6957
a & b

Diag. Cht. No. 77-4

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Topographic

Field No. C & D *Office No.* T-6957 a & b

LOCALITY

State Maryland

General locality Chesapeake Bay, western shore

Locality Plum Point to North Beach

1944

CHIEF OF PARTY

L. P. Raynor

LIBRARY & ARCHIVES

DATE DEC 6 - 1944

B-1870-1 (1)++

6957
a & b

Form 537a

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 Letter C & D

REGISTER NO. T-6957 a & b

State MARYLAND

General locality CHESAPEAKE BAY, ~~western shore~~

Locality Plum Point to North Beach

Scale 1-10000 Date of survey Mar. & April, 1944

Vessel U. S. C. & G. S. S. LYDONIA

Chief of Party L. P. Raynor

Surveyed by C. J. Wagner

Inked by C. J. Wagner

Heights in feet above — to ground to tops of trees

Contour Approximate contour Form line interval — feet

Instructions dated April 17, 1940 and September 23, 1943

Remarks:

U. S. GOVERNMENT PRINTING OFFICE: 1928

DESCRIPTIVE REPORT

to accompany

Topographic sheet No. T-6957 a & b

Project CS-250, Chesapeake Bay, Md. USC&GS Ship LYDONIA
L. P. Raynor, Commanding.

Instructions: April 17, 1940 and September 23, 1943

Area

These sheets cover location of signals and parts of shoreline from Kenwood Beach to North Beach, Maryland, on western shore of the Chesapeake Bay.

General Description of Coast

From Kenwood Beach north to the lower limits of T-6957 b, the shore is usually sand and backed by bluffs, except at the mouth of the many valleys. In places the high water line is at the bluff. On sheet T-6957b, the shore is mostly bulkheaded with timber or steel.

Control

The control stations were from the 1933 and 1934 triangulation, adjusted on NA 1927 datum. A few stations of the 1907 triangulation were recovered and adjusted to the NA 1927 datum by differences at Sharps Island Lighthouse 1898, positions as listed in Special Publication No. 114 and as listed on NA 1927 datum. A list of these stations is attached to this report.

Difficulty was experienced in getting good orientation lines at the triangulation stations. At Patch 1907, topo. signal DARE, located from Buckler 1934 was used for orientation. At Buckler 1934, RM No. 1 was used for orientation. At Baker 1933, Sharps Island Lighthouse was used for orientation. The computations of the azimuths to be plotted on the sheet are attached to this report. These azimuth lines are left on the sheets in pencil. At Hutchine 1934, Sharps Island L.H. was used for Az.

Traverses

All traverses listed below were adjusted by the Straight Line method.

Traverse from Hutchine 1934 to RM 1908 at Ill 2 1907, closure of 3 meters, distance 2.2 statute miles.

Traverse from RM 1908 at Ill 2 1907, to Chesapeake Beach Water Tank 1933, closure 4 meters, distance 2.2 statute miles.

Traverse from Baker 1933 to North Beach Calvert Hotel Cupola 1933, closure 11 meters, distance 1.5 statute miles. Traverse continued to Chesapeake Beach Water Tank 1933, closure 10 meters, distance 1.3 statute miles. The above traverses were tied in by cuts to obtain closure. Later the above traverses were re-run using another alidade and rods, and tied in at the objects. The closure at North Beach Calvert Hotel Cupola 1933 was 7 meters and the closure of the south section at the Chesapeake Beach Water Tank 1933 was 4 meters. In the section Baker to North Beach Hotel Cupola the re-running showed an error in rod reading and other unaccountable errors. Therefore the positions of the signals were changed and as shown on the sheet are believed accurate. In the section from the hotel cupola to the tank, the positions of the signals were checked and found to be correct, except the two range lights and those on the long pier. These were changed only a small amount. In this south section much of the distance was taped with a 300 ft. tape. The stadia distances checked the taped distances within a meter.

Photographs

Many objects were spotted and located on the nine-lens air photographs of this area. Cards, form 524, are transmitted herewith for these stations, and the points are indicated on the pictures with a red circle. The number of the picture on which the object is pricked is indicated in the upper right corner of the cards.

Change in Shoreline

No comparison with earlier surveys was made. From the plotted positions of some triangulation stations, the shoreline appears to have receded westward distances of from 10 to 40 ft. Several stations have been lost due to erosion of the bluff, among them Ill 2 1907 and Herd 1907.

Magnetic Meridians

Alidate H-190 has the regular declinitoire and the regular red lines are shown on the sheet. Alidade 235 has the needle mounted at center of a circle, graduated to half degrees. This was used by placing edge marked E, which placed S to north, and the variation read directly, estimated to tenths of a degree.

Values of the variation as scaled from the sheet are:

Decl.No.	Station	Date 1944	Time	Mag. Var.
235	Tap	Apr. 5	10:00 am	7.5° W.
H-190	Hutchins 1934	Mar. 15	2:25 pm	7° 45' W.
235	New	Mar. 17	2:00 pm	8° W.
235	Hem	Mar. 24	11:30 am	7.8° W.
H-190	Ivy	Mar. 16	11:30 am	7° 34' W.
H-190	Baker 1933	Mar. 14	10:00 am	7° 40' W.

As this party has no Magnetometer or Declinometer, no calibration of the declinitoires has been made. It will be done during the coming field season.

Miscellaneous

Since the air photographs of the area were taken a number of buildings have been erected on the bluff in Lat. 38° 39.5', Long. 76° 31.7', at the Naval Research Laboratory. A print, furnished by Mr. W. M. Brown, Surveyor at the Laboratory, showing the buildings, is furnished with the data for these sheets. The positions of AUK (topo) and the RM 1908 of Ill 2 1907, are indicated on the print. It is believed the positions of the buildings may be obtained from the print, for charting.

Print filed in envelop for topo. sheet. This installation NOT to be charted. L.S.S. approved by H.R.E. 26 May '47

Attached hereto are several sheets, computations of azimuth lines for plotting of the sheets, positions of triangulation stations from Spec. Pub. No. 114, and inverses.

The rodded points on the high water line are indicated by breaks in the inked line and small ink dots.

The rods with each alidade used were checked over taped distances and found to be correctly graduated.

Statistics

Statute miles of shoreline 7.2, total beach line on the sheets, not the actual amount rodded in and inked.

Respectfully submitted,

/signed/ CLIFTON J. WAGNER
Clifton J. Wagner
Lt. Comdr. C & G S

Approved and forwarded :

/signed/ L. P. RAYNOR
L. P. Raynor, Commander C & G S,
Commanding Ship LYDONIA

Triangulation Stations from Special Publication No. 114 TRIANGULATION IN MARYLAND, were plotted on the sheet using the datum differences from the position of Sharps Island Lighthouse as shown therein and as determined on NA 1927:

Sharps Island Lighthouse 1898	(Sp.Pub.114)	38°38'	636.2 m
	(NA 1927)		624.3 m
			- 11.9 m
	(Sp.Pub.114)	76°22'	808.7 m
			813.4 m
			4.7 m

ILL 2 1907	38° 32'	532.8	76° 31'	947.2	m
		-11.9		4.7	
		520.9 m		951.9	m

- -

Position of AUK, sheet T-6957 a, as furnished by Mr. W. M. Brown, of Nevel Research Laboratory:

38°	39'	26.84"	827.6 m
76	31	43.64	1055.3 m

Computation of azimuth line Hutchins - Sharps Island L.H.

Azimuth HUTCHINS 1934 - SHARPS ISLAND LIGHTHOUSE 1898

263° 05' 19".9

log 2903.1 m.	3.462 862
log tan 6° 54' 40"	9.083 539
log x	2.546 401
x	352.0 meters.

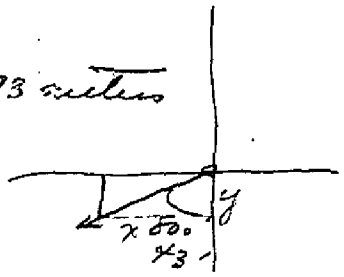
Plotted on sheet, using base 2 min. of longitude, as line could not be laid out from the station on the sheet.

Se computation on back of Thir d order position Computation used for Inverse computation Baker - Sharps Island Lighthouse.

T-6457 a+b

at ILL 2 1907-

RM (1908) 80° 43' 23.83 meters



log sin 80° 43' = 9.994274
log 23.83 = 1.377124
log x = 1.371398
x = 23.5 m.

log cos 80° 43' = 9.207680
log 23.83 = 1.377124
log y = 0.584804
y = 3.8 m

ILL 2	38	39	520.9		76	31	951.9	499.0
			−3.8				+23.5−	−23.5−
			517.1				975.4	475.5
			(1333.0)					

Plane coordinates on Lambert projection

State _____ Station _____

ϕ = ° ′ ″ λ = ° ′ ″

Tabular difference of R for 1″ of ϕ = _____

R (for min. of ϕ)			y′ (for min. of ϕ)		
Cor. for sec. of ϕ		−	Cor. for sec. of ϕ		+
R			y′		
			y″ (=2R $\sin^2 \frac{\theta}{2}$)		+
		° ′ ″	y		
θ (for min. of λ)					
Cor. for sec. of λ		−			° ′ ″
θ			$\frac{\theta}{2}$		
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		log sin $\frac{\theta}{2}$	sin $\frac{\theta}{2}$	
log R				R sin $\frac{\theta}{2}$	
log x′			log $\sin^2 \frac{\theta}{2}$	R $\sin^2 \frac{\theta}{2}$	
x′	R sin θ		log R		
		2,000,000.00	log 2		0.30103000
x			log y″		

$x = 2{,}000{,}000.00 + R \sin \theta$

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

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

(R 340)

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

INVERSE **POSITION COMPUTATION, THIRD-ORDER TRIANGULATION** CHECK

T-6957 a+b

			°	′	″
α	2	to 3			
2d ∠		&	+		
α	2	to 1	125	27	02.7
Δα				−5	39.3
			180	00	00.0
α′	1	to 2	305	21	23.4

			°	′	″
α	3	to 2			
3d ∠		&	−		
α	3	to 1	305	21	23.4
Δα				+5	39.3
			180	00	00.0
α′	1	to 3	125	27	02.7

FIRST ANGLE OF TRIANGLE

	°	′	″			°	′	″
φ	38	38	20.248	2 ~~Sparks~~ Shanks 2d LH	λ	76	22	33.632
Δφ		+5	02.466		Δλ		+9	02.878
φ′	38	43	22.714	1 Baker	λ′	76	31	36.510

	°	′	″			°	′	″
φ	38	43	22.714	3 Baker	λ	76	31	36.570
Δφ		5	02.465		Δλ		−9	02.877
φ′	38	38	20.249	1 Shanks 2d LH	λ′	76	22	33.633

	Logarithms	Values in seconds
s		
Cos α	3.970 2243	
B	8.510 9560	
h	2.481 1803	1st term −302.817
s²	8 235 49	
Sin²α		
C	1.307 41	
	9.542 90	2d term +0.349
h²	4.9600	
D	2.381 5	
	7.341 5	3d term +0.002
		−Δφ −302.466

	°	′	″
½(φ+φ′)	38	40	51.5

	Logarithms	Values in seconds
s	4.117 7462	
Sin α	8.509 1506	
A′	.107 8054	
Sec φ′	2.734 7022	+542.878
Δλ	9.795 8685	
Sin½(φ+φ′)	2.530 5707	+339.3
−Δα		

	Logarithms	Values in seconds
s	4.206 7941	
Cos α	9.762 4251	
B	8.510 9483	
h	2.480 1675	1st term +302.112
s²	8.413 59	
Sin²α	9.822 92	
C	1.308 72	
	9.545 23	2d term +.351
h²	4.9603	
D	2.3818	
	7.3421	3d term +0.002
		−Δφ 302.465

	°	′	″
½(φ+φ′)			

	Logarithms	Values in seconds
s	4.206 7941	
Sin α	9.911 4598	
A′	8.509 1528	
Sec φ′	.107 2954	
Δλ	2.734 7021	−542.877
Sin½(φ+φ′)	9.795 8685	
−Δα	2.530 5706	−339.3

S sin α = 4.117 7462
S cos α = 3.970 2243
Tan α = 0.147 5219
α = 125° 27′ 02.7″

S sin α = 4.117 7462 S cos α = 3.970 2243
Sin α = 9.910 9521 cos α = 9.763 4302
S = 4.206 7941 S = 4.206 7941

11—0362 U. S. GOVERNMENT PRINTING OFFICE: 1929

Baker – Sharps Island L.H. T-6957 a+b

304.80
152.4
18.3
2.7
.1
477.3

182.88
~~30.48~~
2.44
.15
210.95

Baker	38	43	(1149.7) 700.4	76	31	(567.6) 882.0

$$\log \frac{1449.6 + 567.6}{2017.2} = 3.304\,7490$$

$$\tan 35°21'23.4 = 9.850\,9653$$

$$1431.2\text{ m} = 3.155\,7143$$

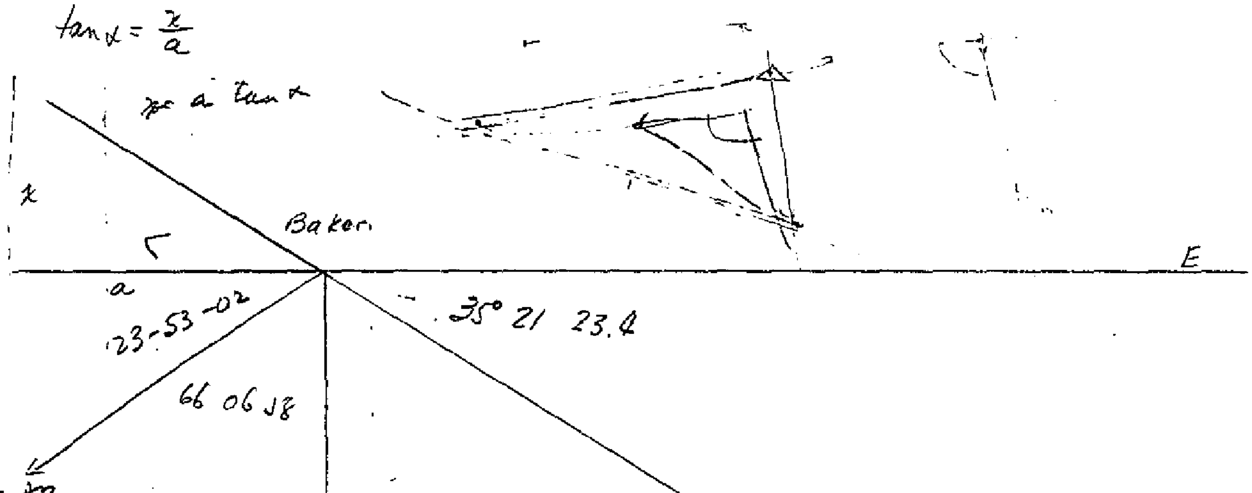
700.3

1449.6
882.0
567.6

1431.2
700.4
2131.6 above 43' on long 33'
1850.1
281.5 m above 44' " "

$\tan\alpha = \frac{x}{a}$

$x = a \tan\alpha$



Baker Fairbanks 2.
Baker Fairbanks to Rue 2.

136-17-40.0
282-49 18.4
419-06 58.4
36
59-06 58
~~- 7 - 53 - 02~~
~~06 - 58~~
30 53-02

α = Baker Rue 2.

~~839.2~~
1206.5
700.4
506.1

tan 30 53 02 = 9.776 778
log 2017.2 = 3.304 7490
3.081 527

1206.5
~~700.4~~
~~138.8 m above 43' on 33'~~

DEPARTMENT OF COMMERCE
U.S. COAST AND GEODETIC SURVEY
Form 596

T-6957 a+b

POSITION COMPUTATION, TRAVERSE

		°	′	″
α	to			
$\angle$	&	+		
α	2 to 1	305	21	23.4
$\Delta\alpha$		−160 / 125	21	23.4
		180	00	00.0
α'	1 to 2			

	°	′	″			°	′	″
ϕ	38	43	22.714	2 Baker	λ	76	31	36.510
$\Delta\phi$		+	48.783	S = 2600 m.	$\Delta\lambda$		+ 1	27.795
ϕ'	38	44	11.497	1 Pt. A.	λ'	76	33	04.305

	Logarithms	Values in seconds	
s	3.414 9733	(1495.6) 354.5	
Cos α	9.762 4251		
B	8.510 9484		
h	1.688 3468	1st term	− 48.7918
s^2	6.829 95		
$\sin^2\alpha$	9.822 92		
C	1.308 62		
	7.961 49	2d term	+ .0091
h^2	3.3761		
D	2.3818		
	5.7584	3d term	+ —
		$-\Delta\phi$	− 48.7827

	°	′	″
$\frac{1}{2}(\phi+\phi')$			

	Logarithms	Values in seconds
s	3.414 9733	(1345.3) 104.0
Sin α	9.911 4598	
A'*	8.509 1503	
Sec ϕ'	0.107 8877	
$\Delta\lambda$	1.943 4711	″ +87.7953
Sin $\frac{1}{2}(\phi+\phi')$		
$-\Delta\alpha$		

9.892 1123
0.107 8877

Do not write in this margin.

* Use ϕ' as the argument for taking out A'.

11—11227 U.S. GOVERNMENT PRINTING OFFICE

GEOGRAPHIC NAMES

Survey No. T6957 a e b

Name on Survey	On Chart No. A	On previous survey No. B	On U. S. quadrangle Maps C	From local information D	On local Maps E	P. O. Guide or Map F	Rand McNally Atlas G	U. S. Light List H	K	
Maryland								USGB		1
Plum Point								"		2
Chesapeake Bay								"		3
North Beach								"		4
Chesapeake Beach										5
Camp Roosevelt										6
Fishing Creek										7
										8
										9
										10
										11
	Names underlined in red approved by H. Heck 4/7/47									12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

M 234

	Remarks	Decisions
1		
2		
[redacted]		
4		
5		
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8		
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11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
[redacted]		
23		
24		
[redacted]		
25		
26		
27		

Descriptive Report (Office)

T-6957 a & b

Those sections of the mean-high-water line and, also, any piers and offshore structures, which were not shown on the Topographic sheets, were applied; these additions were shown in green ink. On sheet T-6957 b, the location of piling has been indicated in pencil. Work "piling" inked

The mean-high-water line was stereoscopically interpreted from the following 9-lens field photographs: 9017 to 9019 inclusive (flown on 4/22/42), 8924 and 8926 (flown on 4/15/42). The stage of tide, at the time these photos were flown, was about 0.6 to 0.7 of a foot above mean low water. The interpretation of the mean-high-water line was facilitated by information available in the field descriptive report and in the delineation of portions of the mean-high-water line on the field photographs by the field inspection party.

The mean-high-water line and other detail were applied to the Topographic Sheets with the projector, a sufficient number of topographic stations, which were located on the Sheets, had been identified in the field on the photographs to insure adequate control for the location of the detail.

Respectfully Submitted,
Charles Hanavich
Mar. 13, 1945

NAUTICAL CHARTS BRANCH

SURVEY NO. T 6957 a & b

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
7/26/45	1225	J P Walker	Before ~~Before~~ ~~After~~ Verification and Review Shoreline changes
5/26/47	551	[illegible]	After Review, before final inspection.
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

M-2169-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF TOPOGRAPHIC SURVEY — REGISTRY NO. T-6957a & b

FIELD No. C & D

Maryland, Chesapeake Bay, Plum Pt. to North Beach
Surveyed March - April 1944 — Scale 1:10,000
Instructions dated April 17, 1940 - Sept. 23, 1943

Plane Table Survey — Aluminum Mounted

Chief of Party - L. P. Raynor
Surveyed by - C. J. Wagner
Inked by - C. J. Wagner and Charles Hanovich
Reviewed by - R. H. Carstens, April 4, 1947
Inspected by - H. W. Murray

1. Adjoining Surveys

A satisfactory junction was made with T-6956b (1944) on the south. On the north the present survey extends to the limit of the present project. Adjacent high-water line charted from T-5348 (1935) is in good agreement with the present high-water line.

2. Comparison with Prior Surveys

T- 198 (1846)	1:20,000
T- 280 (1847)	1:20,000
T-2395 (1903)	1:20,000
T-2836 (1907)	1:20,000
T-5348 (1935)	1:10,000
T-6036 (1933)	1:10,000

The extent of the present survey is completely covered both by the 1846-47 surveys and the 1907 survey. The surveys of 1903, 1933 and 1935 cover only a small part of the present survey on the north.

Since 1846 the shoreline has receded as much as 300 meters in the vicinity of lat. 38°-43' and about 50 meters in the

2. Comparison with Prior Surveys (Continued)

southern part of the present survey. The change in the position of the high water line in lat. 38°-43' since 1935 has been about 12 meters.

Several breakwaters and piers have been constructed in the vicinity of Chesapeake Beach subsequent to these prior surveys.

The present survey is adequate to supersede these prior surveys within the common area.

3. Comparison with Chart 1225 (Latest print date 11/25/46)

A. Topography

The present survey has been applied to this chart. No corrections are necessary.

B. Magnetic Variation

The present survey value of the magnetic meridian is in satisfactory agreement with the charted value.

4. Condition of Survey

The present survey was inked neatly. The shoreline in green was added in the Washington Office from air photographs.

The information in the Descriptive Report covers all the essential details.

5. Compliance with Project Instructions

The present survey adequately complies with the Project Instructions.

6. Additional Work Recommended

This is an excellent survey and no additional work is recommended.

I. E. Rittenburg
Chief, Nautical Chart Branch

K. G. Crosby
Chief, Section of Hydrography

Examined and Approved:

C. M. Durgin
Chief, Division of Charts

C. K. Green
Chief, Division of Coastal Surveys