

8401

Diag. Cnt. No. 1107. and 1000-3.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. HY-1157 Office No. H-3401.

LOCALITY

State Massachusetts

General locality Georges Bank

Locality Texas Tower - Georges Shoal

1945

CHIEF OF PARTY

Walter J. Chovan - Gilbert R. Fish

LIBRARY & ARCHIVES

DATE January 23, 1958

1048
8401

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

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.

REGISTER NO. H-8401

Field No. HY-1157

State Massachusetts ✓

General locality Georges Bank ✓

Locality Texas Tower - Georges Shoal ✓

Scale 1:10,000 Date of survey 21 June - ^{14 Aug.} ~~28 July~~, 1957 ✓

Instructions dated 28 November 1956 Supplemental 28 February 1957

Vessel HYDROGRAPHER

Chief of party Walter J. Chovan - Gilbert R. Fish ✓

Surveyed by W.R. Kachel, D.R. Campbell, V.C. Ahlrich, J.J. McCoy, P.L. Rotondo

Soundings taken by ~~float~~ graphic recorder, ~~hydrographic recorder~~

Fathograms scaled by Ships Personnel

Fathograms checked by Ships Personnel

Protracted by J.J. McCoy - D.R. Campbell

Soundings penciled by D.R. Campbell - J.J. McCoy

Soundings in fathoms 194 at MLW 11111
and are true depths

REMARKS: _____

DESCRIPTIVE REPORT

To Accompany Hydrographic Survey H-8401 (Field No. HY-1157)

Texas Tower - Georges Shoal 1957

Ship HYDROGRAPHER

Scale 1:10,000

Walter J. Chovan - Gilbert R. Fish

Chiefs of Party

A. PROJECT:

Project No. CS-401. Original Instructions dated 28 November 1957. Supplemental Instructions dated 28 February 1957. ✓

B. SURVEY LIMITS AND DATES:

This survey covers the area of Georges Shoal on Georges Bank, Gulf of Maine, in the immediate vicinity of Texas Tower No. 2. The approximate limits of the sheet are: Lat. $41^{\circ} 39.0'$ N to Lat. $41^{\circ} 45.0'$ N and Long. $67^{\circ} 42.0'$ W to $67^{\circ} 49.0'$ W. ✓

Field work on this sheet began 22 June 1957 and ended 14 August 1957.

This survey makes a junction with the following prior surveys:

H-5154	1:20,000	1931
H-5195	1:40,000	1931
H-5173	1:100,000	1931

Review, #5

This survey makes a junction with the following contemporary surveys:

H-8402 (1957) (HY-2157)
H-8404 (1957) (HY-4357)

Review, #4

C. VESSELS AND EQUIPMENT:

The hydrography on this survey was accomplished by the Ship HYDROGRAPHER and Launches Nos. 114 and 117. The Launches were used in the shoal area where the depth of water was not sufficient to allow safe operation of the ship and also in the areas surrounding the Texas Tower. The launches were operated from the ship.

The turning radius at sounding speed (120 RPM or approximately 10 knot) of the HYDROGRAPHER is 80 to 120 meters depending upon the prevailing wind and current.

808 J type Fathometers were used for this entire survey with the exception of positions 151 J thru 175 J on which EDO fathometer No. 205 was used. The following fathometers were used:

Launch #114 #105S

Launch #117 #132

Hydrographer #105S, 153 SPX, 156 SPX, & EDO #205

D. TIDE AND CURRENT STATIONS:

Tide reducers for this survey are referred to the standard tide gage at Boston, Massachusetts. Time difference of minus one hour and ratio of ranges of 0.5 was furnished by the Washington Office. Hourly heights were furnished by the Washington Office.

During the period 21 - 25 June 1957 a 100 hour current station was observed using the Roberts Radio Current Buoy. This station was at Lat. $41^{\circ} 41.25'$ Long. $67^{\circ} 48.61'$ W

E. SMOOTH SHEET:

The smooth sheet projection and raydist arcs were ruled by the Washington Office. The shoran arcs were ruled on board the ship.

This is an offshore survey and contains no shoreline or topographic details.

F. CONTROL STATIONS:

All ship hydrography on this sheet was controlled by Raydist using two stations as follows:

R₂ (also EPIA) at Southwest Harbor, Maine
 Lat. 44° 14' 47.65"
 Long. 68° 17' 37.61"

The G.P. of this station was determined by F.B. Quinn, Boston District Officer, in 1955.

R₁ (also EPIB) at Wellfleet, Cape Cod, Mass.
 Lat. 41° 56' 31.426"
 Long. 69° 59' 11.303"

The G.P. of this station was determined by K.S. Ulm, Boston District Officer, in 1957. It is the same as R.M. 1 of Triangulation station FRAZIER 1957.

All launch work on this sheet was controlled by Shoran. One shoran station was on the Ship HYDROGRAPHER and the other shoran station was located on Texas Tower No. 2.

Shoran arcs for the ship's station were drawn from the following point: Lat. 41° 41.87' (1600 m) N; Long. 67° 36.72' (1986 m) W; which has Raydist distance of R₁ = 4359.5 and R₂ = 6318.5.

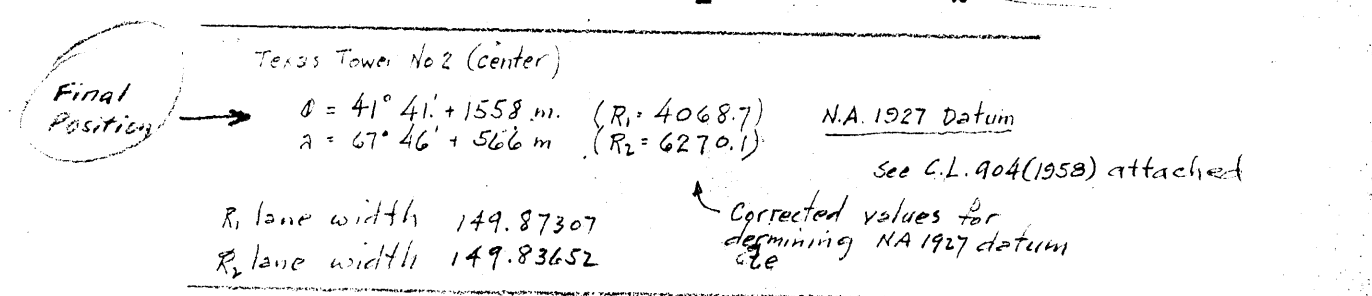
The shoran station on ^{*}Texas Tower No. 2 had two antenna locations. This was necessary to cover the complete area without interference and blind spots resulting from installations on the tower. The first location was used for all work thru 27 July 1957. Location No. 2 was used for all work beginning 28 July 1957. * Position of Texas Tower No. 2 (C.L. 579, 1957) ϕ 41° 41' + 1846 m. (R₁ 4069.0) λ 67° 46' + 507 m. (R₂ 6267.0)

(Position considered to be accurate to within 11m or 45 meters)

Shoran arcs for the Tower station were drawn from the following points: Antenna Position No. 1, Lat. 41° 41.98' (1823 m) N; Long. 67° 46.38' (1527 m) W; which has a Raydist distance of R₁ = 4068.6 and R₂ = 6264.4. Antenna position No. 2, Lat. 41° 42.02' (1721 m) N; Long. 67° 46.37' (1522 m) W, which has Raydist distances of R₁ = 4068.8 and R₂ = 6263.4.

see C.L. 904 (1958) for a new position of tower

NA 1927 Provisional datum
 see below



G. SHORELINE AND TOPOGRAPHY:

No shoreline or topography is shown on this sheet as this is an offshore survey.

H. SOUNDINGS:

All depths were measured using 808 J type fathometers with the exception of position 151 J thru 175 J, in which EDO fathometer #205 was used. All the 808 J type fathometers are old and proved rather unreliable at times. However, adequate checks and tests were made to verify the accuracy of the soundings. See separate report on Velocity and Fathometer Corrections.

While plotting the smooth sheet it was discovered that during B day on 23 June and C day on 26 June 1957 fathometer No. 132 on Launch #117 was running at erratic speeds. A tabulation of the speed corrections is appended to this report. These corrections are used in conjunction with the bar check on 23 June 1957. The fathometer was running properly at the time this bar check was taken.

I. CONTROL OF HYDROGRAPHY:

Raydist control was used for all ship work on this sheet. The Raydist dials were set at the Texas Tower and an abstract of Raydist corrections for this sheet are included at the end of this report. Raydist stations were located as indicated in Section F, of this report. A complete explanation of Raydist control and calibration is included in the Raydist Report submitted to the Washington Office 12/9/57.

Shoran control was used for all launch work on this sheet. The shoran stations were located as indicated in Section F of this report. Shoran corrections were determined as follows:

A correction for the movement of the ship was determined and applied to all readings from the ship's station. It was not practical to anchor the ship fore and aft due to the current in the area. Therefore, the ship was anchored with a short scope as close as possible to the origin of the shoran arcs using Raydist distances. Raydist readings were

taken at intervals while launch hydrography was in progress and these fixes plotted on a large scale plotting sheet. A correction was computed for each launch taking into account the azimuth of the launch from the ship. This correction was called the ship's swing correction and an abstract of these corrections is furnished at the end of this report. The ship's positions are recorded in Vol. 1 of H-8401.

The calibration corrections for the launches were determined as follows. Calibrations were tried in the vicinity of Texas Tower No. 2 using sextant angles from the ship and from the launches and Raydist distances between the ship and Texas Tower and then computing the distances. This did not prove satisfactory and the results were discarded.

The ship station was calibrated inshore near Boston by anchoring the launches and locating them with sextant fixes on fixed objects. The ship then proceeded away and fixes were taken at various distances and the true distance computed. This calibration was used as the basis for corrections to the ship's station.

Each day on which the launches worked near the Texas Tower a calibration of the ships distance was made by positioning the launches directly beneath the shoran antenna on the tower. This gave a fairly accurate check on the calibration of the ship's station. Combining this with crossings of the base line at various distances from the Tower gave a correction to the tower station.

In addition to the above corrections, on a few days a special correction had to be used. This was found necessary in order to get the junctions between launch work and ship work, between work of both launches, and between launch work done on different days, to check. In making these corrections the steep, straight ridges were used as a helpful guide. A sheet of corrections for each days launch work is included at the end of this report.

There is an extra wide line spacing along the 2 mile arc south of the Texas Tower where the two launches join. This was caused by the final corrections to the shoran being plus on one

launch and minus on the other. The final corrections were not determined until smooth plotting. It is recommended that no additional hydrography be done in this area. ✓

An additional arbitrary correction of -0.020 was applied to the ship arc on launch 117 from position 136 thru 145 B day. This correction was necessary to make a smooth junction between H-8401 and H-8402. ✓

Positions 14 thru 16 A and 23 thru 25 A launch 114 were shifted 0.030 statute miles west after the smooth sheet was completed in order to match the depth curves on the shoal an lines run by both launches. The rest of "A" day was inspected and a shift would not make much difference as the area is fairly flat. Therefore, the rest of the day was not changed. ✓

During the course of the hydrography on this sheet it was noted that the shoran on launch No. 114 was very stable. The various calibrations, baseline crossings etc. were consistent. However, the shoran on launch No. 117 was quite erratic and calibrations were inconsistent. Therefore in plotting the sheet the ship lines controlled by Raydist were put on first. Then the shoran controlled work of Launch 114. Finally Launch 117's work was fitted into this work using all available calibrations, and crossings with the other work. Therefore some of the corrections used are arbitrary and only to get the work to fit. ✓

J. ADEQUACY OF SURVEY:

This survey is complete and adequate to supersede prior surveys for charting.

Junctions with the adjoining surveys are satisfactory. *Review, P4* ✓

The depth curves can be adequately drawn at the junctions.

A 15 fathom depth curve was added to the smooth sheet in addition to the standard depth curve to aid in delineating the shoal.

K. CROSSLINES:

Crosslines were run to approximately 5 - 10 % of the regular system of sounding lines. ✓

L. COMPARISON WITH PRIOR SURVEYS:

This survey was compared with prior surveys H-5154, 1:20,000, 1931 and H-5195, 1:40,000, 1931. In general the agreement between the new survey and these prior surveys are very good. Due to closer spacing of sounding lines and more comprehensive development many of the isolated shoals and shoal soundings on the old surveys are now shown as continuous shoals and many new shoals have been developed. ✓

The ten fathom curve is almost identical with the 10 fathom curve of the old survey. The shoals in the SE section of this sheet are indicated in approximately the same positions on the prior survey. *Review, #5* ✓

Only sparse indications of the shoals developed by the survey, to the north and northeast of Texas Tower No. 2, are shown by the prior surveys. ✓

The following two shoal soundings shown on H-5154 were not substantiated:

2 1/6 fms. Lat. 41° 41.85' N	Long 67° 46.0' W	} revised } positions	} Disregard } these sdgs.
3 1/2 fms. Lat. 41° 41.65' N	Long 67° 45.2' W		

They fall in an area of flat bottom generally 6 - 7 fms. on the new survey. It is recommended that these soundings not be used. *Concur; Review, #6* ✓

The shoalest sounding on this survey is a 1.6 fm at Lat. 41° 39.75' N; Long. 67° ~~44.15'~~ 43.83' W. ✓

Several continuous shoals running in a generally NW - SE direction were developed N and E* of Texas Tower No. 2. The tops of these shoals show least depths of 3.5 to 5.0 fms. ✓

The discrepancies between the prior surveys and this survey are judged to be due to the latter having more accurate position control, sounding by graphic recording instruments and closer line spacing. ✓

* from 1 3/4 miles N.W. to 1 1/4 miles
S.E. of Texas Tower

M. COMPARISON WITH CHART:

This survey was compared with chart No. 3076, scale 1:220,000; the largest scale survey of the area available. ✓

The comparison was very good considering the difference in scale between the chart and the smooth sheet. The ^{*Review, #6} 2 1/4 fathom sounding shown on the chart in Lat. 41° 41.2' N; Long. 67° 45.8' W falls in an area of smooth bottom 6 to 9 fathoms deep on the new survey. The nearest shoal sounding to this 2 1/4 fm. spot on the new survey is a 2.8 fm. depth at Lat. 41° 40.5' N; Long. 67° 45.0' W. ✓

The ^{← Review, #6} 3 1/2 fm. sounding charted at Lat. 41° 41.0' N; Long. 67° 45.0' W is about 1/2 mile north of a shoal with similar depths. ✓

The 3 fm. sounding charted at Lat. 41° 40.3' N; Long. 67° 44.1' W is about 1/4 mile ^{200 meters} NE of a shoal with similar depths. ✓

The 4 3/4 fm. sounding charted at Lat. 41° 43.2' N; Long. 67° 46.4' W is probably part of a ridge developed on this survey and having a least depth of 3.6 fm. ✓

N. DANGERS AND SHOALS:

Least Depths		
Fms.	Latitude	Longitude
4.7 ✓	41° 43.63'	67° 47.53'
3.6 ✓	41 42.80	67 46.00
3.5 ✓	41 42.00	67 45.18
4.1 ✓	41 43.07	67 46.93
3.8 ✓	41 42.43	67 45.88
2.8 ✓	41 40.52	67 45.00
1.6 ✓	41 39.75	67 44.18
1.6 ✓	41 39.83	67 43.83

The above soundings are the shoalest depths on various continuous shoals and not isolated shoal soundings. ✓

All charted dangers and shoals were found as charted or shoaler depths were found except for those listed in L, M and W.U. ✓

P. AIDS TO NAVIGATION:

No fixed or floating aids to navigation are located within the limits of this survey with the exception of Texas Tower No. 2. This tower is well lighted at night and during periods of low visibility a diaphone is sounded. ✓

Q. LANDMARKS FOR CHARTS:

No landmarks for charts are located within the limits of this survey. ✓

R. GEOGRAPHIC NAMES:

No investigation of geographic names was made. ✓

U. MISCELLANEOUS:

Preliminary Review Item No. 6 states; "Survey H-5154 covering Georges Shoal in Lat. 41° 40', Long. 67° 45' includes 16 detached shoal soundings carried forward from H-2915, three of these soundings were marked out and the others added in 1956 when a comparison of the two surveys indicated better overall agreement by shifting hydrography of the poorly controlled H-2915. Positions of these soundings are still questionable". *Review, pars. 5a. & b.*

Since this is a modern electronically controlled survey it is recommended it be used to supersede previous surveys. See Section L, M, and N. ✓

Z. TABULATION OF APPLICABLE DATA:

	<u>To Wash. Off.</u>
Season's Report	12/9/57
Raydist Report	12/9/57
Addendum to Raydist Report	12/10/57
Fathometer and Velocity Correction Report	12/10/57 <i>Library No. 114/1957</i>
Oceanographic Report and Records	12/9/57
Current Buoy Observations form #270	7/3/57
Water Samples from Oceanographic Stations	10/14/57

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Abstracts of the various corrections used in this survey are attached to the end of this report.

William R. Kachel
William R. Kachel
LT, C&GS

STATISTICS FOR HYDROGRAPHIC SURVEY H-8401 (1957)

USC & GSS HYDROGRAPHER

Project CS-401

Ship HYDROGRAPHER

<u>Day Ltr.</u>	<u>Vo. No.</u>	<u>Date</u>	<u>No. of Posit.</u>	<u>Naut. Mi. Sdg.</u>
A - G	1	Raydist fixes for control of Launch hydrography only		
H	2 & 3	9 July 1957	247	65.0
J	3 & 4	10 July 1957	303	54.5
K	4, 5 & 6	11 July 1957	286	63.6
L & M	6	Raydist fixes for control of Launch hydrography only		
N	6 & 7	This entire day rejected due to Raydist failure.		
P	7	Shoran fixes for control of Launch hydrography only		
Q & R	7	Raydist fixes for control of Launch hydrography only		
S	7, 8 & 9	11 Aug. 1957	347	64.7
T	9	13 Aug. 1957	8	1.4
U	9 & 10	14 Aug. 1957	179	33.8

Launch #114

A	11	22 June 1957	58	9.0
B	11	23 June 1957	28	5.0
C	11 & 12	26 June 1957	93	18.0
D	12	8 July 1957	110	27.0
E	12 & 13	27 July 1957	124	22.0
F	13 & 14	28 July 1957	186	28.3
G	14 & 15	7 Aug. 1957	110	14.5

Launch #117

A	16	22 June 1957	55	10.3
B	16 & 17	23 June 1957	145	26.6
C	17	26 June 1957	114	14.1
D	18	27 July 1957	128	19.1
E	18 & 19	28 July 1957	201	37.0

		Sheet Total	2722	513.9
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TIDE NOTE

To Accompany

Hydrographic Survey H-8402

Standard Tide Station: Boston, (Commonwealth Pier) Mass.

Location: Lat. $42^{\circ} 21' N$; Long $71^{\circ} 03' W$

Plane of Reference: Mean Low Water 3.3 feet on tide staff

Time Correction: Minus One Hour

Ht. Correction: Ratio of ranges 0.5

Area Covered: Entire survey

Above time and height corrections furnished by Washington Office.

The hourly heights were furnished from the Washington Office.

RAWDIST CORRECTIONS FOR SHEET HC-1157

Date	Day	Position	Field Corr		Final Corr		As corr	Total R ₂
			R ₁	R ₂	R ₁	R ₂		
July 9	H	All	+5.6	+4.8	+1.1	+2.0	-1.4	+0.6
10	J	All	+2.8	+6.6	-1.7	+3.8	-1.4	+2.4
11	K	All	+2.5	-1.4	-2.0	-4.2	-1.4	-5.6
Aug. 6	N	All	+0.3	-0.3	-4.2	-3.1	-1.4	-4.5
11	S	1 - 75	+0.4	+4.0	-4.1	+1.2	-1.4	-0.2
13	T	76 - End	+0.4	+0.6	-4.1	-2.2	-1.4	-3.6
14	U	1 - 8	+0.7	+2.4	-3.8	-0.4	-1.4	-1.8
			+0.4	+0.2	-4.1	-2.6	-1.4	-4.0

TT = Texas Tower Antenna No. 1

TT Approx (Shoran)
TT True (Shoran)

4073.1 6267.2
4068.6 6264.4
-4.5 -2.8

FOR CONTROL OF LANDING HYDRO

Date	Day	Position	Field Corr	Final Corr	As corr	Total R ₂		
June 21	A	All	+6.1	+5.5	+1.6	+2.7	-1.4	+1.3
22	B	All	+6.1	+5.5	+1.6	+2.7	-1.4	+1.3
23	C	All	+6.1	+5.5	+1.6	+2.7	-1.4	+1.3
26	D	1 - 5	+6.1	+5.5	+1.6	+2.7	-1.4	+1.3
26	D	6 - 28	+5.1*	+4.5	+0.6	+1.7	-1.4	+0.3
26	D	29 - 34	-0.9	+0.5	-5.4	-2.3	-1.4	-3.7
28	E		Shoran calibrations at Boston					

From one Anchorage
New Anchorage Controls
no hydro.
* Shoran calibration P. 28,
Vol. 1.

RAYDIST CORRECTIONS FOR SHEET HC-1157 CONT.

Date	Day	Positions	Field Corr		Final Corr		As. Corr	Total	
			R ₁	R ₂	R ₁	R ₂			
July 8	F	1 - 52	+5.7	+3.5	+0.0	+0.7	-1.4	-0.7	See P. 37, Vol. 1 *Mean of two calibration controls no hydro.
9	G	1 - 6	+5.7	+3.5	+1.2	+0.7	-1.4	-0.7	See Vol. 6, P. 23
27	L	1 - 38	-0.4	-34.8	-4.9	-37.6	-1.4	-39.0	See Vol. 6, P. 30
28	M	1 - 49	-0.4	+3.2	-4.9	+0.4	-1.4	-1.0	
Aug. 7	P		NO Raydist this day						
9	Q	2 - 9	-0.4	-2.2	-4.9	-5.0	-1.4	-6.4	See Vol. 7, P. 37
9	Q	10 - 26	-0.4	+1.8	-4.9	-1.0	-1.4	-2.4	Lost 4 James on R ₂ between posit. 9 & 10
10	R	1 - 32	-2.4	-9.2	-6.9	-12.0	-1.4	-14.4	See Vol. 7, P. 42

SHORAN CALIBRATION CORRECTIONS FOR HY-1157

Launch 114

			Ship		
Day Ltr	Date	Tower	Calib	Extra	Total
A	22 June 1957	-0.020	-0.025	0	-0.025
B	23 June 1957	-0.020	-0.025	0	-0.025
C	26 June 1957	-0.020	-0.025	0 0.050	-0.025
D	8 July 1957	-0.020	-0.025	0	-0.025
E	27 July 1957	-0.025	0 0.005	0	-0.025
F	28 July 1957	-0.020	-0.020	0	-0.020
G	7 Aug. 1957	-0.020	-0.010	0	-0.010

Launch 117

			Ship		
Day Ltr	Date	Tower	Calib	Extra	Total
A	22 June 1957	0 0.063	0 0.030	-0.001	0 0.029
B	23 June 1957	0 0.063	0 0.030	0 0.026 0 0.006	0 0.056 0 0.036
C	26 June 1957	0 0.063	0 0.030	0 0.049 0 0.019	0 0.079 0 0.049
D	27 July 1957	0 0.019	0 0.044	0.0	0 0.044
E	28 July 1957	0 0.084	0 0.017	0.0	0 0.017

{ 0 to 1.4 Mi.
 { ~~0~~ 0.069
 { 1.4 to 1.7 Mi.
 { ~~0~~ 0.050
 { 1.7 to 10 Mi.

Pos 136 thru 145
Until noon
after noon

SHORAN CORRECTIONS DUE TO SHIP'S SWING

Time	Brg-ship to Arc origin	22 June 1957		Diff of Azs. Center-Lchs	Corr.	
		Dist. meters	Az to both Launches		meters	Stat. mi.
1000	11°	41	261°	110	414	4.010
1030	28°	45	"	127	427	4.017
1100	26°	45	"	125	426	4.016
1119	37°	71	"	136	451	4.032
1137	35°	62	"	134	443	4.027
1158	43°	60	"	142	447	4.029
1230	52°	69	"	151	460	4.037
1259	64°	70	"	163	467	4.042
1330	87°	70	"	186	469	4.043
1400	112°	74	"	211	463	4.039
1430	135°	90	"	234	453	4.035
1500	144°	112	"	243	451	4.032
1530	156°	120	"	255	431	4.019
1600	158°	122	"	257	427	4.017
1630	161°	122	"	260	421	4.013

SHORAN CORRECTIONS DUE TO SHIP'S SWING

23 June 1957

Time	Brg-Ship to Arc origin	Dist. meters	Launch 114			Launch 117				
			Az Leh	to Center Leh	Diff of Meters	Az Leh	to Center Leh	Diff of Meters		
0953	229°	47	261°	328	-40	-0.025	251°	338	-40	-0.25
1030	56	41	"	155	f.37	f.023	"	165	f.10	f.025
1100	53	48	"	152	f.42	f.026	"	162	f.16	f.029
1130	54	59	"	153	f.53	f.033	"	163	f.56	f.035
1200	62	60	"	161	f.57	f.035	"	171	f.59	f.036
1230	79	74	"	178	f.74	f.046	"	188	f.73	f.045
1300	79	74	"	178	f.74	f.046	"	188	f.73	f.045
1330	90	82	"	189	f.81	f.050	"	199	f.77	f.048
1400	104	84	"	203	f.77	f.048	"	213	f.70	f.043
1430	104	75	"	203	f.69	f.043	"	213	f.63	f.039
1500	135	109	"	234	f.64	f.040	"	244	f.48	f.030
1530	141	120	"	230	f.77	f.048	"	240	f.60	f.037
1600	152	125	"	251	f.41	f.025	"	261	f.20	f.012

SHORAN CORRECTIONS DUE TO SHIP'S SWING

26 June 1957

Time	Brig-Ship to Amsc origin	Dist meters	Lamuch 114			Lamuch 117			
			Ag to Leh center	diff of Meter	Stat. mi.	Ag to Leh center	diff of meter	Stat. mi.	
1000	192	73	261° 291	-26	-.016	251	301	-38	-.024
1030	201	65	" 300	-32	-.020	"	310	-42	-.026
1100	202	60	" 301	-31	-.019	"	311	-40	-.025
1130	217	20	" 316	-12	-.007	"	326	-7	-.004
1200	10	19	" 109	4 6	4.004	"	119	49	4.006
1230	334	23	" 73	- 7	-.004	"	83	-3	-.002
1300	004	47	" 103	411	4.007	"	113	418	4.011
1330	358	65	" 97	4 8	4.005	"	107	430	4.018
1400	006	77	" 105	420	4.012	"	115	432	4.020
1430	13	75	" 112	428	4.017	"	122	440	4.025
1500	15	87	" 114	435	4.022	"	124	449	4.030
1530	26	87	" 125	450	4.031				
1600	38	93	" 137	468	4.042				
1500	15	87				246	Sheet 2157		
1530	26	87				"	129	455	4.034
1600	38	93				"	140	467	4.042
						"	152	482	4.052

SHORAN CORRECTIONS FOR SHIP'S SWING

8 July 1957

Launch 114

Time	Brg Ship to Arc origin	Dist. Meters	Az to Leh	Diff Az	Meters	Corr. Stat. Mi.
1040	318	140	268	50	-90	-.056
1050	327	142	272	55	-81	-.050
1100	338	143	276	62	-67	-.041
1110	342	150	"	66	-61	-.038
1120	347	150	"	71	-49	-.030
1130	355	151	272	83	-18	-.011
1140	358	149	268	90	0	0
1150	01	150	"	93	+8	+0.005
1200	01	150	"	93	+8	+0.005
1210	05	147	"	97	+18	+0.012
1220	05	147	"	97	+18	+0.012
1230	07	148	"	99	+23	+0.014
1240	10	148	"	102	+29	+0.018
1250	16	148	272	104	+33	+0.020
1300	18	141	276	102	+29	+0.018
1310	20	137	"	104	+33	+0.020
1320	22	135	272	110	+45	+0.028
1330	25	132	268	117	+60	+0.038
1340	26	137	"	118	+64	+0.040
1350	29	131	276	113	+51	+0.032
1400	27	128	276	111	+46	+0.028
1410	27	128	"	111	+46	+0.028
1420	32	125	"	116	+55	+0.034
1430	33	121	272	121	+62	+0.038
1440	35	120	268	127	+72	+0.045
1450	38	119	"	130	+77	+0.048
1500	39	114	276	123	+62	+0.038
1510	45	98	"	129	+62	+0.038
1520	57	73	268	149	+62	+0.038
1530	67	48	"	159	+55	+0.034
1540	85	38	"	177	+38	+0.024

SHORAN CORRECTIONS DUE TO SHIP'S HEAVING						
8 July 1957			B Day		Sheet 2157	
Time	Brg Ship to Arc origin	Dist Meters	Az to Lch	Diff Ass	Meters	Stat. Mi.
1010	286	118	246	40	-76	-.048
1020			"			
1030	310	133	"	64	-58	-.036
1040	318	140	"	72	-43	-.027
1050	327	142	"	81	-22	-.014
1100	338	143	"	92	+5	+0.003
1110	342	150	"	96	+16	+0.018 ⁰
1120	347	150	"	101	+29	+0.018
1130	355	151	"	109	+50	+0.031
1140	358	149	"	112	+56	+0.035

(Corrections for 26 June are on same sheet as corrections for sheet 1157)

SHORAN CORRECTIONS FOR SHIP'S SWING

27 July 1957, Launch 114; Launch 117

Time	Brig-Ship to Arc origin	Dist meters	Launch 114			Launch 117				
			Az to diff of center	Leh	Corrections meters	Stat. ml.	Az to diff of center	Leh	Corrections meters	Stat. ml.
0940	180	182	271	Leh	0	0	271	Leh	0	0
0954	181	183	"	"	0	0	"	"	0	0
1005	185	175	"	"	0	0	"	"	0	0
1017	187	179	"	"	-20	-.012	"	"	-20	-.012
1028	190	178	"	"	-30	-.019	"	"	-30	-.019
1031	190	175	"	"	-30	-.019	"	"	-30	-.019
1050	192	173	"	"	-30	-.019	281	Leh	0	0
1100	195	173	"	"	-30	-.019	"	"	0	0
1110	195	171	268	287	-50	-.031	"	"	-10	-.006
1120	197	168	276	281	-32	-.020	"	"	-10	-.006
1130	199	162	"	283	-37	-.023	"	"	-17	-.011
1140	197	169	"	281	-32	-.020	"	"	-22	-.014
1150	195	169	268	287	-50	-.031	"	"	-17	-.011
1200	198	166	"	290	-57	-.035	"	"	-10	-.006
1210	197	165	"	289	-54	-.033	"	"	-20	-.012
1220	200	155	276	284	-38	-.023	"	"	-17	-.011
1230	204	136	"	288	-42	-.026	"	"	-20	-.012
1240	207	124	"	291	-45	-.028	"	"	-24	-.015
1250	211	103	"	295	-44	-.027	"	"	-30	-.022
1300	212	84	"	296	-37	-.023	"	"	-35	-.022
1310	Missed									
1320	217	56	272	307	-34	-.021	"	"	-30	-.022
1330	237	34	"	325	-28	-.017	"	"	-25	-.015
1340	242	21	"	330	-18	-.011	321	Leh	-16	-.010
1350	253	19	"	351	-19	-.12	"	"	-17	-.011

SHORAN CORRECTIONS DUE TO SHIP'S SWING

27 July 1957

Time	Brg Shp to Arc Origin	Dist meters	Launch 114			Launch 117				
			Az to Lch	diff Ass	Corrections meters	Stat. mi.	Az to Lch	diff Az	Corrections meters	Stat. mi.
1400	255	25	272	343	-20	-.012	281	334	-18	-.011
10	299	12	"	27	-11	-.007	"	18	-11	-.007
20	343	12	"	71	-4	-.002	"	62	-4	-.002
30	298	26	"	26	-22	-.014	"	17	-25	-.015
40	323	27	"	51	-17	-.011	"	42	-20	-.012
50	325	34	"	53	-21	-.013	"	44	-25	-.015
1500	338	30	"	66	-12	-.008	"	57	-16	-.010
10	330	35	"	58	-18	-.011	"	49	-23	-.014
20	336	32	"	64	-14	-.009	"	55	-18	-.011
30	353	33	"	81	-5	-.003	"	72	-10	-.006
40	01	34	"	89	0	0	"	80	-6	-.004
50	03	36	"	91	0	0	"	82	-5	-.003
1600	353	29	"	81	-5	-.003	"	72	-9	-.006
10	356	34	"	84	-4	-.002	"	75	-9	-.006

SHORAN CORRECTIONS DUE TO SHIP'S SWING

28 July 1957

Time	Brg	Ship to Arc Origin	Dist meters	Launch 114			Corrections			Launch 117			Corrections		
				Leh	Az to diff	Ass	meters	Stat. ml.	Leh	Az to diff	Ass	meters	Stat. ml.		
0845	137		134	271	226		f.058		271	226		f.058			
49	153		126	"	242		f.037		"	242		f.037			
51	152		125	"	241		f.038		"	241		f.038			
57	152		124	"	241		f.037		"	241		f.037			
0900	152		125	"	241		f.037		"	241		f.037			
10	150		126	"	239		f.040		"	239		f.040			
20	155		123	276	239		f.039		276	239		f.039			
30	157		124	"	241		f.037		"	241		f.037			
40	158		123	"	242		f.036		"	242		f.036			
50	162		124	268	254		f.021		268	254		f.021			
1000	163		127	"	255		f.020		"	255		f.020			
10	163		123	272	251		f.025		272	251		f.025			
20	164		123	276	246		f.050		276	248		f.029			
30	166		126	"	250		f.027		"	250		f.027			
40	169		121	272	257		f.017		268	261		f.012			
50	176		116	268	268		f.002		272	264		f.007			
1100	177		116	"	269		f.001		276	261		f.011			
10	180		114	276	264		f.007		"	264		f.007			
20	195		107	"	279		-0.011		268	287		-0.019			
30	197		102	272	285		-0.016		272	885		-0.016			
40	192		97	268	284		-0.014		276	276		-0.006			
50	195		91	"	287		-0.017		"	279		-0.009			
1200	197		87	"	289		-0.017		268	289		-0.017			
10	198		86	"	290		-0.018		"	290		-0.018			

SHORAN CORRECTIONS DUE TO SHIP'S SWING

28 July 1957

Time	Brg	Ship to Dist	Launch 114			Launch 117				
			Leh	Ass	Corrections meters	Stat. mi.	Leh	Ass	Corrections meters	Stat. mi.
1230	200	77	272	288	-24	-0.015	268	292	-29	-0.018
40	187	96	276	271	0	0	"	279	-15	-0.009
50	193	89	"	277	-11	-0.007	272	281	-17	-0.011
1300	188	78	268	280	-14	-0.009	276	272	-2	-0.002
10	194	67	"	286	-18	-0.011	272	282	-14	-0.009
20	204	50	272	292	-19	-0.012	268	296	-22	-0.014
30	213	40	276	297	-18	-0.011	"	305	-23	-0.014
40	233	27	272	321	-21	-0.013	276	317	-16	-0.010
50	254	18	268	346	-17	-0.011	"	338	-17	-0.011
1400	278	15	"	10	-15	-0.009	268	10	-15	-0.009
10	332	28	276	56	-16	-0.010	"	64	-12	-0.007
20	339	42	272	64	-18	-0.012	276	63	-19	-0.012
30	344	50	268	76	-12	-0.007	272	72	-15	-0.009
40	359	64	272	87	-3	-0.002	268	91	0	0
50	358	70	276	82	-10	-0.006	272	86	-5	-0.003
1500	353	69	268	85	-6	-0.004	276	87	-3	-0.002
10	349	68	"	81	-10	-0.006	272	77	-15	-0.009
20	356	90	276	80	-15	-0.009	268	88	-4	-0.002
30	359	111	"	83	-13	-0.008	272	87	-6	-0.004
40	356	107	"	80	-18	-0.012	276	80	-18	-0.012
50	355	113	276	79	-21	-0.013	268	87	-5	-0.003
1600	04	113	"	88	-4	-0.002	262	104	-26	-0.016
10	01	113	268	93	-6	-0.004	"	99	-18	-0.011
20	03	113	"	95	-10	-0.006	"	101	-22	-0.014
30	0	112	"	92	-14	-0.002	"	98	-16	-0.010
40							"	98	-16	-0.010

SHORAN CORRECTIONS DUE TO SHIP'S SWING

7 August 1957

G Day Launch 114 Sheet 1157

Time	Corr	Time	Corr	Time	Corr	Time	Corr
1050	-.032	1230	-.012	1410	-.015	1550	/.032
1100	-.028	1240	-.012	1420	0	1600	/.033
1110	-.024	1250	-.012	1430	/.001	1610	/.021
1120	-.020	1300	-.005	1440	/.001	1620	/.024
1130	-.017	1310	-.027	1450	/.002	1630	/.025
1140	-.022	1320	-.017	1500	/.003		
1150	-.017	1330	-.017	1510	/.008		
1200	-.017	1340	-.018	1520	/.013		
1210	-.018	1350	-.020	1530	/.016		
1220	-.011	1400	-.022	1540	/.031		

Time	Sh Hd	Shoran	Time	Sh Hd	Shoran
1050	300	8.390	1350	14	
1100	310	.386	1400	17	.380
1110	314	.374 ⁸²	1410	25	.373
1120	317	.378	1420	32	.358
1130	320	.375	1430	40	.357
1140	325	.380	1440	32	.357
1150	331	.375	1450	35	.356
1200	325	.375	1500	37	.355
1210	334	.376	1510	34	.350
1220	344	.369	1520	50	.345
1230	350	.370	1530	48	.340 ²
1240	346	.370	1540	640	.327
1250	352	.370	1550	72	.326
1300	356	.363	1600	86	.325
1310	355	.385	1610	95	.337
1320	08	.375	1620	100	.334
1330	09		1630	113	.333
1340	13				

SHORAN CORRECTIONS DUE TO SHIP'S SWING

Sheet 2157

7 August 1957 C Day launch 117

Time	Corr.	Time	Corr
1050	-.006	1310-1410	/.020
1100	0	1420-1510	/.040
1110	/.006	1520-1530	/.046
1120-1210	+ .012	1540-1600	/.050
1220-1300	/.023	1610-1630	/.038

Sheet 2157

9 August 1957 D Day launch 117

1047-1200	-.059	1430	/.016
1225	-.053	1445	/.023
1229	-.051	1500	/.013
1245	-.033	1515	/.018
1300	-.013	1530	/.028
1315	-.004	1545	/.038
1330	/.005	1600	/.031
1345	/.020	1615	/.034
1400	/.020	1630	/.029
1415	/.020		

Sheet 2157

9 August 1957 A Day launch 114

1245	-.034	1445	/.025
1300	-.011	1500	/.021
1315	0	1515	/.025
1330	/.006	1530	/.035
1345	/.019	1545	/.042
1400	/.019	1600	/.036
1415	/.019	1615	/.039
1430	/.019	1630	/.032

SHORAN CORRECTIONS DUE TO SHIP'S SWING

Sheet 2157

10 August 1957

E Day launch 117

Time	Corr	Time	Corr
1045	-.212	1345	-.145
1100	-.220	1400	-.118
1115	-.222	1415	-.152
1130	-.222	1430	-.135
1145	-.207	1445	-.163
1200	-.205	1500	-.150
1215	-.205	1515	-.150 ⁴³
1230	-.200	1530	-.145
1245	-.190	1545	-.144
1300	-.180	1600	-.145
1315	-.175	1615	-.134
1330	-.155		

Sheet 2157

10 August 1957

B Day launch 114

0845	-.227	1415	-.175
0900	-.215	1430	-.158
0915	-.220	1445	-.175
0930	-.220	1500	-.158
0945	-.220	1515	-.145
1000	-.220	1530	-.145
		1545	-.145
1330	-.180	1600	-.145

VELOCITY CORRECTIONS (All in fms.)

1st. Trip 1 - 10 May

<u>HY-10257</u>	<u>HY-10157</u>	<u>All other sheets</u>
0.0 to 3.3	0.0 to 8.0	0.0 to 7.0
-0.1 to 8.8	-0.2 to 20.0	-0.1 to 11.0
-0.2 to 16.8	-0.4 to 29.5	-0.2 to 25.5
-0.4 to 27.0	-0.6 to 39.0	-0.4 to 44.5
-0.6 to 38.0	-0.8 to 47.5	-0.6 to 62.5
-0.8 to 48.0	-1.0 to 56.0	-0.8 to 80.5
-1.0 to 59.0	-1.2 to 65.0	-1.0 to 98.5
-1.2 to 69.0	-1.4 to 74.0	
-1.4 to 80.0	-1.6 to 82.5	
-1.6 to 92.0	-1.8 to 91.0	
-1.8 to 106.0	-2.0 to 100.0	
-2.0 to 120.0	-2.2 to 109.0	
	-2.4 to 118.0	

Trip 2 31 May - 12 June

Same as Trip 1

Trip 3 19 - 28 June

None	-0.6 to 8.8	0.0 to 12.5
	-0.8 to 18.6	-0.2 to 69.0
	-1.0 to 25.8	-0.4 to 122.0
	-1.2 to 37.4	-0.6 below
	-1.4 to 47.0	
	-1.6 to 56.0	
	-1.8 to 65.4	
	-2.0 to 74.4	
	-2.2 to 83.8	
	-2.4 to 93.4	
	-2.6 to 103.0	
	-2.8 to 113.0	
	-3.0 to 123.0	

VELOCITY CORRECTIONS (Cont.)

Trip 4 6 - 14 July

<u>HY-10157</u>	<u>HY-10257</u>	<u>All other sheets</u>
Same as Trip 3	0.0 to 29.8	0.0 to 21.9
	-0.2 to 40.2	-0.2 to 40.2
	-0.4 to 50.8	
	-0.6 to 61.2	
	-0.8 to 71.8	
	-1.0 to 82.2	
	-1.2 to 92.8	
	-1.4 to 105.6	
	-1.6 to 110.0	

Trip 5 19 - 29 July

Same as Trip 3	Same as Trip 4	0.0 to 30.0
		-0.2 to 40.2
		-0.4 to 50.8
		-0.6 to 61.8
		-0.8 to 71.8
		-1.0 to 82.2
		-1.2 to 92.8
		-1.4 to 105.6
		-1.6 to 110.0

Trip 6 5 - 15 August

0.0 to 12.5	0.0 to 16.4	0.0 to 10.9
-0.2 to 22.5	-0.2 to 30.7	-0.2 to 20.0
-0.4 to 32.7	-0.4 to 41.0	0.0 to 25.2
-0.6 to 42.9	-0.6 to 51.2	-0.2 to 30.7
-0.8 to 52.5	-0.8 to 61.7	-0.4 to 41.0
	-1.0 to 72.0	-0.6 to 51.2
	-1.2 to 82.3	
	-1.4 to 92.7	
	-1.6 to 103.0	
	-1.8 to 113.0	

VELOCITY CORRECTIONS (Cont.)

Trip 7 20 - 27 August

<u>HY-10157</u>	<u>HY-10257</u>	<u>All other sheets</u>
Same as Trip 6	Same as Trip 6	0.0 to 9.2 /0.2 to 20.0

Trip 8 3 - 13 September

0.0 to 18.0	0.0 to 25.0	0.0 to 24.6
-0.2 to 30.5	-0.2 to 39.5	-0.2 to 39.5
-0.4 to 42.7	-0.4 to 51.0	-0.4 to 51.0
-0.6 to 54.7	-0.6 to 62.5	
-0.8 to 66.0	-0.8 to 74.0	
-1.0 to 88.0	-1.0 to 86.5	
	-1.2 to 100.0	
	-1.4 to 115.0	
	-1.6 to 130.0	

Trip 9 18 - 27 September

Same as Trip 8	Same as Trip 8	Same as Trip 8
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Trip 10 30 September - 10 October

Same as Trip 8	Same as Trip 8	Same as Trip 8
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Tabulation of Instrument corrections for ship hydrography as entered in Sounding Records (This correction is the algebraic sum of the Instrument, Draft, Settlement and Squat and Phase Corrections):

FDC #205

(Used only for Position 151 thru 175 J day HY-1157
10 July)

-1.8 fms. all soundings

808 #132

Used only for Launch work.

808 #105

Used only the following days

<u>Date</u>	<u>Positions</u>	<u>Sheet No.</u>
26 July	1R - 66R	HY-4357
11 August	1S - 347S	HY-1157
13 August	1T - 11T	HY-1157
13 August	1A - 256A	HY-2157
14 August	1G - 27G	HY-4257
14 August	1U - 179U	HY-1157

Corrections for the above days:

A scale	+0.1 fm.
B scale	-0.4 fm.
C scale	-1.2 fm.

Inst. Corrections for Ship Hydrography Cont.

808 #153

<u>Trip No.</u>	<u>Date</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
<u>Trip No. 1</u>	<u>1-10 May</u>				
	Begin to 0700 6 May	0.0	1.2	1.2	1.2
	0700 6 May to end	-0.1	1.1	1.1	1.1
<u>Trip No. 2</u>	<u>31 May-12 June</u>				
	Begin to 1800 8 June	0.0	1.2	1.2	1.2
	1800 8 June to end	-0.1	1.1	1.1	1.1
<u>Trip No. 3</u>	<u>19-28 June</u>				
	Begin to 0000 20 June	1.1	1.3	1.3	1.3
	0000 20 June to 0000 27 June	0.0	1.2	1.2	1.2
	0000 27 June to end	-0.1	1.1	1.1	1.1
<u>Trip No. 4</u>	<u>6-14 July</u>				
	Begin to 1200 11 July	0.0	1.2	1.2	1.2
	1200 11 July to end	-0.1	1.1	1.1	1.1
<u>Trip No. 5</u>	<u>19-29 July</u>				
	Begin to 1500 20 July	0.0	1.2	1.2	1.2
	1500 20 July to end	-0.1	1.1	1.1	1.1
<u>Trip No. 6</u>	<u>8-15 August</u>				
	Begin to 1500 10 August	0.0	1.2	1.2	1.2
	1500 10 August	-0.1	1.1	1.1	1.1
<u>Trip No. 7</u>	<u>20-27 August</u>				
	Begin to 1200 25 August	0.0	1.2	1.2	1.2
	1200 25 August to end	-0.1	1.1	1.1	1.1
<u>Trip No. 8</u>	<u>3-13 September</u>				
	Begin to 1500 11 September	-0.1	1.1	1.1	1.1
	1500 11 September to end	-0.2	1.0	1.0	0.0
<u>Trip No. 9</u>	<u>18-27 September</u>				
	Begin to 1800 20 September	0.0	1.2	1.2	1.2
	1800 20 September to end	-0.1	1.1	1.1	1.1
<u>Trip No. 10</u>	<u>30 Sept - 7 Oct.</u>				
	Begin to 1600 4 October	0.0	1.2	1.2	1.2
	1600 4 October to end	-0.1	1.1	1.1	1.1

Inst. Corrections for Ship Hydrography Cont.

BOG #156

	A	B	C	D
<u>Trip No.1</u> <u>1-10 May</u>				
Begin to 0700 6 May	-0.1	2.7	4.7	4.3
0700 6 May to end	-0.2	2.6	4.6	4.2
<u>Trip No.2</u> <u>31 May-6 June</u>				
Begin to 1800 8 June	-0.1	2.7	4.7	4.3
1800 8 June to end	-0.2	2.6	4.6	4.2
<u>Trip No.3</u> <u>19-28 June</u>				
Begin to 0000 20 June	0.0	2.8	4.8	4.4
0000 20 June to 0000 27 June	-0.1	2.7	4.7	4.3
0000 27 June to end	-0.2	2.6	4.6	4.2
<u>Trip No.4</u> <u>6-14 July</u>				
Begin to 1200 11 July	-0.1	2.7	4.7	4.3
1200 11 July to end	-0.2	2.6	4.6	4.2
<u>Trip No.5</u> <u>19-29 July</u>				
Begin to 1500 20 July	-0.1	2.7	4.7	4.3
1500 20 July to end	-0.2	2.6	4.6	4.2
<u>Trip No.6</u> <u>8-15 August</u>				
Begin to 1500 10 August	-0.1	2.7	4.7	4.3
1500 10 August to end	-0.2	2.6	4.6	4.2
<u>Trip No.7</u> <u>20-27 August</u>				
Begin to 1200 25 August	-0.3	2.7	4.7	4.3
1200 25 August to end	-0.2	2.6	4.6	4.2
<u>Trip No.8</u> <u>3-13 September</u>				
Begin to 1500 11 September	-0.2	2.6	4.6	4.2
1500 11 September to end	-0.3	2.5	4.5	4.1
<u>Trip No.9</u> <u>18-27 September</u>				
Begin to 1800 20 September	-0.1	2.7	4.7	4.3
1800 20 September to end	-0.2	2.6	4.6	4.2
<u>Trip No. 10</u> <u>30 Sept.-7 Oct.</u>				
Begin to 4 October	-0.1	2.7	4.7	4.3
1600 4 October to end	-0.2	2.6	4.6	4.2

Tabulation of Instrument Corrections for Launch Hydrography as entered in sounding records. These were determined by bar-checks each day:

Launch #114:

<u>Sheet No.</u>	<u>Day Ltr.</u>	<u>Date</u>	<u>Path No.</u>	<u>Correction</u> (fms)	<u>Depth</u> (fms)
HY-1157	A	22 June	1058	-0.2	to 8.5
				-0.4	to 12.6
				-0.6	below
HY-1157	B	23 June	1058	-0.4	All
HY-1157	C	26 June	1058	-0.2	All
HY-1157	D	8 July	1058	-0.2	All
HY-1157	E	27 July	1058	0.0	to 13.4
				-0.2	below
HY-1157	F	28 July	1058	-0.2	All
HY-1157	G	7 Aug.	1058	0.0	All
HY-2157	A	9 Aug.	1058	0.0	All
HY-2157	B	10 Aug.	153	-0.1	to 11.0
				-0.2	below

Launch #117

<u>Sheet No.</u>	<u>Day Ltr.</u>	<u>Date</u>	<u>Path No.</u>	<u>Correction</u> (fms)	<u>Depth</u> (fms)
HY-1157	A	23 June	132	-0.2	to 7.6
				-0.3	to 11.0
				-0.4	to 13.4
				-0.6	below
HY-1157	B	23 June	132	-0.2	to 7.6
				-0.3	to 11.0
				-0.4	to 13.4
				-0.6	below
HY-1157	C	26 June	132	0.0	to 0.3
				-0.1	to 1.0
and HY-2157	A	26 June	132	-0.2	to 1.7
-0.3				to 2.3	
-0.4				to 2.8	
-0.5				to 3.5	
-0.6				to 4.3	
-0.7				to 5.2	
-0.8				to 6.4	
-0.9				to 7.8	

Tabulation of Luzzish Instrument Corrections Cont.

<u>Sheet No.</u>	<u>Day</u>	<u>Ltr.</u>	<u>Date</u>	<u>Fath. No.</u>	<u>Correction</u> (fms)	<u>Depth</u> (fms)
					-1.0	to 9.2
					-1.2	to 12.0
					-1.4	to 13.7
					-1.6	to 14.7
					-1.8	to 15.8
					-2.0	to 17.0
					-2.2	to 18.2
					-2.4	to 19.5
					-2.6	to 20.7
					-	
HY-2157	B		8 July	132	-0.2	to 6.0
					-0.1	to 7.6
					0.0	to 12.5
					0.1	to 15.6
					0.2	to 16.6
HY-1157	D		27 July	132	-0.1	to 7.6
					0.0	below
HY-1157	F		25 July	132	0.0	All
HY-2157	C		7 August	132	-0.2	All
HY-2157	D		9 Aug.	132	-0.2	to 5.9
					-0.1	to 7.5
					0.0	below
HY-2157	X		10 Aug.	132	0.0	All

FATHOMETER SPEED CORRECTION LAUNCH CS-117

HY-1157 B day 23 June 1957

Position	1-11	12-21	22-30	31-41	42-50	51-63	73-84	85-94	95-105	106-114	115-125	126-135
% Error	7.2	9.5	1.2	12.3	9.1	1.8	1.1	2.7	3.9	5.1	7.3	5.6
Depth (Fms)	-0.1	-0.1	-	-0.1	-0.1	-	-	-0.1	-	-0.1	-0.1	-0.1
1	-0.1	-0.2	-	-0.2	-0.2	-	-	-0.1	-	-0.1	-0.1	-0.1
2	-0.2	-0.3	-	-0.4	-0.3	f0.1	-	-0.1	-0.1	-0.2	-0.2	-0.2
3	-0.3	-0.4	-	-0.5	-0.4	f0.1	-	-0.1	-0.2	-0.2	-0.3	-0.2
4	-0.4	-0.5	f0.1	-0.6	-0.5	f0.1	-0.1	-0.1	-0.2	-0.3	-0.4	-0.3
5	-0.4	-0.6	f0.1	-0.7	-0.6	f0.1	-0.1	-0.2	-0.3	-0.3	-0.4	-0.3
6	-0.5	-0.7	f0.1	-0.9	-0.7	f0.1	-0.1	-0.2	-0.3	-0.4	-0.5	-0.4
7	-0.6	-0.8	f0.1	-1.0	-0.8	f0.1	-0.1	-0.2	-0.3	-0.4	-0.5	-0.4
8	-0.6	-0.9	f0.1	-1.1	-0.9	f0.2	-0.1	-0.2	-0.3	-0.4	-0.5	-0.4
9	-0.7	-1.0	f0.1	-1.2	-1.0	f0.2	-0.1	-0.2	-0.3	-0.4	-0.5	-0.4
10	-0.7	-1.0	f0.1	-1.2	-1.0	f0.2	-0.1	-0.2	-0.3	-0.4	-0.5	-0.4
11	-0.8	-1.0	f0.1	-1.4	-1.1	f0.2	-0.1	-0.2	-0.3	-0.4	-0.5	-0.4
12	-0.9	-1.1	f0.1	-1.5	-1.1	f0.2	-0.1	-0.2	-0.3	-0.4	-0.5	-0.4
13	-0.9	-1.2	f0.2	-1.6	-1.2	f0.2	-0.1	-0.2	-0.3	-0.4	-0.5	-0.4
14	-1.0	-1.3	f0.2	-1.7	-1.3	f0.3	-0.2	-0.3	-0.4	-0.5	-0.6	-0.5
15	-1.1	-1.4	f0.2	-1.8	-1.4	f0.3	-0.2	-0.4	-0.5	-0.6	-0.7	-0.6
16	-1.2	-1.5	f0.2	-2.0	-1.5	f0.3	-0.2	-0.4	-0.6	-0.8	-1.1	-0.8
17	-1.2	-1.6	f0.2	-2.1	-1.6	f0.3	-0.2	-0.5	-0.7	-0.9	-1.2	-0.9

Corrections in Fms.

FATHOMETER SPEED CORRECTIONS LAUNCH CS-117

HY-1157 C day 26 June 1957

Position % Error	1-10 -5.1	11-13 -8.0	13-33 -11.8	34-40 -12.4	41-47 -14.1	48-52 -10.0	53-60 -10.6	70-81 -9.6	81-87 -10.1	88-97 -10.8	98-106 -9.2	107-114 -8.8
Depth (Fms)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
3	0.2	0.2	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2
4	0.2	0.3	0.5	0.5	0.6	0.4	0.4	0.4	0.4	0.3	0.3	0.3
5	0.3	0.4	0.6	0.6	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.4
6	0.3	0.5	0.7	0.7	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.5
7	0.4	0.6	0.8	0.9	1.0	0.7	0.7	0.7	0.7	0.8	0.6	0.6
8	0.4	0.6	0.9	1.0	1.1	0.8	0.8	0.8	0.8	0.9	0.7	0.7
9	0.5	0.7	1.1	1.1	1.3	0.9	0.9	0.9	0.9	1.0	0.8	0.8
10	0.5	0.8	1.2	1.2	1.4	1.0	1.0	1.0	1.0	1.1	0.9	0.9
11	0.6	0.9	1.3	1.4	1.6	1.1	1.1	1.1	1.1	1.2	1.0	1.0
12	0.6	1.0	1.4	1.5	1.7	1.2	1.2	1.2	1.2	1.3	1.1	1.1
13	0.7	1.0	1.5	1.6	1.8	1.3	1.3	1.3	1.3	1.4	1.2	1.1
14	0.7	1.1	1.7	1.7	2.0	1.4	1.5	1.4	1.4	1.5	1.3	1.2
15	0.8	1.2	1.8	1.9	2.1	1.5	1.6	1.5	1.5	1.6	1.4	1.3
16	0.8	1.3	1.9	2.0	2.3	1.6	1.7	1.6	1.6	1.7	1.5	1.4
17	0.9	1.4	2.0	2.1	2.4	1.7	1.8	1.7	1.7	1.8	1.6	1.5

Corrections in Fms.

APPROVAL SHEET

The field work accomplished on this survey after 1 August was under my immediate supervision. Daily inspections of the records, fathograms, boat sheet, and smooth sheet made as the survey progressed.

The records, boat sheet, and smooth sheet as submitted to the Washington Office have been reviewed and are approved by me.

The survey is complete and adequate and additional field work is not recommended.

G R Fish

G.R. Fish
CAPT, C&GS
Comdg., Ship HYDROGRAPHER

U. S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY
 Ship HYDROGRAPHER
 P.O. Box 1259
 St. Petersburg, Fla.

904

(1958)

*L.M.C.
R.T.M.*

10 October 1958

To: The Director
 Coast and Geodetic Survey

Subject: Revised position of Texas Tower No. 2, Georges
 Bank, and change in smooth sheet datum.

In a letter dated 31 July 1957 the distance of Texas Tower No. 2 from the shore stations was given as $R_1 = 4068.6$ and $R_2 = 6264.4$, and the geographic position was based on these distances plotted on a hydrographic sheet with the R_2 distance arcs drawn using a lane width of 149.83652 feet. In 1958 several additional determinations of the distance of the tower from the shore stations were made and are submitted in this letter. In addition the distance run made in 1957 has been corrected in accordance with the knowledge obtained about the Raydist operation since transmitting the original letter. The runs used to determine the position of the southwest leg of the tower are given below:

Date	Calibration area	R_1	R_2
7-21-57	Cape Cod	4068.6	(**6264.1)R
7-13-58	Cape Cod; off Wellfleet for R_2	4068.2	(***6271.2)R
9-24-58	Texas Tower No. 3 (E Leg) Nantucket Shoals	*4068.3	*6269.2
10-2-58	Off Wellfleet on Cape Cod	<u>*4068.2</u>	<u>*6268.9</u>
	Mean	4068.3	6269.0

*Note: These runs made from survey buoy K which was tied to Texas Tower No. 2 by three runs with excellent agreement in values obtained. A run was also made between buoy K and R on 10-3-58 and a check obtained.

**Note: On this day the summation of the two distances failed to equal the base line distance by 1.7 lanes. If this figure is added to the R_2 distance it becomes 6265.8.

3052
 3075
 3076

History

904
 OCT 17 1958

200' 60.9m

***Note: The R_2 partially failed before reaching the calibration area off Wellfleet. It is believed that the value scanned from the Brush Recorder Tape is accurate within several lanes.

Both R_1 and R_2 values are based on a lane width of 149.87307 feet, and the R_2 distances have been corrected by applying the formula $0.00012[(\psi_R'' - \psi_R') - (\psi_G'' - \psi_G')]$, wherein the subscripts R and G mean the R_1 and R_2 dials, respectively, and the prime and second prime notations indicate the dial readings at the calibration point and the position point, respectively. In order to plot the tower position on a survey sheet with R_2 distance arcs drawn with a lane width of 149.83652 feet 1.5 lanes will have to be added to the R_2 value given above.

A summary of the positions of the southwest tower leg which affect the various surveys is given below:

	R_1	R_2
1957 position and datum used for all 1957 and 1958 surveys	4068.6	6264.4
1958 and final position (R_1 and R_2 lane widths of 149.87307 feet)	4068.3	6269.0
1958 and final position with R_2 lane width of 149.83652 feet	4068.3	6270.5

The 1958 and final position of the tower center for plotting on a survey sheet with R_2 distance arcs drawn with a lane width of 149.83652 feet is $R_1 = 4068.7$, $R_2 = 6270.1$.

All work in 1957 and 1958 is plotted on sheets having R_2 distance arcs based on a lane width of 149.83652 feet and using values of $R_1 = 4068.6$, $R_2 = 6264.4$ for the southwest tower leg. To convert these sheets to a final datum corrections to the R_2 distances can be applied according to the following formula:

$$R_2 \text{ correction (in lanes)} = \frac{6.1}{4100} \frac{(R_2 \text{ distance} - 6270)}{100} \times 0.00012$$

$$\left[(R_1 \text{ distance} - 4070) - (R_2 \text{ distance} - 6260) \right]$$

The EPI controlled hydrography on the 1:100,000 sheets should have the distance from Southwest Harbor increased by a distance equal to that obtained by using the above formula at the location of the survey buoy at which the EPI was calibrated.

A recommendation has been made that additional tests be made

904(1958)

in 1959 to check on the accuracy of the azimuth corrections applied to the R_2 distances in 1957. A change in sign of the azimuth corrections would account for the difference in the R_2 position of the Texas Tower between 1957 and 1958.

G. R. Fish

G. R. Fish
CAPT, C&GS
Comdg., Ship HYDROGRAPHER

GRF/r

U. S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Ship HYDROGRAPHER
General Delivery
East Boston 28, Mass.

10 May 1959

To: The Director
Coast and Geodetic Survey

Subject: Location of Texas Tower No. 2, Georges Bank

Reference: Letters to Director dated 10/10/58 and 4/20/59
Letter dated 4/10/59, 22/MEK, S-1-HY.

On 5 May 1959 a run was made between Cape Cod and Texas Tower No. 2, Georges Bank. On this run an uninterrupted Raydist lane count was carried under good weather conditions. The Raydist dials were set East of Wellfleet using visual 3 pt. sextant fixes and a tie was made to the Southwest leg of Texas Tower #2.

This run confirms the location obtained late last year and explained in Letter dated 10 October 1958, a copy of which is also included in Addendum to Raydist Report-1958.

The mean values as determined in 1958 were $R_1 = 4068.3$, $R_2 = 6269.0$. The values determined on the run of 5 May 1959 were $R_1 = 4068.3$, $R_2 = 6269.1$, a remarkably good agreement. These values are for the Southwest leg of the Tower, based on lane width of 149.87307 feet and the R_2 distances have been corrected by applying the formula $0.00012 [(Y'_2 - Y'_1) - (Y'_2 - Y'_1)]$ as previously explained in letter of 10 Oct. 1958.

The final position of the tower center for plotting on a survey sheet with R_2 distance arcs drawn with a lane width of 149.83652 feet is $R_1 = 4068.7$, $R_2 = 6270.1$ as previously indicated in above referenced letter.

Computations for this run were copied from our calibration volume and are included along with the Brush and Clary tapes.

M. E. Wennermark
M. E. Wennermark
CAPT, C&GS
Comdg., Ship HYDROGRAPHER

WRK/s

Inclosures

cc: New York D.O.

TIDE NOTE FOR HYDROGRAPHIC SHEET

Chart Division: R. H. Carstens

27 January 1958

Plane of reference approved in
19 volumes of sounding records for

HYDROGRAPHIC SHEET 8401

Locality Georges Bank, Atlantic Coast

Chief of Party: G. R. Fish in 1957

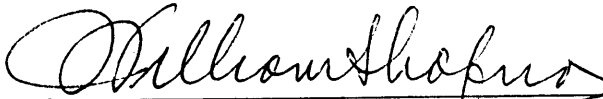
Plane of reference is mean low water

ft. on tide staff at

ft. below B.M.

Height of mean high water above plane of reference is 4.9 feet.

Condition of records satisfactory except as noted below:


Signature

Chief, Tides Branch

GEOGRAPHIC NAMES

Survey No. H-8401

Name on Survey	Source									
	A	B	C	D	E	F	G	H	K	
	On Chart No.	On previous survey No.	On U. S. quadrangle Maps	From local information	On local Maps	P. O. Guide or Map	Rand McNally Atlas	U. S. Light List		
<u>Massachusetts</u>		(title)							BGN	1
<u>Georges Bank</u>		"							"	2
<u>Georges Shoal</u>		"								3
<u>Texas Tower</u>		"								4
										5
										6
										7
<u>Tide Station:</u>										8
<u>Boston</u>										9
										10
										11
										12
										13
										14
										15
										16
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										23
										24
										25
										26
										27

Names approved 3-19-58
L. Heck

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 8401....

Records accompanying survey:

Boat sheets .3...; sounding vols. .19...; wire drag vols.; bomb vols.; graphic recorder rolls 4-Envelopes special reports, etc. 1-Smooth sheet, 1-Descriptive report,.... and 1-Cahier. Raydist Plotting Abstracts.....

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet	2722
Number of positions checked	38
Number of positions revised	33
Number of soundings revised (refers to depth only)	* 60 2fms ① 7 1 fm ②
Number of soundings erroneously spaced	10**
Number of signals erroneously plotted or transferred	None
Topographic details	Time None
Junctions	Time 1/2 hr
Verification of soundings from graphic record	Time 2 hrs

Verification by *E. A. E. Jones* Total time 101 Date 2/12/58

Reviewed by *J. A. Dinsmore* Time 40 Date 2/27/58

* Edo-808 diff
② Reducing errors

** Refers to feature sdg from graphs.

DIVISION OF CHARTS
REVIEW SECTION - NAUTICAL CHART BRANCH
REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-8401

FIELD NO. HY-1157

Mass., Georges Bank, Texas Tower-Georges Shoal

Surveyed: June-August 1957

Scale 1:10,000

Project No. CS-401

Soundings:

Control:

808 Depth Recorder
Edo Echo Sounder

Raydist
Shoran

Chief of Party - W. J. Chovan & G. R. Fish
Surveyed by - W. R. Kachel, D. R. Campbell, V. C. Ahlrich, J. J. McCoy
and P. L. Rotondo

Protracted by - J. J. McCoy & D. R. Campbell
Soundings plotted by - J. J. McCoy & D. R. Campbell
Verified and inked by - E. Thomas
Reviewed by - T. A. Dinsmore
Inspected by - R. H. Carstens

Date 27 Febr. 1958

1. Shoreline and Control

There is no land within the area of this offshore survey sheet.

The origin and method of control are comprehensively covered in the Descriptive Report.

2. Sounding Line Crossings

Depth at crossings are in very good agreement.

3. Depth Curves and Bottom Configuration

The usual depth curves are adequately delineated. The 15-fm. curve has been added to portray bottom features more completely.

This survey covers the northern portion of Georges Shoal which is an extensive broad bank delineated by the 10-fm. curve. Prominent

features on the shoal are several narrow ridges ranging from 1/4 to 3 1/2 miles in length. These elongated ridges which are arcuate in form rise sharply from greater depths and trend in a northwest-southeasterly direction. Depths along the crests of the ridges generally range from 1 1/2 to 5 fms. Three of such ridges in varying lengths lie in juxtaposition immediately northeastward of Texas Tower. Others occur southeastward of the Tower.

Except for these prominent ridges and minor irregularities such as hummocks and shallow depressions, a large portion of the surveyed area is relatively smooth.

4. Junctions with Contemporary Surveys

An adequate junction was effected with H-8402 (1957) on the south. The junctions with surveys H-8403 (1957) on the north and H-8404 (1957) on the east and west will be considered in the reviews of those surveys.

5. Comparison with Prior Surveys

a.	H-1207b. (1873) 1:40,000	<u>H-2915 (1907) 1:300,000</u>
	H-1207c. (1885) 1:3,018	

These early reconnaissance surveys have been compared with and were superseded by the surveys of 1931-32. Further consideration of the early surveys is, therefore, unnecessary.

b.	H-5154 (1931) 1:20,000	<u>H-5218 (1932) 1:10,000</u>
	<u>H-5195 (1931) 1:40,000</u>	

The present survey falls within the area covered by these prior surveys. The prior surveys are basically controlled by R.A.R. which did not provide the degree of accuracy obtained by the electronic methods used on the present survey.

A comparison of the prior and present surveys indicates a good general agreement in depths considering the differences in the methods of surveying. However, the sparse development on the prior surveys failed to reveal the extensiveness, continuity and heights of the ridges on Georges Shoal disclosed by the close development on the present survey. H-5154 shows only a few shoal indications in the area of the prominent shoal ridges appearing on the present survey northeast of Texas Tower. The present survey positions of the ridges on the southeast are 100-350 meters westward of the ridges shown on H-5154. This may indicate a shifting of the ridges or may be attributed in part to weakness in the control of the prior surveys. It seems pertinent to note that the 10-fm. curve on the prior and present surveys is in remarkably good agreement.

The following shoal soundings which were carried forward to H-5154 (1931) from H-2915 (1907) are disproved by the present development and should be disregarded:

<u>Latitude</u>	<u>Longitude</u>	<u>Depth (fms.)</u>
41°41.1'	67°45.8'	2 1/6 (charted)
41.0	45.0	3 1/2 (")
41.25	45.1	3 4/6 (uncharted)

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

6. Comparison with Chart 3076 (Latest print date 11/5/51)

A. Hydrography

A 2-fm. sounding has been applied to the chart by hand-correction in lat. 41°39.8', long. 67°44.2', from advance information of the present survey reported in H. O. Notice to Mariners 49 (1957).

*See item F
of D.R. for
new G.P.
of Texas
Tower*

Except as noted above, the charted hydrography originates with the prior surveys which need no further consideration.

The charted hydrography is entirely superseded by the present survey.

B. Aids to Navigation

The charted position of Georges Shoal Light (Texas Tower No. 2) originates with advance information of the present survey reported in H. O. Notice to Mariners 34 (1957).

No other aids to navigation are charted within the limits of the present survey.

7. Condition of Survey

a. The sounding records are complete; the Descriptive Report is particularly comprehensive.

b. The smooth plotting was generally accurate.

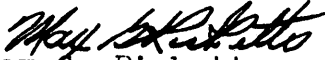
8. Compliance with Project Instructions

The survey adequately complies with the Project Instructions.

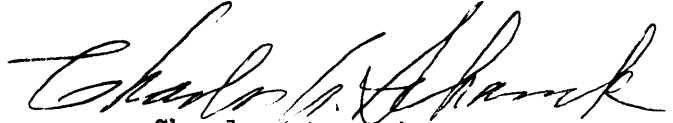
9. Additional Field Work

This is an excellent basic survey and no additional field work is required.

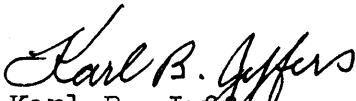
Examined and approved:



Max G. Ricketts
Chief, Nautical Chart Branch



Charles A. Schanck
Chief, Division of Charts



Karl B. Jeffers
Chief, Hydrography Branch



Samuel B. Grenell
Chief, Division of Coastal Surveys

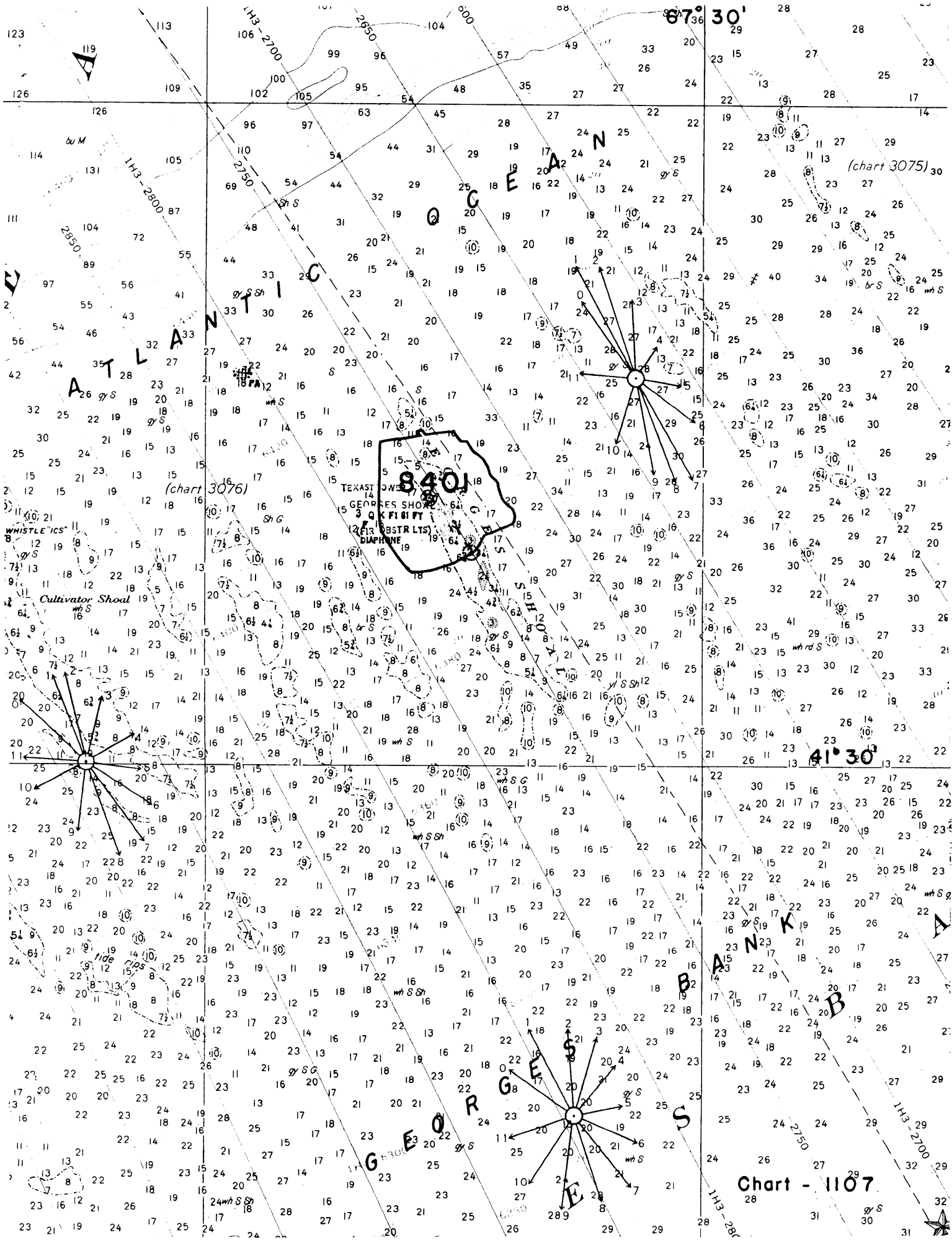


Chart - 1107

(chart 3075)

(chart 3076)

840

TEXAS JEWEL
 GEORGETOWN
 CULTIVATOR SHOAL
 BANKS

ATLANTIC OCEAN

BANKS

GEORGETOWN

Cultivator Shoal

ATLANTIC OCEAN



NAUTICAL CHARTS BRANCH

SURVEY NO. H-8401

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
4-14-58	70	R. H. Dehaender	<i>Partially agreed</i> Before After Verification and Review. <i>Con. shown on</i> <i>Aid Proj # 26 & in review appl at this time.</i> Before After Verification and Review
6/12/58	3052	H. W. Burgoyne	Before After Verification and Review <i>Completely Applied</i>
7-8-58	3076	C. R. Wittmann	Before After Verification and Review " "
7-15-58	3075	C. R. Wittmann	Before After Verification and Review " "
7-15-58	71	M. Rogers	<i>Completely applied</i> Before After Verification and Review <i>thru chart 3076</i>
8 Aug 58	70	Nichols	<i>Ver. via sury 3076 July 18, 1958</i> Before After Verification and Review <i>thru Dwg Chart 3052</i> JMCW
5/11/59	1107	J. H. EATON	Before After Verification and Review <i>Completely Applied</i>
2-27-63	3052	Keeler	Before After Verification and Review <i>Revised projection</i>
3/13/68	1000	Svendsen	Before After Verification and Review <i>Completely applied thru Chart 1107</i>

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.