

5330

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Form 504 Ed. June, 1928 <b>DEPARTMENT OF COMMERCE</b> U. S. COAST AND GEODETIC SURVEY <u>R. S. Patton</u> Director	
State: <u>New Jersey</u>	
<b>DESCRIPTIVE REPORT</b> Photo Topographic } Sheet No. T 5330 <del>Hydrographic</del>	
LOCALITY <u>Atlantic Coast</u> <del>Island Beach.</del>	
<u>Seaside Heights to Cedar Creek</u>	
<del>C. G. S. Section.</del>	
Photographs taken in Field Inspection and Plane table surveys Compiled	1932-1933 1935 1935
<del>1935</del>	
<b>CHIEF OF PARTY</b> <u>Roswell C. Bolstad, Jr. H. &amp; G. E.</u>	

Applied to drawing of Chart 1216 - July 28, 1937 - J.F. Walker  
" " compilation " 825 1938 P.L.S.

2016

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. 74

**T5530**

REGISTER NO. **T 5330**

State New Jersey

General locality Atlantic Coast  
Island Beach.

Locality Seaside Heights to Cedar Creek G.G. Station.

Scale 1:10,000 Date of photographs - July 25, 1932  
Date of ~~survey~~ compilation Feb. 28, 1935

~~XXXXX~~ Air Photo Compilation Party No. 12, New York City.

Reviewer and recommended for approval Roswell C. Bolstad  
Chief of party Roswell C. Bolstad, Jr. R. & G.E.

Surveyed by (See STATISTICS sheet on following page.)

Inked by W. F. von Buehren

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

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

Instructions dated November 15, 1932

Remarks: Compiled on a scale of 1:10,000 and printed

by Photo Lithography.

- STATISTICS -

on

COMPILATION SHEET, FIELD NO. 74, REG. NO. T 5330.

Photographs Nos. 66-51-72 to 78 inclusive, taken July 25, 1932.

Photos M9(871-14) to M23 incl.(reference only) " Jan. 23, 1933 @ 12 Noon.

BY

DATE

From

To

SCALE FACTOR = 1.000

PROJECTION	D. B. Bogart	<i>D. B. Bogart</i>	10/8/34
PROJECTION CHECKED	J. P. O'Donnell	<i>J. P. O'Donnell</i>	10/8/34
CONTROL PLOTTED	W. E. Brown	<i>W. E. Brown</i>	11/1/34
CONTROL CHECKED	J. K. Batchellory	<i>J. K. Batchellory</i>	11/5/34
SMOOTH RADIAL LINE PLOT	W. F. von Buehren	<i>W. F. von Buehren</i>	1/16/35
RADIAL LINE PLOT CHECKED	J. P. O'Donnell	<i>J. P. O'Donnell</i>	1/29/35
DETAIL INKED	W. F. von Buehren	<i>W. F. von Buehren</i>	1/30/35
PRELIMINARY REVIEW	R. H. Peckworth	<i>R. H. Peckworth</i>	6/12/35

AREA OF DETAIL INKED 2.7 sq. Statute Miles (Land Area)

AREA OF DETAIL INKED 0.0 sq. Statute Miles (Shoals in Water)

LENGTH OF SHORELINE (more than 200 m. from nearest opposite shore)  
16.2 Statute Miles.

LENGTH OF SHORELINE (rivers and sloughs less than 200 m. wide)  
4.2 Statute Miles.

LENGTH OF STREETS, ROADS, TRAILS AND RAILROADS, etc. 49.5 Statute Miles.

DATUM North American 1927

STATION Seaside Park 1932

Latitude 39° 54' 50.875" (1569.1 m.)  
Longitude 74° 05' 00.39 " (9.3 m.)

*adjusted*

COMPILER'S REPORT

for

AIR PHOTO TOPOGRAPHIC SHEET, FIELD NO. 74.

The AIR PHOTO FIELD INSPECTION REPORT for the East Coast of New Jersey, attached to the Descriptive Report for Compilation Sheet, register number T 5286, furnished the necessary information for the compilation of this sheet. Additional information was obtained from the members of the field inspecting party who were present in the office during the compilation of this sheet.

This sheet has been compiled from a single strip of single lens photographs, 66-51-72 to 78, taken by the Aero Service Corporation, 1612 Chancellor St., Phil., Pa., with a camera equipped with a special lens (Orthomessar, 8" focal length). The original negatives are on a scale of about 1:21,800. Enlargements were made to a 1:10,000 scale with these negatives by enlarging the image to coincide with previous C. & G.S. topo. sheets on this scale.

No information was available from the Aero Service Corporation in regard to the time of day at which these photographs were taken.

The STATISTICS sheet, following, lists the necessary information in connection with the compilation of this sheet.

The photographs M9(871-14) to M23 were not used directly in the compilation of this sheet. These photographs were made in the Wash. Office from negatives secured from the Beach Erosion Commission. The scale of these photos is much smaller than a 1:10,000 scale and therefore they could not be used for tracing detail from them without selecting a large number of radial points to reduce the amount of proportioning. They have been used for reference and to bring the compilation to date where changes exist which fail to appear on the 1932 photographs.

CONTROL

(A) Sources

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

- (a) Triangulation, 1926, by \_\_\_\_\_ (Final adj. N.A.1927)
- (b) " , 1932, " Lt. Meaney ( " " " )
- (c) Theodolite- taped traverse (see Field Inspection Report attached to Topo. sheet Descriptive report, reg. no. T5286)
- (d) Pennsylvania R.R. track traverse along outer coast.

(B) Errors

In making the radial plot no errors in any of the above listed control stations were discovered; all control agrees well with the photo plot (except as noted below, par. DISCREPANCIES)

(C) Discrepancies

The railroad traverse agreed well in distance but at Seaside Park there appears to be a discrepancy in the deflection

(C) Additional Note - Interpretation

There are many small cedars (up to about 20 feet in height) in this area which have been shown on this compilation by the small pine tree symbol. There are no large trees in this vicinity.

angle where the curve bends westward leading to Toms River. There are several triangulation stations very close to the railroad tracks all along the line and there can be no question that the position as shown on the compilation sheet is correct.

#### COMPILATION

##### (A) Method

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

##### (B) Adjustments of Plot.

By holding to all the available control no unusual adjustments of the plot were required. It is indeed fortunate that no large tilt exists and that the photographs are very close to the 1:10,000 scale on which the compilation was conducted. The control was such that a good plot was obtained in spite of the fact that all intersecting radials are weak. The coast is known to be low and flat and proportioning between control stations was used to establish accurate positions for the radial points where the radial intersecting lines were weak.

##### (C) Interpretation

The usual graphic symbols were used as approved by the Board of Surveys and Maps, and no difficulty was experienced in interpreting the photographic detail.

Good motor roads are shown by a double full line, poor motor roads by a double broken line, and very poor roads and trails by a single broken line.

All buildings for this area have been shown on this compilation sheet.

Shoal areas in the water which appear on the photographs have been omitted from this sheet as Lieut. B.H. Rigg is at the present time engaged in conducting a hydrographic survey of this region.

##### (D) Bridges

The railway and highway causeways which lead to the mainland have their draw openings beyond the limits of this sheet. This information will be shown on the adjacent sheet to the westward, reg. no. T5329.

##### (E) Information from Other Sources.

The high water line along the outer coast was obtained by direct measurements at intervals along the coastline.

(see Field Inspection Report attached to Topo. Descriptive report, reg. no. T5286.) *(notes are made directly on the field photos Nos. 66-551-72 to 78)*

#### NAMES.

All names appearing on this compilation agree with those shown on the U.S.C. & G.S. charts 1216 and 3243 and are believed to be those in local usage at the present time.

#### LANDMARKS

The only landmarks to be shown on the final chart of this area include the standpipe at Seaside Heights and the tank at Seaside Park. (See Field Inspection Report attached to Desc. report for topo. sheet, reg. no. T5286, page 8.) Both of these landmarks were triangulated in by Lieut. C.D.Meaneay in 1932.

#### COMPARISON WITH OTHER SURVEYS

All junctions with adjoining sheets are satisfactory.

No comparison has been made with any of the previous topographic surveys of this locality. They are beleived to be valueless for comparison purposes as they were executed many years previous.

#### RECOVERABLE OBJECTS

All recoverable objects shown on this sheet (by  $2\frac{1}{2}$  mm. diam. black circle) have been listed on the following page. These stations have been described on form 524 by the Field Inspection Party. (see Topo. desc. report, reg. no. T5286)

#### RECOMMENDATIONS FOR FURTHER SURVEYS

This compilation is beleived to have a probable error of not more than two meters in position of well defined detail of importance for charting and of not more than four meters for other detail.

To the best of my knowledge this sheet is complete in all detail of importance for charting, within the accuracy stated above and no additional surveys are required at this time.

Submitted by:-

JUN 15 1935

*W. F. von Buehren*

W.F.vonBuehren, Draftsman.



LIST OF RECOVERABLE TOPOGRAPHIC STATIONS.

This list includes all recoverable objects shown by a small black circle on this sheet and previously described by the Field Inspection Party. (see Field Inspection Report attached to Topo. Desc. report, reg. no. T5286.)

<u>Description</u>	<u>Latitude</u>			<u>Longitude</u>			<u>Method of Determination</u>
	o	'	D.M.	o	'	D.P.	
Cupola	39	56	1132	74	04	413	@@@
Toms River C.G. Flagpole	39	56	190	74	04	558	@@@
Cupola- Gate House	39	53	512	74	05	38	\$\$\$
Iron Pole	39	52	970.8	74	04	1422.5	\$\$\$

Note:- Legend for "Method of Determination"-

@@@ By Air-Photo Plot.

\$\$\$ By theodolite-taped traverse (see Field Inspection report attached to topo. report T5286)

REVIEW OF AIR PHOTO COMPILATION T-5330  
Scale 1:10,000

Data Record

Triangulation to 1932  
Photographs to 1933  
Planetable surveys to 1935  
Hydrography to 1936  
Field inspection to January 1935

The detail of this compilation is that of the date of the photographs except for a few changes along the shoreline as determined by field inspection and 1935 planetable surveys.

Comparison with Contemporary Planetable Surveys

T-6396a (1935), 1:10,000  
T-6397a (1935), 1:10,000  
T-6397b (1935), 1:10,000

T-6396a at lat.  $39^{\circ} 54.8'$ , long.  $74^{\circ} 05.2'$  shows a portion of the Penn. R. R. Causeway approximately 5.0 m. south of the position shown on the compilation. The position as shown on the compilation has been accepted as correct as the photographs and the control are good.

The outer coast high water line on the compilation is of the date of field inspection and according to field inspection notes made on photo No. 74 (66-51) this inspection was made January 1935. The field inspection is sufficient for the general delineation of the high water line but is not exact as regards details because of insufficient reference measurements and the considerable lapse of time between the photography and the inspection. The planetable surveys show sections of high water line of a later date (June 1935) than the field inspection and differing by from 0.0 m. to 15.0 m. The compilation has not been changed as the planetable high water line is not complete.

All detail and information shown on the above graphic control surveys and covered by the compilation is shown on the compilation except temporary topographic signals and magnetic meridians.

Comparison with Contemporary Hydrographic Surveys

H-5870 (1935), 1:10,000  
H-5871 (1935), 1:10,000  
H-6136 (1936), 1:20,000  
H-6140 (1935 and 1936), 1:10,000

H-5871 at lat.  $33^{\circ} 55.1'$ , long.  $74^{\circ} 05.1'$  shows a wreck. This wreck cannot be seen on the photographs and has not been shown on the compilation. The compilation is in agreement with the soundings of the above hydrographic surveys.

Comparison with Former Topographic Surveys

T- 120 (1839), 1:20,000  
T-1371 (1874), 1:20,000  
T-2458 (1899), 1:20,000

A visual comparison shows there has been some erosion along the outer coast since the time of the above surveys.

The compilation is much more complete in detail and is adequate to supersede those portions of the above surveys which it covers.

Comparison with Charts 1216 and 3243

The charts at lat.  $33^{\circ} 55.1'$ , long.  $74^{\circ} 05.1'$  show a wreck which is also shown on H-5871 which can not be seen on the photographs and has not been shown on the compilation but is not questioned as to its existence and should not be removed from the charts.

July 7, 1937.

*L. C. Lande*  
L. C. Lande

## REVIEW OF AIR PHOTO COMPILATION NO. T 5330

Chief of Party: Roswell G. Bolstad

Compiled by: W.F.vonBuehren

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) R.R. track traverse data returned to owners.
- ✓ 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. Copy previously forwarded to Lt. Rigg. No reply received contrary to data furnished him.
- ✓ 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 lines, ~~and depths, and~~ ~~rocks~~, and legends pertaining to them is satisfactory. (Par. 36, 37, 38, 39, 40, 41) No low water lines shown on this sheet; this data may best be obtained from hydrographic surveys of Lt. Rigg, 1935.
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)
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 *adjusted* 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: Any additional requirements affecting this area are referred to the surveys of Lt. Rigg who is now conducting a combined operations party in this locality.

18. Examined and approved;  
Preliminary review-

*R.H. Peckworth.*  
R.H. Peckworth, Draftsman.

*Roswell C. Bolstad*  
Roswell C. Bolstad  
Chief of Party

19. Remarks after review in office:

Reviewed in office by: *L.C. Landy* *B.G. Jones*

Examined and approved:

*E. H. Green*  
Chief, Section of Field Records

*K.T. Adams*  
Acting Chief, Division of Charts

*Fred. L. Pearson*  
Chief, Section of Field Work

*G. Hude*  
Chief, Division of Hydrography  
and Topography.

## Remarks

## Decisions

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# GEOGRAPHIC NAMES

Survey No.

T-5330

Name on Survey

	A	B	C	D	E	F	G	H	K	
	On Chart No.	On previous survey No.	On U. S. quadrangle Maps	From local information	On local Maps	P. O. Guide or Map	Rand McNally Atlas	U. S. Light List		
<u>Barnegat Bay</u>	1216									1
<u>Island Beach</u>	1216									2
<u>Atlantio Ocean</u>	1216									3
<u>Seaside Park</u>	1216		✓			✓	✓			4
<u>Seaside Heights</u>	1216					✓	✓			5
										6
										7
										8
										9
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Names underlined in red approved

by *C. H. H. H.* on 3/4/30



## 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 \_\_\_\_\_

Positions checked by \_\_\_\_\_

Grid inked on machine by \_\_\_\_\_

Intersections inked by \_\_\_\_\_

Points used for plotting grid:

x  
y

x  
y

x  
y

x  
y

x  
y

x  
y

x  
y

x  
y

Triangulation stations used for checking grid:

1. \_\_\_\_\_ 5. \_\_\_\_\_

2. \_\_\_\_\_ 6. \_\_\_\_\_

3. \_\_\_\_\_ 7. \_\_\_\_\_

4. \_\_\_\_\_ 8. \_\_\_\_\_

\* This grid was not plotted on celluloid because of poor projection. The attached computations may be used later. R.E.Ask.

# GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE New Jersey

STATION T-5330-1

$x$	<u>2,160,000.00</u>	$\log S_e$	<u>5.20411575</u>
$K$		$\log (1200/3937)$	<u>9.48401583</u>
$x' (=x-K)$	<u>+160 000.00</u>	$\log (1/R)$	<u>1086</u>
$x'^3/(6\rho_o^2)_e$	<u>1.56</u>	$\log S_m$	<u>4.68814244</u>
$S_e$	<u>159,998.44</u>	cor. arc to sine	<u>422</u>
		$\log S_1$	<u>4.68813822</u> ✓
$3 \log x'$	<u>5,612 35994</u>	$\log A$	<u>8.50911985</u>
$\log 1/(6\rho_o^2)_e$	<u>4.581 0213</u>	$\log \sec \phi$	<u>0.11538931</u>
$\log x'^3/(6\rho_o^2)_e$	<u>0.193 38124</u>	$\log \Delta\lambda_1$	<u>3.31264738</u>
		cor. sine to arc	<u>+ 718</u>
$\log S_m^2$	<u>9.37628488</u> ✓	$\log \Delta\lambda$	<u>3.31265456</u>
$\log C$	<u>1.327491</u> ✓	$\Delta\lambda$	<u>2054.2560</u>
$\log \Delta\phi$	<u>0.703776</u>		
$y$	<u>405 000.00</u>		
$\phi'$ (by interpolation)	<u>39 56 42.9461</u> ✓	$\lambda$ (central mer.)	<u>74 40 "</u>
$\Delta\phi$	<u>5.2556</u>	$\Delta\lambda$	<u>34 14.2560</u>
$\phi$	<u>39 56 37.8905</u>	$\lambda$	<u>74 05 45 7440</u>

Explanation of form:

$$x' = x - K$$

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

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

$R$  = scale reduction factor

$\phi'$  is interpolated from table of  $y$

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

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

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

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

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

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

# GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE New Jersey

STATION T-5330-2

$x$	<u>2,175 000.00</u>	$\log S_e$	<u>5.243 03299</u>
$K$		$\log (1200/3937)$	<u>9.484 01583</u>
$x' (=x-K)$	<u>175 000.00</u>	$\log (1/R)$	<u>1086</u>
$x'^3/(6\rho_e^2)_e$	<u>2.04</u>	$\log S_m$	<u>4.7270 5968</u>
$S_e$	<u>174997.96</u>	cor. arc to sine	<u>505</u>
		$\log S_1$	<u>4.7270 5463</u>
$3 \log x'$	<u>5.72908415</u>	$\log A$	<u>8.509 11 986</u>
$\log 1/(6\rho_e^2)_e$	<u>4.5810213</u>	$\log \sec \phi$	<u>0.11538756</u>
$\log x'^3/(6\rho_e^2)_e$	<u>0.310 10545</u>	$\log \Delta\lambda_1$	<u>3.35156205</u>
		cor. sine to arc	<u>+ 860</u>
$\log S_m^2$	<u>9.45411936</u>	$\log \Delta\lambda$	<u>3.35157065</u>
$\log C$	<u>1.327491</u>	$\Delta\lambda$	<u>2246.8322</u>
$\log \Delta\phi$	<u>0.781610</u>		
$y$	<u>405,000.00</u>		
$\phi'$ (by interpolation)	<u>39° 56' 42.9461</u>	$\lambda$ (central mer.)	<u>74 40 "</u>
$\Delta\phi$	<u>6.0480</u>	$\Delta\lambda$	<u>37 26.8322</u>
$\phi$	<u>39 56 36.8981</u>	$\lambda$	<u>74 02 33.1678</u>

Explanation of form:

$$x' = x - K$$

$$S_e = x' - \frac{x'^3}{(6\rho_e^2)_e}$$

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

$R$  = scale reduction factor

$\phi'$  is interpolated from table of  $y$

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

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

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

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

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

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

# GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE New Jersey

STATION T-5330-3

$x$	<u>2,160,000.00</u>	$\log S_0$	<u>5.20411575</u>
$K$		$\log (1200/3937)$	<u>9.48401583</u>
$x' (=x-K)$	<u>+160 000.00</u>	$\log (1/R)$	<u>1086</u>
$x'^3/(6\rho_0^2)_0$	<u>1.56</u>	$\log S_m$	<u>4.68814244</u>
$S_0$	<u>159 998.44</u>	cor. arc to sine	<u><del>422</del></u>
		$\log S_1$	<u>4.68813822</u>
$3 \log x'$	<u>5.612 35994</u>	$\log A$	<u>8.50912194</u>
$\log 1/(6\rho_0^2)_0$	<u>4.581 0213</u>	$\log \sec \phi$	<u>0.114 86 732</u>
$\log x'^3/(6\rho_0^2)_0$	<u>0.193 38124</u>	$\log \Delta\lambda_1$	<u>3.31212765</u>
		cor. sine to arc	<u>+ 716</u>
$\log S_m^2$	<u>9.37628488</u>	$\log \Delta\lambda$	<u>3.31213501</u>
$\log C$	<u>1.326230</u>	$\Delta\lambda$	<u>2051.7999</u>
$\log \Delta\phi$	<u>0.702515</u>		<u>82</u>
$y$	<u>375 000.00</u>		
$\phi'$ (by interpolation)	<u>39° 51' 46.4581</u>	$\lambda$ (central mer.)	<u>74° 40' 59"</u>
$\Delta\phi$	<u>5.0410</u>	$\Delta\lambda$	<u>34 11.7922</u>
$\phi$	<u>39 51 41.4171</u>	$\lambda$	<u>74 05 48.2000</u>
			<u>18</u>

Explanation of form:

$$x' = x - K$$

$$S_0 = x' - \frac{x'^3}{(6\rho_0^2)_0}$$

$$S_m = \frac{1}{R} \left( \frac{1200}{3937} \right) S_0$$

$R$  = scale reduction factor

$\phi'$  is interpolated from table of  $y$

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

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

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

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

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

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

# GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE New Jersey STATION T-5330-4

$x$	<u>2,175 000.00</u>	$\log S_g$	
$K$		$\log (1200/3937)$	<u>9 . 4 8 4 0 1 5 8 3</u>
$x' (=x-K)$		$\log (1/R)$	
$x'^3/(6\rho_0^2)_g$		$\log S_m$	
$S_g$		cor. arc to sine	
		$\log S_1$	<u>4.72705463</u>
$3 \log x'$		$\log A$	<u>8.50912195</u>
$\log 1/(6\rho_0^2)_g$		$\log \sec \phi$	<u>0.11486558</u>
$\log x'^3/(6\rho_0^2)_g$		$\log \Delta\lambda_1$	<u>3.35104216</u>
		cor. sine to arc	<u>+ 857</u>
$\log S_m^2$	<u>9.45411936</u>	$\log \Delta\lambda$	<u>3.35105073</u>
$\log C$	<u>1.326230</u>	$\Delta\lambda$	<u>2244.1440</u>
$\log \Delta\phi$	<u>0.780349</u>		
$y$	<u>375 000 00</u>		
$\phi'$ (by interpolation)	<u>39° 51' 46.458"</u>	$\lambda$ (central mer.)	<u>74° 40' "</u>
$\Delta\phi$	<u>6.0304</u>	$\Delta\lambda$	<u>37 24.1440</u>
$\phi$	<u>39 51 40.4277</u>	$\lambda$	<u>74 02 35.8560</u>

Explanation of form:

$$x' = x - K$$

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

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

$R$  = scale reduction factor

$\phi'$  is interpolated from table of  $y$

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

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

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

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

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

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

# GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE New Jersey

STATION T-5330-5

$x$	<u>2,165 000.00</u>	$\log S_0$	<u>5.21747944</u>
$K$		$\log (1200/3937)$	<u>9.48401583</u>
$x' (=x-K)$	<u>+165 000.00</u>	$\log (1/R)$	<u>1086</u>
$x'^3/(6\rho_0^2)_0$	<u>1.71</u>	$\log S_m$	<u>4.70150693</u>
$S_0$	<u>164 998.29</u>	cor. arc to sine	<u>449</u>
		$\log S_1$	<u>4.70150164</u>
$3 \log x'$	<u>5.65245182</u>	$\log A$	<u>8.50912089</u>
$\log 1/(6\rho_0^2)_0$	<u>4.5810213</u>	$\log \sec \phi$	<u>0.11512757</u>
$\log x'^3/(6\rho_0^2)_0$	<u>0.23347312</u>	$\log \Delta\lambda_1$	<u>3.32575010</u>
		cor. sine to arc	<u>+ 763</u>
$\log S_m^2$	<u>9.40301226</u>	$\log \Delta\lambda$	<u>3.32575773</u>
$\log C$	<u>1.326860</u>	$\Delta\lambda$	<u>2107.4522</u>
$\log \Delta\phi$	<u>0.729872</u>		<u>2117.1797</u>
			<u>4522</u>
$y$	<u>390,000.00</u>		
$\phi'$ (by interpolation)	<u>39° 54' 14.7026</u>	$\lambda$ (central mer.)	<u>74° 40' "</u>
$\Delta\phi$	<u>5.3687</u>	$\Delta\lambda$	<u>3517.4522</u>
$\phi$	<u>39° 54' 09.3339</u>	$\lambda$	<u>74° 04' 42.5478</u>

Explanation of form:

$$x' = x - K$$

$$S_0 = x' - \frac{x'^3}{(6\rho_0^2)_0}$$

$$S_m = \frac{1}{R} \left( \frac{1200}{3937} \right) S_0$$

$R$  = scale reduction factor

$\phi'$  is interpolated from table of  $y$

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

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

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

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

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

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