

8600

ORIGINAL

Diag. Cht. No. 1107.

Form 504 U. S. DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY	
DESCRIPTIVE REPORT	
Type of Survey	HYDROGRAPHIC
Field No.	EX 40-2-61
Office No.	
LOCALITY	
State	Massachusetts
General locality	Nantucket Shoals
Locality	Davis Bank
19 61	
CHIEF OF PARTY	
Edmund L. Jones, CAPT, C&GS	
LIBRARY & ARCHIVES	
DATE	DEC 28 1961

USCOMM-DC 5087

8600

HUB

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

REGISTER No. H-8600

Field No. EX 40-2-61

State Massachusetts

General locality Nantucket Shoals

Locality Davis Bank

Scale 1:40,000 Date of survey 6/24/61 to 8/27/61

Instructions dated 27 November 1959

Vessel USC&GS Ship EXPLORER

Chief of party Edmund L. Jones, CAPT, C&GS

Surveyed by Ship's Officers

Soundings taken by fathometer, ~~XXXXXXXXXXXXXXXXXXXX~~ 808 & DE-723

Fathograms scaled by Ship's Personnel

Fathograms checked by Ship's Personnel & R. D. Lynn

Protracted by Ship's Officers & R. D. Lynn

Soundings penciled by R. D. Lynn

Soundings in ~~XXXXXX~~ feet at MLW ~~XXXXXX~~

REMARKS:

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.....
.....
.....
.....

XWW 8/25/92

DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SURVEY

H-8600, EX 40-2-61

SCALE 1:40,000

USC&GSS EXPLORER

Edmund L. Jones, CAPT, C&GS, Comdg.

1961 Season

A. Project:

This hydrographic survey was conducted in accordance with Revised Instructions - Project CS-401, Nantucket Shoals (1960), dated 27 November 1959; Revised Instructions - Project CS-401 Nantucket Shoals (1960), dated 4 December 1959; Supplemental Instructions - Project OPR-401 Nantucket Shoals, dated 15 December 1960; Amended Instructions - Project OPR-401 Nantucket Shoals, dated 1 March 1961; Amended Instructions - Project OPR-401 Nantucket Shoals, dated 10 March 1961; Supplemental Instructions - Project OPR-401, 17 March 1961; Amended Instructions - Project OPR-401, Nantucket Shoals, dated 13 April 1961, and Amended Instructions - Project OPR-401, Nantucket Shoals, dated 1 August 1961.

B. Area Surveyed:

This survey covers the most southwestern part of Nantucket Shoals, Massachusetts. The area is bounded by: latitudes $40^{\circ} 34'N$ and $40^{\circ} 58'N$, longitudes $69^{\circ} 34'W$ and $69^{\circ} 58'W$. The western limit of the area is further delineated by an east-west diagonal line extending from $40^{\circ} 34.5'N$ to $40^{\circ} 42'N$.

Survey dates were from 24 June to 27 August 1961.

Junctions were made with the following prior and concurrent surveys: EX 40-2-60 (H-8540), EX 40-3-60 (H-8541), EX 40-1-61 (H-8599), EX 40-3-61 (H-8601), and EX 20-2-61 (H-8603).

C. Sounding Vessel:

All hydrography was done by the Ship EXPLORER.

D. Sounding Equipment:

The soundings for this survey were obtained by using a type 808 fathometer, Serial No. 57-20, and type Raytheon DE-723 fathometer, Serial No. 61-29.

The 808 was used at the calibration velocity of 820 fathoms/second, using the "A" scale in fathoms with the initial set at 2.0 fathoms. When the variable frequency power supply was functioning properly, the calibrated speed of the sound in the water surveyed was used in conjunction with the DE-723. The speed of sound was determined at weekly intervals or more often by a model TR-2 Velocimeter and a Hewlett-Packard digital recorder. When the variable frequency power supply was inoperative, a calibration speed of 800 fathoms/second (60.0 cycles/second) was used with the corrections being determined by the standard numerical methods. Bathythermographs were taken every four hours during the time the ship was sounding.

The first five days of hydrography, "A" thru "E" days, the 808 was used exclusively; "F" thru "P" days the DE-723 was used as the major sounding instrument, using the 808 as a stand-in replacement when the fathometer paper needed changing in the DE-723. On "P" day, the 808 was used to obtain 26 positions, 206 thru 231. On "Q" day, the 808 was used exclusively.

808 fathometer paper was inadvertently substituted on the DE-723 fathometer on "L" day from position 151 to position 243. A special template was prepared and the fathogram re-scanned and all applicable corrections applied.

A copy of the special report, Corrections to Echo Soundings, USC&GSS EXPLORER, Project OPR-401, describes in detail all of the corrections used and how they were obtained. Summaries of velocity and draft corrections for EX 40-2-61 are attached to this report.

E. Smooth Sheet:

The Washington Office furnished the machine-ruled smooth sheet with the Raydist curves drawn.

The sheet was plotted on the bridge as a boat-smooth sheet by pricking the Raydist positions through a mylar overlay directly onto the smooth sheet while the survey was being made.

After final Raydist corrections had been determined, 21% of the total number of positions were found to be misplotted by one or two lanes. To make the probable maximum error in positioning in the order of 2mm, 16% of the total number of positions were replotted: 1-13B, 174-186C, 1-281D, and 61-142G. There is a one lane error in positions 1-129H, but these positions were not replotted.

The method of boat-smooth sheet plotting in the field is discussed in detail in a Special Report.

F. Control: *See letter to GO from Chief of Operations Div. (211 mmy - dated Dec. 1, 1961. in this DR. 12/29/61 L. S. S.)*

Horizontal control was maintained throughout this survey by implementing Hasting-Raydist, model GA 38, Serial No. 020. Atmospheric conditions seemed to dictate the stability of the system. However, firm control was maintained by frequent recalibration. The set was recalibrated on an average of twice every 24 hour period.

The Boston Office located the 1961 positions of the shore stations as follows:

R₁ - Station CHAT (Red) 41° 40' 11.59"N
69° 59' 53.78"N

Azimuth: CHAT - MART 53° 17' 10.0"

R₂ - Station MART (Green) 41° 22' 08.225"N
70° 31' 54.232"W

Azimuth: MART - CHAT 232° 55' 57.0"

Length of base line: MART - CHAT 55,677.26 meters or 1,226.40 lanes.

Lane width was 45.3990 meters (148.9467 feet) based on a frequency of 3300.4 kc. The partial lane corrections for this survey were determined by visual fix calibration on various fixed objects on Nantucket Island (8/17/61). They are: CHAT +0.2, MART +0.3. The special report entitled "Raydist Operations 1961, Project OPR-401, USC&GSS EXPLORER", should be referred to for complete descriptions and methods of calibration procedures. A summary of Raydist corrections for sheet EX 40-2-61 is attached.

G. Shoreline:

There is no shoreline within the limits of this survey.

H. Crossline:

10.1% crosslines were run on this survey with all crossings adequate.

I. Junctions:

The junctions with prior and concurrent surveys have been examined and found adequate.

J. Comparisons with prior surveys:

As directed by Preliminary Review No. 9, The Andrea Doria wreck investigation was conducted on "P" day, 18 August 1961, and has been discussed in a Special Report. The least depth obtained over the Andrea Doria was 156.6 feet.

The reported wreck at lat. 40° 38.5', long. 69° 34.5' was thoroughly investigated and disproved on "P" day, 18 August 1961. The least depth obtained was 159.0 feet. It is recommended that this feature be deleted from existing charts.

K. Comparisons with the chart:

Comparisons have been made with chart 1107, 7th ed., 6/2/45, Revised 3/28/60, and no new dangers to navigation were found.

L. Adequacy of Survey:

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

M. Aids to Navigation:

Davis S. Shoal Buoy falls outside the survey limits of this sheet.

N. Statistics:

Total number of positions.....2395*
Total nautical miles of sounding lines.....1730.4*
Total surveyed area in square nautical miles.....338
Total number of bottom samples.....35
One Oceanographic Station, No. 7, was observed 3 times at the following position: 40° 44'N and 69° 48'W.

*Including development of Andrea Doria Wreck.

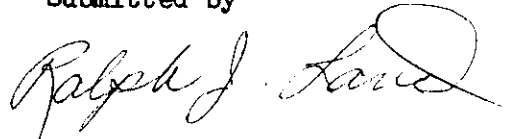
Q. References to Reports:

The following special reports have been previously submitted:

Special Report, Corrections to Echo Soundings, USC&GSS EXPLORER
Project OPR-401. 6 November 1961
Special Report, Raydist Operations 1961, USC&GSS EXPLORER
Project OPR-401. 19 October 1961
Special Report, Andrea Doria Investigation, Project OPR-401.
24 August 1961
Special Report, Concurrent Smooth Plotting in the Field,
USC&GSS EXPLORER, Project OPR-401. 19 October 1961

19 December 1961

Submitted by



Ralph J. Land
ENS, C&GS

TIDE NOTE

TO ACCOMPANY HYDROGRAPHIC SURVEY

H-8600, EX 40-2-61

USC&GSS EXPLORER

PROJECT OPR-401

A bubbler tide gage, with its orifice unit south of Nantucket Island, telemetered tidal data to the EXPLORER between 13 July and 20 August 1961.

Hourly heights from this bubbler tide gage were used to reduce soundings during this period. For the periods 24 June to 13 July and 20 August to 27 August, hourly heights from the Boston gage were used with a time correction of -4 hours and a height ratio of 0.3 as provided by the Washington Office.

SUMMARY OF VELOCITY CORRECTIONS

SHEET BX 40-2-61

PROJECT OPR-401

USCGC EXPLORER E. L. JONES, COMDG.

1961

DATE	DEPTH (fms)	CORRECTION 800 f/s	CORRECTION 820 f/s
JUNE 24-26	B- 7		-0.1
	7.1-12		-0.1
	12.1-17		-0.2
	17.1-22		-0.3
	22.1-27		-0.3
JUNE 27-28			NO CORR.*
JULY 16 (thru pos. 39F)			NO CORR.*
JULY 16-18 (after pos. 39F)	2- 7	0.0	-0.1
	7.1-12	0.0	-0.2
	12.1-17	+0.1	-0.3
	17.1-22	+0.1	-0.4
	22.1-27	+0.1	-0.5
	27.1-32	+0.2	
	32.1-37	+0.2	
	37.1-42	+0.2	
	42.1-47	+0.3	
JULY 24-27	B- 7	0.0	-0.1
	7.1-12	+0.1	-0.2
	12.1-17	+0.1	-0.3
	17.1-22	+0.1	-0.4
	22.1-27	+0.2	-0.5
	27.1-32	+0.2	-0.6
			-0.7
AUGUST	B- 7	0.0	-0.1
	7.1-12	+0.1	-0.2
	12.1-17	+0.1	-0.3
	17.1-22	+0.2	-0.3
	22.1-27	+0.2	-0.4
	27.1-32	+0.3	-0.5
		-0.5	

* FATHOMETER OPERATED AT SPEED OF SOUND IN WATER

Tables extended to conform to raw depths.
DJS
9/12/68

SUMMARY OF DRAFT CORRECTIONS

SHEET EX 40-2-61

PROJECT OPR-401

USC&GSS EXPLORER E. L. JONES, COMDG.

1961

DATE	DAY	CORRECTION
6/24	A	±0.2
6/25	B	±0.2
6/26	C	±0.2
6/27	D	±0.2
6/28	E	±0.2
7/16	F	±0.3
7/17	G	±0.3
7/18	H	±0.3
7/24	J	±0.4
7/25	K	±0.3
7/26	L	±0.2
7/27	M	±0.2
8/17	N	±0.3
8/18	P	±0.2
8/19	Q	±0.2
8/27	R	±0.4

SUMMARY OF RAYDIST CORRECTIONS

SHEET EX 40-2-61

PROJECT OPR-401

USC&GSS EXPLORER E. L. JONES, COMDG.

1961

DATE	DAY	POSITIONS	R ₁	R ₂
6/24	A	1- 32	3.6	-7.7
6/25	B	1- 47	11.6	13.3
		48- 58	11.6	20.3
6/26	C	1-141	11.6	0.3
		142-174	11.6	-1.7
		175-291	8.6	-0.7
6/27	D	1-236	8.6	1.3
		237-280	7.6	2.3
6/28	E	1-114	6.6	-3.7
7/16	F	1- 23	-3.8	-21.7
		24-143	1.2	1.3
7/17	G	1- 30	1.2	1.3
		31- 59	0.2	10.3
		60- 95	0.2	11.3
		96- 97	0.2	10.3
		98-142	0.2	8.3
7/18	H	1-205	0.2	8.3
		206-217	-1.8	-12.7
7/24	J	1- 41	2.2	2.3
7/25	K	1- 60	2.2	6.3
		61-168	3.2	5.3
		169-173	3.2	6.3
		174-211	3.2	7.3
		212-215	3.2	9.3

SHEET EX 40-2-61

DATE	DAY	POSITIONS	R ₁	R ₂
7/26	L	1-291 292-308	3.2 3.2	-7.7 -8.7
7/27	M	1- 71	3.2	-8.7
8/17	N	1- 93	3.2	19.3
8/18	P	1-232	3.2	19.3
8/19	Q	1-118	3.2	11.3
8/27	R	1- 37	1.2	0.3

LIST OF SIGNALS
TO ACCOMPANY HYDROGRAPHIC SURVEY

H-8600, EX 40-2-61

USC&GSS EXPLORER

There were two stations used in the Raydist controlled, off-shore survey as follows:

CHAT: Red Station (R1) Lat: 41-40-11.59N, Long. 69-59-53.78W

MART: Green Station (R2) Lat: 41-22-08.225N
Long: 70-31-54.232W

APPROVAL SHEET

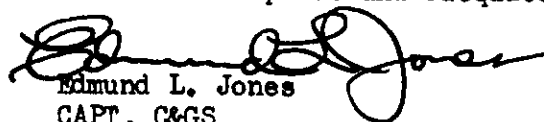
TO ACCOMPANY HYDROGRAPHIC SHEET

H-8600, EX 40-2-61

USC&GSS EXPLORER

The smooth sheet for this survey and the accompanying records have been examined and are approved. This work was done under close personal supervision with an examination of the ship boat sheet and records several times during each day. The field work is considered complete and adequate and no additional work is recommended.

19 December 1961



Edmund L. Jones
CAPT, C&GS
Comdg., Ship EXPLORER

CDJ
~~833~~ 311
211/222 832

Commanding Officer
USCAGS Ship EXPLORER

Dec. 1, 1961 FILE

Chief, Operations Division

Project OPR-401 -- Hydrographic sheet EK-40-2-61

The lane discrepancy concerned with EK-40-2-61 and mentioned in your phone call of November 30 will require replotting all positions that are out by two lanes or more. Those subject to one lane error will be acceptable provided that they do not adversely effect the placement of soundings in a junctional area. Mention of this control problem shall be included in your descriptive report.

1/s/ John Bowie *by* 1/s/ Emmett H. Sheridan
John Bowie

cc:
Norfolk D. O.
83
22
211
211 LB
21 Files

CORRECTED ABSTRACT TO H-8600 (1961)

ORIGINAL RECORDS			AUTOMATED RECORDS		
Day	Date (1961)	Position	Day of Year Logged	Corrected Day of Year	Position
A	June 24	1-32	175	175	1-32
B	June 25	33-90	176	176	33-90
C	June 26	91-382	177	177	91-382
D	June 27	383-664	178	178	383-664
E	June 28	665-777	179	179	665-777
F	July 16	778-919	180	197	778-919
G	July 17	920-1061	181	198	920-1061
H	July 18	1062-1277	182	199	1062-1277
J	July 24	1278-1315	183	205	1278-1315
K	July 25	1316-1531	184	206	1316-1531
L	July 26	1532-1839	185	207	1532-1839
M	July 27	1840-1908	186	208	1840-1908
N	Aug. 17	1909-2001	187	229	1909-2001
P	Aug. 18	2002-2231	188	230	2002-2231
Q	Aug. 19	2232-2349	189	231	2232-2349
R	Aug. 27	2350-2386	190	239	2350-2386

GEOGRAPHIC NAMES
Survey No. H-8600

Name on Survey	A	B	C	D	E	F	G	H	K	
Nantucket Shoals (title)										1
Davis Bank										2
										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
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										23
										24
										25
										26
										27

George M. Ball
Geographic Names
49 Jan 1962

Boat Sheet Kept in the field

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. *8600*

Records accompanying survey: Smooth sheets *.1*....;

boat sheets *.0*....; sounding vols. *.12*....; wire drag vols.;

Descriptive Reports *.1*....; graphic recorder envelopes *.10*....;

special reports, etc. *.1-Cahier, Raydist Tapes*.....

.....

CL 943/1960 (misc. file) 1 Volume Explorer 1960

The following statistics will be submitted with the cartographer's report on the sheet: *Andria Doria location*

Number of positions on sheet

Number of positions checked

Number of positions revised

Number of soundings revised
(refers to depth only)

Number of soundings erroneously spaced

Number of signals erroneously plotted
or transferred

Topographic details Time

Junctions Time

Verification of soundings from
graphic record Time

Special adjustments Time

Verification by *George Myers*..... Total time *350*..... Date *1/70*.....

Reviewed by Time Date

EAC

TIDE NOTE FOR HYDROGRAPHIC SHEET

January 29, 1962

~~Division of Coastal Surveys:~~

Division of Charts: R. H. Carstens

Plane of reference approved in
12 volumes of sounding records for

HYDROGRAPHIC SHEET 8600

Locality Nantucket Shoals, Massachusetts

Chief of Party: E. L. Jones (1961)

Plane of reference is, mean low water, reading
7.6 ft. ^{above on face of} ~~on tide staff~~ pressure gage at south side, Nantucket, Mass.
17.5 ft. below B. M. 1 SWB (1935)

Height of mean high water above plane of reference is: 2.6 ft.

Condition of records satisfactory except as noted below:

J. M. Symonds
Chief, Tides and Currents Branch

~~Chief, Division of Tides and Currents~~

VERIFIER'S REPORT OF HYDROGRAPHIC SURVEY NO. H-8600

The verifier should deal with the present hydrographic survey only, as the reviewer considers its relation to previous surveys and published charts. He should be thoroughly familiar with Chapters 3, 7 and 9 of the Hydrographic Manual.

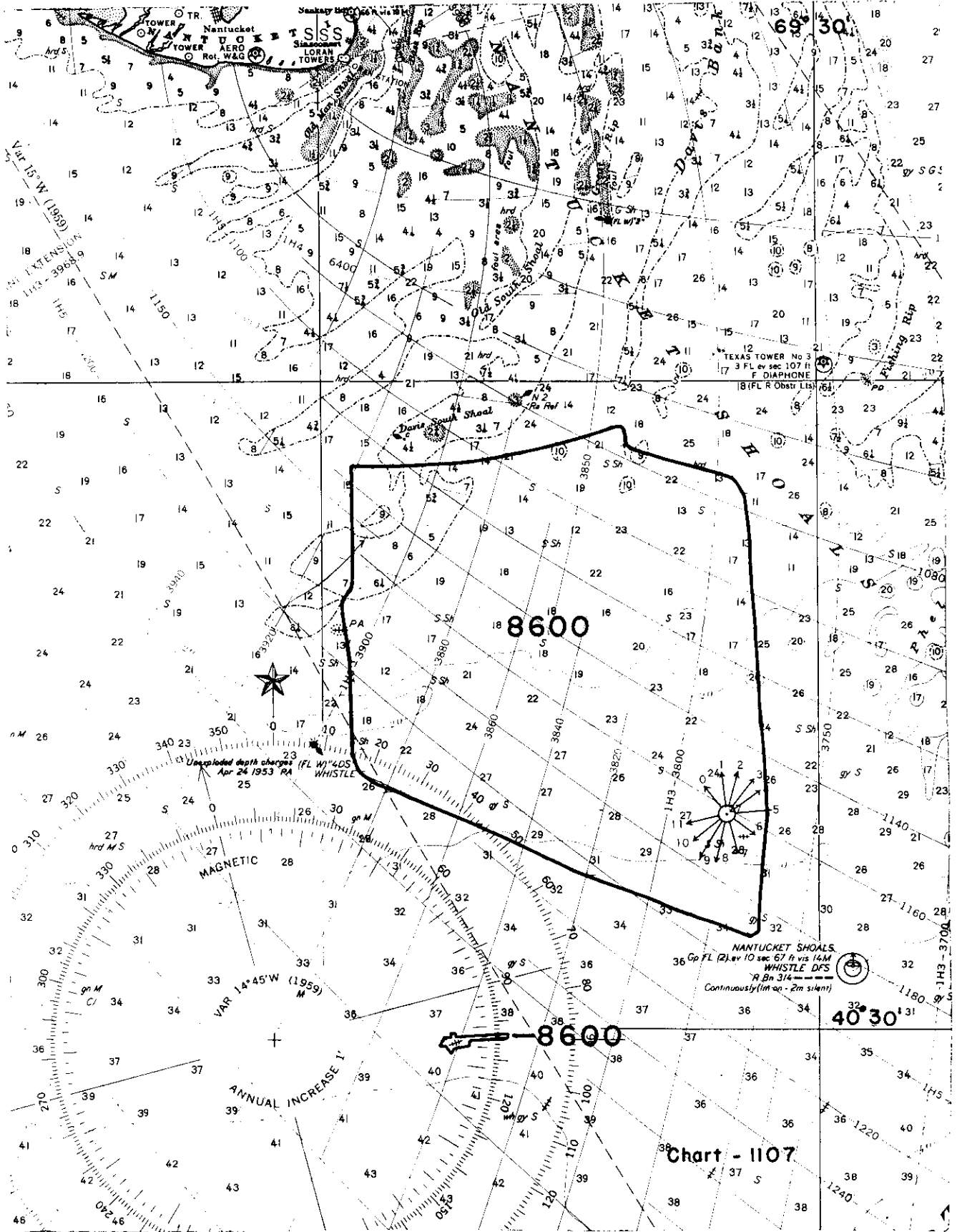
1. The descriptive report was consulted and appropriate notes were made in soft pencil regarding action taken.
2. Soundings originating with the survey and mentioned in the descriptive report have been verified, including latitude and longitude.
3. All reference to survey sheets mentioned in the descriptive report include the registry number and year.
4. Geographic names of hydrographic features if on sheet are in slanting lettering and of topographic features in vertical lettering.
5. All items affecting the plotting of the survey which are entered in the remarks columns of the sounding records were noted and check marked. In all cases appropriate action was taken.
6. All positions verified instrumentally were check marked in the sounding records.
7. All critical soundings are clear and legible and are a little larger than the adjacent soundings.
8. The metal protractor has been checked within the last three months.
9. The protracting and plotting of all bad crossings were verified.
10. All detached positions locating critical soundings, rocks or buoys were verified.
11. The boat sheet was compared with the smooth sheet.

12. The spacing of soundings as recorded in the records was closely followed.
13. The bottom characteristics were shown on outstanding shoals.
14. The reduction and plotting of doubtful soundings were checked.
15. The transfer of contemporary topographic information was carefully examined.
16. All junctions were transferred and overlapping curves made identical.
17. The notation "JOINS H- (19--)" was added in ink for all contemporary adjoining or overlapping sheets now registered. Those not verified are shown in pencil.
18. The depth curves have been inspected before inking.
19. All triangulation stations and transfer of topographic and hydrographic signals were checked.
20. Heights of rocks were checked against range of tide.
21. Rocks transferred from topographic surveys have a dotted curve where shown thereon. Rocks located accurately by hydrographer are encircled by dotted red curve.
22. Unnecessary pencil notes have been removed.
23. Objects on which signals are located and which fall outside of the low water line have been described on the sheet.
24. The low water line and delineation of shoal areas have been properly shown.
25. Degree and minutes values and symbols have been checked.
26. Questionable soundings have been checked on the fathograms.

27. Source of shoreline and signals (when not given in report).
28. All notes on sheet are in accordance with figure 171 in the Hydrographic Manual.
29. All aids located, with those on contemporary topographic sheets, have been shown on survey.
30. Depth curves were satisfactory except as follows:
31. Sounding line crossings were satisfactory except as follows:
32. Junctions with contemporary surveys were satisfactory except as follows:
33. Condition of sounding records was satisfactory except as follows:
34. The protracting was satisfactory except as follows:
35. The field plotting of soundings was satisfactory except as follows:
36. Notes to reviewer:

Verified by

Date



NAUTICAL CHARTS BRANCH

SURVEY NO. H-8600

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
1-12-62	1108	h.j. Keeler	<i>Part appl.</i> Before After Verification and Review
3-20-62	1000	<i>Carl W. Johnson</i>	Before After Verification and Review <i>Exam No corr.</i> <i>thru chrt 1108 drg #29</i>
9-24-62	71	G.R. Johnson	Before After Verification and Review <i>Partly Applied</i> <i>through chrt 1108 drg #29</i>
10-17-62	70	G.R. Johnson	Before After Verification and Review <i>Partly Applied</i> <i>through chrt 71 drg #16 - No Correction</i>
12-20-62	1107	G.R. Johnson	Before After Verification and Review <i>Partly Appl'd</i> <i>Added one sounding thru 1108 drg #29</i>
6-22-63	3076	G.R. Johnson	Before After Verification and Review <i>Partly applied.</i> <i>No Correction</i>
12/4/78	1108	<i>Bill Wankers</i>	Before After Verification and Review <i>Class #1</i> <i>(Adequate Application)</i> Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.