

8938

Diag. Cht. Nos. 1107 & 1207-2

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey HYDROGRAPHIC
Field No. EX 40-1-67
Office No..... H-8938

LOCALITY

State MASSACHUSETTS
General Locality ATLANTIC OCEAN
Locality MASSACHUSETTS BAY

19 67

CHIEF OF PARTY

F. E. JONES & P. A. STARK

LIBRARY & ARCHIVES

7-11-69

DATE

8938

HYDROGRAPHIC TITLE SHEET

H-8938

INSTRUCTIONS - 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.

EX 40-1-67

State Massachusetts

General locality Atlantic Ocean

Locality Massachusetts Bay

Scale 1:40,000

Date of survey 11 June 1967 to 30 Aug 1967

Instructions dated 27 March 1967, 11 May 1967

Project No. OPR - 473

Vessel Ship EXPLORER OSS 28

Chief of party CAPT Emerson E. Jones, 27 March to 24 July 1967
CDR Pentti A. Stark, 24 July to 30 August 1967

Surveyed by Ship EXPLORER, Chief of Party

Soundings taken by echo sounder, ~~hand-lead, pole-~~ echo sounder

Graphic record scaled by Ship personnel

Graphic record checked by Ship personnel

Protracted by _____ Automated plot by Gerber Digital Plot.

Soundings penciled by Gerber Digital Plotter, PMC

Soundings in fathoms ~~feet-~~ at MLW -MLLW-

REMARKS:

Scanned by R.H.

MAR 20 1967

J.J.L.

DESCRIPTION REPORT

To Accompany Hydrographic Survey

EX 40-3-67 H-8938

1967 Scale 1:40,000

CAPT Emerson E. Jones, Comdg.
CDR Pentti A. Stark, Comdg.

A. PROJECT

Hydrography was accomplished in accordance with instructions for Project OPR-473, dated 27 March, 1967, revised 11 May 1967.

A. AREA SURVEYED

The area surveyed is Massachusetts Bay from Cape Cod to Cape Ann, Massachusetts. The survey is bounded on the east by Longitude $70^{\circ} 04'$, and on the west by Longitude $70^{\circ} 40'$, on the south by Latitude $42^{\circ} 20' 30''$ and on the north by Latitude $42^{\circ} 37'$. Hydrography was begun on 11 June 1967 and ended on 30 August 1967.

The survey makes junctions with the following prior surveys:

H-6564 (1940) 1:120,000 scale

H-7140 (1947) 1:40,000 scale

A junction was made with the following contemporary survey:

EX 10-3-67 (1967, H-8941) 1:10,000 scale

The area surveyed was covered by the following prior surveys:

H- 516 (1854) 1:80,000 scale

H-8413 (1957) 1:100,000 scale

C. SOUNDING VESSEL

All hydrography was accomplished by the Ship EXPLORER, using blue day letters.

D. SOUNDING EQUIPMENT

Raytheon DE-723 fathometers, calibrated at 800 fm/sec, serial numbers 248 and 258 were used. Temperature and salinity measurements were taken monthly. Phase comparisons and draft readings were made regularly.

All soundings and tide reducers are in fathoms to facilitate boat sheet plotting and to insure a continuous bottom profile in particularly irregular areas. The initial setting for all soundings was two fathoms. For smooth sheet plotting all soundings and tide reducers should be in feet.

Smooth tides were obtained from the standard tide gauge at Boston, Mass.

Additional information may be found in the Fathometer and Velocity Correction Report, OPR-473, dated

E. SMOOTH SHEET

The smooth sheet will be plotted electronically at the Pacific Marine Center.

F. CONTROL

The RAYDIST stations were established using third order traverse. The arcs were plotted on the boat sheet using a frequency of 3300.4 kc by the processing office of the Atlantic Marine Center.

G. SHORELINE

Not applicable.

H. CROSSLINES

Crosslines were run in accordance with the requirements indicated in the Hydrographic Manual and compose 8% of the hydrography.

I. JUNCTIONS

In general the present survey agrees well with H-6564 (1940) except for the extreme northeast and southeast corners of the sheet. In the northeast corner the present soundings are two to three fathoms shoaler than in the prior survey. In the southeast corner in the area bounded by 42° 21' N to 42° 26' N and 70° 02' W to 70° 03' W soundings are as much as thirty fathoms shoaler than in the prior survey. As the depth in this area increases rapidly as one proceeds eastward, it seems possible that these particular soundings were mispositioned in the previous survey.

The junctions with H-7140 (1947) and EX 10-3-67 (H-8941; 1967) are satisfactory.

J. COMPARISON WITH PRIOR SURVEYS

The prior survey H-516, dated 1854-5, covers the northern part of the sheet from Latitude $42^{\circ} 30' N$ to $42^{\circ} 38' N$. As this survey was essentially a sketchy, reconnaissance-type survey on a 1:80,000 scale with $2\frac{1}{2}$ mile spacing, comparison with it is, of necessity, scanty and the validity of the present survey is best determined by the crossline comparison of the present work.

see
Review
notes

The southern part of the sheet was surveyed in 1957 on H-8413. The present survey agrees well in this area with the prior survey. There are no numbered pre-survey items on this sheet, however, inadequately developed or unsupported soundings are as follows:

- ① The 108 foot depth ^{from H-396a (1853)} reported at $42^{\circ} 33.2' N$ and $70^{\circ} 38.5' W$ was not found, although several lines were run in the area. These lines were 150 meters apart, but revealed no evidence of this feature. Nevertheless, there are numerous 19 and 20 fathom soundings in the area and it is not unlikely that the feature exists and it should be charted. No sounding shoaler than 25 fathoms (150') was found at $42^{\circ} 26.9' N$ and $70^{\circ} 33.8' W$ where a depth of 144 feet is charted. It is recommended that the latter depth be charted, if smooth tides reduce the present sounding. see Review
- ② The 180 foot depth at $42^{\circ} 20.8' N$ and $70^{\circ} 35.0' W$ was verified by ^{one} 30 fathom (180 ft.) sounding. from H-8413 (1957-59)
- ③ The 198 foot depth ^{from H-8413} at $42^{\circ} 20.1' N$ and $70^{\circ} 33.0' W$ was verified and found to be one fathom shoaler, i.e. 32 fathoms (192 ft.).
- ④ The 222 foot depth at $42^{\circ} 23.7' N$ and $70^{\circ} 28.2' W$ was verified and a shoaler sounding of 31 fathoms (186 ft.) was found to be a more accurate least depth. from H-8413
188 ft. MLW
- ⑤ The 180 foot depth at $42^{\circ} 29.2' N$ and $70^{\circ} 27.8' W$ was not found. This sounding is situated on a rather abrupt plateau, but there is no evidence of a sounding shoaler than 33 fathoms (198 ft.) in the immediate vicinity. There is, however, a sounding of 30 fathoms (180 ft.) ^(185 ft.) at $42^{\circ} 28.9' N$ and $70^{\circ} 28.3' W$, approximately $\frac{1}{2}$ mile to the southwest. Due to the irregularity of the bottom the existence of the charted depth cannot be disproved and this depth should be charted. from H-8413
9' from H-8413
Concur

⑦ The 240 foot depth ^{from H-516 (1854-55)} at 42° 31.2' N and 70° 24.7' W was not found. There is considerable evidence of shoaling in the immediate vicinity of the charted sounding. The existence of a depth of 47 fathoms (87 ft.) in an area where the depth is generally 55 to 60 fathoms indicates the probable existence of the 40 fathom depth, which should be charted. ✓
see
Review
notes

No evidence was found of the two 78 foot depths ^{from H-516 (1854-55)} at 42° 22.4' N and 70° 24.0' W and 42° 24.3' N and 70° 24.8' W. These two depths are in the Stellwagen Bank, which was well developed with hydro lines spaced less than 200 meters apart, but there was no indication of depths less than 14 fathoms (26 ft.). The entire area is fairly flat, but the existence of a six foot pinnacle cannot be disproved. Hence it is recommended that the 78 foot depths remain charted. Disregard
see review
great depths
adequate

The 222 foot depth at 42° 24.1' N and 70° 08.5' W was verified by a sounding of 37 fathoms (222 ft.) at 42° 24.2' N and 70° 08.4' W. It is recommended that this depth be charted. *Least depth in area of 222' is 229' on H-8938*

No evidence of the doubtful 300 foot depth ^{from H-516} at 42° 26.8' N and 70° 27.9' W was found. The soundings in this area are all in the 31 to 34 fathom (57 to 62 ft.) range. It is recommended that this sounding be deleted.

K. COMPARISON WITH THE CHART

Massachusetts Bay is covered on C&GS chart 1207, scale 1:80,000, 11 ed., 18 March 1967. Most pertinent items have already been discussed in section J. The extreme north quarter of the chart, based on H-516 (1854-5) is completely obsolete. Although agreement with H-8413 (1957) is much better, there are many areas where the old chart does not agree with the present survey. Examples of these discrepancies are as follows:

<u>Charted Sounding</u>	<u>Present Sounding</u>	<u>Location (Approx)</u>
252 Ft.	301m (180 ft.) 179#	42° 34.1' N 70° 31.7' W
288 Ft.	691m (414 ft.) 426#	42° 34.7' N 70° 24.7' W
210 Ft.	561m (336 ft.) 342#	42° 26.8' N 70° 26.5' W
348 Ft.	841m (504 ft.) 516#	42° 33.2' N 70° 19.2' W
292 Ft.	701m (474 ft.) 462#	42° 29.6' N 70° 22.8' W
594 Ft.	791m (234 ft.) 235#	42° 29.7' N 70° 17.7' W

✓
Soundings
are not
far from
present
comparable
depths

The present chart should be revised according to the new survey. ✓

L. ADEQUACY OF THE SURVEY

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

M. AIDS TO NAVIGATION

Buoy "A", W & Or, Fl 4 sec, was found at $42^{\circ} 26' 55''$ N and $70^{\circ} 35' 00''$ W.
18"

N. STATISTICS

There are 3864 positions, totaling 3233.8 nautical miles of sounding line. The area surveyed is 476 square nautical miles in extent. There are 81 bottom samples.

O. MISCELLANEOUS

All of "T" day was rejected as the RAYDIST was improperly calibrated. Also rejected are positions: 1592-1596 and 1600-1602 ("P" day), 1704-1750 ("T" day), 2247-2249 ("X" day), 2288-2298 ("X" day), 2537 ("Y" day), 3555-3557 ("GA" day) for bad calibration or lost fathogram.

P. RECOMMENDATIONS

The present survey should supersede all prior surveys.

Q. REFERENCES TO REPORTS

Report

Date Submitted

Seasons Report

Fathometer and Velocity Correction Report.

RAYDIST Report

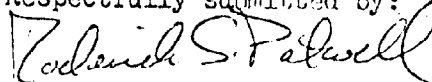
R. NOTES FOR AUTOMATED SMOOTH PLOTTING

Field data was processed according to Provisional Instructions Automated Hydrographic Surveys and Comments on Provisional Instructions Automated Hydrographic Surveys from the Pacific Marine Center, with the following exceptions:

1. As previously noted boat sheet soundings and tide reducers are in fathoms. Smooth sheet depths and reducers should be in feet.


2. The RAYDIST rates as logged on "FA", "CA" and "HA" days are too small by a factor of ten. To obtain the correct smooth plot either move the decimal point for the rates one place to the right, i.e. 0101.57 must be changed 1015.70, or increase the lane width by a factor of ten, i.e. one lane is 458.38 meters wide instead of 45.838 meters wide.

Respectfully submitted by:



Roderick S. Patwell
ENS, USESSA

Approved and forwarded:


Pentti A. Stark
CDR, USESSA
Comdg., Ship EXPLORER

-0.1 0.0 +0.1

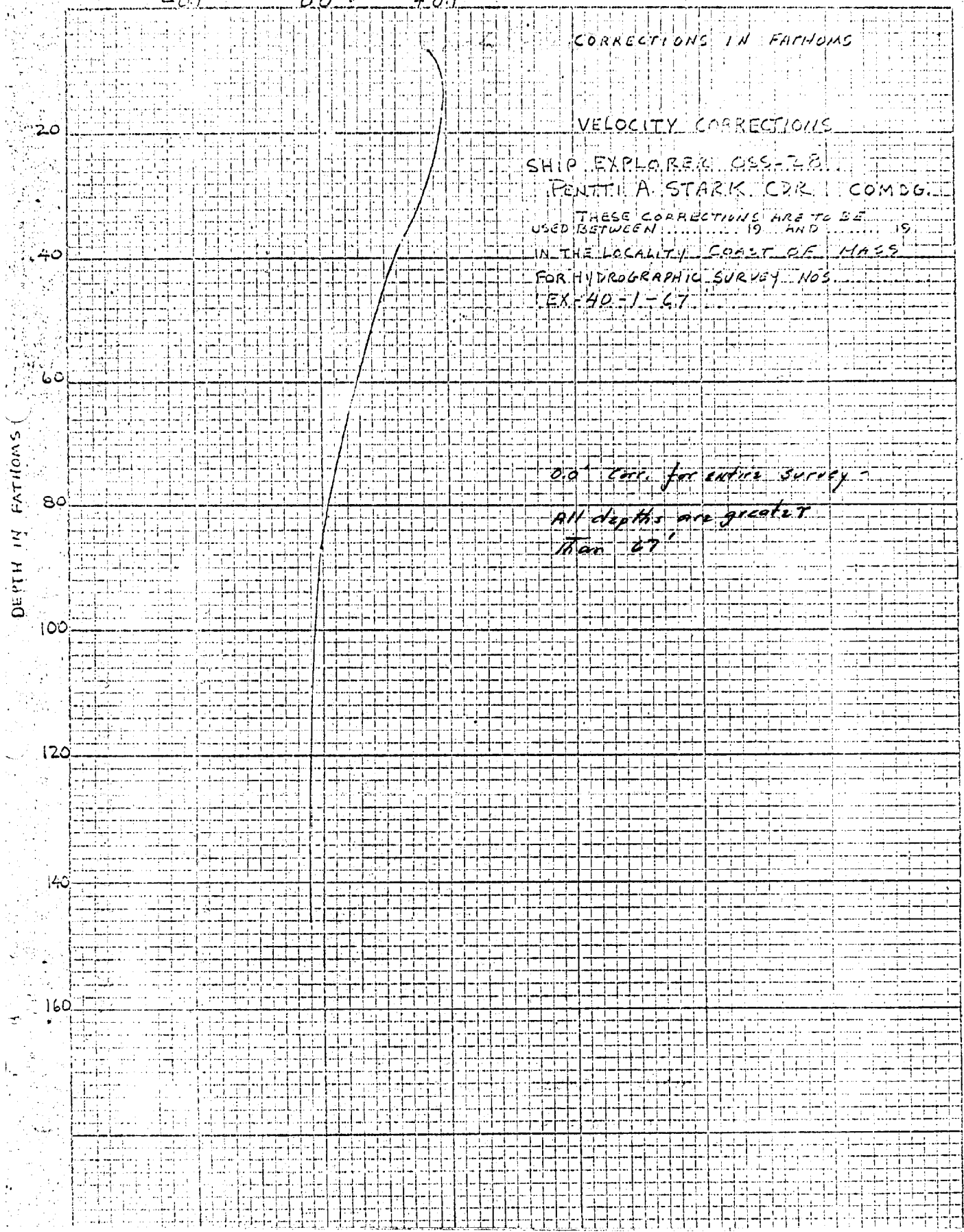
CORRECTIONS IN FATHOMS

VELOCITY CORRECTIONS

SHIP EXPLORER, USS-78...
PENTTI A. STARK, CDK, COMDG.

THESE CORRECTIONS ARE TO BE
USED BETWEEN 19... AND 19...
IN THE LOCALITY COAST OF MASS
FOR HYDROGRAPHIC SURVEY NOS...
EX-40-1-67

0.0 Corr. for entire survey -
All depths are greater
than 67'



45
DRAFT CORRECTIONS

EX-40-1-67

DATE	CORRECTION (fathoms)
June 11	.3
12	.3
14	.3
15	.3
16	.2
21	.4
22	.4
July 14	.3
15	.3
16	.2
18	.2
19	.2
20	.2
21	.2
27	.4
Aug 3	.3
4	.3
10	.4
13	.4
14	.3
15	.3
16	.3
17	.2
18	.2
23	.4
24	.4
25	.3
26	.3
27	.3
28	.3
29	.3
30	.2

COMP. JMM

CHECKED WORK

AMC Inverse Computation

AIRLINE DISTANCE UNDER 100 MILES, INVERSE COMPUTATION

LATITUDE(A) LATITUDE(B) LONGITUDE(A) LONGITUDE(B)
FROM DUNE TO HAUFLER
H-8938 EX-40-1-67

42 11 53.929 42 04 32.915 70 42 54.951 70 13 49.298

OUTPUT VALUES

DISTANCE	FWD AZIMUTH	BACK AZIMUTH
138896.18 FT. <i>42 335.6 MI</i>	26.30 STAT. MI. 288 35 7.259	108 54 38.432

42 04 32.915 42 11 53.929 70 13 49.298 70 42 54.951

OUTPUT VALUES

DISTANCE	FWD AZIMUTH	BACK AZIMUTH
138896.18 FT.	26.30 STAT. MI. 108 54 38.432	288 35 7.259

INVERSE POSITION COMPUTATION

$$s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right) = \frac{\Delta\lambda_1 \cos \phi_m}{A_m}$$

$$s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) = \frac{-\Delta\phi_1 \cos \frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha = \Delta\lambda \sin \phi_m \sec \frac{\Delta\phi}{2} + F(\Delta\lambda)^2$$

in which $\log \Delta\lambda_1 = \log (\lambda' - \lambda)$ - correction for arc to sin*; $\log \Delta\phi_1 = \log (\phi' - \phi)$ - correction for arc to sin*; and $\log s = \log s_1 +$ correction for arc to sin*.

NAME OF STATION					
1. ϕ	42° 04' 32.915"	DUNE	λ	70° 13' 49.298"	
2. ϕ'	42 11 53.929	HAUFLER	λ'	70 42 54.951	
$\Delta\phi (= \phi' - \phi)$	7'21.014"		$\Delta\lambda (= \lambda' - \lambda)$	29'05.653"	
$\frac{\Delta\phi}{2}$	3'40.507" <i>True</i>		$\frac{\Delta\lambda}{2}$	14'32.826"	
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	42°09'13.422"				
$\Delta\phi$ (secs.)	441.014		$\Delta\lambda$ (secs.)	1745.653	
$\log \Delta\phi$	2.6444524		$\log \Delta\lambda$	3.2419579	
cor. arc-sin	- 1		cor. arc-sin	- 13	
$\log \Delta\phi_1$	2.6444523		$\log \Delta\lambda_1$	3.2419566	
$\log \cos \frac{\Delta\lambda}{2}$	9.9999961		$\log \cos \phi_m$	9.8701358	
$\text{colog } B_m$	-1.4893117		$\text{colog } A_m$	-1.4909360	
$\log \left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.1337601	(opposite in sign to $\Delta\phi$)	$\log \left\{ s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.6030284	
			$\log \left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.1337601	
$\log \Delta\lambda$	3.2419579	$3 \log \Delta\lambda$ 9.726	$\log \tan \left(\alpha + \frac{\Delta\alpha}{2} \right)$.4692683	
$\log \sin \phi_m$	9.8266618	$\log F$ 7.859	$\alpha + \frac{\Delta\alpha}{2}$	108 44 52.84	
$\log \sec \frac{\Delta\phi}{2}$	0.0000002	$\log b$ 7.585	$\log \sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.9763230	
$\log a$	3.0686199		$\log \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.5070548	
a	1171.169		$\log s_1$	4.6267054	
b	0.004		cor. arc-sin	+ 8	
$-\Delta\alpha$ (secs.)	-1171.173		$\log s$	4.6267062	
$\frac{-\Delta\alpha}{2}$	-585.587		$s = 42335.6$		
$\alpha + \frac{\Delta\alpha}{2}$	108° 44' 52.84"				
α (1 to 2)	108° 35' 07.26" <i>38432</i>				
$\Delta\alpha$	- 19' 31.17"				
	180				
α' (2 to 1)	288° 35' 38.43" <i>38432</i>				

* Use the table on the back of this form for correction of arc to sin.

Notes: See ANC inverse computation - H.L.P. computed by RSP checked by DRA

NOTE.—For $\log s$ up to 4.0 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 3', omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 7 decimal places.

COMPUTER PARAMETERS FOR ELECTRONICALLY CONTROLLED SURVEYS

(RANGE - RANGE)

(1) Project No. OFF 473 (2) N. No. H-8938 (3) Field No. I 40-1-67

(4) Type of Control: SHORAN, RAYDIST, HI-FIX, RADAR
 Frequency (for conversion of RAYDIST or HI-FIX lanes to meters) 3300.4 kc

(5) RANGE ONE (R1) Latitude 42 ° 11 ' 53."929
 Station Name HUFLER Longitude 71 ° 0 ' 42"951

(6) RANGE TWO (R2) Latitude 42 ° 04 ' 32."915
 Station Name DUNE Longitude 70 ° 13 ' 49."298

(7) Azimuth from R1 to R2 208 ° 35 ' 07."259" * See AMC Comp.
~~208~~ ° ~~51~~ ' ~~38."~~17

(8) Baseline Length in Meters 42,335.6 M.

(9) Location of survey with respect to Electronic Baseline: CHECK ONE
 (To determine: imagine an observer standing at R1 and looking directly at R2 --- if the survey area is to the observer's LEFT then A is negative; if the survey area is to the observer's RIGHT then A is positive.)

-A (minus) +A (plus)

(10) If SHORAN corrections are applied by the equation, $K(X) + C = D$, where X is SHORAN distance and D is true distance, enter the Constant Coefficients of the equations here:

K(R1) _____, C(R1) _____, K(R2) _____, C(R2) _____.

(11) Number of Velocity Tables to be used:

None, One, More than one.

(12) _____ This form is submitted only as an aid in preparing a boat sheet projection.

This form applies to all data on this survey.

_____ This form applies to part of the data on this survey -

Time and Date limitations: From _____ To _____

Position Number Limitations: From _____ To _____

This is Form #3 Sheet # 1 of 1 Sheets for this survey.

(13) Other Remarks:

TIDE NOTE

To Accompany EX 40-1-67

H-8938

Tide reducers were obtained from the standard tide gauge at Boston, Massachusetts. Hourly heights, furnished by the Tides and Currents Branch at Rockville, Maryland, were measured from 3.58 feet below Mean Low Water and adjusted to Mean Low Water.

LOCATION OF GAUGE:

Latitude: $42^{\circ} 21.3' N$

Longitude: $70^{\circ} 03.0' W$

TIME MERIDIAN:

$75^{\circ} W$

APPROVAL SHEET FOR HYDROGRAPHIC SURVEY

Project OPR-473

Survey No H-8938

USC&CSS EXPLORER

The Chief of Party and the Operations Officer exercised a continuous supervision and inspection of the field work and field records. This survey is approved and considered to be a complete, adequate and basic hydrographic survey done in accordance with criteria indicated in the Hydrographic Manual and the Project Instructions. No further field work is recommended.

Pentti A. Stark

Pentti A. Stark
CDR, USN
Chief of Party

TIDE NOTE FOR HYDROGRAPHIC SHEET

February 27, 1968

~~XXXXXXXXXXXXXXX~~ Pacific Marine Center

Plane of reference approved ~~XXXXXXXXXXXXXXX~~ for

HYDROGRAPHIC SHEET 8938

Locality: Cape Anne, Mass.

Chief of Party: E. E. Jones, 1967

Plane of reference is mean low water

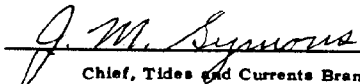
Tide Station Used (Form C&GS-681):

Boston

Height of Mean High Water above Plane of Reference is as follows:

Boston = 9.5 feet

Remarks


Chief, Tides and Currents Branch

NORFOLK HYDROGRAPHIC PROCESSING BRANCH

FATHOMETER VELOCITY CORRECTIONS

H-8938 (Ex 40-1-67)

A review of the fathometer velocity corrections compiled by ship personnel showed they had apparently attempted to determine stylus arm length error by phase differences rather than by determining the actual stylus length to derive a correction. These corrections were applied with the sign reversed, resulting in crossing discrepancies of up to 14 ft. on the preliminary overlays.

This office compiled and applied stylus arm length corrections in accordance with "C&GS Change 1a to DE-723 Maintenance Instructions, dated 21 Dec. 1966". Phase corrections were compiled separately. Field values were used for velocity and draft corrections.

Phase, draft and initial corrections were combined in the TRA column. Stylus length and velocity correction tables were logged in the Velocity Indicator Column. Abstracts of these corrections are appended to this report



Hugh L. Proffitt
Chief, Processing Branch, AMC

FORM C&GS-946
(REV. 11-65)
(PRESC. BY
HYDROGRAPHIC
MANUAL 20-2,
6-94, 7-13)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
NAUTICAL CHART DIVISION

HYDROGRAPHIC SURVEY STATISTICS
HYDROGRAPHIC SURVEY NO. H-8938

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		1	BOAT SHEETS		1	
DESCRIPTIVE REPORT		1	OVERLAYS (MYLAR)		1 + 8	
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS / SOURCE DOCUMENTS
ENVELOPES	X		6			
CAMERS	2		1			
VOLUMES	7					
BOXES				1		
T-SHEET PRINTS (LINE) <i>NOT APPLICABLE</i>						

SPECIAL REPORTS (LINE)
1-FATHOMETER VELOCITY CORRECTION REPORT

OFFICE PROCESSING ACTIVITIES
The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				3864
POSITIONS CHECKED		440	40	
POSITIONS REVISED		57	2	
DEPTH SOUNDINGS REVISED				
DEPTH SOUNDINGS ERRONEOUSLY SPACED				
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED				
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		-	-	
JUNCTIONS		16 hrs	8	
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		41 hrs	65	
SPECIAL ADJUSTMENTS	138 hrs	-	10	
ALL OTHER WORK		420 hrs	79	
TOTALS	138 hrs	477 hrs	157 hrs	

14 PRE-VERIFICATION BY GUY F. TERRETTEN AND ALLAN K. SCHUGERD *calculated 3/10/77*

BEGINNING DATE 24 MAY 1968 ENDING DATE 5 AUGUST 1968

VERIFICATION BY ALLAN K. SCHUGERD

BEGINNING DATE 24 JANUARY 1969 ENDING DATE 30 JUNE 1969

REVIEW BY ALLAN K. SCHUGERD
Inspection - J.T. Galahon 46 hr 11/2/76

BEGINNING DATE 6/23/70 ENDING DATE 7/27/70 11-2-76

REGISTRY NO. H-8938

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey, the following shall be completed:

CARDS CORRECTED

DATE _____ TIME REQUIRED _____ INITIALS _____

REMARKS:

REGISTRY NO. _____

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE _____ TIME REQUIRED _____ INITIALS _____

REMARKS:

H-8938

Items for Future Presurvey Reviews

This is an offshore survey covering the North Atlantic approaches to Massachusetts Bay. A comparison between prior and present depths reveals no noteworthy changes in the area, except as evidenced by the extension of Stellwagen Bank. Here depths have shoaled considerably along its western slope. Present depths in this area are about 90 feet.

<u>Position</u>	<u>Index</u>	<u>Bottom Change</u>	<u>Use</u>	<u>Resurvey</u>
<u>Lat.</u>	<u>Long.</u>	<u>Index</u>	<u>Index</u>	<u>Cycle</u>
422	0701	0	2	50 years
423	0701	0	2	50 years
422	0702	2	6	25 years
423	0702	0	2	50 years
422	0703	2	6	25 years
423	0703	0	6	50 years
422	0704	0	6	50 years
423	0704	1	6	50 years

OFFICE OF MARINE SURVEYS AND MAPS

MARINE SURVEYS DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-8938

FIELD NO. EX-10-1-67

Massachusetts, Atlantic Ocean, Massachusetts Bay

SURVEYED: June 11 - August 30, 1967

SCALE: 1:40,000

PROJECT NO.: OPR-473

SOUNDINGS: DE-723 Echo Sounder

CONTROL: Raydist

Chief of Party	E. E. Jones
.....	P. A. Stark
Surveyed by	J. E. Colt
.....	L. H. Perry
.....	J. M. McClelland
.....	R. F. Coons
.....	R. S. Patwell
.....	T. M. Wells
.....	J. E. Walsh
.....	M. N. Walters
.....	E. R. Krisher
Automated Plot by	Gerber Digital Plotter (PMC)
Verified by	A. K. Schugeld
Reviewed by	G. K. Myers
.....	Date: July 27, 1970
Inspected by	J. T. Gallahan

1. Description of the Area

This offshore survey southeast of Cape Ann covers a rectangular area of Massachusetts Bay. Survey limits extend north from latitude 42°20' to latitude 42°38' and west from longitude 70°02' to longitude 70°40'.

The bottom in this area is largely irregular. Many knolls and ridges rise as much as 150-200 feet from the bottom of bordering basins. Depths range from 67 feet near shore to over 600 feet in the southeast area of the survey.

The northern part of Stellwagen Bank extends about 10 miles in a north-westerly direction from the southern limit of the survey. Here depths from 85-120 feet are found.

Tillies Bank, a ridge rising about 500 feet above the sea bed in the center of an inverted Y-shaped valley, extends about 8 miles from the survey's northern limit.

2. Control and Shoreline

The origin of control is adequately covered in part F of the Descriptive Report.

There is no shoreline within the limits of this survey.

3. Hydrography

Depths at crossings are considered in good agreement and the usual depth curves were adequately delineated.

The development of bottom configuration is considered good and the investigation of least depths is considered adequate.

4. Condition of Survey

The field plotting, sounding records, and Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual supplemented by the Instruction Manual for Automated Hydrographic Surveys except for the following:

A. Abstracts and records not inserted into the Descriptive Report were:

(1) A description of logging equipment utilized, including tape production (ASC II or BCD code) and single or dual indicator disposition.

(2) Separate abstracts of the component correctors that make up TRA.

(3) An abstract of tide corrections.

(4) An abstract of hydrographic data located on the survey; i.e., bottom characteristics.

B. Simultaneous comparisons were not made by the hydrographer. On large vessels where bar checks are not practicable, vertical cast comparisons should be made and recorded at selected intervals when good casts are obtained.

C. Bottom characteristics of rks was improperly shown on the survey for rky and was revised by the reviewer.

5. Junctions

Adequate junctions were made with H-9011 and H-9013 of 1968 on the south, H-6564 (1940) on the east, H-7140 (1947) on the north, H-8941 (1967) on the northwest, H-9064 on the west, and H-9063 on the southwest.

6. Comparison with Prior Surveys

A.	H-396A	(1853)	1:10,000
	H-516	(1854-1905)	1:80,000
	H-2269	(1896)	1:10,000

These prior surveys cover the entire area of the present survey. Inasmuch as poor control and the lack of development preclude a detailed comparison with the present survey, numerous differences are noted--most of which can be attributed to the erroneous positioning of sounding lines.

However, significant changes have occurred as evidenced by the extension of Stellwagen Bank westward. Here depths at the end of the bank are 70 feet shoaler on the present survey.

Attention is directed to the following:

(1) The 78 depth charted in latitude $42^{\circ}23.4'$, longitude $70^{\circ}24.0'$ and the 78 depth charted in latitude $42^{\circ}24.3'$, longitude $70^{\circ}24.4'$ from H-516 (1854-1905) fall in present depths of 86 and 95 respectively. Considering the smooth nature of bottom revealed by all sounding profiles in the vicinity, the early survey methods, and scale of the early survey, and the development on the present survey, the 78-foot soundings are considered discredited and should be deleted from the charts.

(2) The 108 charted in latitude $42^{\circ}33.1'$, longitude $70^{\circ}38.5'$ from H-396a (1853) falls in present depths of 167 feet. The soundings appearing at the outer limits of this early survey are probably displaced excessively in position and should not be retained.

(3) The 144 charted in latitude $42^{\circ}26.9'$, longitude $70^{\circ}33.75'$ from H-516 (1854-1905) falls in general depths of 160 feet. Considering the featureless nature of the bottom in this area and the method of surveying on this early survey, it is considered unlikely that a 144-foot depth exists in this area. It is recommended that present depths be used in charting this area.

The present survey supersedes the prior surveys within the common area.

B.	H-3947 WD	(1916)	1:80,000	H-3951 WD	(1916)	1:25,000
	H-3948 WD	(1916)	1:25,000	H-3780 WD	(1915)	1:25,000
	H-3950 WD	(1916)	1:10,000			

These wire-drag surveys taken together cover the eastern edge of Massachusetts Bay. No conflicts are noted between the effective drag depths and depths on the present survey.

C. H-4822B (1928) 1:80,000

This track line, plotted for reconnaissance purposes only, provides no significant information of this area and a comparison with the present survey would be of little value. The present survey supersedes the prior survey within the common area.

D. H-8413 (1957-59) 1:100,000

A comparison between the prior and present depths reveals no noteworthy change. A local deepening of about 1-8 feet is found along the slopes throughout the present survey. At the end of Stellwagen Bank present depths are 5-8 feet deeper than prior depths and indicate a probable leveling in this area.

The larger scale and more completely developed present survey is adequate to supersede the prior survey within the common area.

7. Comparison with Chart 1207 (latest print date July 7, 1969)
243 (latest print date September 13, 1969)

A. Hydrography

The charted hydrography originates with the previously discussed surveys, which require no further consideration, supplemented by depths from the boat sheet (Bp-73625) of the present survey.

The 102 charted at latitude 42°34.09', longitude 70°37.50' from the boat sheet (Bp-73625) was erroneously scanned from the fathogram and should be deleted from the chart.

Soundings charted from the prior surveys no longer portray the actual conditions and the present survey is considered adequate to supersede the charted hydrography within the common area.

B. Aids to Navigation

The charted aids to navigation agree with the present survey positions and adequately mark the features intended.


8. Compliance with Instructions

This survey adequately complies with project instructions.

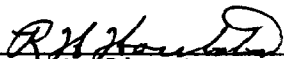
9. Additional Field Work

This is a very good basic survey and no additional field work is recommended.

Examined and Approved:



Chief
Marine Surveys Division



Associate Director
Office of Marine Surveys
and Maps

NONDANGEROUS WRECKS
 Nondangerous wrecks shown on chart 1207 have been omitted from this chart. The limits of chart 1207 are shown in magenta.

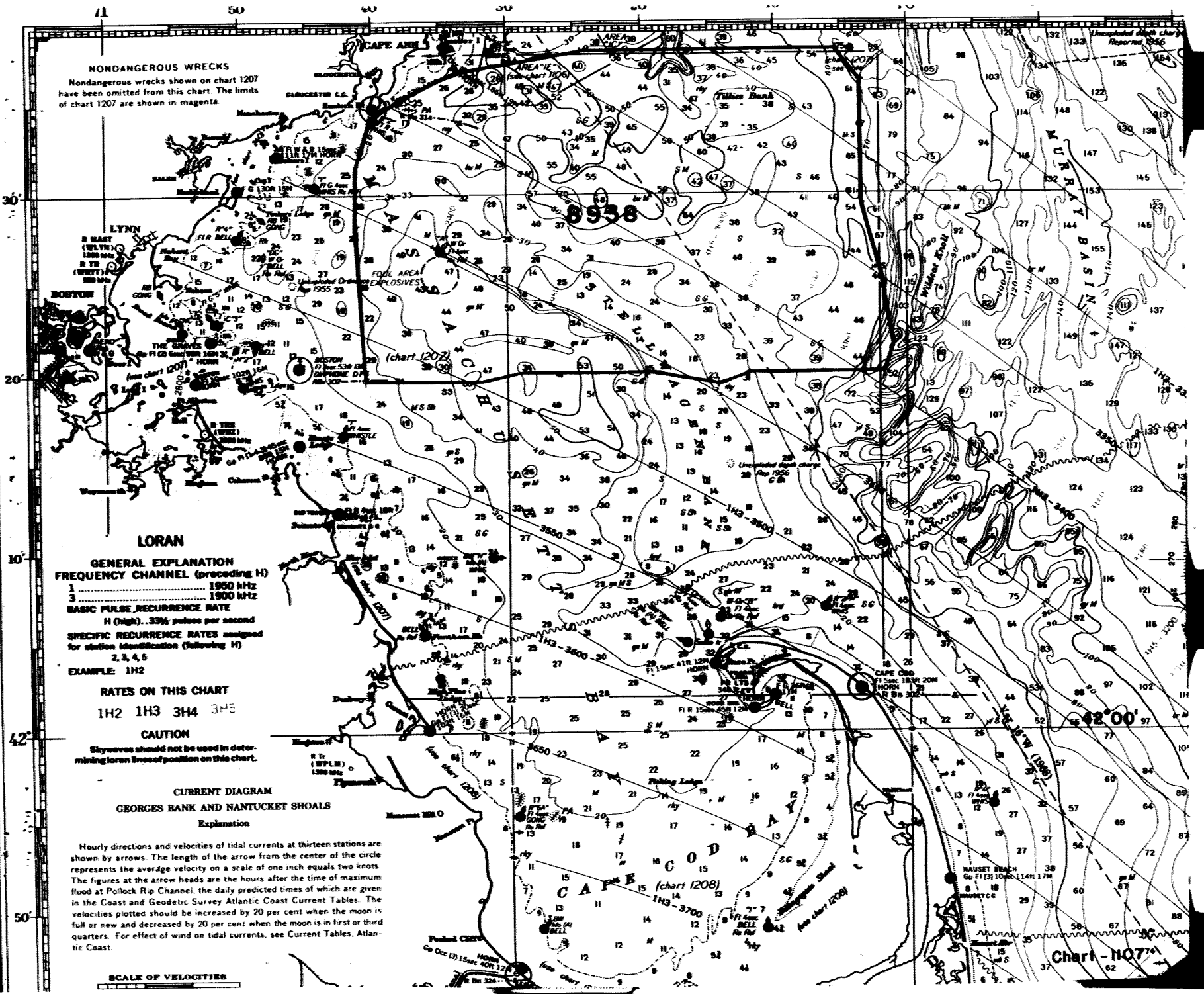
LORAN
GENERAL EXPLANATION
FREQUENCY CHANNEL (preceding H)
 1 1950 kHz
 3 1900 kHz
BASIC PULSE RECURRENCE RATE
 H (high) .33% pulses per second
SPECIFIC RECURRENCE RATES assigned for station identification (following H)
 2, 3, 4, 5
EXAMPLE: 1H2

RATES ON THIS CHART
 1H2 1H3 3H4 3H5

CAUTION
 Skywaves should not be used in determining loran lines of position on this chart.

CURRENT DIAGRAM
GEORGES BANK AND NANTUCKET SHOALS

Explanation
 Hourly directions and velocities of tidal currents at thirteen stations are shown by arrows. The length of the arrow from the center of the circle represents the average velocity on a scale of one inch equals two knots. The figures at the arrow heads are the hours after the time of maximum flood at Pollock Rip Channel. The daily predicted times of which are given in the Coast and Geodetic Survey Atlantic Coast Current Tables. The velocities plotted should be increased by 20 per cent when the moon is full or new and decreased by 20 per cent when the moon is in first or third quarters. For effect of wind on tidal currents, see Current Tables, Atlantic Coast.



RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. **H-8938**

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
70	8/12/69	O. Svendsen	Full Part Before After Verification Review Inspection Signed Via
1106	3/13/70	Jeffrey Stuart	Drawing No. 33 & 33M Examined - no
		Reviewed 4-13-70	Critical corrections Added & Deleted several sdgs.
1207	4-16-70	Eric Fry	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. Examined for critical corrections only
			added & revised 9 sdgs.
1000	4/29/70	O. Svendsen	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 47 Exam. No critical corr
			thru Chart 1106 Dwg #25
71	5-5-70	Eric Fry	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 24 Examined for critical corrections only
			revised 2 soundings.
243	6-5-70	L. Moore	Full Part Before After Verification Review Inspection Signed Via
		Reviewed DJK	Drawing No. EXAM. NO critical corr. added
			ONE sdg. 67 at Lat. 42° 35.7' - 70° 38.85'
613-5010-1-70		James Chatham	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. Added 67'SNDG. THRU CHT. 243 DWG #19
			before review & inspection before
1206	10-7-70	H. Ladd	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 24 app'd thru chit. 1207 #30 after Verif.
			app'd Review directly before
613-50	10-7-70	James Chatham	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. App'd directly to chit. reviewer's report
			before inspection.
1207	3-26-71	Oscar Chapman	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 31 fully applied directly to chart before
			inspection
1106	3-26-71	Oscar Chapman	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. Applied thru chit. 1207 DWG #31
1107	3-29-71	Scott McKella	Fully applied after verification, Review but before
			inspection thru chit. 1106.
71	30 Apr 71	R.D. Sanochi	Applied thru chit. 1107 dwg #24 After verification
			review and before inspection to dwg #25.
243	6-17-71	Joe Esterreicher	Part after Review, before inspection. Deleted one
			sdg.
70	7-30-71	KIRBY GEAN	APP IN PART THRU CHART 71 DWG #25 AFTER VERIF
			REVIEW BEFORE WSP

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-8938

INSTRUCTIONS

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1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review

CHART	DATE	CARTOGRAPHER	REMARKS
1000	6-14-72	J. Bailey	Full Part Before After Verification Review Inspection Signed Via
	8/8/73		Drawing No. Exam. thru Drwg. 70 # ³⁷ 36
			No critical corrs.
613SC	12-16-77	H.C. Aron	Full Part Before ^{After} After Verification Review Inspection Signed Via
(B) 13274			Drawing No. 9 - Revised most soundings in the area after inspection.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
13278	9-8-78	RJ Wilson	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 29 Added + continued curves to the next line; add a few shoal soundings in curves at next line
13267	10-5-79	Kevin D Shaw	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 39 REVISED A FEW SNOGS AS PER INSPI. - REVISED SEVERAL SNOGS TO AGREE WITH 13274(B)
13279	12-10-79	Eric Fry	Full Part Before After Verification Review Inspection Signed Via
(2/13)			Drawing No. 28 Revised all soundings in area
13003	2-7-90	Ed Martin	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 61 Adequately applied, no further processing required
13006	2-12-90	Russell P Keimig	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 47 Adequately applied, no further processing required
13260	2-22-90	Russell P Keimig	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 37 Adequately applied, no further processing required
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.