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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-5449

State New Jersey

LOCALITY

Hudson River,
e
Weehawken.

~~1935~~
Date of photos: Nov. 25, 1934

CHIEF OF PARTY

Roswell C. Bolstad ~~Jr. H. & G. Engr.~~

U. S. GOVERNMENT PRINTING OFFICE: 1934

Applied to Chart 746 - May 1937 - C.M.Z.

Corr'ns. to Mar. 15, 1939 applied to 746 3/15/39 J.M.A.

Applied to Chart 369 April 1937 C.M.Z.

Corr'ns. to 4/3/39 applied to 746 9/9/39 J.M.A.

Sppl' applied to Chart 746 11-16-40 E.C.H.

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. 81

REGISTER NO. T-5449.

State New Jersey.

General locality Hudson River.

Locality Weehawkin.

Scale 1:5,000 * Date of photographs- Nov. 25, 1934.
Date of Compilation- April 29, 1936.

Vessel Air Photo Compilation Party No. 12.

Reviewed and recommended for approval- Roswell C. Bolstad.
Chief of party Roswell C. Bolstad.

Surveyed by See STATISTICS SHEET, page 2 of this Report.

Inked by D.B.Bogart and J.K.Batchellor.

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

Contour, Approximate contour, Form line interval - - feet

Instructions dated November 15th., 19 32

Remarks: Compiled on a scale of 1:5,000 and printed by photo-lithography.

* Blueprint on mat 1:5000

* STATISTICS *

on

COMPILATION; FIELD NO. 81, REGISTER NO. T-5449.

Photographs No.	Date	Time.	Tide.
V- 315 - 316 (876A-8)	Nov. 25, 1934	10:50 A.M.	At about M.H.W.
V-85 - 91 (870M-8)	Nov. 25, 1934	10:48 A.M.	"

	By	Date From	To
SCALE FACTOR (1.000)	R.C.Bolstad R.C.Bolstad	(Previously determined)	
PROJECTION	D.B.Bogart D.B.Bogart	3/9/35	
PROJECTION CHECKED	J.P.O'Donnell J.P.O'Donnell	3/9/35	
CONTROL PLOTTED	D.B.Bogart D.B.Bogart	3/20/35	
CONTROL CHECKED	R.H.Peckworth R.H.Peckworth	3/20/35 - 3/21/35	
TOPOGRAPHY TRANSFERRED	None		
TOPOGRAPHY CHECKED	None		
SMOOTH RADIAL LINE PLOT	D.B.Bogart D.B.Bogart	3/25/35 - 3/30/35	
RADIAL LINE PLOT CHECKED	W.E.Hackett W.E.Hackett	5/9/35	
DETAIL INKED	D.B.Bogart D.B.Bogart J.K.Batchaller J.K.Batchaller	5/10/35 - 6/4/35 3/16/36 - 4/29/36	
PRELIMINARY REVIEW OF SHEET	R.C.Bolstad R.C.Bolstad	4/28/36 - 4/30/36	

AREA OF DETAIL INKED 4.6 Sq. Statute Miles (Land Area).

AREA OF DETAIL INKED 0.0 Sq. Statute Miles (Shoals in water area).

LENGTH OF SHORELINE (More than 200 m. from nearest opposite shore) 5.9 Statute Miles.

LENGTH OF SHORELINE (Rivers, sloughs, etc., less than 200 m. wide) 13.1 Statute Miles.

LENGTH OF STREETS, ROADS, TRAILS, RAILROADS, etc. 199.0 Statute Miles

REFERENCE STATION: Capitol, 1932
Datum: North American 1927
Latitude: 40° 46' 50.762" (1565.9m)
Longitude: 74° 01' 18.765" (440.0m) (adjusted

~~Latitude 40° 46' 50.762" (1565.9m.)~~
~~Longitude 74° 01' 18.765" (440.0m.)~~

New York System of Plane Coordinates (Long Island Zone)
x coordinate: 1,993,940.51 ft.
y coordinate: 202,290.30 ft.

New Jersey System of Plane Coordinates
x coordinate: 2,178,572.26 ft.
y coordinate: 710,025.35 ft.

COMPILER'S REPORT
for
AIR PHOTO TOPOGRAPHIC SHEET, FIELD NO. 81.

GENERAL INFORMATION.

The Air-photo Field Inspection Report for New Jersey, Part 1, Hudson River, George Washington Bridge to Bedloes Island, attached to the descriptive report for compilation T-5448, furnished the necessary information for the compilation of this sheet.

This sheet has been compiled from single lens photographs (see STATISTICS Sheet, page 2) taken by the U.S.Army Air Corp at Mitchell Field. They were taken with a special camera known as the "K-7C" ("K-7A" by Fairchild Corp.) recently developed by the Fairchild Camera Corporation, 62-10 Woodside Ave., Woodside, New York City, with the cooperation of the Air Corp. 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(24" f.l.) was used which placed the original negatives on a scale of 1:7,500. Contact prints were furnished the field party for inspecting purposes and the original negatives were used to enlarge a set of office prints to a scale of 1:5,000 in the Washington Office. These office prints were furnished this party and were used for the compilation of this sheet.

CONTROL.

(a) Sources.

Control for the compilation of this sheet was obtained from the following sources:-

(1) Triangulation, 1932, Lt. Woodworth. As the final office adjusted positions on N.A. 1927 datum were not available except for main stations, the field positions on N.A. datum were used after applying a correction previously determined by comparison of common stations for the area. (Following corrections were used:- Lat. -11.7m. to -12.0m.; Long. Plus 3.2m. to 3.5m.) With the application of these corrections the plotted positions should be accurate within any plottable limits at this scale, 1:5,000.

(2) U.S.E.D. Stations as listed on page 5, and described on form 524 submitted with this report.

(b) Errors.

No error in the position of any of the above control stations established by Lieut. Woodworth of this bureau was discovered.and no appreciable errors were found in any of the U.S.E.D. stations.

COMPILATION.

(a) Method.

The usual radial line method of plotting was used in the compilation of this sheet.

The U.S.E.D. stations as listed in the back of this report were used as supplementary control for the radial plot. They were plotted on an aluminum sheet from their coordinate positions (at 5000 scale) and transferred to the celluloid compilation sheet by means of fitting to common stations (i.e., cordinate positions of triangulation stations on the aluminum sheet fitted to their corresponding geographical position on the celluloid sheet). The transferred position of the U.S.E. station was not accepted unless it adherred strictly to the photo plot, as there is sufficient triangulation control to independently establish the plot.

(b) Adjustments of Plot.

No unusual adjustments of the photo plot were effected. Some adjustment was necessary along the inshore area where a junction is made with the 1-10,000 scale compilation. Due to the weak angle of intersection in this area the radials give a somewhat weak determination in a longitudinal direction with a strong determination in at latitude direction. The 10,000 photo plot was used to correct this and aid in obtaining an agreement at the junction area.

(c) Interpretation.

No difficulty was experienced in interpreting the photographic detail for this compilation.

The usual graphic symbols were used as approved by the Board of Surveys and Maps (1932) with the exception of some of the following;

The actual boundaries of all wrecks have been shown by a dashed line rather than the symbol. They have been adequately labeled on the overlay sheet.

At lat. 40°-47.2' there has been shown a dashed line in the water area to represent a line of dolphins, the exact position in a longitude direction of which cannot be definately determined because of shadows obscuring the location.

The triangulation station Dome, St. Michaels Monastery, has been shown on this sheet by a broken triangle. The dome was destroyed by fire in 1934; the opening where the dome covered can be seen on the photos.

At the north end of this sheet, from North Hudson Park, there has been shown on this compilation a double track trolley line which extends the full length of the sheet with a branch to the waterfront near the center of the sheet. As no notes were made on the field prints for all of the trolley lines in this area their position had to be determined by stereoscopic study; it may be therefore that some of the trolley lines have been omitted. At lat. 40°-45.5', long. 74°-01.7' a bridge overpass for the trolley tracks is shown. While this does not actually exist at the time the photos were taken the construction shows in photo V86(870M-8) and it is assumed that it has been completed by this date.

The Pennsylvania R.R. tunnels (north and south) as shown on this sheet were obtained from the 1930 Port of New York Authority Maps; these maps do not fit in exactly with the compilation, however, changes are probably due to improvements since the date of survey are other changes are not serious. A comparison has been made with these Port Authority Maps by means of photostats reduced to the proper scale. (Port Authority Map MH-F-3 is map referred to; on scale of 1" = 100 ft.)

Piling and dolphins have been shown by a very small circle and labeled on the overlay sheet. This area is subject to change and therefore piling and dolphins shown on this compilation are those indicated by the field inspection party on the field prints and those appearing when viewed under the stereoscope; it is suggested that field verification of this compilation may show other piles and dolphins now in this area.

The houses, buildings and oil tanks shown on this compilation include only the waterfront area (except other inland prominent buildings) or area of visibility from the river. Adequate labels on the overlay sheet provide for the omitted buildings. No attempt has been made to show latrines, small woodsheds, garages, etc. Due to shadows small porches, bays, etc. on some of the buildings may have been omitted and therefore will not conform strictly to plan view; there is no remedy except to obtain photos with the sun at higher altitudes.

(d) Information from Other Sources.

The New Jersey Junction (operated by N.Y.C.R.R.), Erie, and West Shore R.R. blueprints of track and yard traverses were used as an aid

in detailing this compilation. The New York Port Authority Maps were also used to aid in compiling this sheet. The MH-F-3 map was compared (See paragraph Interpretation).

(e) Names.

All geographical names shown on this compilation have been listed on the special forms in the back of this report. For street names see the New York City Map, Board of Estimate and Apportionment, 1933, which lists the correct names for some of the major streets. The Port Authority Maps, particularily MH-F-3, shows the names of the streets.

COMPARISON WITH OTHER SURVEYS.

(a) Proper junctions with adjoining sheets have been made and are in agreement.

(b) Comparison with Chart.

No direct comparison of this compilation with the Charts by means of contact negatives was made as they were not immediately available at the time of completion of this sheet. However, numerous discrepancies were noted and it appears likely that the topography of the present charts 745 and 746 is badly in error as is true of the area to the north of this compilation, Air-photo Topographic sheet T-5448.

LANDMARKS.

The list of landmarks for the area covered by this compilation were previously submitted, Feb. 22, 1933, by Lieut. Woodworth.

LIST OF RECOVERABLE STATIONS.

The following tabulation lists all recoverable objects shown on this compilation by a small (2½ mm. diam.) black circle; they have all been located by the photo plot and have been described on form 524, submitted with this report.

NAME	LAT.	LONG.
Tower (Shakespeare Towers)	40°- 47.1'	74°- 00.4'
U.S.Mon. 16 (U.S.E.)	- 46.8'	- 00.5'
Station 16 (U.S.E.)	- 46.6'	- 00.4'
Chy. (West Shore)	- 46.3'	- 00.8'
U.S.Mon. 14 (U.S.E.)	- 46.3'	- 00.8'
West Shore (U.S.E.)	- 46.1'	- 00.7'
Steel Tripod (Port Authority) (U.S.E?)	- 45.9'	- 01.3'
U.S.Mon. 11 (U.S.E.)	- 45.8'	- 01.3'
Sounding Station Erie F (U.S.E.)	- 45.6'	-01.2'

BRIDGES.

There are no bridges of importance to navigation within the area of this compilation.

ADDITIONAL NOTE.

At latitude 40°-46.0', longitude 74°-01.2' there are shown two broken boundary lines which represent the limits of cut for the new tunnel now under construction to New York City. It is recommended that one or two photographs be retaken in this area to show all changes in connecting highways and approach to tunnel, just as soon as project is completed. The compilation can be revised easily and accurately by fitting into present street detail, etc. now shown on this compilation.

RECOMMENDATIONS FOR FURTHER SURVEYS.

The compilation of this sheet is beleived to have a probable error of not over 1 meter in position for well defined waterfront detail of importance for charting, not over 2 meters for other waterfront detail and not to exceed 3 meters for inland detail.

This compilation is believed to be complete in all detail of importance for charting purposes, within the accuracy stated above, and no additional surveys are required.

Submitted by-

April 29, 1936.

J.K. Batchellor

J.K. Batchellor, Draftsman.

	Remarks	Decisions
1	See map (1) for city limits.	
2	" " " " " "	
3	" " " " " "	
4		
5		
6		
7	Local people, particularly commercial concerns, steamship companies, etc., always refer to "NORTH RIVER"; name "HUDSON RIVER" very very seldom used by them.	
8		
9		
10	See map (1) for city limits.	
11		
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27		

GEOGRAPHIC NAMES

Survey No. T-5449

Air-photo Compilation.

Name on Survey	A On Chart No. 745, 746.	B On previous survey No.	C On U. S. quadrangle Maps	D From local information	E On local Maps	F P. O. Guide or Map	G Rand McNally Atlas	H U. S. Light List	K Hwy. Maps. T-5449	
Guttenberg	x			2 men x	(1)* (2)*		~	~	(3)*	1
Weehawken	* x		~	3 men x	~ (1)*	~	~	~	(3)*	2
West New York				3 men x	~ (1)* (2)*		~		(3)*	3
Days Point	* x				~					4
Weehawken Cove	* x				~					5
North Hudson Park				~	~ (1)* (2)*					* 6
Hudson River	* x	**	~ x	3 men x**	~ (1)* (2)*		~	~	(3)*	7
Delaware and Hudson Canal Co.	* x			~	~					8
				##						* 9
Union City			~	2 men x	~ (1)*	*	~		~ (3)*	10
New Jersey Junction Railroad (New York Central Railroad Co.)				~	~					* 11
West Shore Railroad (New York Central Railroad Co.)	*			~	~		~			12
Erie Railroad	*			~	~		~			13
Hoboken Manufacturers R.R. Co.				~	~					* 14
										15

*LEGEND:-

(1) - From the Port of N.Y. Authority Railroad Terminal Map of New York Harbor. 16

17

(2) - From the Map of the City of New York, Board of Estimate & Apportionment, 1933. 18

(3) - From the New Jersey State Board of Commerce & Navigation Highway Map, 1934. 19

20

NOTE:- Names of Railroads were obtained from the above maps and from blueprints of track traverses furnished by the railroad companies. 21 22

23

24

Names underlined in red approved by C.P.N. on 6/11/36 25

26

27

M 234

REVIEW OF AIR PHOTO COMPILATION T 5449
Scale 1:5,000

Comparison with Graphic Control Surveys

There are no graphic control surveys in this area.

Comparison with Previous Topographic Surveys

T 1573 (1885), 1:5,000

T 1573 covers practically the entire area of the compilation. The changes since 1885 are so numerous that common detail is hard to find. The compilation is adequate to supersede T 1573 in all points of detail within the area common to the two surveys.

T 2323 (1889), 1:10,000, Chart 369$\frac{4}{5}$
T 3151 (1911), 1:10,000, Chart 369$\frac{8}{5}$
T 3226 (1911), 1:10,000, Chart 369$\frac{4}{5}$

The above named sheets are copies of the charts noted, used as field sheets for the determination of corrections to the charts. The compilation is adequate to supersede the above surveys in all points of topographic detail throughout their areas common with the compilation.

Comparison with Hydrographic Surveys

The latest hydrographic surveys in this area were made in 1885 and no comparison is made with these surveys.

Comparison with the Charts

Chart 745

The ruined pier shown at 40° 45.9 - 74° 01.0' is shown with solid lines on the compilation. The piles and floor beams of this pier are still in place and the pier is apparently used to some extent although the flooring is no longer in place.

None of the numerous wrecks shown on the compilation are charted.

There are eight piers at the dry dock company in Weehawken Cove. The chart shows seven.

Because of the difference in scale, detailed comparison with the chart was not made. Random points checked for position with proportional dividers, scaled 0 to 10 meters from true positions as given on the airphoto compilation.

Additional streets and buildings, not shown on Chart 745, are given on the compilation.

Note. The hachured lines on this compilation represent the top of steep bluffs. From the foot of the bluffs to the water line the ground has been nearly all levelled off and the in this area the contours on chart 746 are no longer correct. It is recommended that the bluff lines from this compilation be used on chart 746 in place of the contours. B.G.F.

The bluff line of the Hudson River Palisades is not shown on Chart 745.

Chart 746

The smaller pier between Piers 12 and 13 of the West Shore R.R. is not shown on Chart 746,

The wreck shown on the compilation at lat. 40° 47.5', long. 73° 59.8' has been plotted from the photographs in this office. It shows well above water on the photographs and is distinguished from moored barges in this area only by its gutted appearance and the fact that it checks in position with the wreck now on the chart.

As on Chart 745, none of the wrecks shown on the compilation, except the one mentioned above appear on Chart 746.

The two small docks shown at 40° 47.7' - 73° 59.7' on Chart 746 are now in ruins. Of the southerly one, only a couple of piles remain.

As on Chart 745, random positions scaled 0 to 10 meters different from the compilation.

The inshore detail on Chart 746 is very meagre and can be supplemented from the compilation.

The town names of Union City, West New York, Guttenberg, and North Bergen are not shown on Chart 746.

Landmarks And Aids to Navigation

The "ventilator" charted at 40° 46.7' - 74° 00.4' on Charts 745 and 746 is in reality the east gable of a grain elevator. Careful examination of the photographs reveals no trace of a ventilator at or near the end of this building. The gable of the elevator has been located by triangulation and the station "Elevator, Pier 7" recommended as a landmark. (See Form 567, R. W. Woodworth, filed as Chart Letter 176 (1933). This mark is labeled "elevator" on Chart 369.

The landmark "Largest Dome", shown on Chart 369 and recommended in the 1933 list of landmarks noted above, was destroyed by fire in 1934 according to a statement on page 4 of the preceding report. Examination of the photographs reveals that the dome was entirely removed.

With the above exceptions, all landmarks on the charts and in the 1933 List of Landmarks appear on the compilation and no others are recommended.

There are no lights or non-floating aids to navigation within the area covered by the compilation.

See offsheet page.

Plane Coordinate Grids

In accordance with the system outlined in the review of Air-photo Compilation T 5458, both the Long Island and New Jersey Systems of Plane Coorinates, have been placed on this sheet in this office. The grids are represented by intersection marks at 2000 foot intervals, properly labeled as to value and system.

General

The drafting on this sheet is clean and clearly done. The detailing is accurate and complete. Along the waterfront area, this sheet is probably accurate within the limits stated on page 6 of the foregoing report. For other detail, particularly farther inland, these limits may be exceeded somewhat due to the difficulties such as displacement, scale, fluctuations, etc. imposed on photographs of an area having considerable relief.

Ralph Moore Berry
V B G Jones

May 23, 1936

grid positions computed in division of geodesy. Positions plotted by R. M. Berry checked by J. A. McGann. grid intersections ruled on Projection Ruling Machine. computations are filed at back of this report. B.G.J.

REVIEW OF AIR PHOTO COMPILATION NO.T-5449.

Chief of Party: Roswell C. Bolstad Compiled by: (See STATISTICS SHEET).

Project: Air Photo Compilation Party #12 Instructions dated: Nov. 15, 1932.

✓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,c,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)

✓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)

✓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.

✓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 [redacted] 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." M-67

8. The representation of low water lines, reefs, coral reefs and rocks, and legends pertaining to them is satisfactory. (Par. 36, 37, 38, 39, 40, 41) None shown on this sheet.

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) Previously furnished.

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 on this sheet.

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: This sheet was compiled in the Baltimore office because of shut-down of the New York office on account of lack of funds.

18. Examined and approved;

Roswell C. Bolstad, Jr. H. & G. Engr.,
Chief of Party

19. Remarks after review in office:

Reviewed in office by: Ralph Thornberry B.J. Jones

Examained and approved:

C. K. Green.
Chief, Section of Field Records

Jived L. Peacock
Chief, Section of Field Work

L. O. Colbert
Chief, Division of Charts

Chief, Division of Hydrography and Topography.

T-5449
Datum Station
Position Page 17
N.Y.C. & Vic.

Plane coordinates on Lambert projection

Long Island System State New Jersey Station Capitol, 1932

ϕ = 40° 46′ 50″.762 λ = 74° 01′ 18″.765

Tabular difference of R for 1″ of ϕ = 101.20217

θ 1″ λ 4.54 08209

R (for min. of ϕ)		24,265,392.98	y′ (for min. of ϕ)		197,152.32
Cor. for sec. of ϕ		− 5 137.22	Cor. for sec. of ϕ		+ 5137.22
R		24,260,255.76	y′		202,289.54
			y″ (=2R $\sin^2 \frac{\theta}{2}$)		+ 0.26
θ (for min. of λ)		− 00° 00′ 39″.24493	y		202,289.80
Cor. for sec. of λ		− 12.27385			0.30
θ		00° 01′ 12″.44795	$\frac{\theta}{2}$		00° 00′ 25″.22372
θ''	For machine computation	51.51878		For machine computation	
			log θ''		
log θ''			colog 2		9.69897000
S for θ			S for $\frac{\theta}{2}$		1248871
log sin θ	sin θ	.0003751351 2497701	log sin $\frac{\theta}{2}$	sin $\frac{\theta}{2}$	.0001756176
log R				R sin $\frac{\theta}{2}$	3029.747 .0000000308
log x′			log $\sin^2 \frac{\theta}{2}$	R $\sin^2 \frac{\theta}{2}$	0.378
x′	R sin θ	6.059.49 − 852.1705	log R	$2R\sin^2\frac{\theta}{2}$	0.76
		2,000,000.00	log 2		0.30103000
x		1,991,470.95 3940.51	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

$3\frac{3}{4}$

(R 340)

T-5449
Datum Station

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION

State New Jersey Station Capitol, 1932

ϕ 40° 46' 50".762

λ (Central meridian)	74° 40' 00".000
λ	74 01 18.765
$\Delta\lambda$ (Central meridian–λ)	+ 0 38' 41".235
$\Delta\lambda$ (in sec.)	2321".235

log $\Delta\lambda$	3.365571911	log S_m^2	9.471672284
Cor. arc to sine	− 917	log C*	1.340238
log $\Delta\lambda_1$	3.36570994	log $\Delta\phi$	0.811938
log. cos ϕ	9.879219883	$\Delta\phi'$	
colog A	1.49090140	ϕ	40° 46' 50".762
log S_1	4.735583417	$\Delta\phi$	+ 6.4854
Cor. sine to arc	+ 525	ϕ'	40° 46' 57".2474
log S_m	4.735583942		
log 3937/1200	0.515588417	Tabular difference of y for 1" of ϕ'	101.20000
log. R	− 1086		
log S_g	5.251809773	y (for min. of ϕ')	704,231.91
log S_g^3	16.754542819	y (for seconds of ϕ')	+ 5793.404
log $1/6\rho_0^2R^2$	4.581021320	y	710,025.314
log $(S_g^3/6\rho_0^2)_g$	0.336450849		
S_g	178 570.09	log sin $\frac{\phi+\phi'}{2}$	
$(S_g^3/6\rho_0^2)_g$	2.17	log $\Delta\lambda$	
x'	+ 178 572.26	log $\Delta\alpha_1$	
	2,000,000.00	log $(\Delta\lambda)^3$	
x	2,178,572.26	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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T-5449
off sheet

GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE N. J. STATION Intersection

x	2,188,000.00	$\log S_g$	5.274155201
K	2,000,000.00	$\log (1200/3937)$	9.4840158 3
x' $(=x-K)$	+188,000.00	$\log (1/R)$	+ 1082
$x'^3/(6\rho_o^2)_g$	− 2.53	$\log S_m$	4.758217870
S_g	+187,997.47	cor. arc to sine	− 582
		$\log S_1$	4.758184552
$3 \log x'$		$\log A$	8.504098833
$\log 1/(6\rho_o^2)_g$		$\log \sec \phi$	0.120855123
$\log x'^3/(6\rho_o^2)_g$		$\log \Delta\lambda_1$	3.388134083
		cor. sine to arc	+ 1016
$\log S_m^2$	9.516355.8	$\log \Delta\lambda$	3.388145424
$\log C$	1.340432	$\Delta\lambda$	2444.″242
$\log \Delta\phi$	0.856790		
y	714,000.00		
ϕ' (by interpolation)	40° 47′ 36.″5225	λ (central mer.)	74° 40′ ″
$\Delta\phi$	− 7.1910	$\Delta\lambda$	40 44.242
ϕ 1850.8 .48885 904.8	40 47 29.331	λ 1406.7 .26263 369.4	73 59 15.758
	+1809.6m		+738.8m
	−41.2		−667.9m

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

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

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

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

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

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

$\lambda = \lambda \text{ (central mer.)} - \Delta\lambda$

U. S. GOVERNMENT PRINTING OFFICE 11—11521

Form No. 748
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Ed. May 1925

T-5449
1p

GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE N. J. STATION Intersection ✓

x	2,180,000.00	$\log S_g$	5.255207 13
K	2,000,000.00	$\log (1200/3937)$	9.4840 1583
x' $(=x-K)$	+180,000.00	$\log (1/R)$	+ 1086
$x'^3/(6\rho_o^2)_g$	− 2.22	$\log S_m$	4,739.29382
S_g	+179,997.78	cor. arc to sine	− 5.34
		$\log S_1$	4.739288 48
$3 \log x'$		$\log A$	8.5090 9833
$\log 1/(6\rho_o^2)_g$		$\log \sec \phi$	0.1208 5231
$\log x'^3/(6\rho_o^2)_g$		$\log \Delta\lambda_1$	3.3692 3912
		cor. sine to arc	+ 932
$\log S_m^2$	9.4785 88	$\log \Delta\lambda$	3.3692 4844
$\log C$	1.340 432	$\Delta\lambda$	2340.″176
$\log \Delta\phi$	0.819 020		
y	714,000.00		
ϕ' (by interpolation)	40° 47′ 36.″225	λ (central mer.)	74° 40′ ″
$\Delta\phi$	− 6.5920	$\Delta\lambda$	39 00.176
ϕ 1850.8 .49883 923.2	40 47 29.930	λ 1402.1 4.999707 649.2	74 00 59.824
	+ 1846.4 m		74° 00′ 30″ + 1398.4 m
	− 04.4 m		8.3 m

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

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

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

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

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

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

$\lambda = \lambda\ (\text{central mer.}) - \Delta\lambda$

U. S. GOVERNMENT PRINTING OFFICE 11—11521

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GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE N. J. STATION Intersection L

x	2,180,000.00	$\log S_g$	5.2353726713
K	2,000,000.00	$\log (1200/3937)$	9.4840158 3
x' $(=x-K)$	+180,000.00	$\log (1/R)$	+ 1086
$x'^3/(6\rho_o^2)_g$	− 2.22	$\log S_m$	4.7392938 2
S_g	+179,997.78	cor. arc to sine	− 534
		$\log S_1$	4.7392884 8
$3 \log x'$		$\log A$	8.5090987 4
$\log 1/(6\rho_o^2)_g$		$\log \sec \phi$	0.1207 4464
$\log x'^3/(6\rho_o^2)_g$		$\log \Delta\lambda_1$	3.3691 3186
		cor. sine to arc	+ 931
$\log S_m^2$	9.4785 588	$\log \Delta\lambda$	3.3691 4117
$\log C$	1.340 182	$\Delta\lambda$	2339.″598
$\log \Delta\phi$	0.818770		
y	708,000.00		
ϕ' (by interpolation)	40° 46′ 37.″2341	λ (central mer.)	74° 40′ ″
$\Delta\phi$	− 6.5885	$\Delta\lambda$	38 59.598
ϕ 1250.6 .51077 19.9	40 46 30.646	λ 1457.0 .00670 9.4	74 01 00.402
	40′ 46 30″ +39.8m		+18.8m
	−1811.0		−1388.2m

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

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

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

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

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

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

$\lambda = \lambda \text{ (central mer.)} - \Delta\lambda$

U. S. GOVERNMENT PRINTING OFFICE 11—11621

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GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE N. J. STATION Intersection ✓

x	2,180,000.00	$\log S_\varphi$	5.235267 13
K	2,000,000.00	$\log (1200/3937)$	9.4840158 3
x' $(=x-K)$	+180,000.00	$\log (1/R)$	+ .1086
$x'^3/(6\rho_o^2)_\varphi$	− 2.22	$\log S_m$	4.73929382
S_φ	+179,997.78	cor. arc to sine	− 534
		$\log S_1$	4.73928848
$3 \log x'$		$\log A$	8.5090 4 9917
$\log 1/(6\rho_o^2)_\varphi$		$\log \sec \phi$	0.12063701
$\log x'^3/(6\rho_o^2)_\varphi$		$\log \Delta\lambda_1$	3.36902466
		cor. sine to arc	+ 931
$\log S_m^2$	9.4785588	$\log \Delta\lambda$	3.36903397
$\log C$	1.3399 31	$\Delta\lambda$	2334.020
$\log \Delta\phi$	0.8185 19		
y	702,000.80		
ϕ' (by interpolation)	40° 45′ 37.9455	λ (central mer.)	74° 40′ ″
$\Delta\phi$	− 6.5844	$\Delta\lambda$	38 59.020
ϕ 1850.8 .82268 420	40 45 31.361	λ 1407.4 .011633 28.0	74 01 00.980
	40° 45′ 30″.+84.0m		+46.0m

−1766.8 −1361.4 m

Explanation of form:

$x' = x - K$

$S_\varphi = x' - \dfrac{x'^3}{(6\rho_o^2)_\varphi}$

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

R = scale reduction factor

ϕ' is interpolated from table of y

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

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

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

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

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

$\lambda = \lambda\ (\text{central mer.}) - \Delta\lambda$

U. S. GOVERNMENT PRINTING OFFICE 11—11821

T-5449 P

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GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE Ga. & S. C. STATION Intersection ✓

x	2,174,000.00	$\log S_g$	5.24054424
K	2,000,000.00	$\log (1200/3937)$	9.48401583
x' $(=x-K)$	+174,000.00	$\log (1/R)$	+ 1086
$x'^3/(6\rho_o^2)_g$	− 2.01	$\log S_m$	4.72455093
S_g	173,997.99	cor. arc to sine	− 499
		$\log S_1$	4.72455594
3 log x'		$\log A$	8.50909918
$\log 1/(6\rho_o^2)_g$		$\log \sec \phi$	0.12063780
$\log x'^3/(6\rho_o^2)_g$		$\log \Delta\lambda_1$	3.35430292
		cor. sine to arc	+ 870
$\log S_m^2$	9.449142	$\log \Delta\lambda$	3.35431162
$\log C$	1.339931	$\Delta\lambda$	2261.058
$\log \Delta\phi$	0.789073		
y	702,000.00		
ϕ' (by interpolation)	40° 45′ 37.″9455	λ (central mer.)	74° 40′ ″
$\Delta\phi$	− 6.1528	$\Delta\lambda$ 1407.4	37 41.058
ϕ 1850.2 .529788 55.3	40 45′ 31.793	λ 3157.0 494.3	74 02 18.942
	40° 45′ 30″ +110.6m		74°02′ +888.6
	−1740.2		−518.8

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

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

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

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

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

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

$\lambda = \lambda\ (\text{central mer.}) - \Delta\lambda$

U. S. GOVERNMENT PRINTING OFFICE 11—11521

T-5449

Geodetic positions from Lambert coordinates

State N.Y. – L.I. Station Intersection ✓

x	2,002,000.00	$R_b + A$	24,462,545.30
C	2,000,000.00	y	208,000.00
x' (= x – C)	+ 2,000.00	$R_b + A - y$	24,254,545.30
			0.000041229385
tan θ	0.000082458771	R	
θ	0° 00' 17.00834		
	+ 26.003	y	208,000.00
$\frac{\theta}{\ell}$ (= Δλ)		y''	– 0.08
		y'	207,999.92
λ (central mer.)	74° ' "		
– Δλ	26.003	φ (by interpolation)	41° 04' 15.280
λ	73 59 33.997		40° 47' 47.187"
	73° 59' 30" + 187.4m		40° 47' 30" + 1060.4m
	– 1219.3m		– 990.4m

Station

x		$R_b + A$	
C		y	
x' (= x – C)		$R_b + A - y$	
tan θ		R	
θ	° ' "		
	"	y	
$\frac{\theta}{\ell}$ (= Δλ)		y''	–
		y'	
λ (central mer.)	° ' "		
– Δλ		φ (by interpolation)	° ' "
λ			

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

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

$$\lambda = \lambda\,(\text{central mer.}) - \Delta\lambda$$

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

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

$$y' = y - y''$$

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)

Geodetic positions from Lambert coordinates

T-5449

State N. J.; L. I. Station Intersection ✓ P

x	1,988,000.00	$R_b + A$	24,462,545.30
C	2,000,000.00	y	194,000.00
$x' (= x - C)$	− 12,000.00	$R_b + A - y$	24,268,545.30
			0.000024723607
tan θ	0.00004944 67214	R	
θ	0° 01′ 41.″99118		
	101.″99118	y	194,000.00
$\frac{\theta}{\ell} (= \Delta\lambda)$	− 155.930	y″	− 2.97
		y′	193,997.03
λ (central mer.)	74° ′ ″		
$-\Delta\lambda$	2 35.930	φ (by interpolation)	~~41° 01′ 56.922″~~
λ .99883 140 7.4 139.1	74 02 31.930	.48038 1852.9 889.1	40° 45′ 28.823″
	74° 02′ 30″ +278.2m		+778.2m
	− 1129.2m		− 72.6m

Station Intersection ✓ P

x	1,994,000	$R_b + A$	24,462,545.30
C	2,000,000	y	194,000.00
$x' (= x - C)$	− 6000	$R_b + A - y$	24,268,545.30
			0.000123616803
tan θ	0.00024723607	R	
θ	0° 00′ 50.″99559		
	− 77.″965	y	194,000.00
$\frac{\theta}{\ell} (= \Delta\lambda)$		y″	− 0.74
		y′	193,999.26
λ (central mer.)	74° ′ ″		
$-\Delta\lambda$	01 17.965	φ (by interpolation)	~~41° 01′ 56.944″~~
λ .29992 140 7.4 421.4	74 01 17.965	.48073 1850.9 889.7	40° 45′ 28.844″
	+842.8m		+1779.4m
	− 564.6m		− 71.4m

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

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

$\lambda = \lambda$ (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)

T-5449
Blue (5)

Geodetic positions from transverse Mercator coordinates

State N.J. - L.I. Station Intersection

x	2,186,000.00	log S_g	5.26950727
C	2,000,000.00	log (1200/3937)	9.48401583
x' (=x−C)	+186,000.00	log (1/R)	1086
$x'^3/(6\rho_o^2)_g$	− 2.46	log S_m	4.75353396
S_g	185,997.54	cor. arc to sine	− 570
		log S_1	4.75352826
log S_m^2	9.507068	log A	8.50909828
log C	1.340432	log sec ϕ	0.12085151
log $\Delta\phi$	0.847500	log $\Delta\lambda_1$	3.38347805
		cor. sine to arc	+ 995
y	714,000.00	log $\Delta\lambda$	3.38348800
ϕ' (by interpolation)	40° 47' 36".523	$\Delta\lambda$	2418."1765
$\Delta\phi$	− 7.039	λ (central mer.)	° 40' 18."1765
ϕ 1850.8 .49140 909.5	40° 47' 29."484	$\Delta\lambda$	74 40
	+1819.0 m	λ 1406.7 .69706 277.2	73° 59' 41."8235
	− 31.8 m		73°59' 30" + 564.4 m
			− 852.3 m

Station Intersection

x		log S_g	
C		log (1200/3937)	9.48401583
x' (=x−C)		log (1/R)	
$x'^3/(6\rho_o^2)_g$	−	log S_m	
S_g		cor. arc to sine	−
		log S_1	
log S_m^2		log A	
log C		log sec ϕ	
log $\Delta\phi$		log $\Delta\lambda_1$	
		cor. sine to arc	+
y		log $\Delta\lambda$	
ϕ' (by interpolation)	° ' "	$\Delta\lambda$	"
$\Delta\phi$	−	λ (central mer.)	° ' "
ϕ		$\Delta\lambda$	
		λ	

(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.) $- \Delta\lambda$

T-5449 P

Geodetic positions from Lambert coordinates

State N. J. – L. I. Station Intersection ✓

x	1,994,000.00	$R_b + A$	24,462,545.30
C	2,000,000.00	y	201,000.00
x' (= x – C)	– 6,000.00	$R_b + A - y$	24,261,545.30
			0.000123655247
tan θ	0.000247304940	R	
θ	0° 00' 51."01030		
	– 77."988	y	201,000.00
$\frac{\theta}{\ell}$ (= Δλ)		y''	– 0.74
		y'	200,999.26
λ (central mer.)	74° ' "		
– Δλ	01 17.988	φ (by interpolation)	41° 03' 06."109
λ 29980 1407.0 421.8	74 01 17.988	23353 1850.8 247.1	40° 46' 38.012
	+843.6m		40° 46' 30" +494.2m
	– 563.4m		– 1356.6m

Station Intersection ✓P

x	1,994,000.00	$R_b + A$	24,462,545.30
C	2,000,000.00	y	208,000.00
x' (= x – C)	– 6,000	$R_b + A - y$	24,254,545.30
			0.000123688156
tan θ	0.000247376313	R	
θ	0° 00' 51."02508		
	– 78."010	y	208,000.00
$\frac{\theta}{\ell}$ (= Δλ)		y''	– 0.74
		y'	207,999.26
λ (central mer.)	74° ' "		
– Δλ	01 18.010	φ (by interpolation)	41° 04' 16."274
λ 30017 1406.7 422.2	74 01 18.010	18635 1850.8 520.0	40° 47' 47.181"
	+844.4m		40° 47' 30" +1060.0m
	– 562.3m		– 790.8m

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

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

$$\lambda = \lambda(\text{central mer.}) - \Delta\lambda$$

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

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

$$y' = y - y''$$

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-26)

Geodetic positions from Lambert coordinates

State Long Island Station 2,000,000 / 206,000

x	2,000,000	$R_b + A$	24,462,545.30
C	2 —	y	206,000
$x' (= x - C)$	0	$R_b + A - y$	24,256,545.30
$\tan \theta$	0	R	
θ	° 0 ′ ″		
	″	y	206,000.00
$\frac{\theta}{\ell} (= \Delta\lambda)$	0	y″	− 0
		y′	206,000
λ (central mer.)	74° 00′ 00″.000		
$- \Delta\lambda$	0	ϕ (by interpolation)	40° 47′ 27″.42575
λ	74 00 00.000		

Station

x		$R_b + A$	
C		y	
$x' (= x - C)$		$R_b + A - y$	
$\tan \theta$		R	
θ	° ′ ″		
	″	y	
$\frac{\theta}{\ell} (= \Delta\lambda)$		y″	−
		y′	
λ (central mer.)	° ′ ″		
$- \Delta\lambda$		ϕ (by interpolation)	° ′ ″
λ			

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

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

$\lambda = \lambda$ (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)

Report for Supplemental T 5449
3/15/39

The corrections shown in red on T 5449 supplemental were plotted in this office in March 1939 from single lens air photographs without field inspection

Field inspection is now in progress and any additional corrections resulting from the field inspection will be added in another color as soon as the field inspection is completed

Photographs Single lens, 7"x9", scale 1:10 000, ... Negatives on file in this office. Photographs taken by the Naval air station Washington, D.C. early in Feb 1939. (Exact date not furnished)

Plot Details in red plotted by T.C. Lande and J.W. Gibbermann. The section around the tunnel entrance was plotted on a reproduction albumen radial plot with 1:5000 scale radial points, and transfered to the supplemental. Details along the waterfront transfered direct from the 1:10000 scale contact prints to T 5449 supplemental in the projector.

The field inspection will doubtless show additional minor changes in the number and positions of wrecks and dolphins which cannot be plotted from an office inspection of the photographs.

A section of sheet on line near the new tunnel has been removed as it is not possible to determine the position of the tracks from an office inspection of the photographs.

Hydrographic Surveys The changes shown in red on this supplemental have not been applied to the new Hydrographic Surveys. (over) BG Jones 3/15/39

Details in blue were added to T 5449 supplemental in May 1939 after receipt of the field inspection.)

BG Jones 6/2/39

Field inspection notes are shown on the field photographs and on C.S. 158 (Air Photo Unit file)