5602

Diag. Cht. No. 1210-2

Form 504
Rev. Dec. 1933

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

DESCRIPTIVE REPORT

Topographic / *Hydrographic* Sheet No. 5602
Field 2

December 1, 1936

State Mass. & R. I.

LOCALITY

West Branch of Westport River
West Branch
and Vicinity.

1936

CHIEF OF PARTY

Thos. B. Reed.

U.S. GOVERNMENT PRINTING OFFICE: 1934

Dec. 1, 1936

applied to drawing of chart 237 - Nov. 19, 1936 - J.F.W.
" " " " " 1210 - Dec. 12, 1938 - K.R.

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. 2

REGISTER NO. T5602

State Massachusetts and Rhode Island

General locality Westport, Mass

Locality West Branch of Westport River and Vicinity
Photos November 15,1934

Scale 1:10,000 Date of survey Compilation July 1936, 19

~~Vessel~~ Field Party No. 16

Chief of party Thos. B. Reed

Surveyed by See Data in Descriptive Report

Inked by Raymond S. Poor

Heights in feet above -------- to ground to tops of trees
No Contours.

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

Instructions dated September 28, 19 35

Remarks: Compiled on scale of 1:10,000

PHOTO TOPOGRAPHIC SHEET NO. 2

REGISTER NO._____

Photos Nos	Date	Time
M309 to M318 incl.	Nov 15, 1934	11:39AM
M366 to M377 "	" " "	11:51AM

Projection by Projection machine Washington Office Feb 1936.

Triangulation and Traverse Stations plotted by R. S. Poor June, 1936

Triangulation and Traverse Stations checked by Thos. B. Reed June, 1936

Topographic Stations transfered from plane table sheets by Washington Office Feb 1936

Smooth Radial Plot by Thos. B. Reed and R. S. Poor June 1936

Detail Inked by R. S. Poor July 1936

STATISTICS

Area of detail inked (land area) 15.5 Sq. Statute Miles

Length of shore line (more than 200 meters from nearest shore) 23.0 Statute Miles

Length of shoreline (Streams less than 200 meters wide) 4.0 Statute Miles

Datum: North American, 1927, ~~Adjusted.~~ Unadjusted

Reference Station: Nootas 2, 1934 Lat. 41° 32' 12.863" (396.8)
Long 71° 07' 25.001" (579.6)

Triangulation in process of readjustment and values from first adjustment not final

Ref. Sta –
$x = 703,058.89$ FT. } Mass. Grid.
$y = 195,874.46$ FT.

$x = 603,050.50$ FT. } R.I. Grid.
$y = 165,487.80$ FT.

DESCRIPTIVE REPORT

to accompany

Photo Topographic Sheet No. T_____
Field No. 2
West Branch of Westport River and Vicinity, Mass and R. I.

Thos. B. Reed, Chief of Party.

DATE OF INSTRUCTIONS: Letter dated Sept 28, 1935,No 22 AA 1990 (16).

DATE OF SURVEY: Nov. 15, 1934, with revision by Field Inspection Party Nov. 1935 and Feb. 1936.

GENERAL INFORMATION:

Photographs: This sheet was compiled from parts of two flights of 1;10,000 scale five lens aerial photographs taken by the Army Air Corps on Nov. 15, 1934, with Model T3A Camera No Ac31-78-A. The flights were designated 886-14 and the photographs of the lower flight were numbered M 309 to M 318 (numbers increasing from west to east); the numbers of the upper flight were numbered M366 to M377, (numbers increasing from east to west). The camera had a focal length of six inches and the photographs were taken from a height of approximately 5,000 feet. The stage of the tide when the photographs were taken was 1.7 feet as computed from the Tide Tables.

General Description; This sheet comprises the coast line from the entrance of the Westport River westward for approximately 3 miles and the area to the northward for approximately 5½ miles.

The terrain is of a hilly nature and the larger portion is covered with woods and brush. It is entirely rural and there are many scattered farms throughout the entire area. Also, there are 3 small villages in the area, Central Village, Mass., Adamsville R. I., and Westport Harbor, Mass.although the last named is a summer colony.

Many brooks drain the area and empty into several large shallow ponds just north of the beach. Most of the land adjacent to these ponds is leased by duck hunters as these ponds attract many wild ducks and geese.

The most important feature on the sheet is the West Branch of the Westport River and the entrance. There is not a great deal of water at the entrance and only small fishing and pleasure boats use it. The channel is subject to change and according to local fishermen there has been considerable change since the hydrography was completed. There are many small marsh islands in the West Branch of the river.

The beach is characteristic of the entire coast along this region. There are many off lying rocks and ledges and with the exception of a few small sand beaches the beach itself is rocky and covered with small boulders.

(Monuments marking the Mass-Rhode Island boundary are shown on this survey, and are not in a straight line as might be expected. M. Poor visited these monuments in the field and found that they are actually not in line.) — Word Boundary removed from file copy pending further information in matter - JSE 11/24/36

CONTROL

Sources: Second and Third Order Triangulation by W. D. Patterson, 1934.

Second Order Traverse by Massachusetts Geodetic Survey 1936.

Topographic Stations established by plane table party of W. D. Patterson in 1934.

Errors: No errors were found in the Triangulation or Traverse stations. Errors in Topographic Stations are discussed in deatil under the heading "Comparison with Plane Table Sheets Nos. 6118, 6119, 6120.

Other sources of control: No control other than that mentioned above, was used in the compilation of this sheet.

COMPILATION

Method: The usual 5 lens radial line method of plotting was used in the compilation of this sheet. There was sufficient Triangulation and Traverse stations to control the plot without the use of the plane table positions. However, Topographic stations that could be identified on the photographs were located by radial plot to check the plane table positions.

In making the radial plots, this sheet was joined with Field Sheets Nos 1 & 3 and the radial plot was continued across to assure accuracy.

Adjustments of Plot: No unusual adjustment of the plot was necessary.

INTERPRETATION

No difficulty was experienced in interpreting the detail from the photographs.

The sterescope was used for defining buildings and sand dunes.

In Lat 41 31.3' and Long. 71 07.2' there is a new section of road that was not complete when the photographs were taken. This section is shown on the sheet from sketches submitted by the Field Inspection Party.

CONVENTIONAL TOPOGRAPHIC SYMBOLS:

Only graphic symbols, approved by the Board of Surveys and

Maps were used, except as follows:

() was used to denote brush.

Cultivated fields were left blank to avoid a too congested appearance on the sheet, otherwise all areas were filled in with the conventional symbols.

The boundaries of shoal water areas in West Branch of the Westport River which could be seen on the photographs were shown by dashed lines in blue ink. If it is desired that these shoal water areas be shown on the completed sheet they should be compared with the hydrographic sheet of this area before inking over with black ink. *Boundaries of shoal water not inked on compilation.*

INFORMATION FROM OTHER SOURCES

None available.

GEOGRAPHIC NAMES:

Names of Geographic Features were obtained from U. S. C & G. S. charts and plane table sheets and were verified by the field inspection party from local residents.

New Names There are no new names on this sheet.

Conflicting Names: There are no conflicting names on this sheet.

COMPARISON WITH OTHER SURVEYS.

Topo Sheet No. T 6118. The following Topo Stations agreed very closely with the radial plot: Kap, Are, and Am and they are shown on this sheet in the same position. Topo Station Art was found to be 10 meters off according to the radial plot. This station was tied in on the photographs by measurement and plotted 10 meters from the plane table position in a northerly direction. Incidently Topo Station Wos a short distance to the southwest was off the same distance and in the same direction. The position shown on this sheet for station Art is the radial plot position. A fence corner just to the southeast of this station checks very closely to the old survey sheet of this area when corrected for the 1927 N. A. Datum and the station actually is to the northwest of this fence corner. *Wos outside limits of T-5302*

The high water line checks in quite well with the compilation but there is considerable difference in the off lying rocks. We were able to pick out many more rocks than were shown on the topo sheet and also correct some of the positions of rocks that were shown. It is believed that some of these differences were due to the above mentioned topo stations being out of position.

The south shore of Quicksand Pond differs quite a bit from the compilation. And there is evidence that there is an opening through the beach from this pond although it was closed when visited by the field inspection party in November 1935. This is also true of Tunipus pond to the west.

Topo Sheet No. T 6119. The following Topo Stations checked in very well with the radial line plot: Ola, Ma, Ray, Gab, and Lag. Station Six could not be seen on the photographs but it is shown on this compilation in the same position as the Topo Sheet. Station Hot did not check so well but in as much as the station was too far out on the wing print to be identified correctly there is considerable doubt as to its accuracy, therefore we did not feel that we would be justified in using a new position.

The high water line checks very good except near Station Hot where there is about 30 meters difference. Also some of the islands in the West Branch of the Westport River are slightly different. *Probably due to interpretation*

Long Rock, just east of Quicksand Point, has the same shape as that on the Topo Sheet but a different azimuth. Most of the rocks located on the photographs check the plane table sheet. Instead of using a general symbol on that rocky point just southwest of Topo Station Mos, all the rocks that could be seen on the photographs were shown on the compilation and a foul line drawn around the area. *Azimuth on T-5602 checked by K-183.*

There is no Jetty or Breakwater shown on the Topo Sheet, T-6119 at Horseneck Point.

Topo Sheet No T. 6120-Thefollowing Topo Stations were easily identified on the photographs and checked very well: Bar,Dip,Egg,Cot,Abe and Ask. Stations Big and Box could not be accurately identified and did not check very closely so the position shown on the compilation are the same as the Topo Sheet. Stations Bin, Arc, and Ado were obviously out of position as there was no doubt about the points picked on the photographs. It should be mentioned here that several of the traverse stations in this vicinity were located by radial plot before we had the positions and when we finally got the positions they all checked so we feel justified in changing the positions of these three stations. Arc was 15 meters off, Bin was 12 meters off and Ado was 8 meters off. Topo Stations Arm and Boy are torn down. *(Arc, Bin, and Ado shown on this survey (T-5602) in radial plot position.)*

The high water line checks very closely except as follows: just to the east of Topo Station Egg there is a difference of about 20 meters on one of the points. According to notes by the field inspection party this was to be represented as grass in the water and the high water line was drawn in from these notes. The island on which Topo Station Ado is located is out of azimuth and slightly smaller than that shown on the Topo Sheet.

Old Topo Sheet No 1161: Only a small portion of this sheet is covered by this compilation but there has been little change since this was surveyed in 1870. The shore line agrees almost exactly with the compilation except the outlets of the ponds. The fields and roads coincide as does Tunipus Pond. Some of the stone fences that were in existence at that time are nowttorn down because there is no trace of them on the photographs.

T-2217

Old Topo Sheet, 1895-96 Survey. The old survey shows more land at the south end of Quicksand Pond than there is on this compilation. This is probably due to grass growing in the water which makes it difficult to determine the boundary. The shape of the pond agreed very well with the compilation. This is true of Cock East Pond also.

On the eastern side of Quicksand Point, the beach has washed out about 20 meters since 1895-96.

The outlet to Richmond Pond has changed as the outlet shown on the old survey is now closed up.

The beach on Horseneck Point has changed considerable. It has washed out 50 meters on the beach front and about 100 meters on the western end of the point.

The old roads and fields agree very closely the those shown on this compilation.

LANDMARKS.

A list of Landmarks for Charts, chart letter #302 (1934) was submitted by Lieut. W. D. Patterson in connection with hydrographic surveys of this area in 1934 and 1935. No additional landmarks have been established since that time.

RECOMMENDATION FOR FURTHER SURVEYS.

This compilation is believed to have a probable error of not more than 3 to 5 meters in position of well defined detail of importance for charting purposes and of 3 to 6 meters for other data.

To the best of my knowledge this compilation is complete in all detail of importance for charting purposes within the accuracy stated above, and no further surveys are required.

Respectfully submitted,

Raymond S. Poor

Raymond S. Poor
surveyor, U. S. C. & G. S.
Party No. 16.

	Remarks	Decisions
1		
2	Rhode Island Gazetteer	
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GEOGRAPHIC NAMES

Survey No. 5602

Name on Survey	A: On Chart No. 1210	B: On previous survey No. 2217	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	
CENTRAL VILLAGE (Mass.)			✓			✓				1
ADAMSVILLE ~~RIVER~~ Brook										2
ADAMSVILLE (R.I.)			✓			✓				3
~~MILL~~ POND										4
WEST BRANCH WESTPORT ~~RIVER~~	✓	✓	✓							5
QUICKSAND POND	✓	✓	✓							6
RICHMOND POND		✓								7
COCK EAST POND		✓								8
WESTPORT HARBOR		✓	✓							9
~~WESTPORT HARBOR (Mass.)~~	✓		✓			Acoaxet	Acoaxet			10
THE KNUBBLE		✓	✓							11
HORSE NECK POINT	✓	✓	✓							12
TUNIPUS POND		1116 ✓	✓							13
TUNIPUS BEACH	✓	~~1116~~ ✓	✓							14
QUICKSAND POINT	✓	2217 ✓	✓							15
Halfway Rock	✓	1116 ✓	✓							16
Long Rock	✓	2217 ✓								17
Halfmile Rock	✓	2217 ✓								18
										19
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										23
										24
										25
										26
										27

Names underlined in red approved by K.T.R on 10/8/36

M 234

REVIEW OF AIR PHOTO COMPILATION T-5602
Scale 1:10,000

Although the contemporary plane table surveys in this area have been registered and reviewed as topographic surveys they have been handled in connection with this review as graphic control surveys.

Comparison with Graphic Control Surveys

T-6118 (1934), 1:10,000

The comparison with T-6118 is adequately covered on page 3 of this descriptive report.

Attention is called to the 10 meter error in location of ⊙ ART on T-6118.

All detail on T-6118 over the common area is shown on T-5602 except temporary signals and the magnetic meridian.

T-6119 (1934), 1:10,000

The comparison with T-6119 is given on page 4 of this descriptive report.

The rocks common to the two surveys at 41° 30', 71° 06.5' were located some 10 meters farther east on T-5602 than on T-6119. The photographs check the location as shown.

Off the foul area at 41° 30.13', 71° 05.5', T-6119 in two cases shows two rocks awash where T-5602 shows only one.

All detail on T-6119 over the common area is shown on T-5602 except temporary signals and the magnetic meridian.

T-6120 (1934), 1:10,000

The comparison with T-6120 is adequately covered on page 4 of this descriptive report.

Attention is called to the 8 to 15 meters errors in location of ⊙ ADO, ⊙ BIN, and ⊙ ARC on T-6120.

All detail on T-6120 over the common area is shown on T-5602 except temporary signals and the magnetic meridian.

The above graphic control surveys show many numerous elevations of rocks and small islands above H.W. Only the most important of these elevations have been transfered to the compilation

Comparison with Previous Topographic Surveys

T-183 bis (1844), 1:10,000

The general shoreline agreement is good. The shoreline at Horse Neck Pt. has receded (eastward) some 100 meters. The azimuth of Long Rock on T-183 agrees with T-5604 (see page 4, under comparison with T-6119).

T-1161 (1870), 1:10,000

This comparison is adequately covered on page 4 of this descriptive report.

As in the review of T-5603, attention is called to the excellent agreement of the fence lines, most of which are stone.

In general the rocks on T-1161 have been verified by T-5602, except along the shore in the vicinity of 41° 29.25', 71° 08.5'. Several bare rocks on T-1161 in this area are not shown on T-5602. Since the field inspection party visited this area and located a number of rocks awash and also since these rocks in question were not located by the hydrographic party, the compilation T-5602 is accepted as representing the correct delineation at this time.

T-2217 (1895-96), 1:10,000

A comparison with T-2217 is given on page 5 of this descriptive report.

The few rocks on T-2217 that were not located by T-5602 have been disposed of in the review of H-5622.

Long Rock is located on T-2117 in the same azimuth as shown on T-6119. The azimuth as shown on T-5602 and checked by T-183 is correct. (See page 4, this descriptive report, under T-6119.)

The two small rocks on T-2117 just south of The Knubble (41° 30.25', 71° 05 1/2') are not shown on T-5602. Two small rocks and a rock awash are shown + 70 meters to the west on T-5602. As these rocks are not shown on T-183, T-6119 or H-5628 and are not visible in the photographs, they were evidently located erroneously on T-2217.

T-5602 in conjunction with the disposal of rocks by H-5622, H-5628 and H-5629 is adequate to supersede T-183, T-1161, and T-2217 over the common area except for contours.

Comparison with Contemporary Hydrographic Surveys

H-5622 (1934 - Addl. work 1935), 1:10,000
H-5628 (1934), 1:5,000
H-5629 (1934), 1:10,000

There are no conflicts with the hydrography.

These hydrographic surveys show several rocks not on T-5602.

There are a number of rocks on T-5602 which are not on these hydrographic surveys. Signal ART is 10 meters in error on H-5622 and signals ADO, BIN, and ARC are 8 to 15 meters in error on H-5629. These omissions and corrections have been called to the attention of the Chief of Field Records Section.

Comparison with Chart 1210

Additions and corrections to the chart as a result of this survey have been discussed under comparison with previous topographic surveys.

All landmarks and aids to navigation on the chart and recommended by the field in this area are shown on this survey.

Frank G. Erskine

Oct. 6, 1936. Frank G. Erskine.

REVIEW OF AIR PHOTO COMPILATION NO. Field 2

Chief of Party: Thos B. Reed Compiled by: R. S. Poor

Project: Vicinity of Westport Mass. Instructions dated: 9/28/35

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 submitted, except town map of Westport showing names of roads.

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. 12b; 44; and 66 c,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."

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)

Yes

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)

Located by plane table by party of W. D. Patterson 1934

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)

Furnished by W. D. Patterson in conjunction with Hydrographic and Topographic Survey of this area in 1934. No change since.

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

No Bridges.

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

Yes

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

Yes

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 Longitude 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.

None

17. Remarks:

18. Examined and approved;

Thos B Reed
Chief of Party

19. Remarks after review in office:

Reviewed in office by: Frank G. Erskine

Examained and approved:

C. H. Green
Chief, Section of Field Records

Fred L. Peacock
Chief, Section of Field Work

L O Colbert
Chief, Division of Charts

Chief, Division of Hydrography and Topography.

M-350

T-5602

PLANE COORDINATE GRID SYSTEM
(Mass. state 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 R.E. Ask & H.D. Reed, Jr.

Positions checked ~~by~~ on Ruling machine

Grid inked on machine by H.D.R., Jr.

Intersections inked by H.D.R. Jr.

Points used for plotting grid:

x = 695,000 FT y = 175,000 FT.	x y
x 695,000 y 210,000	x y
x 710,000 y 210,000	x y
x 710,000 y 175,000	x y

705 - 203 553.9 1961

Triangulation stations used for checking grid:

x = 703,053.89 FT — y = 195,874.46 FT.

705 703 553.1 1961

Ref. sta.

1. Nootas 2, 1934. — 5. ____
x = 707,814.27 - y = 207,965.84
2. 82 AJ. 1936. (Mass G. S.) — 6. ____
3. Mass. Geod. Survey — 7. ____
TT 82-AK and TT82-AH Positions
4. in letter attached to Descr. — 8. ____
Report T 5604

Plane coordinates on Lambert projection

State Mass Station 710,000 / 210,000

ϕ = 41° 34′ 32″.1022 λ = 71° 05′ 52″.7965

Tabular difference of R for 1″ of ϕ = 101.21917

R (for min. of ϕ)		23,342,985.90	y′ (for min. of ϕ)		206,491.42
Cor. for sec. of ϕ		− 3 249.36	Cor. for sec. of ϕ		+ 3 249.36
R		23,339,736.54	y′		209,740.78
			y″ (=2R sin² $\frac{\theta}{2}$)		+ 259.22
θ (for min. of λ)		+ 0° 16′ 47″.5930	y		210,000.00
Cor. for sec. of λ		− 35.4649			
θ		16 12.1281	$\frac{\theta}{2}$		° 8′ 06″.06405
θ''	For machine computation	″		For machine computation	
			log θ''		
log θ''			colog 2		9.69897000
S for θ			S for $\frac{\theta}{2}$		
log sin θ	sin θ	.004712 9926	log sin $\frac{\theta}{2}$	sin $\frac{\theta}{2}$	.00235 65028
log R				R sin $\frac{\theta}{2}$	55,000.155
log x′			log sin² $\frac{\theta}{2}$	R sin² $\frac{\theta}{2}$	129.608
x′	R sin θ	110,000.01	log R		
		2,000,000.00	log 2		0.30103000
x		710,000.01	log y″		

x = 2,000,000.00 + R sin θ

y = y′ + 2R sin² $\frac{\theta}{2}$

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

T-5602

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

GEODETIC POSITIONS FROM LAMBERT COORDINATES

STATE Mass. STATION

x	710,000	R_b+A	23,549,477.32
C	600,000	y	175,000.00
x' $(=x-C)$	+ 110,000	R_b+A-y	23,374,477.32
log $(x-C)$	5.0413 9269	$\frac{\theta}{2}$ (in secs.)	4885.3362
log (R_b+A-y)	7.3682 4191	log $\frac{\theta}{2}$	2.6860 4269
log tan θ	7.6726 5078	log S	4.6855 7326
θ	° 1′ 10.″6725	log sin $\frac{\theta}{2}$	7.3716 1595
	970.″6725		
log θ (θ in secs.)	2.9870 7271	log sin^2 $\frac{\theta}{2}$	4.7432 319
log l	4.8271 9348	log 2	0.3010 3000
log $\frac{\theta}{l}$	3.1598 7883	log R*	7.3648 419
$\Delta\lambda$ $(=\frac{\theta}{l})$	1445.0365	log y''	2.4130 038
		y''	258.82
λ (central mer.)	71° 30′ 00.″0000		
$-\Delta\lambda$	24 05.0365	R_b+A-y	23,374,477.32
λ	71 05 54.9635	y''	+ 258.82
		R	23,374,736.14
		y	175,000.00
		y''	− 258.82
		y'	174,741.18
		ϕ (by interpolation)	41 24 46.3224

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

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

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

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

$y'=y-y''$

C is constant added to x' in computation of coordinates

R_b is map radius of lowest parallel

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

ϕ is interpolated from table of y'

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

U.S. GOVERNMENT PRINTING OFFICE 11—11524

T-5602

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

GEODETIC POSITIONS FROM LAMBERT COORDINATES

STATE Mass. STATION

x	695,000	R_b+A	23,549,477.32
C	600,000	y	175,000.00
x' $(=x-C)$	+ 95,000	R_b+A-y	23,374,477.32
log $(x-C)$	4.9777 2361	$\frac{\theta}{2}$ (in secs.)	419.1548
log (R_b+A-y)	7.3687 4191	log $\frac{\theta}{2}$	2.6223 7444
log tan θ	8.6089 8170	log S	4.6855 7367
θ	° 13′ 58″.3096	log sin $\frac{\theta}{2}$	7.3079 4811
	838″.3096		
log θ (θ in secs.)	2.9234 0444	log sin^2 $\frac{\theta}{2}$	4.6158 9622
log l	9.8271 9388	log 2	0.3010 3000
log $\frac{\theta}{l}$	3.0962 1056	log R*	7.3647 419
$\Delta\lambda$ $(=\frac{\theta}{l})$	1247.9484	log y''	2.2856 681
		y''	193.05
λ (central mer.)	71° 30′ 00″.0000		
$-\Delta\lambda$	− 20 47.9884	R_b+A-y	23,374,477.32
λ	71 09 12.0116	y''	+ 193.05
		R	23,374,670.37
		y	175,000.00
		y''	− 193.05
		y'	174,806.95
		ϕ (by interpolation)	41 28 46.9722

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

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

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

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

$y'=y-y''$

C is constant added to x' in computation of coordinates

R_b is map radius of lowest parallel

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

ϕ is interpolated from table of y'

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

U.S. GOVERNMENT PRINTING OFFICE 11—11524

T-5602

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

GEODETIC POSITIONS FROM LAMBERT COORDINATES

STATE Mass. STATION

x	695,000	R_b+A	23,549,477.32
C	600,000	y	210,000.00
x' $(=x-C)$	+ 95,000.	R_b+A-y	23,339,477.32
$\log (x-C)$	4.9777 2361	$\frac{\theta}{2}$ (in secs.)	419.7834
$\log (R_b+A-y)$	7.3680 9112	$\log \frac{\theta}{2}$	2.6230 2526
$\log \tan \theta$	7.6096 3249	$\log S$	4.6855 7367
θ	° 13′ 59.″5667	$\log \sin \frac{\theta}{2}$	7.3085 9893
	839.″5667		
$\log \theta$ (θ in secs.)	2.9240 5522	$\log \sin^2 \frac{\theta}{2}$	4.6171 9779
$\log l$	9.8271 9388	$\log 2$	0.3010 3000
$\log \frac{\theta}{l}$	3.0968 6134	$\log R^*$	7.3680 9111
$\Delta\lambda$ $(=\frac{\theta}{l})$	1249.8599	$\log y''$	2.2863 1990
		y''	193.34
λ (central mer.)	71° 30′ 00.″0000		
$-\Delta\lambda$	− 20 49.8599	R_b+A-y	23,339,477.32
λ	71 09 10.1401	y''	+ 193.34
		R	23,339,676.66
		y	210,000.00
		y''	− 193.34
		y'	209,806.66
		ϕ (by interpolation)	41 34 32.7531

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

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

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

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

$y' = y - y''$

C is constant added to x' in computation of coordinates

R_b is map radius of lowest parallel

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

ϕ is interpolated from table of y'

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

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M-350

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PLANE COORDINATE GRID SYSTEM
(Rhode Island system)

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

Positions plotted by H. D. Reed, Jr.

Positions checked ~~by~~ on Ruling machine

Grid inked on machine by H.D.R., Jr.

Intersections inked by H. D. R. Jr.

Points used for plotting grid:

x = 615,000 FT y = 180,000 FT.	x 595,000 y 150,000
x 615,000 y 150,000	x y
x 605,000 y 165,000	x y
x 595,000 y 180,000	x y

Triangulation stations used for checking grid:
y = 603,050.50. FT. - y = 165,487.80 FT.

Ref. sta 1. Nootas 2, 1934 5. _____

2. _____ 6. _____

3. _____ 7. _____

4. _____ 8. _____

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

GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE R 2 STATION 615,000 150,000

x		$\log S_g$	
K		$\log (1200/3937)$	9.4840 1583
x' $(=x-K)$	+115 000	$\log (1/R)$	
$x'^3/(6\rho_o^2)_g$	.6	$\log S_m$	
S_g		cor. arc to sine	−
		$\log S_1$	4.5447118
3 log x'		$\log A$	8.5090804
$\log 1/(6\rho_o^2)_g$		$\log \sec \phi$	0.1255053
$\log x'^3/(6\rho_o^2)_g$		$\log \Delta\lambda_1$	3.1792975
		cor. sine to arc	+ 39
$\log S_m^2$	9.0894	$\log \Delta\lambda$	3179 3014
$\log C$	1.357	$\Delta\lambda$	1511."13
$\log \Delta\phi$	0.440		
y	150 000		
ϕ' (by interpolation)	41° 29′ 42.05	λ (central mer.)	71° 30′ "
$\Delta\phi$	− 2.75	$\Delta\lambda$	25 11.13
ϕ	41 29 39.30	λ	71 04 48.87

Explanation of form:

$x'=x-K$

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

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

R=scale reduction factor

ϕ' is interpolated from table of y

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

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

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

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

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

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

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Form No. 743
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Ed. May 1935

GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE R2 STATION 615,000 / 180,000

x		$\log S_g$	5.0606955
K		$\log (1200/3937)$	9.4840158 3
x' $(=x-K)$	115,000	$\log (1/R)$	27
$x'^3/(6\rho_o^2)_g$	− .6	$\log S_m$	45447140
S_g	114,999.4	cor. arc to sine	− 22
	5.061 9.64a 5.18.3	$\log S_1$	4.5447118
$3 \log x'$	4.581 26	$\log A$	8.5090783
$\log 1/(6\rho_o^2)_g$	4.581	$\log \sec \phi$	0.1260581
$\log x'^3/(6\rho_o^2)_g$	9.764	$\log \Delta\lambda_1$	3.1798482
		cor. sine to arc	+ 39
$\log S_m^2$	9.0894	$\log \Delta\lambda$	3.1798521
$\log C$	1.352	$\Delta\lambda$	1513.05
$\log \Delta\phi$	0441		
y	180,000		
ϕ' (by interpolation)	41° 34′ 38.45″	λ (central mer.)	71° 30′ ″
$\Delta\phi$	− 2.76	$\Delta\lambda$	25 13.05
ϕ	41 34 35.69	λ	71 04 46.95

Explanation of form:

$x'=x-K$

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

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

R=scale reduction factor

ϕ' is interpolated from table of y

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

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

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

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

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

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

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GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

605,000

STATE R. I. STATION 165,000

x		$\log S_g$	5.0211877
K		$\log (1200/3937)$	9.4840158 3
x' $(=x-K)$	105 000	$\log (1/R)$	27
$x'^3/(6\rho_o^2)_g$	.4 104,999.6	$\log S_m$	4.5052062
S_g	5021	cor. arc to sine	− 18
		$\log S_1$	4.5052044
$3 \log x'$	5.063	$\log A$	8.5090793
$\log 1/(6\rho_o^2)_g$	4.581	$\log \sec \phi$	0.1257823
$\log x'^3/(6\rho_o^2)_g$	9.644	$\log \Delta\lambda_1$	3.1400660
		cor. sine to arc	+ 33
$\log S_m^2$	9.0104	$\log \Delta\lambda$	3.1400693
$\log C$	1.352	$\Delta\lambda$	+ 1380.60
$\log \Delta\phi$	0.362		
y	165,000		
ϕ' (by interpolation)	41° 32′ 10.25	λ (central mer.)	71° 30′ ″
$\Delta\phi$	− 2.30	$\Delta\lambda$	23 00.60
ϕ	41 32 07.95	λ	71 06 59.40

Explanation of form:

$x' = x - K$

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

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

R = scale reduction factor

ϕ' is interpolated from table of y

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

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

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

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

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

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

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Form No. 743
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
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GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE R.I. STATION 595,000 / 150,000

x		$\log S_g$	4.9777221
K		$\log (1200/3937)$	9.4840158 3
x' $(=x-K)$	+ 95,000	$\log (1/R)$	271
$x'^3/(6\rho_o^2)_g$	− .33	$\log S_m$	4.4617406
S_g	94,999.67	cor. arc to sine	− 15
		$\log S_1$	4.4617391
3 log x'	4.933	$\log A$	8.5090704
$\log 1/(6\rho_o^2)_g$	4.581	$\log \sec \phi$	0.1255069
$\log x'^3/(6\rho_o^2)_g$	9.514	$\log \Delta\lambda_1$	3096326 4
		cor. sine to arc	+ 26
$\log S_m^2$	8.9235	$\log \Delta\lambda$	3.0963290
$\log C$	1.3511	$\Delta\lambda$	1248.329
$\log \Delta\phi$	0.2746		
y			
ϕ' (by interpolation)	41° 29′ 42.″051	λ (central mer.)	71° 30′ 00″
$\Delta\phi$	− 1.882	$\Delta\lambda$	20′ 48.″329
ϕ	41° 29′ 40.″169	λ	71° 09′ 11.″671

Explanation of form:

$x'=x-K$

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

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

R=scale reduction factor

ϕ' is interpolated from table of y

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

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

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

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

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

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

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Form No. 743
DEPARTMENT OF COMMERCE
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Ed. May 1935

GEODETIC POSITIONS FROM TRANSVERSE MERCATOR COORDINATES

STATE R.I. STATION 595,000 / 180,000

x		$\log S_g$	
K		$\log (1200/3937)$	9.4840 1583
x' $(=x-K)$	+ 95,000	$\log (1/R)$	
$x'^3/(6\rho_o^2)_g$	− .33	$\log S_m$	
S_g		cor. arc to sine	−
		$\log S_1$	4.4617391
3 log x'		$\log A$	8.5090784
log $1/(6\rho_o^2)_g$		log sec ϕ	0.1260597
log $x'^3/(6\rho_o^2)_g$		log $\Delta\lambda_1$	3.0968772
		cor. sine to arc	+ 26
log S_m^2	8.9235	log $\Delta\lambda$	3.0968798
log C	1.3523	$\Delta\lambda$	1249.″913
log $\Delta\phi$	0.2758		
y			
ϕ' (by interpolation)	41° 34′ 38.″448	λ (central mer.)	71° 30′ ″
$\Delta\phi$	− 1.887	$\Delta\lambda$	20 49.913
ϕ	41° 34′ 36.″561	λ	71° 09′ 10.″087

Explanation of form:

$x'=x-K$

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

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

R=scale reduction factor

ϕ' is interpolated from table of y

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

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

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

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

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

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

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PLANE COORDINATES ON TRANSVERSE MERCATOR PROJECTION

State R2. Station Nootas 2 1934

ϕ 41° 32' 12.863

λ (Central meridian) 71° 30' "

λ 71 07 25.001

$\Delta\lambda$ (Central meridian–λ) 22 34.999

$\Delta\lambda$ (in sec.) 1355.00

log $\Delta\lambda$	3.1316279 9393	log S_m^2	8.9933499
Cor. arc to sine	− 31	log C*	1.352
log $\Delta\lambda_1$	3.1319362	log $\Delta\phi$	0.3456
log cos ϕ	9.8742085		
colog A	1.4909207	ϕ	° ' 12".863
log S_1	4.4970654	$\Delta\phi$	+ 2.21
Cor. sine to arc	+ 17	ϕ'	15.07
log S_m	4.4970671		
log 3937/1200	0.5159841 7	Tabular difference of y for 1" of ϕ'	
log R	− 27		
log S_g	5.0130485	y (for min. of ϕ')	
log S_g^3	5.038	y (for seconds of ϕ')	+
log $1/6\rho_o^2R^2$	4.581	y	165,487.8
log $(S_g^3/6\rho_o^2)_g$	9.619		
S_g	+ 103,050.1	log sin $\frac{\phi+\phi'}{2}$	
$(S_g^3/6\rho_o^2)_g$	.4	log $\Delta\lambda$	
x'	103,050.5	log $\Delta\alpha_1$	
	5		
	2,000,000.00	log $(\Delta\lambda)^3$	
x	603,050.5	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)