5330

5330

5330

1216-2

*State:* New Jersey

# DESCRIPTIVE REPORT

Photo
*Topographic* }
~~Hydrographic~~ } *Sheet No.* T 5330

## LOCALITY

*Atlantic Coast*

~~Island Beach.~~

Seaside Heights to ~~Cedar Creek~~

~~C.G. Station.~~

| | |
|---|---|
| Photographs taken in | 1932 - 1933 |
| Field Inspection and | |
| Plane table surveys | 1935 |
| Compiled | 1935 |

~~193 6~~

## CHIEF OF PARTY

Roswell C. Bolstad,    Jr. H.& G.E.

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

**DEPARTMENT OF COMMERCE**
**U.S. COAST AND GEODETIC SURVEY**

# TOPOGRAPHIC TITLE SHEET

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

Field No...74................    **T5530**

REGISTER NO. T 5530

State                          New Jersey



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

Date of photographs -  July 25, 1932

Scale...1: 10,000....... Date of survey compilation....Feb. 28......, 19.35

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

Reviewer and recommended for approval

Chief of party....Roswell C. Bolstad, Jr. H.& 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

- STATISTICS -

on

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

Photographs Nos. 66-51-72 to 78 inclusive, taken July 25, 1932.
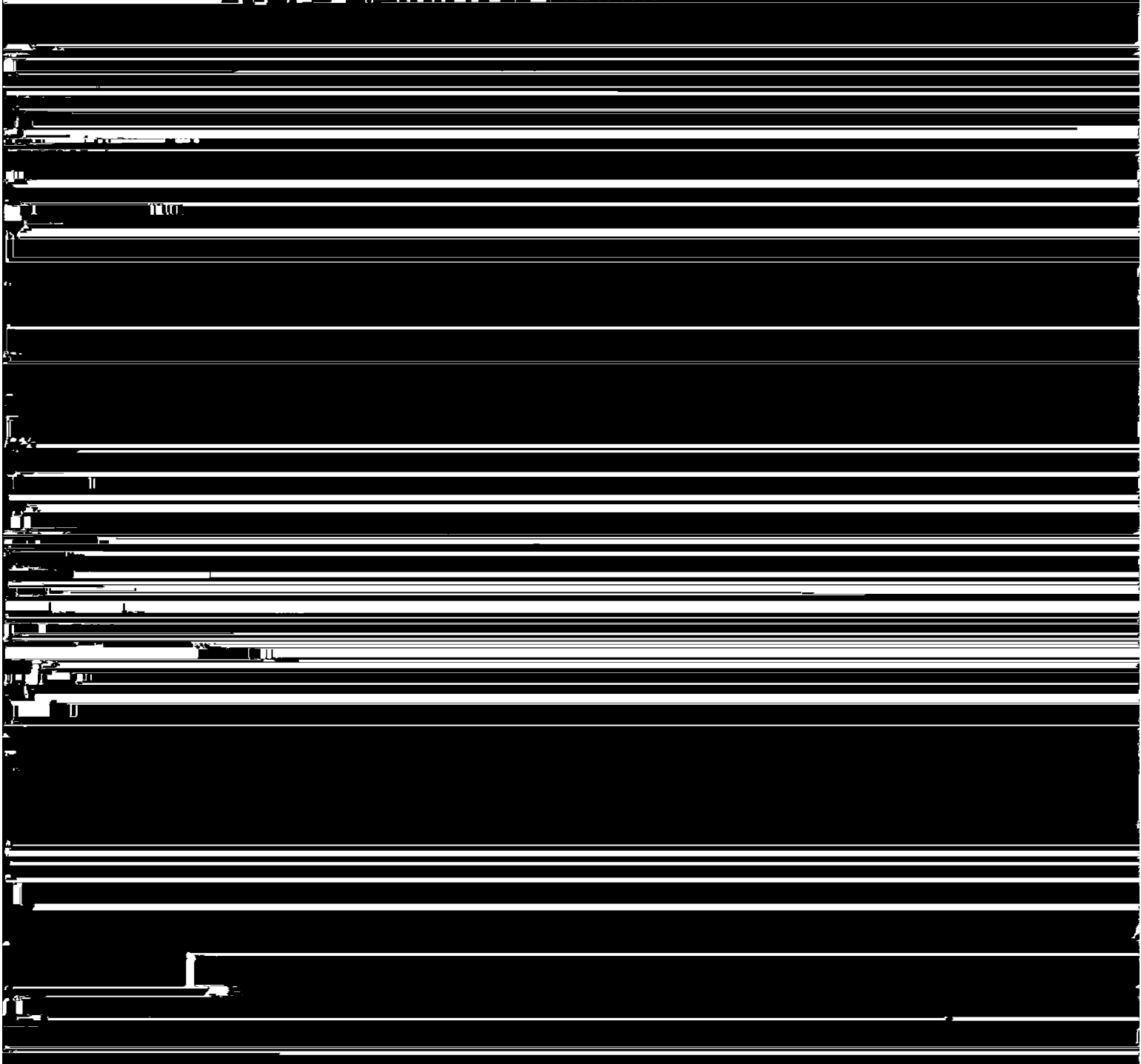Photos M9(871-14) to M23 incl.(reference only) " Jan. 23, 1933 @ 12 Noon.

| | BY | DATE | |
|---|---|---|---|
| | | From | To. |

SCALE FACTOR = 1.000
PROJECTION _ _ _ _ _ _ _ _ D.B.Bogart _D. B. Bogart_ 10/8/34 _ _ _ _ _
PROJECTION CHECKED _ _ _ _ _ J.P.O'Donnell _J. O'Donnell_ 10/8/34 _ _ _ _ _
CONTROL PLOTTED _ _ _ _ _ _ W.E.Brown _W.E.Brown_ 11/1/34 _ _ _ _ _
CONTROL CHECKED _ _ _ _ _ L.K.Batcheller _L.K.Batcheller_ _ _ _

## 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.

(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 adj-
ustments 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 main-
land 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-#51-72 &578

NAMES.

    All names appearing on this compilation agree with those shown
on the U.S.C.& G.S. charts 1216 and 3243 and are beleived to be those
in local useage 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. (Seel 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.Meaney in 1932.


COMPARISON WITH OTHER SURVEYS
     All junctions with adjoining sheets are satisfactory.
     No comparison has been made with any of the previous topo-
graphic 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.)

| Description | Latitude | | | Longitude | | | Method of |
|---|---|---|---|---|---|---|---|
| | o | ' | D.M. | o | ' | D.P. | Determination |
| 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)

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° 54.8', long. 74° 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° 55.1', long. 74° 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° 55.1', long. 74° 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.

*L. C. Lande*

July 7, 1937.

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 naviga-
   tion 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 applica-
   tion 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 xxxxxxxxxxxx coast is clear and ade-
✓  quate 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 Compila-
tion of Planimetric Line Maps from Five Lens Air Photographs."   M-87

8. The representation of low water lines, ~~ranCoprocodacorrocdcocomol~~
~~rooks~~, 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 naviga-
tion 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.

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, Draftsman.

Roswell C. Bolstad
Chief of Party

19. Remarks after review in office:

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

Examained and approved:

Chief, Section of Field Records

Chief, Section of Field Work

Acting Chief, Division of Charts

Chief, Division of Hydrography and Topography.

| | Remarks | Decisions |
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# GEOGRAPHIC NAMES

Survey No.

T-5330

| Name on Survey | On Chart No. A | On previous survey No. B | On U. S. quadrangle Maps C | From local information D | On local Maps E | P. O. Guide or Map F | Rand McNally Atlas G | U. S. Light List H | K | |
|---|---|---|---|---|---|---|---|---|---|---|
| Barnegat Bay | 1216 | | | | | | | | | 1 |
| Island Beach | 1216 | | | | | | | | | 2 |
| Atlantic Ocean | 1216 | | | | | | | | | 3 |
| Seaside Park | 1216 | | ✓ | | | ✓ | ✓ | | | 4 |
| Seaside Heights | 1216 | | | | | ✓ | ✓ | | | 5 |
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Names underlined in red approved
by ⟨signature⟩ on 3/4/36

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NR.
T-5330

# 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 _____          x _____
y _____          y _____

x _____          x _____
y _____          y _____

x _____          x _____
y _____          y _____

x _____          x _____
y _____          y _____

Triangulation stations used for checking grid:

1. _____          5. _____

2. _____          6. _____

3. _____          7. _____

4. _____          8. _____

# GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE __New Jersey__          STATION __T-5330-1__

| | | | |
|---|---|---|---|
| $x$ | 2,160,000.00 | $\log S_g$ | 5.204 11 575 |
| $K$ | | $\log (1200/3937)$ | 9.484 01 583 |
| $x' (=x-K)$ | +160 000.00 | $\log (1/R)$ | 1086 |
| $x'^3/(6\rho_0^2)_g$ | — 1.56 | $\log S_m$ | 4.688 14 244 |
| $S_g$ | 159,998.44 | cor. arc to sine | — 422 |
| | | $\log S_1$ | 4.688 13 822 |
| $3 \log x'$ | 5,612 35994 | $\log A$ | 8.509 11 985 |
| $\log 1/(6\rho_0^2)_g$ | 4.581 0213 | $\log \sec \phi$ | 0.115 38 931 |
| $\log x'^3/(6\rho_0^2)_g$ | 0.193 38 124 | $\log \Delta\lambda_1$ | 3.312 64 735 |
| | | cor. sine to arc | + 718 |
| $\log S_m^2$ | 9.376 28488 | $\log \Delta\lambda$ | 3.312 65 456 |
| $\log C$ | 1.327 491 | $\Delta\lambda$ | 2054".2560 |
| $\log \Delta\phi$ | 0.703.776 | | |
| | | | |
| $y$ | 405 000.00 | | |
| $\phi'$ (by interpolation) | 39° 56' 42".9461 | $\lambda$ (central mer.) | 74° 40' " |
| $\Delta\phi$ | — 5.0556 | $\Delta\lambda$ | 34 14.2560 |
| $\phi$ | 39 56 37.8905 | $\lambda$ | 74 05 45.7440 |

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 $y$

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

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

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

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

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

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

# GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE _New Jersey_                     STATION _T-5330-2_

| | | | |
|---|---|---|---|
| $x$ | 2,175 000, 00 | $\log S_g$ | 5.24303299 |
| $K$ | | $\log (1200/3937)$ | 9.48401583 |
| $x'\ (=x-K)$ | 175 000  00 | $\log (1/R)$ | 1086 |
| $x'^3/(6\rho_0{}^2)_0$ | — 2.04 | $\log S_m$ | 4.72705968 |
| $S_g$ | 174997.96 | cor. arc to sine | — 505 |
| | | $\log S_1$ | 4.72705463 |
| $3 \log x'$ | 5.72908415 | $\log A$ | 8.50911986 |
| $\log 1/(6\rho_0{}^2)_0$ | 4.5810213 | $\log \sec \phi$ | 0.11538756 |
| $\log x'^3/(6\rho_0{}^2)_0$ | 0.31010545 | $\log \Delta\lambda_1$ | 3.35156205 |
| | | cor. sine to arc | + 860 |
| $\log S_m{}^2$ | 9.45411936 | $\log \Delta\lambda$ | 3.35157065 |
| $\log C$ | 1.327491 | $\Delta\lambda$ | 2246.8322 |
| $\log \Delta\phi$ | 0.781610 | | |
| $y$ | 405,000, 00 | | |
| $\phi'$ (by interpolation) | 39° 56' 42".9461 | $\lambda$ (central mer.) | 74° 4' 0" |
| $\Delta\phi$ | — 6.0480 | $\Delta\lambda$ | 37 26.8322 |
| $\phi$ | 39 56 36.8981 | $\lambda$ | 74 02 33.1678 |

Explanation of form:

$$x' = x - K$$

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

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

$R =$ 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 - $ cor. arc to sine

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

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

# GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE __New Jersey__          STATION __T-5330-3__

| | | | |
|---|---|---|---|
| $x$ | 2,160,000.00 | $\log S_g$ | 5.20411575 |
| $K$ | | $\log (1200/3937)$ | 9.48401583 |
| $x' (=x-K)$ | +160 000.00 | $\log (1/R)$ | 1086 |
| $x'^3/(6\rho_0^2)_g$ | − 1.56 | $\log S_m$ | 4.68814244 ~~422~~ ~~385~~ |
| $S_g$ | 159 998.44 | cor. arc to sine | − |
| | | $\log S_1$ | 4.68813854 ~~32~~ |
| $3 \log x'$ | 5.61235994 | $\log A$ | 8.50912194 |
| $\log 1/(6\rho_0^2)_g$ | 4.58101213 | $\log \sec \phi$ | 0.11486732 |
| $\log x'^3/(6\rho_0^2)_g$ | 0.19338124 | $\log \Delta\lambda_1$ | 3.31212708 ~~48~~ |
| | | cor. sine to arc | + 716 ~~464~~ |
| $\log S_m^2$ | 9.37628488 | $\log \Delta\lambda$ | 3.31213568 |
| $\log C$ | 1.326230 | $\Delta\lambda$ | 2051.7977 ~~82~~ |
| $\log \Delta\phi$ | 0.702515 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $y$ | 375 000.00 | | | | | | |
| | | ° | ′ | ″ | | | |
| $\phi'$ (by interpolation) | | 39 | 51 | 46.4581 | $\lambda$ (central mer.) | 74 40 39 | |
| $\Delta\phi$ | − | | | 5.0410 | $\Delta\lambda$ | 34 11.79 ~~82~~ | |
| $\phi$ | | 39 | 51 | 41.4171 | $\lambda$ | 74 05 48.20 | |
| | | | | | | 18 | |

Explanation of form:

$x' = x - K$

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

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

$R$ = scale reduction factor

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

$\Delta\phi = C S_m^2$

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

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

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

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

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

# GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE __New Jersey__          STATION __T-5330-4__

| | | | |
|---|---|---|---|
| $x$ | 2,175 000.00 | $\log S_g$ | |
| $K$ | | $\log (1200/3937)$ | 9 . 4 8 4 0 1 5 8 3 |
| $x'\ (=x-K)$ | | $\log (1/R)$ | |
| $x'^3/(6\rho_0{}^2)_g$ | — | $\log S_m$ | |
| $S_g$ | | cor. arc to sine | — |
| | | $\log S_1$ | 4.72705463 |
| $3 \log x'$ | | $\log A$ | 8.50912195 |
| $\log 1/(6\rho_0{}^2)_g$ | | $\log \sec \phi$ | 0.11486558 |
| $\log x'^3/(6\rho_0{}^2)_g$ | | $\log \Delta\lambda_1$ | 3.35104216 |
| | | cor. sine to arc | + 857 |
| $\log S_m{}^2$ | 9.4541193 6 | $\log \Delta\lambda$ | 3.35105073 |
| $\log C$ | 1.326230 | $\Delta\lambda$ | 2244.1440" |
| $\log \Delta\phi$ | 0.780349 | | |
| | | | |
| $y$ | 375 000 00 | | |
| $\phi'$ (by interpolation) | 39° 51' 46.4581" | $\lambda$ (central mer.) | 74° 40' " |
| $\Delta\phi$ | − 6.0304 | $\Delta\lambda$ | 37 24.1440 |
| $\phi$ | 39 51 40.4277 | $\lambda$ | 74 02 35.8560 |

Explanation of form:

$x' = x - K$

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

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

$R$ = 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 - $ cor. arc to sine

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

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

# GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE _New Jersey_                STATION _T-5330-5_

| | | | |
|---|---|---|---|
| $x$ | 2,165 000.00 | $\log S_g$ | 5.21747944 |
| $K$ | | $\log (1200/3937)$ | 9.48401583 |
| $x'\ (=x-K)$ | +165 000.00 | $\log (1/R)$ | 1086 |
| $x'^3/(6\rho_o{}^2)_g$ | − 1.71 | $\log S_m$ | 4.7015069 3 |
| $S_g$ | 164 998.29 | cor. arc to sine | − 449 |
| | | $\log S_1$ | 4.7015016 4 |
| $3 \log x'$ | 5.65245182 | $\log A$ | 8.50912089 |
| $\log 1/(6\rho_o{}^2)_g$ | 4.5810213 | $\log \sec \phi$ | 0.11512757 |
| $\log x'^3/(6\rho_o{}^2)_g$ | 0.23347312 | $\log \Delta\lambda_1$ | 3.32575010 |
| | | cor. sine to arc | + 763 |
| $\log S_m{}^2$ | 9.40301226 | $\log \Delta\lambda$ | 3.32575773 |
| $\log C$ | 1.326860 | $\Delta\lambda$ | 2107.4522 |
| $\log \Delta\phi$ | 0.729872 | | 2117.1797 |
| | | | 4522 |
| $y$ | 390, 000.00 | | |
| $\phi'$ (by interpolation) | 39° 54' 14.7026" | $\lambda$ (central mer.) | 74° 40' " |
| $\Delta\phi$ | − 5.3687 | $\Delta\lambda$ | 35 17.4522 |
| $\phi$ | 39 54 09.3339 | $\lambda$ | 74 04 42 5478 |

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

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

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

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

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

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

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

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