

8943

Diag. Cht. No. 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-5-2-67
Office No. H-8943

LOCALITY

State MASSACHUSETTS
General Locality CAPE ANN
Locality GLOUCESTER HARBOR

1967

CHIEF OF PARTY

P. A. Stark

LIBRARY & ARCHIVES

DATE 7/1/69

8943

HYDROGRAPHIC TITLE SHEET

H-8943

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 5-2-67

State MASSACHUSETTS

General locality CAPE ANN

Locality GLOUCESTER HARBOR

Scale 1:5,000 Date of survey 11-29 September 1967
27 March 1967

Instructions dated 11 May 1967 Amendment Project No. OPR-173

Vessel USC&GSS EXPLORER OSS 28

Chief of party CDR. P.A. Stark

Surveyed by LT. Merritt N. Walter; LTjg. D.R. Askew; LTjg. L.H. Perry

Soundings taken by echo sounder, hand lead, pole

Graphic record scaled by H.J. Berman; M.G. Billos

Graphic record checked by ENS. J.E. Clark

Protracted by Gerber Digital Plotter, PMC Automated plot by Gerber Digital Plotter

Soundings penciled by Gerber Digital Plotter, PMC

Soundings in fathoms feet at MLW MLLW Salem gage 42°31'08"N 70°53'13"W

REMARKS: AWOIS / SURF checks M&M 12/5/85

Inset:
Inner Harbor Pier Facings:
Scale 1:2,500 on Boat Sheet
1:5,000 on Smooth Sheet

DESCRIPTIVE REPORT

To accompany hydrographic report
scale 1:5000 (1:2500 of inner harbor pier facings) 1967
USC&GSS EXPLORER OSS 28
Launches 2,3,4, and Skiff 1A
CDR. P.A. Stark Commanding Officer

A. PROJECT:

Hydrographic survey, OPR-473, was conducted in accordance with instructions dated 27 March 1967 and amendment instruction dated 11 May 1967.

B. AREA SURVEYED:

This survey covers the harbor of Gloucester, including the Blynman Canal to the railroad bridge, on the south side of Cape Ann in the state of Massachusetts. The southern boundary is latitude 42°34'30"N and extends from 70°40'00"W to 70°41'45"W. The survey was conducted from 11 to 29 September 1967, using three boat sheets: EX 5-2-67A extending south from Mayflower Ledge, EX 5-2-67B extending north of Mayflower Ledge, and EX 5-2-67C covering the inner harbor pier facings on a scale of 1:2500. Junction is made with contemporary survey H-8941 (EX 10-3-67) on the east, completed August 1967 and H 8942 (EX 5-1-67) at the railroad bridge on the Blynman Canal, completed September 1967.

C. SOUNDING VESSELS:

1. Launch #2 denoted by brown day letters, EX 5-2-67B
2. Launch #3 denoted by red day letters, EX 5-2-67B
3. Launch #4 denoted by blue day letters, EX 5-2-67A
4. Skiff #1A denoted by green day letters, EX 5-2-67C

D. SOUNDING EQUIPMENT:

Raytheon DE 723 fathometers, calibrated at 800 fms/sec, were used to obtain most soundings. A lead line was used along jetties in the inner harbor. A calibrated pole was used at the head of the stream in pre-survey review item number 26 and at selected rocks awash.

Fathometer corrections were determined by bar checks and phase comparisons. Velocity corrections were determined by salinity and temperature measurements; an abstract of which is found attached to this report. See Norfolk Fathometer Report.

Launch fathometer serial numbers follow:

Launch #2, serial No. 255 ✓

Launch #3, serial No. 518 for day letters a thru b, thence serial No. 255 ✓

Launch #4, serial No. 536

E. SMOOTH SHEET:

The smooth sheet will be plotted by automated methods at the Pacific Marine Center. Note subparagraph two of paragraph "R". ✓

F. CONTROL:

Horizontal control was accomplished by visual means except for soundings along piers in the inner harbor, which was done by graphically positioning soundings relative to pier points. (see boat sheet of inner harbor, 1:2500 scale) ✓

Available triangulation was plotted using forward and back dm's and dp's. Other signals were located by photogrametric methods using preliminary manuscripts T-12970 and T-12971 dated June 1967, except for signals PAX, YAK, and SIX which were cut in by sextant angles. See launch #4 Volume I page 19; Launch #4 volume I page 3 and Launch #2 volume I, page 16 respectively. See Review ✓

13

G. SHORELINE:

All shorelines originated from manuscripts listed in Paragraph "F" above. ✓

The low water line was not defined by soundings in some scattered areas due to the inability to carry lines inshore during periods of low tide and heavy weather without damage to launches. However, adjacent sounding lines completed on subsequent days indicate that the shore line is essentially correct. ✓

H. CROSS LINES:

Cross lines are adequate, producing crossings in agreement and are in compliance with current C&GS hydrographic regulations. ✓

I. JUNCTIONS:

Comparison with contemporary survey H-8941, ⁽¹⁹⁶⁷⁾ (EX 10-3-67) was made and is generally in agreement within two feet, a variance which is accredited to the presence of rocks in the area. Junction, somewhat revised by reviewer, is O.K. ✓

No. 22. Charted 200 at lat. 42°35'58.7" long. 70°39'34.1" found as
rock awash at lat. 42°35'59" long. 70°39'33.2" See smooth sheet.

Soundings are in agreement with contemporary survey H-8942 ⁽¹⁹⁶⁷⁾ ~~(EX-167)~~ at the railroad bridge on the Blynman Canal. ✓

J. COMPARISON WITH PRIOR SURVEYS:

Pre-survey review item findings, with corresponding number to PRE-SURVEY REVIEW OPR-473, are as follows:

No. 16. One sunken wreck was found as charted at 42°36'40.7"N 70°40'08.7"W, the outer limits of which are noted in volume X13 page 58 and 59 of launch #2. Source: Chart Letter # 738 (1959) ✓
Charted sunken wreck found as HK (barge) bare 5ft. at MHN.

No. 17. The rock awash at 42°36'31.9"N 70°40'21.4"W was located as listed, but bares at 1.6 feet vice 1 foot. See launch #3 volume IV page 24 D.P. 5074 and 5075. Source: Chart Letter # 1205 (1966) ✓

No. 18. Subject monument located 230 yards east of the entrance to the Blynman Canal is not conspicuous enough to be of piloting value to mariners, hence its location on C&GS chart 233 should be discontinued. Source: Chart Letter 892 (1959) (also on T-9079 and on T-12971) ✓
Pos. Lat. 42°36'36" - Long. 70°40'15"

No. 19. Both the piling and the dolphin were located at positions listed. Dolphin 42°36'33.7"N 70°40'13.6"W. Piling 42°36'30.0"N 70°39'59.9"W. Source: T-4393 (1928) ✓
5000 (pos. 5070 on pres. surv.)

No. 20. See 1:2500 scale of inner harbor for location of wrecks, piles, and changes to pier structures. ✓

No. 21. The 13 foot sounding was located as listed at 42°36'22.0"N 70°40'01.7"W, but reduced to 12 feet. See launch #3 volume IV page 62 D.P. 5081. Source: USE. bp. # 52390 (1955). On H-4849 (1928) it's 14 ft. ✓
12RX shown on smooth sheet

No. 22. The rock awash was verified to be at position 42°36'14.5"N 70°39'37.2"W. See launch #3 volume IV page 24 D.P. 5078 (Source: Ch. Let. 677 [1932]) ✓

No. 23. Three of the four 18 foot soundings were verified. One before position 1099 volume V page 34 of launch #4 reveals a 16 foot sounding vice the charted 18 foot sounding. Further investigation in this area proved that the 16 foot sounding is correct as positioned on the boat sheet at 42°35'59.8"N 70°40'01.7"W. (Source of 18 is Ch. Let. 613 [1915]) ✓
With final reduces: 17.2

No. 24. The 25 foot sounding at 42°35'53.1"N 70°40'29.1"W was found. See launch #4 volume IV, page 66. pos. 946-947 it's 26 ft. ✓
Source of 25 is Ch. Let. 5 (1917). H-2311a (1904) it's 18 ft. (before blasting)

No. 25. The shoal soundings at Prairie Ledge are developed on the boat sheet. Note that the suspected depth of 4 feet at 42°35'53"N ✓

This 4' sounding is on chart - it was plotted on the smooth sheet - see strong trace on bathogram between positions 920 & 921, launch 4 - M.L.P. (also pos. 1180-1181, vol. 5, p. 63) S.R.
as a 5' sounding

70°40'48"W was not located, although a diligent search was conducted for two hours using the grid search method of closely spaced lines running north south, followed by lines running east west. This system was repeated several times, with a buoy being placed at the least depth and additional search conducted in that area. It is recommended that this sounding be removed from C&GS chart 233. Source of 4 ft. is H-2311 (1897) Sharp drop-off; peaks carried forward. See Review ✓

No.26. The head of Freshwater Cove was well developed; see boat sheet. Note that the 6 foot channel is not now in existence and that the dock at the head of the one time 6 foot channel is now in ruins. 8½ ft. channel depth to maxime ty 75 Meters North of pier ruins. (Bp. 67882 "A") ✓

No.27. Subject cupola is not conspicuous, hence, is of no value to mariners. It is recommended that the cupola be removed from C&GS chart 233. Cupola's location: 42°35'55.3"N 70°39'22.3"W. Removed on Sixth Ed. of Chart # 233 (Source: Ch. Let. 738 [1959]) ✓

No.28. The twin towers is a predominate land mark and has been located by photogrametric means at the following location for each tower. 42°35'05.9"N 70°41'34.6"W and 42°35'06.0"N 70°41'34.3"W. The latter tower was used as signal ZIG. See T-12970 and Ch. Let. 892 (1959) ✓

No.29. The two foot sounding was verified and the area between Norman's Woe Rock and the mainland developed. See boat sheet. Source: Ch. Let. 1205 (1966) ✓

No.30. Subject tower is not conspicuous, hence is of no value to mariners. It is recommended that the tower, located at 42°34'51.9"N 70°39'42.0"W, be removed from C&GS chart 233. Removed on Sixth Ed. of Chart # 233 ✓

Prior survey H-2269, 1896, 1:10,000 is in general agreement, except for the eighteen foot shoal at 42°34'47"N 70°40'14"W. A depth of 20 feet was found ~~to~~ meters ~~west~~ east which gives support to the 18 foot shoal. Although further investigation, by the method described in item No. 25 above, did not locate it, retention of the 18 foot sounding is recommended due to the presence of rocks in the area. Source of the 18-ft. Sounding is H-3950 (1916) and carried forward to pres. survey ✓

Prior survey H-4849, 1928, 1:5,000 covers mostly the inner harbor; soundings are in general agreement. Several changes have occurred due to construction of piers and presence of wrecks. See boat sheet of inner harbor 1:2500 scale. (Source: Inner Harbor development: Ch. Let. 605 [1938]) ✓

Prior survey H-396, 1853, 1:10,000 covers the outer harbor, but was conducted prior to the construction of the breakwater off Eastern Point, hence is of no value in that area. Mid harbor soundings are consistently deeper on the older survey by approximately three feet. this difference is attributed to silting for the past 114 years and is supported by the existence of mud in these areas. Other areas are in general agreement. ✓

pos. 5080, $42^{\circ}36'12''$ ⁰/₄" - $70^{\circ}40'04''$, 19 ft., vol. 10, p. 43

pos. 5082, $42^{\circ}36'12''$ ⁰/₃" - $70^{\circ}40'01''$, 18 ft., vol. 11, p. 12

K. COMPARISON WITH THE CHART:

A comparison with C&GS chart 233 5th Ed., Jan.2/67 was made. The following are important newly-found dangers to navigation:

1. Shoal Area-RKs (18 ft rep) P.A. north of TENFOUND IS. has been determined to be ~~two~~ ^{one} 18 foot soundings with the following positions: $42^{\circ}36'11.9''N$ $70^{\circ}40'00.7''W$ and $42^{\circ}36'12.8''N$ $70^{\circ}40'03.8''W$. See launch #3 volume IV page 43 D.P. ~~5079~~ ⁵⁰⁸⁰ and 5080² and page 12, Vol. 11

2. Submerged Piling-A piling was located in the Blynman Canal at $42^{\circ}36'55.4''N$ $70^{\circ}40'45.1''W$ with a ⁵foot sounding. See volume X¹¹ launch #3 page 23 D.P. 5084. (Barges $\frac{1}{2}$ ft at MLW)

3. Pipe Line- See paragraph "M" subparagraph 2.

The 17 foot shoal off DOGBAR at $42^{\circ}35'00''N$ $70^{\circ}40'34''W$ was not located. An extensive investigation was conducted in this area, in the same manner as was conducted for item No. 25 of paragraph "J". It is recommended that the 17 foot sounding be removed from C&GS chart 243 and 233. Source: H-3950 (1916)WD (See Review)

Other soundings are in general agreement except as noted in Paragraph "J" subparagraph 25.

L. ADEQUACY OF SURVEY:

This survey is considered complete and adequate to supersede all prior surveys for charting except as noted in the comparison paragraph with survey H-2269, 1896, 1:10,000.

M. AIDS TO NAVIGATION:

The comparison of charted aids with actual positions taken by sextant angle are within tolerance for navigational purposes. At $42^{\circ}35'50.8''N$ $70^{\circ}40'55.1''W$ a white Coast Guard Buoy is located which does not appear on C&GS chart 233 5th Ed. Jan.2/67. See launch #4 volume VI page 4 D.P. 7031 This buoy not in Lite List 1967, 1968. See Review.

An uncharted pipeline crossing exists in the Blynman Canal. A D.P. 5087 was taken at the entrance of the pipe into the water on the east side at $42^{\circ}36'55.1''N$ $70^{\circ}40'42.9''W$. The pipe line apparently continues under ground on the west side. See launch #3 volume X¹¹ page 23 and the boat sheet. (See T-12971)

Pos. 5079
at 18 ft
is west of Ten-
found Island.
Vol. 10, P. 43
southwest

Retained

N. STATISTICS:

	Positions	Miles sounded
Launch #2	125	3.7
Launch #3	555	37.0
Launch #4	1328	120.4
Skiff 1A	488	6.0
Totals	<u>2496</u>	<u>167.1</u>

Bottom Samples: 4 5 Square miles of hydrography: 2.4

O. MICSELLANEOUS:

None

P. RECOMMENDATIONS:

Survey H-8943 (EX 5-2-67) is complete and adequate. No further field work is necessary.

Q. REFERENCE TO REPORTS:

Season's Report
Fathometer & Velocity Correction Report
Coast Pilot Report

R. NOTES FOR AUTOMATED SMOOTH PLOTTING:

Field data was processed according to "Provisional Instruction, Automated Hydrographic Surveys" and "Comments on Provisional Instructions Automated Hydrographic Surveys", Originated at the Pacific Marine Center.

The inner harbor on the 1:2500 scale should be smooth plotted by hand to facilitate handling of item No. 20 paragraph "J" and the depth of water along piers. *see Vol. 12* pos. 4100 - 4488 see Note on page 3 Vol 12**
On Smooth Sheet at scale 1:5,000

Angles were displaced one position to the right on all tapes. The Pacific Marine Center has been informed of this error and will make allowances for it.

D.P.s 5054 thru 5060 represent depths along a new marina on the Blynman Canal and must be plotted by hand.

*pos. Destroyed on pos. of sounding print-
outs so they can be plotted by hand
OPT*

Submitted By:

Merritt N. Walter

LT. Merritt N. Walter USESSA

Approved By:

Pentti A. Stark

Pentti A. Stark

CDR. USESSA

C.O. USC&GSS Explorer OSS 28

NAME	CODE#	ORIGIN
ABE	073	T-12970
AGO	024	"
AMP	049	T-12971
ANT	025	"
BAG	050	"
BAT	074	T-12970
BIB	080	"
BOG	098	"
BOX	026	T-12971
CAB	023	T-12970
CAT	104	T-12971
CIT	089	△ City Ledge, 1934-53 <i>page 277</i>
CON	051	T-12971
COP	075	T-12970
CUT	021	"
DEB	052	T-12971
DIM	028	"
DOG	096	△ Dog Bar Lt. 1916-53 <i>page 280</i>
DON	027	T-12071
DUD	076	T-12970
EAR	005	"
EBB	053	T-12971
EEL	078	T-12970
ELI	101	"
END	029	T-12971
EVA	013	△ Hamond Small Twp 1928 <i>page T-12971</i>
FAR	030	T-12971
FIN	079	T-12970
FIT	008	T-12971
FOG	055	"
FRO	077	△ Neck Front, 1943-53 <i>page 374</i>
GAD	031	T-12971
GAG	056	"
GAL	083	T-12970
GAZ	081	T-12970
GIN	106	T-12971
GLO	091	△ Gloucester, City Hall, 1902-53 <i>page 275</i>
HAG	019	T-12970
HEX	085	T-12971
HID	032	"
HOP	006	"
HUT	057	"

NAME	CODE#	ORIGIN
ICE	058	T-12971
IDA	004	T-12970
JAP	059	T-12971
JAR	020	T-12970
JAW	034	T-12971
JOY	033	"
KED	060	"
KIT	094	T-12970
LAM	012	T-12971
LAY	035	"
LED	088	△ Railroad Ledge, 1934-53 <i>page 277</i>
LEE	087	△ Lepege Glue Factory 1928-53 <i>page 880</i> LEE (GLOUCESTER, LePage)
LIG	111	△ East Pt. Lt. 1902-53 <i>page 277</i> Eastern Point Light House 1902-53
LIP	061	T-12971
LUX	002	"
MAG	003	"
MAL	084	T-12970
MAX	036	T-12971
MOP	014	△ Kent 1934-53 <i>page 277</i> Topo. T-12971
MUM	062	T-12971
NIB	082	T-12970
NIG	063	T-12971
NIL	017	T-12970
NIT	037	T-12971
NOT	097	T-12970
NUB	001	T-12971
OAK	038	"
OLD	064	"
PAD	039	"
PAX	112	Sextant Cut (see volume I launch #4 page 19)
PEG	016	T-12970
PHU	109	T-12971
PIN	065	"
PIT	015	"
PRO	007	T-12970
PUS	108	T-12971
QUO	040	" <i>Gloucester, page 280</i>
RAD	110	△ Eastern Pt. Radio Mast 1940-53
RAG	010	T-12971
RAT	066	"
RIG	041	"
ROP	011	"
RUM	107	"

APPROVAL SHEET FOR HYDROGRAPHIC SURVEY

Project OPR-473

Survey No. H-8943

USC&GSS EXPLORER

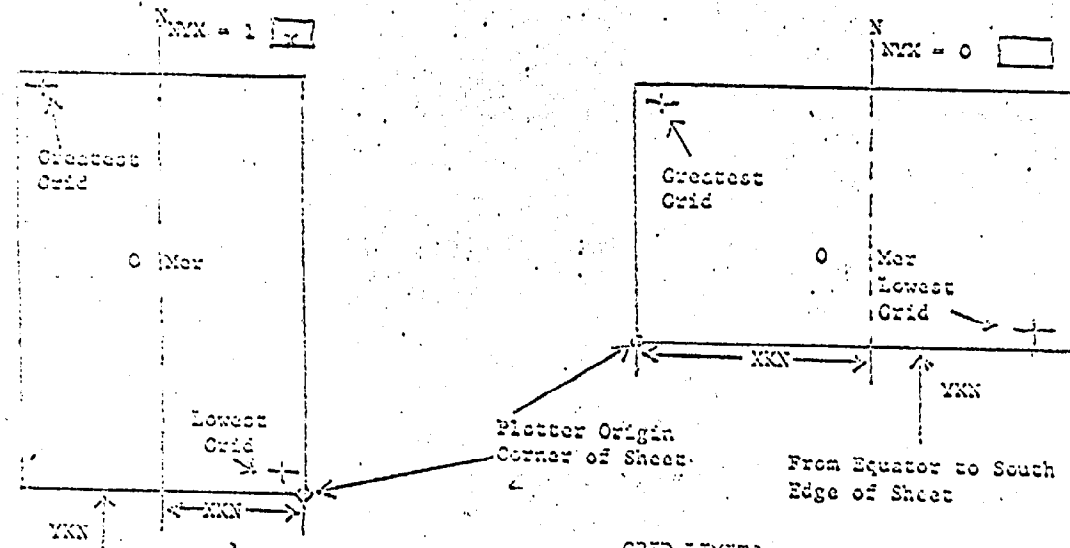
The Chief of Party and the Operations Officer exercised a continuous supervision and inspection of the field work and field records. This survey is approved and considered to be a complete, adequate and basic hydrographic survey done in accordance with criteria indicated in the Hydrographic Manual and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

Pentti A. Stark
Pentti A. Stark
CDR, USESSA
Chief of Party

PARAMETERS FOR DIGITAL COMPUTING
POLYGONIC PROJECTION

Form #1

- (1) Project No. OPR 473 (4) Requested by _____
- (2) H No. H-8943 (5) Ship or Office Explorer
- (3) Field No. Ex 5-2-67 (6) Date Required _____
- (7) Visual X (8) Electronic N.A. (Fill out Form #3)
- (9) NKN (SP 5) Distance from OMER to East Edge (NKN = 1) or West Edge (NKN = 0). 2265.2 Meters
- (10) YKN (SP 241) Distance from Equator to South Edge of Sheet 4,714,174.3 Meters
- (11) Central Meridian 070° 40' 15"
- (12) Survey Scale 1:5,000
- (13) Size of Sheet (Check One) 36 X 60 X 42 X 60 _____
- (14) NKN Orientation of Sheet (Check One) _____



GRID LIMITS

From Equator to South Edge of Sheet

- (15) Greatest Latitude 42° 37' 30" (Projection Line Interval
- (16) Lowest Latitude 42° 34' 00" Page 4 Hydro
- (17) Difference 00° 03' 30" Manually
- (18) 00' 15"
- (19) 14 YSN
- (20) Greatest Longitude 70° 41' 45"
- (21) Lowest Longitude 70° 38' 45" (23) 00' 15"
- (22) Difference 03' 00" (24) 12 YSN

List C.P. of all stations to be plotted on this projection on the back of this form

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		
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.W. Feazel	4/17/69
B.	PROJECTION INTERSECTIONS VERIFIED BY	W.W. Feazel	4/17/69
C.	PROJECTION LINES RULED BY	W.W. Feazel	4/18/69
D.	ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED		
E.	OVERLAYS COMPLETED BY		
	1. POSITION NUMBER LEADERS ADDED	G.F. Trefethen	5/27/69
	2. EXCESS SOUNDING OVERLAY COMPARED	G.F. Trefethen	4/16/69
	3. PRELIMINARY SMOOTH PLOTS COMPARED	G.F. Trefethen	4/10/69
	4. OTHERS UTILIZED		
	A.		
	B.		
F.	DESCRIPTIVE REPORT ADDENDUM		
G.	CONTROL STATIONS VERIFIED	D.R. Mumford	3/15/68
H.	POSITIONS MANUALLY PLOTTED	D.R. Mumford GET	7/26/68
I.	MANUAL PLOT VERIFIED	DAM G.F. Trefethen	4/2/69
J.	SHORELINE APPLIED	G.F. Trefethen	5/6/69
K.	BOTTOM CHARACTERISTICS ADDED	G.F. Trefethen	5/19/69
L.	NOTES AND DEPTH CURVES ADDED	GET W.W. Feazel	6/11/69

NAME	CODE#	ORIGIN
SAD	067	T-12971
SAG	042	"
SAL	092	*Δ Gloucester Universalist church spire, 1849-1953 page 831
SAM	099?	T-12970
SIX	113 115	Sextant Cut (Vol. 13, p. 16, pos. 5047)
SOK	102	T-12971
SOW	009	T-12970
SOU	054	Sextant Cut
SUB	095	T-12971
SUE	100	T-12970
TAB	103	T-12971
TAC	105	"
TAP	043	" TARR (Gloucester, Tarr and Wanson's Factory, chimney), 1916-53
TAR	086	Δ Tar and Wanson Factory Chimney 1916-53 page 880
TAX	068	T-12971
TIK	093	T-12970
USE	044	T-12971
VAL	045	"
VET	018	T-12970
VIM	069	T-12971
WAR	070	Δ Wee R.M. No. 1 Topo T-12970
WHO	090	T-12970
WIG	046	T-12971
YAK	022	" (Signal pos. not on Adv. Manuscript of T-12971)
YAM	071	T-12970
YET	047	T-12971
ZAG	048	"
ZIG	072	T-12970 (T-sheet claims NE tower; hydro pos. seems to be SW tower)
TUG	119	Δ Gloucester, Portugese church, East Tower, 1916-53 page 853
POR	120	Δ Gloucester, Portugese church West Tower, 1916-53 page 853
PYR	118	Δ PYR (Gloucester congregational church, PYRAMID spire), 1928-53 page 882
TAV	117	Δ TAV, Gloucester Tavern Red chimney, 1928-53 page 882
GEN	114	Δ GEN (General Foods Corp. Tower), 1916-53 page 884

8943	029	42361322	070392153	END ✓	
8943	030	42354614	070391416	FAR ✓	
8943	031	42353804	070391552	GAD ✓	
8943	032	42353137	070393209	HID ✓	
8943	033	42350450	070394564	JOY ✓	
8943	034	42351620	070394877	JAW ✓	
8943	035	42353036	070393643	LAY ✓	
8943	036	42351993	070394490	MAX ✓	
8943	037	42355794	070392740	NIT ✓	
8943	038	42361403	070392754	OAK ✓	
8943	039	42362161	070392728	PAD ✓	
8943	040	42363101	070392215	QUO ✓	
8943	041	42362589	070392188	RIG ✓	
8943	042	42365091	070385617	SAG ✓	
8943	043	42365217	070390355	TAP ✓	
8943	044	42365036	070390921	USE ✓	
8943	045	42364712	070391403	VAL ✓	
8943	046	42365557	070390640	WIG ✓	
8943	047	42365519	070391447	YET ✓	
8943	048	42370223	070390276	ZAG ✓	
8943	049	42363908	070395548	AMP ✓	
8943	050	42363976	070394820	BAG ✓	
8943	051	42363360	070394583	CON ✓	
8943	052	42365201	070385770	DEB ✓	
8943	053	42363888	070395298	EBB ✓	
12 11	8943	054	42372790	070412625	SOU ✓
10 9	8943	055	42362680	070393254	FOG ✓
8 7	8943	056	42361195	070393438	GAG ✓
6					
5					
4					

8943	057	42361646	70393772 HUT	✓	
8943	058	42361986	070393355 ICE	✓	
8943	059	42360722	070392535 JAP	✓	
8943	060	42360100	070392815 KED	✓	
8943	061	42355493	070392245 LIP	✓	
8943	062	42353325	070392547 MUM	✓	
8943	063	42352430	070394569 NIG	✓	
8943	064	42351124	070394235 OLD	✓	
8943	065	42350567	070395130 PIN	✓	
8943	066	42350272	070395376 RAT	✓	
8943	067	42344699	070394199 SAD	✓	
8943	068	42350194	070395919 TAX	✓	
8943	069	42345681	070395576 VIM	✓	
8943	070	42344666	070413908 WAR	✓	
8943	071	42345451	070414653 YAM	✓	
8943	072	42350609	070413425 ZIG	✓	
8943	073	42351118	070413141 ABE	✓	
8943	074	42351114	070411912 BAT	✓	
8943	075	42350790	070411583 COP	✓	
8943	076	42352822	070410272 DUD	✓	
8943	077	42353726	070405548 FRO	✓	
8943	078	42354271	070410368 EEL	✓	
8943	079	42354342	070410846 FIN	✓	
8943	080	42372540	070411602 BIB	✓	
8943	081	42371448	070405112 GAZ	✓	
12 11	8943	082	42370528	070404643 NIB	✓
10 9	8943	083	42354935	070410614 GAL	✓
8 7	8943	084	42370994	070413182 MAL	✓
6					
5					
4					

	8943	085	42362349	070403996	HEX	✓
	8943	086	42362249	070393947	TAR	△ ✓
	8943	087	42365674	070412813	LEE	△ ✓
	8943	088	42370032	070404265	LED	△ ✓
	8943	089	42364799	070404119	CIT	△ ✓
	8943	090	42371422	070414143	WHQ	✓
	8943	091	42365032	070394820	GLO	△ ✓
	8943	092	42364705	070400017	SAL	△ ✓
	8943	093	42372346	070414152	TIK	✓
	8943	094	42372080	070413639	KIT	✓
	8943	095	42372336	070413072	SUB	✓
	8943	096	42345704	070402232	DOG	△ ✓
	8943	097	42371633	070411874	NOT	✓
	8943	098	42371503	070411505	BOG	✓
	8943	099	42370502	070411220	SAM	✓
	8943	100	42370447	070405520	SUE	✓
	8943	101	42370324	070404700	ELI	✓
	8943	102	42365677	070404483	SOK	✓
	8943	103	42364695	070404282	TAB	✓
	8943	104	42364076	070403391	CAT	✓
	8943	105	42363765	070402882	TAC	✓
	8943	106	42363564	070402632	GIN	✓
	8943	107	42363406	070402430	RUM	✓
	8943	108	42363571	070403874	PUS	✓
	8943	109	42364132	070403891	PHU	✓
12	8943	110	42345020	070395357	RAD	△ ✓
11	8943	111	42344854	070395392	LIG	△ ✓
10	8943	112	42351607	070411228	PAX	✓
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8						
7						
6						
5						
4						

8943 113

42360661 070395811 TEN ✓

8943 114

42363393 070395710 GEN ✓ 139

8943 115

42364721 070404011 SIX ✓

8943 116

42362138 070394413 BOR ✓

8943 117

42363551 070400342 TAV ✓

8943 118

42364728 070395364 PYR ✓

8943 119

42370055 070392707 TUG ✓

8943 120

42370064 070392759 POR ✓

8943 121

42364673 070391938 BEA ✓

12
11
10
9
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	8943	001	42365441	070403847	NUB ✓
	8943	002	42364750	070403597	LUX ✓
	8943	003	42364556	070403540	MAG ✓
	8943	004	42361552	070410219	IDA ✓
	8943	005	42364919	070410157	EAR ✓
	8943	006	42364284	070405352	HOP ✓
	8943	007	42370116	070411466	PRO ✓
	8943	008	42363506	070403123	FIT ✓
	8943	009	42363422	070403167	SOW ✓
	8943	010	42363111	070404185	RAG ✓
	8943	011	42363736	070401390	ROT ✓
	8943	012	42361471	070405760	LAM ✓
	8943	013	42355729	070405855	EVA ✓
	8943	014	42363312	070403641	MOP ✓
	8943	015	42361827	070403479	PIT ✓
	8943	016	42354472	070410214	PEG ✓
	8943	017	42355250	070410289	NIL ✓
	8943	018	42355366	070410342	VET ✓
	8943	019	42353286	070405723	HAG ✓
	8943	020	42352945	070410991	JAR ✓
	8943	021	42351850	070410938	CUT ✓
	8943	022	42361289	070403764	YAK ✓
	8943	023	42360570	070405734	CAB ✓
	8943	024	42361085	070404571	AGO ✓
	8943	025	42363283	070390763	ANT ✓
12	8943	026	42364196	070390434	BOX ✓
11	8943	027	42362430	070391267	DON ✓
10	8943	028	42361925	070391741	DIM ✓
9					
8					
7					

H- 8943

A. Additions and corrections have been furnished the plotter
center by the verification unit. Except those to be submitted by
Review Section.
Signed *Alfred J. Ruffner*
Date June 25, 1969 Title Chief, Hydro Branch, AMC

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

Signed *Alfred J. Ruffner*
Date June 25, 1969 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).

Signed *Alfred J. Ruffner*
Date June 25, 1969 Title Chief, Hydro Branch, AMC

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

Date June 26, 1969.

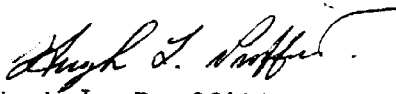
NORFOLK HYDROGRAPHIC PROCESSING BRANCH

VERIFICATION NOTE

SURVEY H-8943

GENERAL

After a complete recompile of the fathometer velocity corrections in this Office, this appears to be an excellent basic survey. The various problems encountered and the methods used to resolve them may be determined by a progressive review of the overlays, printouts, recompiled velocity corrections and the Note to EDAT.


Hugh L. Proffitt
Chief, Hydro Br., AMC

Norfolk, Va.
June 25, 1969

TIDE NOTE FOR HYDROGRAPHIC SHEET

February 29, 1968

~~NOVICAL OCEANOGRAPHIC~~ Pacific Marine Center

Plane of reference approved
~~reduced to zero by means of~~ 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


Chief, Tides and Currents Branch

GEOGRAPHIC NAMES

Survey No. H-8943

Name on Survey	Source of Name											
	A	B	C	D	E	F	G	H	K			
Black Bass Point												1
Blynman Canal												2
Dalliver Neck												3
Eastern Point												4
East Gloucester												5
Fort Point												6
Freshwater Cove												7
Gloucester												8
Gloucester Harbor												9
Harbor Cove												10
Inner Harbor												11
Lighthouse Cove												12
Mussel Point												13
Niles Beach												14
Oldhouse Cove												15
Rocky Neck												16
Smith Cove												17
Southeast Harbor												18
Stage Head												19
Tenpound Island												20
Western Harbor												21
Wanson Cove												22
Mayflower Ledge												23
HALEMOON BEACH												24
TABLET ROCK												25
												26
												27

PREPARED BY

Frank W. Pickett

CARTOGRAPHIC TECHNICIAN

A. J. Wright

APPROVED BY

CEH
9-7-76

CHIEF GEOGRAPHER

Reg. No. H-8943

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 REQ'D _____ INITIALS _____

REMARKS:

H-8943

Information for Future Presurvey Reviews

There are no noteworthy differences between the prior and present soundings.

<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>
423	0703	1	6	50 years
423	0704	1	6	50 years

OFFICE OF MARINE SURVEYS AND MAPS

MARINE SURVEYS DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-8943

FIELD NO. EX-5-2-67

Massachusetts, Cape Ann, Gloucester Harbor

SURVEYED: September 11-29, 1967

SCALE: 1:5,000

PROJECT NO.: OPR-473

SOUNDINGS: DE-723 Depth Recorders
Hand Lead, Pole

CONTROL: Sextant Fixes on
Shore Signals

Chief of Party	P. A. Stark
Surveyed by	M. N. Walter
.....	D. R. Askew
.....	L. H. Perry
Automated Plot by	Gerber Digital Plotter (PMC)
Verified by	G. F. Trefethen
.....	W. W. Feazel
Reviewed by	S. Rose
	Date: May 22, 1970
Cursory inspection made--survey	G. K. Myers
processing considered complete	September 3, 1976

1. Description of the Area

This survey covers the port of Gloucester and its approaches which include Gloucester Harbor and Blynman Canal. It is the first hydrographic survey showing the new pier detail of Inner Harbor and the blending of Five Pound Island into a 100-meter wide artificially constructed peninsula. The bottom in Gloucester Harbor gradually slopes seaward; however, several rocky shoals exist within the area. Many ledges are found alongshore, alternating with sand and boulder strewn beaches.

Predominant bottom characteristics of the area are mud and rocky.

2. Control and Shoreline

The source of control is adequately described in the Descriptive Report. Most of the signals were located photogrammetrically. The positions of Signals ZIG and SIX that are locations of a landmark and fixed aid, respectively, were apparently misidentified on the photographs and were located about 1 mm. in error on the control sheet. The displacement of

these signals does not significantly affect hydrography and they were revised to their true positions on the smooth sheet.

The shoreline originates with reviewed photogrammetric manuscripts T-12970 and T-12971 of 1965-68, and is shown on the smooth sheet for guidance only. The true position of the shoreline, except revisions by the hydrographer in red, is shown on the above topographic surveys.

The islet at latitude $42^{\circ}35.53'$, longitude $70^{\circ}39.59'$ on T-12971 was found to be in error after examining the surveys records, and was revised to a rock awash.

3. Hydrography

A. Depths at crossings are in good agreement.

B. The usual depth curves are adequately delineated. The 3-foot depth curve was added to more adequately delineate the bottom configuration. In some cases, dashed depth curves were drawn to emphasize lesser depths in areas of deeper soundings.

C. The investigation of least depths and delineation of the bottom configuration are considered adequate.

4. Condition of Survey

The sounding records, Atlantic Marine Center verification, 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. Limits of ledges and the mean low water line determined by photogrammetry were improperly delineated by black dashed lines on the smooth sheet.

B. Descriptions of signals and elevations of rocks were poorly drafted on the smooth sheet.

5. Junctions

Adequate junctions were effected with H-8941 (1967) on the southeast, H-8942 (1967) on the north, and H-9090 (1969) on the south.

6. Comparison with Prior Surveys

A.	H-396	(1853)	1:10,000
	H-516	(1854-55)	1:80,000
	H-2198	(1894)	1:10,000

H-2269	(1896)	1:10,000
H-2311	(1897)	1:10,000
H-2311a	(1904)	1:10,000
H-4849	(1928)	1:5,000
FE No. 1	(1950)	1:2,500

A comparison between prior and present depths reveals only minor differences except in areas of harbor improvements resulting from dredging and blasting. In several areas artificial changes due to the construction of port facilities have altered the shoreline.

Soundings on the present survey are 1-2 feet less than prior depths in deeper areas. These differences are mainly attributed to methods of surveying. Evidences of deepening are found in the immediate vicinity of Ten Pound Island where a scouring of the sand and mud bottom has occurred among the rocky reefs.

Attention is directed to the following:

(1) The submerged hulk charted at latitude $42^{\circ}36.69'$, longitude $70^{\circ}39.10'$ originating with T-4392 (1928) was not mentioned by the hydrographer or indicated on T-12971. Since the low water line extends offshore from the charted wreck, this feature should be deleted from the chart.

(2) The pier charted at latitude $42^{\circ}35.54'$, longitude $70^{\circ}39.55'$ originates with T-4396 (1928) and presently falls on a rocky ledge. The pier was not mentioned by the hydrographer or indicated on T-12971. This feature should be deleted from the chart.

(3) The 1- and 7-foot soundings charted at latitude $42^{\circ}36.18'$, longitude $70^{\circ}39.77'$ and latitude $42^{\circ}36.04'$, longitude $70^{\circ}39.96'$, respectively, originate with H-2198. These soundings presently fall in depths of greater than 12 feet and are probably nearer inshore than shown on the prior survey. These depths should be deleted from the chart.

(4) Sunken rock symbols charted in the immediate vicinity of latitude $42^{\circ}36.16'$, longitude $70^{\circ}39.86'$ as shown on H-4849 are considered only to depict a rocky bottom and not features dangerous to navigation. These symbols should be deleted from the chart.

(5) The rock awash charted at latitude $42^{\circ}36.17'$, longitude $70^{\circ}39.83'$ originates with H-2198 and is shown as a feature that apparently uncovers at MLW. This feature falls in depths of 2 feet on the present survey and was identified as a submerged reef from recent low water photography. The rock should be deleted from the chart.

Some soundings and submerged ruins have been brought forward from the prior surveys. With these additions, the present survey supersedes the prior surveys within the common area.

B. H-3950 WD (1916) 1:10,000

A portion of this wire-drag survey covers the area of the present survey. No conflicts between present depths and effective wire-drag depths were found.

Some soundings and bottom characteristics have been brought forward to supplement present hydrography.

7. Comparison with Chart 233 (latest print date December 9, 1968)

A. Hydrography

The charted hydrography originates with the previously discussed prior surveys which need no further consideration supplemented by the boat sheet of the present survey and numerous chart letters and Corps of Engineers dredging surveys.

Presurvey Review items are discussed in paragraph J of the Descriptive Report.

The present survey is adequate to supersede the charted hydrography within the common area.

B. Controlling Depths

(1) The charted controlling depth note - 14 ft reported - for the dredged slip in latitude 42°36.6', longitude 70°39.82' from CL-28/66 falls in present depths of 4-13 feet and should be deleted from the chart.

(2) The table of controlling depths for Annisquam River is based on Corps of Engineers information of 1965-67. These depths are in harmony with the present survey and should be retained on the chart.

(3) In the charted controlling depth area in the entrance channel to Inner Harbor present depths are as much as 2 feet shoaler than Corps of Engineers surveys of 1964-65.

(4) The following charted controlling depth notes from 1964-65 Corps of Engineers surveys are in agreement with the present survey:

<u>Controlling Depth Note</u>	<u>Immediate Vicinity (Lat./Long.)</u>
(a) 18 FT 1964-1965	42°36.45', 70°39.8'
(b) 18 FT 1965	42°36.6', 70°39.75'

<u>Controlling Depth Note</u>	<u>Immediate Vicinity (Lat./Long.)</u>
(c) ANCHORAGE - 15 FT	42°36.55', 70°39.65'
(d) ANCHORAGE - 16 FT	42°36.65', 70°39.4'
(e) 16 FT AUG 1965	42°36.55', 70°39.25'
(f) NORTH CHANNEL 20 FT FOR WIDTH OF 200 FT AUGUST 1965	42°36.88', 70°39.25'
(g) SOUTH CHANNEL 20 FT FOR WIDTH OF 200 FT AUGUST 1965	42°36.6', 70°39.3'

C. Aids to Navigation

The fixed and floating aids located on the present survey are in substantial agreement with the chart and adequately mark the features intended.

8. Compliance with Project Instructions

The survey complies with the Project Instructions.

9. Additional Field Work

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

Examined and Approved:

Roy K. Matsushige
 Chief
~~Marine Surveys Division~~
 Hydrographic Surveys Branch

L. Weston Yeager
~~Associate Director~~
~~Office of Marine Surveys~~
~~and Maps~~
 Chief
 Nautical Charting Division

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-8943 (EX-5-2-67)

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

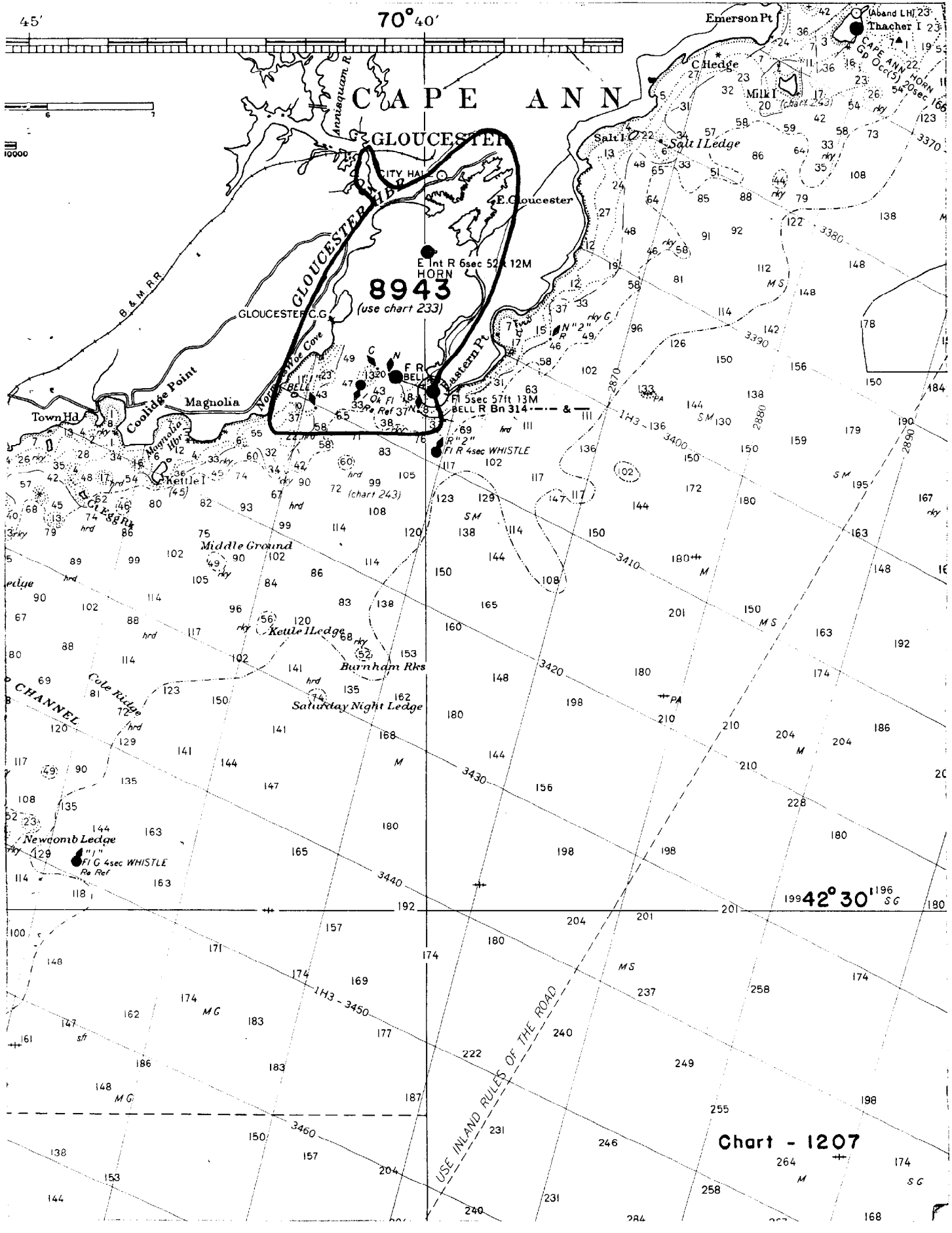
RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		✓	3 BOAT SHEETS { 1:2500 Inney Harbor 1:5000 Western & Inney Harbor 1:5000 Gloucester Harbor		X 3	
DESCRIPTIVE REPORT		✓	OVERLAYS <u>One</u> Mylar Position Overlay		2 ← ?	
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS / SOURCE DOCUMENTS
ENVELOPES	X		12			
CAHIERS	✓		1			
VOLUMES	13					
BOXES						
T-SHEET PRINTS (LINE)						
SPECIAL REPORTS (LINE)						

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				2541
POSITIONS CHECKED		600	48	648
POSITIONS REVISED		491	1	492
DEPTH SOUNDINGS REVISED			0	-
DEPTH SOUNDINGS ERRONEOUSLY SPACED			0	-
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED			0	-
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		84	3 hrs	87
JUNCTIONS			5 hrs	5
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		56	9 hrs	65
SPECIAL ADJUSTMENTS <i>Stylus, TRA, Tide.</i> <i>Low water line and ledge adjusted</i> <i>About 50% of descriptions and leaders redrawn</i> <i>ALL OTHER WORK</i> <i>Positions in volumes classified</i>	103		34 hrs	34
TOTALS	103	609	232 hrs.	841
PRE-VERIFICATION BY <i>D. R. Munford & G. F. Trefethen</i>	BEGINNING DATE <i>3/15/68</i>	ENDING DATE <i>10/25/68</i>		
VERIFICATION BY <i>G. F. Trefethen & W. W. Feazel</i>	BEGINNING DATE <i>1/2/69</i>	ENDING DATE <i>6/13/69</i>		
REVIEW BY <i>S. Rose</i>	BEGINNING DATE <i>4-13-1970</i>	ENDING DATE <i>5-22-1970</i>		

D. Engle 2-28-80
 70 hrs 9/8/76
 see map: A Project



45'

70°40'

CAPE ANN

GLOUCESTER

8943
(use chart 233)

Emerson Pt

Aband LH 23
Thacher I 23

CAPE ANN HORN
Go Occ(S) 20sec 166

C Hedge

Milk I

Salt I

Salt I Ledge

CITY HALL

E. Gloucester

E Int R 6sec 52' 12M

GLOUCESTER C.G.

B & W R.R.

GLOUCESTER Pt

N Woe Cove

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RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-8943

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
243	9/13/69	H.V. Howard	Full Part Before ^{after} After Verification ^{before} Review Inspection Signed Via Drawing No. 18
1207	4-8-70	Eric Fry	Full Part Before ^{after} After Verification ^{before} Review Inspection Signed Via ^{cht 243} Drawing No. 18 revised low water line for critical corrections only
613-SC	3-10-70	A.J. Hoffman	Full Part Before ^{before} After Verification ^{before} Review Inspection Signed Via Drawing No. Revised hydro thru cht. 243 Dug. #18 Before review & inspection
233	10-7-70	W.B. Wambler	Full Part Before ^{before} After Verification ^{before} Review Inspection Signed Via Drawing No. 13 corrections applied thru reviewers report only
613-SC	10-13-70	James Chisham	Full Part Before ^{before} After Verification ^{before} Review Inspection Signed Via Drawing No. partially applied reviewers report directly to cht. 613-SC
1206	10-14-70	H. Redden	Full Part Before ^{before} After Verification ^{before} Review Inspection Signed Via Drawing No. #24 part appl thru cht. 1207 30 etc Verification only No corr (App'd review directly)
243	6-21-71	J. Esterich	Full Part Before ^{before} After Verification ^{before} Review Inspection Signed Via Drawing No. 20 Applied Critical Corr. from Reviewers Report only.
233	9-5-72	J. Bailey	Full Part Before ^{before} After Verification ^{before} Review Inspection Signed Via Drawing No. Re-applied for additional critical corrections
1207	5-24-73	Spa E. Beckel	Full Part Before ^{before} After Verification ^{before} Review Inspection Signed Via Drawing No. RE-EXAMINED FOR CRITICAL CORRECTION - NO CORRECTIONS.
233	2-18-77	W.C. Green	Full Part Before ^{before} After Verification ^{before} Review Inspection Signed Via Drawing No. Applied all changes of curve lines, soundings, shore lines, & bottom characteristics thru reduction of smooth sheet.
13279	5-8-91	B. Jagtkowski	Full after Verification Review Inspection Signed Via Drawing No. Applied thru 13281 (233)
113278	3-2-98	W. Ross	From - Applied Full thru 13281 (no corr required)