5204

DESCRIPTIVE REPORT

Map Drawing
~~Topographic~~
~~Hydrographic~~ } Sheet No. T-5204
(19)

State .... F L O R I D A

LOCALITY

ST. JOHNS RIVER

ORANGE MILLS and Vicinity

Photographs taken February 27, 28

and March 1, 1935.

1939

CHIEF OF PARTY

Hubert A. Paton - Riley J. Sipe

Applied to chart Comp. 686 January 13, 1940 H.C. MacEwen

/ ≡≡ //
/

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. .19...............

REGISTER NO. T-5204 **T5204**

State................ Florida

General locality.......... St. Johns River.

Locality.................... Orange Mills and Vicinity.

Photographs

Scale .1:10,000........... Date of ~~survey~~ Feb. 27, 28, Mar. 1...., 1935.

Vessel............... Party No. AP 2A

Chiefs of party.......... Hubert A. Paton - Riley J. Sipe

Surveyed by............. See Page 1

Inked by.................... D. R. Skallenberger

Heights in feet above...None............to ground to tops of trees

Contour, Approximate contour, Form line interval none feet

Instructions dated................. March 4., ..., 19 35

Remarks: ..... Camera No. 32-2 U. S. Army Air Corps Field

Inspection Nov. 1938

NOTES ON COMPILATION

SHEET NO 19.

REGISTER NUMBER T-5204

See next page for date of field surv. and Supplemental Surv.

PHOTOGRAPHS:

Five Lens Flight No. 11; Nos. 538 to 542, Feb. 27, 1935
Five Lens Flight No. 12; Nos. 275 to 291, Feb. 28, 1935
Five Lens Flight No. 15; Nos. 635 to 653, Mar. 1, 1935

SCALE PLOT BY: H. A. Paton

SCALE FACTOR USED: 1.00

PROJECTION BY: Washington Office

CONTROL PLOTTED: F. R. Gossett

CONTROL CHECKED: H. A. Paton

SMOOTH RADIAL PLOT BY: H. A. Paton

DETAIL INKED BY: D. R. Shallenberger

OVERLAY SHEET BY: D. R. Shallenberger

AREA OF DETAIL INKED: 12.7 Square Statute Miles

LENGTH OF SHORELINE (over 200 m)   7.2 Statute Miles

LENGTH OF SHORELINE (under 200m)   6.5 Statute Miles

LENGTH OF SHORELINE OF SMALL LAKES   1.7 Statute Miles

Ref. Sta. Hastings 1933   Lat. $29°42'51.059''$ (1572.1 m) adjusted
Long. $81°31'45.201''$ (1215.0 m)

$x = 331,999.08$

$y = 1,956,293.77$

FIELD INSPECTION AND SUPPLEMENTAL SURVEYS

Photographs taken Feb. 27,28, and Mar. I, 1935

Graphic Control Survey C. S. I62 M made about May, 1935

Field Inspection made about in Nov. I938

Details o T 5204 are of the date of the photographs with the exception of:

I. Shoreline details such as Piers, Piling, and stakes
   located by the Graphic Control Survey.

2. Pier at Lat 29 42.4 Long 8I 33.5 located by Field Inspection.

DESCRIPTIVE REPORT

TO ACCOMPANY MAP

DRAWING NUMBER 19, REGISTER

NUMBER T-5204

February 8,1939.

GENERAL INFORMATION:
            This sheet was compiled from air photographs taken by
the U. S. Army Air Corps, using a five lens camera No. 32-2.

            The main part of the sheet was covered by part of
Flight No. 15, photographs No. 635 to 653 inclusive. The western part of
the sheet was covered by part of Flight No. 12, photographs No. 275 to 291
inclusive. Part of Flight 11, photographs No. 538 to 542, inclusive,
cover a small portion of the northwest corner. These last, being badly
out of scale, were not used as this area was adequately covered by Flight
No. 12. The scale of Flight No. 12 was 1.00 and the scale of Flight N_0.15
was .99 and the projection was made with a scale factor of 1.00

            No difficulty was experienced from a photographic
viewpoint in compiling the detail shown on this sheet.

CONTROL:
            A total of 24 control points were plotted on this
sheet, of which 11 lie within the tracinglimits.Of these, 8 were triangu-
lation stations established by this party in 1934 and 1935, two were from
G. C. Sheet K K and one was a traverse station established by the Florida
Geodetic Survey.
            The radial plot was put through without difficulty.
F. I. S. point D at triangulation station Boy was found to be in error.
Value used was that given in description of station which checked. G. C.
Station PUS was found in error 8 meters and was moved southeast to cor-
rect position.

GENERAL DESCRIPTION OF TOPOGRAPHY:
            This sheet covers the territory along the east side of
the St. Johns River from the vicinity of Federal Point south to Dog Branch
and on the west shore from the vicinity of Bridgeport south to Fairview
Point.
            The east shoreline is principally high ground with
small isolated areas of swamp. The west shoreline is about evenly divided
between high ground and swamp. Most of the high ground is in the form of
a bluff which attains a height of 12 feet at Dancy Point.

            The principal part of the area shown on this sheet
lies between Hastings, Federal Point and East Palatka and is part of an
agricultural section which is well known for its production of vegetables,
especially potatoes, cabbage and beans.

FIELD INSPECTION:

            The field inspection was made by truck in November,1938.

JUNCTIONS:

On the south this sheet is joined by Sheet No. 5196 which has been completed. There was no detail involved as this junction is beyond the tracing limits of the photographs. On the west, this sheet is joined by Sheets No. 5202 and 5203 which are being compiled. Satisfactory junctions have been made with each. On the north this sheet will be joined to Sheet No. 5236 and No 5205 which have not been compiled.

COMPARISON WITH PREVIOUS SURVEYS:

U. S. Coast & Geodetic Survey Chart No. 684 compared favorably as well as could be determined due to difference in scale. Changes in wharves are due to disintegration, or removal of old and building of new ones. Change of the name Verdiere Point to Fairview Point, and elimination of the names Orange Mills P. O. and Oak Villa P. O. are discussed under geographic names.

TCS.162M This map drawing was compared in detail with Graphic Control Sheet KK which was surveyed by this party in 1935. A discrepancy of approximately 6 meters at the mouth of Canal No. 17 was noted as well as a difference of approximately 8 meters near Mays Branch. Location of ruined pier in Murphys Cove fails to check by about 13 meters.

Comparison was made with U. S. E. Topographic maps compiled from Air photographs in 1933, Sheets 1 and 2, Route 13 B. The difference in number of houses is due to outhouses, chicken houses, small sheds and other small unimportant buildings being omitted from this sheet. Where differences occur in shoreline it is believed that this sheet represents the true conditions more accurately. Where trails and ditches shown on the survey have been omitted from this sheet, additional field inspection has shown the ditches to be unimportant and the trails reduced to paths crossed by ditches and not passable for vehicles.

A comparison was made with U. S. C. & G. S. surveys of 1884 and 1885 of which we have reproductions on the same scale as this sheet. The shoreline agreed remarkably well, the principal differences being the shore-line along swamp.

This sheet also compares well with U. S. Geological Survey Quadrangle Palatka, 1926, although detailed comparison was impossible due to difference in scale.

POWER TRANSMISSION LINES:

Two power transmission lines were shown parallel to roads have been displaced slightly for clearness in representation.

TOLL LINES:

Where parallel to road, symbol has been kept as close to road as practical. Position of portion between road and railroad was determined by measurement on field inspection. At railroad, Toll Line joins numerous other lines and runs with railroad northwesterly toward Hastings.

ROADS:

The road parallel to railroad at Orange Mills R. R. Station has been displaced in order to show railroad siding. In accordance with recent instructions, all trails leading to houses or to the shoreline are shown as second class roads. / _there are not trails but second_

class roads BJP

DITCHES:

        The area covered by this sheet contains many drainage
ditches. Only the most prominent are shown.

BUILDINGS:

        All buildings,except small sheds, outhouses, chichen houses
etc., that could be seen on the photographs including those located by
field inspection were shown. A new house adjacent to Simpkins Branch
was located by measurements on field inspection.

PIERS:

        A new pier is shown adjacent to Simpkins Branch and was
located by field inspection.

WRECKS:
        A sunken barge off Dancy Point, grounded and bares 3 ft. at M.L.W.
was transferred from G. C. Sheet K K.

GEOGRAPHIC NAMES:
        The names on the overlay were obtained from the following
sources.

    1. Name established by local usage.
    2. U. S. C. & G. S. Chart No. 684
    3. U. S. G. S. Palatka Quadrangle, 1926.
    4. Putnam County Precinct Map.
    5. Department of Agriculture, Soil Map Putnam Co.
    6. U. S. G. S., State of Florida, 1932
    7. Putnam County Commissioners Map
    8. Sectional Map of Florida, State Dept.of Agriculture,1938
    9. Official Road Map, Fla. State Road Dept., 1936
   10. U. S. C. & G. S. T-1564 A, Survey of 1884 -1885
   11. Graphic Control Sheet KK
   12. Real Estate Plat in office of Loveland & Tanner,Palatka,Fla.
   13. Light List, South Atlantic Coast, 1938
   14. Randall Wells, Putnam County, Fla. Tax Collector.
   15. Descriptive Report of G. C. Sheet KK

BODINES POINT: Sources 1, 4, and 7.
        A point on the west shore of the St. Johns River midway
between Masons Creek and Fairview Point.

CANAL NO. 17: Source 12.
        On the east shore ofthe St. Johns River a drainage canal
between Mays Landing and Mays Branch.

DANCY POINT: Sources 1 and 4.
        A point on the east shore of the St. Johns River between
Murphys Cove and Simpkins Branch. Source 5 shows Dancy's Point but this
form is not recommended. The name was derived from the estate of Col.
Dancy, which is indicated on source 10. According to Mrs. J. H. Millican,
410 North 4th St., Palatka, Fla., the granddaughter of Col. Dancy, the
name was originally D'Ancy, later simplified to Dancy. The spelling,
"Dancey", as shown at Beacon 53, is in error. Also "Dancey" on source 10.

GEOGRAPHIC NAMES

Survey No.   T-5204

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	
St. Johns River										1
Orange Mills										● 2
Murphys Cove										3
Hawhead Swamp										4
Dancey Point										5
Myrtlewood Point										6
Fairview										7
Dog Branch										8
Simpkins Branch										9
Mays Branch										10
Mays Landing										11
Mays Swamp										12
Middle Point										13
Verdiere Point										14
Bodine Point										15
Masons Creek										16
Orange Mill Flat										17
Cole Point										18
Garden Homes										19
Fair.										20
										21
										22
										● 23
										24
										25
										26
										27

Names underlined in red approved
by L. Heck on 7/15/39

M 234

	Remarks	Decisions	
1			USGB
2		296815	
3		"	
4		"	
5	After originally approved as Dancy, the name was reconsidered & changed to Dancey.(TMP. on authority of L.Heck.)	297815	
6		"	
7		"	
8		"	
9		"	
10		"	
11		"	
12		"	
13		"	
14	Not Fairview Point: a recent Board decision.	"	USGB
15		"	
16		"	
17		"	
18	From GNS 684: point just west of Mays Branch (signal Boy)	"	
19		296815	
20			
21			
22			
23			
24			
25			
26			
27			

M 234

DOG BRANCH: Sources, 1, 2, 3, 5 and 10.
             A stream on the east shore of the t. Johns River, west of
Murphys Cove.

FAIRVIEW: Sources 1, 3, 5, 7 and 8.
             A section in the vicinity of Fairview Point.

FAIRVIEW POINT: Sources 1 and 16.
             On the west shore of the St. Johns River, the second point south
of Bodines Point. Although shown as Verdiere Point on sources 2, 3, 4, 5
7 and 10, this name was not known to those interviewed. The name, Fairview
Point, being well established by local usage, is therefore recommended.

GARDEN HOMES: Sources 1 and 12.
             A subdivision on State Highway No. 14 between East Palatka and
Orange Mills.

HAWHEAD SWAMP: Source 1.
             A swamp west of Orange Mills so named because of haws which
grew in vicinity. This swamp extends north and south of drainage Canal No.
17. North of Canal No. 17 and outside of the normal tracing limits, Hawhead
Swamp becomes Hawhead Branch which flows into Cracker Branch which has its
source in cracker swamp, east of, but connected to Hawhead Swamp. Sources
3 and 7 call Hawhead Branch, Crocker Creek. Above names and locations were
substantiated by personal interviews with the following persons:

             Mrs. C. L. Ross, Box 225, Hastings, Fla., resident for 50 years
             Mr. G. M. Wilkinson, Hastings, Fla., resident for 40 years.
             Mr. E. Cruse, Hastings, Fla., resident for 17 years.
MASONS CREEK: Source 14.
             On the west shore of the St. Johns River, a stream between
Bodines Point and Bridgeport.

MAYS BRANCH: Source 12.
             On the east hhore of the St. Johns River, a stream between
Mays Landing and Simpkins Branch. Also substantiated by Mrs. J. H. Millican,
410 North 4th Street, Palatka, Fla.

MAYS LANDING: Source 1.
             On the east shore of the St. Johns River, a not very prominent
point between Mays Swamp and Mays Branch.

MAYS SWAMP: Source 1.
             A swamp on the east shore of the St. Johns River between Middle
Point and Mays Landing. Authority: Mr. G. M. Wilkinson, Hastings, Fla.,
resident for 40 years.

MIDDLE POINT: Sources 1, 2, 3, 4, 5, 7 and 10.
             On the east shore of the St. Johns River, the first point north
of Mays Swamp.

MURPHYS COVE: Sources 1 and 14.
             On the east shore of the St. Johns River between Dancy Point
and Myrtlewood Point. Formerly known as Mulberry Cove.

MYRTLEWOOD POINT: Source 1.
             On the east shore of the St. Johns River, between Murphys Cove
and Dog Branch.

ORANGE MILLS: Sources, 1, 3, 4, 5, 6, 7, 8 and 9.
A scattered community near the intersection of Fla. State
Highway No. 14 and the Florida East Coast Railroad.

ORANGE MILL FLAT: Sources 13 and 14.
A shoal in the St. Johns River between Nine Mile Flat Light
No. 60 and Dancey Point Front Range Light No. 53.

SIMPKINS BRANCH: Source 12.
A stream on the east shore of the St. Johns River, between
Mays Branch and Dancy Point.   Substantiated by Mrs. J. H. Millican, 410 North
4th Street, Palatka, Fla.

SELF EXPLANATORY NAMES:

The following names are all in agreement and well established
by local usage:
St. Johns River,
Florida East Coast R. R.,
State Highway No. 14,
Jacksonville-Tampa Toll Line.

MISCELLANEOUS:
Oak Villa P. O. shown on source 2 and 10 at the point be-
tween Fairview Point and Bodines Point.
Orange Mills P. O. shown on source 2 and 10 between Middle
Point and Dancy Point.
Both of the above are no longer in existence.
Mule Pen Drain, source 10, no longer used. Now Canal 17.

Respectfully submitted,

David R. Shallenberger

David R. Shallenberger,
Draftsman.

Forwarded.

Riley J. Sipe
Chief of Party

REVIEW OF AIR PHOTO COMPILATION NO.

Chief of Party: Hubert A. Paton-
          Riley J. Sipe

Compiled by: D.R.S.

Project:

Instructions dated: March 5, 1935.

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)

                                  Yes

- 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)

                                  Yes

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)

                                  Yes

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)

                                  None

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.

                                  Yes

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. 12) and see 66 g,h,i)~~

                                  Yes

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

                                  Yes

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-87

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

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)

                                                    Yes

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)
                                                    No landmarks

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)
                                                    No bridges

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

                                                    Yes

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)
                                                    Yes

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.   Yes

        2. The degrees and minutes of Latitude and Longi-
            tude are correctly marked.
                                                    Yes
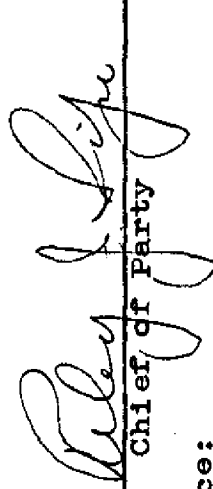
3. All station points are exactly marked by fine
    black dots.   Yes

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

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

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

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

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

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

17. Remarks:

18. Examined and approved;

                                        _____
                                            Chief of Party

19. Remarks after review in office:

REVIEW OF AIR PHOTOGRAPHIC SURVEY T-5204
Scale 1:10,000

Contemporary Graphic Control Survey.

CS 162M (1935) 1:10,000.

Dancy Point range 220° 26' shown on CS 162M has not
been shown on T-5204. The azimuth was obtained by
inverse computation between triangulation stations.
See page 3, paragraph 3, of Descriptive Report for
a comparison made by the field party.

All information and detail shown on CS 162M has
been shown on T-5204 except as noted below:

> Temporary topographic stations
> The range azimuth mentioned above
> Magnetic Declination
>> CS 162M at triangulation station Lager 1935
>> Latitude 29° 43.0', longitude 81° 34.6' shows
>> a magnetic declination of 0° 46' east.

Contemporary Hydrographic Surveys.

H-6299 (1935) 1:10,000.

H-6299 has been compared with T-5204 and no discrep-
ancies were found. The shoreline from T-5204 has
not been added to H-6299 as T-5204 was not completed
until after the review of H-6299. The reviewing
section has been notified that T-5204 is now avail-
able.

Numerous pile, fish stakes, and sunken logs have
been located on H-6299 but have not been shown on
T-5204 as they could not be seen on the photographs.

Previous Topographic Surveys.

T-1564a (1885) 1:10,000.

T-1564a agrees closely with T-5204. T-5204 is
complete and adequate to supersede the portions
of T-1564a which it covers.

Chart 684.

Chart 684 shows only the shoreline and topography
adjacent to the shoreline. The shoreline agrees
closely but there are some changes in docks. See
paragraph under contemporary graphic control surveys
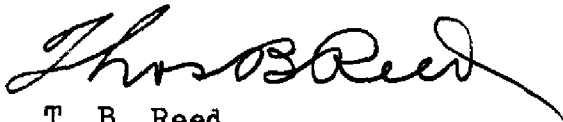for Dancy Point Range.

General.

The descriptive report and compilation of details
on T-5204 are complete and the drawing is satis-
factory for reproduction.

Reviewed in office by - L. C. Lande.
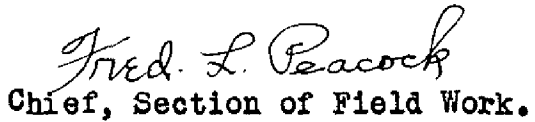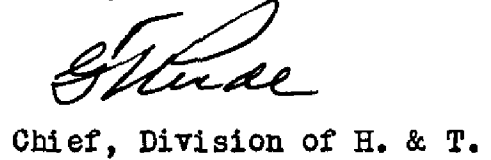
Inspected by - B. G. Jones.

Examined and approved:

T. B. Reed,
Chief, Section of Field Records.

Chief, Division of Charts.

Chief, Section of Field Work.

Chief, Division of H. & T.

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 _S. Kass_

Positions checked by _S. Kass_

Grid inked on machine by _S. Kass_

Intersections inked by _S. Kass_

Points used for plotting grid:

x _325,349.84_
y _1,945,166.20_

x _314,856.54_
y _1,963,340.41_

x _336,016.10_
y _1,963,239.66_

x _____
y _____

x _335,880.75_
y _1,932,935.97_

x _____
y _____

x _314,703.71_
y _1,933,036.54_

x _____
y _____

Triangulation stations used for checking grid:

1. _Hastings 1933_   5. _____

2. _____   6. _____

3. _____   7. _____

4. _____   8. _____

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION
(CALCULATING MACHINE COMPUTATION)

State __Fla.__   Zone __East__   Station __29 41__   __81 33__   ° ′ ″

λ (Central meridian) _____

φ _____ ° ′ ″   λ _____

Δφ (Excess of φ over even 10′ expressed as minutes and decimal) _____ ′

ΔλN (Central meridian−λ) _____

Δλ (in sec.) __ $-1980''$ __

		$\left(\frac{\Delta\lambda''}{100}\right)^2$	
Tabular H (even 10′)		Tabular V (even 10′)	
Interpolated H (fraction of 10′)	−	Interpolated V (fraction of 10′)	+
		Cor. for second dif.	+ 2
Cor. for second dif.	+ 34	V	1.059080
H	88.210542		
		Tabular difference of y for 1″ of φ }	
a	− .738		
b	+ 9.090	y (for minutes of φ)	
		y (for seconds of φ)	
$H(\Delta\lambda'')$	174,656.87	Tabular y	1,944,691.06
ab	− 6.71	$V\left(\frac{\Delta\lambda''}{100}\right)^2$	415.20
x'	174,650.16		
	500,000.00	c	− .08
x	325,349.84	y	1,945,106.20
$\frac{(\text{Tabular } y) + y}{2}$		$\Delta\lambda'' \sin\frac{\phi+\phi'}{2}$	
		$F(\Delta\lambda)^3$	
$\frac{\phi+\phi'}{2}$ (Interpolated from projection table)		$\Delta a''$	″
$\sin\frac{\phi+\phi'}{2}$		Δa	° ′ ″

$$x' = H\Delta\lambda + ab$$

$$x = x' + 500,000$$

$$y = \text{Tabular } y + V\left(\frac{\Delta\lambda''}{100}\right)^2 + c$$

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

T5204

②

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION
(CALCULATING MACHINE COMPUTATION)

State _Fla._   Zone _East_   Station _29 44_   _81 31_

        °   ′   ″

λ (Central meridian) _____

ϕ _____ λ _____

$\Delta\phi$ (Excess of ϕ over even 10′ expressed as minutes and decimal) _____ ′

$\Delta\lambda$ (Central meridian—λ) _____

$\Delta\lambda$ (in sec.) _____ -1860 ″

		$\left(\frac{\Delta\lambda''}{100}\right)^2$	
Tabular H (even 10′)		Tabular V (even 10′)	
Interpolated H (fraction of 10′)	$-$	Interpolated V (fraction of 10′)	$+$
		Cor. for second dif.	$+$ 4
Cor. for second dif.	$+$ 90	V	1.060175
H	88.166843		
		Tabular difference of y for 1″ of ϕ	
a	$-$ $.735$		
b	$+$ 8.743	y (for minutes of ϕ)	
		y (for seconds of ϕ)	
H ($\Delta\lambda''$)	$163,990.33$	Tabular y	$1,962,872.95$
ab	$-$ 6.43	$V\left(\frac{\Delta\lambda''}{100}\right)^2$	366.78
x'	$-163,983.90$		
	$500,000.00$	c	$-$ $.07$
x	$336,016.10$	y	$1,963,239.66$
$\frac{\text{(Tabular } y) + y}{2}$		$\Delta\lambda'' \sin\frac{\phi+\phi'}{2}$	
		$F(\Delta\lambda)^3$	
$\frac{\phi+\phi'}{2}$ (Interpolated from projection table)		$\Delta a''$	
$\sin\frac{\phi+\phi'}{2}$		Δa	

$x' = H\Delta\lambda + ab$ $y = \text{Tabular } y + V\left(\frac{\Delta\lambda''}{100}\right)^2 + c$

$x = x' + 500,000$ $\Delta a'' = \Delta\lambda'' \sin\frac{\phi+\phi'}{2} + F(\Delta\lambda'')^3$

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION
(CALCULATING MACHINE COMPUTATION)

State _Fla._   Zone _East_   Station _29 39 81 31_

λ (Central meridian) _____

ϕ _____ λ _____

$\Delta\phi$ (Excess of ϕ over even 10' expressed as minutes and decimal) _____

$\Delta\lambda$ (Central meridian $-\lambda$) _____

$\Delta\lambda$ (in sec.) _$-1860''$_

		$\left(\frac{\Delta\lambda''}{100}\right)^2$	
Tabular H (even 10')		Tabular V (even 10')	
Interpolated H (fraction of 10')	$-$	Interpolated V (fraction of 10')	$+$
		Cor. for second dif.	$+$ 2
Cor. for second dif.	$+$ 34	V	1.058348
H	88.239637		
a	$-.740$	Tabular difference of y for 1" of ϕ	
b	$+8.743$	y (for minutes of ϕ)	
		y (for seconds of ϕ)	
H ($\Delta\lambda''$)	$164,125.72$	Tabular y	$1,932,569.89$
ab	$-$ 6.47	$V\left(\frac{\Delta\lambda''}{100}\right)^2$	366.15
x'	$-164,119.25$		
	$500,000.00$	c	$-$ $.07$
x	$335,880.75$	y	$1,932,935.97$
$\frac{(\text{Tabular } y) + y}{2}$		$\Delta\lambda'' \sin\frac{\phi+\phi'}{2}$	
		$F (\Delta\lambda)^3$	
$\frac{\phi+\phi'}{2}$ (Interpolated from projection table)		$\Delta a''$	$''$
$\sin\frac{\phi+\phi'}{2}$		Δa	$°$ $'$ $''$

$$x' = H\Delta\lambda + ab \qquad\qquad y = \text{Tabular } y + V\left(\frac{\Delta\lambda''}{100}\right)^2 + c$$

$$x = x' + 500,000 \qquad\qquad \Delta a'' = \Delta\lambda'' \sin\frac{\phi+\phi'}{2} + F(\Delta\lambda'')^3$$

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form No. 744 a
June 1938

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION
(CALCULATING MACHINE COMPUTATION)

State _Fla_   Zone _East_   Station _Hastings 1933_

λ (Central meridian) _81° 00′ ″_

ϕ _29° 42′ 51″.059_   λ _81 31 45.201_

$\Delta\phi$ (Excess of ϕ over even 10′ expressed as minutes and decimal) _2′.85098_

$\Delta\lambda$ (Central meridian−λ) _31_

$\Delta\lambda$ (in sec.) _− 1905″.201_

		$\left(\frac{\Delta\lambda''}{100}\right)^2$	
Tabular _H_ (even 10′)		Tabular _V_ (even 10′)	
Interpolated _H_ (fraction of 10′)	−	Interpolated _V_ (fraction of 10′)	+
		Cor. for second dif.	+ 4
Cor. for second dif.	+ 74	_V_	_1.059757_
_H_	88.183586		
		Tabular difference of _y_ for 1″ of ϕ	
_a_	− .736		
_b_	+ 8.881	_y_ (for minutes of ϕ)	
		_y_ (for seconds of ϕ)	
_H_ ($\Delta\lambda''$)	168,007.46	Tabular _y_	1,955,909.17
_ab_	− . 6.54	$V\left(\frac{\Delta\lambda''}{100}\right)^2$	384.67
_x′_	− 168,000.92		
	500,000.00	_c_	− .07
_x_	331,999.08	_y_	1,956,293.77
$\dfrac{\text{(Tabular } y) + y}{2}$	~~60.15.34~~ 60.93	$\Delta\lambda'' \sin\dfrac{\phi+\phi'}{2}$	39.43
		$F(\Delta\lambda)^3$	
$\dfrac{\phi+\phi'}{2}$ (Interpolated from projection table)		$\Delta a''$	″
$\sin\dfrac{\phi+\phi'}{2}$		Δa	° ′ ″

$$x' = H\Delta\lambda + ab$$

$$x = x' + 500,000$$

$$y = \text{Tabular } y + V\left(\frac{\Delta\lambda''}{100}\right)^2 + c$$

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

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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
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June 1938

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION
(CALCULATING MACHINE COMPUTATION)

State _Fla_   Zone _East_   Station $\begin{matrix}29 & 39\\ 81 & 35\end{matrix}$

° ′ ″

λ (Central meridian)_____

ϕ _____ ° ′ ″ λ _____

$\Delta\phi$ (Excess of ϕ over even 10′ expressed as minutes and decimal) _____′_____

$\Delta\lambda$ (Central meridian−λ)_____

$\Delta\lambda$ (in sec.)____ $-2100''$

		$\left(\frac{\Delta\lambda''}{100}\right)^2$	
Tabular _H_ (even 10′)		Tabular _V_ (even 10′)	
Interpolated _H_ (fraction of 10′)	−	Interpolated _V_ (fraction of 10′)	+
		Cor. for second dif.	+ 2
Cor. for second dif.	+ 34	_V_	1.058348
_H_	88.239637		
		Tabular difference of _y_ for 1″ of ϕ	
_a_	− .740		
_b_	+ 9.398	_y_ (for minutes of ϕ)	
		_y_ (for seconds of ϕ)	
_H_ ($\Delta\lambda''$)	185,303.24	Tabular _y_	1,932,569.89
_ab_	− 6.95	$V\left(\frac{\Delta\lambda''}{100}\right)^2$	466.73
_x′_	185,296.29		
	500,000.00	_c_	− .08
_x_	314,703.71	_y_	1,933,036.54
$\frac{(\text{Tabular } y) + y}{2}$		$\Delta\lambda'' \sin\frac{\phi+\phi'}{2}$	
		$F(\Delta\lambda)^3$	
$\frac{\phi+\phi'}{2}$ (Interpolated from projection table)		$\Delta a''$	″
$\sin\frac{\phi+\phi'}{2}$		Δa	° ′ ″

$x' = H\Delta\lambda + ab$ $y = \text{Tabular } y + V\left(\frac{\Delta\lambda''}{100}\right)^2 + c$

$x = x' + 500,000$ $\Delta a'' = \Delta\lambda'' \sin\frac{\phi+\phi'}{2} + F(\Delta\lambda'')^3$

PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION
(CALCULATING MACHINE COMPUTATION)

29 44

State _Fla._ Zone _East_ Station _81 35_

λ (Central meridian) _____

ϕ ____°____'____"____

λ _____

$\Delta\phi$ (Excess of ϕ over even 10' expressed as minutes and decimal) ____.____'

$\Delta\lambda$ (Central meridian $-\lambda$) _____

$\Delta\lambda$ (in sec.) $- 2100''$

		$\left(\frac{\Delta\lambda''}{100}\right)^2$	
Tabular H (even 10')		Tabular V (even 10')	
Interpolated H (fraction of 10')	$-$	Interpolated V (fraction of 10')	$+$
		Cor. for second dif.	$+$ 4
Cor. for second dif.	$+$ 90	V	1.060175
H	88.166843		
		Tabular difference of y for 1" of ϕ	
a	$-$ .735		
b	$+$ 9.398	y (for minutes of ϕ)	
		y (for seconds of ϕ)	
H $(\Delta\lambda'')$	185,150.37	Tabular y	1,962,872.95
ab	$-$ 6.91	$V\left(\frac{\Delta\lambda''}{100}\right)^2$	467.54
x'	$-$ 185,143.46		
	500,000.00	c	$-$ .08
x	314,856.54	y	1,963,340.41
$\frac{(\text{Tabular } y) + y}{2}$		$\Delta\lambda'' \sin\frac{\phi+\phi'}{2}$	
		$F (\Delta\lambda)^3$	
$\frac{\phi+\phi'}{2}$ (Interpolated from projection table)		$\Delta a''$	"
$\sin\frac{\phi+\phi'}{2}$		Δa	° ' "

$$x' = H\Delta\lambda + ab$$
$$x = x' + 500,000$$

$$y = \text{Tabular } y + V\left(\frac{\Delta\lambda''}{100}\right)^2 + c$$
$$\Delta a'' = \Delta\lambda'' \sin\frac{\phi+\phi'}{2} + F(\Delta\lambda'')^3$$