5043

Diag. Cht. No. 1000-2

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Massachusetts

Field No. ..... Office No. 5043

LOCALITY

State Georges Bank

General locality .....

Locality .....

1930

CHIEF OF PARTY

G. W. Cowie

LIBRARY & ARCHIVES

DATE .....

B-1870 I (1)++

5043

5043

Form 504
Ed. June, 1928

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

State: MASSACHUSETTS

DESCRIPTIVE REPORT

~~Topographic~~
Hydrographic } Sheet No. 1 5043

LOCALITY

GEORGES BANK

Development of Shoal Area

in the vicinity of Buoy "T".

19 30

CHIEF OF PARTY

George D. Cowie.

U. S. GOVERNMENT PRINTING OFFICE: 1928

5043

Form 537
Ed. Sept., 1929

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

REG. NO. 5043

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 1

REGISTER NO. 5043

State Massachusetts

General locality ~~East Coast~~ Georges Bank

Locality ~~Georges Bank~~ Eastern End

Scale 1:20000 Date of survey Sept. 23 & 27, 19 30

Vessel LYDONIA

Chief of Party George D. Cowie

Surveyed by George D. Cowie, W.M. Scaife, K.G. Crosby, L.S. Hubbard, W.F. Malnate, O.B. Hartzog, M.A. Hecht.

Protracted by M.A. Hecht.

Soundings penciled by M.A. Hecht.

Soundings in fathoms ~~feet~~

Plane of reference Mean low water

Subdivision of wire dragged areas by

Inked by

Verified by

Instructions dated May 17, 19 30

Remarks:

U. S. GOVERNMENT PRINTING OFFICE: 1930

1 B.S.
1 Hdq. Rept.
1 Sdg Vol.

DESCRIPTIVE REPORT TO ACCOMPANY

FIELD SHEET #1

GEORGES BANK, SHOAL DEVELOPMENT- 1930.

.....

AUTHORITY:

This survey was executed in accordance with instructions from the Director dated May 17, 1930, to the Commanding Officers of the LYDONIA and OCEANOGRAPHER covering Projects 62 and 63 respectively.

LIMITS:

The shoal in the vicinity of Buoy "T" was developed for the purpose of use as a recoverable mark during the 1931 season. Generally the lines were run approximately with the current, and in some cases followed along the edge of tide rips. The area covered by this sheet extends from Buoy "T", Lat. 41°51' (224m.), Long. 67°18' (1037) in a direction NW to Lat. 41°52', Long. 67°20'; thence North to Lat. 41°53'; then SSE to Lat. 41°52', Long. 67°19'; then ESE to Lat. 41°51'.5, Long. 67°17'.5; then South to Lat. 41°50'.5; then NW to Buoy "T".

METHODS:

The control for the hydrography on this sheet was based entirely on visual control, using four survey buoys as signals.

Buoys were plotted with the best available information at the time of plotting the boat sheet. The location of Buoy "T" was scaled from a tracing furnished by the OCEANOGRAPHER. The location of Buoy "T" for the smooth sheet is the final adjusted value as determined by the Washington office. At the time of commencing the smooth sheet, this value was not available. The projection was shifted after the final position of Buoy "T" had been determined.

There is attached the computations of distances between Buoys "To", "Tam" and "T". Using buoys scopes, etc., the computed distances are: "Tam" to "To" -- 5,306 meters; "T" to "Tam" -- 3,342 meters. The final azimuth used in plotting was the sun azimuth observed by Lt. Burmister on September 23rd, 1930 --"Tam" to "To" 277°01'44". A sun azimuth observed by Lt. Studds on the same day and included with this data conflicted with the observation that Buoy "Tam" was 36.5 meters North of the range "To" to "T". This azimuth was therefore not used in plotting the sheets.

Buoy "Tom" was plotted by a three-point fix, taken from the

launch, at Buoy "Tom" to Buoys "Tam", "T" and "To". The scopes of the buoys were then drawn, with these points as centers. Scope of "T" -- 206 meters; "To" -- 207 meters; "Tam" -- 209 meters, and "Tom" -- 208 meters. With these circles as loci of the buoys, their position was able to be found at any minute of the day from the direction of the current. The LYDONIA, being underway on September 23, was unable to observe currents. They were interpolated from observations taken the next day, September 24th, while at anchor, as follows: Fifty minutes was subtracted from the time of each observation on September 24th to give the observation for September 23rd (75th mer. time). Soundings were recorded in 60th meridian time, hence one hour was added to current times to get them to the proper meridian. A curve was then drawn for September 23rd, and directions scaled off for every half hour. These were then plotted on each of the four buoys, and subdivided for every ten minutes. In plotting each position, the time was noted in the record book, and the position of the buoy at the same time on the scope circle.

Soundings were taken with hand-lead for the greater part of the area. The impact fathometer ceased functioning before beginning hydrography and the greater part of the work had been completed before it could be overhauled. Due to the general depth, the ship was run at slow speed to get soundings. Fathometer soundings were reduced for comparison with the hand-lead.

Bottom samples were obtained by arming the lead. The bottom, for the most part, was hard with sand and gravel.

STATISTICS:

Number of positions:	"A" day -- 219. "B" day -- 6.
Number of Soundings:	Fathometer, "A" day -- 195. "B" day -- 41.
	Hand-lead, "A" day -- 246.
Miles of Hydrography(Statute) -- 27.6	

DISCREPANCIES:

Sounding lines cross with satisfactory checks for the most part. Except for the discrepancies noted, the crossings were within one or two fathoms. These differences may be attributed to reduction of soundings, incorrect soundings, or to error in the fix due to method of plotting with currents. Where lines fail to check, the shoalest or hand-lead sounding should be taken.

The line 185 - 225, "A" day, fails to check adjacent lines * after position 212. The discrepancy seems to show the line to be improperly located. The crossings of this line from 185 to 198 are good, and from this position to 212 it does not cross other lines. Therefore the positions are in error somewhere after position 198. Since there are no adjacent lines, it is impossible to tell by inspection just where the error occurred.

* Soundings accepted to L198. 1931 work will probably determine the accuracy of the remainder of line. R. See note in pencil on Smooth Sheet H-5043

It seems that the line should be shifted to the North-eastward, but since it is suspected that the buoy positions were not as plotted at this time, the distances and directions would not be proportional. It is not probable that a good adjustment could be made. It is recommended that the line be rejected from position 210 to 225, saving that part from 198 to 210 in order to show the shoal area crossed.

The soundings between positions 2 and 3, "B" day, fail to check the cross line between positions 133 and 134, "A" day, by 4 fathoms. The hand-lead soundings on "A" day should be held, since it does not seem possible that hand-lead soundings which are too shoal could occur several times. The leadsman was reliable and had had a great deal of experience.

*for a note of this statement the soundings on B day are further verified by Sdgs on QQ day and HH W day. H5712b The sdgs. on A day appear to be too shoal. Reject sdgs between L130 L137 A day. Ams

The sounding between positions 155 and 156, "A" day, fails to check soundings between 176 and 177, "A" day, by 7 fathoms. These soundings were taken with hand-lead. The sounding of 17 fathoms is believed to exist, as water was seen boiling up around this position indicating a shoal area.

? Shoal, the 20 ft. see Record p. 27

SHOAL SOUNDING:

A sounding of ten fathoms was obtained in Latitude 41° 51'.8, Longitude 67° 19'.2. Although this was the shoalest depth, soundings of eleven, twelve and thirteen fathoms indicate a ridge running to the north-northwestward from the 10-fathom spot.

TIDAL OBSERVATIONS: ?

Tidal observations were attempted several times during the season. A fairly successful series was obtained on September 18th at the north end of Sultivator Shoal, and on September 3rd at the south end of the Shoal. Tides at Boston were reduced to Buoy "T" by subtracting 52 minutes and using 50% of the range. These values were arrived at by interpolation and the use of the best observational values.

Note: This report includes a previous report submitted by Ensign Hartzog, " Descriptive Report to Accompany Boat Sheet, Development of Shoal Area in Vicinity of Buoy "T". This was returned by the office to be re-submitted with the smooth sheet.

Respectfully submitted:

M. A. Hecht

M.A. Hecht,
Ensign, U.S.C. & G.S.

Approved and forwarded:

George D. Cowie

George D. Cowie,
Chief of P arty.

U.S.C. & G.S.S. OCEANOGRAPHER

Sun's Azimuth observed at Buoy "TAM" from Buoy "TO" to Sun's right tangent. Buoy "TAM" and Buoy "TO" in range.

Time P.M. 60 Merid. West	Computed Azimuth	Observer.
5-57-30	276° 56' 40"	C.A.B.
6-03-11	277 03 00	C.A.B.
6-05-10	277 00 30	C.A.B.
6-07-28	277 07 30	C.A.B.
6-11-20	277 01 00	C.A.B.
Mean	277 01 44	from Buoy "TAM" to "TO".

Angles at Buoy "TAM" from Buoy "T" to

Buoy "TAM" and Buoy "T" in range.

Time P.M. 60 Merid. West.	Computed Azimuth	Observer.
5-57-26	277° 59' 00"	R.F.A.S.
6-00-33	278 00 40	R.F.A.S.
6-05-20	277 59 00	R.F.A.S.
6-07-11	277 59 00	R.F.A.S.
6-11-58	278 00 00	R.F.A.S.
6-17-47	278 00 00	R.F.A.S.
Mean	277° 59' 37"	from Buoy "TAM" to "T".

not used on plotting sheets.

M.A.H.

DATA FOR LOCATING BUOYS

BUOY "T" to BUOY "TAM"

Sept. 22, 1930.

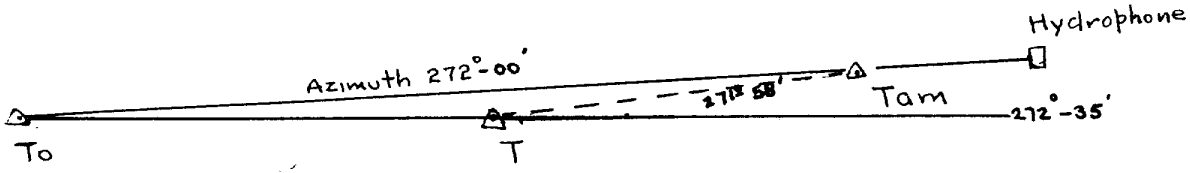
.....

LYDONIA'S hydrophone was located on range with Buoys "Tam" and "To" and at the distances shown in the table below away from "Tam". Buoy "Tam" is 120 feet (36.5 meters) to the northward of the line passing through Buoys "To" and "T". OCEANOGRAPHER observed sun azimuth from Buoy "T" to "Tam" -- 98°28'.* The true bearing from Buoy "Tam" to Buoy "To" as determined by the LYDONIA was 272°.* The data observed by the ~~OCEANOGRAPHER~~ Lydonia was, however, used. in a preliminary computation. No currents observed.**

TIME	Dist. Hydro. from "TAM"	POSITION OF OCEANOGRAPHER	SHIPS HEAD TRUE	FUSE BOMB DISTANCE INT. Sec.	Sec.	Meters
7-12-10	41m	Buoy "T" 35 meters on stbd beam	103°	20	2.24	
7-21-10	40	" " 50 " " port "	269	18	2.25	
7-39-40	40	" " 60 " " stbd "	109	20	2.23	
8-21-30	29	" " 40 " " " "	110	19	2.25	

**Current observation, 8.50 3° 1.5 knots.

* Preliminary azimuths. Better values subsequently obtained.



Azimuth "TAM" to "T" 277°59' 37"

DISTANCE FROM ANCHOR OF BUOY "T" to ANCHOR OF BUOY "TAM"

1st Bomb
2nd Bomb
3rd Bomb
4th Bomb

Mean

BUOY "T" to BUOY "Tam"

Sept. 22, 1930.

.....

	HYDROPHONE X	HYDROPHONE Y	BOMBS X	BOMBS Y	COMBINED X	COMBINED Y	
1.	+184	+57	+225	-97	+41	-40	
2.	+189	+51	+243	-98	+54	-47	✓ K.G.C.
3.	+200	+15	+259	-57	+59	-42	
4.	+205	+7	+251	-22	+46	-15	

Velocity of Sound 1506.2 m/s

	BOMB TIME	BOMB DISTANCE	DISTANCE ANCHOR T to Tam	V	V^2
Bomb 1.	2.24	3374	3334	8	64
2.	2.25	3389	3342	0	0
3.	2.23	3359	3317	25	625
4.	2.25	3389	3374	32	1024
					1713
			Mean 3342		

$$p.e. = 0.6745 \sqrt{\frac{1713}{12}} = 8.0 \text{ meters}$$

Comp. M.A.H.

Checked K.G.C.

BUOY "TO" to BUOY "TAM"

Sept. 22, 1930.

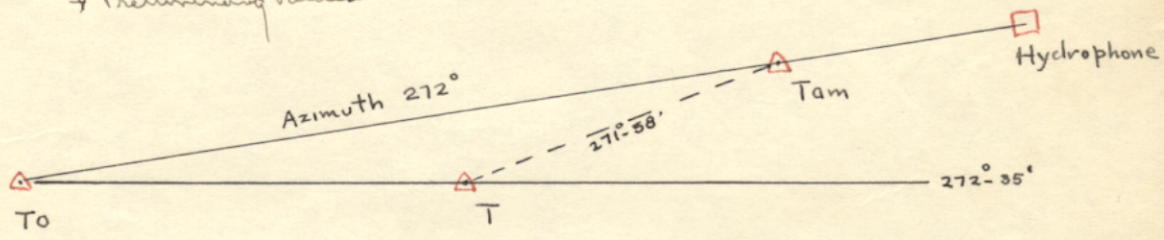
.....

LYDONIA'S hydrophone was located on range with Buoys "Tam" and "To" and at the distances shown in table below away from "Tam". Buoy "Tam" is 120 feet (36.5 meters) to the northward of the line passing through Buoys "To" and "T". OCEANOGRAPHER observed sun azimuth from Buoy "T" to "Tam" -- 98°28'*. The true bearing from Buoy "Tam" to Buoy "To" as determined by the LYDONIA was 272°*. The data observed by the ~~OCEANOGRAPHER~~ Lydonia was, however, used, for the preliminary computations.

TIME	DIST. HYDRO FROM "TAM"	POSITION OF OCEANOGRAPHER	SHIPS HEAD TRUE	FUSE INT. Secs.	BOMB DISTANCE Secs	BOMB DISTANCE Meters
7-06-30	41	Buoy "To" 40 meters stbd beam	105	22	3.53	
7-25-55	40	" " 90 " port "	267	14	3.36	
8-16-00	28	" " 60 " stbd "	105	13	3.56	
8-39-00	30	" " 50 " port "	266	17	3.55	

Current Observation, 8.50 -- 3° 1.5 knots

* Preliminary values



Velocity of Sound used:

AZIMUTH BUOY "TAM" to BUOY "TO" -- 272°

BUOY "To" to BUOY "Tam"

Sept. 22, 1930.

(Bomb positions corrected for drift)

	HYDROPHONE X	HYDROPHONE Y	BOMBS X	BOMBS Y	COMBINED X	COMBINED Y
1.	+180	+63	+227	-106	47	-43
2.	+192	+45	+285	-106	93	-61
3.	+205	+11	+273	-35	68	-24
4.	+211	-16	+268	-25	57	-41

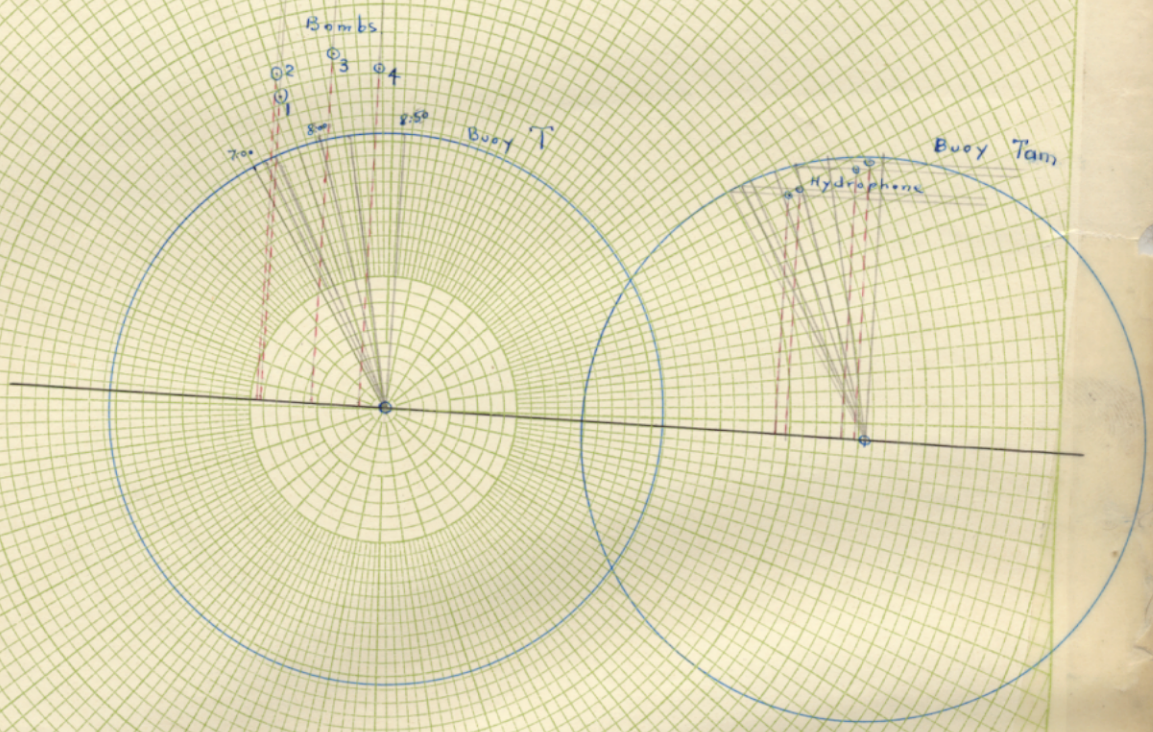
Velocity of Sound -- 1506.2 m/s

	BOMB TIME	BOMB DISTANCE	DISTANCE ANCHOR To to Tam	V	V^2
1.	3.53	5317	5274	32	1024
2.	3.36 R				
3.	3.56	5362	5337	31	961
4.	3.55	5347	5306	0	0
					1985
		Mean	5306		

$$p.e. = 0.6745 \sqrt{\frac{1985}{6}} = 12 \text{ meters}$$

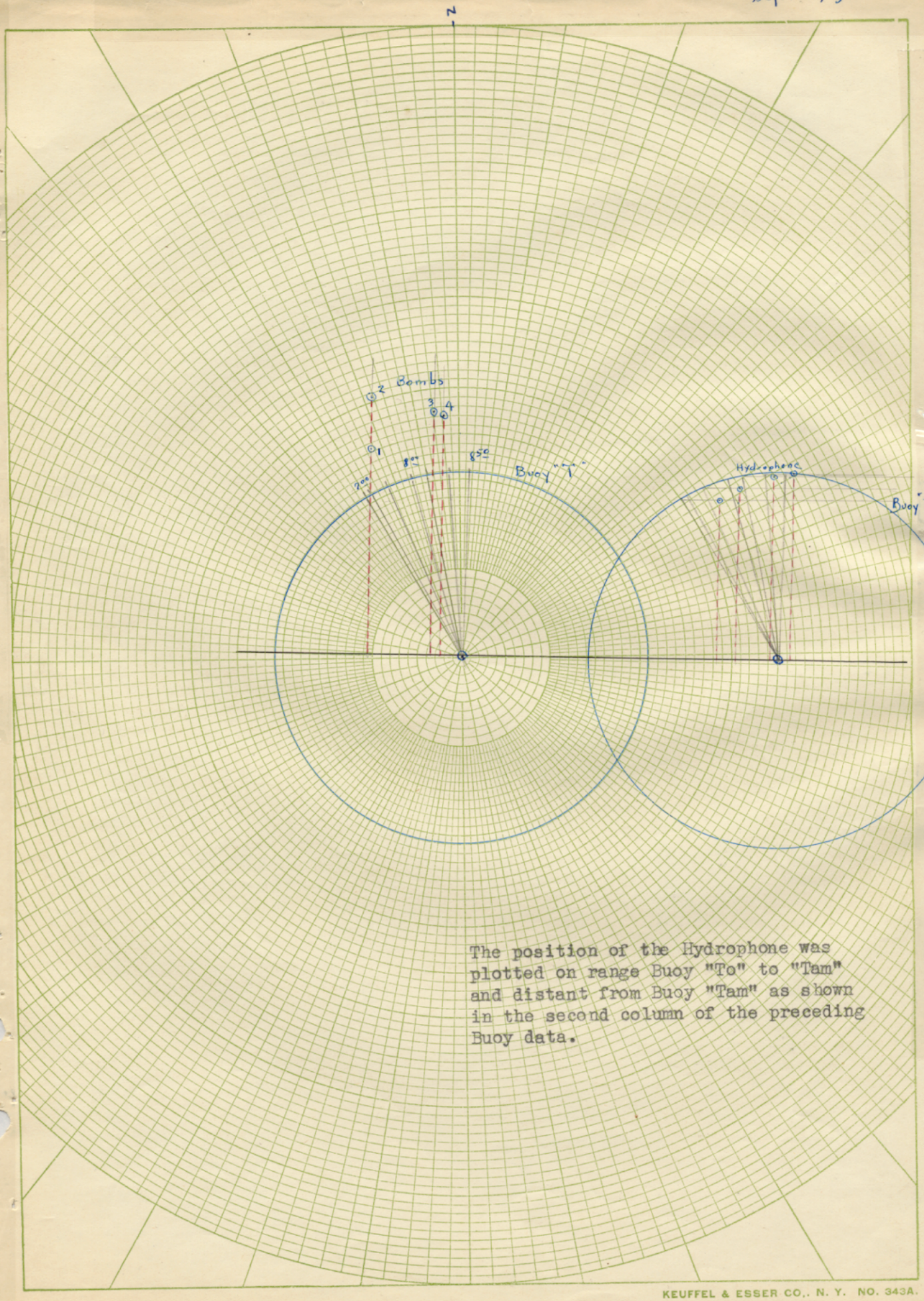
Comp. M.A.H.
Checked O.B.H.

Buoy "T" to "Tam"



The position of the Hydrophone was plotted on range Buoy "T" to "Tam" and distant from Buoy "Tam" as shown in the second column of the preceding Buoy data.

Buoy "To" to "Tam"
Sept. 22, 1930



The position of the Hydrophone was plotted on range Buoy "To" to "Tam" and distant from Buoy "Tam" as shown in the second column of the preceding Buoy data.

U.S. COAST AND GEODETIC SURVEY

R.S. PATTON- DIRECTOR.

NEW ENGLAND COAST

GEORGES BANK

PROJECT NO. 63.

Held
To be attached
to Hydrographic
Sheet report H 5043

COMPUTATIONS OF POSITIONS OF

BUOYS "TO", "TOM" and "TAM".

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

GEORGE D. COWIE

H.& G.E., COMMANDING.

COMPUTATIONS OF POSITIONS OF

BUOYS "TO", "TOM" and "TAM",

1930

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

.....

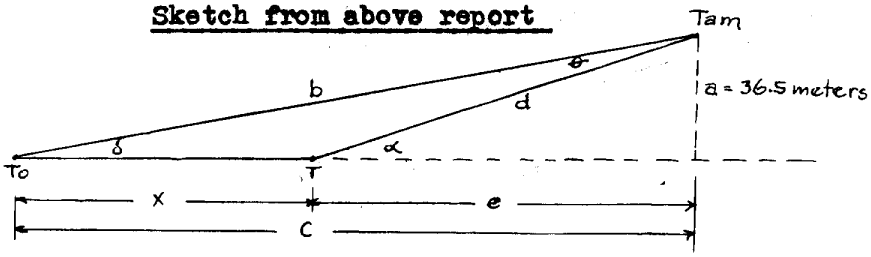
Az.	Tam - To	$97^\circ 01' 44''$	(Geodetic Az.)(Sun Az.)
Dist.	Tam - To	5306 meters.	
Dist.	Tam - T	3342 meters.	

See page 8 of this cahier for position of "T". (From office computation)

Fix taken at Buoy "Tom"

Tam	$64^\circ 39' 40''$
T	
To	$21^\circ 33' 00''$

Sketch from above report



$$c = \sqrt{b^2 - a^2} = 5305.874 \text{ meters}$$

$$e = \sqrt{d^2 - a^2} = 3341.8 \text{ meters}$$

$$x = c - e = 1964.1 \text{ meters}$$

Log 36.5 = 1.5622929
Log 3342 = 3.5240064
Log sin α = 8.0382865

$\alpha = 0^\circ 37' 33''$

Log 36.5 = 1.5622929
Log 5306 = 3.7247672
Log sin δ = 7.8375257

$\delta = 0^\circ 23' 39''$

Az "Tam" to "To"	97°	01'	44"
*		-02	32
Az "To" to "Tam"	276	59	12
+		0	23	39
Az " To" to "T"	277	22	51
-		0	37	33
Az "T" to "Tam"	276°	45'	18"

*See Page 1a.

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

This position not to be used.
This value of Δa used to obtain azimuth of "To" - "Tam".

POSITION COMPUTATION, TRAVERSE.

					°	′	″
a			to				
∠			&		+		
a	2	Tam	to 1	To	97	01	44
Δa						- 2	32
					180	00	00.0
a′	1	To	to 2	Tam	276	59	12

	°	′	″				°	′	″
φ	41	51	28.4	2	Tam	λ	67	15	31.8
Δφ	+		21.0	s =	5306.0 m.	Δλ	+	3	48.3
φ′	41	51	49.4	1	To	λ′	67	19	20.1

Do not write in this margin.

		log s	3.7247672	log s²	7.4495		
½(φ+φ′)	41 ° 51 ′ 38.9 ″	log cos a	9.0876742 n	log sin² a	9.9934	log h²	2.646
		log B	8.5107098	log C	1.3566	log D	2.390
h	-21.045 ″	log h	1.3231512	log 2d term	8.7995	log 3d term	5.036
2d and 3d terms	+ 063		21.045	2d term	.0630	3d term	
−Δφ	-21.0						

log s	3.7247672		
log sin a	9.9967238		
log A′ *	8.5090710	log Δλ	2.3585607
log sec φ′	0.1279980	log sin ½ (φ+φ′)	9.8243362
log Δλ	2.358607	log (−Δa)	2.1828969
Δλ	228.32 ″	−Δa	152.37 ″

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

11—6552

Comp. W.H.B.
Checked C.A.B.

M.A.H.

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

POSITION COMPUTATION, TRAVERSE.

			°	′	″
α		to			
∠		&	+		
α	2 T	to 1 Tam	276	45	18.0
Δα			+	01	36.0
			180	00	00.0
α′	1 Tam	to 2 T	96	46	54.0

	°	′	″			°	′	″
φ	41	51	43.4	2 T	λ	67	17	55.3
Δφ		- 0	12.8	s = 3342	Δλ		-02	23.9
φ′	41	51	30.6	1 Tam	λ′	67	15	31.4

			log s	3.5240064	log s²	7.04801		
½(φ+φ′)	41 ° 51 ′ 37.0 ″		log cos α	9.0704962 +	log sin² α	9.99395	log h²	2.210
			log B	8.5107095	log C	1.3566	log D	2.390
h		12.74 ″	log h	1.1052121 +	log 2d term	8.39856	log 3d term	4.600
2d and 3d terms		+ 02			2d term	.02	3d term	
−Δφ		12.8						

log s	3.5240064		
log sin α	9.9969747 N		
log A′ *	8.5090711	log Δλ	2.1580157 n
log sec φ′	0.1279635	log sin ½ (φ+φ′)	9.8243318
log Δλ	2.1580157 n	log (−Δα)	1.9823475 n
Δλ	-143.9 ″	−Δα	96.02 ″

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

11—6552

Comp. W.H.B.
Checked C.A.B.

Do not write in this margin.

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

POSITION COMPUTATION, TRAVERSE.

			°	′	″
α		to			
∠		&	+		
α	2 Tam	to 1 To	97	01	44.0
Δα				- 02	32
			180	00	00.0
α′	1 To	to 2 Tam	276	59	12.0

	°	′	″			°	′	″
φ	41	51	30.6	2 Tam	λ	67	15	31.4
Δφ		+ 00	21.0	s = 5306	Δλ		+ 03	48.3
φ′	41	51	51.6	1 To	λ′	67	19	19.7

	° ′ ″	log s	3.7247672	log s²	7.4495344		
½(φ+φ′)	41 51 41.1	log cos α	9.0876742 N	log sin² α	9.99344	log h²	2.6462
		log B	8.5107095	log C	1.35664	log D	2.3898
h	″ -21.04	log h	1.3231509 N	log 2d term	8.79961	log 3d term	5.0360
2d and 3d terms	+ .06		-21.04	2d term	+ .06	3d term	
−Δφ	-20.98						

log s	3.7247672		
log sin α	9.9967238		
log A′ *	8.5090710	log Δλ	2.3585648
log sec φ′	0.1280028	log sin ½ (φ+φ′)	9.8243649
log Δλ	2.3585648	log (−Δα)	2.1829297
Δλ	″ 228.33	−Δα	″ +152.38

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

11—6552

Comp. W.H.B.
Checked C.A.B.

Do not write in this margin.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 506.

POSITION COMPUTATION, TRAVERSE.

		°	′	″
α	to			
∠	&	+		
α	2 To to 1 T	277	22	51.0
Δα			+ 00	56
		180	00	00.0
α′	1 T to 2 To	97	23	47

	°	′	″			°	′	″
φ	41	51	51.6	2 To	λ	67	19	19.7
Δφ		-00	08.2	s = 1964.1	Δλ		- 01	24.4
φ′	41	51	43.4	1 T	λ′	67	17	55.3

	° ′ ″						
		log s	3.2931636	log s²	6.58635		
½(φ+φ′)	41 51 47.5	log cos α	9.1087809	log sin² α	9.99277	log h²	1.8252
		log B	8.5107093	log C	1.35669	log D	2.3899
h	+ 8.18″	log h	0.9126538	log 2d term	7.93581	log 3d term	4.2151
2d and 3d terms	+ 01		+ 8.18	2d term	+ .01	3d term	
−Δφ	8.19						

log s	3.2931636		
log sin α	9.9963865 N		
log A′ *	8.5090710	log Δλ	1.9266085 N
log sec φ′	0.1279874	log sin ½ (φ+φ′)	9.8243567
log Δλ	1.9266085 N	log (−Δα)	1.7509652 N
Δλ	- 84.45″	−Δα	- 56.36″

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

11—6552

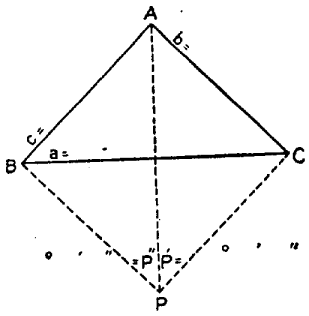
Comp. W.H.B.
Checked C.A.B.

Do not write in this margin.

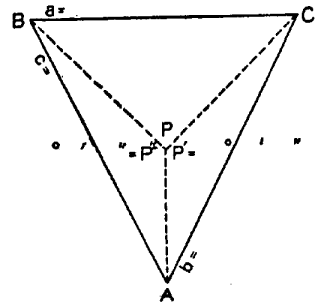
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 655

COMPUTATION OF THREE-POINT PROBLEM

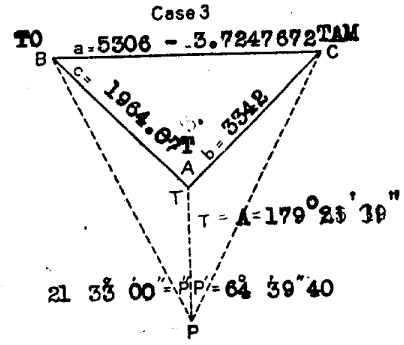
Case 1



Case 2



Case 3



Cases 1 and 2

P′	
P″	
A	
Sum	
½ Sum	

Case 3

P′	64 39 40
P″	21 33 00
Sum	86 12 40
A	179 21 31
A − sum	93 08 51
S = ½ (A − sum) =	46 34 25.5

S = 180° − ½ sum =

Log c =	3.2931570
Log sin P′ =	9.9560686
Colog b =	6.4759936
Colog sin P″ =	0.4349637
Sum = log tan Z =	0.1601829
Z =	55 20 04.6
Z + 45° =	100 20 04.6
Log cot (Z + 45°) =	9.2609175 n
Log tan S =	10.0238696
Sum = log tan ε =	9.2847871 n (sign −)
ε	169 05 42.4
S	46 34 25.5

(Tan ε+)
S + ε = angle ABP
S − ε = angle ACP

57 28 43.1
35 40 07.9

(Tan ε−)
S − ε = angle ABP
S + ε = angle ACP

BPA		APC		PCB	35 54 58
ABP		PCA		CBP	57 52 22
PAB		CAP		BPC	86 12 40
					180 00 00

(For explanation of this form see Special Publication No. 26, 2d edition, paragraph 108, page 57)

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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 25

COMPUTATION OF TRIANGLES

State: GEORGES BANK

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3						3.7847672
	1 Tom	86°12'40"					0.0009503
	2 To	57 52 22					9.9278164
	3 Tem	35 54 58					9.7683421
	1-3						3.6535339
	1-2						3.4940596
	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

Comp. W.H.B.
Checked C.A.B.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

					°	′	″
α	2	To	to 3	Tam	276	59	12
2d ∠			&		+ 57	52	22
α	2	To	to 1	Tom	334	51	34
Δα					+	00	38
					180	00	00.0
α′	1	Tom	to 2	To	154	52	12
				First Angle of Triangle	86	12	40

																	°	′	″
α	3	Tam	to 2	To	97	01	44												
3d ∠			&		− 35	54	58												
α	3	Tam	to 1	Tom	61	06	46												
Δα						−01	54												
					180	00	00.0												
α′	1	Tom	to 3	Tam	241	04	52												

	°	′	″			°	′	″
φ	41	51	51.6	2 To	λ	67	19	19.7
Δφ		−01	31.5	3.4940596	Δλ		−00	57.4
φ′	41	50	20.1	1 Tom	λ′	67	18	22.3

	°	′	″			°	′	″
φ	41	51	30.6	3 Tam	λ	67	15	31.4
Δφ		−01	10.5	3.6535339	Δλ	+	02	50.9
φ′	41	50	20.1	1 Tom	λ′	67	18	22.3

	Logarithms		Values in seconds
s	3.4940596		
Cos α	9.9567773 +		
B	8.5107094		
h	1.9615463	1st term	91.52″
s^2	6.98812		
$\sin^2\alpha$	9.25651		
C	1.35668		
	7.60131	2d term	+
h^3	3.9331		
D	2.3898		
	6.3229	3d term	+
		−Δφ	91.52

	° ′ ″		
½(φ+φ′)	41 51 05.6		
		Logarithms	Values in seconds
s		3.4940596	
Sin α		9.6282257 N	
A′		8.5090716	
Sec φ′		0.1278303	
Δλ		1.7591872 N	−57.44″
Sin ½(φ+φ′)		9.8242581	
−Δα		1.5834453 N	−38.32

	Logarithms		Values in seconds
s	3.6535339		
Cos α	9.6840255 +		
B	8.5107097		
h	1.8482691	1st term	70.51″
s^2	7.31706		
$\sin^2\alpha$	9.88458		
C	1.35660		
	8.55824	2d term	+ .03
h^3	3.6965		
D	2.3898		
	6.0863	3d term	+
		−Δφ	70.54

	° ′ ″		
½(φ+φ′)	41 50 55.3		
		Logarithms	Values in seconds
s		3.6535339	
Sin α		9.9422920	
A′		8.5090716	
Sec φ′		2.1278303	
Δλ		2.2327278	170.89″
Sin ½(φ+φ′)		9.8242338	
−Δα		2.0569616	114.02

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Comp. C.A.P.

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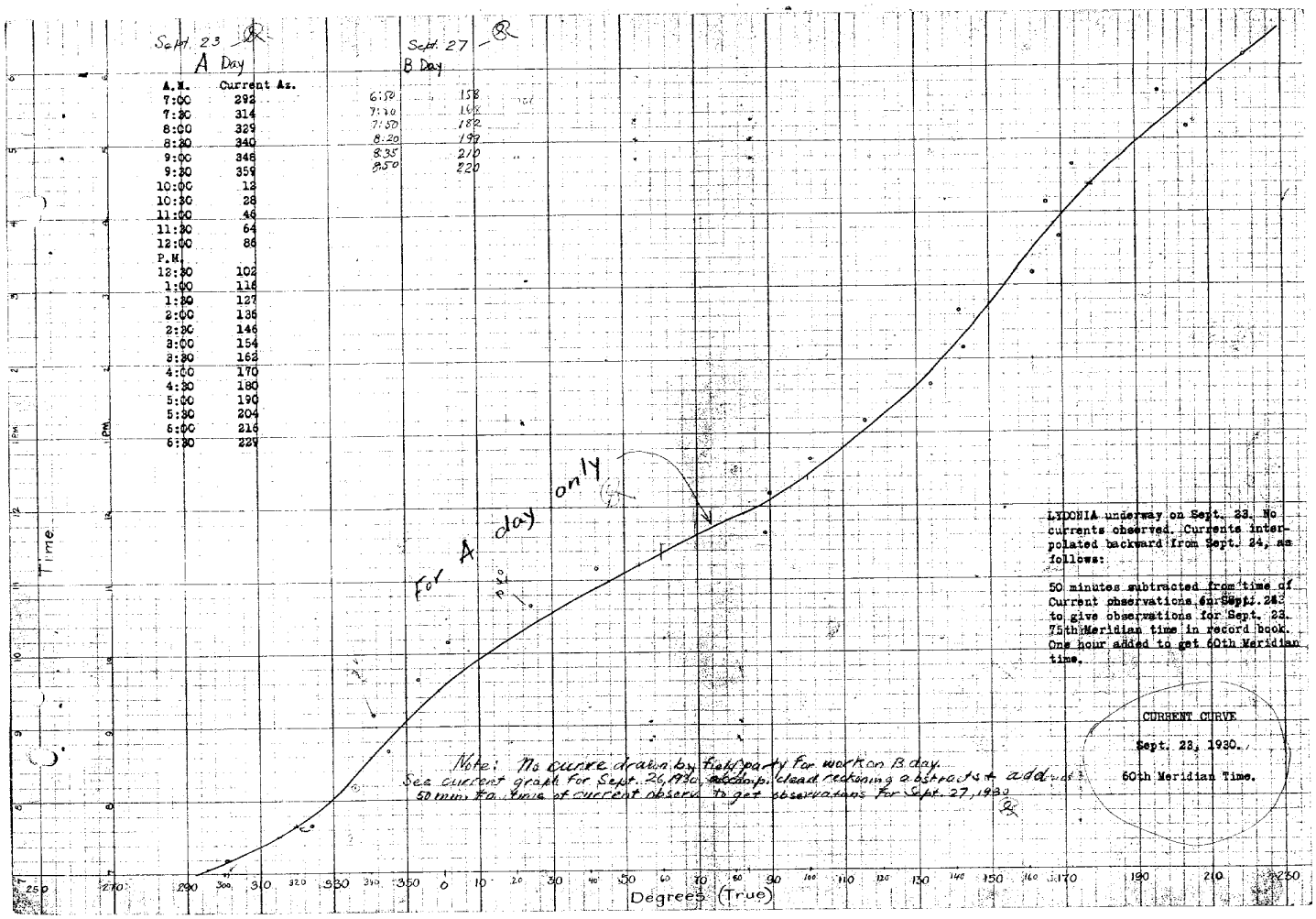
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
FORM 28 B

GEOGRAPHIC POSITIONS

Accession No. of Computation: .....

Locality GEORGES BANK *Datum* *State*

STATION	LATITUDE AND LONGITUDE	SECONDS IN METERS	AZIMUTH	BACK AZIMUTH	TO STATION	DISTANCE		
						LOGARITHM (METERS)	METERS	FEET
	° ′ ″		° ′ ″	° ′ ″				
T (From Office Computation)	41 51 43.4	1339.	276 45 18	96 46 54	Tam	3.524006	3342.0	
	67 17 55.3	1275						
Tam	41 51 30.6	944	97 01 44.0	276 59 12	To	3.724767	5306.0	
	67 15 31.4	724						
To	41 51 51.6	1592	277 22 51	97 23 47	T	3.293164	1964.1	
	67 19 19.7	454						
Tom	41 50 20.1	620	154 52 12	334 51 34	To	3.494060	3119.3	
	67 18 22.3	515	241 04 52	61 06 46	Tam	3.653534	4503.3	


Sept. 23
A Day
A.M. Current Az.
7:00 292
7:30 314
8:00 329
8:30 340
9:00 346
9:30 359
10:00 12
10:30 28
11:00 46
11:30 64
12:00 86
P.M.
12:30 102
1:00 116
1:30 127
2:00 136
2:30 146
3:00 154
3:30 162
4:00 170
4:30 180
5:00 190
5:30 204
6:00 216
6:30 229
Sept. 27
B Day
6:50 158
7:10 166
7:50 182
8:20 199
8:35 210
8:50 220
For A day only
Time
Degrees (True)
LYDONIA underway on Sept. 23. No currents observed. Currents interpolated backward from Sept. 24, as follows:
50 minutes subtracted from time of Current observations for Sept. 24 to give observations for Sept. 23. 75th Meridian time in record book. One hour added to get 60th Meridian time.
CURRENT CURVE
Sept. 23, 1930.
60th Meridian Time.
Note: No curve drawn by Field party for work on B day.
See current graph for Sept. 26, 1930, accomp. chart reckoning abstracts + add
50 mins to time of current observ. to get observations for Sept. 27, 1930

11

16

December 30, 1930

Division of Hydrography and Topography:

Division of Charts:

Tide Reducers are approved in
1 volume of sounding records for

HYDROGRAPHIC SHEET 5043

Locality Georges Bank

Chief of Party: G. D. Cowie, in 1930
Plane of reference is mean low water, reading
3.3 ft. on tide staff at Boston
18.1 ft. below B. M. 1

Allowance made for difference in range and time

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

Paul P. Whitney

Chief, Division of Tides and Currents.

SECTION OF FIELD RECORDS

Review of Hydrographic Sheet No. 5043.
Georges Bank, Massachusetts.
Surveyed in 1930.
Instructions dated May 17, 1930 (Lydonia)

Chief of Party - G. D. Cowie.
Surveyed by - Field Party.
Protracted by - M. A. Hecht.
Soundings penciled by - M. A. Hecht.
Verified and inked by - G. Risegari.

1. The records conform to the requirements of the General Instructions.

2. The plan and character of development fulfill the requirements of the General Instructions.

3. The plan and extent of development satisfy the Specific Instructions.

4. The sounding line crossings are adequate. The crossing which line 130A to 137A makes with line 1B to 6B is questionable. Recommendation for rejection of line 130A to 137A was sustained by Chief of Field Records. The overlapping work of H. 5112b and adjacent lines to A day on H. 5043 bear out the fact that the depths on A day are too shoal.

5. The 20 fathom depth curve at the northern end of the survey can only be partially drawn.

6. Junctions with H. 5112b, H. 5167, H. 5173 are satisfactory.

7. No further surveying is deemed necessary as the area appears to be sufficiently covered.

8. Attention is called to the use of the names "Tam" and "Tom" for signals, which look very much the same in some hand writings. It is believed such similarity of names should be discouraged in the name of signals.

In recording the signals in the record the use of "Same" was used extensively. This practice is generally conceded in the office to be bad in that a question may arise, where a signal or signals have been changed in the record over a "Same", whether the following "Sames" are in agreement with the changes.

It can readily be seen how a recorder who is accustomed to write "Same" continually may note in his mind a change of signals when such occurs, but who may fail from force of habit to note it in the record.

In reprotracting or checking a position where "Same" is noted, it is often necessary to scrutinize the previous pages of a record in order to be certain of the proper signals that were used.

9. In order to check the plotting of B day, it was necessary to secure the current data from the current graphs of H. 5112b for Sept. 26, 1930 (accompanying dead record abstracts) and reduce the data in order to get the times

and current azimuths for Sept. 27, 1930. This information was necessary in order to know the positions of the buoys on their respective scopes.

10. Attention is called to the last paragraph on page 2, descriptive report, under "Discrepancies", regarding the line between positions 185A and 225A.

The section of this line between positions 192A and 220A, was replotted to the scale of 1/40,000 (the scale of the 1931 survey, H. 5196) by using the average speed between positions 192A and 198A for most of the line, except for section where half speed is recorded, and the recorded bearings, corrected for compass deviations. The field plotting of positions 192 and 220A were checked and accepted and used for the determination of the final adjustment of the line. The adjustment of the line was then accomplished by pivoting the replotted line about pos. 192A and adjusting it to the 1931 work on H. 5196. The line could not be fitted as a whole to H. 5196 and the portion from pos. 192A to pos. 212A was first adjusted to the 1931 work, and with pos. 212A thus fixed the resulting error of closure at pos. 220A was distributed along the line 212A-220A. This finally adjusted line was then transferred to H. 5043.

Several of the adjusted positions were compared with the recorded angles and in all cases the fiducial edges of the protractor fell within the scope circle of the buoys, although not in the same azimuth. This would seem to indicate that the buoys were affected by different current conditions.

11. Attention is called to the insufficiently developed area in vicinity of lat. 41° 53' long. 67° 19, which was not covered in the 1931 work. There is indication of shoaler water existing here.

Reviewed by - G. Risegari. October 9, 1931.

Inspection Note by - A. L. Shalowitz.

The adjustment mentioned in par. 10 of this review was made under my immediate supervision. Had the line in question not contained such shoal soundings, or had the 1931 work fully covered this area, the line would have been rejected. While the adjustment may seem somewhat arbitrary, it is believed that on the whole a logical result has been obtained consistent with both the 1930 work (H. 5112b) as well as the 1931 work.

Sheet Inspected by - A. L. Shalowitz.

Examined and approved:

L. O. Colbert,
Chief, Field Records Section.

Chief, Division of Charts.

Chief, Field Work Section.

Chief, Division of H. & T.