5465

Form 504
Rev. Dec. 1933

DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
R. S. PATTON, DIRECTOR

DESCRIPTIVE REPORT

Air Photo
Topographic
~~*Hydrographic*~~ } *Sheet No.* T-5465

State New York

LOCALITY

Staten Island

~~Staplaton to~~ Fort Wadsworth
and Vicinity

193 7

CHIEF OF PARTY

J.C.Partington Jr. H.& G.E.

U.S. GOVERNMENT PRINTING OFFICE: 1934

5465

Applied to Court 285 Dec 22 1937 Chas K Zunk Jr
" " " 541 May 1938 J.A.D.
" " " 540 June 1945 W.A. Bruder

Form 537a
Ed. Nov. 1929

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO.

TOPOGRAPHIC TITLE SHEET

The Topographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. T-5465

REGISTER NO. T-5465 T5465

State New York

General locality Staten Island

Locality ~~Stapleton to~~ Fort Wadsworth and Vicinity

Scale 1:5000 Date of ~~survey~~ Photographs 5/15/1935 5/22, 1935

Vessel Photo Compilation Party # 25

Chief of party J.C.Partington

Surveyed by Field Inspection - J.Rippstein
Radial Plot - C.R.Bush & E.L.Jones

Inked by C.R.Bush & E.L.Jones

Heights in feet above ---- to ground to tops of trees

Contour, Approximate contour, Form line interval --- feet

Instructions dated March 14, 1934

Remarks:

GPO

-Statistics-

AIR PHOTO COMPILATION, REGISTER NO. T-5465.

Photograph No.	Date	time	high tide time	high tide hts.	low tide time	low tide hts.
V 196-201 (870N-8)	5/15/35	9:40a	5:25a	4.0'	11:35a	0.3'
V 218-~~220~~ (870N-8)	5/22/35	12:00	10:37a	4.2'	4:27p	-0.3'

Scale Factor (1.000) R.C.Bolstad (Previously determined)

Projection ---------- Ruling Machine ------- No date

Projection Checked --------- F.G.Erskine ---------- " "

Control Plotted ---------- C.R.Bush ---------- " "

Control Checked ---------- F.B.Kelley ---------- " "

Radial Line Plot ---------- C.R.Bush & E.L.Jones " "

Radial Line Plot Checked --- E.L.Jones ---------- May 6, 1937

Detail inked ---------- C.R.Bush ---------- No date
E.L.Jones ----------May 7 - 15,1937

Preliminary Review --------- J.C.Partington --------- June 7 - 8, 1937

Area of detail inked (land area) ------ 2.1 square statue miles
Area of detail inked (shoals) -------- 0 square statue miles

Length of shoreline(morethan 200m. from opposite shore --- 2.4 stat. mile
Length of shoreline (docks) -------- 3.1 statue miles.

Length of streets, roads, trails, railroads,etc. ---29.3 statue miles

General location : New York
Locality: Staten Island
Fort Wadsworth and Vicinity

Datum: North American 1927
Station: ~~Fort Tomkins 2~~, 1868-~~1932 (N.Y.)~~
Fort Tompkins 2, Latitude 40° 36' 15.474" 477.3 meters
Longitude 74° 03' 23.580" 554.4 "
(adjusted)
- J.W.P.

N.J. Grid { X = 2,169,416.59 FT.
Y = 645,665.89 FT.

L.I. Grid { X = 1,984,296.84 FT.
Y = 138,002.84 FT.

Compiler's Report
for
Air Photo Topographic Sheet, Register No. T-5465

General Information.

The field inspection for the area covered by this sheet is part of a special report covering the northern section of Staten Island, submitted by Lt.(J.G.) R.C.Bolstad in 1935. Filed with Des. Report T 5107
Field Inspection done March 1934
This sheet was originally started by compilation party No. 12 T.M.P.
in April 1935 but was discarded in November 1936 in favor of a machine made projection.

This sheet has been compiled from single lens photographs listed on page 2 of this report. Photographs V 196 to 201(870N-8) were taken approximately 2 hours before low water. Photographs V 218 to 220(870N-8) were taken approximately 1½ hours after high water.

The photographs were taken by the U.S.Army Corp at Mitchell Field, Long Island, N.Y. with a special camera developed by the Fairchild Camera Corporation, 62-10 Woodside Ave., Woodside, New York City and with the cooperation of the Air Corp. This camera is known as the "K-7C" by the Army and as "K-7A" by the Fairchild Corporation.

The Army plane was piloted by Lieut. Cullen at an altitude very close to 15,000 feet; the photographer was Sergeant Cates. A 24 inch cone (focal length 24") was used which placed the original negatives on a scale of 1:7500. Contact prints were furnished the field party for inspection purposes and the original negatives were used to enlarge a set of office prints to a 1:5000 scale in the Washington Office. These office prints were furnished this party and were used to compile this sheet.

Control.

The radial plot is controled by 17 triangulation stations, all of which are from Lieut. R.W.Woodworth's 1930-33 triangulation except:
Fox Hills 1908
Fort ~~Tomkins~~ Tompkins 2, 1908

Recoverable topographic stations previously located and U.S.E. coordinate stations were not used in controling the radial plot. They are shown on this sheet by circles 2½ mm in diameter.

A recovery note on Form 526 is submitted for triangulation station Ft. Wadsworth Lighthouse. It is to be noted that the triangulation position of Fort Wadsworth Light is from Lieut. R.W.Woodworth's 1930 scheme and that no descrepancy was found with this station by the radial plot.
Rec. Note Given to Geodesy

A recovery note on Form 526 is submitted for triangulation station Old Tank, located by Lieut. R.W.Woodworth in 1930. This tank has been dismantled except for a short section of the center pipe.
Reported to Geodesy and to Storm.

Triangulation station Fort Wadsworth, King's House, Green Cupola, 1930 now has a red cupola according to the air photo field inspection notes.
Reported to Geodesy

Triangulation Station Fort Wadsworth, Incinerator, Small Stack, 1930 is shown on the sheet but was not used in controling the radial plot due to insufficent ties to plot this station on the photographs.

Compilation.

(a) General.

The radial plot and the inking of detail was completed north of latitude 40° 37' 00", except on the extreme western limits, by C.R.Bush in the Washington Office. Celluloid templates were used in this area and according to notes left by Mr. Bush no difficulty was experienced with the radial plot.

The work on the sheet was resumed by Party #25 in Baltimore, Maryland in May 1937.

(b) Method.

The usual radial line method of plotting was used in the compilation of this sheet. The plot to the south and , also, on the western limits of the sheet is in general weak due to insufficent overlap. Where radial points are encircled in blue (below latitude 40° 37' 00") three or more radials gave good intersections; where points are encircled in green they were located from either two radials or from three radials intersecting at a weak angle. The radial circles have been left on the back of the sheet for the aid of the reviewer.

(c) Adjustment of Plot.

No great difficulty was encountered in running the radial plot. No unusual adjustment of the plot was necessary.

(d) Recoverable Topographic Stations (Card Form 524).

Sixteen Card Forms 524 are submitted for the area covered by this sheet. Except for one station " Tower (Marine Hospital)", which was located by the photocompilation, all the remaining stations are U.S.E. stations with coordinate distances.

Geographic positions for all U.S.E. stations were computed from coordinate distances as furnished by the U.S.E. Dept. These positions are shown on the sheet. The computations in connection with these stations are to be found in the appendix.

Station P#3, U.S.E. has as its origin U.S.C. & G.S. triangulation station "Memorial Church".

All other U.S.E. stations shown on this sheet are on the Borough of Richmond Grid, which has its axes perpendicular and parallel to the meridian through U.S.C.& G.S. triangulation station "Bogart", with its origin so chosen as to make Bogart south 20,350.00 feet and west 20,250.00 feet.

16 Form 524 filed under T 5465
1 " " " T 6381

(e) Interpretation.

No attempt has been made to show street car tracks on this sheet. Double railroad tracks have been generalized and are shown by single tracks on the sheet with a note "double tracks" on the overlay.

The double full line has been used to show all first class roads and streets (curb to curb); the double dashed line to show second class roads; and the single dashed line to show trails.

An attempt has been made to show all buildings of any importance along the waterfront and a few of the more important buildings inland. The stereoscope has been used freely in determining the shapes of buildings.

Wrecks are shown in true size and shape by a dashed line since they are all being dismantled for firewood. ~~All of the wrecks shown bare at high water.~~

The private drives leading to the U.S.Marine Hospital at Stapleton are not all shown since this hospital was partly under construction at the time the air photographs were taken.

No detail except the high water line is shown in Fort Wadsworth since this is a fortified area.

(f) Information from other sources.

1. Control from sources as stated on page 3 of this report.
2. Recoverable topographic stations as stated on page 4.
3. Names from sources as listed on Form M234 in the appendix.
5. Piling transferred from topographic Sheet 6381 (so labeled on the overlay)

Except as mentioned above all other information shown on the sheet was taken from the field inspection notes and the photographs.

(g) Names.

A list of geographic names shown on the sheet is given on Form M234 in the appendix of this report.

~~B.P. 25094, filed in vaults is a better source for street names.~~

The names of the streets may be obtained from the New Map of the City of New York, Board of Estimate and Apportionment.

Filed in Air Photo Section

Junctions.

This sheet is bounded on the east and south by The Narrows; on the southwest by photocompilation t-5108; (1:10,000) and on the north along latitude 40° 37' 30" by T-5466. (1:5,000)

Junction with T 5466 satisfactory. Junction with T 5108 will be made in office when reduced prints of T 5465 are available.

Comparison with other Surveys.

The compilation was compared directly with a bromide enlargement of Topographic Sheet # 6381, surveyed in 1934 by the party of Lieut. M.O.Witherbee. A very close agreement exists between the two sheets. A few of the larger descrepancies are as follows: Comparison with T 6220a made in review.

(a) The compilation shows Pier 22 to be extended in length from that shown on Sheet # 6381. The field inspection has included what appears to be the outline of a barge extending off the end of the dock. If this is a barge

it is believed that it is used as a floating dock. The field inspection notes have been followed on the compilation (see photograph V199-870N ,1:7500 scale). compilation accepted as correct. T.M.P.'37

(b) A descrepancy of approximately 10 meters exist in the position of the flag pole at the U.S.P.H.S. Quarantine Station Dock. The position of the dock agrees closely on both sheets. The position shown on the compilation was obtained from 3 radials, two of which are from the same direction. The flag pole is ~~not~~ a described station. (filed under T6381) Form 524 corrected to radial plot location which was checked. Intersection strong on photos. Note made on sheet T6381

Comparison with Charts.

Chart 285

Due to the difference of scale between this chart and the compilation no direct comparison was made. A visual comparison indicates the following descrepancies:

(a) Pier 22 extended on compilation from that shown on chart. See last paragraph Page 5. compilation accepted as correct. T.M.P.'37
(b) Numerous changes in the street system, such as, new streets, underpasses and etc.
(c) Small dock (Latitude 40 37' 00", Longitude 74 63.9') shown on the chart but not on the compilation. Not on photos. Compilation accepted as correct.

Chart 369

A visual comparison indicates that the descrepancies are the same as on Chart 285. A few additional descrepancies in the area of Fort Wadsworth, not covered by Chart 285, are as follows:

(a) The location of the fog horn on the Quarantine Station Dock disagrees with respect to the location of the horn on the dock itself. Horn and wharf are not in proper relation to each other.
(b) The small docks to the south of the Quarantine Station Dock shown on the chart are not included on the compilation. Not on photos. Compilation accepted as correct.
(c) Changes in the bulkhead and dock on the southeast side of Fort Wadsworth.

Landmarks.

The landmarks shown on Chart #369 are all in existence and should be shown on future charts. One additional Landmark "Tower (Marine Hospital)" is submitted on Card Form 524 and on Form 567. Reported to Storm with form 567 + deletion of Tank (△ Fox Hills, Old Tank, 1930) reported.

Recommendation for Further Surveys.

This sheet is believed to be complete in all detail of importance for charting and no additional surveys are required.

The probable error is not greater than $2\frac{1}{2}$ meters in

position of well defined objects along the waterfront and not greater than 5 meters for other detail.

Respectfully submitted,
Edmund L. Jones
Edmund L. Jones
Aid, U.S.C.& G.S.

Approved:
J.C. Partington
J.C.Partington
Chief-of-Party

	Remarks	Decisions
1		see T-638/
2		" "
3		" "
4		" "
5		" "
6	Called "Narrows" on Chart NO. 369	" "
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M 234

GEOGRAPHIC NAMES

Survey No. T-5465

Name on Survey	A. On Chart No. 369	B. On previous survey No.	C. On U. S. quadrangle Maps	D. From local information	E. Field Inspect.	F. Board of Est. & Apportionment On local Maps	G. P. O. Guide or Map	H. Rand McNally Atlas	K. U. S. Light List / R. R. Guide	
Staten Island	✓ (appd)		✓	✓			✓			1
Stapleton	✓ (appd)		✓	✓	✓	✓	✓			2
Clifton	✓ (appd)		✓	✓	✓		✓		✓	3
Rosebank	✓ (appd)		✓	✓	✓	✓	✓			4
Fort Wadsworth	✓ (appd)		✓	✓	✓		✓			5
The Narrows	✓ 541 (appd)		✓	✓	✓					6
New York	✓ appd									7
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Names underlined in red approved by GPE on 1/27/37

M 234

Computation of Geographic Coordinates From Plane Coordinates

Chart No.

Origin of coordinates: Bogart (1885)

Lat. 40 ° 36' (223.9 m.) Coordinate value of origin N. or S. 20350 feet 6202.69 m.

Long. 74 ° 06' (1367.4 m.) referred to the Zero E. or W. 20250 feet 6172.21 m.

Name of station: City Mon. (Bay & Broad Sts.) USE

Coordinates: N. or S. 11813.26 feet = 3600.69 m.

E. or W. 9370.57 feet = 2856.16 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 2602.0 m.	E. or W.	feet = 3316.0 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1366.9 m.
N. or S. of 40 °36'	= 2825.9 m.	E. or W. of 74 °06'	= 1949.7 m.
From table + or – 1'	= 1850.7 m.	From table – or – 2'	= 2820.4 m.
Lat. (uncorrected) 40°37'	975.2 m.	Longitude 74°04'	870.7 m.
Curvature	= - 0.7 m.		
★Latitude 40°37'	974.5 m.		

Name of station: City Mon (Near NE Corner Marine Hospital) USE

Coordinates: N. or S. 12,256.74 feet = 3735.86 m.

E. or W. 8,780.56 feet = 2676.32 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 2466.8 m.	E. or W.	feet = 3495.9 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1366.9 m.
N. or S. of 40°36'	= 2690.7 m.	E. or W. of 74 °06'	= 2129.0 m.
From table + or – 1'	= 1850.7 m.	From table – or – 2'	= 2820.4 m.
Lat. (uncorrected) 40°37'	1840.0 m.	Longitude 74 °04'	691.4 m.
Curvature	= - 0.8 m.		
★Latitude 40°37'	1839.2 m.		

Name of station: City Mon #446, USE

Coordinates: N. or S. 12914.05 feet = 3936.21 m.

E. or W. 8241.92 feet = 2512.14 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 2266.5 m.	E. or W.	feet = 3660.1 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.0 m.
N. or S. of 40°36'	= 2490.4 m.	E. or W. of 74 °06'	= 2293.1 m.
From table + or – 1'	= 1850.7 m.	From table + or – 2'	= 2820.6 m.
Lat. (uncorrected) 40 °37'	639.7 m.	Longitude 74°04'	527.5 m.
Curvature	= - 0.9 m.		
★Latitude 40°37'	638.8 m.		

Computed by E.L. Jones June 8 1937

✓ by J.C.P. June 8, 1937

★Use in taking out longitude values.

File with history slip of largest scale chart covering this area.

(R-325)

Computation of Geographic Coordinates From Plane Coordinates

Chart No

Origin of coordinates: Bogart (1885)

Lat. 40 °36' (223.9 m.) Coordinate value of origin N. or S. 20350 feet = 6202.69 M

Long. 74 °06' (1367.4 m.) referred to the Zero E. or W. 20250 feet 6172.21 M.

Name of station: City Mon # 1273, USE

Coordinates: N. or S. 15043.84 feet = 4585.37 m.

E. or W. 6976.93 feet = 2126.57 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 1617.3 m.	E. or W.	feet = 4045.6 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.1 m.
N. or S. of	40 °36' = 1841.2 m.	E. or W. of	74 °06' = 2678.5 m.
From table + or –	' = m.	From table + or –	2' = 2820.8 m.
Lat. (uncorrected)	° ' m.	Longitude	74 °04' 142.3 m.
Curvature	= – 1.1 m.		
★Latitude	40 °36' 1840.1 m.		

Name of station: City Mon # 166 USE

Coordinates: N. or S. 15628.19 feet = 4763.48 m.

E. or W. 6650.15 feet = 2026.97 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 1439.2 m.	E. or W.	feet = 4145.2 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.1 m.
N. or S. of	40 °36' = 1663.1 m.	E. or W. of	74 °06' = 2778.1 m.
From table + or –	' = m.	From table + or –	2' = 2820.9 m.
Lat. (uncorrected)	° ' m.	Longitude	74 °04' 42.8 m.
Curvature	= – 1.1 m.		
★Latitude	40 °36' 1662.0 m.		

Name of station: City Mon # 545 USE

Coordinates: N. or S. 22 864.77 feet = 6969.20 m.

E. or W. 5547.90 feet = 1691.00 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or (S)	feet = 766.5 m.	E. or W.	feet = 4481.2 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.3 m.
N. or S. of	40°36' = 542.6 m.	E. or W. of	74 °06' = 3113.9 m.
From table + or –	' = 1850.7 m.	From table + or –	3' = 4232.5 m.
Lat. (uncorrected)	40 °35' 1308.1 m.	Longitude	74 °03' 1118.6 m.
Curvature	= – 1.3 m.		
★Latitude	40°35' 1306.8 m.		

Computed by E L Jones June 8 1937

✓ by J.C.P. June 8, 1937

★Use in taking out longitude values.

File with history slip of largest scale chart covering this area.

(R - 325)

Computation of Geographic Coordinates From Plane Coordinates

Chart No.

Origin of coordinates: Bogart (1885)

Lat. 40 ° 36′ (223.9 m.) Coordinate value of origin N. or S. 20350 feet = 6202.69 m.

Long. 74 ° 06′ (1367.4 m.) referred to the Zero E. or W. 20250 feet = 6172.21 m.

Name of station: City Mon. #1252 USE

Coordinates: N. or S. 16228.86 feet = 4946.57 m.

E. or W. 6311.67 feet = 1923.80 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 1256.1 m.	E. or W.	feet = 4248.4 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.1 m.
N. or S. of	40° 36′ = 1480.0 m.	E. or W. of	74 ° 06′ = 2881.3
From table + or –	′ = m.	From table + or –	3′ = 4231.3 m.
Lat. (uncorrected)	° ′ m.	Longitude	74 ° 03′ 1350.0 m.
Curvature	= – 1.2 m.		
★Latitude	40° 36′ 1478.8 m.		

Name of station: City Mon. #332 USE

Coordinates: N. or S. 15973.49 feet = 4868.73 m.

E. or W. 6455.57 feet = 1967.66 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 1338.0 m.	E. or W.	feet = 4204.6 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.1 m.
N. or S. of	40 ° 36′ = 1557.9 m.	E. or W. of	74 ° 06′ = 2837.5 m.
From table + or –	′ = m.	From table + or –	3′ = 4231.3 m.
Lat. (uncorrected)	° ′ m.	Longitude	74 ° 03′ 1393.8 m.
Curvature	= – 1.2 m.		
★Latitude	40 ° 36′ 1556.7 m.		

Name of station: _____

Coordinates: N. or S. feet = m.

E. or W. feet = m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = m.	E. or W.	feet = m.
+ or – seconds in meters	= m.	+ or – seconds in meters	= m.
N. or S. of	° ′ = m.	E. or W. of	° ′ = m.
From table + or –	′ = m.	From table + or –	′ = m.
Lat. (uncorrected)	° ′ m.	Longitude	° ′ m.
Curvature	= m.		
★Latitude	° ′ m.		

Computed by EL Jones June 8, 1937

✓ by J.C.P. June 8, 1937

★Use in taking out longitude values.

File with history slip of largest scale chart covering this area.

(R-325)

Computation of Geographic Coordinates From Plane Coordinates

Chart No. 5

Origin of coordinates: Bogart (1885)

Lat. 40 ° 36′ (223.9 m.) Coordinate value of origin N. or S. 20350 feet 6202.69

Long. 74 ° 06′ (1367.4 m.) referred to the Zero E. or W. 20250 feet 6172.21

Name of station: City Mon. # 169, USE

Coordinates: N. or S. 14467.76 feet = 4409.78 m.

E. or W. 7299.09 feet = 2224.77 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 1792.9 m.	E. or W.	feet = 3947.4 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.1 m.
N. or S. of	40° 36′ = 2016.8 m.	E. or W. of	74 °06′ = 2580.3 m.
From table + or –	1′ = 1850.7 m.	From table + or –	2′ = 2820.7 m.
Lat. (uncorrected)	40° 37′ 166.1 m.	Longitude	74 ° 04′ 240.4 m.
Curvature	= – 1.0 m.		
★Latitude	40° 37′ 165.1 m.		

Name of station: City Mon. # 1271 USE

Coordinates: N. or S. 14320.55 feet = 4364.91 m.

E. or W. 7060.51 feet = 2152.05 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 1837.8 m.	E. or W.	feet = 4020.2 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.1 m.
N. or S. of	40° 36′ = 2061.7 m.	E. or W. of	74 °06′ = 2653.1 m.
From table + or –	1′ = 1850.7 m.	From table + or –	2′ = 2820.7 m.
Lat. (uncorrected)	40 ° 37′ 211.0 m.	Longitude	74 ° 04′ 167.6 m.
Curvature	= 1.1 m.		
★Latitude	40 °37′ 209.9 m.		

Name of station: City Mon # 682, USE

Coordinates: N. or S. 14779.60 feet = 4504.83 m.

E. or W. 6553.36 feet = 1997.47 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 1697.9 m.	E. or W.	feet = 4174.7 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.1 m.
N. or S. of	40° 36′ = 1921.8 m.	E. or W. of	74 °06′ = 2807.6 m.
From table + or –	1′ = 1850.7 m.	From table + or –	2′ = 2820.8 m.
Lat. (uncorrected)	40° 37′ 71.1 m.	Longitude	74 ° 04′ 13.2 m.
Curvature	= 1.2 m.		
★Latitude	40 °37′ 69.9 m.		

Computed by EL Jones June 8, 1937 193

✓ by J.C.P. June 8, 1937

★Use in taking out longitude values.

File with history slip of largest scale chart covering this area.

(R - 325)

Computation of Geographic Coordinates From Plane Coordinates

Chart No.

Origin of coordinates: Bogart (1885)

Lat. 40 ° 36′ (223.9 m.) Coordinate value of origin N. or S. 20350 feet = 6202.69 m.

Long. 74 ° 06′ (1367.4 m.) referred to the Zero E. or W. 20250 feet = 6172.21 m.

Name of station: City Mon #445, USE

Coordinates: N. or S. 13768.82 feet = 4196.74 m.

E. or W. 7730.82 feet = 2356.36 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 2005.9 m.	E. or W.	feet = 3815.8 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.0 m.
N. or S. of	40°36′ = 2229.8 m.	E. or W. of	74 °06′ = 2448.8 m.
From table + or –	1′ = 1850.7 m.	From table + or –	2′ = 2820.7 m.
Lat. (uncorrected)	40°37′ 379.1 m.	Longitude	74 °04′ 371.9 m.
Curvature	= – 1.0 m.		
★Latitude	40°37′ 378.1 m.		

Name of station: City Mon. #680, USE

Coordinates: N. or S. 14049.19 feet = 4282.20 m.

E. or W. 7360.31 feet = 2243.43 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 1920.5 m.	E. or W.	feet = 3928.8 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.0 m.
N. or S. of	40 °36′ = 2144.4 m.	E. or W. of	74 °06′ = 2561.8 m.
From table + or –	1′ = 1850.7 m.	From table + or –	2′ = 2820.7 m.
Lat. (uncorrected)	40 °37′ 293.7 m.	Longitude	74°04′ 258.4 m.
Curvature	= – 1.0 m.		
★Latitude	40 °37′ 292.7 m.		

Name of station: ~~City Mon. #164, USE~~

Coordinates: ~~N. or S. 14168.68 feet = 4318.62 m.~~

~~E. or W. 7467.67 feet = 2276.15 m.~~

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	~~feet = 1884.07 m.~~	E. or W.	~~feet = 3896.0 m.~~
+ or – seconds in meters	~~= 223.9 m.~~	+ or – seconds in meters	~~= 1367.0 m.~~
N. or S. of	~~40° 36′ = 2108.0 m.~~	E. or W. of	~~74 °06′ = 2529.0 m.~~
From table + or –	~~1′ = 1850.7 m.~~	From table + or –	~~2′ = 2820.7 m.~~
Lat. (uncorrected)	~~40° 37′ 257.3 m.~~	Longitude	~~74 °04′ 291.7 m.~~
Curvature	~~= – 1.0 m.~~		
★Latitude	~~40° 37′ 256.3 m.~~		

Computed by E L Jones June 8 1937

by J.C.P. June 8, 1937

★Use in taking out longitude values.

File with history slip of largest scale chart covering this area.

(A-325)

Computation of Geographic Coordinates From Plane Coordinates

Chart No. 9

Origin of coordinates: Bogart (1885)

Lat. 40°36' (223.9 m.) Coordinate value of origin N. or S. 20350 feet = 6202.69 m.

Long. 74°06' (1367.4 m.) referred to the Zero E. or W. 20250 feet 6172.21 m.

Name of station: City Mon. # 2790, USE

Coordinates: N. or S. 17548.75 feet = 5348.87 m.

E. or W. 5567.92 feet = 1697.11 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 853.8 m.	E. or W.	feet = 4475.1 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.2 m.
N. or S. of	40°36' = 1077.7 m.	E. or W. of	74°06' = 3107.9 m.
From table + or –	° ' = m.	From table + or –	3' = 4231.6 m.
Lat. (uncorrected)	m.	Longitude	74°03' 1123.7 m.
Curvature	= 1.3 m.		
★Latitude	40°36' 1076.4 m.		

Name of station: City Mon. # 1253 USE

Coordinates: N. or S. 17197.40 feet = 5241.78 m.

E. or W. 5765.90 feet = 1757.45 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 960.9 m.	E. or W.	feet = 4414.8 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.2 m.
N. or S. of	40°36' = 1184.8 m.	E. or W. of	74°06' = 3047.6 m.
From table + or –	° ' = m.	From table + or –	3' = 4231.5 m.
Lat. (uncorrected)	m.	Longitude	74°03' 1183.9 m.
Curvature	= 1.3 m.		
★Latitude	40°36' 1183.5 m.		

Name of station: City Mon # 2793 USE

Coordinates: N. or S. 17057.40 feet = 5199.11 m.

E. or W. 5030.97 feet = 1533.44 m.

Latitude N. – S. coordinates		Longitude E. – W. coordinates	
N. or S.	feet = 1003.6 m.	E. or W.	feet = 4638.8 m.
+ or – seconds in meters	= 223.9 m.	+ or – seconds in meters	= 1367.2 m.
N. or S. of	40°36' = 1227.5 m.	E. or W. of	74°06' = 3271.6 m.
From table + or –	° ' = m.	From table + or –	3' = 4231.5 m.
Lat. (uncorrected)	m.	Longitude	74°03' 959.9 m.
Curvature	= 1.4 m.		
★Latitude	40°36' 1226.1 m.		

Computed by E.L. Jones June 8 1937

✓ by J.C.P. June 8, 1937

★Use in taking out longitude values.

File with history slip of largest scale chart covering this area.

(R-325)

Chart No. _____

Computation of Geographic Coordinates From Plane Coordinates

Origin of coordinates: Memorial Church (1885)

Lat. 40 °46′ (1763.2 m.) Coordinate value of origin ~~N. or S.~~ 0.0 feet

Long. 73 °57′ (604.7 m.) referred to the Zero ~~E. or W.~~ 0.0 feet

Name of station: Sta. P# 3, USE, 1935

Coordinates: ~~N.~~ or S. 59,372.40 feet = 18,096.74 m.

~~E.~~ or W. 31 029.62 feet = 9,457.85 m.

Latitude N. – S. coordinates

~~N.~~ or S. feet = 18 096.7 m.

+ or ~~–~~ seconds in meters = 1763.2 m.

~~N.~~ or S. of 40 °46′ = 16333.5 m.

From table ~~+~~ or – 9′ = 16657.4 m.

Lat. (uncorrected) 40 °37′ 323.9 m.

Curvature = – 6.0 m.

★Latitude 40 °37′ 317.9 m.

Longitude E. – W. coordinates

~~E.~~ or W. feet = 9457.8 m.

+ or ~~–~~ seconds in meters = 606.2 m.

~~E.~~ or W. of 73 °57′ = 10064.0 m.

From table + or ~~–~~ 7′ = 9872.2 m.

Longitude 74 °04′ 191.8 m.

Name of station: _____

Coordinates: N. or S. feet = m.

E. or W. feet = m.

Latitude N. – S. coordinates

N. or S. feet = m.

+ or – seconds in meters = _____ m.

N. or S. of ° ′ = m.

From table + or – _____ ′ = _____ m.

Lat. (uncorrected) ° ′ m.

Curvature = _____ m.

★Latitude _____ ° ′ _____ m.

Longitude E. – W. coordinates

E. or W. feet = m.

+ or – seconds in meters = _____ m.

E. or W. of ° ′ = m.

From table + or – _____ ′ = _____ m.

Longitude _____ ° ′ _____ m.

Name of station: _____

Coordinates: N. or S. feet = m.

E. or W. feet = m.

Latitude N. – S. coordinates

N. or S. feet = m.

+ or – seconds in meters = _____ m.

N. or S. of ° ′ = m.

From table + or – _____ ′ = _____ m.

Lat. (uncorrected) ° ′ m.

Curvature = _____ m.

★Latitude _____ ° ′ _____ m.

Longitude E. – W. coordinates

E. or W. feet = m.

+ or – seconds in meters = _____ m.

E. or W. of ° ′ = m.

From table + or – _____ ′ = _____ m.

Longitude _____ ° ′ _____ m.

Computed by E.L. Jones, June 8, 1937

✓ by J.C.P. June 8, 1937

★Use in taking out longitude values.

File with history slip of largest scale chart covering this area.

(R-325)

Form 567
Rev. March 1935

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

LANDMARKS FOR CHARTS

TO BE CHARTED / ~~TO BE DELETED~~ } STRIKE OUT ONE

Baltimore, Md. June 10, 1937 193

I recommend that the following objects which ~~have~~ (*have not*) been inspected from seaward to determine their value as landmarks, be charted on (~~delete from~~) the charts indicated.

The positions given have been checked after listing.

J.C. Partington
J.C. Partington *Chief of Party.*

GENERAL LOCALITY New York, Staten Id.

NAME AND DESCRIPTION	POSITION					METHOD OF LOCATION	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
	LATITUDE		LONGITUDE		DATUM						
	° ′	D. M. METERS	° ′	D. P. METERS							
Tower (Marine Hospital)	40 37	626	74 04	769	NA 1927	Air Photo.	6/10/37	X X X			285 ~~369~~ 541 ✓

This form shall be prepared in accordance with 1934 Field Memorandum, "LANDMARKS FOR CHARTS." The data should be considered for the charts of the area and not by individual field survey sheets. Information under each column heading should be given.

U. S. GOVERNMENT PRINTING OFFICE

REVIEW OF AIR PHOTO COMPILATION T-5465

Data Record

Triangulation to 1930-32.
Recoverable stations of less than third order accuracy to 1937.
U. S. Engineers control stations established in 1931, accuracy not known, treated as recoverable H & T stations.
Photographs to May 1935.
Planetable graphic control surveys to October 1934.
Field inspection to 1935.

The field inspection was for the interpretation of the photographs. Except for the piles, and the recoverable H & T stations taken from the 1934 planetable surveys, and the recoverable H & T stations taken from the U. S. Engineers surveys of 1931, The detail of this compilation is of the date of the photographs.

Comparison with Recent Graphic Control Surveys.

The following recent surveys are filed as topographic surveys but have been treated as graphic control surveys in this review:

T-6220a	(1934)	1:10,000
T-6381	(1934)	1:10,000

T-6220a

The shoreline and the ruined bulkhead north of 40° 35.9' differ in position with the compilation 20 meters. The compilation is correct.

T-6381.

(1) All triangulation stations are undated.
(2) Five triangulation stations in area were omitted from sheet.
(3) Shoreline and bulkhead ruins between latitude 40° 35.8' and 40° 36.2' differ a maximum of 20 m. from compilation. The latter is correct.
(4) Piers 17, 18, 19 are 10 m. too wide at outer end and the slips between 16, 17, 18, 19 extend 8 m. too far inshore on the G. C. S.
(5) Other differences as described on pages 5 and 6 of the descriptive report have been checked and the compilation accepted as correct.

General T-6381, 6220a.

(1) The above planetable sheets have been carefully compared with the compilation, the photographs and recent hydrographic sheets. In general the field inspection is adequate and the photographs show the detail clearly. The compilation has been corrected against above sources of information and in case of any differences between the planetable sheets and the compilation; the latter should now be taken as correct.

(2) This compilation is on a scale of 1:5,000, whereas the planetable surveys are on a scale of 1:10,000.

(3) All detail on the above planetable sheets within the area of the compilation is now shown on the compilation, except:

(a) Detail proved in error or no longer existing as discussed above.
(b) Magnetic declination.
(c) Temporary topographic stations.

Comparison with Previous Topographic Surveys.

Except of those surveys treated above as graphic control surveys the following list gives the previous topographic surveys in the area covered by the compilation:

T-6	(1835)	1:5,000	T-1413a	(1875)	1:10,000
T-9	(1835-6)	1:10,000	T-1576	(1885)	1:10,000
T-490	(1855)	1:10,000	T-1710	(1886)	1:10,000
T-816	(1856)	1:10,000			

Because of the many changes to be expected in an area of this character since the above surveys were made, only a general comparison was made between the above surveys and the compilation.

This compilation is adequate to supersede the portions of the former topographic surveys which it covers, except for bluffs and contours.

Comparison with Recent Hydrographic Surveys.

H-5607 (1934) 1:10,000
H-5736 (1934) 1:10,000

U. S. Engineers' blue prints Nos. 24059 to 24061 (1930). 1:1200

The shoreline of the above Coast and Geodetic Survey hydrographic surveys was taken from the recent graphic control surveys and therefore differs with this compilation in the same respects as discussed under the G. C. S. comparison. The differences are minor and no corrections were made to the hydrographic surveys which have been completed and applied to the charts.

There is no conflict between the soundings on the hydrographic surveys and the detail on the compilation.

No close comparison was made with the above U. S. Engineers' blue prints because of the difference in scale, difference in projection, and since no shoreline was shown on the blue prints. The soundings were not taken close enough to shore to cause conflict with the compilation.

Comparison with Charts.

Because the current large scale charts of this area were prepared laregly from the 1934 topographic and hydrographic surveys, the differences discussed in connection with those surveys apply also to the charts. Additional differences are as follows:

Chart 541 (Edition June 11, 1937).

(1) Along shore between latitude 40° 36.8' and 40° 39.0', additional wrecks should be added.
(2) Extending from shore at latitude 40° 36.6', a ruined pier should be added.
(3) Pier 22 should be extended as described on page 5 (last paragraph) of the descriptive report.
(4) The short pier between piers 22 and 23 should have piles along its north side.
(5) Fog horn on Quarantine wharf should be corrected in its relation to wharf to agree with compilation.
(6) Latitude 40° 36.4', longitude 74° 04.4'. Landmark "Tank" gone.
(7) Several additional wrecks and rocks along shore to be added.

Chart 285 (Edition January 21, 1937).

For area covered, same corrections apply as for Chart 541.

Chart 369 (Edition April 17, 1937).

Same corrections apply as for chart 541.

Latitude 40° 36.0', longitude 74° 03.3' blukhead and wharf now ruined.

Remarks.

(1) Landmarks and Aids to Navigation.
  (a) Latitude 40° 36.4', Longitude 74° 04.4'
    Tank (Triangulation station Fox Hills, Old Tank, 1930). Delete from charts.
  (b) Latitude 40° 37.3', Longitude 74° 04.5'
    Tower (Marine Hospital) Add to charts.
  (c) Latitude 40° 36.8', Longitude 74° 03.5'
    Fog Horn. Change charted relation of aid to wharf.

(2) Accuracy.
  The statement of accuracy given in the report appears correct.

(3) Recoverable H & T stations.
  1 Form 524 filed under T-6381
  16 " 524 " " T-5465

(4) Changes to Sheet upon Review.
  (a) Fog Horn Quarantine wharf moved 6 m. S. W. to agree with field inspection notes.
  (b) Latitude 40° 37.1' Long. 74° 04.0' catwalk & piles added
    " 40° 37.4' " 74° 04.3 added wreck above L.W.
    " 40° 36.1' " 74° 03.5' ruined pier extended 20 m.
    " 40° 37.0' " 74° 03.8' added wreck above L. W.

(5) Wrecks have been shown with a dashed outlined whether above L. W. or above H. W. and the heights indicated by labels. Pier and bulkhead ruins have been indicated by a dashed line without distinction as to height or material.

Additional Work.

This survey is complete and adequate for chart compilation, except for the location of submerged pipe lines and cable crossings.

T. M. Price, Jr.

August 11, 1937.

REVIEW OF AIR PHOTO COMPILATION NO. T-5465

Chief of Party: J.C. Partington Compiled by: C.R. Bush, E.L. Jones

Project: HT-175 Instructions dated: Mar. 14, 1934

Notes in rec'd by T.M.P. 1937

1. The charts of this area have been examined and topographic information necessary to bring the charts up to date is shown on this compilation. (Par. 16a, b, ~~k~~, d, e, g and i; 26; and 64)

2. Change in position, or non-existence of wharfs, lights, and other topographic detail of particular importance to navigation which affect the chart, is discussed in the descriptive report. (Par. 26; and 66 g, n)

3. Ground surveys by plane table, ~~sextant~~, or theodolite have been used to supplement the photographic plot where necessary to obtain complete information, and all such surveys are discussed in the descriptive report. (Par. 65; and 66 d, e)

~~No ground surveys~~. G.C.S. T 6381 + 6220a by plane table. U.S.E. stations located by theodolite probably.

4. Blue-prints and maps from other sources which were transmitted by the field party contain sufficient control for their application to the charts. (Par. 28)

No blue-prints or maps transmitted.

City map for street names filed in air photo section.

5. Differences between this compilation and contemporary plane table and hydrographic surveys have been examined and rectified in the field before forwarding the compilations to the office and are discussed in the descriptive report.

Discussed in descriptive report. and review

6. The control and adjustment of the photo plot are discussed in the descriptive report. Unusual or large adjustments are discussed in detail and limits of the area affected are stated. (Par. 12b; 44; and 66 c, h, i)

7. High water line ~~on marshy and mangrove coast~~ is clear and adequate for chart compilation. (Par. 16a, 43, and 44)

NOTE: Strike out paragraphs, words or phrases not applicable and modify those requiring it. Paragraph numbers refer to those in the Topographic Manual. Refer also to the pamphlet "Notes on the Compilation of Planimetric Line Maps from Five Lens Air Photographs."

8. The representation of ~~low water~~ foul lines, ~~reefs, coral reefs~~ and rocks, and legends pertaining to them is satisfactory. (Par. 36, 37, 38, 39, 40, ~~41~~)

9. Recoverable objects have been located and described on Form 524 in accordance with circular 30, 1933, circular letter of March 3, 1933, and circular 31, 1934. (Par. 29, 30, and 57)

10. A list of landmarks was furnished on Form 567 and instructions in the Director's letter of July 16, 1934, Landmarks for Charts, complied with. (Par. 16d, e, and 60)

11. All bridges shown on the compilation are accompanied by a note stating whether fixed or draw, clearance, and width of draw if a draw bridge. Additional information of importance to navigation is given in the descriptive report. (Par. 16c)

No bridges.

12. Geographic names are shown on the overlay tracing. The accepted local usage of new names has been determined and they are listed in the report, together with a general statement as to source of information and a specific statement when advisable. Complete discussion of place names differing from the charts and from the U. S. G. S. Quadrangles is given in the descriptive report, together with reasons for recommendations made. (Par. 64, and 66k)

13. The geographic datum of the compilation is N.A. 1927 and the reference station is correctly noted.

14. Junctions with adjoining compilations have been examined and are in agreement. (Par. 66j)

15. The drafting is satisfactory and particular attention has been given the following:

    1. Standard symbols authorized by the Board of Surveys and Maps have been used throughout except as noted in the report.

    2. The degrees and minutes of Latitude and Longitude are correctly marked.

3. All station points are exactly marked by fine black dots. ✓

4. Closely spaced lines are drawn sharp and clear for printing. ✓

5. Topographic symbols for similar features are of uniform weight. ✓

6. All drawing has been retouched where partially rubbed off. ✓

7. Buildings are drawn with clear straight lines and square corners where such is the case on the ground. ✓

(Par. 34 ✓, 35 ✓, 36 ✓, 37 ✓, 38 ✓, 39 ✓, 40 ✓, 41 ✗, 42 ✓, 43 ✓, 44 ✓, 45 ✓, 46 ✓, 48 ✓)

16. No additional surveying is recommended at this time. ✓

17. Remarks:

18. Examined and approved;

J. C. Partington
Chief of Party

19. Remarks after review in office:

Reviewed in office by: T. M. Price Aug. 10, 1937

Examained and approved:

E. K. Green
Chief, Section of Field Records

Fred. L. Peacock
Chief, Section of Field Work

L. O. Colbert
Chief, Division of Charts

[illegible]
Chief, Division of Hydrography and Topography.

M-350

T-5465

PLANE COORDINATE GRID SYSTEM

Positions of grid intersections used for fitting the grid to this compilation were computed by Division of Geodesy and the computation forms are included in this report.

Positions plotted by H. D. REED, JR.

Positions checked by _____

Grid inked on machine by H. D. REED, JR.

Intersections inked by H. D. REED, JR.

Points used for plotting grid:

N. J. GRID

x 2,162,000 FT. y 654,000 FT.	x 2,166,000 y 646,000
x 2,170,000 y 654,000	x y
x 2,162,000 y 642,000	x y
x 2,170,000 y 642,000	x y

Triangulation stations used for checking grid:

x = 2,169,416.59 FT. y = 645,665.89 FT.

1. FT. TOMPKINS 2, 1868	5. _____
2. _____	6. _____
3. _____	7. _____
4. _____	8. _____

T 5465

Geodetic positions from transverse Mercator coordinates

State New Jersey Station Grid intersection

x	2,162,000	$\log S_g$	5.20951067
C	2	log (1200/3937)	9.48401583
x' (=x−C)	+162,000	log (1/R)	1086
$x'^3/(6\rho_o^2)_g$	− 1.620	$\log S_m$	4.69353736
S_g	161,998.380	cor. arc to sine	− 432
		$\log S_1$	4.69353304
$\log S_m^2$	9.387075	log A	8.50910251
log C	1.337924	log sec ϕ	0.11978053
log $\Delta\phi$	0.724999	$\log \Delta\lambda_1$	3.32241608
		cor. sine to arc	+ 751
y	654,000	$\log \Delta\lambda$	3.32242359
ϕ' (by interpolation)	40° 37′ 43.″6306	$\Delta\lambda$	2100.″9881
$\Delta\phi$	− 5.3088	λ (central mer.)	74° 40′ ″
ϕ	40 37 38.3218	$\Delta\lambda$	+ 35 00.9881
		λ	74 04 59.0119

Station Grid intersection

x	2,170,000	$\log S_g$	5.23044414
C		log (1200/3937)	9.48401583
x' (=x−C)	+170,000	log (1/R)	1086
$x'^3/(6\rho_o^2)_g$	− 1.872	$\log S_m$	4.71447083
S_g	169,998.128	cor. arc to sine	− 476
		$\log S_1$	4.71446607
$\log S_m^2$	9.428942	log A	8.50910251
log C	1.337924	log sec ϕ	0.11977956
log $\Delta\phi$	0.766866	$\log \Delta\lambda_1$	3.34334814
		cor. sine to arc	+ 827
y	654,000	$\log \Delta\lambda$	3.34335641
ϕ' (by interpolation)	40° 37′ 43.″6306	$\Delta\lambda$	2204.″7351
$\Delta\phi$	− 5.846.1	λ (central mer.)	74° 40′ ″
ϕ	40 37 37.7845	$\Delta\lambda$	36 44.7351
		λ	74 03 15.2649

(M-29)

(over)

Explanation of form:

$$x' = x - C$$

$$S_g = x' - \frac{x'^3}{(6\rho_o^2)_g}$$

$$S_m = \frac{1}{R}\left(\frac{1200}{3937}\right)S_g$$

R = scale reduction factor

ϕ' is interpolated from table of y

$\Delta\phi = C\, S_m^2$

$\phi = \phi' - \Delta\phi$

$\Delta\lambda_1 = S_1 A \sec\phi$

log S_1 = log S_m − cor. arc to sine

log $\Delta\lambda$ = log $\Delta\lambda_1$ + cor. arc to sine

$\lambda = \lambda$(central mer.) − $\Delta\lambda$

T5465

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION

State New Jersey Station Grid intersection

λ (Central meridian) 74° 40' "

φ 40° 37' 38.3218 λ 74. 04 59.0119

Δλ (Central meridian–λ) + 35 00.9881

Δλ (in sec.) 2100.9881

log Δλ	3.32242359	log S_m^2	9.387075
Cor. arc to sine	− 751	log C*	1.337924
log $\Delta\lambda_1$	3.322416 08	log Δφ	0.724999
log cos φ	9.88021947		
colog A	1.49089747	φ	40° 37' 38.3218
log S_1	4.69353302	Δφ	+ 5.3088
Cor. sine to arc	+ 432	φ'	43.6306
log S_m	4.69353734		
log 3937/1200	0.51598417	Tabular difference of y for 1" of φ'	101.19733
log R	− 1086		
log S_g	5.20951065	y (for min. of φ')	649,584.70
log S_g^3	15.6285320	y (for seconds of φ')	+ 4,415.30
log $1/6\rho_o^2R^2$	4.5810213	y	654,000.00
log $(S_g^3/6\rho_o^2)_g$	0.2095533		
		log sin $\frac{\phi+\phi'}{2}$	
S_g	161,998.373	log Δλ	
$(S_g^3/6\rho_o^2)_g$	1.620	log $\Delta\alpha_1$	
x'	161,999.99		
	2,000,000.00	log $(\Delta\lambda)^3$	
x	2,161,999.99	log F	
		log b	
		$\Delta\alpha_1$	"
		b	
		$\Delta\alpha$	"
		$\Delta\alpha$	° ' "

* Take out C first for φ and correct for approximate φ'.

(R 349)

$$x = 2{,}000{,}000.00 + x'$$

$$x' = S_g + \left(\frac{S_g^3}{6\rho_0^2}\right)_g$$

$$S_g = \frac{3937}{1200} S_m R$$

$$\log S_m = \log S_1 + \text{cor. sine to arc}$$

$$S_1 = \frac{\Delta\lambda_1 \cos\phi}{A}$$

$$\log \Delta\lambda_1 = \log \Delta\lambda - \text{cor. arc to sine}$$

$$\left(\frac{S_g^3}{6\rho_0^2}\right)_g = \frac{S_g^3}{6\rho_0^2 R^2}$$

$$\phi' = \phi + \Delta\phi$$

$$\Delta\phi = C S_m^2$$

$$\Delta\alpha = \Delta\lambda \sin\frac{\phi + \phi'}{2} + F(\Delta\lambda)^3$$

S_m = distance in meters from point to central meridian

S_1 = distance in meters from point to central meridian reduced to sine

S_g = grid distance in feet from point to central meridian

R = scale reduction factor

Values of y in minutes and tabular difference for one second, scale reduction factors, colog A, and log C are given in auxiliary tables.

T 5465

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION

State New Jersey Station Grid Intersection

λ (Central meridian) 74° 40' "

φ 40° 37' 37.7845" λ 74 03 15.2649

Δλ (Central meridian−λ) + 36 44.7351

Δλ (in sec.) " 2204.7351

log Δλ	3.34335641	log S_m^2	9.428942
Cor. arc to sine	− 827	log C*	1.337923
log $\Delta\lambda_1$	3.34334814	log Δφ	0.766865
log cos φ	9.88022044		
colog A	1.49089749	φ	40° 37' 37.7845
log S_1	4.71446607	Δφ	+ 5.8461
Cor. sine to arc	+ 476	φ'	43.6306
log S_m	4.71447083		
log 3937/1200	0.51598417	Tabular difference of y for 1" of φ'	101.19733
log R	− 1086		
log S_g	5.23044414	y (for min. of φ')	649,584.70
log S_g^3	15.6913324	y (for seconds of φ')	+ 4,415.30
log $1/6\rho_o^2R^2$	4.5810213	y	654,000.00
log $(S_g^3/6\rho_o^2)_g$	0.2723537		
		log sin $\frac{\phi+\phi'}{2}$	
S_g	169,998.129	log Δλ	
$(S_g^3/6\rho_o^2)_g$	1.872	log $\Delta\alpha_1$	
x'	170,000.00		
	2,000,000.00	log $(\Delta\lambda)^3$	
x	2,170,000	log F	
		log b	
		$\Delta\alpha_1$	"
		b	
		$\Delta\alpha$	"
		$\Delta\alpha$	° ' "

* Take out C first for φ and correct for approximate φ'.

(R 349)

$$x = 2{,}000{,}000.00 + x'$$

$$x' = S_g + \left(\frac{S_g^3}{6\rho_0^2}\right)_g$$

$$S_g = \frac{3937}{1200} S_m R$$

$$\log S_m = \log S_1 + \text{cor. sine to arc}$$

$$S_1 = \frac{\Delta\lambda_1 \cos\phi}{A}$$

$$\log \Delta\lambda_1 = \log \Delta\lambda - \text{cor. arc to sine}$$

$$\left(\frac{S_g^3}{6\rho_0^2}\right)_g = \frac{S_g^3}{6\rho_0^2 R^2}$$

$$\phi' = \phi + \Delta\phi$$

$$\Delta\phi = C\, S_m^2$$

$$\Delta\alpha = \Delta\lambda \sin\frac{\phi + \phi'}{2} + F(\Delta\lambda)^3$$

S_m = distance in meters from point to central meridian

S_1 = distance in meters from point to central meridian reduced to sine

S_g = grid distance in feet from point to central meridian

R = scale reduction factor

Values of y in minutes and tabular difference for one second, scale reduction factors, colog A, and log C are given in auxiliary tables.

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Form No. 743
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Ed. May 1935

GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE N. J. STATION

x	2,162,000.00	$\log S_g$	5.20955067
K	2,	$\log (1200/3937)$	9.48401583
x' $(=x-K)$	+162,000.00	$\log (1/R)$	1086
$x'^3/(6\rho_o^2)_g$	− 1.62	$\log S_m$	4.69353736
S_g	161,998.38	cor. arc to sine	− 432
		$\log S_1$	4.69353304
3 log x'	15.62854503	$\log A$	8.50910223
$\log 1/(6\rho_o^2)_g$	4.54102133	$\log \sec \phi$	0.11945194
$\log x'^3/(6\rho_o^2)_g$	0.20956636	$\log \Delta\lambda_1$	3.32247357
		cor. sine to arc	+ 351
$\log S_m^2$	9.38707472	$\log \Delta\lambda$	3.32249472
$\log C$	1.3348091	$\Delta\lambda$	2101.4161 (3322)
$\log \Delta\phi$	0.7251666		
	4		
y	658 000.00		
ϕ' (by interpolation)	40° 38′ 23.1573″	λ (central mer.)	74° 40′ 00″
$\Delta\phi$	− 5.3109	$\Delta\lambda$	− 35 01.4161 (3322)
ϕ	40 38 17.8464	λ	74 04 58.4839 (.6678)

110.10 mm

134.74

Explanation of form:

$x'=x-K$

$S_g=x'-\dfrac{x'^3}{(6\rho_o^2)_g}$

$S_m=\dfrac{1}{R}\left(\dfrac{1200}{3937}\right)S_g$

R=scale reduction factor

ϕ' is interpolated from table of y

$\Delta\phi=C\,S_m^2$

$\phi=\phi'-\Delta\phi$

$\Delta\lambda_1=S_1 A \sec\phi$

$\log S_1=\log S_m-$cor. arc to sine

$\log \Delta\lambda=\log \Delta\lambda_1+$cor. arc to sine

$\lambda=\lambda$ (central mer.)$-\Delta\lambda$

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U. S. COAST AND GEODETIC SURVEY
Ed. May 1935

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GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE N.J. STATION

x	2,170,000.00	$\log S_g$	5.23044414
K	2,000,000.00	$\log (1200/3937)$	9.48401583
x' $(=x-K)$	+ 170,000.00	$\log (1/R)$	1086
$x'^3/(6\rho_o^2)_g$	− 1.87	$\log S_m$	4.71447043
S_g	+ 169,998.13	cor. arc to sine	− 476
		$\log S_1$	4.71444607
3 $\log x'$	15.69134676	$\log A$	8.50910223
$\log 1/(6\rho_o^2)_g$	4.58102133	$\log \sec \phi$	0.11945097
$\log x'^3/(6\rho_o^2)_g$	0.27236481	$\log \Delta\lambda_1$	3.34341927
		cor. sine to arc	+ 827
$\log S_m^2$	9.42899166	$\log \Delta\lambda$	3.34342754
$\log C$	1.33809 1	$\Delta\lambda$	2205.0962
$\log \Delta\phi$	0.7670 33		
	4		
y	658 000.00		
ϕ' (by interpolation)	40 38 23.1573	λ (central mer.)	74 40
$\Delta\phi$	− 5.8483	$\Delta\lambda$	36 45.0962
ϕ	40 38 17.3090	λ	74 03 14.9038

10678 mm

70.05 mm

Explanation of form:

$x'=x-K$

$S_g=x'-\frac{x'^3}{(6\rho_o^2)_g}$

$S_m=\frac{1}{R}\left(\frac{1200}{3937}\right)S_g$

R=scale reduction factor

ϕ' is interpolated from table of y

$\Delta\phi=C\,S_m^2$

$\phi=\phi'-\Delta\phi$

$\Delta\lambda_1=S_1 A \sec\phi$

$\log S_1=\log S_m-$cor. arc to sine

$\log \Delta\lambda=\log \Delta\lambda_1+$cor. arc to sine

$\lambda=\lambda$ (central mer.)$-\Delta\lambda$

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GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE N. J STATION

x	2,162,000.00	$\log S_g$	5.20951067
K	2	$\log (1200/3937)$	9.48401583
x' $(=x-K)$	+ 162,000.00	$\log (1/R)$	10 86
$x'^3/(6\rho_o^2)_g$	− 1.62	$\log S_m$	4.69353736
S_g	161,998.38	cor. arc to sine	− 432
		$\log S_1$	4.69353304
3 log x'	15.62854503	$\log A$	8.50910334
$\log 1/(6\rho_o^2)_g$	4.58102 13	$\log \sec \phi$	0.11956447
$\log x'^3/(6\rho_o^2)_g$	0.20956 63	$\log \Delta\lambda_1$	3.32220281
		cor. sine to arc	+ 750
$\log S_m^2$	9.38707472	$\log \Delta\lambda$	3.32221035
$\log C$	1.33 8 0 9 1	$\Delta\lambda$	2099.9567
$\log \Delta\phi$	0.72 5 1 6 6		
y	642 000.00		
ϕ' (by interpolation)	40 35 45.0501	λ (central mer.)	74 40
$\Delta\phi$	− 5,31 0 9	$\Delta\lambda$	− 34 59.9567
ϕ	40 35 39.7352	λ	74 05 00.0433

60.13 mm 0.20 mm

Explanation of form:

$x'=x-K$

$S_g=x'-\frac{x'^3}{(6\rho_o^2)_g}$

$S_m=\frac{1}{R}\left(\frac{1200}{3937}\right)S_g$

R=scale reduction factor

ϕ' is interpolated from table of y

$\Delta\phi=C\,S_m^2$

$\phi=\phi'-\Delta\phi$

$\Delta\lambda_1=S_1 A \sec\phi$

$\log S_1=\log S_m-$cor. arc to sine

$\log \Delta\lambda=\log \Delta\lambda_1+$cor. arc to sine

$\lambda=\lambda$ (central mer.)$-\Delta\lambda$

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Form No. 743
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Ed. May 1935

GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE N. J. STATION

x	2,170,000.00	$\log S_g$	5.23044414
K	2,	$\log (1200/3937)$	9.48401583
x' $(=x-K)$	+ 170,000.00	$\log (1/R)$	1086
$x'^3/(6\rho_o^2)_g$	− 1.87	$\log S_m$	4.71447083
S_g	+ 169,998.13	cor. arc to sine	− 476
		$\log S_1$	4.71446607
3 log x'	15.6913 4676	$\log A$	8.5091037
$\log 1/(6\rho_o^2)_g$	4.5810213	$\log \sec \phi$	0.1195476
$\log x'^3/(6\rho_o^2)_g$	0.2723681	$\log \Delta\lambda_1$	3.3431174
		cor. sine to arc	+ 426
$\log S_m^2$	9.4249416 6	$\log \Delta\lambda$	3.3431256
$\log C$	1.337422	$\Delta\lambda$	2203.564
$\log \Delta\phi$	0.766364		
y	642 000.00		
ϕ' (by interpolation)	40 35 45.0501	λ (central mer.)	74 40
$\Delta\phi$	− 5.4393	$\Delta\lambda$	− 36 43.564
ϕ	40 35 39.2108	λ	74 03 16.436

56.82 mm

77.31 mm

Explanation of form:

$x'=x-K$

$S_g=x'-\frac{x'^3}{(6\rho_o^2)_g}$

$S_m=\frac{1}{R}\left(\frac{1200}{3937}\right)S_g$

R=scale reduction factor

ϕ' is interpolated from table of y

$\Delta\phi=C\,S_m^2$

$\phi=\phi'-\Delta\phi$

$\Delta\lambda_1=S_1 A \sec\phi$

$\log S_1=\log S_m-$cor. arc to sine

$\log \Delta\lambda=\log \Delta\lambda_1+$cor. arc to sine

$\lambda=\lambda$ (central mer.)$-\Delta\lambda$

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GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE N. J. STATION

x	2,166,000.00	$\log S_g$	5.22010354
K	2,	$\log (1200/3937)$	9.48401583
x' $(=x-K)$	166,000.00	$\log (1/R)$	1086
$x'^3/(6\rho_o^2)_g$	− 1.74	$\log S_m$	4.70413023
S_g	165,998.26	cor. arc to sine	− 454
		$\log S_1$	4.70412569
3 log x'	15,660 32427	$\log A$	8.50910307
$\log 1/(6\rho_o^2)_g$	4.581 0213	$\log \sec \phi$	0.12063350
$\log x'^3/(6\rho_o^2)_g$	0.241 34 56	$\log \Delta\lambda_1$	3.33386926
		cor. sine to arc	+ 788
$\log S_m^2$	9.408 26046	$\log \Delta\lambda$	3.33387714
$\log C$	1.337 5848	$\Delta\lambda$	2157.3466
$\log \Delta\phi$	0.745 4449		52.1570
y	646 000.00		
ϕ' (by interpolation)	40 36 24.5770	λ (central mer.)	74 40 02.1570
$\Delta\phi$	− 5.5699	$\Delta\lambda$	35 57.3466
ϕ	40 36 19.0071	λ	74 04 07.8430

117.26 mm

36.88 mm

Explanation of form:

$x'=x-K$

$S_g=x'-\frac{x'^3}{(6\rho_o^2)_g}$

$S_m=\frac{1}{R}\left(\frac{1200}{3937}\right)S_g$

R=scale reduction factor

ϕ' is interpolated from table of y

$\Delta\phi=C\,S_m^2$

$\phi=\phi'-\Delta\phi$

$\Delta\lambda_1=S_1 A \sec\phi$

$\log S_1=\log S_m-$cor. arc to sine

$\log \Delta\lambda=\log \Delta\lambda_1+$cor. arc to sine

$\lambda=\lambda$ (central mer.)$-\Delta\lambda$

U. S. GOVERNMENT PRINTING OFFICE 11—11521

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PLANE COORDINATE GRID SYSTEM

Positions of grid intersections used for fitting the grid to this compilation were computed by Division of Geodesy and the computation forms are included in this report.

Positions plotted by H. D. REED, JR.

Positions checked by _____

Grid inked on machine by H. D. REED, JR.

Intersections inked by H. D. REED, JR.

Points used for plotting grid:

LONG ISLAND GRID

x 1,976,000 FT. y 146,000 FT.	x 1,980,000 y 142,000
x 1,986,000 FT y 146,000 FT.	x y
x 1,976,000 y 134,000	x y
x 1,986,000 y 134,000	x y

Triangulation stations used for checking grid:

X = 1,984,296,84FT. Y = 138,002,84FT.

1. FT. TOMPKINS, 2, 1868
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

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Geodetic positions from Lambert coordinates

State L. Island Station Grid intersection

x	1,976,000	$R_b + A$	24,462,545.30
C	2	y	146,000
x' (= x − C)	−24,000	$R_b + A - y$	24,316,545.30
tan θ		R	
θ	° ′ ″		
	″	y	146,000
$\frac{\theta}{\ell}$ (= Δλ)		y″	− 11.84
		y′	145,988.16
λ (central mer.)	74° 00′ ″		
− Δλ	5 11.2448	φ (by interpolation)	40° 37′ 34.4305
λ	74 05 11.2448		

Station Grid intersection

x	1,986,000.	$R_b + A$	24462
C		y	146.000
x' (= x − C)	−14,000	$R_b + A - y$	24,316,545.30
tan θ		R	
θ	° ′ ″		
	″	y	146,000
$\frac{\theta}{\ell}$ (= Δλ)		y″	− 4.03
		y′	145,995.97
λ (central mer.)	74° 00′ ″		
− Δλ	3 01.5595	φ (by interpolation)	40° 37′ 34.5076
λ	74 03 01.5595		

$\tan\theta = \frac{x - C}{R_b + A - y}$

$\Delta\lambda = \frac{\theta}{\ell}$

$\lambda = \lambda$ (central mer.) $- \Delta\lambda$

$R = (R_b + A - y) \sec\theta$

$y'' = 2R \sin^2 \frac{\theta}{2}$

$y' = y - y''$

C is constant added to x′ in computation of coordinates

R_b is map radius of lowest parallel

A is value of y′ for R_b; in most cases it is zero

φ is interpolated from table of y′

(M-28)

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Plane coordinates on Lambert projection

State L. Island Station Grid Intersection

ϕ = 40° 37′ 34.4305 λ = 74° 05′ 11.2448

Tabular difference of R for 1″ of ϕ = 101.20017

R (for min. of ϕ)		24,320,041.51		y′ (for min. of ϕ)		142,503.79	
Cor. for sec. of ϕ		− 3484.37		Cor. for sec. of ϕ		+ 3,484.37	
R		24,316,557.14		y′		145,988.16	
				y″ (=2R sin² $\frac{\theta}{2}$)		+ 11.84	
θ (for min. of λ)		− ° 3′ 16.″22463		y		146,000.00	
Cor. for sec. of λ		− 7.35502					
θ		3 23.57965		$\frac{\theta}{2}$		° 1′ 41.″789825	
θ''	For machine computation	"			For machine computation		
				log θ''			
log θ''				colog 2		9.69897000	
S for θ				S for $\frac{\theta}{2}$			
log sin θ	sin θ	.000 9869818		log sin $\frac{\theta}{2}$	sin $\frac{\theta}{2}$	.000 4934910	
log R					R sin $\frac{\theta}{2}$	12,000.000	
log x′				log sin² $\frac{\theta}{2}$	R sin² $\frac{\theta}{2}$	5.922	
x′	R sin θ	− 24,000.00		log R			
		2,000,000.00		log 2		0.30103000	
x		1,976,000		log y″			

$x = 2{,}000{,}000.00 + R \sin \theta$

$y = y' + 2R \sin^2 \frac{\theta}{2}$

y′= the value of y on the central meridian for the latitude of the station

S = log of ratio for reducing arc expressed in seconds to sine

(see log tables)

R, y′, and θ are given in special tables

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Plane coordinates on Lambert projection

State L. Island Station Grid Intersection

ϕ = 40° 37′ 34.5076″ λ = 74° 03′ 01.5595″

Tabular difference of R for 1″ of ϕ = 101.20017

R (for min. of ϕ)		24,320,041.51	y′ (for min. of ϕ)		142,503.79
Cor. for sec. of ϕ		− 3492.17	Cor. for sec. of ϕ		+ 3492.17
R		24,316,549.34	y′		145,995.96
			y″ (=2R $\sin^2 \frac{\theta}{2}$)		+ 4.03
θ (for min. of λ)		− ° 1′ 57.73478″	y		145,999.99
Cor. for sec. of λ		− 1.02004			
θ		1 58.75482	$\frac{\theta}{2}$		° 0′ 59.37741″
θ''	For machine computation			For machine computation	
			log θ''		
log θ''			colog 2		9.69897000
S for θ			S for $\frac{\theta}{2}$		
log sin θ	sin θ	,000 5757396	log sin $\frac{\theta}{2}$	sin $\frac{\theta}{2}$	,000 2878698
log R				R sin $\frac{\theta}{2}$	7,000.00
log x′			log sin^2 $\frac{\theta}{2}$	R sin^2 $\frac{\theta}{2}$	2.015
x′	R sin θ	− 14,000.00	log R		
		2,000,000.00	log 2		0.30103000
x		1,986,000	log y″		

x = 2,000,000.00 + R sin θ

y = y′ + 2R $\sin^2 \frac{\theta}{2}$

y′ = the value of y on the central meridian for the latitude of the station

S = log of ratio for reducing arc expressed in seconds to sine (see log tables)

R, y′, and θ are given in special tables

(R 340)

Ask

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U. S. COAST AND GEODETIC SURVEY
Ed. May 1935

GEODETIC POSITIONS FROM LAMBERT COORDINATES

STATE Ut. STATION

x	1,976,000.00	R_b+A	24,462,545.30
C	2	y	150,000.00
x' $(=x-C)$	- 24,000.00	R_b+A-y	24,312,545.30
log $(x-C)$	4.3802 1124	$\frac{\theta}{2}$ (in secs.)	01' 41".8066
log (R_b+A-y)	7.3858 3043	log $\frac{\theta}{2}$	
log tan θ	6.9943 9081	log S	
θ	° 0.3 23".61314	log sin $\frac{\theta}{2}$	6.6933 4250
	203.61"314		
log θ (θ in secs.)	2.3088 0584	log sin$^2\frac{\theta}{2}$	3 3866 9500
log l	9.8156 3226	log 2	0.3010 3000
log $\frac{\theta}{l}$	2.4931 7358	log R*	2.3858 3043
$\Delta\lambda$ $(=\frac{\theta}{l})$	311.2960	log y''	1.0735 5554
		y''	
λ (central mer.)	74° ' "		
$-\Delta\lambda$	+ 05 11.2960	R_b+A-y	24,312,545.30
λ	74 05 11.2960	y''	+ 11.85
		R	24,312,557.15
	53.09 mm		
			146
		y	~~150~~ 000.00
		y''	- 11.85
		y'	149,988.15
		ϕ (by interpolation)	40 38 13.9560

86.09 mm

$\tan\theta=\dfrac{x-C}{R_b+A-y}$

$\Delta\lambda=\dfrac{\theta}{l}$

$\lambda=\lambda$ (central mer.)$-\Delta\lambda$

$y''=2R\sin^2\dfrac{\theta}{2}$

$y'=y-y''$

C is constant added to x' in computation of coordinates

R_b is map radius of lowest parallel

A is value of y' for R_b; in most cases it is zero

ϕ is interpolated from table of y'

* Use (R_b+A-y) as an approximate value of R and later correct this value when R is obtained below.

U.S. GOVERNMENT PRINTING OFFICE 11—11524

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U. S. Coast and Geodetic Survey
Ed. May 1935

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GEODETIC POSITIONS FROM LAMBERT COORDINATES

STATE L. I. STATION

x	1,986,000.00	R_b+A	24,462,545.30
C	2,	y	150,000.00
x' $(=x-C)$	− 14,000.00	R_b+A-y	24,312,545.30
log $(x-C)$	4.1461 2804	$\frac{\theta}{2}$ (in secs.)	
log (R_b+A-y)	7.3858 3043	log $\frac{\theta}{2}$	59.38784
log tan θ	6.7602 9761	log S	
θ	° 0′ 58.″7244	log sin $\frac{\theta}{2}$	6.4592 5299
	118.″77436		
log θ (θ in secs.)	2.0747 2269	log sin$^2\frac{\theta}{2}$	2.9185 0598
log l	9.8156 3226	log 2	0.3010 3000
log $\frac{\theta}{l}$	2.2590 9043	log R*	7.3858 3043
$\Delta\lambda$ $(=\frac{\theta}{l})$	181.58937	log y''	0.6053 6641
		y''	4.03
λ (central mer.)	74° ′ ″		
$-\Delta\lambda$	03 01.5894	R_b+A-y	24,312,545.30
λ	74 03 01.5894	y''	+ 4.03
	7.47 mm	R	24,312,549.33
			146
		y	~~150~~ 000.00
		y''	− 4.03
		y'	149,995.97
		ϕ (by interpolation)	40 38 14.03 32

86.57 mm

$\tan\theta=\frac{x-C}{R_b+A-y}$

$\Delta\lambda=\frac{\theta}{l}$

$\lambda=\lambda$ (central mer.)$-\Delta\lambda$

$y''=2R\sin^2\frac{\theta}{2}$

$y'=y-y''$

C is constant added to x' in computation of coordinates

R_b is map radius of lowest parallel

A is value of y' for R_b; in most cases it is zero

ϕ is interpolated from table of y'

* Use (R_b+A-y) as an approximate value of R and later correct this value when R is obtained below.

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GEODETIC POSITIONS FROM LAMBERT COORDINATES

STATE N.J. L I STATION

x	1,976,000.00	R_b+A	24,462,545.30
C	2,000,000.00	y	134,000.00
x' $(=x-C)$	24,000.00	R_b+A-y	24,328,545.30
$\log (x-C)$	4.3802 1124	$\frac{\theta}{2}$ (in secs.)	1' 41.″73961
$\log (R_b+A-y)$	7.3861 1614	$\log \frac{\theta}{2}$	
$\log \tan \theta$	6.9940 9510	$\log S$	
θ	0° 03' 23.″47923	$\log \sin \frac{\theta}{2}$	6.6493 0686
	203.″47923		
$\log \theta$ (θ in secs.)	2.3085 2009	$\log \sin^2 \frac{\theta}{2}$	~~3.3861 2172~~ ~~1 2172~~
$\log l$	4.8156 3226	$\log 2$	0.3010 3000
$\log \frac{\theta}{l}$	2.4928 4783	$\log R^*$	7.3861 1614
$\Delta\lambda$ $(=\frac{\theta}{l})$	311.09128	$\log y''$	1.0732 6786
		y''	11.84
λ (central mer.)	74° ' "		
$-\Delta\lambda$	05 11.0913	R_b+A-y	24,462,545.30
λ	74 05 11.0913	y''	+ 11.84
	52.16 mm	R	24,462,557.14
		y	134,000.00
		y''	− 11.84
		y'	133,988.16
		ϕ (by interpolation)	40 35 35.8533 ~~9703~~

36.11 mm

$\tan \theta = \frac{x-C}{R_b+A-y}$

$\Delta\lambda = \frac{\theta}{l}$

$\lambda = \lambda$ (central mer.) $-\Delta\lambda$

$y'' = 2R \sin^2 \frac{\theta}{2}$

$y' = y - y''$

C is constant added to x' in computation of coordinates

R_b is map radius of lowest parallel

A is value of y' for R_b; in most cases it is zero

ϕ is interpolated from table of y'

* Use (R_b+A-y) as an approximate value of R and later correct this value when R is obtained below.

U.S. GOVERNMENT PRINTING OFFICE 11—11524

T-5465

Form No. 742
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Ed. May 1935

GEODETIC POSITIONS FROM LAMBERT COORDINATES

STATE L. I. STATION

x	1,986,000.00	R_b+A	24,462,545.30
C	2,	y	134,000.00
x' $(=x-C)$	14,000.00	R_b+A-y	24,328,545.30
log $(x-C)$	4.1461 2804	$\frac{\theta}{2}$ (in secs.)	"
log (R_b+A-y)	7.3861 1614	log $\frac{\theta}{2}$	59.34812
log tan θ	6.7600 1190	log S	
θ	° 01 58.24624	log sin $\frac{\theta}{2}$	6.4589 6788
	118.69"624		
log θ (θ in secs.)	2.0744 3698	log sin$^2\frac{\theta}{2}$	2.9179 3576
log l	9.8156 3226	log 2	0.3010 3000
log $\frac{\theta}{l}$	2.2588 0472	log R*	7.3861 1614
$\Delta\lambda$ $(=\frac{\theta}{l})$	181.4699	log y''	0.6050 8190
		y''	4.03
λ (central mer.)	74 ° ' "		
$-\Delta\lambda$	03 01.4699	R_b+A-y	24,328,545.30
λ	74 03 01.4699	y''	+ 4.03
		R	24,328,549.33
	6.91 mm		
		y	134,000.00
		y''	− 4.03
		y'	133,995.97
		ϕ (by interpolation)	40 35 35.9305

36.59 mm

$\tan\theta=\frac{x-C}{R_b+A-y}$

$\Delta\lambda=\frac{\theta}{l}$

$\lambda=\lambda$ (central mer.)$-\Delta\lambda$

$y''=2R\sin^2\frac{\theta}{2}$

$y'=y-y''$

C is constant added to x' in computation of coordinates

R_b is map radius of lowest parallel

A is value of y' for R_b; in most cases it is zero

ϕ is interpolated from table of y'

* Use (R_b+A-y) as an approximate value of R and later correct this value when R is obtained below.

U. S. GOVERNMENT PRINTING OFFICE 11—11524

T-5462

Form No. 742
DEPARTMENT OF COMMERCE
U. S. Coast and Geodetic Survey
Ed. May 1935

GEODETIC POSITIONS FROM LAMBERT COORDINATES

STATE U. I. STATION

x	1,980,000.00	R_b+A	24,462,545.30
C	2,	y	140,000.00
x' $(=x-C)$	20,000.00	R_b+A-y	24,322,545.30
log $(x-C)$	4.301030000	$\frac{\theta}{2}$ (in secs.)	1° 24" 80394
log (R_b+A-y)	7.386009021	log $\frac{\theta}{2}$	
log tan θ	6.915020981	log S	
θ	0° 02' 49.60788	log sin $\frac{\theta}{2}$	6.613986100
	169.60788		
log θ (θ in secs.)	2.229446001	log sin^2 $\frac{\theta}{2}$	3.227972200
log l	5.815632261	log 2	0.301030000
log $\frac{\theta}{l}$	2.413813739	log R*	3.386009021
$\Delta\lambda$ $(=\frac{\theta}{l})$	259.3067	log y''	0.915011220
		y''	8.22
λ (central mer.)	74° ' "		
$-\Delta\lambda$	04 19.3067	R_b+A-y	24,322,545.30
λ	74 04 19.3067	y''	+ 8.22
		R	24,322,553.52
	90.78 mm		
		y	140,000.00
		y''	− 8.22
		y'	139,991.78
		ϕ (by interpolation)	40 3 C 35,1777

31.94 mm

$\tan\theta=\frac{x-C}{R_b+A-y}$

$\Delta\lambda=\frac{\theta}{l}$

$\lambda=\lambda$ (central mer.)$-\Delta\lambda$

$y''=2R\sin^2\frac{\theta}{2}$

$y'=y-y''$

C is constant added to x' in computation of coordinates

R_b is map radius of lowest parallel

A is value of y' for R_b; in most cases it is zero

ϕ is interpolated from table of y'

* Use (R_b+A-y) as an approximate value of R and later correct this value when R is obtained below.

U.S. GOVERNMENT PRINTING OFFICE 11—11524

Plane coordinates on Lambert projection

State L. Island Station Fort Jonkins 2 (N.Y.)

ϕ = 40° 36′ 15.474 λ = 74° 03′ 23.580

Tabular difference of R for 1″ of ϕ = 101.19983

R (for min. of ϕ)		24,326,113.50		y′ (for min. of ϕ)			136,431.80
Cor. for sec. of ϕ		− 1565.97		Cor. for sec. of ϕ			+ 1565.97
R		24,324,547.53		y′			137,997.77
				y″ (=2R $\sin^2 \frac{\theta}{2}$)			+ 5.07
θ (for min. of λ)		− ° 1′ 57.73478		y			138,002.84
Cor. for sec. of λ		− 15.42326					
θ		− 2 13.15804		$\frac{\theta}{2}$			° 1′ 06.57902
θ''	For machine computation	″			For machine computation		
				log θ''			
log θ''				colog 2			9.69897000
S for θ				S for $\frac{\theta}{2}$			
log sin θ	sin θ	.000645 55683		log sin $\frac{\theta}{2}$	sin $\frac{\theta}{2}$		.000322 7842
log R					R sin $\frac{\theta}{2}$		7,851.58
log x′				log sin^2 $\frac{\theta}{2}$	R sin^2 $\frac{\theta}{2}$		2.534
x′	R sin θ	− 15,703.16		log R			
		2,000,000.00		log 2			0.30103000
x		1,984,296.84		log y″			

$x = 2{,}000{,}000.00 + R \sin \theta$

$y = y' + 2R \sin^2 \frac{\theta}{2}$

y′= the value of y on the central meridian for the latitude of the station

S = log of ratio for reducing arc expressed in seconds to sine (see log tables)

R, y′, and θ are given in special tables