6237a

6237a

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. Patton, *Director*

State: VIRGINIA

DESCRIPTIVE REPORT

GRAPHIC CONTROL
~~Topographic~~
~~Hydrographic~~ } *Sheet No.* E

LOCALITY
Vicinity of
CHINCOTEAGUE INLET
~~AND VICINITY~~
Watts Bay to Bogues Bay
~~BOGUES, POWELLS, and WATTS BAY~~

1934

CHIEF OF PARTY

H. A. Seran

U. S. GOVERNMENT PRINTING OFFICE: 1933

Form 537a
Ed. Nov., 1929

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

TOPOGRAPHIC TITLE SHEET

GRAPHIC CONTROL 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. E

REGISTER NO. 6237a

State VIRGINIA

General locality Vicinity of CHINCOTEAGUE INLET ~~AND VICINITY~~

Locality Watts Bay to Bogues Bay ~~BOGUES, POWELLS, and WATTS BAY~~

Scale 1:10,000 Date of survey Sept. 25-28, 1934

Vessel Sub-party Ship OCEANOGRAPHER

Chief of party H. A. Seran

Surveyed by J. E. Waugh

Inked by F. J. Kish -- J. E. Waugh

~~Heights in feet above XXXXXXXXXXXXXXXX ground to tops of trees~~

~~Contour, Approximate contour, Form Line Interval XXXXXXXXX feet~~

Instructions dated April 27, 1933 - June 19, 1934

Remarks: This sheet is for the control of hydrographic survey.

DESCRIPTIVE REPORT

to accompany

GRAPHIC CONTROL SHEET (Field Letter E)

CHINCOTEAGUE INLET AND VICINITY

Sub-party Ship OCEANOGRAPHER H. A. Seran, Chief of Party

PROJECT NO. H.T. 142

The descriptive report for Topographic Sheet (field letter E) which covers the plane table control for hydrography in Bogues Bay, Powells Bay, Watts Bay and the creeks and sloughs leading into these bays is herewith submitted.

INSTRUCTIONS:

The topography on Sheet E is a part of Project No. H.T. 142. The instructions for this part of the project are dated June 19, 1934.

LIMITS AND SCALE:

The scale of this sheet is 1:10,000. It covers that area between Latitudes 37°-51'.5 and 37°-55'.6 and Longitudes 75°-26'.5 and 75°-30'.4.

CONTROL AND SURVEY METHODS:

The control consisted of three triangulation stations of third order accuracy and one, three point fix obtained with the theodolite. The location of triangulation station Narrows, 1934 is Latitude 37°-53', 1077.8 m, Longitude 75°-26 1263.2.

The usual plane table survey methods were used. The plane table positions were obtained by resection and three point problem methods. There was no traverse.

This sheet was for the location of signals for hydrographic purposes only. The shore line and detail topography was furnished the party by the office.

When it was found that the hydrography did not fit the air photos covered on this sheet, three point fixes were taken with the theodolite at ⊙Mary, ⊙Dam, and ⊙Bob. The control points used at ⊙May and ⊙Dam were △Chester 1902, 1933; △Chin, 1933; △Wall, 1933; and △Taylor, 1849, 1933. The control points used at ⊙Bob were △Narrows, 1934; ⊙Isle; △Taylor, 1849, 1933; and ⊙May. The position of ⊙Bob is not as strong as the other positions due to the fact that ⊙May and ⊙Isle are used as control points. Trouble was experienced here also in obtaining good pointings due to the character of the signals over ⊙Isle and △Taylor, 1849, 1933. It was found that the

location of the signals as obtained by the plane table checked satisfactorily with the positions obtained from the three point problems.

Comparisons of the two positions are given in the following table:

Name	Position Computed	Scaled (Adjusted)	Difference	Error Dir.	Error Dist.
May	Lat. 37°-53' +73.7 m	+72.0 m	-1.7 m		
	Long. 75°-27' +1284.4 m	+1283.3 m	-1.1 m	S.E.	1.87 m
Dam	Lat. 37°-53' +1157.1 m	+1155.0 m	-2.1 m		
	Long. 75°-28' +1350.1 m	+1352.2 m	+2.1 m	S.W.	2.79 m
Bob	Lat. 37°-51' +1426.6 m	+1423.0 m	-3.6 m		
	Long. 75°-28' +1138.3 m	+1136.2 m	-2.1 m	S.E.	4.16 m

Shore line reference was taken at △Narrows, 1934; ⊙Rat; ⊙Dam; ⊙May; ⊙Bob. ⊙Gab is the east gable of the oyster house on Bogues Bay. The shore line at the signals on the north of the sheet check satisfactorily. However; as one moves south on this sheet the difference between the shore line on the air photos and the shore line obtained by shore line references, increases. The descrepancy reaches a maximum on the south of the sheet. The shore line at ⊙Bob seems to be out approximately 34 meters in longitude and 16 meters in latitude.

MARSHES:

The marshes in this area are large and are covered at high water. The soil is soft and boggy and is covered by marsh grass.

MAGNETIC MERIDANS:

The magnetic meridan as indicated on the sheet was determined at triangulation station Narrows, 1934. The declinatoire was not checked in the field because the magnetic declination was not known and no instruments were on hand to make the necessary observations.

AIDS TO NAVIGATION:

There are two beacons established by the Light House Service that fall on this sheet. They are on each end of the cut through the eastern edge of Bogues Bay.

Each beacon consists of a single pile approximately 15' in height. There is a rectangular banner fastened to the face of and at the top of the pile. There is a large white number on the face of the banner. Beacon Number Two is the southern most one, while Beacon Number Three is the one to the northerd.

RECOVERABLE TOPOGRAPHIC STATIONS:

The discription of five recoverable topographic stations on this sheet are being submitted on form 524.

LANDMARKS:

There are two objects that can be used as land marks on this sheet. Form 567 is attached.

Respectfully submitted,

J. E. Waugh,
Ensign, C. & G. S.

Approved and forwarded:

H. A. Seran.

H. A. Seran, Comdr., C. & G. S.,
Commanding Ship OCEANOGRAPHER

PLANE TABLE POSITIONS:

1. Gable, east, oyster house, Wishert's Point. (⊙ Gab)
2. Tank, elevated, white, Bogues Bay. (⊙ Tan)

Duplicate

Form 567
Rev. Jan., 1933

DIVISION OF CHARTS, FILE NO._____

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

LANDMARKS FOR CHARTS

Norfolk, Virginia

_____, 193

DIRECTOR, U. S. COAST AND GEODETIC SURVEY:

The following determined objects are prominent, can be readily distinguished from seaward from the description given below, and should be charted.

H. A. Seran

"AID TO NAVIGATION" H. A. Seran Chief of Party.

DESCRIPTION	POSITION					METHOD OF DETERMINATION	CHARTS AFFECTED
	LATITUDE		LONGITUDE		DATUM		
	° '	D. M. METERS	° '	D. P. METERS			
BEACON "2", black (⊙ Two at enterance to Cat Creek)	37 -51	1583	75 -28	656	NA 1927	Plane-table	No. 1109, 1221
BEACON "3", black (⊙ Three, at south enterance to Id. Hole Narrows)	37 - 51	1837	75 - 28	272	NA 1927	Plane-table	No. 1109, 1221

Three positions were computed checked against original

J. E. Vaughn

A list of objects carefully selected because of their value as landmarks as determined from seaward together with individual descriptions, must be furnished in a special report on this form, and a copy of such report must be attached by the Chief of Party to his descriptive report.

The selection, determination, and description of these points are an important factor in the value of the chart. Landmarks selected at appropriate intervals can be clearly charted. However, when none is outstanding, a group of two or three objects may by their interrelationship provide positive indentification. A group so selected should be indicated.

The description of each object should be short, but such as will clearly identify it; for example, a standpipe, elevated tank, gas tank, church spire, tall stack, red chimney, radio mast, etc. Assign numerals to landmarks to indicate: (1) offshore, (2) inshore, (3) harbor, 1, 2, 3 would be a mark useful on all charts. Generally, flagstaffs and like objects are not sufficiently permanent to chart.

U. S. GOVERNMENT PRINTING OFFICE: 1933

Form 567
Rev. Jan., 1933

Duplicate

DIVISION OF CHARTS, FILE NO._____

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

LANDMARKS FOR CHARTS

Norfolk, Virginia

_____, 193

DIRECTOR, U. S. COAST AND GEODETIC SURVEY:

The following determined objects are prominent, can be readily distinguished from seaward from the description given below, and should be charted.

H. A. Seran — Chief of Party.

DESCRIPTION	POSITION					METHOD OF DETERMINATION	CHARTS AFFECTED
	LATITUDE		LONGITUDE		DATUM		
	° ′	D. M. METERS	° ′	D. P. METERS			
TANK (ELEVATED), white							
(⊙ Tan, SW side of							
Bogues Bay)	37 - 52	1378 ✓	75 - 29	959 ✓	NA 1927	Plane-table	No. 1109, 1221 ✓
BUILDING, east gable,							
(⊙ Gab - chart outline)	37- 52	1663 ✓	75 - 29	671 ✓	NA 1927	Plane-table	No. 1109, 1221 ✓

These positions were copied checked against the original

J.E. Vaughn

A list of objects carefully selected because of their value as landmarks as determined from seaward together with individual descriptions, must be furnished in a special report on this form, and a copy of such report must be attached by the Chief of Party to his descriptive report.

The selection, determination, and description of these points are an important factor in the value of the chart. Landmarks selected at appropriate intervals can be clearly charted. However, when none is outstanding, a group of two or three objects may by their interrelationship provide positive indentification. A group so selected should be indicated.

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U. S. GOVERNMENT PRINTING OFFICE: 1933

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

Fourth Order
LIST OF DIRECTIONS

62378

Station O Bob State Virginia

Chief of party H. A. Seran Date 11/13/34 Computed by JEW

Observer F. S. Trantham Instrument 7" Berger No. 255 Checked by F.S.T.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
Taylor 1849	0 00 00.00			0 00 00.00	
O May	74 13 51.9 ✓				
Narrows, 1934	84 48 56.8 ✓				
Isle, 1934	178 14 35.5 ✓				

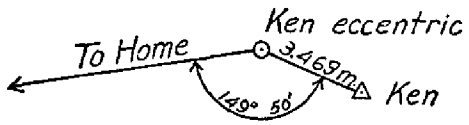
* These columns are for office use and should be left blank in the field

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed at the station.*

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

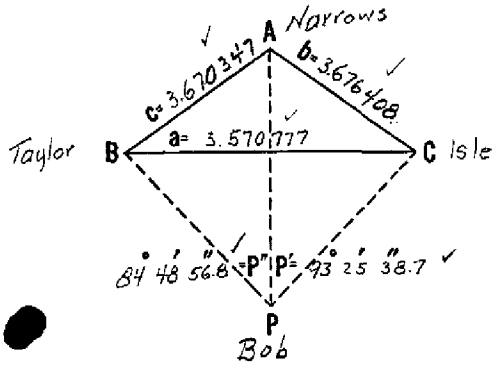
It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 655
Ed. Sept., 1929

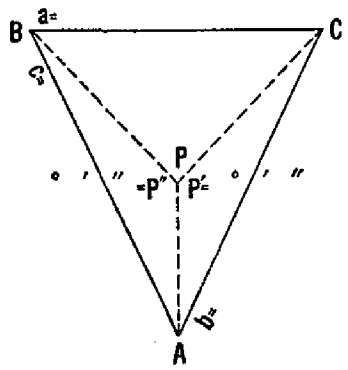
Fourth Order

COMPUTATION OF THREE-POINT PROBLEM

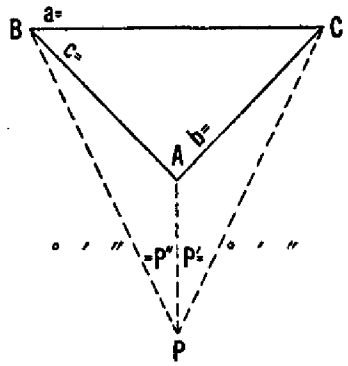
Case 1



Case 2



Case 3



Cases 1 and 2

P'	93° - 25' - 38.7 ✓
P"	84 - 48 - 56.8 ✓
A	46 - 29 - 54.4 ✓
Sum	224 - 44 - 29.9 ✓
½ Sum	112 - 22 - 15.0 ✓
S = 180° − ½ sum =	67 - 37 - 45.0 ✓

Case 3

P'	
P"	
Sum A	
A − sum	
S = ½ (A − sum) =	

Log c =	3.670347 ✓
Log sin P' =	9.999223 ✓
Colog b =	6.323592 ✓
Colog sin P" =	0.001780 ✓
Sum = log tan Z =	9.994942 ✓
Z =	44° - 39' - 58.9 ✓
Z + 45° =	89 - 39 - 58.9 ✓
Log cot (Z + 45°) =	7.765159 ✓
Log tan S =	0.385551 ✓
Sum = log tan ε =	8.150710 ✓ (sign +)
ε	00° - 48' - 38.1 ✓
S	67 - 37 - 45.0 ✓

(Tan ε +)		(Tan ε −)
S + ε = angle ABP	68° - 26' - 23.1 ✓	S − ε = angle ABP
S − ε = angle ACP	66 - 49 - 06.9 ✓	S + ε = angle ACP

BPA	84° - 48' - 56.8" ✓	APC	93° - 25' - 38.7 ✓	PCB	00° - 59' - 10.8"
ABP	68 - 26 - 23.1 ✓	PCA	66 - 49 - 06.9 ✓	CBP	00° - 45' - 33.8" ✓
PAB	26 - 44 - 40.1 ✓	CAP	19 - 45 - 14.4 ✓	BPC	178° - 14' - 35.5" ✓

00.1

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98–100)

U. S. GOVERNMENT PRINTING OFFICE: 1929
11—9912

Comp'd by JEW
✓ J.O.J.

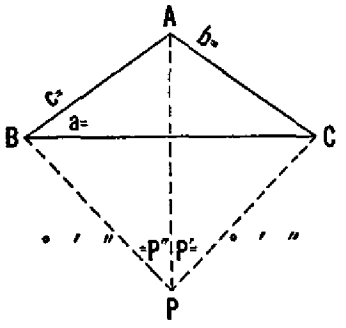
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 655
Ed. Sept., 1929

Fourth Order

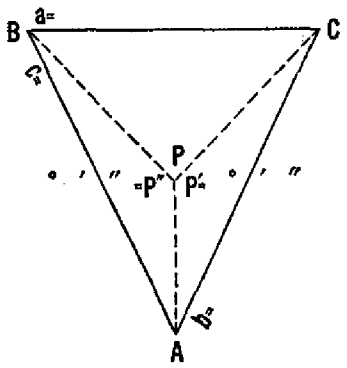
B-4

COMPUTATION OF THREE-POINT PROBLEM

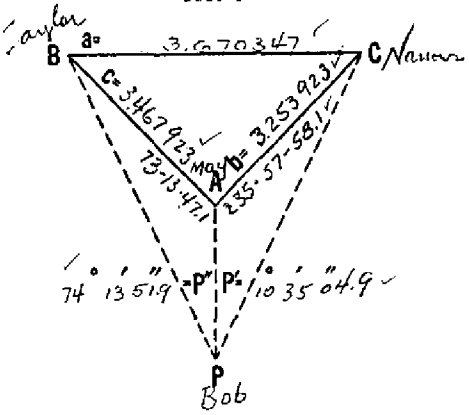
Case 1



Case 2



Case 3



Cases 1 and 2		Case 3	
P'		P'	10-35-04.9 ✓
P"		P"	74-13-51.9 ✓
A			84-48-56.8 ✓
		Sum	
Sum		A	162-44-11.0
½ Sum			
		A−sum	77-55-14.2
S=180°−½ sum=		S=½ (A−sum)=	38-57-37.1

Log c = 3.467923 ✓
Log sin P' = 9.264083 ✓
Colog b = 6.746077 ✓
Colog sin P" = 0.016660 ✓

Sum=log tan Z= 9.494743 ✓

Z= 17°-21-00.0 ✓
Z+45°= 62-21-00.0 ✓

This is computed as a check on 3-pt. Fix: Taylor, Navarro, Bob

Log cot (Z+45°) = 9.719248 ✓
Log tan S= 9.907754

Sum=log tan ϵ= 9.627002 (sign +)

ϵ 22°-57-34.9
S 38-57-37.1

(Tan ϵ+)	(Tan ϵ−)
S+ϵ=angle ABP 61-55-12.0	S−ϵ=angle ABP
S−ϵ=angle ACP 16-00-02.2	S+ϵ=angle ACP

BPA	74-13-51.9 ✓	APC	10-35-04.9 ✓	PCB	26°-43-59.4 ✓
ABP	61-55-12.0 ✓	PCA	16-00-02.2 ✓	CBP	68-27-03.8 ✓
PAB	43-50-56.1 ✓	CAP	153-24-51.9 ✓	BPC	84°-48'-56.8 ✓
					180 00 00.0

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98–100)

Comp by F.S.Y.
✓ by Jew

U. S. GOVERNMENT PRINTING OFFICE: 1929
11—9912

Fourth Order

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 25
Ed. Jan., 1929

COMPUTATION OF TRIANGLES

State: VIRGINIA

11—9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
		From Fix: Taylor, Narrows, Dale					
	2-3						3.670347 ✓
	1 Bob	84° 48' 56".8 ✓					0.001 780 ✓
	2 TAYLOR, 1849	68 - 26 - 23.1 ✓					9.968 498 ✓
	3 NARROWS, 1934	26 - 44 - 40.1 ✓					9.653 224 ✓
	1-3	000					3.640625 ✓
	1-2						3.325351 ✓
	2-3						3.676 408 ✓
	1 Bob	93° 25' 38".7 ✓					0.000777 ✓
	2 NARROWS, 1934	19 - 45 - 14.4 ✓					9.528 894 ✓
	3 ISLE, 1934	66 - 49 - 06.9 ✓					9.963 440 ✓
	1-3	000					3.206 079 ✓
	1-2						3.640625 ✓
		From Fix: Taylor, May, Narrows					
	2-3						3.467923 ✓
	1 Bob	74° 13' 51".9 ✓					0.016 660 ✓
	2 TAYLOR, 1849	61 - 55 - 12.0 ✓					9.945 612 ✓
	3 May	43 - 50 - 56.1 ✓					9.840 582 ✓
	1-3	000					3.430 195 ✓
	1-2						3.325 165 ✓
	2-3						3.670 347 ✓
	1 Bob	84° 48' 56".8 ✓					0.001 780 ✓
	2 TAYLOR, 1849	68 - 27 - 03.8 ✓					9.968 532 ✓
	3 NARROWS, 1934	26 - 43 - 59.4 ✓					9.653 054 ✓
	1-3	000					3.640 659 ✓
	1-2						3.325 181 ✓

Do not write in this margin

J. S. J.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 25
Ed. Jan., 1929

Fourth Order

COMPUTATION OF TRIANGLES

11—9121

State: VIRGINIA

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3	From Lis: Taylor, May, Narrows					3.253923 /
	1 Bob	10°-35'-04.9" /					0.735917 /
	2 May	153-24-52.9 /					9.650822 /
	3 NARROWS, 1934	16-00-02.2 /					9.440354 /
	1-3						3.640662 /
	1-2						3.430194 /
							✓ J.J.
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						

Do not write in this margin

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April, 1929

From Fix: Taylor, Narrows, Isle

Fourth Order

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

		°	′	″
α	2 TAYLOR 1849 to 3 NARROWS, 1934	246	40	44.7
2d ∠	NARROWS, 1934 & Bob	+ 68	26	23.1
α	2 TAYLOR 1849 to 1 Bob	315	07	07.8
Δα		+	00	37.5
		180	00	00.0
α′	1 Bob to 2 TAYLOR, 1849	135	07	45.3
	FIRST ANGLE OF TRIANGLE	84	48	56.8

		°	′	″
α	3 NARROWS, 1934 to 2 TAYLOR, 1849	66	42	32.7
3d ∠	TAYLOR, 1849 ↔ & Bob	− 26	44	40.1
α	3 NARROWS 1934 to 1 Bob	39	57	52.6
Δα		−	01	10.5
		180	00	00.0
α′	1 Bob to 3 NARROWS, 1934	219	56	42.1

	°	′	″			°	′	″
φ	37	52	34.89	2 TAYLOR, 1849	λ	75	29	47.63
Δφ	−	00	48.62		Δλ	−	01	01.06
φ′	37	51	46.27	1 Bob	λ′	75	28	46.57

	°	′	″			°	′	″
φ	37	53	34.96	3 NARROWS 1934	λ	75	26	51.70
Δφ	−	01	48.69		Δλ	+	01	54.86
φ′	37	51	46.27	1 Bob	λ′	75	28	46.56 (+0.1)

	Logarithms	Values in seconds	
s	3.325351		
Cos α	9.850384		
B	8.511012		
h	1.686747	1st term	+48.″612
s²	6.6507		
Sin²α	9.6971		
C	1.2956		
	7.6434	2d term	+ 0.004
h³			
D			
		3d term	+
		−Δφ	+48.616

	°	′	″	Logarithms	Values in seconds
½(φ+φ′)	37	52	10.6		
s				3.325351	
Sin α				9.848582 n	
A′				8.509172	
Sec φ′				0.102658	
Δλ				1.785763	-61.″061
Sin½(φ+φ′)				9.788074	
−Δα				1.573837	-37.48

	Logarithms	Values in seconds	
s	3.640625		
Cos α	9.884481		
B	8.511011		
h	2.036117	1st term	+108.″672
s²	7.2812		
Sin²α	9.6155		
C	1.2959		
	8.1926	2d term	+ 0.016
h³			
D			
		3d term	+ —
		−Δφ	+108.688

	°	′	″	Logarithms	Values in seconds
½(φ+φ′)	37	52	40.6		
s				3.640625	
Sin α				9.807748	
A′				8.509172	
Sec φ′				0.102658	
Δλ				2.060183	+114.″864
Sin½(φ+φ′)				9.788155	
−Δα				1.848338	+ 70.52

Comp by JEW

11—9362 U. S. GOVERNMENT PRINTING OFFICE, 1929

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

Fourth Order 62378

LIST OF DIRECTIONS

Station O Dam State Virginia

Chief of party H.A. Seran Date 11/13/34 Computed by JEW.

Observer F.S. Trantham Instrument 7"- Berger No. 255 Checked by F.S.T.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chester, 1902	0 00 00.00			0 00 00.00	
Chin, 1933	54 03 19.2				
Wall, 1933	80 56 59.4				
Taylor, 1849	183 20 02.9				

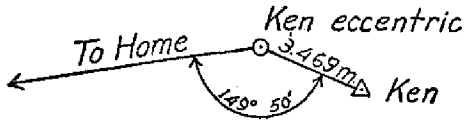
*These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	— 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	— 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed at the station.*

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24a some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

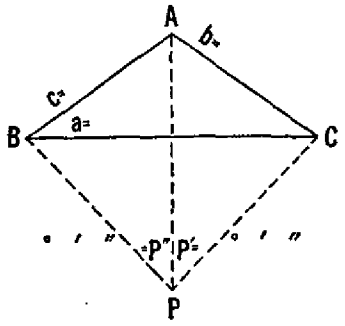
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 655
Ed. Sept., 1929

Fourth Order

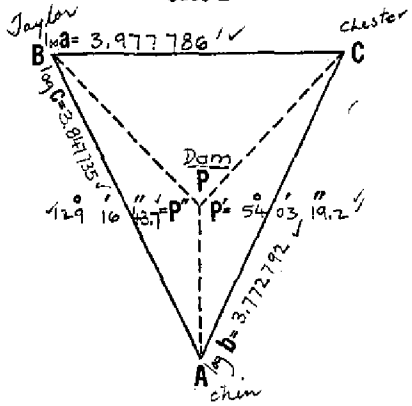
Sta. Dam

COMPUTATION OF THREE-POINT PROBLEM

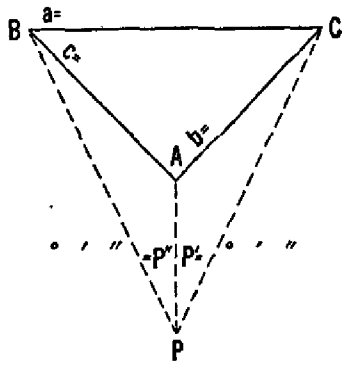
Case 1



Case 2



Case 3



Cases 1 and 2

P′	54 03 19.2 ✓
P″	129 16 43.7 ✓
A	93 48 55.0 ✓
Sum	277 08 57.9 ✓
½ Sum	138 34 29.0 ✓
S = 180° − ½ sum =	41 25 31.0 ✓

Case 3

P′	
P″	
Sum	
A	
A − sum	
S = ½ (A − sum) =	

Log c =	3.847 735 ✓ ✓
Log sin P′ =	9.908 262 ✓ ✓
Colog b =	6.227 208 ✓ ✓
Colog sin P″ =	0.111 217 ✓ ✓
Sum = log tan Z =	10.094 422 ✓ ✓
Z =	51 10 48.0 ✓ ✓
Z + 45° =	96 10 48.0 ✓ ✓
Log cot (Z + 45°) =	9.034 555 ✓ ✓
Log tan S =	9.945 667 ✓ ✓
Sum = log tan ϵ =	8.980 222 ✓ ✓ (sign −)
ϵ	05 27 28.6 ✓
S	41 25 31.0 ✓

(Tan ϵ+)		(Tan ϵ−)
S + ϵ = angle ABP	46° 52′ 59.6	S − ϵ = angle ABP
S − ϵ = angle ACP	35 58 02.4	S + ϵ = angle ACP

BPA	129 16 43.7 ✓	APC	54 03 19.2 ✓	PCB	00 48 44.9 ✓
ABP	35 58 02.4 ✓	PCA	46 52 59.6 ✓	CBP	02 31 18.2 ✓
PAB	14 45 13.9 ✓	CAP	79 03 41.2 ✓	BPC	176 39 57.1 ✓
					180 00 00.2

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98–100)

Comp. by F. S. J.
Vhy Jam

U. S. GOVERNMENT PRINTING OFFICE: 1929
11—9012

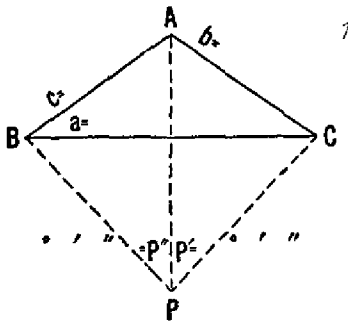
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 655
Ed. Sept., 1929

Fourth Order

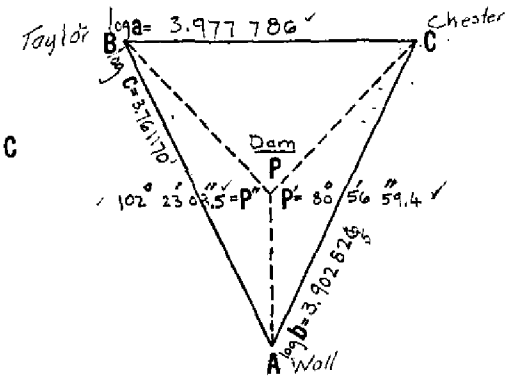
COMPUTATION OF THREE-POINT PROBLEM

Sta. Dam

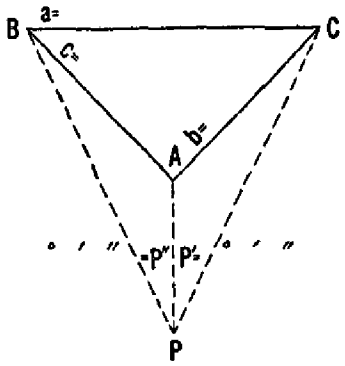
Case 1



Case 2



Case 3



Cases 1 and 2

P'	80 56 59.4 ✓
P"	102 23 03.5 ✓
A	85 41 13.8
Sum	269 01 16.7
½ Sum	134 30 38.4
S=180°−½ sum=	45 29 21.6

Case 3

P'	
P"	
Sum A	
A−sum	
S=½ (A−sum)=	

Log c =	3.761 170 ✓
Log sin P' =	9.994 560 ✓
Colog b =	6.097 175 ✓
Colog sin P" =	0.010 225 ✓
Sum=log tan Z=	9.863 130 ✓
Z=	36 07 02.4 (07.5)
Z+45°=	81 07 02.4 (07.5)
Log cot (Z+45°) =	9.193 932 (20)
Log tan S=	0.007 418 ✓
Sum=log tan ε=	9.201 338 (sign +)
ε	09 01 59.5 (53 02.0)
S	45 29 21.6

This is computed for a check on 3-pt. fix Taylor, Chester, Chin.

(Tan ε+) ✓		(Tan ε−)
S+ε=angle ABP	54-31-21.1	S−ε=angle ABP
S−ε=angle ACP	36-27-22.1	S+ε=angle ACP

BPA	102 23 03.5 ✓	APC	80 56 59.4 ✓	PCB	00 48 42.1
ABP	54 31 21.1	PCA	36 27 22.1	CBP	02 31 21.0
PAB	23 05 35.4	CAP	62 35 38.5	BPC	176 39 57.1 ✓

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98–100)

Comp by F.S.T.
✓ by JOM

U. S. GOVERNMENT PRINTING OFFICE: 1930
11—9912

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 25
Ed. Jan., 1929

Fourth Order

COMPUTATION OF TRIANGLES

State: Va.

11—9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3						3.902 826 5 ✓
	1 Dam	80 56 59.4 ✓	+00".1	59".5	00".1	59".4	0.005 440 ✓
	2 CHESTER	36 27 22.1	—	22.1	—	22.1	9.773 938
	3 WALL	62 35 38.5	—	38.5	—	38.5	9.948 299
	1-3			00".1		00.0	3.682 203 ✓
	1-2						3.856 564 ✓
	2-3						3.761 170 ✓
	1 Dam	102 23 03.5 ✓					0.010 225 ✓
	2 WALL	23 05 35.4					9.593 538
	3 TAYLOR	54 31 21.1					9.910 808
	1-3						3.364 933
	1-2						3.687 208 ✓
*	2-3						3.772 792 ✓
	1 Dam	54 03 19.2 ✓	+00".1	19".3	00".1	19".2	0.091 738 ✓
	2 CHESTER	46 52 59.6 ✓		59.6		59.6	9.863 300 ✓
	3 CHIN	79 03 41.2 ✓		41.2		41.2	9.992 037 ✓
	1-3			00.1		00.0	3.727 830 ✓
	1-2						3.856 567 ✓
	2-3						3.847 735 ✓
	1 Dam	129 16 43.7 ✓					0.111 217 ✓
	2 CHIN	14 45 13.9 ✓					9.405 973 ✓
	3 TAYLOR	35 58 02.4 ✓					9.768 878 ✓
	1-3						3.364 928 ✓
	1-2						3.727 830 ✓

Comp by F.S.T.
✓ by JCW

Do not write in this margin

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April, 1929

Fourth Order

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

		°	'	"
α	2 Chester, 1902 to 3 Chin, 1933	343	20	39.3
2d ∠	Chin, 1933 & Dam	+ 46	52	59.6
α	2 Chester, 1902 to 1 Dam	30	13	38.9
Δα		−	01	31.0
		180	00	00.0
α'	1 Dam to 2 Chester, 1902	210	12	07.9
	First Angle of Triangle	54	03	19.3

		°	'	"
α	3 Chin, 1933 to 2 Chester, 1902	163	21	22.0
3d ∠	Dam & Chester, 1902	− 79	03	41.2
α	3 Chin, 1933 to 1 Dam	84	17	40.8
Δα		−	02	13.7
		180	00	00.0
α'	1 Dam to 3 Chin, 1933	264	15	27.1

	°	'	"			°	'	"
φ	37	56	58.980	2 Chester, 1902	λ	75	26	27.168
Δφ	−	01	21.448		Δλ	+	02	28.088
φ'	37	53	37.532	1 Dam	λ'	75	28	55.256

	°	'	"			°	'	"
φ	37	53	54.818	3 Chin, 1933	λ	75	25	17.643
Δφ	−	00	17.286		Δλ	+	03	37.613
φ'	37	53	37.532	1 Dam	λ'	75	28	55.256

	Logarithms	Values in seconds
s	3.856 567	1157.15 (692.71)
Cos α	9.930 531	
B	8.511 006	
h	2.304 104	1st term + 201.4206
s²	7.713	
Sin² α	9.404	
C	1.297	
	8.414	2d term + 0.0259
h²	4.61	
D	2.38	
	6.99	3d term + 0.0010
		−Δφ + 201.4475

	°	'	"	Logarithms	Values in seconds
½(φ+φ')	37	55	18.3		
s				3.856 567	1350.11 (115.94)
Sin α				9.701 943	
A'				8.509 171	
Sec φ'				0.102 840	
Δλ				2.170 521	+ 148.0884
Sin ½(φ+φ')				9.788 582	
−Δα				1.959 103	+ 91.01

	Logarithms	Values in seconds
s	3.727 830	
Cos α	8.997 440	
B	8.511 010	
h	1.236 280	1st term + 17.2298
s²	7.456	
Sin² α	9.996	
C	1.296	
	8.748	2d term + 0.0560
h²	2.47	
D	2.38	
	4.85	3d term + ———
		−Δφ + 17.2858

	°	'	"	Logarithms	Values in seconds
½(φ+φ')	37	53	46.2		
s				3.727 830	
Sin α				9.997 843	
A'				8.509 171	
Sec φ'				0.102 840	
Δλ				2.337 684	+ 217.6126
Sin ½(φ+φ')				9.788 331	
−Δα				2.126 015	+ 133.66

11—9362 U. S. GOVERNMENT PRINTING OFFICE: 1929

Comp. F.S.D.
11/14/36

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 214
Rev. Oct., 1932

LIST OF DIRECTIONS

62378

APR 2 1935

Acc. No.

Station O May
State Virginia
Chief of party H.A. Seran
Date 10/30/34
Computed by
Observer J.E. Waugh
Instrument 7" Berger No. 255
Checked by F.S.T.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″		° ′ ″	′ ″
Taylor, 1849	0 00 00.00			0 00 00.00	
*O Dam	52-01-50 ✓				
Chester, 1902	122-42-54.4 ✓				
Narrows, 1934	162-43-20 ✓				
*O Tip (Beacon No 1 Ballast Nos)	167-53-10 ✓				
Chin, 1933	173-37-40.1 ✓				
Wall, 1933	209-13-47.3 ✓				
*Beacon No 3 (Id. Hole Narrows)	300-02-00 ✓				
*Beacon No 2 (Id. Hole Narrows)	307-47-00 ✓				
*O Bob	316-08-00 ✓				

* Directions obtained from one pointing on object

Fourth Order

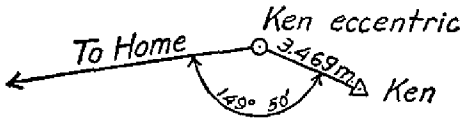
*These columns are for office use and should be left blank in the field.

Station: Ken | *State:* Maryland

Chief of party: C. V. H. | *Date:* 1917 | *Computed by:* O. P. S.

Observer: C. V. H. | *Instrument:* No. 168 | *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed at the station.*

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

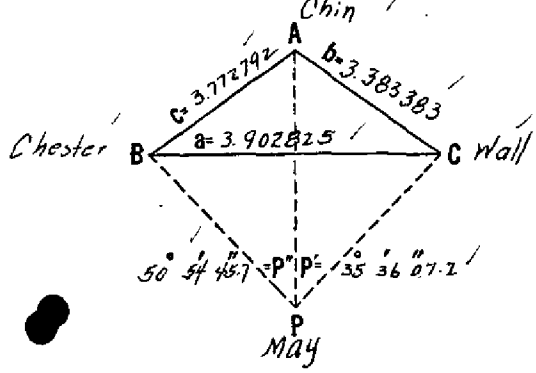
It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 655
Ed. Sept., 1929

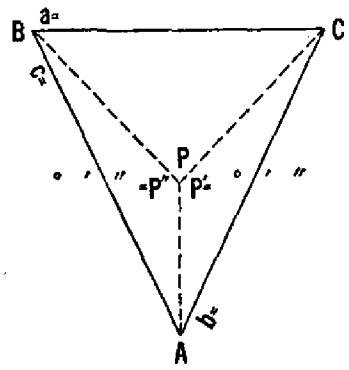
Fourth Order

COMPUTATION OF THREE-POINT PROBLEM

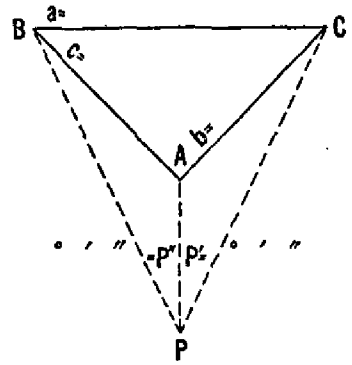
Case 1



Case 2



Case 3



Cases 1 and 2		Case 3	
P′	35° 36′ 07.″2	P′	
P″	50 - 54 - 45.7	P″	
A	143 - 14 - 00.4		
		Sum	
Sum	229 - 44 - 53.3	A	
½ Sum	114 - 52 - 26.6		
		A − sum	
S = 180° − ½ sum =	65 - 07 - 33.4	S = ½ (A − sum) =	

Log c =	3.772 792
Log sin P′ =	9.765 036
Colog b =	6.616 617
Colog sin P″ =	0.110 034
Sum = log tan Z =	0.264 479
Z =	61° 27′ 29.″2
Z + 45° =	106 - 27 - 29.2
Log cot (Z + 45°) =	9.470 438 (sign n)
Log tan S =	0.333 824
Sum = log tan ϵ =	9.804 262 (sign n)
ϵ	32° 30′ 16.″1
S	65 - 07 - 33.4

(Tan ϵ +)		(Tan ϵ −)
S + ϵ = angle ABP	32° 37′ 17.″3	S − ϵ = angle ABP
S − ϵ = angle ACP	97 - 37 - 49.5	S + ϵ = angle ACP

BPA	50° 54′ 45.″7	APC	35° 36′ 07.″2	PCB	71° 17′ 30.″5
ABP	32 - 37 - 17.3	PCA	97 - 37 - 49.5	CBP	22 - 11 - 38.8
PAB	96 - 27 - 57.0	CAP	46 - 46 - 03.3	BPC	86 - 30 - 52.91

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(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98–100)

U. S. GOVERNMENT PRINTING OFFICE: 1929
11—9812

Comp by J.S.T.
Copy by J.S.T.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 25
Ed. Jan., 1929

Fourth Order

COMPUTATION OF TRIANGLES

State: VIRGINIA

11—9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	From 3-point Fix: CHESTER, CHIN, WALL.						
	2-3						3.772792 ✓
	1 May	50° 54' 45.7"	+00.1	45.8	00.1	45.7	0.110034 ✓
	2 Chester, 1902	32-37-17.3	—	17.3	00.0	17.3	9.731658 ✓
	3 Chin, 1933	96-27-57.0	—	57.0	00.0	57.0	9.997229 ✓
	1-3	00.0		00.1			3.614484 ✓
	1-2						3.880055 ✓
	2-3						3.383383 ✓
	1 May	35° 36' 07.2"					0.234964 ✓
	2 Chin, 1933	46-46-03.3					9.862478 ✓
	3 Wall, 1933	97-37-49.5					9.996137 ✓
	1-3	00.0					3.480825 ✓
	1-2						3.614484 ✓
	2-3						3.902826 ✓
	1 May	86° 30' 52.9"	+00.1	53.0	00.1	52.9	0.000804 ✓
	2 Chester, 1902	22-11-36.8	—	36.8	—	36.8	9.577189 ✓
	3 Wall, 1933	71-17-30.3	—	30.3	—	30.3	9.976425 ✓
	1-3	00.0		00.1			3.480819 ✓
	1-2						3.880055 ✓
	2-3						Comp by J.S.T.
	1						✓ by JEW
	2						Copy by JEW
	3						
	1-3						
	1-2						

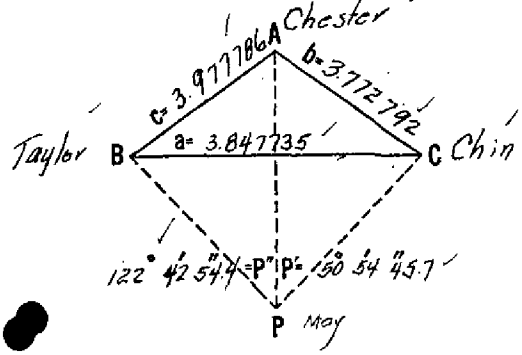
Do not write in this margin

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 655
Ed. Sept., 1929

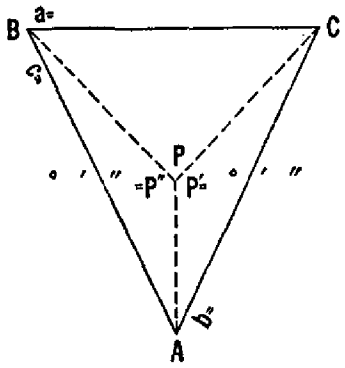
Fourth Order

COMPUTATION OF THREE-POINT PROBLEM

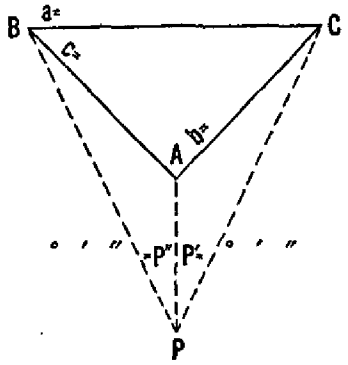
Case 1



Case 2



Case 3



Cases 1 and 2

P'	50° - 54' - 45.7 ✓
P"	122 - 42 - 54.4 ✓
A	47 - 41 - 44.5 ✓
Sum	221 - 19 - 24.6 ✓
½ Sum	110 - 39 - 42.3 ✓
S = 180° − ½ sum =	69 - 20 - 17.7 ✓

Case 3

P'	
P"	
Sum A	
A − sum	
S = ½ (A − sum) =	

Log c =	3.977786 ✓
Log sin P' =	9.989966 ✓
Colog b =	6.227208 ✓
Colog sin P" =	0.075014 ✓
Sum = log tan Z =	0.169974 ✓
Z =	55° - 56' - 11.2" ✓
Z + 45° =	100 - 56 - 11.2 ✓
Log cot (Z + 45°) =	9.286073 n ✓
Log tan S =	0.423537 ✓
Sum = log tan ε =	9.709610 ✓ (sign n)
ε	27° - 07' - 50.3" ✓
S	69 - 20 - 17.7 ✓

This is computed as a check on 3-point fix: CHESTER, CHIN, WALL

(Tan ε +)		(Tan ε −)
S + ε = angle ABP		42° - 12' - 27.4" ✓ S − ε = angle ABP
S − ε = angle ACP		96 - 28 - 08.0 ✓ S + ε = angle ACP

BPA	122° - 42' - 54.4" ✓	APC	50° - 54' - 45.7" ✓	PCB	02° - 39' - 13.0" ✓
ABP	42 - 12 - 27.4 ✓	PCA	96 - 28 - 08.0 ✓	CBP	03 - 43 - 06.8 ✓
PAB	15 - 04 - 38.2 ✓	CAP	32 - 37 - 06.3 ✓	BPC	173 - 37 - 40.1 ✓

59.9

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98–100)

U. S. GOVERNMENT PRINTING OFFICE: 1929
11—9012

Comp by J.F.S.T.
Copy by J.F.S.J.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 25
Ed. Jan., 1929

Fourth Order

COMPUTATION OF TRIANGLES

State: VIRGINIA

11—9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
		From 3-pt. fix: TAYLOR, CHESTER, CHIN					
	2-3						3.977786 ✓
	1 May	122° 42' 54".4	+00".1	54".5	00".1	54".4	0.075014 ✓
	2 Taylor, 1849	42 12 27.4	—	27.4	-	27.4	9.827252 ✓
	3 Chester, 1902	15 04 38.2	—	38.2	-	38.2	9.415176 ✓
	1-3	00.0		00.1		00.0	3.880052 ✓
	1-2						3.467976 ✓
	2-3						3.772792 ✓
	1 May	50° 54' 45".7	+00".1	45".8	00".1	45".7	0.110034 ✓
	2 Chester, 1902	32 37 06.3	—	06.3	-	06.3	9.731622 ✓
	3 Chin, 1933	96 28 08.0	—	08.0	—	08.0	9.997226 ✓
	1-3	00.0		00.1		00.0	3.614448 ✓
	1-2						3.880052 ✓
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						Comp by J.S.T. ✓ by Jen
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						

Do not write in this margin

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April, 1929

Fourth Order

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

		°	′	″
α	2 Chin, 1933 to 3 Wall, 1933	20	07	21.6
2d ∠	Wall, 1933 & May	+ 46	46	03.3
α	2 Chin, 1933 to 1 May	66	53	24.9
Δα		−	01	35.2
		180	00	00.0
α′	1 May to 2 Chin, 1933	246	51	49.8
		35	36	07.2

		°	′	″
α	3 Wall, 1933 to 2 Chin, 1933	200	07	00.8
3d ∠	Chin, 1933 & May	− 97	37	49.5
α	3 Wall, 1933 to 1 May	102	29	11.3
Δα		−	01	14.2
		180	00	00.0
α′	1 May to 3 Wall, 1933	282	27	57.1

First Angle of Triangle

	°	′	″			°	′	″
φ	37	53	54.818	2 Chin, 1933	λ	75	25	17.643
Δφ	−	00	52.427		Δλ	+	02	34.921
φ′	37	53	02.391	1 May	λ′	75	27	52.564

	°	′	″			°	′	″
φ	37	52	41.189	3 Wall, 1933	λ	75	25	51.676
Δφ	+	00	21.201		Δλ	+	02	00.888
φ′	37	53	02.390	1 May.	λ′	75	27	52.564

	Logarithms	Values in seconds	
s	3.614484		
Cos α	9.593833		
B	8.511010		
h	1.719327	1st term	52.399
s²	7.22897		
Sin² α	9.92734		
C	1.29592		
	8.45223	2d term	+ 0.028
h²	3.4386		
D	2.3788		
	5.8174	3d term	+ −
		−Δφ	+52.427

	°	′	″
½(φ+φ′)	37	53	28.6

	Logarithms	Values in seconds
s	3.614484	
Sin α	9.963672	
A′	8.509172	
Sec φ′	0.102783	
Δλ	2.190111	+154.921
Sin ½(φ+φ′)	9.788285	
−Δα	1.978396	+ 95.1

	Logarithms	Values in seconds	
s	3.480825		
Cos α	9.334874 n		
B	8.511011		
h	1.326710	1st term	− 21.218
s²	6.96165		
Sin² α	9.97921		
C	1.29563		
	8.23649	2d term	+ 0.017
h²			
D			
	—	3d term	+ —
		−Δφ	− 21.201

	°	′	″
½(φ+φ′)	37	52	51.8

	Logarithms	Values in seconds
s	3.480825	
Sin α	9.989604	
A′	8.509172	
Sec φ′	0.102783	
Δλ	2.082384	+120.888
Sin ½(φ+φ′)	9.788186	
−Δα	1.870570	+ 74.2

Comp. by JEW
Copy by JEW

11—9862 U. S. GOVERNMENT PRINTING OFFICE: 1930

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 24A
Rev. Oct., 1932

62378 Fourth Order

LIST OF DIRECTIONS

APR 2 1935

Acc. No.

Station Temp. Banner No One State Virginia

Chief of party H.A. Seran Date 9/29/34 Computed by JCH

Observer J.E. Waugh, jr. Instrument 7" Berger No. 255 Checked by F.S.T.

U. S. GOVERNMENT PRINTING OFFICE: 1933 11—9503

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chincoteague Water Tower, 1933	0 00 00.00			0 00 00.00	
Chin, 1933	36 15 00.4 ✓				
Narrows, 1934	62 52 51.7 ✓				
Isle, 1934	99 07 42.1 ✓				

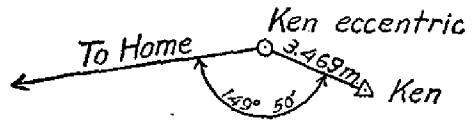
* These columns are for office use and should be left blank in the field.

Station: Ken *State:* Maryland

Chief of party: C. V. H. *Date:* 1917 *Computed by:* O. P. S.

Observer: C. V. H. *Instrument:* No. 168 *Checked by:* W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
	° ′ ″	′ ″	″	° ′ ″	′ ″
Chevy	0 00 00.00	− 7.31		0 00 00.00	
Tank west of △ Dulce	29 03 37.0	−1 09.8		29 02 34.5	
Ken (center), 3.469 meters	176 42				
Forest Glen standpipe	313 24 53.0	+3 01.2		313 28 01.5	
Home	326 31 30.21	+ 31.93		326 32 09.45	
Bureau of Standards, wireless pole	352 17 20.8	+ 5.7		352 17 33.8	
Reno	357 28 48.63	− 1.16		357 28 54.78	
Reference mark, 16.32 m	358 31 20				



This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. *To be acceptable it must contain every direction observed at the station.*

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned *clockwise* around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

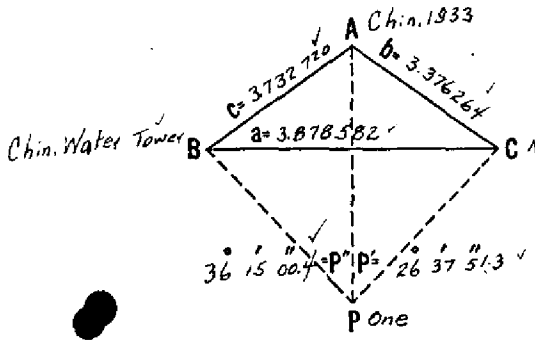
It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. *Measure no sum angles.* Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 655
Ed. Sept., 1929

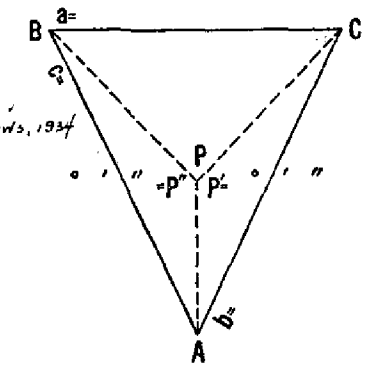
Fourth Order

COMPUTATION OF THREE-POINT PROBLEM

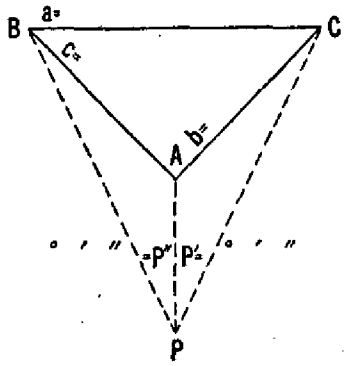
Case 1



Case 2



Case 3



Cases 1 and 2

P′	26-37-51.3 ✓
P″	36-15-00.4 ✓
A	150-13-30.0 ✓
Sum	213-06-21.7 ✓
½ Sum	106-33-10.8 ✓
S=180°−½ sum=	73-26-49.2 ✓

Log c =	3.732720 ✓
Log sin P′ =	9.651512 ✓
Colog b =	6.623736 ✓
Colog sin P″ =	0.228184 ✓
Sum=log tan Z=	0.236152 ✓
Z=	59°-51′-44.0″ ✓
Z+45°=	104-51-44.0 ✓
Log cot (Z+45°) =	9.423858 n ✓
Log tan S=	0.526922 ✓
Sum=log tan ϵ=	9.950780 ✓ (sign n)
ϵ	41°-45′-36.6″ ✓
S	73-26-49.2 ✓

Case 3

P′	
P″	
Sum A	
A−sum	
S=½(A−sum)=	

(Tan ϵ+)		(Tan ϵ−)
S+ϵ=angle ABP	31°-41′-12.6″ ✓	S−ϵ=angle ABP
S−ϵ=angle ACP	115°-12′-25.8″ ✓	S+ϵ=angle ACP

BPA	36°-15′-00.4″ ✓	APC	26°-37′-51.3″ ✓	PCB	94°-25′-06.4″ ✓
ABP	31-41-12.6 ✓	PCA	115-12-25.8 ✓	CBP	22-42-02.0 ✓
PAB	112-03-47.0 ✓	CAP	38-09-42.9 ✓	BPC	62-52-51.7 ✓

00.1

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98–100)

U. S. GOVERNMENT PRINTING OFFICE: 1929
71—0912

Comp by JSJ
✓ J.S.J.

Fourth Order

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 25
Ed. Jan., 1929

COMPUTATION OF TRIANGLES

11—0121

State: VIRGINIA

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3						3.732720 ✓
	1 No. One	36°-15'-00".4 ✓					0.228184 ✓
	2 Chin. W. Tower	31-41-12.6 ✓					9.720388 ✓
	3 Chin, 1933	112-03-47.0 ✓					9.966972 ✓
	1-3						3.681292 ✓
	1-2						3.927876 ✓
	2-3						3.376264 ✓
	1 No. One	26°-37'-51".3 ✓					0.348488 ✓
	2 Chin, 1933	38-09-42.9 ✓					9.790908 ✓
	3 Narrows, 1934	115-12-25.8 ✓					9.956540 ✓
	1-3						3.515660 ✓
	1-2						3.681292 ✓
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						
	2-3						
	1						
	2						
	3						Comp by JEW
	1-3						
	1-2						

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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April, 1929

Fourth Order
POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

		°	′	″
α	2 Chin. W. Tower to 3 Chin, 1933	45	20	34.8
2d ∠	Chin, 1933 & No. One	+ 31	41	12.6
α	2 Chin. W. Tower to 1 No. One	77	01	47.4
Δα		-	03	27.7
		180	00	00.0
α′	1 No. One to 2 Chin. W. Tower	256	58	19.7
		36	15	00.4

FIRST ANGLE OF TRIANGLE

	°	′	″			°	′	″
φ	37	55	58.04	2 Chin. W. Tower	λ	75	22	40.31
Δφ	-	01	01.79		Δλ	+	05	37.90
φ′	37	54	56.25	1 No. One	λ′	75	28	18.21

	Logarithms	Values in seconds
s	3.927876	1734.4′ (115.8)
Cos α	9.351 106	
B	8.511 008	
h	1.789990	1st term + 61.66″
s²	7.8558	
Sin²α	9.9776	
C	1.2965	
	9.1299	2d term + 0.13
h²		
D		
		3d term +
		−Δφ + 61.79

	°	′	″
½(φ+φ′)	37	55	27.1

	Logarithms	Values in seconds
s	3.927876	444.8′ (1020.6)
Sin α	9.988 776	
A′	8.509 171	
Sec φ′	0.102 969	
Δλ	2.528 792	337.90″
Sin ½(φ+φ′)	9.788 606	
−Δα	2.317 398	207.7

	°	′	″			°	′	″
α	3 Chin, 1933 to 2 Chin. W. Tower	225	18	58.1
3d ∠	Chin. W. Tower & No. One	- 112	03	47.0
α	3 Chin. 1933 to 1 No. One	113	15	11.1
Δα		-	01	50.9
		180	00	00.0
α′	1 No. One to 3 Chin. 1933	293	13	20.2

	°	′	″			°	′	″
φ	37	53	54.82	3 Chin, 1933	λ	75	25	17.64
Δφ	+	01	01.43		Δλ	+	03	00.57
φ′	37	54	56.25	1 No. One	λ′	75	28	18.21

	Logarithms	Values in seconds
s	3.681292	
Cos α	9.596 370	
B	8.511 010	
h	1.788 672	1st term - 61.47″
s²	7.3626	
Sin²α	9.9264	
C	1.2960	
	8.5850	2d term + 0.04
h²		
D		
		3d term +
		−Δφ - 61.43

	°	′	″
½(φ+φ′)	37	54	25.5

	Logarithms	Values in seconds
s	3.681292	
Sin α	9.963 207	
A′	8.509 171	
Sec φ′	0.102 969	
Δλ	2.256639	180.57″
Sin ½(φ+φ′)	9.788 438	
−Δα	2.045 077	110.9

Comp by JCH

11—9362 U. S. GOVERNMENT PRINTING OFFICE, 1929

M-189

REVIEW OF GRAPHIC CONTROL SURVEY T- 6237a, SCALE 1: 10,000

Date of Review 2/18/38

1. This survey has been reviewed in connection with Air Photo Compilation Nos. T-5193, , , with particular attention to the following details:

(a) Projection has been checked in the Field.

(b) Accuracy of location of plane table control points.

(c) Discrepancies between detail on this survey and the air photo compilations listed above.

(d) Discrepancies found in descriptions submitted on Form 524 when compared with the air photo compilations listed above.

2. Refer to the reviews and descriptive reports of air photo compilations Nos. T-5193, , , for a more complete discussion of any errors or discrepancies found.

Any material errors found on this survey are noted in subsequent paragraphs of this review, and these have been reported to the Field Records Section and the Cartographic Section.

Notes and corrections resulting from the review are shown on this survey in green.

L. C. Lande

6237b

Form 504
Rev. Dec. 1933

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

DESCRIPTIVE REPORT

Graphic Control
~~Topographic~~
~~Hydrographic~~ Sheet No. F

State Virginia

LOCALITY

Chincoteague Bay
~~Scuddy Creek - Locust Creek~~
Egg Point Marsh, ~~Shell Bay,~~ Queen Sound
~~North end of Queen Sound~~ to
~~West side of Chincoteague Bay~~

1934

CHIEF OF PARTY

H. A. Seran

U.S. GOVERNMENT PRINTING OFFICE: 1934

6237b

Form 537a
Ed. Nov., 1929

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

TOPOGRAPHIC TITLE SHEET

GRAPHIC CONTROL 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. F

REGISTER NO. 6237b

State VIRGINIA

General locality CHINCOTEAGUE ~~INLET AND VICINITY~~ Bay

Locality ~~OCKLE CREEK, MOSQUITO CREEK, and~~ Egg Point Marsh, ~~Shell Bay~~ to QUEEN SOUND

Scale 1:10,000 Date of survey Nov. 13-15, 19 34

Vessel Sub-party Ship OCEANOGRAPHER

Chief of party H. A. Seran

Surveyed by J. E. Waugh

Inked by F. J. Kish and J. E. Waugh

~~Heights in feet above mean low water~~

~~Contour Approximate contour Form line Interval feet~~

Instructions dated April 27, 1933 - June 19, 19 34

Remarks: This sheet is for control of hydrographic survey.

GPO

DESCRIPTIVE REPORT

to accompany

GRAPHIC CONTROL SHEET (Field Letter F)

CHINCOTEAGUE INLET AND VICINITY

Sub-party Ship OCEANOGRAPHER H. A. Seran, Chief of Party

PROJECT NO. H.T. 142

The descriptive report for Topographic Sheet (field letter F) which covers the plane table control for hydrography in Cockle Creek, Mosquito Creek, northern end of Queen Sound, and the western side of Chincoteague Bay is herewith submitted.

INSTRUCTIONS: The topography on sheet F is a part of Project No. H.T. 142. The instructions for this part of the project are dated June 19, 1934.

LIMITS AND SCALE:

The scale of this sheet is 1: 10,000. It covers that area between Latitudes 37°-54'.3 and 37°-58'.3 and Longitudes 75°-23'.7 and 75°-27'.7.

CONTROL AND SURVEY METHODS:

The control consists of four triangulation stations of third order accuracy. The location of triangulation station Chester 1902, 1933 is Lat. 37°-56' +1818.4, Longitude 75°-26' +663.3.

The usual plane table survey methods were used. The plane table positions were obtained by resection and three point problem methods. There was no traverse.

This sheet was for the location of signals for hydrographic purposes only. The shore line and detail topography was furnished the party by the office.

MAGNETIC MERIDANS:

The magnetic meridan as indicated on the sheet was determined at triangulation station Queen, 1934. The declinatoire was not checked in the field because the magnetic declination was not known and no instruments were on hand to make the necessary observations.

AIDS TO NAVIGATION:

None.

RECOVERABLE TOPOGRAPHIC STATIONS:

The description of four Recoverable Topographic Stations on this sheet are being submitted on form 524.

LANDMARKS: There is one object that can be used as a land mark on this sheet. Form 567 is attached.

Respectfully submitted,

J. E. Waugh,
Ensign, C. & G.S.

Approved and forwarded:

H. A. Seran, Comdr., C. & G. S.

PLANE TABLE POSITIONS:

1. Gable, east, Oyster House, Mosquito Creek. (⊙ Myers)
2. Building, S. E. corner, Mosquito Creek Marsh. (⊙ Help)

Duplicate

Form 567
Rev. Jan., 1933

DIVISION OF CHARTS, FILE NO._____

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

LANDMARKS FOR CHARTS

Norfolk, Virginia

_____, 193

DIRECTOR, U. S. COAST AND GEODETIC SURVEY:

The following determined objects are prominent, can be readily distinguished from seaward from the description given below, and should be charted.

A. Vorhees.

Chief of Party.

DESCRIPTION	POSITION					METHOD OF DETERMINATION	CHARTS AFFECTED
	LATITUDE		LONGITUDE		DATUM		
	° ′	D. M. METERS	° ′	D. P. METERS			
BUILDING, east gable							not charted - JFW
(⊙ Myer - chart outline)							
	37 - 56	963	75- 26	1226	NA 1927	Plane-table	No. 1109, 1220
			This position was copied checked against original				
						J.F. Waugh	

A list of objects carefully selected because of their value as landmarks as determined from seaward together with individual descriptions, must be furnished in a special report on this form, and a copy of such report must be attached by the Chief of Party to his descriptive report.

The selection, determination, and description of these points are an important factor in the value of the chart. Landmarks selected at appropriate intervals can be clearly charted. However, when none is outstanding, a group of two or three objects may by their interrelationship provide positive indentification. A group so selected should be indicated.

The description of each object should be short, but such as will clearly identify it; for example, a standpipe, elevated tank, gas tank, church spire, tall stack, red chimney, radio mast, etc. Assign numerals to landmarks to indicate: (1) offshore, (2) inshore, (3) harbor, 1, 2, 3 would be a mark useful on all charts. Generally, flagstaffs and like objects are not sufficiently permanent to chart.

U. S. GOVERNMENT PRINTING OFFICE: 1933

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REVIEW OF GRAPHIC CONTROL SURVEY T-6237b , SCALE 1:10,000

Date of Review 2/18/38

1. This survey has been reviewed in connection with Air Photo Compilation Nos. T-5193, , , with particular attention to the following details:

(a) Projection has been checked in the Field.

(b) Accuracy of location of plane table control points.

(c) Discrepancies between detail on this survey and the air photo compilations listed above.

(d) Discrepancies found in descriptions submitted on Form 524 when compared with the air photo compilations listed above.

2. Refer to the reviews and descriptive reports of air photo compilations Nos. T-5193, , , for a more complete discussion of any errors or discrepancies found.

Any material errors found on this survey are noted in subsequent paragraphs of this review, and these have been reported to the Field Records Section and the Cartographic Section.

Notes and corrections resulting from the review are shown on this survey in green.

L. C. Landy