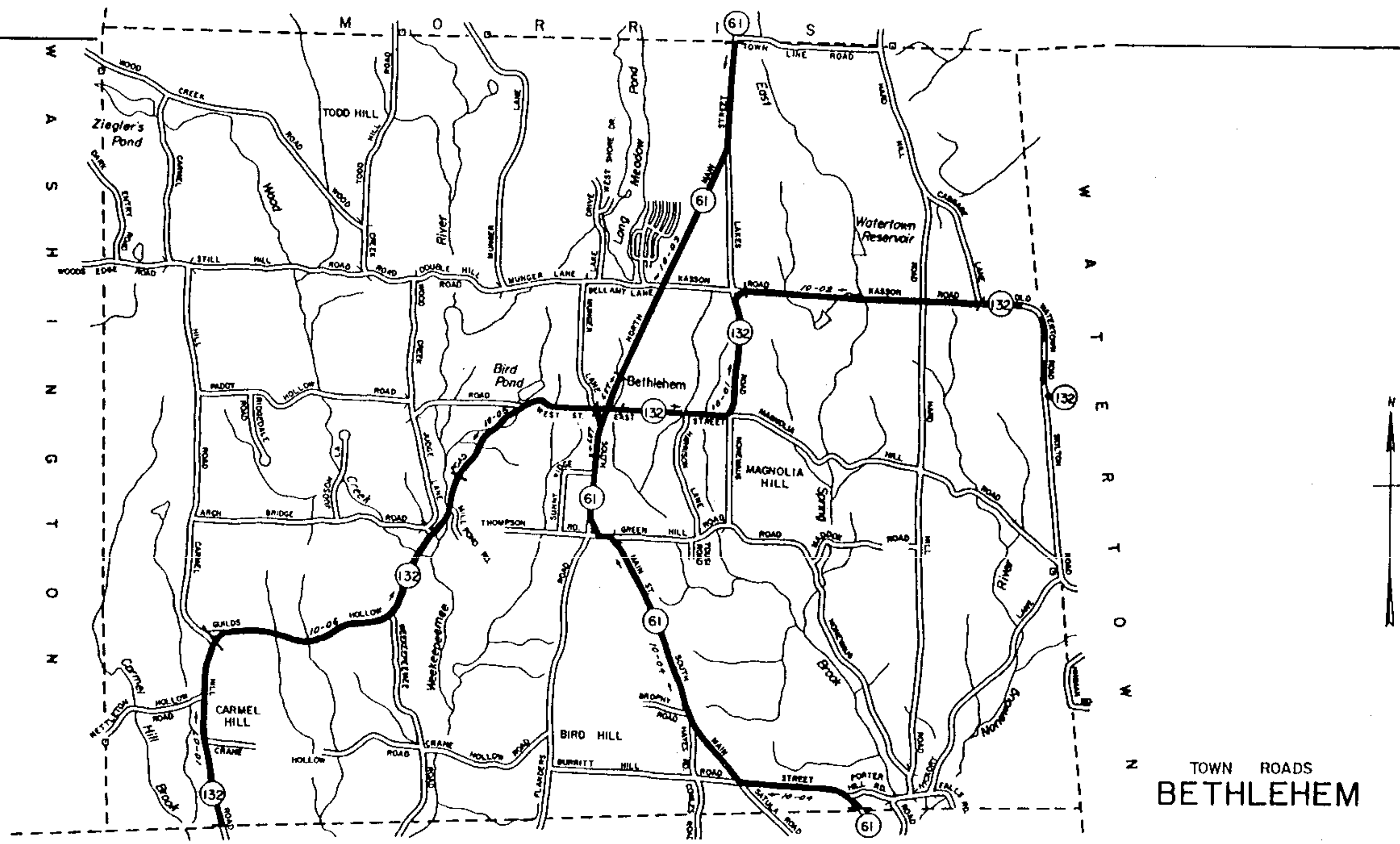
RECOVERY NOTES

Date	Organization	Condition

SKETCH:




CONNECTICUT COORDINATE SYSTEM
TOWN INDEX MAP
TOWN ROADS
CLINTON
The Connecticut Highway Department
SCALE
0
2 MILES
REVISED TO JAN. 1969
Town No. 27
LEGEND
WESTBROOK
MADISON
NEW HAVEN COUNTY
LONG ISLAND SOUND
Menunketesuck River
Indian River
Hammonasset
Chapman Mill Pond
Duck Island
Kelsey Point
Clinton Breakwater
Hammock Pt.
Cedar Island
CLINTON HARBOR
West Rock
SAYBROOK QUADRANGLE
GUILFORD QUADRANGLE



TOWN ROADS

BETHLEHEM

The Connecticut Highway Department

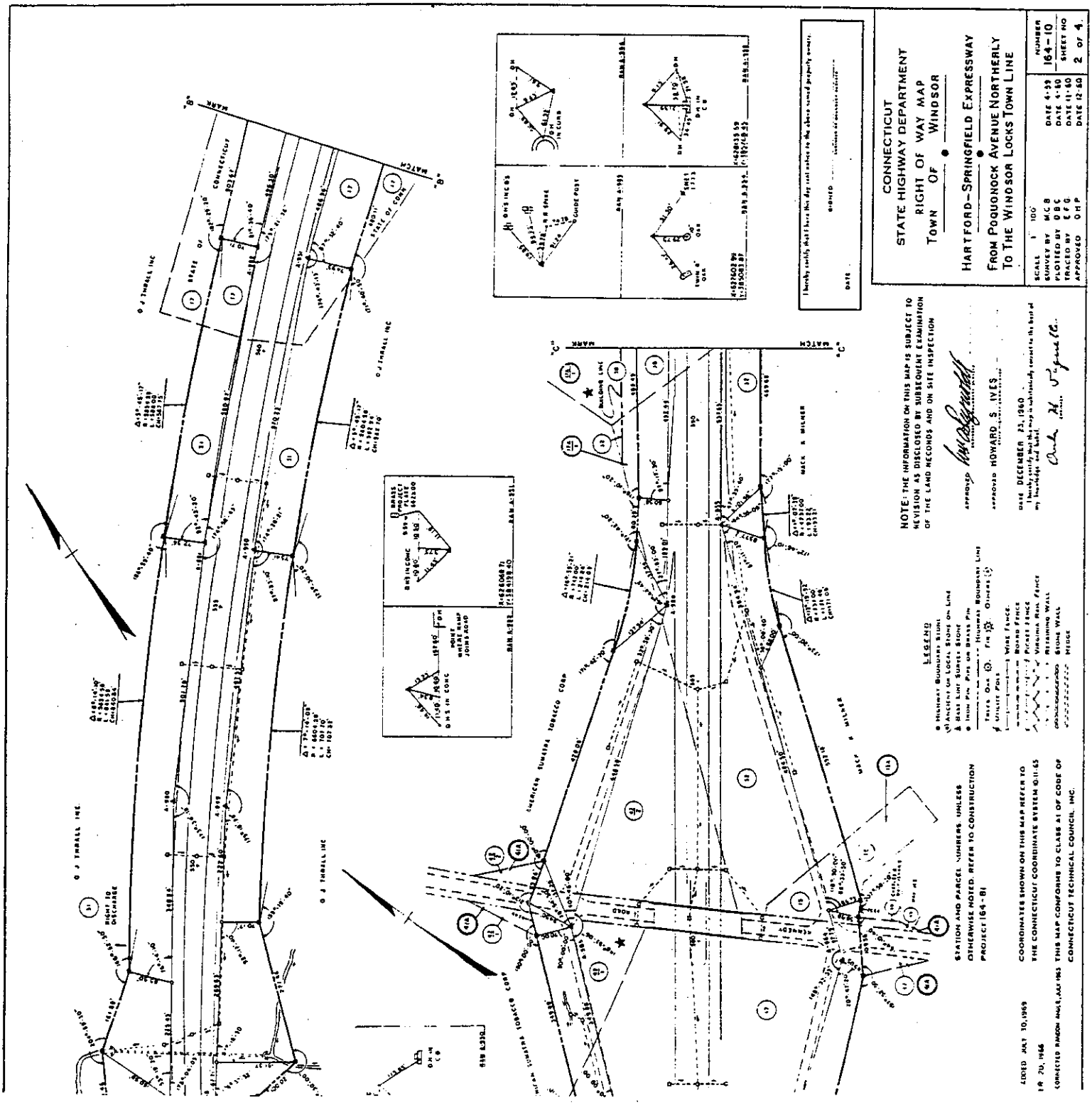
SCALE

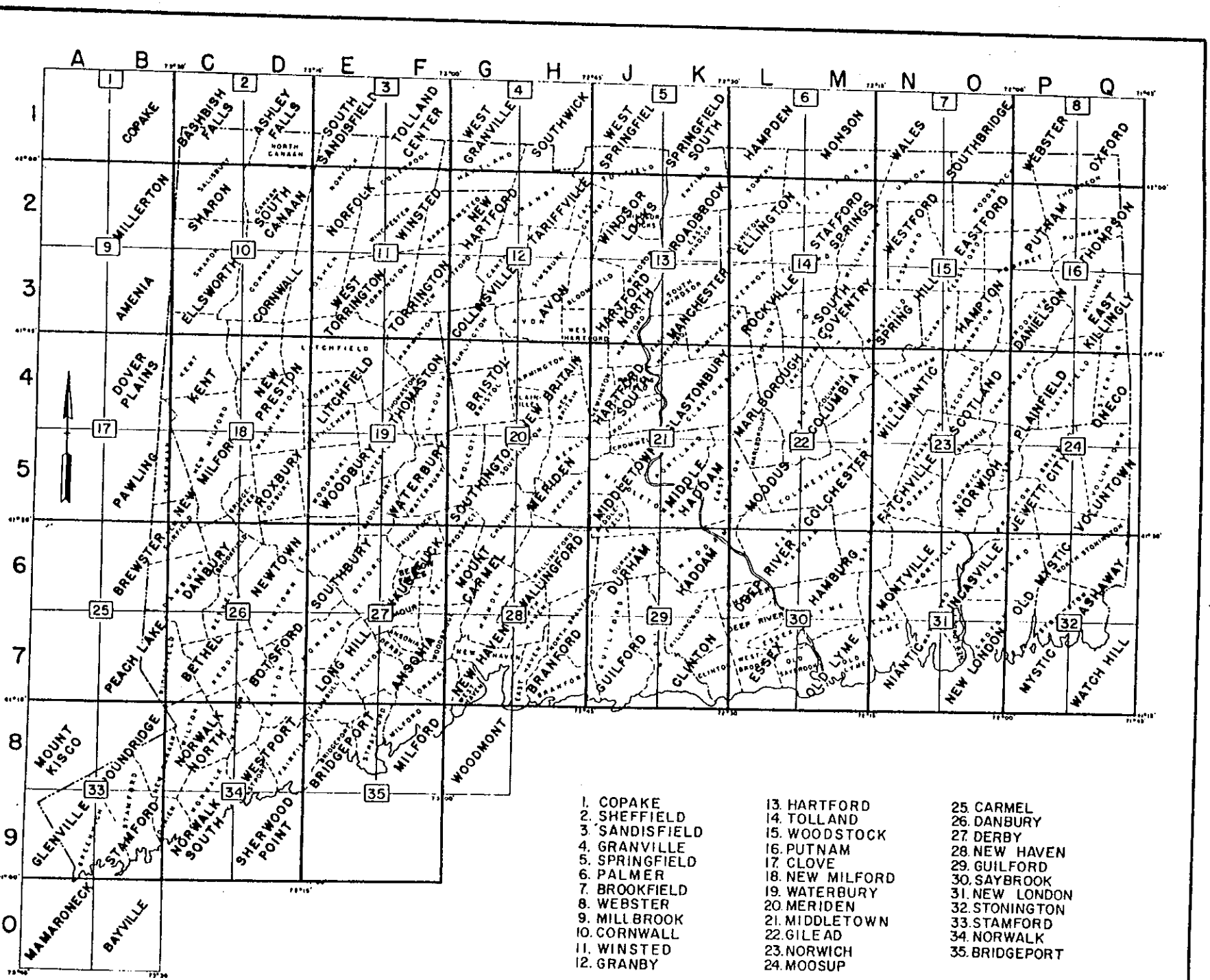
0 1 2 MILES

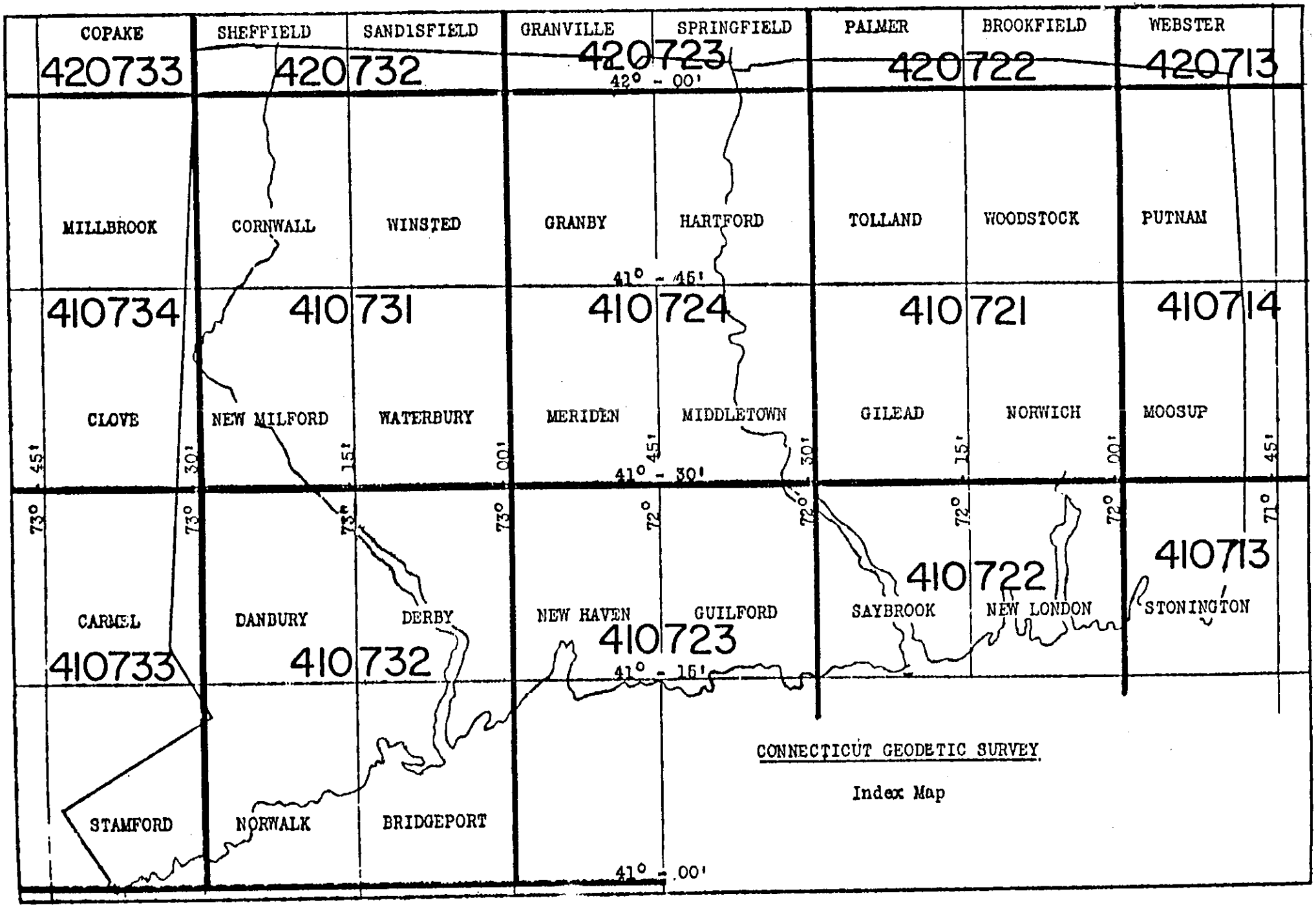
REVISED TO JAN. 1969

Town No. 10

Appendix "D"
A Portion of a Right of Way Boundary Map
Showing Coordinated Base Line Monuments

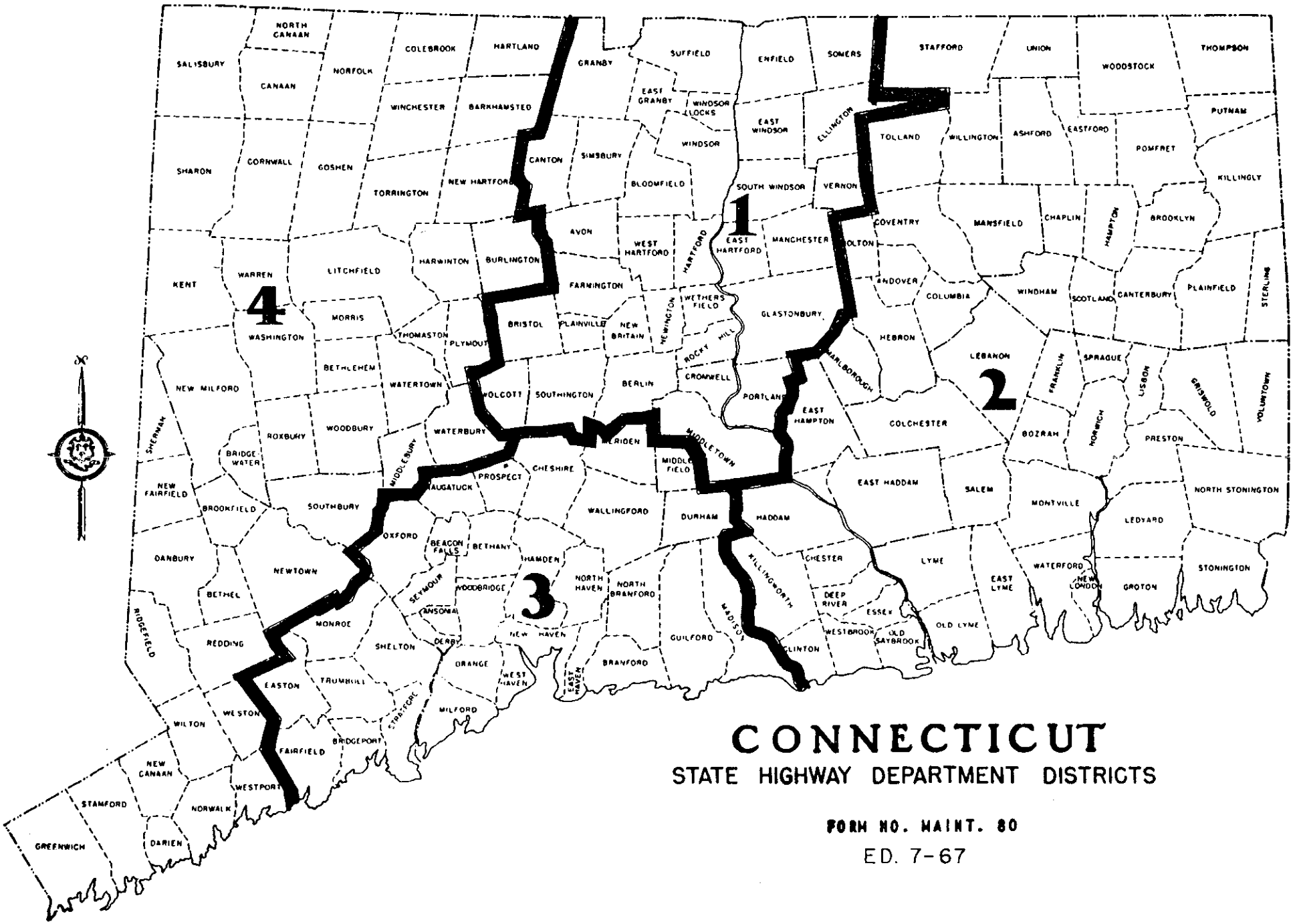



A B C D E F G H J K L M N O P Q
1 2 3 4 5 6 7 8 9 10
COPAKE
BASHBISH FALLS
ASHLEY FALLS
SOUTH SANDISFIELD
TOLLAND CENTER
WEST GRANVILLE
SOUTHWICK
WEST SPRINGFIEL
SPRINGFIELD SOUTH
HAMPDEN
MONSON
WALES
SOUTHBRIDGE
WEBSTER
OXFORD
MILLERTON
SHARON
SOUTH CANAAN
NORFOLK
WINSTED
NEW HARTFORD
TARIFFVILLE
WINDSOR LOCKS
BROADBROOK
ELLINGTON
STAFFORD SPRINGS
WESTFORD
EASTFORD
PUTNAM
THOMPSON
AMENIA
ELLSWORTH
CORNWALL
WEST TORRINGTON
TORRINGTON
COLLINSVILLE
AVON
HARTFORD NORTH
MANCHESTER
ROCKVILLE
SOUTH COVENTRY
SPRING HILL
HAMPTON
DANIELSON
EAST KILLINGLY
DOVER PLAINS
KENT
NEW PRESTON
LITCHFIELD
THOMASTON
BRISTOL
NEW BRITAIN
HARTFORD SOUTH
GLASTONBURY
MARLBOROUGH
COLUMBIA
WILLIMANTIC
SCOTLAND
PLAINFIELD
ONECO
PAWLING
NEW MILFORD
ROXBURY
WOODBURY
WATERBURY
SOUTHINGTON
MERIDEN
MIDDLETOWN
MIDDLE HADDAM
MOODUS
COLCHESTER
FITCHVILLE
NORWICH
JEWETT CITY
VOLUNTOWN
BREWSTER
DANBURY
NEWTOWN
SOUTHBURY
OXFORD
MOUNT CARMEL
WALLINGFORD
DURHAM
HADDAM
DEEP RIVER
HAMBURG
MONTVILLE
MOHEGAN
OLD MYSTIC
ASHAWAY
PEACH LAKE
BETHEL
BOTSFORD
LONG HILL
ANSONIA
NEW HAVEN
BRANFORD
GUILFORD
CLINTON
ESSEX
OLD LYME
NIANTIC
NEW LONDON
MYSTIC
WATCH HILL
MOUNT KISCO
YOUNDRIDGE
NORWALK NORTH
WESTPORT
BRIDGEPORT
MILFORD
WOODMONT
GLENVILLE
STAMFORD
NORWALK SOUTH
SHERWOOD POINT
MAMARONECK
BAYVILLE
1. COPAKE
2. SHEFFIELD
3. SANDISFIELD
4. GRANVILLE
5. SPRINGFIELD
6. PALMER
7. BROOKFIELD
8. WEBSTER
9. MILLBROOK
10. CORNWALL
11. WINSTED
12. GRANBY
13. HARTFORD
14. TOLLAND
15. WOODSTOCK
16. PUTNAM
17. CLOVE
18. NEW MILFORD
19. WATERBURY
20. MERIDEN
21. MIDDLETOWN
22. GILEAD
23. NORWICH
24. MOOSUP
25. CARMEL
26. DANBURY
27. DERBY
28. NEW HAVEN
29. GUILFORD
30. SAYBROOK
31. NEW LONDON
32. STONINGTON
33. STAMFORD
34. NORWALK
35. BRIDGEPORT



CONNECTICUT GEODETIC SURVEY

Index Map



CONNECTICUT

STATE HIGHWAY DEPARTMENT DISTRICTS

FORM NO. MAINT. 80

ED. 7-67

NAD 83

NAD PROJECT

THE DATUM

Name: NAD 83

Ellipsoid: GRS 80 (Geocentric)

$a = 6378137.$ m

$1/f = 298.257222$

Comparison of Datum Elements

	NAD 27	NAD 83
Reference Ellipsoid	Clarke Ellipsoid of 1866 a = 6,378,206.4 m. b = 6,356,583.8 m.	GRS 80 a = 6,378,137 m. f = 1/298.2572221...
Datum Point	Triangulation station MEADES RANCH	NONE (mass center of the earth)
Longitude Origin	Greenwich Meridian (BIH zero meridian)	SAME
Azimuth Orientation	From SOUTH	From NORTH
Adjustment	25K Points Several hundred base lines Several hundred astro azi.	250K Points Approx. 30K EDMI base lines 5K astro azimuths Doppler point positions VLBI vectors
Best Fitting	North America	World-Wide

Figure 2.--Expected longitude change from NAD 27 to NAD 83 (in meters).

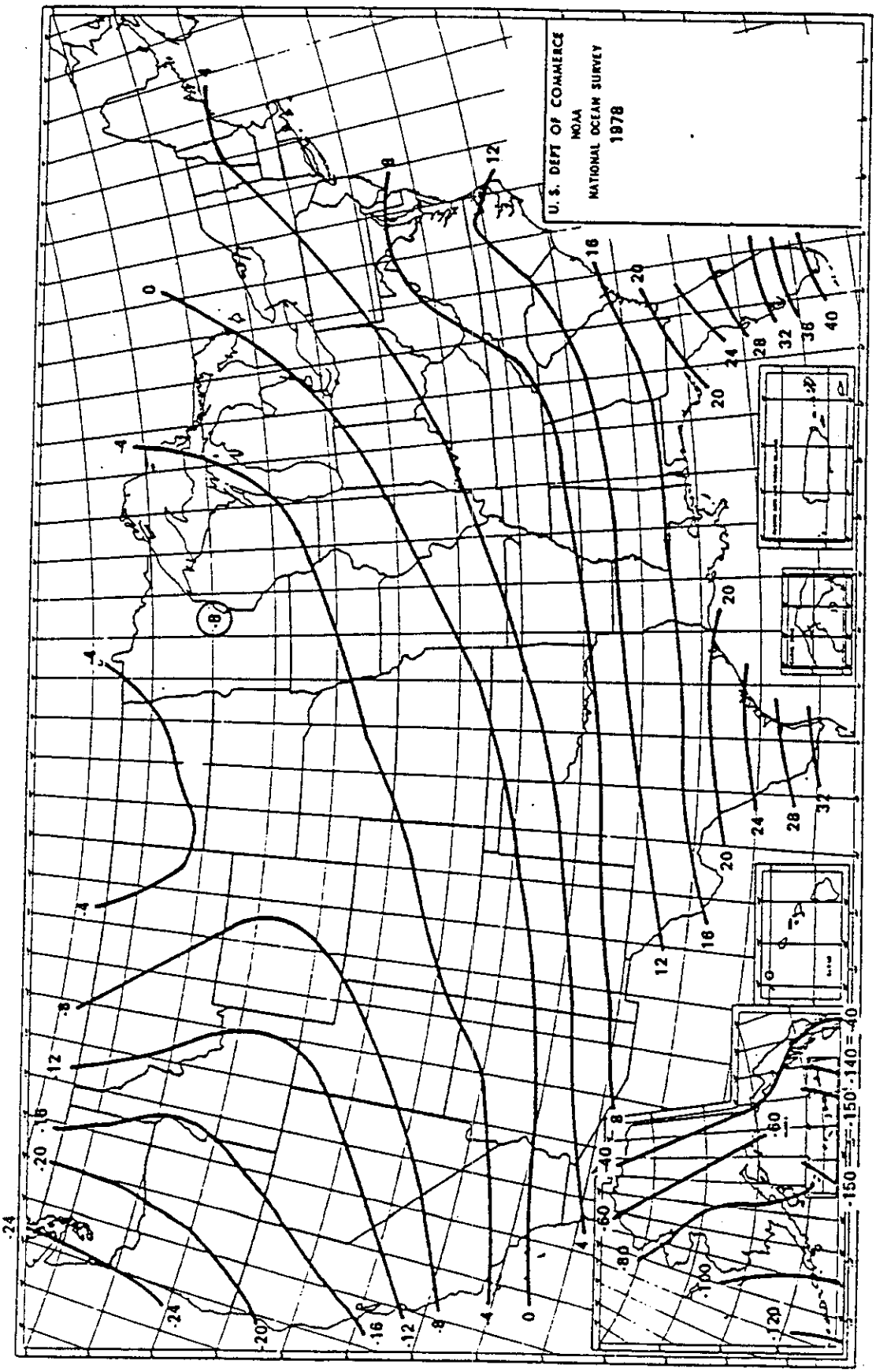
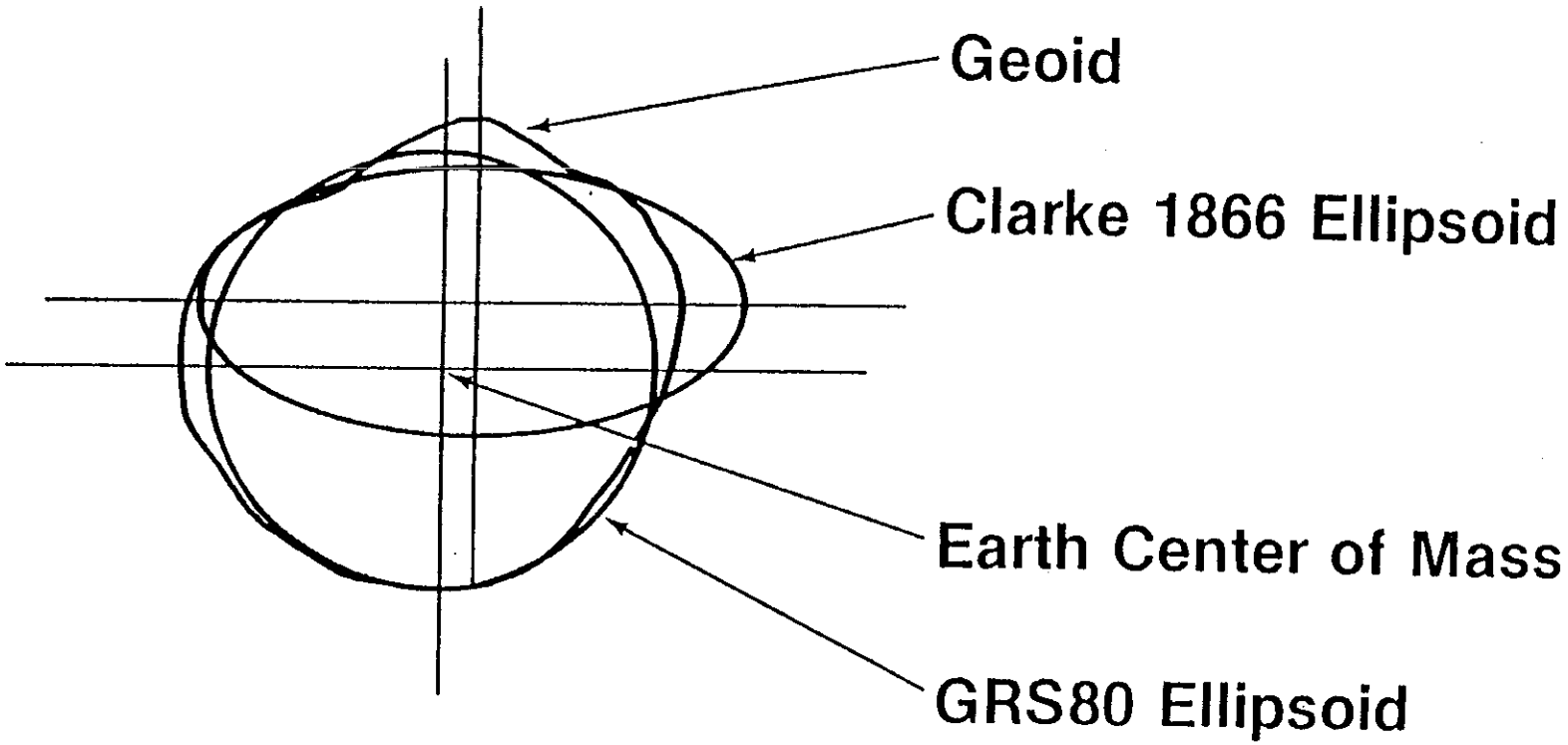


Figure 1.--Expected latitude change from NAD 27 to NAD 83 (in meters).

NAD PROJECT

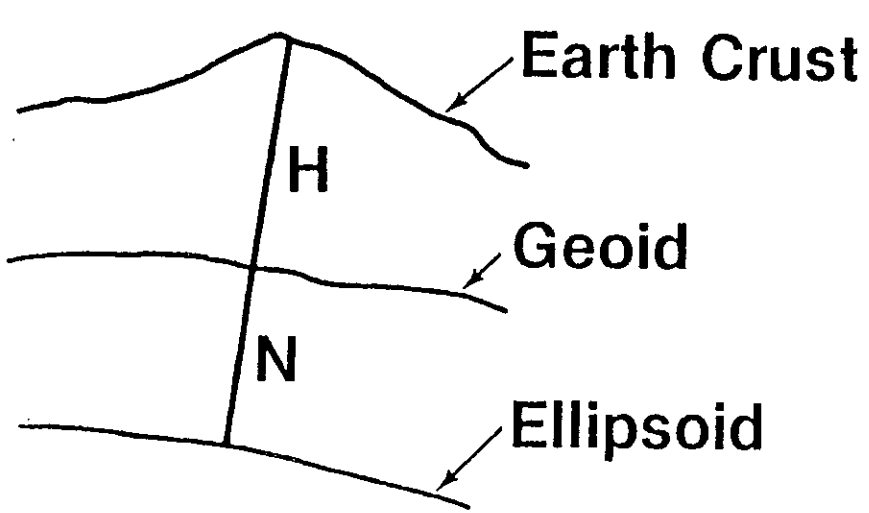
THE GEOID AND TWO ELLIPSOIDS



NAD PROJECT

THE GEOID

The geoid is the equipotential surface of the earth's attraction and rotation which, on the average, coincides with mean sea level in the open ocean.



H = Height Above Sea Level

N = Geoid Height

h = H + N = Ellipsoidal Height

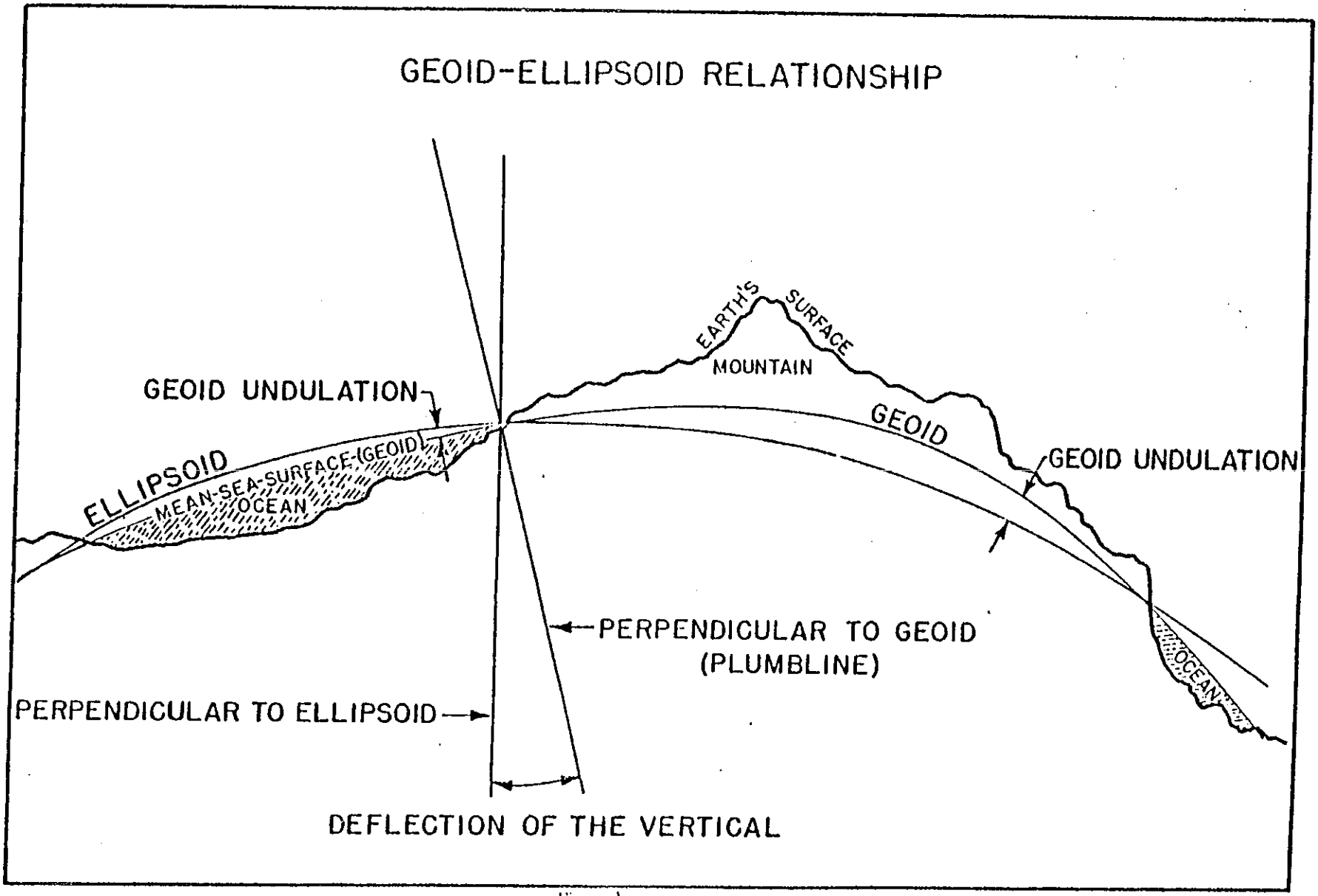
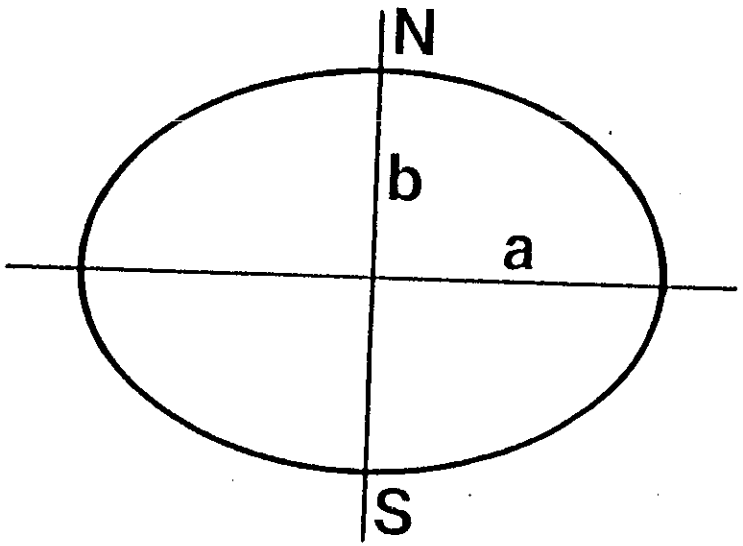

GEOID-ELLIPSOID RELATIONSHIP
EARTH'S SURFACE
MOUNTAIN
GEOID UNDULATION
GEOID
GEOID UNDULATION
ELLIPSOID
MEAN-SEA-SURFACE-(GEOID)
OCEAN
PERPENDICULAR TO GEOID
(PLUMBLINE)
OCEAN
PERPENDICULAR TO ELLIPSOID
DEFLECTION OF THE VERTICAL

Figure 1

NAD PROJECT

THE ELLIPSOID



a = Semi major axis
b = Semi minor axis
$f = \frac{a - b}{a}$ = Flattening

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