

HYDROGRAPHIC TITLE SHEET

H-8941

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 10-3-67

State MASSACHUSETTS

General locality COAST OF MASSACHUSETTS

Locality S. E. CAPE ANN

Scale 1:10,000

Date of survey ^{30th of} JULY, 1967 to 21st of Sep^r 1967

Instructions dated 27 March 1967

Project No. OPR - 473

Vessel Launch EX 2 (EXPLORER'S) and EXPLORER

Chief of party E. E. Jones, CAPT USESSA, to 7/26/67, P. A. Stark, CDR USESSA to end of 1967 Field Season.
(Apparently E.E. Jones not a board during progress of this survey)

Surveyed by D. R. Askew, LT(jg) USESSA

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

Graphic record scaled by Ship Personnel

Graphic record checked by Ship Personnel

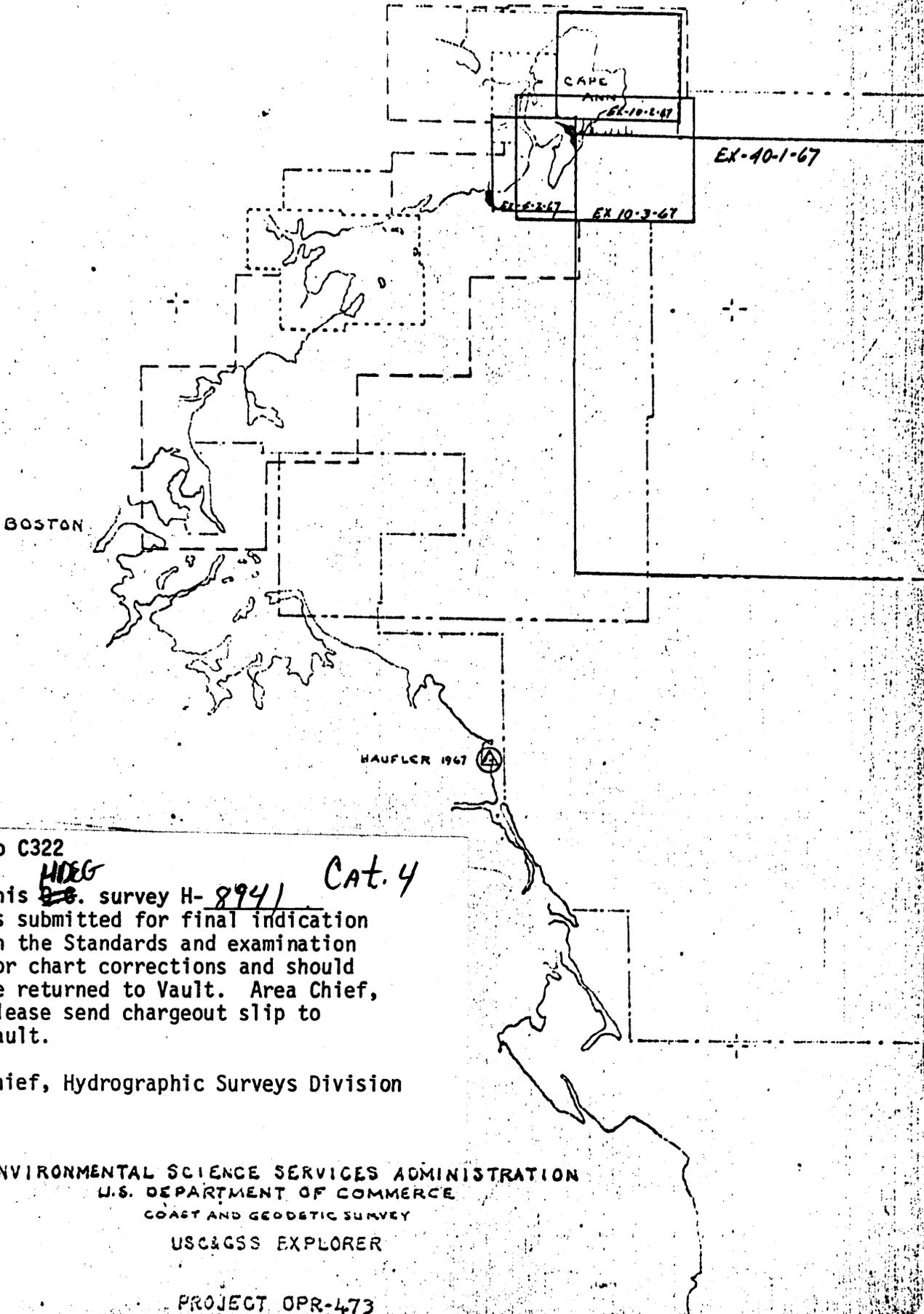
Protracted by D. R. Askew (Boat Sheet) Automated plot by Pacific Marine Center

Soundings penciled by Gerber Digital Plotter, P.M.C.

Soundings in ~~XXXX~~ feet at MLW ~~XXXX~~ Tide Gage located at Salem, Mass. Lat. 42°31'08" N, Long. 70°53'08" W.

REMARKS:

GMA
JMS



To C322

HDEG
This ~~is~~ survey H- 8941 *Cat. 4*
is submitted for final indication
on the Standards and examination
for chart corrections and should
be returned to Vault. Area Chief,
please send chargeout slip to
Vault.

Chief, Hydrographic Surveys Division

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

PROJECT OPR-473

DESCRIPTIVE REPORT

To Accompany Hydrographic Survey

EX ~~40-1-67 H8938~~^{10-3- H-8941}

1967 Scale 1:~~40,000~~^{10,000}

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

A. PROJECT

Hydrography was conducted in accordance with INSTRUCTIONS, OPR 473, CAPE ANN to CAPE COD, MASSACHUSETTS, dated 27 March, 1967. Ammended instructions, dated 11 May, specified the use of digital equipment to record hydrographic data. ✓

B. AREA SURVEYED

*Geographic Board Decision without "t" for the island's name; (with "t" for Δ)
See T-12964, A Thatchers Island*
The survey covers the south east coast of Cape Ann. This area extends from the southern tip of Thatcher Island to Eastern Point Lighthouse. The completed hydrography forms an irregular shape, extending south from Eastern Point Lighthouse to Latitude 42° 34' 05.1" N., Longitude 70° 39' 55.0" W.; hence northeast to Latitude 42° 36' 53.5" N, Longitude 70° 33' 00.0" N, hence north to Latitude 42° 37' 52.5" N, Longitude 70° 33' 00" N; hence westerly to the shore line of Cape Ann, hence southwesterly along the shoreline to the Eastern Point Lighthouse. The survey's inclusive dates are from 30 July 1967 to 21 September 1967, with a total of 23 workdays. ✓

The survey ~~makes junctions with~~^{overlaps portions of} the following prior surveys:

396a (1853)	1:10,000 scale	} prior coverage (see Review)
396b (1885)	"	
2269 (1896)	"	
H-3950 (wire drag) (1916)	"	
H-7140 (1947)	1:40,000 scale	
H-3948 (1916) WD	1:25,000	

A junction was made with the following contemporary surveys:

EX 40-1-67 on the southeast	(H-8938)
EX 10-2-67 on the north	(H-8940)
EX 5-2-67 on the west	(H-8943)
1969 survey on the southwest	(H-9090)

C. SOUNDING VESSEL

EXPLORER LAUNCH 2- brown color.

SHIP EXPLORER- blue color-one sounding line, fourteen positions, 30 ~~July~~ 1967. (pos. 3001-3014 record only on fathogram and printout) Aug. ✓

D. SOUNDING EQUIPMENT

SHIP EXPLORER- Raytheon DE-723 fathometer #258, positions 3001-3014.

LCH-2 Raytheon DE-723 fathometer #255.

The leadline and/or sounding pole was used where feasible when sounding for least depths in critical inshore areas with the launch. Bar checks and phase comparisons were taken periodically to determine echo sounder corrections for the launch hydrography. Temperature and salinity observations were made to determine echo sounder corrections for the ship. Draft corrections were observed for the ship hydrography.

E. SMOOTH SHEET

The smooth sheet will be plotted by computer methods at the Pacific Marine Center

F. CONTROL

Raydist electronic control was used for the greater part of this sheet. Red lanes are R₁ and the station was at Scituate (HAUFLER). Green lanes are R₂ and the station is at Race Point (DUNE). Each station was located by a short traverse using Electrotape and T-2 instruments. Red and green arcs were put on the boat sheet by the Norfolk Processing Office in Portsmouth.

Where possible, when the Raydist launch approached the shoreline, visible fixes were taken (with the launch stopped) to see if the Raydist signals were being affected by the ~~close~~ proximity to land. The Raydist signals in this area did not pass over intervening land areas and comparisons between visual and Raydist fixes indicated no discrepancies. However, due to faulty equipment at the green station, during later stages of hydrography it was necessary to use visual control taking advantage of the Red arc to keep the launch on the line between fixes (p, r and s days).

With the exception of nine triangulation stations and two signals cut in by sextants, all signals were located on Photographs 65-S-7048; 65-S-7049; 65-S-7050; 65-S-7051; 65-S-7052 (on Manuscript T-12971) and Photographs 65-S-7250, 65-S-7251 and 65-S-7252 (on Manuscript T-12964). These signals were used to control visual hydrography and calibrate the Raydist work.

The following is a list of Raydist and visual controlled positions:

RAYDIST Control

1-124, a day
125-306, b day
307-450, c day

Visual Control

603-642, f day
643-720, g day
721-784, h day

451-560, d day
561-602, e day
1021-1075, n day
1180-1214, q day

Total of 686 pos. RAYDIST
Control

785-870, j day
871-883, k day
884-943, l day
944-1020, m day
1076-1179, p day
1215-1352, r day
1353-1493, s day
1494-1549, u day
1550-1572, v day
1573-1636, w day
1637-1693, x day
5004-5037, t day(D.P.) Bottom Samples
5062, y day D.P.

Total of 1122 pos. Visual control

G. SHORELINE

Shoreline was transferred from manuscripts referred to in F. In the vicinity of Latitude $42^{\circ} 35' 40''$ N, to Latitude $42^{\circ} 36' 13''$ N and Longitude $70^{\circ} 37' 48.0''$ W to Longitude $70^{\circ} 38' 18.0''$ W, generally offshore from Beacon Hill, Sheet T-12971 shows several rocks that are awash at MLW. These rocks do not exist. These rocks were searched for by dropping buoys in the general location and running patterns back and forth while observing the fathometer. The area was also visited during periods at 6 to 8 foot ground swells to see if white water gave any indication of the rocks. No indications of rocks or shoaling were discovered. Local lobstermen verify that these rocks do not exist. *Reported to Photogrammetry - Rocks removed from T-sheet. H.L.P.*

H. CROSSLINES

There were 10.7% of crosslines on this survey. Crosslines were within acceptable limits of agreement with the exceptions noted. It appears that sounding crosslines of n day and a day are not in close agreement. The sounding lines are both Raydist controlled and it was expected that a jump in control had occurred. However, a recheck of calibration and position plotting proved that no jump had occurred. The only explanation is that it is in an area of extremely rocky bottom with sharp ledges and dropoffs.

The following is a position list of crosslines of n day and a day that are not in agreement. (Smooth plot did not uncover any discrepancy.)

<u>Latitude</u>	<u>Longitude</u>	<u>Discrepancy</u>
42° 35' 03.2" N	70° 38' 24.5" W	9'
42° 35' 05.2" N	70° 38' 02.5" W	13'
42° 35' 00.0" N	70° 38' 00.0" W	5'
42° 35' 04.0" N	70° 37' 50.6" W	9'

I. JUNCTIONS

H-8940 (1967)
EX-10-2-67B to the North- Satisfactory agreement.
EX-40-1-67 to the Southeast- Satisfactory agreement.
H-8938 (1967)

H-8943(1967)

EX-5-2-67 to the West- Satisfactory agreement. 8943

H-7140, 1:40,000, 1947 to the Northeast- Satisfactory agreement.

J. COMPARISON WITH PRIOR SURVEYS

- ✓ Presurvey review item #46, Latitude 42° 37' 36.5" N, Longitude 70° 34' 22.8" W, a 26' sounding, was searched for and verified? with a depth of 26'. See page 32 Sounding Volume X. 29 is 150 meters south of prior. Does not disprove H-3950 (1916) WD, source of the 26 ft. depth. 26-ft depth, 26 retained. See Review, Sec. 6C.
- ✓ Presurvey review item #47, Latitude 42° 36' 58.52" N, Longitude 70° 37' 57.94" W, is an approximately located landmark which was recommended in Coast Pilot Chart Letter no. 891 of 1959. This cupola is an excellent landmark and should be retained. It's position was determined on T-12964 by photogrammetric methods and used as signal SOW. A Form 567 has been prepared.
- ✓ Presurvey review item #48, Latitude 42° 35' 25.0" N, Longitude 70° 38' 38.0" W, an area of 5-8' foot soundings originating on H-396a. This area was adequately developed on overlay #1, pages 16-24 in Sounding Volume X. There are three main rocks that should be charted as shown on the boat sheet, but the area in general is foul with rocks and is protected by a red nun buoy #12". Pos. 1652-1681, Bemo Ledge at Brace Cove; see also T-397 and T-12967.
- Presurvey review item enclosed by dashed circle, Latitude 42° 38' 00.0" N, Longitude 70° 35' 03" W, is an area of shoal soundings between Milk Island and Thatcher Island. This area has been adequately sounded and results should supercede prior survey no. H-396b although soundings are in agreement, with one exception. In Latitude 42° 37' 55.2" N, Longitude 70° 35' 15" W, the charted sounding of 2' does not exist and should be deleted from the charts. No indications of this shoal sounding have been witnessed either on the fathogram or visits to the area in periods of heavy ground swells. (sound vol. H-396 "b" E 1885 after pos. 9, betw. 08:52:00 & 09:20:40, July 17, 1885, apparently is source) * See Review par. 6A (the islet and 2-ft. rock) Shoal disprove: pos. 327-328 " 381-388 " 676-676 H-8941
- Presurvey review item enclosed by dashed circle, Latitude 42° 37' 55" N, Longitude 70° 35' 42" W, is an area of shoal soundings between Milk Island and Emerson Point, and is named Milk Island Bar. This area has been adequately sounded and should supercede prior survey no. H-396b. The shoal sounding of 3' on chart 243 8th ed., 14 September 1964 corrected through 8 April 1967, in Latitude 42° 37' 54.5" N, Longitude 70° 35' 42.5" W, should be shifted south 80 meters to agree with 3' sounding of position 690-691 g day pg. 31 vol. IV. Erroneously converted from fathom to feet in 1916-1920. Should be 4 1/2 feet.
- ✓ Presurvey review items enclosed in dashed circle in Latitude 42° 37' 58.5" N, Longitude 70° 36' 18" W, does exist and is delineated on T-12964. This rock is bare 3' above MLW.
- ✓ Presurvey review items enclosed in dashed circles in Latitude 42° 37' 57.0" N, Longitude 70° 35' 57.0" W, do exist and were found during normal hydrographic coverage. (Milk Is. Bar) 23 #28-H depths.

- ✓ Presurvey review items enclosed in dashed circles in Latitude 42° 37' 38.0" N, and Longitude 70° 34' 58.0" W, do not exist as were disclosed during normal hydrographic coverage. These are soundings of 17' and 19' and do not exist in this area. Source: H-396 "b" ~~in 1885~~ (pres. survey shows 26 ft.) (17 inshore of charted 17' on pres. survey) ✓
- ✓ Presurvey review item enclosed in dashed circles in Latitude 42° 37' 53.8" N, and Longitude 70° 34' 39.0" W, is a 16' sounding. During normal hydrographic coverage an 18' sounding was recorded and should be charted. 16 ft. from H-3950 (1916) WD must be retained. ✓
- Presurvey review items enclosed in dashed circles in Latitude 42° 37' 30.0" N, and Longitude 70° 35' 43.0" W, is a 20' sounding and was verified during normal hydrographic coverage with shoaler depths inshore 20 ft. on H-3950 (1916) WD [source] ✓
- ✓ Presurvey review item enclosed in dashed circles in Latitude 42° 37' 31.0" N, and Longitude 70° 36' 45.0" W, is a 31' sounding. During normal hydrographic coverage a 27' sounding was recorded and should be charted at 42° 37' 30" - 70° 36' 48" (Source of 31 is an error in conversion from fathom to feet in year 1916-1920; should have been 36 ft.) ✓
- ✓ Presurvey review item enclosed in dashed circles in Latitude 42° 37' 10.5" N, and Longitude 70° 36' 44.0" W, is a 34' sounding. During normal hydrographic coverage a 37' sounding was recorded and should be charted. 28 ft Northwestward. (Pos. 1396-97) ✓
- ✓ Presurvey review items enclosed in dashed circles in Latitude 42° 37' 10" N, and Longitude 70° 37' 04.0" W, is known as Salt Island Ledge; a very closely spaced system of lines ~~was~~ run in this vicinity to develop the area. Three obvious discrepancies were found. See H-396 "a" - "b" (1853-1885) and pos. 5053 of this survey; also pos. 233-234; 1362-63; 936-937; 853-854; 1372-73; 846-847 ✓
- ✓ #1- The 6' sounding shown on chart 243 in Latitude 42° 37' 04.0" N, and Longitude 70° 37' 04.0" W, does not exist and should be deleted from the chart; this location has a depth of 37'. (6 ft. on H-396 "a") (located in H-396 "a" vols.) (apparent error 1853) could not plot. ✓
- ✓ #2- The 12' sounding shown on chart 243 in Latitude 42° 37' 06.5" N, and Longitude 70° 37' 03.5" W, does not exist and should be deleted from the chart. This location has depths of 30'. See Review 6A4 (12 ft. on H-396 "a") ✓
- ✓ #3- The chart shows 3 ^{subm.} rocks in Latitude 42° 37' 10.5" N, and Longitude 70° 37' 02.8" W. There are not 3 separate rocks in this area. It is a fairly large rocky area that has been delineated on the boat sheet with the main feature shown as a submerged rock. See page 7 (see H-396 "a") Sounding Volume X. This area is the only part of Salt Island Ledge that could be dangerous to small craft, and was quite evident during periods of heavy swell when breakers and white water disclosed the feature adequately. Rock awash at MLW ✓
- ✓ Presurvey review item enclosed in dashed circles in Latitude 42° 36' 01.0" N, and Longitude 70° 37' 40.0" W, is a 19' sounding. This sounding was searched for and the shoalest sounding was 23'. See page 61 Sounding Volume 5, and vol. 7, p. 42 (pos. 1299 plus 15 sec.) H-3950 - Apparent error in transcribing original records. Should be 29 feet which is in agreement with present depths. Disregard 19 ✓

The only surveys of this area were H 396a and H 397b, 1: 10,000 scale, surveys made in 1853 and these are not of sufficient accuracy or density to compare with today's surveys. A comparison was made with the largest scale chart of the area (which is based on the 1853 survey) and is in the next paragraph. ✓

K. COMPARISON WITH CHARTS

Reviewers Comparison with Chart # 233, Sixth Ed., Dec. 9, 1968
 Reviewers Comparison with Chart # 243, Eleventh Ed., Sept. 13, 1969
 Several comparisons have already been made with the largest scale chart in section J, presurvey review item. Comparison was made with C&GS 243, 8th ed., 14 September 1964. Corrected through Notice to Mariners no. 14, 8 April 1967. Agreement with Chart 243 was in general very poor. One reason could be that the bottom is extremely rocky. The second and most probable is that this survey is really the first basic survey ever done off the Southeast Coast of Cape Ann. See Review;

✓ Four soundings that should be mentioned, that have not been discussed previously and should be deleted, are the following: ✓

<u>Latitude</u>	<u>Longitude</u>	<u>Charted Sounding</u>	<u>H-8941 Base Chart Reduced Depths</u>
✓ 42° 36' 55.5" N	70° 36' 43.5" W	33	69
✓ 42° 36' 54.5" N	70° 36' 35.5" W	H-396 "a" 43	735
✓ 42° 36' 53.0" N	70° 36' 18.5" W	51	789
✓ 42° 36' 50.0" N	70° 36' 06.5" W	54	846

L. ADEQUACY OF SURVEY

EX-10-3-67 is a completed survey and adequate to supersede all previous surveys of this area for charting purposes.

M. AIDS TO NAVIGATION

Reviewers Comparison with Light List, year 1967
 Compared with Light List Volume I Atlantic Coast, CG-158, 1966. Brace Cove Buoy 2- red nun with red reflector, Latitude 42° 35' 17.6" N, Longitude 70° 38' 33.2" W, checks with light list. It is in 42' of water instead of the 30' depth of water as listed in the light list. See page 45 Sounding Volume VI. Eastern Point Ledge Buoy 4- Off southwest point of ledge, Latitude 42° 34' 39.1" N, Longitude 70° 40' 05.3", red nun with white reflector in 24' of water versus 21' of water as listed in the light list. See page 20 Sounding Volume VII. Eastern Point Lighted Whistle Buoy 2, Fl. R., 6^s (1^s Fl) red buoy in Latitude 42° 34' 13.4" N, Longitude 70° 39' 53.5" W. The buoy is in 99' of water which agrees with the light list. ✓

There are no unofficial aids to navigation, bridges or cables on this sheet.

N. STATISTICS

The survey covered 8.0 square nautical miles with a total of 1755 positions for 259.5 nautical miles of sounding lines for launch 2 and a total of 127 positions and 213 nautical miles of sounding lines for the SHIP EXPLORER. There were 39 bottom samples taken.

2.13

O. MISCELLANEOUS

None

P. RECOMMENDATIONS

None

Q. REFERENCES TO REPORTS

- Seasons Report
- Fathometer and Velocity Correction Report
- Raydist Report
- Coast Pilot 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.

Respectfully submitted by:

D. R. ASKEW
LTJG, USESSA

Approved and forwarded:

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

LIST OF SIGNALS ON EX-10-3-67

SIGNAL NAME	ORIGIN OF STATION
AMY (069)	T-12971
APE (001)	CAPE ANN NORTH LIGHTHOUSE, 1902-1953
ARM (020)	T-12964
BAR (064)	DOG BAR LIGHT, 1916-1953
BIT (056)	T-12971
BOX (026)	T-12964
BUS (007)	"
CAT (050)	T-12971
DAD (045)	"
DIM (022)	T-12964
DOC (049)	T-12971
DON (037)	"
EAT (052)	"
FAT (061)	"
FLY (012)	T-12964
FRY (028)	T-12971
FUN (004)	T-12964
GLO (062)	GLOUCESTER, EASTERN POINT RADIO MAST, 1940-1953
HAG (023)	T-12974
HAT (008)	THATCHERS ISLAND, 1849-1953
HER (005)	THATCHERS ISLAND SOUTH LIGHTHOUSE, 1940-1953
HID (029)	T-12971
HIM (039)	"
HOP (066)	"
JIM (071)	PAGE 39 & 40 SOUNDING VOLUME VI
JOE (059)	T-12971
JUT (021)	T-12964
KEY (067)	T-12971
KIS (070)	PAGE 39 & 40 SOUNDING VOLUME VI
LIG (063)	EASTERN POINT LIGHTHOUSE, 1902-1953
LIP (024)	T-12964
LIZ (055)	T-12971
LON (465)	LONDONER BEACON, 1849
LOR (053)	T-12971
MID (002)	T-12964
MIL (027)	MILK ISLAND 2, 1916-1953
MOM (038)	T-12971
MOP (043)	"
NAT (058)	"
NAW (015)	T-12964
NUX (017)	"
OAK (033)	T-12971
OIL (025)	T-12964
PAT (036)	T-12971
PIP (009)	T-12964
PIX (006)	"
POD (019)	"
POT (013)	"
RAP (046)	T-12971

← "T" OK

RAT (011)	T-12964
RIP (003)	"
ROD (040)	T-12971
RUB (014)	T-12964
SAD (044)	T-12971
SAL (031)	<u>SALT ISLAND 2, 1916-1953</u>
SEX (057)	T-12971
SOB (060)	"
SOP (030)	"
SOW (035)	"
SUE (016)	T-12964
TAP (054)	T-12971
TIP (042)	"
TOM (051) <i>TOP (047)</i>	<u>"</u> T-12971
TUB (010)	T-12964
VAN (018)	T-12964
WAX (065)	T-12971
WEB (048)	"
WIN (032)	"
WIT (034)	"
ZAG (068)	"

NORFOLK HYDROGRAPHIC PROCESSING BRANCH

FATHOMETER VELOCITY CORRECTIONS

SURVEY H-8941

LAUNCH 2, FATH. NO., 255

JULIAN DAYS 211 thru 215

TABLE 1

0.0 to	10.0'	1.0
	40.0	1.2
	200.0	1.4

JULIAN DAYS 225 thru 264

TABLE 2

0.0 to	5.0'	0.8
	10.0	1.0
	18.0	1.2
	25.0	1.4
	60.0	1.6
	160.0	1.8

SHIP EXPLORER - POLE & LEADLINE TABLE 3

0.0' ALL DEPTHS

TIDE NOTE

The tidal control requirements for this survey were specified in the Project Instructions - OPR 473, dated 27 March 1967. In compliance with said instructions, a portable tide gage was located at the end of the Salem Naval Reserve Training Center Wharf, Latitude 42°31'08"N and longitude 70°53'13"W.

*off sheet
Limits*

Mean low water on the staff corresponds to 1.4 feet on the tide staff as indicated in a memorandum from Chief Datum Planes Section dated August 15, 1967; Subject: Tidal data OPR 473.

Hourly heights for days during which the gage malfunctioned will be provided by the Tides Section, based on Boston data.

No tidal zoning was necessary for this survey, as indicated in a memorandum from Chief; Datum Planes Section, dated August 15, 1967 Subject: Tidal data OPR 473.

FIG. 18.

DESCRIPTIVE REPORT DATA RECORD		
PART I SMOOTH SHEET PREPARATION		
	PREPARED BY/OPERATOR	DATE
A. PLOTTER OPERATOR	EDAT	
B. DISTORTION MARKS PLOTTED	EDAT	
C. PROJECTION INTERSECTIONS PLOTTED	EDAT	
D. POINTS OF ELECTRONIC CONTROL ARCS PLOTTED	EDAT	
E. OVERLAYS PREPARED BY	EDAT	
1. POSITION NUMBER	EDAT	
2. EXCESS SOUNDINGS	EDAT	
3. PRELIMINARY SMOOTH PLOT	EDAT	
4. LIST OTHERS		
A.		
B.		
F. SOUNDING SELECTION BY	EDAT	
G. PLOTTER INPUT	PREPARED	EDAT
H.	CHECKED	EDAT
I. DESCRIPTIVE REPORT ADDENDUMS		
PART II SMOOTH SHEET COMPLETION		
	CARTOGRAPHER	DATE
A. DISTORTION SCALE TICKS IDENTIFIED BY NOTE	W.L. JONNS	7/7/69
B. PROJECTION INTERSECTIONS VERIFIED BY	W.L. JONNS	7/7/69
C. PROJECTION LINES RULED BY	W.L. JONNS	7/8/69
D. ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED	W.L. JONNS	7/8/69
E. OVERLAYS COMPLETED BY		
1. POSITION NUMBER LEADERS ADDED	W.L. JONNS	7/2/69
2. EXCESS SOUNDING OVERLAY COMPARED	G.F. TREFETHEN	1/29/69
3. PRELIMINARY SMOOTH PLOTS COMPARED	G.F. TREFETHEN	2/5/69
4. OTHERS UTILIZED		
A.		
B.		
F. DESCRIPTIVE REPORT ADDENDUM	W.L. JONNS	9/5/69
G. CONTROL STATIONS VERIFIED		
H. POSITIONS MANUALLY PLOTTED	G.F. TREFETHEN	9/6/68
I. MANUAL PLOT VERIFIED	G.F. TREFETHEN	1/24/69
J. SHORELINE APPLIED	W.L. JONNS	9/4/69
K. BOTTOM CHARACTERISTICS ADDED	W.L. JONNS	7/29/69
L. NOTES AND DEPTH CURVES ADDED	W.L. JONNS	9/29/69

H- 8941

- A. Additions and corrections have been furnished the plotter
Except those listed for correct-
center by the verification unit. ion by Review,

Date Nov. 7, 1969

Signed *Abraham S. Puffer*
Title Chief, Hydro Branch, AMC

- B. Additions and corrections have been added to the survey
Review
records and the final smooth sheet forwarded to the ~~verifica-~~
~~tion~~ unit.

Date Nov. 7, 1969

Signed *Abraham S. Puffer*
Title Chief, Hydro Branch, AMC

- C. The smooth sheet has been inspected, is complete, and
meets the requirements of the General Instructions for
automated surveys and the Hydrographic Manual. (Note:
All exceptions are listed in the verifier's report).

Date Nov. 7, 1969

Signed *Abraham S. Puffer*
Title Chief, Hydro Branch, AMC

- D. Smooth sheet and records forwarded to Rockville, Maryland
Office.

Date Nov. 12, 1969.

TIDE NOTE FOR HYDROGRAPHIC SHEET

February 29, 1968

~~XXXXXXXXXXXXXXXXXXXX~~ Pacific Marine Center

Plane of reference approved in
~~XXXXXXXXXXXXXXXXXXXX~~ for

HYDROGRAPHIC SHEETS 8941 & 8943

Locality: Cape Ann, Massachusetts

Chief of Party: E. E. Jones, 1967

Plane of reference is mean low water

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

Salem

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

Salem = 8.8 feet

Remarks

J. M. Simon
Chief, Tides and Currents Branch

GEOGRAPHIC NAMES

Survey No. H-8941

Name on Survey	Source of Name											
	A	B	C	D	E	F	G	H	K			
Bass Rocks												1
Bemo Ledge												2
Brace Cove												3
Brace Rock												4
Brier Neck												5
Cape Ann												6
Cape Hedge												7
Eastern Point												8
Eastern Point Ledge												9
Emerson Point												10
Good Harbor Beach												11
Lands End												12
Londoner												13
Long Beach												14
Milk Island												15
Milk Island Bar												16
Salt Island												17
Salt Island Ledge												18
Thacher Island												19
Webber Rock												20
												21
												22
												23
												24
												25
												26
												27

PREPARED BY

Frank W. Sickett
CARTOGRAPHIC TECHNICIAN

APPROVED BY

A. J. Wright
CHIEF GEOGRAPHER

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-8941

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		/	BOAT SHEETS		/	
DESCRIPTIVE REPORT		/	OVERLAYS		14 + 1 Mylar P&S Overlay	
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS Brush Tapes	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES	*		3			
CAHIERS	1		1	1		
VOLUMES	10 + 1 calibration					
BOXES						

T-SHEET PRINTS (List) *See page 7 of D. Report* T-12964 & T-12967

SPECIAL REPORTS (List)

See page 7 of D. 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				1808 1775
POSITIONS CHECKED		200	17	217
POSITIONS REVISED		110	pos. # 5050 1 (?)	111
DEPTH SOUNDINGS REVISED		30	5	35
DEPTH SOUNDINGS ERRONEOUSLY SPACED			0	-
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED			0	-
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		60	20	80
JUNCTIONS		6	3	9
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		31	3	34
TRA-TIDES-STYLIUS ARM CHECK SPECIAL ADJUSTMENTS	37		0	-
ALL OTHER WORK		393	185	578
TOTALS	37	490	211	701

PRE-VERIFICATION BY <u>A.K. Schugeld, G.F. Trefethen</u>	BEGINNING DATE <u>May 2, 1968</u>	ENDING DATE <u>May 6, 1968</u>
VERIFICATION BY <u>W.W. Feazel, G.F. Trefethen, W.V. Johns</u>	BEGINNING DATE <u>Sept. 2, 1968</u>	ENDING DATE <u>Oct. 30, 1968</u>
REVIEW BY <u>S. Rose</u>	BEGINNING DATE <u>May 25, 1970</u>	ENDING DATE <u>Sept. 22, 1970</u>

See page 6 KM year 48 hrs P. ENGLE 30 hrs 9/7/78

REGISTRY NO. A-8941

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-8941

Items for Future Presurvey Reviews

There are no significant differences between the prior and present surveys.

At some future time the rock awash carried forward from H-3695 in latitude 42°37.95', longitude 70°35.23' and discussed in the Review, par. 6A (The islet and 2-ft. sounding), should be investigated by Wire Drag for final disposition.

WD investigation not likely. Intensified study possible

*DH
5/1/80*

<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

HYDROGRAPHIC SURVEYS DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-8941

FIELD NO. EX-10-3-67

Massachusetts, Southeast Coast of Cape Ann, Thacher Island to Eastern Point

SURVEYED: July 30 - September 21, 1967

SCALE: 1:10,000

PROJECT NO.: OPR-473

SOUNDINGS: DE-723 Depth Recorders
Lead Line

CONTROL: Raydist
Sextant Fixes on
Shore Signals

Chief of Party	P. A. Stark
Surveyed by	D. R. Askew
Automated Plot by	Gerber Digital Plotter (PMC)
Verified by	W. W. Feazel, G. F. Trefethen, W. L. Jonns
Reviewed by	S. Rose
Cursory inspection made--survey processing considered complete	Date: September 22, 1970 G. K. Myers August 12, 1976

1. Description of the Area

This survey covers an area off the southeast coast of Cape Ann which extends from Eastern Point to Thacher Island. The bottom in this area slopes gradually from shore. Along the shore there are ledges and boulder strewn beaches.

The predominate bottom characteristic in this area is rocky.

2. Control and Shoreline

The source of control is adequately described in the Descriptive Report.

The shoreline originates with final reviewed manuscripts T-12964 (1965-69) and T-12967 (1965-68) and is shown for guidance only. Its true position is shown on the aforementioned manuscripts.

Several foreshore characteristics shown as "rky" or "Rocky" on the above manuscripts were described by the more appropriate "Boulders" on the smooth sheet of the present survey.

H-8941

3. Hydrography

- A. Depths at crossings are in good agreement.
- B. The usual depth curves are adequately delineated.
- C. The development of the bottom configuration and the investigation of least depths are considered adequate except in areas where numerous soundings from prior wire drag surveys were not verified or disproved.

4. Condition of the Survey

The field work, sounding records, Descriptive Report, and Atlantic Marine Center verification are adequate and conform to the requirements of the Hydrographic Manual, supplemented by the Instruction Manual for Automated Hydrographic Surveys.

5. Junctions

Adequate junctions were effected with H-8938 (1967) on the south and H-8943 (1967) and H-9090 (1969) on the west. Junction with H-8940 (1967) on the north will be discussed in the review of that survey.

6. Comparison with Prior Surveys

A.	H-396a	(1853)	1:10,000
	H-396b	(1873-75)	1:10,000
	H-516	(1854-55)	1:80,000

The prior surveys taken together cover the present survey. The reconnaissance nature of H-396a and H-516 preclude a detailed comparison in many areas common to the present survey. The following charted soundings from H-396a and H-396b significantly differ with present depths.

(1) The charted 8-, 13-, and 29-foot soundings in the immediate vicinity of latitude $42^{\circ}35.1'$, longitude $70^{\circ}38.9'$ originate with a single sounding line from H-396a. The soundings fall in depths that are 11-22 feet deeper on the present survey.

(2) The charted 30-foot sounding at latitude $42^{\circ}36.42'$, longitude $70^{\circ}37.62'$ falls in present depths of 40-43 feet.

(3) The charted 33-, 43-, 51-, and 54-foot soundings in the vicinity of latitude $42^{\circ}36.90'$, longitude $70^{\circ}36.55'$ fall in present depths of greater than 70 feet.

(4) The 6- and 12-foot soundings charted at latitude $42^{\circ}37.05'$, longitude $70^{\circ}37.01'$ and latitude $42^{\circ}37.08'$, longitude $70^{\circ}37.05'$ fall in present depths of greater than 30 feet.

(5) The 11-foot sounding charted at latitude $42^{\circ}37.90'$, longitude $70^{\circ}35.14'$ falls in present depths of 18-20 feet.

(6) The 18-foot sounding charted at latitude $42^{\circ}37.96'$, longitude $70^{\circ}34.95'$ falls in present depths of 28-30 feet.

(7) The 19-foot sounding charted at latitude $42^{\circ}37.68'$, longitude $70^{\circ}34.90'$ falls in present depths of 26 feet.

The above differences are considered to be due to errors on the prior surveys. The prior depths are considered to be discredited by the development on the present survey and should be disregarded.

The islet (actually a zero sounding on a rock) and 2-foot sounding charted in the immediate vicinity of latitude $42^{\circ}37.95'$, longitude $70^{\circ}35.23'$ originating with H-396b fall in present depths of 12-16 feet. Neither the rock nor the 2-foot depth was found on the present survey. However, this feature was supported by soundings from two other lines on the prior survey and has been carried forward to the present survey as a rock awash pending future disposal by wire drag.

The three submerged rock symbols charted in the immediate vicinity of latitude $42^{\circ}37.18'$, longitude $70^{\circ}37.05'$ were not found during the field investigation. However, breakers were observed and a rock awash was located at this position. The symbols should be deleted from the chart in favor of the present survey data.

The black specks charted in the vicinity of latitude $42^{\circ}35.45'$, longitude $70^{\circ}38.66'$ were adequately investigated and found to be rocks on the present survey. These rocks should be charted in accordance with the present survey.

B. H-2269 (1896) 1:10,000

This prior survey covers the southwestern part of the present survey. A detailed comparison between prior and present depths reveals a stable bottom.

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

C.	H-3947 WD	(1916)	1:80,000
	H-3948 WD	(1916)	1:25,000
	H-3950 WD	(1916)	1:10,000

These wire-drag soundings cover portions of the present survey area. No conflicts between present depths and effective wire-drag depths were found. Several soundings from H-3948 WD and H-3950 WD have been brought forward to supplement the present survey.

The position of the 26-foot sounding in lat. $42^{\circ}37'36.5''$, long. $70^{\circ}34'22.8''$ from H-3950 WD was not verified or disproved on the present survey. The 26-ft. depth was questionable because H-3950 showed a 32-ft. drag passing over it. However, it originated with a 27-ft. grounding supported by a detached position and a 26-ft. sounding. It has been carried forward to the present survey. Bight on
H-3950
misplotted

7. Comparison with Chart 233 (latest print date December 9, 1968)
243 (latest print date September 13, 1969)

A. Hydrography

The charted hydrography originates with the previously discussed surveys which need no further consideration supplemented by the boat sheet of the present survey and an unknown source.

Attention is directed to the following:

(1) The rock awash charted at latitude $42^{\circ}35.39'$, longitude $70^{\circ}39.01'$ originates with the boat sheet of the present survey and falls in present depths of 7-10 feet. The survey records reveal the rock to plot about 45 meters inshore of its boat sheet position in an area strewn with rocks. The charted rock is considered to be in error and should be revised in accordance with the smooth sheet.

(2) The 17-foot sounding charted at latitude $42^{\circ}37.60'$, longitude $70^{\circ}35'$ appeared on the chart in 1919 from an unknown source. This sounding falls in present depths of 25-27 feet and should be disregarded.

(3) The cupola charted as an approximately located landmark in latitude $42^{\circ}36.99'$, longitude $70^{\circ}37.96'$ from Chart Letter No. 891 of 1959 was verified on the present survey and should be charted as an accurately located landmark.

B. Aids to Navigation

The charted aids to navigation adequately mark the features intended.

8. Compliance with Project Instructions

This survey adequately complies with the Project Instructions.

9. Additional Field Work

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

Examined and Approved:



Chief
Hydrographic Surveys Division



Associate Director
Office of Marine Surveys
and Maps

70° 40'

(JOINS CHART 1209)

CAPE ANN

GLOUCESTER

1850

3950 W.D.

8941

4849

143

350 W.D.

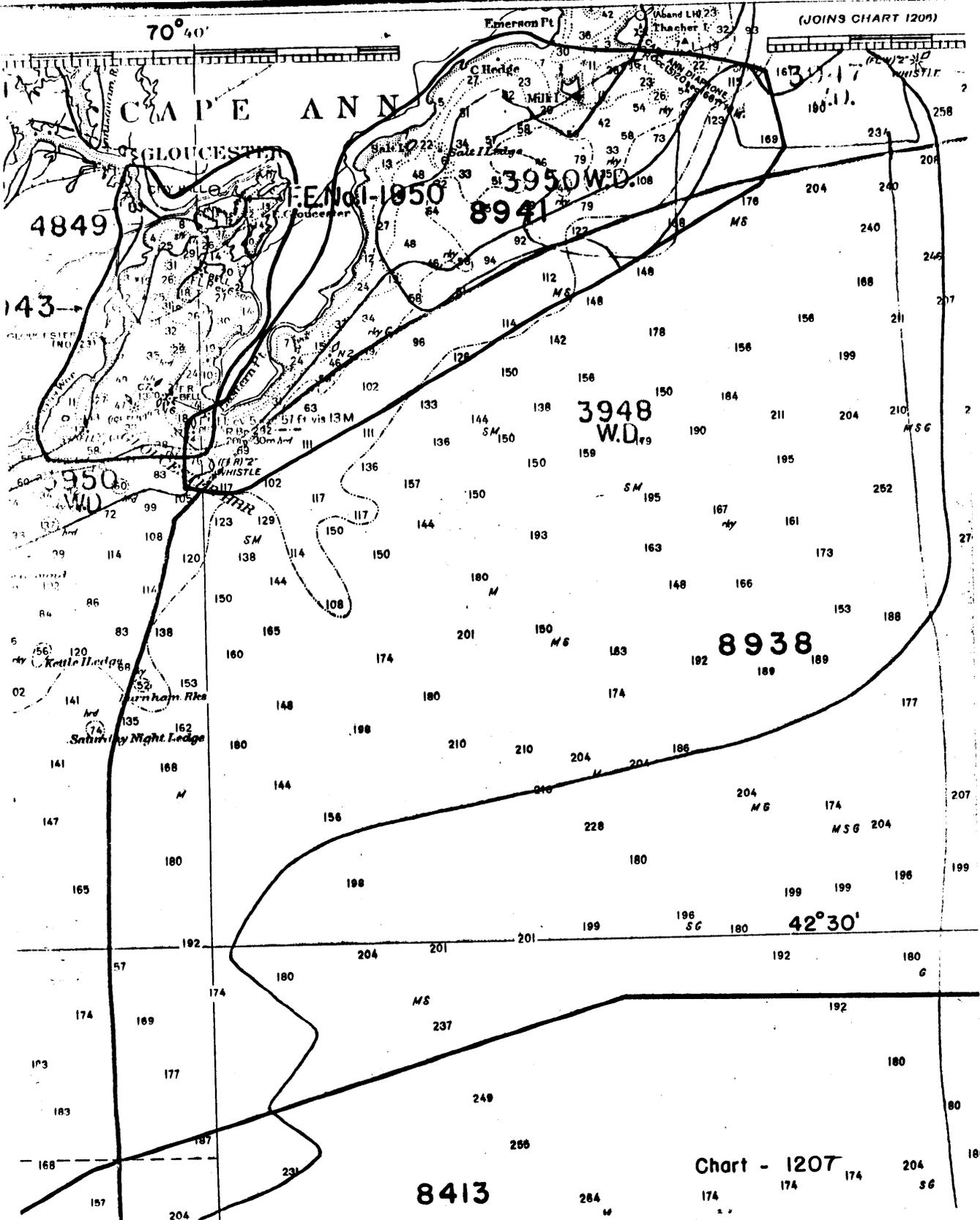
3948 W.D.

8938

42° 30'

8413

Chart - 1207



RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-8941

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
1106	8/13/70	JEFFREY STUART	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>EXAMINED NO CRITICAL CORRECTIONS</i>
1207	4-16-70	<i>Eric Fry</i>	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>revised five critical soundings only.</i>
243	7-2-70	<i>M. More</i> <i>Konnm reviewer</i>	Full Part Before After Verification ^{before} Review Inspection Signed Via Drawing No. <i>Added NUMEROUS ROCKS & SANDS</i>
613-5C	10-2-70	<i>James Dickson</i>	Full Part Before After Verification ^{before} Review Inspection Signed Via Drawing No. <i>Added Rks & sandgs. thru cht. 243 dug #19 Before review & inspection</i>
1206	10-9-70	<i>H. Radd</i>	Full Part Before After Verification ^{before} Review Inspection Signed Via Drawing No. <i>part app'd thru cht. 243 #19 (see history of cht. 1206 #24 concerning Review)</i>
613-5C	10-12-70	<i>James Dickson</i>	Full Part Before After Verification ^{before} Review Inspection Signed Via Drawing No. <i>App'd reviewers report directly to cht. 613-5C after review before inspection</i>
233	11-19-70	<i>Jeanette McConno</i>	Full Part Before After Verification ^{before} Review Inspection Signed Via Drawing No. <i>13 at Proof Stage</i>
1207	3-11-71	<i>D. Chapman</i>	Full Part Before After Verification ^{before} Review Inspection Signed Via Drawing No. <i>31 Applied thru 613-5C.</i>
1106	4-15-71	<i>D. Chapman</i>	Full Part Before After Verification ^{before} Review Inspection Signed Via Drawing No. <i>Examined Critical Corr. thru 1207 DWG #31</i>
71			Full Part Before After Verification ^{before} Review Inspection Signed Via Drawing No. <i>25 Exam thru cht. 1106 (partly app'd.)</i>
243	6/21/71	<i>Joe Esterreicher</i>	Part After Verification Review before Inspection Signed Via Drawing No. <i>20 Added (a) to * Critical Corr. from Reviewers Report only</i>
70	7-30-71	<i>KIRBY GEAN</i>	PART AFTER VER & REVIEW BEFORE INSP THRU CHART 71 DRW # 25
{ 1107 1106	8-31-71	<i>KIRBY GEAN</i>	PART AFTER VER & REVIEW BEFORE INSP THRU CHART 1207 DRW # 31

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-8941

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
233	9-5-72	J. Bailey	Full Part Before After Verification Review Inspection Signed Via ^{Before} Drawing No. Re-applied for additional critical corrections
233	6-5-72	Josephine R. Harris	Full Part Before After Verification Review Inspection Signed Via Drawing No. Direct Application thru smooth sheet
13279	5/30/80	Charles D. Meador	Full Part Before After Verification Review Inspection Signed Via Drawing No. 29 CHANGED CURVES AND SOGS, ADDED ROCKS AND BOTTOM CHARACTERISTICS
13009	5/30/80	Charles D. Meador	Full Part Before After Verification Review Inspection Signed Via Drawing No. 34 EXAMINED AND NO CORRECTIONS
13000	6/4/80	Charles D. Meador	Full Part Before After Verification Review Inspection Signed Via Drawing No. 44 EXAMINED AND NO CORRECTIONS
13274	10-8-80	D. Wylie	Full Part Before After Verification Review Inspection Signed Via Drawing No. 12 B THRU CHT 13279
13278	10-9-80	D. Wylie	Full Part Before After Verification Review Inspection Signed Via Drawing No. 30 THRU CHT 13274
13267	10-20-80	Robert Healey	Full Part Before After Verification Review Inspection Signed Via Drawing No. 40X
13281	11-17-80	Robert Healey	Full Part Before After Verification Review Inspection Signed Via Drawing No. 18 2HR Ver 11-17-80 Ver 0.5hr
13279	11-13-80	Robert Healey	Full Part Before After Verification Review Inspection Signed Via Drawing No. 29. REAPPLIED 12HR Ver 11-17-80 Ver OC 2.0hr
13274	12-12-80	Josephine R. Harris	FULL AFTER VERIFICATION REVIEW INSPECTION SIGNED VIA DRG # 12B (REAPPLIED) THRU CHART 13279 14hrs Ver 5HR GH
13267	4.13.81	WINN	REAPPLIED THRU 13274 FINAL FULL (8.0wa cm) AFTER VER, REV, INSP. ON DRG. #40 REV 3HR
13278	4.13.81	WINN	REAPPLIED THRU 13267 FINAL FULL (8.0wa cm) AFTER VER, REV, INSP ON DRG # 31 REV 3HR
13200	8-13-82	R. Winnfield	FULL after Verification Review Inspection signed Via Drawing # 35 1.5hr 15-min Ver OC

