

# 8944

Diag. Cht. No. 1206-2

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 2.5-1-67  
Office No. .... H 8944

### LOCALITY

State ..... MASSACHUSETTS  
General Locality ..... CAPE ANN  
Locality ..... ROCKPORT HARBOR

19 67

CHIEF OF PARTY  
P. A. STARK

### LIBRARY & ARCHIVES

DATE ..... 4-29-68

8944

**HYDROGRAPHIC TITLE SHEET**

H-8944

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-2.5-1-67

State MASSACHU<sup>SE</sup>SETTS

General locality ~~COAST OF MASSACHU<sup>SE</sup>SETTS~~ CAPE ANN

Locality ROCKPORT HARBOR AND APPROACHES

Scale 1:2,500 Date of survey September<sup>23-28,</sup> 1967

Instructions dated 27 March 1967 Project No. OPR-473

Vessel USC&GSS EXPLORER Launch EX-1, 1 Aluminum Skiff and borrowed dinghy.

Chief of party CDR Pentti A. Stark, USESSA

Surveyed by ICDR R.A. Trauschke, USESSA

Soundings taken by echo sounder, hand lead, pole Leadline

Graphic record scaled by \_\_\_\_\_

Graphic record checked by \_\_\_\_\_

Protracted by Ship's Personnel Automated plot by \_\_\_\_\_

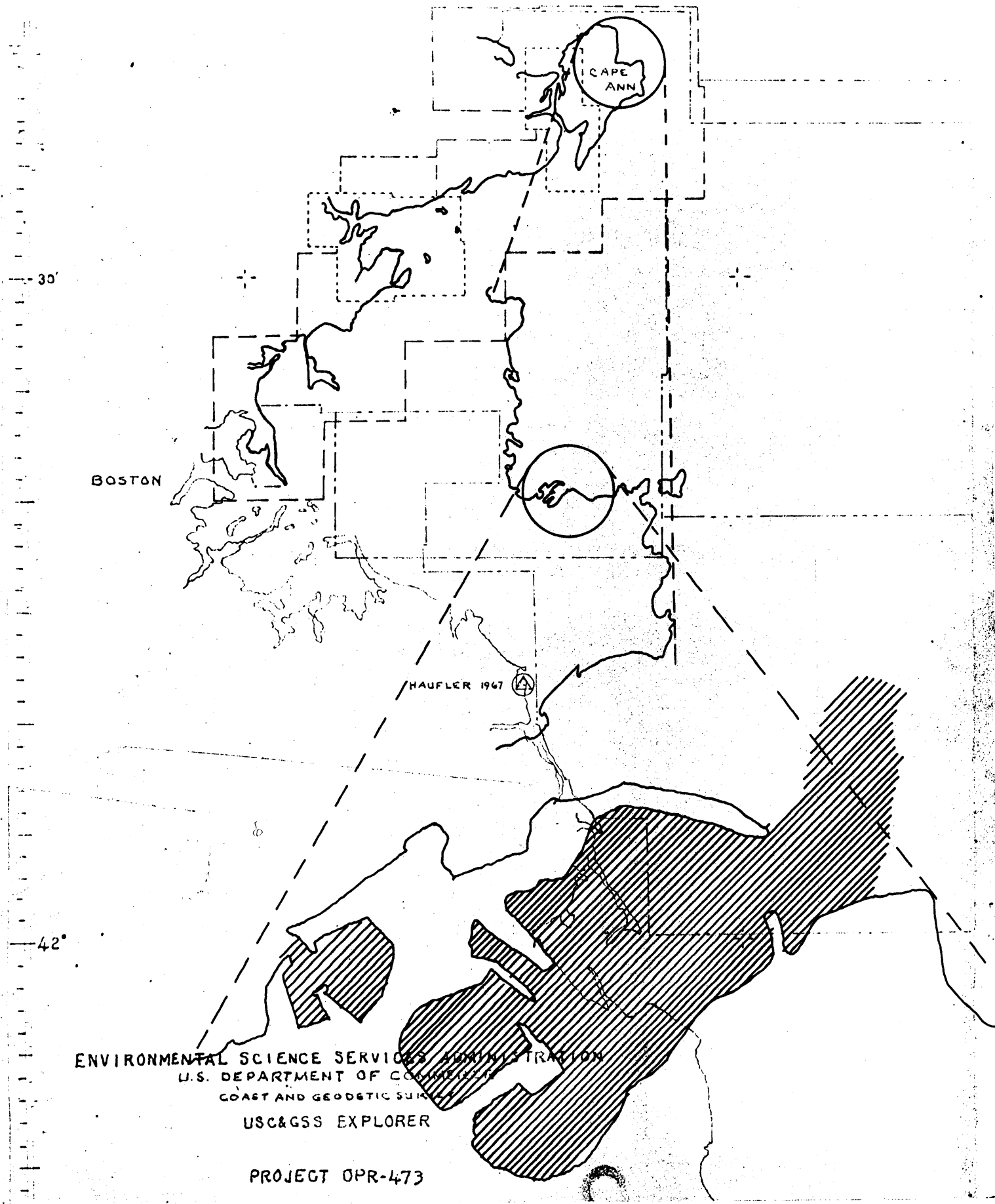
Soundings penciled by Ship's Personnel

Soundings in fathoms feet at MLW MLLW Feet at MLW

REMARKS: NONE

*J. J. G.*

ROCKPORT HARBOR, MASS.  
Approx. Scale 1/5000



ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION  
U.S. DEPARTMENT OF COMMERCE  
COAST AND GEODETIC SURVEY  
USC&GSS EXPLORER

PROJECT OPR-473

A. PROJECT:

The survey of Rockport Harbor is part of Project OPR-473. ✓  
Instructions from Hydrographic Office dated 27 March 1967  
authorized the survey.

B. AREA SURVEYED:

All of Rockport Harbor and its approaches as far north as ✓  
Latitude  $42^{\circ} 39' 45''$  are included in the survey. A small  
basin west of the harbor is also included. *at lat.  $42^{\circ} 39' 34''$ , long.  $70^{\circ} 31' 03''$*   
*and is detached from the main body of the survey.*

The survey began on 23 September and was completed on ✓  
28 September 1967.

This survey <sup>overlaps</sup> ~~junctions with~~ prior survey H-2606, 1:10,000, ✓  
dated 1902. The prior survey of the harbor is H-4850, ✓  
1:5,000, dated 1928. This survey junctions with contem-  
porary survey EX-10-2-67, H-8940 (1967).

C. SOUNDING VESSEL:

Two of the EXPLORER'S boats were used and a dinghy was ✓  
borrowed to survey the west basin. An aluminum skiff  
was used for the tag line survey in the harbor. EXPLORER  
Launch No. 1 was used for sounding at two least depths.

D. SOUNDING EQUIPMENT:

All soundings were taken with hand lead. ✓

E. SMOOTH SHEET:

Smooth Sheet was constructed on the coordinate plotter in ✓  
Photogrammetry Section, Atlantic Marine Center. Positions  
in west basin are estimated, using measured distances and  
ranges along existing features. Probable error: 2 meters.

F. CONTROL:

Horizontal control was established with standard tag line ✓  
survey methods, using a calibrated sheave and ranges. Ranges  
were established at 75 control points that were located  
graphically, with traverse and stadia, from four topographic  
stations and three previously established triangulation stations.  
Topographic stations Gull and Jet were established with a  
computed three point fix. Gull and Jet were then occupied  
and topographic stations Rock and Lob established by inter-  
section from Gull and Jet. No photographs of the survey area  
were available at the scale of the survey.

G. SHORELINE:

Shoreline was transferred from preliminary shoreline manuscript T-12964 (Insert). *See Review*

H. CROSSLINES:

Crosslines were run in compliance with Section 1-26 of the Hydrographic Manual. Good agreement was obtained at all crossings. ✓

I. JUNCTIONS:

Soundings at junction with sheet *H-8940 (1967)* (EX-10-2-67) were within one foot. ✓

J. COMPARISON WITH PRIOR SURVEYS:

Soundings generally agree within one foot with previous survey H-4850 (1928, 1:5,000) except areas dredged northwest and south-east of town pier. The Harbormaster verified that dredging was performed since 1928.

*From Bp. 25357-58 Mass. Dept. Public Works survey*  
Presurvey review Item 49, a reef at Latitude  $42^{\circ} 39' 37.7''$  N, *See Review*  
Longitude  $70^{\circ} 36' 50.5''$  W, exists as shown, and the height and location of the reef is indicated on the boat and smooth sheets. ✓  
*Bare 6 feet at MLW.*

Presurvey review Item 50, a rock with a depth of 2 feet at Latitude  $42^{\circ} 39' 36.7''$  N, Longitude  $70^{\circ} 36' 49.8''$  W, was not found after an extensive search of the area for one hour. The Rockport Harbormaster has no knowledge of a rock in this area. This sounding should be changed to 9 feet. *The 2 ft. sounding originates with the Mass. Harbor and Commission in 1915 and was added to H-4850.*

Presurvey review Item 51, a rock with a depth of 6 feet at Latitude  $42^{\circ} 39' 32.4''$  N, Longitude  $70^{\circ} 36' 57.3''$  W, was not found after an extensive search of the area for one hour. The area was dredged since 1931 and local mariners cross the area daily in boats drawing more than 6 feet. A rock with 7 feet depth is 40 meters away. This is the only rock local mariners acknowledge in the area. This sounding should be changed to 12 feet. *Not charted on Chf 243 (9-13-59).* ✓

K. COMPARISON WITH CHART:

Soundings generally agree within one foot with C&GS Chart 243 (printed September 14, 1964) with the above exceptions in presurvey review items 50 and 51. Chart 243 is compiled mostly

COMPARISON WITH CHART - Cont.

from H-~~8450~~<sup>4850</sup>, discussed above. One additional discrepancy is the shoal of 5 feet on the chart at Latitude  $42^{\circ} 39' 35.7''$  N, Longitude  $70^{\circ} 36' 50.7''$  W. No indication of the shoal was found with the regular sounding lines. It is recommended that the 5 foot shoal be deleted and the sounding be changed to 8 feet. *Not charted on chart 243 (9.13-69)*

L. ADEQUACY OF SURVEY:

*H-8944 (1967)*  
(EX-2.5-1-67) is a completed survey and adequate to supersede all previous surveys of this area for charting purposes.

M. AIDS TO NAVIGATION:

Aids to navigation are correctly shown on Chart 243 and in the Light List except buoy No. 4. Red nun buoy No. 4 is incorrectly plotted on Chart 243. The ~~position~~<sup>*smooth sheet*</sup> position is Latitude  $42^{\circ} 39' 42.7''$  N, Longitude  $70^{\circ} 36' 40.9''$  W, ~~as shown on smooth sheet.~~<sup>*and lays 20 meters SW of chart pos.*</sup> The depth at the buoy is 25 feet instead of 18 feet as noted in the Light List. *Red nun buoy no. 4 on present survey is closer to the feature Harbor Rk. than charted pos. This buoy moved further away on a later edition of chart 243*

N. STATISTICS:

The survey covered .035 square miles with a total of 702 soundings; 687 from the aluminum skiff; 13 from the borrowed dinghy, and two from Launch No. 1. No bottom samples were taken.

O. MISCELLANEOUS:

None

P. RECOMMENDATIONS:

*H-8944 (1967)*  
This survey (X-2.5-1-67) is complete and adequate and no further work is needed at the present time.

Q. REFERENCES TO REPORTS:

See Season's Report and Coast Pilot Report.

Submitted by:

  
LCDR R.A. TRAUSCHKE

Approved by:

  
Pentti A. Stark, CDR, USESSA  
CO, USC&GSS EXPLORER (OSS-28)

APPROVAL SHEET FOR HYDROGRAPHIC SURVEY

Project No. OPR-473 Survey No. H-8944

USC&GSS EXPLORER

The Chief of Party and the Operations Officer exercised a continuous supervision and inspection of the field work and field reports. The 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  
QDR, USESSA  
Chief of Party

LIST OF SIGNALS

<u>NAME</u>	<u>ORIGIN</u>
Rockport Breakwater Lt.	Rockport Breakwater Light 1953
Rockport Orthodox Ch.	Rockport Orthodox Church 1902-1928 <sup>53</sup>
Rockport Universalist Ch.	Rockport Universalist Church 1916-1928 <sup>53</sup>
LOB GULL, ROCK, JET.	Third order triangulation
LOB 2	Traverse
LOB 3	Traverse
A	Traverse
B	Traverse
C	Traverse
D	Traverse
E	Traverse
F	Traverse
G	Traverse
H	Traverse
I	Traverse
J	Traverse
K	Traverse
L	Traverse
L2	Traverse
L3	Traverse
M	Traverse
N	Traverse
O	Traverse



LIST OF SIGNALS - cont.

<u>NAME</u>	<u>ORIGIN</u>
P	Traverse
Q	Traverse
R	Traverse
S	Traverse
T	Traverse
U	Traverse
V	Traverse
W	Traverse
X	Traverse
Y	Traverse
Z	Traverse
AA	Traverse
BB	Traverse
CC	Traverse
DD	Traverse
EE	Traverse
FF	Traverse
GG	Traverse
HH	Traverse
II	Traverse
KK	Traverse
LL	Traverse
MM	Traverse

LIST OF SIGNALS - kont.

<u>NAME</u>	<u>ORIGIN</u>
NN	Traverse
PP	Traverse
QQ	Traverse
RR	Traverse
SS	Traverse
TT	Traverse
UU	Traverse
VV	Traverse
WW	Traverse
XX	Traverse
YY	Traverse
ZZ	Traverse
A'	Traverse
B'	Traverse
C'	Traverse
D'	Traverse
E'	Traverse
F'	Traverse
G'	Traverse
H'	Traverse
J'	Traverse
K'	Traverse
L'	Traverse

LIST OF SIGNALS - cont.

<u>NAME</u>	<u>ORIGIN</u>
M'	Traverse
N'	Traverse
P'	Traverse
Q'	Traverse
R'	Traverse
S'	Traverse
T'	Traverse
U'	Traverse
V'	Traverse
W'	Traverse
X'	Traverse
Y'	Traverse

ROCKPORT BREAKWATER  
LIGHT, 1953

Lat	meters	Long	meters
42°39'30"	257.4 ✓ (205.4)	70°36'30"	332.5 ✓ (9.2)

ROCKPORT ORTHODOX  
CHURCH, 1902; r. 1928

42°39'15"	407.7 ✓ (55.1)	70°37'00"	221.6 ✓ (120.1)
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ROCKPORT UNIVERSALIST  
CHURCH SPIRE, 1916; r. 1928

42°39'15"	383.4 ✓ (79.5)	70°37'00"	306.5 ✓ (35.1)
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GULL

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 97  
Ed. April 1945

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

$\alpha$	2	to 3	295	48	43	$\alpha$	3	to 2	115	50	09
$2^d L$		&	+ 35	50	50.0	$3^d L$		&	- 29	20	19.6
$\alpha$	2	to 1	331	39	33.0	$\alpha$	3	to 1	086	29	49.4
$\Delta\alpha$			+		24.5	$\Delta\alpha$			-	01	01.6
			180	00	00.0				180	00	00.0
$\alpha'$	1	to 2	151	39	57.5	$\alpha'$	1	to 3	766	28	47.8

FIRST ANGLE OF TRIANGLE  $114.48.50.3''$

$\phi$	42	40	29.13	2	PIGEON COVE CHURCH	$\lambda$	70	37	26.13	$\phi$	42	39	43.786	8	STRAITSMOUTH LIGHTHOUSE	$\lambda$	70	35	17.0
$\Delta\phi$	-	00	49.46			$\Delta\lambda$	-		36.14	$\Delta\phi$	-		4.113			$\Delta\lambda$	+	01	22.2
$\alpha'$	42	39	39.67	1	GULL	$\alpha'$	70	36	49.99	$\phi'$	42	39	39.673	1	GULL	$\alpha'$	70	36	49.99

Logarithms		Values in seconds		Logarithms		Values in seconds		Logarithms		Values in seconds	
$s$	3.239 012			$s$	3.316 460			$s$	3.316 460		
$\text{Cos } \alpha$	9.944 551			$\text{Cos } \alpha$	8.786 040			$\text{Cos } \alpha$	8.786 040		
B	8.510 677			B	8.510 648			B	8.510 648		
$h$	1.694 710	1st term	49.455	$h$	0.613 178	1st term	4.1034	$h$	0.613 178	1st term	4.1034
$s^2$	6.478 07			$s^2$	6.632 92			$s^2$	6.632 92		
$\text{Sin}^2 \alpha$	9.357 87			$\text{Sin}^2 \alpha$	9.998 38			$\text{Sin}^2 \alpha$	9.998 38		
C	1.368 95			C	1.368 76			C	1.368 76		
	7.199 84	2d term	+0.002		8.000 06	2d term	+0.0100		8.000 06	2d term	+0.0100
$h^2$	3.388 7			$h^2$	1.776 3			$h^2$	1.776 3		
D	2.391 1			D	2.391 0			D	2.391 0		
	5.779 5	3d term	+		3.617 3	3d term	+		3.617 3	3d term	+
		$-\Delta\phi$	+ 49.459			$-\Delta\phi$	+ 4.1134				

$\frac{\phi + \phi'}{2} = 42^{\circ} 39' 39.67''$   
 $\frac{\lambda + \lambda'}{2} = 70^{\circ} 36' 49.99''$

Comp: CDK  
CHECK: MVW

$\frac{\phi + \phi'}{2} = 42^{\circ} 39' 39.67''$   
 $\frac{\lambda + \lambda'}{2} = 70^{\circ} 36' 49.99''$

Rock

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
FORM 87  
Ed. April 1945

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

$\alpha$	2	GULL	to 3	JET	289	01	09.6	$\alpha$	3		to 2	109	01	13.1
$2^d L$			&		+ 99	29	12.4	$3^d L$			&	-55	10	08.2
$\alpha$	2		to 1	ROCK	028	30	22.0	$\alpha$	3		to 1	053	51	04.9
$\Delta\alpha$							3.4	$\Delta\alpha$						6.9
					180	00	00.0					180	00	00.0
$\alpha'$	1		to 2		028	30	18.6	$\alpha'$	1		to 3	053	50	58.0

FIRST ANGLE OF TRIANGLE 025.20, 39.4

$\phi$	42	39	39.673	2	GULL	$\lambda$	70	36	49.995	$\phi$	42	39	38.352	3	JET	$\lambda$	70	36	44.2
$\Delta\phi$			6.830			$\Delta\lambda$			5.026	$\Delta\phi$			5.505			$\Delta\lambda$			10.8
$\phi$	42	39	32.344	1	ROCK	$\lambda$			55.021	$\phi$	42	39	32.847	1	ROCK	$\lambda$			55.021

Logarithms		Values in seconds		Logarithms		Values in seconds		Logarithms		Values in seconds		Logarithms		Values in seconds	
$\phi$	2.379933			$\phi$	2.379933			$\phi$	2.459625			$\phi$	2.459625		
$\cos \alpha$	9.943873			$\cos \alpha$	9.720765			$\cos \alpha$	9.720765			$\cos \alpha$	9.720765		
B	2.510642			B	2.510642			B	2.510642			B	2.510642		
h	0.834454	1st term	6.830	h	0.741108	1st term	5.5094	h	0.741108	1st term	5.5094	h	0.741108	1st term	5.5094
$\phi$	4.759866			$\phi$	4.919390			$\phi$	4.919390			$\phi$	4.919390		
$\sin^2 \alpha$	9.988038			$\sin^2 \alpha$	9.814274			$\sin^2 \alpha$	9.814274			$\sin^2 \alpha$	9.814274		
C	1.368760			C	1.368740			C	1.368740			C	1.368740		
	6.116614	2d term	+ 2.04		6.102404	2d term	+ 2.04		6.102404	2d term	+ 2.04		6.102404	2d term	+ 2.04
h'	0.215182			h'	1.482216			h'	1.482216			h'	1.482216		
D	2.391000			D	2.391000			D	2.391000			D	2.391000		
	2.606182	3d term	+ 40.35		3.813216	3d term	+ 74.82		3.813216	3d term	+ 74.82		3.813216	3d term	+ 74.82
		$-\Delta\phi$				$-\Delta\phi$				$-\Delta\phi$				$-\Delta\phi$	

COMD: M N W

LOB

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
Form 37  
Ed. April 1945

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

$\alpha$	2	GULL	to 3	289	01	09.6	$\alpha$	3	to 2	109	01	13.1	
$2^d L$			&	+ 76	14	04.8	$3^d L$		&	- 81	03	16.	
$\alpha$	2	LOB	to 1	005	15	14.4	$\alpha$	3	LOB	to 1	077	57	5
$\Delta\alpha$						.9	$\Delta\alpha$					4.4	
				180	00	00.0				180	00	00.0	
$\alpha'$	1		to 2	185	15	13.5	$\alpha'$	1	to 3	207	57	52.4	

FIRST ANGLE OF TRIANGLE 22 42 38.9

$\phi$	42	39	39.673	GULL	$\lambda$	70	36	49.925	$\phi$	42	39	39.352	JET	$\lambda$	70	36	44.5
$\Delta\phi$			10.328		$\Delta\lambda$			1.287	$\Delta\phi$			9.006		$\Delta\lambda$			
$\phi'$	42	39	29.345	LOB	$\lambda'$	70	36	51.282	$\phi'$	42	39	29.346	LOB	$\lambda'$	70	36	51.282

Logarithms		Values in seconds		Logarithms		Values in seconds	
$s$	7.505184	$\frac{1}{2}(\phi+\phi')$ 42 39 34.504		$s$	7.505184	$\frac{1}{2}(\phi+\phi')$ 42 39 34.504	
$\cos\alpha$	9.998172	1st term	10.328	$\sin\alpha$	8.961759	1.287	
B	8.510648		$A'$	8.509051			
h	1.014004	2d term	<del>9.020</del>	$\sec\phi'$	0.133470	872	
$s'$	5.010368		$\Delta\lambda$	0.109464			
$\sin^2\alpha$	7.923518	3d term	<del>+30.277</del>	$\sin\frac{1}{2}(\phi+\phi')$	9.931000		
C	1.368750		$-\Delta\alpha$	9.940464			
$h^2$	2.028000	$-\Delta\phi$	10.328				
D	2.391000						
	4.419000						

Logarithms		Values in seconds		Logarithms		Values in seconds	
$s$	7.497843	$\frac{1}{2}(\phi+\phi')$ 42 39 33.		$s$	7.497843	$\frac{1}{2}(\phi+\phi')$ 42 39 33.	
$\cos\alpha$	9.946073	1st term	9.006	$\sin\alpha$	9.671121	6.1	
B	8.510648		$A'$	8.509050			
h	0.954564	2d term	<del>+</del>	$\sec\phi'$	0.133470	4.3	
$s'$	4.995686		$\Delta\lambda$	0.811484			
$\sin^2\alpha$	9.342242	3d term	<del>130.15</del>	$\sin\frac{1}{2}(\phi+\phi')$	9.930998		
C	1.36842		$-\Delta\alpha$	0.642482			
$h^2$	1.909130	$-\Delta\phi$	9.006				
D	2.3910						
	4.300130						

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

JET

$\alpha$	2	to 3	115	50	09	$\alpha$	3	to 2	295	48	43
$\beta$	2	to 1	30	44	31.3	$\beta$	3	to 1	+33	11	24
$\Delta\alpha$	2	to 1	85	05	37.99	$\Delta\alpha$	3	to 1	329	00	02
$\Delta\alpha$				00	58.0	$\Delta\alpha$			+	31	28
$\alpha$	1	to 2	180	00	00.0	$\alpha$	1	to 3	180	00	00.0
$\alpha$	1	to 2	765	04	39.8	$\alpha$	1	to 3	149	00	35.9

FIRST ANGLE OF TRIANGLE  
 149 00 35.9  
 116 04 03.9

$\lambda$	42	39	43.786	2	STRAISMOOUTH L.H. 1902	$\lambda$	70	35	19.173	$\lambda$	42	40	39.13	3	PURDON COVE ORTHO. CH. 1902	$\lambda$	70	37	36
$\Delta\lambda$			5.734			$\Delta\lambda$	+	01	25.630	$\Delta\lambda$	+		50.78		1902	$\Delta\lambda$	-		41
$\lambda$	42	39	38.352	1	JET	$\lambda$	70	36	44.803	$\lambda$	42	39	38.38	1	JET	$\lambda$	70	36	44

Logarithms		Values in seconds		Logarithms		Values in seconds		Logarithms		Values in seconds	
$\cos \alpha$	9.932 097			$\cos \alpha$	9.933 076			$\cos \alpha$	9.932 097		
$B$	9.1510 648			$B$	9.510 647			$B$	9.201 978		
$h$	0.734 424	1st term	5.4752	$h$	1.705 658	1st term	50.775	$h$	9.711 818		
$\alpha$	6.583 36			$\alpha$	6.523 86			$\alpha$	8.509 050		
$\sin^2 \alpha$	9.996 81			$\sin^2 \alpha$	9.428 62			$\sin^2 \alpha$	0.753 489		
$C$	1.360 76			$C$	1.368 97			$C$	1.201 218		-41
	7.949 93	2d term	+0.0080		7.316 44	2d term	+0.007		9.831 066		
$h^2$	1.4688			$h^2$	3.4113			$h^2$	7.477 344		-28
$D$	2.3910			$D$	2.3910			$D$	3.539		
	3.8598	3d term	+		8.8073	3d term	+		17.3957		
$\Delta\alpha$	5.434			$\Delta\alpha$	50.777			$\Delta\alpha$	50.777		



INSTRUMENT POSITION	INITIAL OBJECT	ANGLE (-) →	SECOND OBJECT	ANGLE	CORRECTED L-ANGLE R	DISTANCE	DX 4	23
A'	VV	—	M'	90°00'00"	+90°00'00"	20.51 m	82	
YY	H'	—	N'		+90°00'00"	13.95 m	55.8	
WW	H'	—	P'		+90°00'00"	19.49 m	78.0	
VV	H'	—	R'		+90°00'00"	26.29 m	105.2	
X	Breakwater Lt	00°00'17"	S'	191°19'19"	-168°40'58"	44.26 m	177.0	
			T'			10.0 m	40	
			U'			20.0 m	80	
			V'			30.0 m	120	
			W'			40.0 m	160	
U'	S'	—	X'		90°00'00"	10.0 m	40	
W'	U'		Y'		+90°00'00"	8.33 m	33.3	

Checked Tra



	INSTRUMENT POSITION	INITIAL OBJECT	ANGLE (-)	SECOND OBJECT	ANGLE	CORRECTED ANGLE	DISTANCE	D x 4	§ 2
	W	GG	—	HH		-90°00'00"	23.7 m	94.8	✓
	BB	GG	—	JJ		-90°00'00"	23.0 m	92	✓
	CC	GG	—	KK		-90°00'00"	22.75 m	91	✓
	DD	GG	—	LL		-90°00'00"	22.59 m	90.1	✓
	EE	W	—	MM		+90°00'00"	22.27 m	89.1	✓
	FF	W	—	NN		+90°00'00"	22.5 m	90	✓
	ROCK	Breakwater Lt.	00°00'07"	PP	181°48'02"	-178°12'05"	6.1 m	24.4	✓
	PP	Rockport Orth. Church	00°00'08"	South face of pier	63°06'53"	63°06'45"			
				QA			10.0 m	40	✓
				RR			20.0 m	80	✓
				SS			30.0 m	120	✓
				TT			40.0 m	160	✓
				UU			50.0 m	200	✓
	Y	Rockport Orth	00°00'01"	VV	00°00'00"	-00°00'01"	5.53 m	22.6	✓
	YV	Rockport Orth	00°00'03"	WW	338°43'42"	-21°-16'-14"	10.0 m	40	✓
				XX			20.0 m	80	✓
				YY			30.0 m	120	✓
				ZZ			40.0 m	160	✓
				A'			50.0 m	200	✓
				B'			60.0 m	240	✓
				C'			70.0 m	280	✓
				D'			80.0 m	320	✓
				E'			90.0 m	360	✓
				F'			100.0 m	400	✓
				G'			110.0 m	440	✓
				H'			120.0 m	480	✓
	G'	VV	—	J'		90°00'00"	15.43 m	61.7	✓
	E'	VV	—	K'		90°00'00"	18.46	73.8	✓
	C'	VV	—	L'		90°00'00"	18.55	74.1	✓

CHECKED DRN

STOCK NO. 37  
(4-30-57)  
COMM-DC 28424

LOB  
LOB 2  
LOB 3  
BK Wt Lt 1953

R O C R O C  
1902, 1953 1916-1953

	INSTRUMENT POSITION	INITIAL OBJECT	ANGLE (-)	SECOND OBJECT	ANGLE	CORRECTED ANGLE +R -L	DISTANCE	Dx4	I
	JET	Rockport Orth. Church	00°00'05"	A	246°39'59"	-113°20'06"	6.6m	26.4	✓
	A	Rockport Orth. Church	00°00'01"	B	54°32'21"	+54°32'20"	20.0m	80	✓
				C			40.0m	160	✓
				D			60.0m	240	✓
	D	Rockport Orth. Church	00°00'03"	E	36°27'00"	+36°26'57"	20.0m	80	✓
				F			40.0m	160	✓
				G			61.0m	244	✓
				H			84.5m	338	✓
				J			104.5m	418	✓
				GULL	47°30'54"	+47°30'51"	72.0m	(check)	208 ✓
	A	Rockport Orth. Church	00°00'02"	K	233°28'40"	-126°31'28" <sup>22"</sup>	158.0m	632	✓
				L	240°35'00"	-119°24'58" <sup>25"</sup>	146.0m	584	✓
				M	243°27'00"	-116°32'58" <sup>33.02"</sup>	116.0m	464	✓
				N	253°17'00"	-106°43'02"	107.0m	428	✓
				O	265°11'00"	-94°49'02"	105.0m	420	✓
				P	277°01'00"	-82°59'02"	110.0m	440	✓
				Q	286°41'00"	-73°19'02"	127.0m	508	✓
				R	299°36'00"	-60°24'02"	93.0m	372	✓
				S	303°21'00"	-56°39'02"	142.0m	568	✓
				T	308°06'00"	-51°54'02"	159.0m	636	✓
				U	317°40'00"	-42°20'02"	165.0m	660	✓
	ROCK	<del>JET</del>	202°26'40"	V	174°45'21"	<del>113°20'06"</del>	42.0m	168	✓
				W	165°13'34"	-37°15'15"	29.5m	110	✓
				X	307°02'03"	104°33'14"	78.0m	312	✓
				Fleet corner	313°13'43"	110°44'54"	24.0m	96	✓ Fleet is
				Fleet corner	309°56'43"	107°27'58"	30.0m	120	✓ 10.1 m long
				Y	321°24'04"	118°55'16"	42.0m	168	✓
	V	JET	00°00'07"	Z	308°31'	-51°29'	80.0m	320	✓
				AA	287°24'	-72°36'	68.0m	272	✓
	W	JET	00°00'04"	BB	251°01'03"	-108°59'01"	10.0m	40	✓
				CC			20.0m	80	✓
				DD			30.0m	120	✓
				EE			40.0m	160	✓
				FF			50.0m	200	✓
				GG			60.0m	240	✓
				checked		DEA			

TIDE NOTE FOR EX 2.5-1-67 (H-8944)

The tidal control requirements for this survey were specified in the Project Instructions - OPR473, dated 27 March, 1967. In compliance with said instructions, a portable tide gage was located at the Annisquam Bridge across the northeast branch of Annisquam Harbor at Latitude 42-39-17 N and Longitude 70-40-33 W. The 1927 Datum height is 1.5 feet above the zero reading on the tide staff. This was determined in Washington D.C. and corresponded to the Ship EXPLORER in a memorandum from Chief DATum Planes Section dated August 15, 1967.

Time Meridian 75° W.

TIDE NOTE FOR HYDROGRAPHIC SHEET

February 19, 1968

~~Nautical Chart Division~~ Atlantic Marine Center

Plane of reference approved in  
1 volumes of sounding records for

HYDROGRAPHIC SHEET 8944

Locality: Rockport Harbor, Mass.

Chief of Party: P. A. Stark, 1967

Plane of reference is mean low water

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

*Annisquam Bridge lat. 42°39'17" long. 70°40'33"  
Tide Sta. outside limits of H-8944*

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

8.7 feet

Remarks

*J. M. Symons*  
\_\_\_\_\_  
Chief, Tides and Currents Branch



Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. *H-8944 (EX-2.5-1-67)*

Records accompanying survey: Smooth sheets *1*;  
 boat sheets *1*; sounding vols. *1*; wire drag vols. *—*;  
 Descriptive Reports *1*; graphic recorder envelopes *None*;  
 special reports, etc. *—*  
*1-Compilation, T-12964(inset) Control*

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

Number of positions on sheet	<i>642</i>
Number of positions checked	<i>642</i>
Number of positions revised	<i>11</i>
Number of positions revised (refers to depth only)	<i>11</i>
Number of soundings/erroneously spaced	<i>—</i>
Number of signals erroneously plotted or transferred	<i>None</i>
Topographic details	Time <i>4 hrs.</i>
Junctions	Time <i>N.A.</i>
Verification of soundings from graphic record	Time <i>— Head Lead</i>
Special adjustments	Time <i>—</i>

Verification by *W.W. FAZEL* Total time *27 hrs.* Date *4/16/68*

Reviewed by *George K. Myers* Time *46 hrs* Date *10/23/70*

Inspected by *J. T. Gallahan* Time *37 hrs.* Date *3-30-77*  
*Carroll* *6 hr 5/4/77*



H-8944

Information for Future Presurvey Reviews

This is a large-scale (1:2,500) tagline survey of Rockport Harbor and is a good basic survey of an area with a relatively stable bottom. Major changes are the continued construction of man-made features.

<u>Position 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>
423	0704	2	6	25 years

OFFICE OF MARINE SURVEYS AND MAPS

MARINE SURVEYS DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-8944

FIELD NO. EX-2.5-1-67

Massachusetts, Cape Ann, Rockport Harbor

SURVEYED: September 23-28, 1967

SCALE: 1:2,500

PROJECT NO.: OPR-473

SOUNDINGS: Lead Line

CONTROL: Tagline measurements

Chief of Party .....	P. A. Stark
Surveyed by .....	R. A. Trauschke
.....	L. H. Peary
Protracted by .....	Ship's Personnel
Soundings Plotted by .....	Ship's Personnel
Verified and Inked by .....	W. W. Feazel (AMC)
Reviewed by .....	G. K. Myers
	Date: October 23, 1970
Inspected by .....	J. T. Gallahan

1. Description of the Area

This is a tagline survey of Rockport Harbor entrance and a small basin, detached from the main body of the survey, at latitude 42°39'34", longitude 70°37'03". Small boat landings and wharves are located within the harbor. The harbor entrance controlling depth is 13 feet. Two dredged basins at the southwest end of the harbor have a controlling depth of 7 feet.

Harbor Rock, located outside the harbor's entrance, is covered by 2 feet of water at mean low water.

2. Control and Shoreline

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

The shoreline originates with a preliminary manuscript inset of T-12964 (1967) and is more fully discussed under item 4b. Several offshore rocks awash shown on the present survey originate with the final reviewed manuscript of T-12964 (1965-69).

The mean high water line is shown for guidance only; the true position is shown on topographic survey T-12964 (1965-69).

### 3. Hydrography

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

Due to the unusually large scale of the present survey, the 3-, 24-, and 36-foot supplemental depth curves were added to more adequately depict the bottom configuration.

### 4. Condition of Survey

The field plotting, sounding record, the Descriptive Report, and the Atlantic Marine Center verification are adequate and conform to the requirements of the Hydrographic Manual, except as follows:

a. The inked shoreline on the smooth sheet is taken from a 1:2,500-scale compilation of the Rockport Harbor area of T-12924 (1965-69). Minor discrepancies exist between the shoreline on the present survey and that shown on final reviewed manuscript of T-12964 (1965-69).

b. The verified smooth sheet showed an offshore islet at latitude  $42^{\circ}39'35''$ , longitude  $70^{\circ}37'07''$  which originated with the preliminary manuscript of T-12964. This islet has been deleted and replaced with a rock awash baring 5 feet at MLW as shown on the final reviewed manuscript of T-12964 (1965-67).

### 5. Junctions

An adequate junction was effected with H-8940 (1967) in the area outside of Rockport Harbor. Scale differences prevented a direct coincidence of the depth curves in the junctional area.

### 6. Comparison with Prior Surveys

H-597	(1857)	1:10,000
H-2602	(1902)	1:10,000
H-4850	(1928)	1:5,000

The prior surveys cover the present survey in its entirety. A comparison between the prior and present surveys reveals generally good agreement in depths, except for changes resulting from dredging and fill in the basins and those areas as mentioned in the Descriptive Report. Artificial changes and erosion have altered the shoreline in numerous areas.

The 12 feet charted in latitude 42°39'43", longitude 70°36'41" from H-4850 (1928) falls in present depths of 24 feet and is considered disproved by the present survey.

Attention is directed to the Descriptive Report, Section J, "Comparison with Prior Surveys," for additional comparison of features with the present survey.

A 2-foot depth from H-4850 (1928) on Harbor Rock was carried forward to supplement present depths.

With this addition, the present survey is adequate to supersede the prior surveys within the common area.

7. Comparison with Chart 243, latest print date September 13, 1969

a. Hydrography

The charted hydrography originates in part with the previously discussed prior surveys which require no further consideration. A few soundings originate with a 1930-31 Massachusetts Department of Public Works survey (Bp-25957-58). The remaining depths are from the boat sheet (Bp-73626) and the verified smooth sheet of the present survey.

Attention is directed to the following:

(1) The two dredged areas with the legends "7 FT REP 1963" originate with the Corps of Engineers Chart Letter 129 of 1965. The legend should be revised to "7 FT 1967" to reflect present survey information.

(2) The charted alongshore ledge within Rockport Harbor originates with T-4395 (1928) and T-11156 (1952-53). Current information on the present survey shows this as low water mud, sand, or gravel area. T-12964 shows only a foul limit here. H-4850 (1928) shows mud bottom characteristics back of a low water line. The present survey representation should be charted.

Except as noted above, the present survey is adequate to supersede the charted hydrography within the common area.

b. Aids to Navigation

Rockport Breakwater Light and Harbor Rock buoy No. 4 are located on the present survey. These aids to navigation are in substantial agreement with the charted positions and adequately mark the features intended.

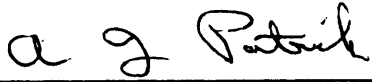
8. Compliance with Instructions

This survey adequately complies with the project instructions.

9. Additional Field Work

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

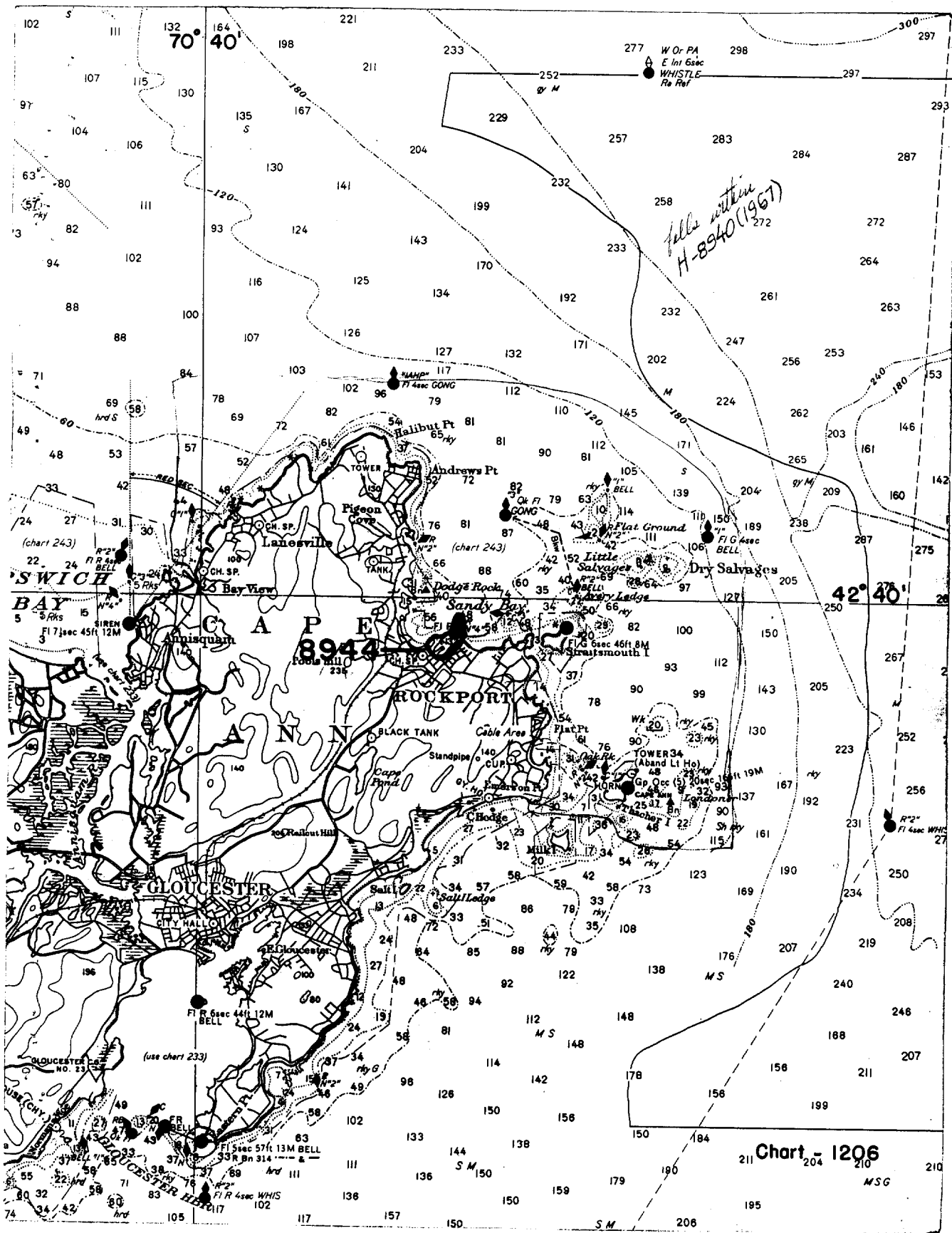
Examined and Approved:



Chief  
Marine Surveys Division



Associate Director  
Office of Marine Surveys  
and Maps



RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-8944

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
1206	12/19/68	<i>Steward</i>	<del>Full Part Before</del> After Verification <del>Review</del> Inspection Signed Via Drawing No.
243	10-5-70	<i>James Graham</i>	<del>Full Part Before</del> After Verification <sup>Before</sup> Review Inspection Signed Via Drawing No. <i>Added TRK in Rockport Hbr. to CHT 243</i>
613-SC	10-5-70	<i>James Graham</i>	<del>Full Part Before</del> After Verification <sup>Before</sup> Review Inspection Signed Via Drawing No. <i>Added TRK in Rockport Hbr. thru CHT 243 Dwg. #19 Before review &amp; inspection</i>
243	6-17-71	<i>Joe Esterreicher</i>	<del>Full Part Before</del> After Verification <del>Review</del> Inspection Signed Via Drawing No. <i>20 Examined Review. No additional critical corrections.</i>
243	8-25-72	<i>Joe Esterreicher</i>	<del>Full Part Before</del> After Verification <del>Review</del> Inspection Signed Via Drawing No. <i>21 Applied rocks and revised shoreline in conjunction with Adv. Memo T-12964</i>
243	7-22-77	<i>Josephine R. Harris</i>	<del>Full Part Before</del> After Verification <del>Review</del> Inspection Signed Via Drawing No. <i>26 Revised soundings &amp; depth curves. Revised rock &amp; shoreline in conjunction with T-12964</i>
613-SC	7-26-77	<i>Josephine R. Harris</i>	<del>Full Part Before</del> After Verification <del>Review</del> Inspection Signed Via Drawing No. <i>9 Revisions made thru pantograph reduction of Chart 243</i>
1206	7-29-77	<i>Josephine R. Harris</i>	<del>Full Part Before</del> After Verification <del>Review</del> Inspection Signed Via Drawing No. <i>Revisions made thru pantograph reduction of Chart 613-SC</i>
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.