

9009

572 or 177
6099

Diag. Cht. No. 1207-2

FORM C&GS-504

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

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. PE-5-1-68 Office No. H-9009

LOCALITY

State Massachusetts

General locality Massachusetts Bay

Locality Beverly Harbor

19 68

CHIEF OF PARTY

LCDR J. Austin Yeager

LIBRARY & ARCHIVES

DATE 8/7/70

USCOMM-DC 87022-P68

240
241
6135C-B

9009

HYDROGRAPHIC TITLE SHEET

H-9009

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.

PE 5-1-68

State MASSACHUSETTS

General locality VICINITY OF CAPE ANN

Locality BEVERLY HARBOR

Scale 1:5000 Date of survey April - August 1968

Instructions dated 26 March 1968 Project No. OPR-473

Vessel LAUNCH AND SKIFF OF SHIP PEIRCE

Chief of party J. AUSTIN YEAGER

Surveyed by D.R. ASKEW, R.T. OLACK & A.B. MOSTUE

Soundings taken by echo sounder, hand lead, pole

Graphic record scaled by SHIP PERSONNEL

Graphic record checked by SHIP PERSONNEL

Protracted by GERBER DIGITAL PLOTTER, PACIFIC MARINE CENTER

Soundings penciled by " " " " " "

oundings in fathoms feet at MLW MLLW

REMARKS:

Jan 20 1968

DESCRIPTIVE REPORT
TO ACCOMPANY
HYDROGRAPHIC SURVEY PE 05-1-68
1968 FIELD SEASON

USC&GS SHIP PEIRCE
J. AUSTIN YEAGER, LCDR USESSA

SCALE 1:5,000
CHIEF OF PARTY

A. PROJECT

This survey was authorized under Project OPR 473, Cape Ann to Cape Cod, Massachusetts. Revised Instructions dated March 26, 1968 supercede all previous instructions.

B. AREA SURVEYED

The area covered by this survey includes Beverly harbor and extends inshore to cover all of Bass and North Rivers as far as the head of navigation. Seaward, the survey extended to $\lambda 70^{\circ} 51'15''W$ on the east and to $\phi 42^{\circ} 31'45''N$ on the south.

Hydrography covered all inshore navigable areas. In the offshore portions, junction was made with contemporary surveys PE 5-4-68 (unassigned H- number as it is incomplete) on the east and survey PE 5-3-68 (H-9010) on the south.

H-9046 (1968)

Hydrography commenced on this boat sheet on April 16, 1968 and was completed on August 29, 1968.

C. SOUNDING VESSEL

Hydrography was accomplished using both launch and skiff. Positions established by Launch PE-2 are denoted by red position numbers. All skiff positions are inked in green color.

D. SOUNDING EQUIPMENT

A Raytheon (type 723) fathometer was employed for sounding. Launch PE-2 used fathometer number 260. Echo soundings were taken in depths up to 40 feet.

Sounding with the skiff was accomplished using a 16 foot graduated pole and/or leadline. Where possible, skiff work was verified by running crosslines with launch and fathometer.

Settlement and squat correctors were determined for launch work through level measurements.

Bar checks were taken once or twice a day as wind and sea conditions permitted. Bar check results were then tabulated and the mean fathometer error at each depth was determined. These values were then placed on a graph and the fathometer error at given depths was taken from the graph in 0.2 foot increments.

The initial on the fathogram was held at 2.0 feet for this survey. Since the launches were refueled every other day, and draft correction due to fuel consumption was found to be negligible; thus no draft corrector was required other than that incorporated in the initial. Included in the initial is a reduction of one foot from the draft of the vessel as per memorandum from the Chief, Instrument Division dated October 1, 1962.

No phase correction was necessary as all work was accomplished on "A" scale.

E. SMOOTH SHEET

The smooth sheet will be plotted automatically at the Pacific Marine Center, Seattle, Washington by the Gerber Plotter. Field records were encoded on punched tapes designed for computer use. Two tapes were made from observations taken; a "position" tape providing position information obtained from three-point visual fixes, and a "sounding" tape providing depths. Additional corrector tapes were logged to provide all other data necessary to reduce these depths to final, correct values.

F. CONTROL

Visual control was used for all survey work. Three-point sextant fixes were utilized on triangulation and photogrammetric points. The fixes were plotted by three-arm protractor.

Photogrammetric signals were located in the field by Photogrammetric Field Party PFP-62, E. W. Hartford, Chief of Party, and identified on photographs. From the photographs, the signal positions were plotted and pricked on the following photogrammetric compilations.

Incomplete Manuscript T-12972 - compilation complete
pending field edit January 1967

Incomplete Manuscript T-12973 - compilation complete
pending field edit January 1967

Signal positions were then transferred from these T-sheets to the boat sheet.

Five
Six additional hydro signals were required that could not be established by photogrammetry. Three-point sextant fixes with check angles were used to locate these.

To accomplish automated smooth processing, positions of the signals used were scaled in degrees, minutes, and meters of latitude and longitude. Scaling was done from the most accurate source document available. T-sheets were used for all photo signals and the boat sheet for sextant located hydro signals.

Triangulation stations used for control as signals were placed on boat sheets using geographic positions listed as adjusted North American Datum, 1927.

G. SHORELINE

Shoreline was transferred to the boat sheet from blue line manuscripts of the photogrammetric compilations listed in Section "F". A shoreline manuscript of the upper portions of Waters and Porter Rivers at 1:5,000 was enlarged from T-12978 and furnished by the Director, Atlantic Marine Center in a letter dated March 25, 1968. Within the area covered by this manuscript, signals were located by attaching a dog-ear to T-sheet T-12972 and plotting the positions from photos.

No portion of the shoreline required revision. The high water line was inspected and verified by the hydrographer. The low water line was determined by taking the survey vessels as close to shore as possible during times of calm sea and high water. The low water line was also determined by walking shoal areas at low water.

H. CROSSLINES

Crosslines were run at 8.7% of the total mileage of sounding lines. Crossings were in good agreement.

I. JUNCTIONS *H-9010 (1968)* *H-9046 (1968)*

Outside of the harbor, junction was made with contemporary surveys PE 5-3-68 and PE 5-4-68. Most junctions agreed within a foot and depth curves showed no discontinuity through the junction.

J. COMPARISON WITH PRIOR SURVEYS

Pre-Survey Review Item 74: This channel has been fully developed to provide up to date information for charting. Evidence of the channel's existence is still present although the shoalest depth is now six feet. According to the Commodore of the United Shoe Manufacturing Company Yacht Club, this channel was dredged in the early 1950's. At present there is a bill in the Massachusetts Legislature that will complete the dredging up to the head of navigation of the river. Also, the swing bridge over Bass River can only be opened upon 24 hours advance notice. It is presently a hand cranked bridge but a bill is in the State Legislature that will mechanize the opening of the bridge.

Pre-Survey Review Item 75: This area was developed to verify or disprove the report of shoaling. There are no indications of shoaling that would be hazardous to the small craft that use the area.

Pre-Survey Review Item 80: This three piling dolphin is used as photo hydro signal "ABE"(115). It has a sign on it stating "5 MPH SPEED LIMIT BEGINS AT RED NUN BUOY # 5".

Questionable Soundings

The three foot sounding in the Danvers River between the bridges was not found. A six foot shoal was located north of the PSR position and a 3-1/2 foot sounding south east about 100 yards.

^{three} The four foot sounding in Beverly Harbor south of Red Nun Buoy "6" and south of the ship channel was located about 40 yards south of the PSR position.

The three foot sounding near the dolphin north of the channel was found in its PSR position (just south west of Item 80).

The ten foot sounding on a rock south of Woodbury Point was located just south of the PSR position. *unable to find any indication of this shoal in records*

The twenty-nine foot sounding east of Jupiter Point and west of "Red Nun Buoy 18" was not found although 30 foot soundings exist in the area immediately adjacent. *25ft sounding at $\lambda 72^{\circ} 32' 18''$
 $\lambda 70^{\circ} 51' 42''$*

Two hours of development were run searching for the fifteen foot sounding due east of Jupiter Point. No indication of the fifteen foot sounding was found. *18ft sounding at $\lambda 42^{\circ} 32' 02''$
Posn. 1533 $\lambda 70^{\circ} 51' 64''$*

While searching for the six foot sounding just east of the entrance to Jupiter Cove, ~~six and one-half foot soundings~~ were found in the immediate area. *5 to 6 ft* $\phi 42^{\circ} 31'.88$
 $\lambda 70^{\circ} 51.9$

✓ The twenty foot questionable sounding northeast of Abbott Rock near Salem Harbor was investigated and a 21 foot shoal found on the north edge of the PSR position.

The twenty-four ~~foot~~ *23 ft found.* questionable sounding east southeast of Abbott Rock near Salem Harbor was verified, the sounding occurring on the south edge of the PSR position.

The fifteen foot sounding north of the Salem Willows Yacht Club (on Salem Neck) was searched for but no indication found in the two hours spent.

The nine foot sounding next to Black Can Buoy "5" near Beverly Harbor was also investigated for two hours and nothing was found. ✓

The pair of twelve foot soundings southeast of Lobster Rocks Beacon in the entrance to Beverly Harbor exist. Each sounding occurred just west of the plotted PSR position. *The most S. Ely of the two is now 13 ft. 11 ft sounding at* $\phi 42^{\circ} 32'.17$ $\lambda 70^{\circ} 52'.79$

The twelve foot sounding just west of Lobster Rocks Beacon was searched for but not found. The shallowest depth recorded in the area was fifteen feet. ✓

K. COMPARISON WITH THE CHARTS

Comparison was made with two charts covering this area, C&GS 240 and 241. Due to the stable nature of this area, agreement was generally quite good.

On chart 241, a rock is shown in position $\phi 42^{\circ} 31'.36''$ N, $\lambda 70^{\circ} 52'.10''$ W with a depth of two feet. Upon investigation the obstruction was found to be a wooden crate covered with kelp. Its position was noted on the boat sheet as position 4718 with a depth of ~~1-1/2~~ feet. *1/2 ft.* *plotted as an obstruction*

A wreck was found and investigated by divers at $\phi 42^{\circ} 32'.26''$ N, $\lambda 70^{\circ} 53'.07''$ W. A least depth of 8 feet was recorded (position 1529, Launch PE-2). According to information available, the boat is an 85 foot yacht, the "VAGRANT", which went down in a 1954 hurricane. It is located at the Beverly Marina piers. ✓ The wreck lies on its starboard side with the least depth occurring on the after port cabin corner. The hull is essentially intact but marine growth and silt cover the boat. It is not a hazard to navigation as it is well within the Marina complex and sufficiently deep for the boats that use this Marina to clear.

On chart 240, the six foot channel in the upper reaches of the Porter River has now shoaled to a depth of five feet. The upper portion of the Waters River has apparently been dredged to allow for the travel of oil tankers. Deepest depth in that region has changed from the 4 foot charted depth to 9 feet along the bulkhead and 12³ feet in the channel.

L. ADEQUACY OF SURVEY

This survey is complete and adequate to supercede prior surveys of the area.

M. AIDS TO NAVIGATION

A total of thirty four floating aids to navigation were located in the form of buoys. All positions agreed well with charted positions on charts 240 and 241. An abstract of these buoys is contained in ARPENDIX H - Hydrographic Data Located on the Survey.

One privately maintained aid to navigation was located in Jupiter Cove. Its position was fixed (position 4666 - skiff) and the Red Day Marker was used as hydro signal "ZAP"(198).

N. STATISTICS

	<u>No. of Pos.</u>	<u>Naut. Mi. Sdg. Line</u>	<u>Bottom Samples</u>	<u>Area Surveyed</u>
Launch PE-2	1535	92.4	21	2.6
Skiff	<u>715</u>	<u>26.5</u>	<u>31</u>	<u>1.3</u>
Total	2250	118.9	52	3.9 Sq.Mi.

O. MISCELLANEOUS

The current study proposed in the Project Instructions was performed using a Geodyne photo-type current meter. The meter was established on Station 7, ϕ 42° 32.4'N, λ 70° 51.9'W, on May 20, 1968 and removed on June 6, 1968. The meter recorded data for the full seventeen days it was on station. The film and field records of the study were forwarded to Chief, Tides and Currents. Processing of the data is not complete so results are not yet available.

At 0001 hours, April 28, 1968, the PEIRCE switched all shipboard clocks to Eastern Daylight Saving Time. All hydrography performed previous to this time must be reduced to the 75°W time meridian. All hydro after this time is based on the 60°W time meridian.

P. RECOMMENDATIONS

None.

Q. REFERENCES TO REPORTS

Report on Landmarks for Charts and Fixed Aids to Navigation,
USC&GS Ship PEIRCE, 1968 Field Season.

Coast Pilot Report, USC&GS Ship PEIRCE, 1968 Field Season.

Season's Report, USC&GS Ship PEIRCE, 1968 Field Season.

Respectfully submitted,

A. Brian Mostue

A. Brian Mostue
ENS USESSA

Approved and Forwarded

J. Austin Yeager
J. Austin Yeager
LCDR USESSA

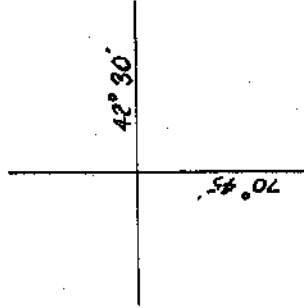
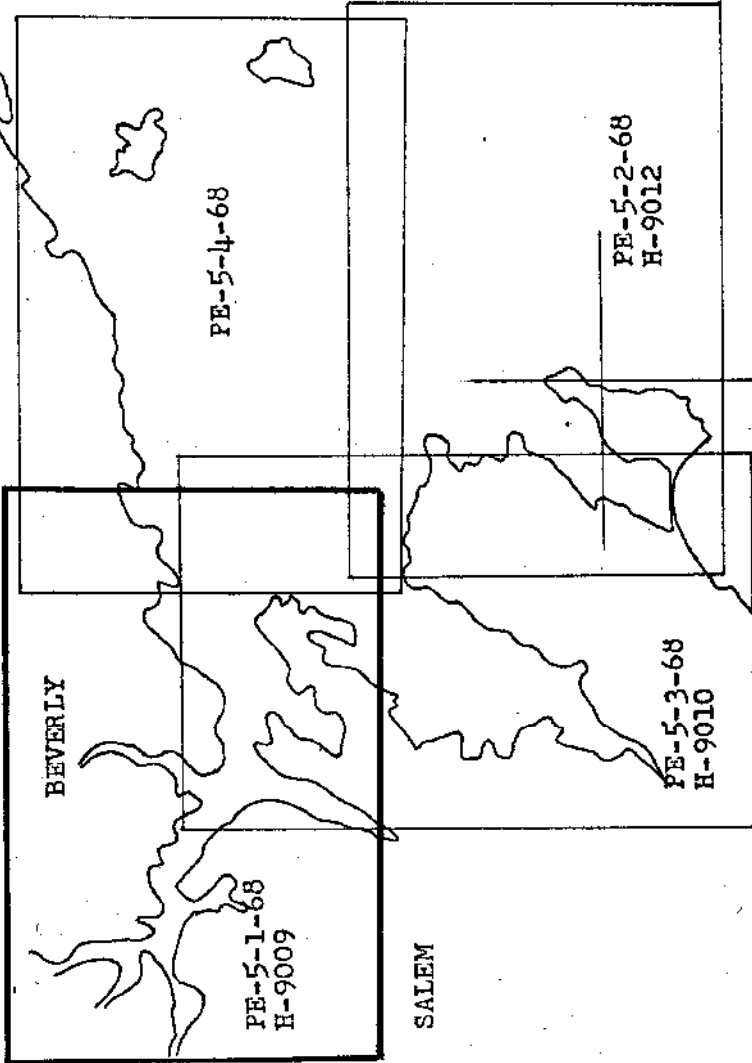
APPROVAL SHEET

FIELD NUMBER PE 5-1-68

The field work from this hydrographic survey was under the immediate, daily supervision of LCDR Charles K. Townsend. The boat sheet and all records have been reviewed and are approved by me. It is believed this survey is completely adequate to supercede all prior surveys and no additional field work is recommended.

J. Austin Yeager
J. Austin Yeager
LCDR USESSA

MANCHESTER



SHEET LAYOUT
OPR 473

COAST & GEODETIC SURVEY - JAMES C. TISON, DIRECTOR
 MONTHLY PROGRESS SKETCH - OPR-473
 CAPE ANN TO CAPE COD

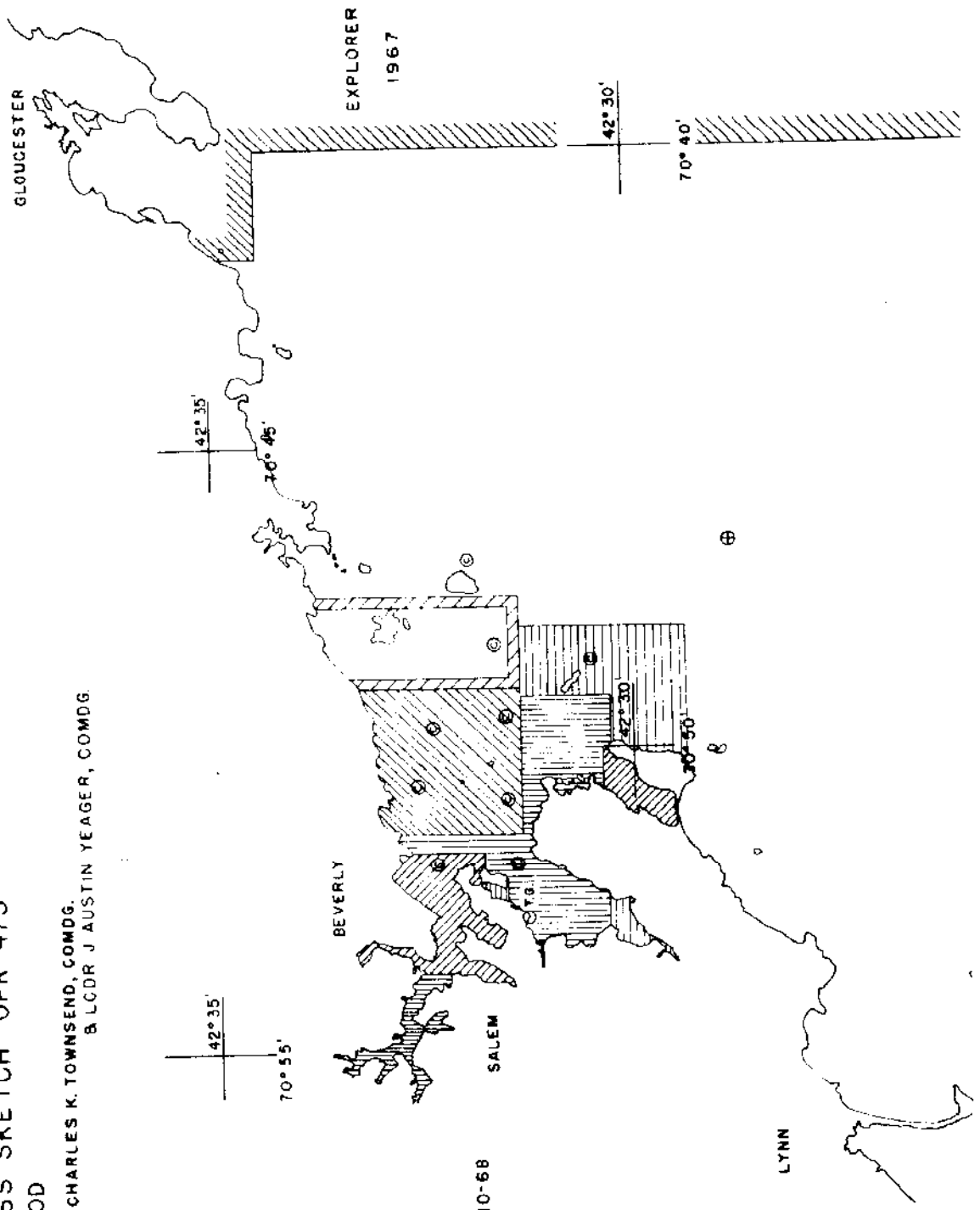
USC & GSS PEIRCE LCDR CHARLES K. TOWNSEND, COMDG.
 & LCDR J. AUSTIN YEAGER, COMDG.

1968 FIELD SEASON

SCALE CHART 1207

- APRIL
- MAY
- JUNE
- JULY
- AUGUST

NOT SHOWN: 4 DAY
 PROJECT SP-AMC-10-68

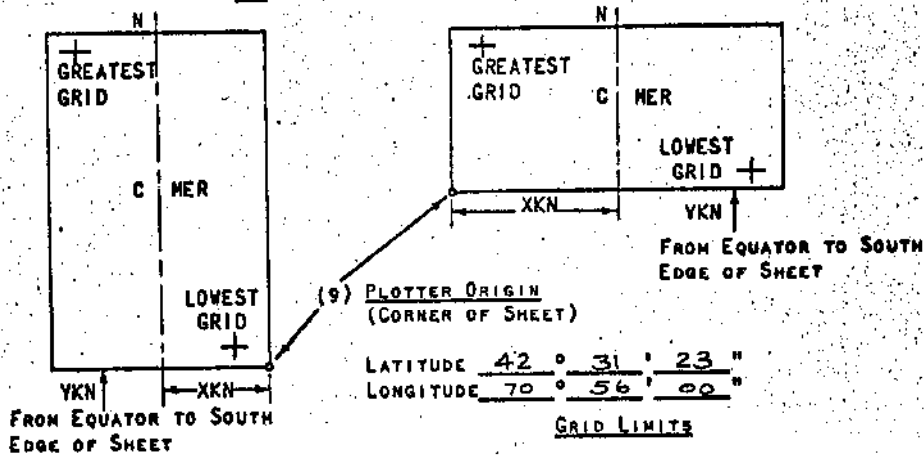


FORM # 1

FIG. 15

PARAMETERS FOR DIGITAL COMPUTING
POLYCONIC PROJECTION

- (1) PROJECT No. OPR 473 (4) REQUESTED BY P.M.C.
 (2) H No. H-9009 (5) SHIP OR OFFICE PEARCE
 (3) FIELD No. PE-5-1-68 (6) DATE REQUIRED ASAP
 (7) VISUAL (8) ELECTRONIC (FILL OUT FORM #3)
 (10) XKN (SP 5) DISTANCE FROM CHER TO EAST EDGE (NYX = 1)
 OR WEST EDGE (NYX = 0). 3,423.2 METERS
 (11) YKN (SP 241) DISTANCE FROM EQUATOR TO SOUTH EDGE
 OF SHEET. 4,709,522.627 METERS
 (12) CENTRAL MERIDIAN 70° 53' 30"
 (13) SURVEY SCALE 1: 5,000
 (14) SIZE OF SHEET (CHECK ONE) 36x54 42x60 OTHER
 (15) NYX, ORIENTATION OF SHEET (CHECK ONE)
 NYX = 1 NYX = 0



LIST G.P. OF ALL
STATIONS TO BE
PLOTTED ON THIS
PROJECTION ON THE
BACK OF THIS FORM.
(DEG., MIN., METERS)

- (16) GREATEST LATITUDE 42° 33' 45" (PROJECTION LINE
 (17) LOWEST LATITUDE 42° 31' 30" INTERVAL, PAGE 4
 (18) DIFFERENCE 0° 2' 15" HYDRO MANUAL)
 (19) 0° 15"
 (20) 9 YSN
 (21) GREATEST LONGITUDE 70° 56' 00"
 (22) LOWEST LONGITUDE 70° 51' 00"
 (23) DIFFERENCE 0° 5' 00"
 (24) 0° 15"
 (25) 20 XSN

SEPARATES FOLLOWING TEXT:

APPENDIX A. TIDAL NOTE

- B. ABSTRACT OF CORRECTIONS TO ECHO SOUNDINGS
- C. ABSTRACT OF CORRECTIONS TO DISTANCE MEASUREMENTS
- D. ABSTRACT OF TRA CORRECTORS
- E. ABSTRACT OF DAILY CONSECUTIVE POSITION NUMBERS BY VESSEL
- F. LIST OF SIGNALS
- G. ABSTRACT OF STANDARD FORMAT COLUMN HEADINGS
- H. ABSTRACT OF HYDROGRAPHIC DATA LOCATED ON THE SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

February 26, 1969

~~Northwest Coast District~~ Atlantic Marine Center

Plane of reference approved by
~~the Massachusetts Board of Survey~~ for

HYDROGRAPHIC SHEETS 9009-9013

Locality: Salem Harbor, Massachusetts

Chief of Party: J. A. Yeager, 1968

Plane of reference is mean low water

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

Salem
Boston

at the working grounds
Height of Mean High Water above Plane of Reference is as follows:

Zone 1 = 9.0 feet
Zone 2 = 8.1 "
Salem = 8.8 "

Remarks

Tide reducers for Day No. 149, H.S. 9009 have been revised and verified.

J. M. Seymour
Chief, Tides and Currents Branch

Memorandum

TO : Hydro Processing
✓ Atlantic Marine Center
Pacific Marine Center

DATE: 3/6/69

In reply refer to:

FROM : Commanding Officer
USC&GSS PEIRCE

SUBJECT: Revised tides, OPR 473

Enclosed are tidal revisions for H. S. 9009, PE-05-1-68,
Day No. 149. These corrections were supplied and verified
by the Tides and Currents Branch.

J. Austin Yeager
J. Austin Yeager, LCDR,
Commanding Ship PEIRCE

*Corrected
in
field -*



BUY U.S. SAVINGS BONDS REGULARLY ON THE PAYROLL SAVINGS PLAN

131300	0	1034		
132000	0	1032		
132600	0	1030		
133300	0	1028		
134000	0	1026		
134500	0	1024		
135600	0	1022		
092300	0	1038	0000 148 000000 000000	
092800	0	1040		
093400	0	1042		
094000	0	1044		
094600	0	1046		
095200	0	1048		
095800	0	1050		
100300	0	1052		
101000	0	1054		
101700	0	1056		
102400	0	1058		
103100	0	1060		
104000	0	1062		
104800	0	1064		
105700	0	1066		
110900	0	1068		
112000	0	1070		
113500	0	1072		
131600	0	1074		
132800	0	1072		
134000	0	1070		
135000	0	1068		
140000	0	1066		
140800	0	1064		
141800	0	1062		
142300	0	1060		
143200	0	1058		
143900	0	1056		
144700	0	1054		
145300	0	1054		
150000	0	1050		
090000	0	1014	0000 149 000000 000000	
090800	0	1012		
091700	0	1010		
092400	0	1008		
102800	0	1006		
103400	0	1004		
104000	0	1002		
104700	0	1000		
105300	0	0998		
110000	0	0996		
110600	0	0994		
111200	0	0992		
111900	0	0990		
112600	0	0988		
113100	0	0986		
113800	0	0984		
114400	0	0982		
115200	0	0980		
134000	0	1074	1350 0 1072	
140300	0	1070	1415 0 1068	
143800	0	1066	1425 0 1066	
145300	0	1062		
092100	0	1030		

Tide revisions

H-9009 (PE 05-1-68)

Plane of Reference Approved
Datum: Mean Sea Level

FIELD NUMBER PE 5-1-68

TIDAL NOTE

Tidal heights for this survey were obtained from marigrams at the portable tide gage the PEIRCE established in Salem, Massachusetts harbor, ϕ $42^{\circ} 31'18''N$, λ $70^{\circ} 52'46''W$. Hourly heights were picked off and verified by the Tides and Currents Branch. Tides for periods when hydrography was run but no marigrams were obtained have been supplied directly from the Tides and Currents Branch. All waters in this survey use the same tide zone. Times for the portable tide station at Salem, Massachusetts and the hydrography itself were on 75° west time zone until 2400 hours, April 27 (Day 118). All times of the tide station and hydrography done after the above date, (April 27 (Day 118), were of the 60° west time zone. This procedure was followed because of national observance of Daylight Saving Time. Tides were placed on separate tapes because several vessels did hydrography at the same time.

*not within
sheet limits.*

Abstract of Tides follows as a copy of the Tide Tape Printout because of the length of the document.

It is printed according to the standard tide tape format as detailed in Appendix "F" - Standard Format Column Headings.

TIDES
PE-5-1-68

085300 0 0002 0000 107 000000 000000
085900 0 0000
090400 0 1002
091000 0 1004
091700 0 1006
091900 0 1008
092300 0 1010
092700 0 1012
093100 0 1014
093500 0 1016
094000 0 1018
094300 0 1020
094700 0 1022
095100 0 1024
095500 0 1026
100000 0 1028
100300 0 1030
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103200 0 1042
103700 0 1044
104300 0 1046
104900 0 1048
105400 0 1050
110000 0 1052
110500 0 1054
111000 0 1056
111500 0 1058
112000 0 1060
112500 0 1062
113000 0 1064
113500 0 1066
114000 0 1068
114300 0 1070
115200 0 1072
120000 0 1074
120700 0 1076
121500 0 1078
122000 0 1080
122700 0 1082
123500 0 1084
124000 0 1086
125400 0 1088
131000 0 1090
139000 0 1092
141000 0 1094
142500 0 1096
143500 0 1098
144000 0 1100

148700 0 1070
150300 0 1073
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151300 0 1074
152300 0 1072
152900 0 1070
152799 0 1068
154200 0 1066
0024000 0 0014 0000 100 000000 000000
085500 0 0012
091100 0 0010
092300 0 0008
093100 0 0006
093700 0 0004
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095000 0 0000
095300 0 1002
100000 0 1004
100400 0 1006
101000 0 1008
101700 0 1010
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144300 0 1032
150000 0 1034
151000 0 1022
152300 0 1030
152400 0 1072
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157400 0 0010 0250 100 000000 000000
158000 0 0008
102700 0 0002
102700 0 0000
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112000 0 1016
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121000 0 1050

130000 0 1052
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145000 0 1078
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095700 0 0000
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141000 0 1002
143000 0 8000
150700 0 1002
152000 0 1004
152300 0 1006
152300 0 1004
153400 0 1010
153700 0 1012
097300 0 1026 0000 115 000000 000000
095000 0 1024
130200 0 1008

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008700 0 1030
009100 0 1032
102500 0 1030
114200 0 1072
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136000 0 1065
139300 0 1054
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138800 0 1054
139000 0 1054
139700 0 1052
135600 0 1050
140700 0 1058
143100 0 1035
142900 0 1034
100700 0 1043 0000 119 000001 000000
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034300 0 1005
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115700 0 1054
120300 0 1066
140300 0 1073

142500 0 1076
143800 0 1074
145000 0 1078
150000 0 1070
151000 0 1068
151900 0 1066
152000 0 1064
153500 0 1062
154100 0 1060
154700 0 1058
155600 0 1056
000000 0 1004 0000 121 000000 000000
125700 0 1072
130700 0 1074
132000 0 1076
133300 0 1078
143500 0 1038
150000 0 1030
153500 0 1076
153500 0 1074
004200 0 1003 0000 122 000000 000000
001000 0 1010
002000 0 1012
005400 0 1014
002800 0 1016
003800 0 1018
100000 0 1020
100300 0 1022
101300 0 1024
102300 0 1026
103100 0 1028
103700 0 1030
104600 0 1032
105200 0 1034
110000 0 1036
110700 0 1038
111300 0 1040
112000 0 1042
112500 0 1044
113000 0 1046
113700 0 1048
114500 0 1050
131000 0 1072
131300 0 1074
132300 0 1076
133300 0 1078
133300 0 1080
135100 0 1082
141000 0 1064
151000 0 1056
152000 0 1054
152000 0 1052
155000 0 1050
103700 0 1013 0000 123 000000 000000
104700 0 1014
105700 0 1016
110700 0 1018
111300 0 1020
112300 0 1022
113200 0 1024
113000 0 1026
113500 0 1028
113600 0 1030
113600 0 1032
113600 0 1034
113600 0 1036

103100 0 1031
104700 0 1064
105700 0 1053
106000 0 1073
005300 0 1014 0000 124 000000 000000
000700 0 1012
000400 0 1010
102400 0 1004
104000 0 1010
110000 0 1012
111200 0 1014
107000 0 1033
105800 0 1033
106000 0 1040
100000 0 1048
101200 0 1044
103100 0 1043
102000 0 1042
103000 0 1050
104300 0 1032
004000 0 1010 0000 130 000000 000000
000000 0 1004
004700 0 1040
102000 0 1070
101000 0 1075
103000 0 1074
102000 0 1072
103000 0 1070
102000 0 1068
105000 0 1066
103000 0 1054
104000 0 1025
103000 0 1024
105000 0 1022
103000 0 1020
103000 0 1013
101000 0 1016
101700 0 1012
102000 0 1012
102700 0 0002
102000 0 0002
102700 0 1005
103000 0 1074 0000 121 000000 000000
002000 0 1073
002000 0 1073
004000 0 1060
004000 0 1042
002000 0 1034
101700 0 1033
102700 0 1034
103000 0 1032
110000 0 1040
111000 0 1073
111000 0 1073
111700 0 1074
113000 0 1072
104000 0 1033
104000 0 1033
102000 0 1032
102000 0 1032
103000 0 1032
103400 0 1033
104000 0 1034
104000 0 1032
103000 0 1022
103000 0 1022
103000 0 1022

103000 0 1044
103000 0 1043
110300 0 1043
111700 0 1050
111300 0 1052
111700 0 1054
112000 0 1055
112400 0 1053
112800 0 1050
113700 0 1032
114200 0 1054
121000 0 1033
125300 0 1020
121700 0 1033
126300 0 1033
123300 0 1054
124300 0 1033
125200 0 1030
126000 0 1070
127500 0 1076
127700 0 1074
128100 0 1070
129200 0 1070
129200 0 1033
001600 0 0012 0000 136 000000 000000
002000 0 0010
110200 0 1033
112000 0 1036
112500 0 1033
113000 0 1040
113500 0 1042
113700 0 1044
122000 0 1033
122700 0 1044
122800 0 1036
124000 0 1033
124700 0 1070
125300 0 1070
130000 0 1074
130500 0 1076
131300 0 1076
132700 0 1030
133000 0 1030
133500 0 1034
135000 0 1036
140000 0 1033
143000 0 1020
151000 0 1033
152000 0 1036
153000 0 1054
003000 0 1073 0000 124 000000 000000
003000 0 1040
004200 0 1032
101000 0 1030
101700 0 1070
102000 0 1076
105000 0 1074
100700 0 1053
100500 0 1056
121300 0 1054
122000 0 1052
122400 0 1050
123100 0 1043
123700 0 1046
124300 0 1044
124900 0 1043

131300 0 1034
 132000 0 1032
 132600 0 1030
 133300 0 1028
 134000 0 1026
 134800 0 1024
 135600 0 1022 ✓
 092300 0 1038 0000 148 000000 000000
 092800 0 1040
 093400 0 1042
 094000 0 1044
 094600 0 1046
 095200 0 1048
 095800 0 1050
 100300 0 1052
 101000 0 1054
 101700 0 1056
 102400 0 1058
 103100 0 1060
 104000 0 1062
 104800 0 1064
 105700 0 1066
 110900 0 1068
 112000 0 1070
 113500 0 1072
 131600 0 1074
 132800 0 1072
 134000 0 1070
 135000 0 1068
 140000 0 1066
 140800 0 1064
 141800 0 1062
 142300 0 1060
 143200 0 1058
 143900 0 1056
 144700 0 1054
 145200 0 1052
 150000 0 1050
 090000 0 1014 0000 149 000000 000000
 090200 0 1012 24
 091700 0 1010 26
 092400 0 1008 28
 102800 0 1006 30
 103400 0 1004 48
 104000 0 1002 50
 104000 0 1000 52
 104700 0 0998 54
 105300 0 0996 56
 110000 0 0994 58
 110600 0 0992 60
 111200 0 0990 62
 111900 0 0988 64
 112600 0 0986 66
 113100 0 0984 66
 113800 0 0982 68
 114400 0 0980 70
 115200 0 0978 72
 132000 0 1022 74 1350 0 1072
 140300 0 1010 70 1415 0 1068
 143800 0 1004 64 1425 0 1066
 145300 0 1002 62
 093100 0 1054 0000 156 000000 000000
 093400 0 1052

Plans of Reference Approved
 Date 2/25/69

075000 0 1043
085700 0 1046
090200 0 1044
091000 0 1042
091800 0 1040
092300 0 1038
093000 0 1036
093700 0 1034
094200 0 1032
094800 0 1030
095400 0 1028
100200 0 1025
100300 0 1024
101600 0 1022
102200 0 1020
103100 0 1018
104000 0 1016
082700 0 1068 0000 157 000000 000000
083400 0 1066
084000 0 1064
084700 0 1062
085300 0 1060
090000 0 1058
090700 0 1056
091400 0 1054
100300 0 1033 0000 164 000000 000000
093500 0 0002 0000 241 000000 000000
091000 0 0000 0000 242 000000 000000
135300 0 1072
140400 0 1074
141100 0 1076
141900 0 1078
142700 0 1080
143400 0 1082
144300 0 1084
145400 0 1086
150500 0 1088
152000 0 1090
155000 0 1092
160500 0 1094

FIELD NUMBER PE 5-1-68ABSTRACT OF CORRECTIONS TO ECHO SOUNDINGS

All velocity corrections for this survey were obtained through bar checks taken daily as weather permitted. The velocity corrections were tabulated in tables which are supplied later in this Appendix and also placed on a special corrector tape.

Each vessel established its own correctors. It became necessary to break the velocity corrections of each vessel down further into tables for different times of the work year. The water temperature changed sufficiently during the course of the survey to necessitate this breakdown. The results of the bar checks were placed on graphs and values were picked off the graph in 0.2 foot increments for enclosure in the velocity tables and tapes mentioned above.

Raytheon type 723 fathometers were used in the launches for this survey. Launch PE-1 used fathometer 242 and Launch PE-2 used fathometer 260. Soundings in the skiff were obtained with either a sounding pole or a leadline.

In this survey, table one was used for Launch PE-2 for all days until 2400 hours, May 23 (Day 144). Table two was used for Launch PE-2 for all days after May 23 (Day 144). Table five was used for all skiff work.

TABLE ONE

<u>TO DEPTH</u>	<u>CORRECTION</u>
5.8	- 1.0
12.2	- 0.8
30.0	- 0.6
999.0	- 0.8

TABLE TWO

<u>TO DEPTH</u>	<u>CORRECTION</u>
6.4	- 0.8
10.0	- 0.6
15.0	- 0.4
25.0	- 0.2
30.0	- 0.4
999.0	- 0.6

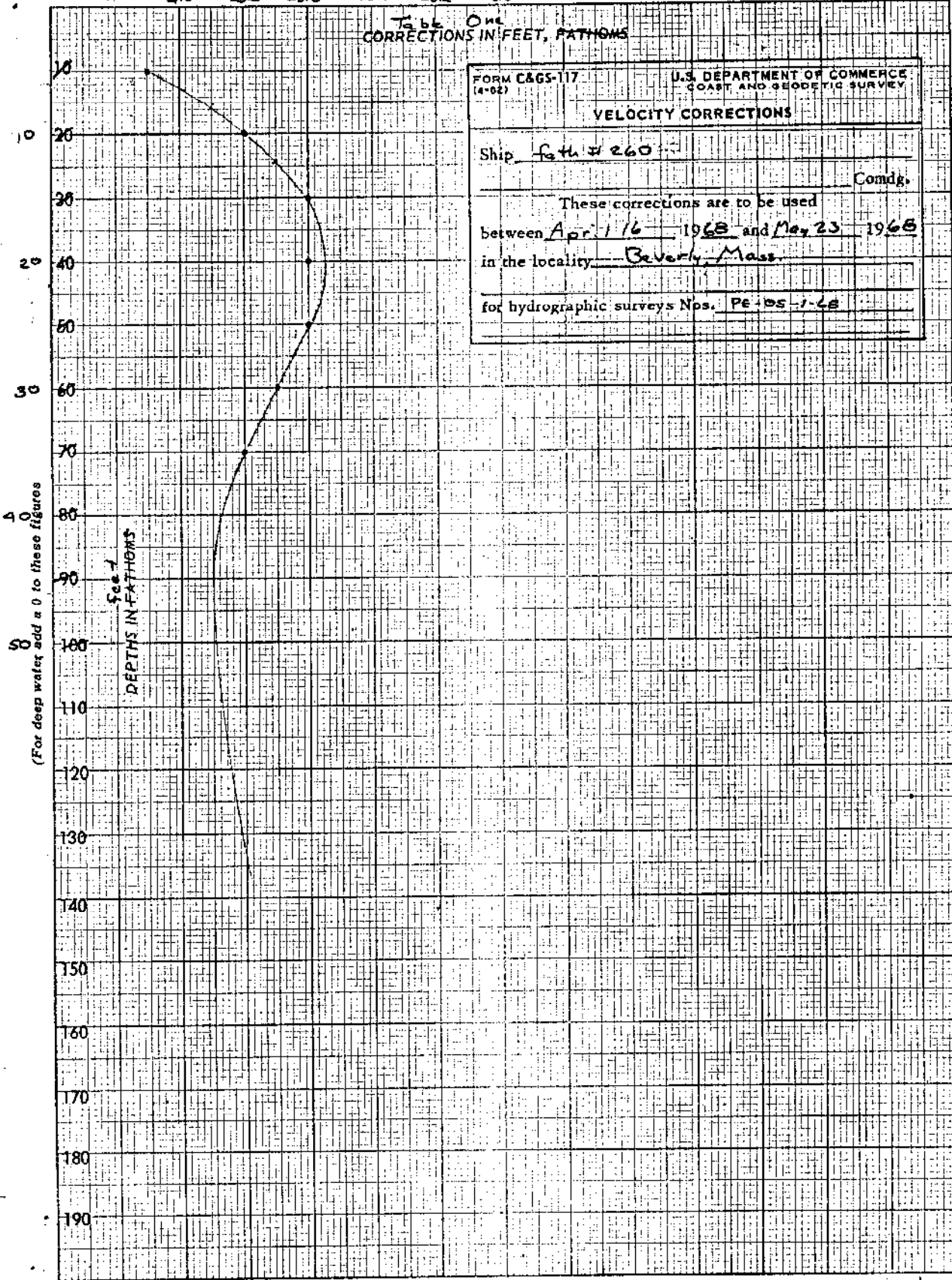
TABLE FIVE

<u>TO DEPTH</u>	<u>CORRECTION</u>
999.0	0.0

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

Table One
CORRECTIONS IN FEET, FATHOMS

FORM C&GS-117 (4-62)	U.S. DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY
VELOCITY CORRECTIONS	
Ship <u>Fath # 260</u>	Comdg.
These corrections are to be used between <u>Apr 16</u> 19 <u>68</u> and <u>May 23</u> 19 <u>68</u> in the locality <u>Beverly, Mass.</u>	
for hydrographic surveys Nos. <u>PE-05-1-68</u>	

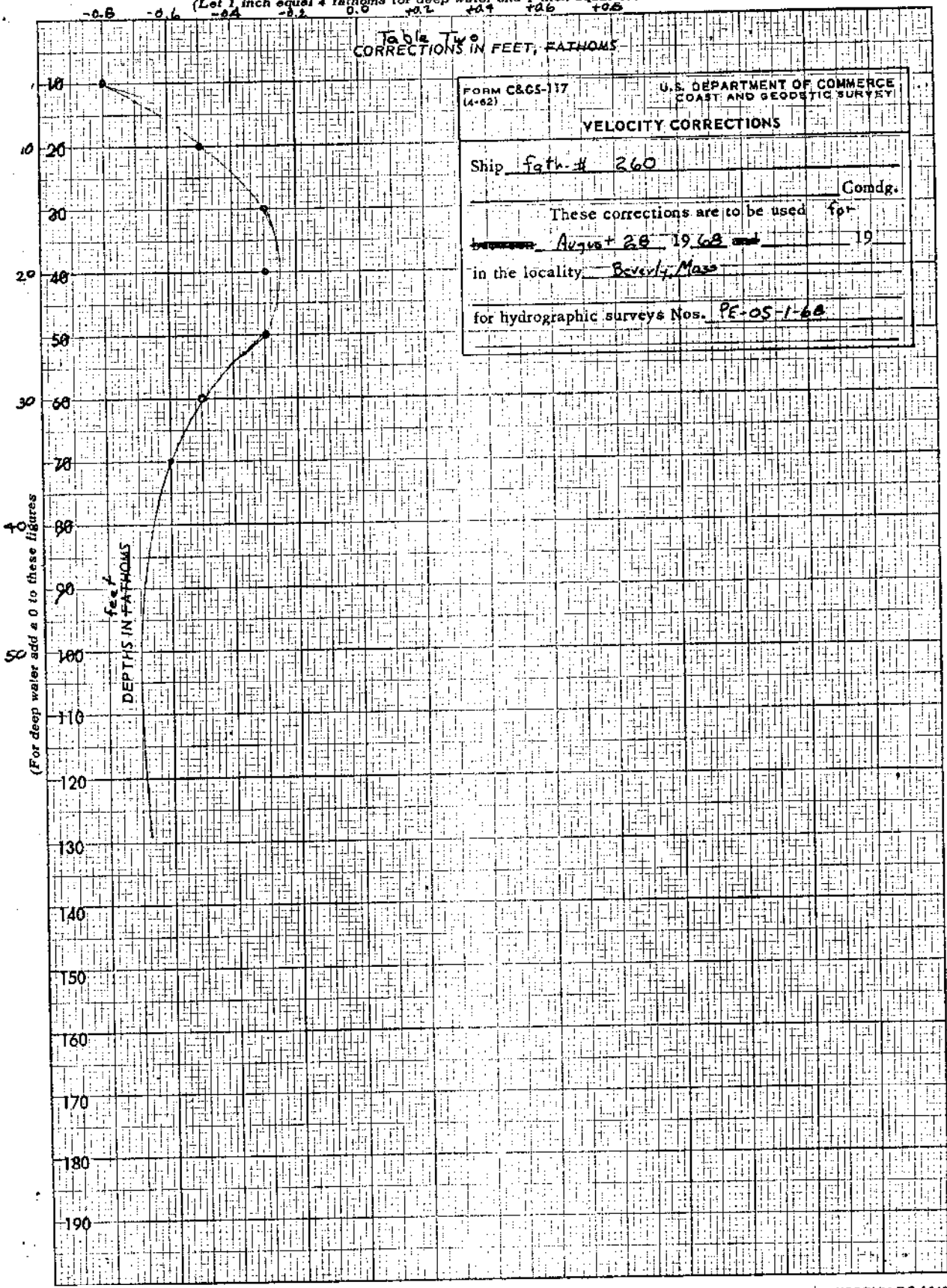


20 X 20 TO THE IN 46 1240
7 X 10 INCHES
MADE IN U.S.A.
KEUFFEL & ESSER CO.

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

Table Two
CORRECTIONS IN FEET, FATHOMS

FORM C&GS-117 (4-62)	U.S. DEPARTMENT OF COMMERCE COAST AND GEODETIC SURVEY
VELOCITY CORRECTIONS	
Ship <u>fath. # 260</u>	Comdg.
These corrections are to be used for	
between <u>August 28 1968</u>	<u>19</u>
in the locality <u>Beverly, Mass</u>	
for hydrographic surveys Nos. <u>PE-05-1-68</u>	



20 X 20 TO THE INCH 1940
7 X 12 INCHES
KEUFFEL & ESSER CO.

APPENDIX C.

ABSTRACT OF CORRECTIONS TO DISTANCE MEASUREMENTS

There are no distance measurement correctors as all hydrography on this survey was visually controlled.

FIELD NUMBER PE 5-1-68

ABSTRACT OF TRA CORRECTIONS

The TRA corrector is a combination of several correctors that actually apply only to depths taken by electronic methods. Therefore, it should be noted that all skiff work has a zero TRA value and is logged as such. The TRA correctors are supplied in this descriptive report by the use of the T/VTI tape and tables. TRA is defined as follows:

TRA = Transducer draft + Instrumental error
 + Phase correction + Initial correction
 + Settlement & squat + Fathometer speed correction

The components of the TRA corrector are as follows:

TRANSDUCER DRAFT

Transducer draft for both launches (PE-1 and PE-2) is 3 feet. This draft has been eliminated by the setting of the initial on the fathometers at 2 feet in accordance with the memorandum dated October 1, 1962, from the Chief, Instrument Division. Any difference between the actual transducer draft and this pre-set draft is absorbed by the velocity correctors determined by the bar checks. (We have negative velocity corrections at depths of 5 feet giving preliminary credence to an incorrect pre-set transducer draft. Again we emphasize that this makes no actual difference because this error is absorbed by the bar check). Also, there is no appreciable draft change because of fuel consumption. The launches are refueled at least every other day. Two days loss of fuel is not enough change in weight to affect the draft. As a result of all these considerations, the transducer draft correction is negligible.

INSTRUMENTAL ERROR

Velocity corrections for both fathometers were obtained by bar checks, thus instrumental error is non-existent.

PHASE CORRECTION

There is no phase correction necessary for this survey as the depths were not great enough to change scales.

INITIAL CORRECTION

The following corrections are applied to the indicated days of work for each vessel:

APPENDIX D(2)

FIELD NUMBER PE 5-1-68

<u>DAY</u>	<u>TIME FROM</u>	<u>CORRECTION</u>	<u>DAY</u>	<u>TIME FROM</u>	<u>CORRECTION</u>
107	0000	0.0	114	0000	0.0
108	0000	0.0	115	0000	0.0
	0832	+ 0.3	116	0000	0.0
	0858	- 0.3	117	0000	0.0
	0916	0.0	120	0000	0.0
	0922	- 0.2	121	0000	0.0
	0927	0.0	122	0000	0.0
	0932	- 0.2	130	0000	0.0
	1034	0.0	131	0000	0.0
109	0000	0.0		134515	+ 0.2
110	0000	0.0		150415	0.0
	090530	- 0.3	134	0000	0.0
	090845	0.0	144	0000	0.0
	0941	- 0.2	242	0000	0.0
	094415	0.0		1551	- 0.3
				1600	0.0

SETTLEMENT AND SQUAT

Settlement and squat data was obtained for Launch PE-2. As Launch PE-1 is identical, the same data applies for it also. This data is supplied below. The actual corrections for settlement and squat were obtained by noting the speed changes in the sounding volumes.

<u>RPM</u>	<u>CORRECTOR IN TENTHS OF FT.</u>	<u>CORRECTOR IN INCHES</u>
0000	0.0	0.0
500	0.0	0.0
1000	- 0.1	- 1.0
1200	- 0.1	- 1.0
1500	- 0.2	- 2.0
1800	- 0.2	- 2.0
2300	- 0.1	- 1.0

FIELD NUMBER PE 5-1-68

In compliance with the Hydrographic Manual, corrections for this type of survey should be in 0.2 foot increments plus or minus 0.1. Therefore, we have set the settlement and squat corrector to be a constant value of - 0.1 so that at any speed used on the launches we would be within 0.1 as specified. The skiff has no settlement and squat corrector.

FATHOMETER SPEED CORRECTION

The fathometers were maintained so that there was little speed corrector necessary. Any existing error was absorbed by the use of bar checks in obtaining velocity correctors.

The abstract of TRA corrections follows as a copy of the T/VTI Tape Printout because of the length of the document. It is printed according to the standard T/VTI Tape format as detailed in Appendix F - Standard Format Column Headings.

PE-5-1-68

OPR 473

T/VTI TAPE

LAUNCH PE-2

000000	0	1001	0000	107	000000	000000
000000	0	1001	0000	108	000000	000000
000000	0	0000				
000000	0	1004				
000000	0	1001				
000000	0	1003				
000000	0	1001				
000000	0	1003				
100000	0	1001				
000000	0	1001	0000	109	000000	000000
000000	0	1001	0000	109	000000	000000
000000	0	1001	0000	110	000000	000000
000000	0	1004				
000000	0	1001				
000000	0	1003				
000000	0	1001				
000000	0	1001	0000	114	000000	000000
000000	0	1001	0000	115	000000	000000
000000	0	1001	0000	116	000000	000000
000000	0	1001	0000	117	000000	000000
000000	0	1001	0000	120	000000	000000
000000	0	1001	0000	121	000000	000000
000000	0	1001	0000	122	000000	000000
000000	0	1001	0000	130	000000	000000
000000	0	1001	0000	131	000000	000000
130000	0	0001				
150000	0	1001				
000000	0	1001	0000	134	000000	000000
000000	0	1001	0000	144	000000	000000
000000	0	1001	0000	249	000000	000000
150000	0	1004				
160000	0	1001				

PE-5-1-68 OPR 473

T/VTI TAPE SKIFF

000000	0	0000	0000	114	000000	000000
000000	0	0000	0000	115	000000	000000
000000	0	0000	0000	116	000000	000000
000000	0	0000	0000	120	000000	000000
000000	0	0000	0000	121	000000	000000
000000	0	0000	0000	122	000000	000000
000000	0	0000	0000	123	000000	000000
000000	0	0000	0000	124	000000	000000
000000	0	0000	0000	135	000000	000000
000000	0	0000	0000	136	000000	000000
000000	0	0000	0000	142	000000	000000
000000	0	0000	0000	143	000000	000000
000000	0	0000	0000	149	000000	000000
000000	0	0000	0000	156	000000	000000
000000	0	0000	0000	157	000000	000000
000000	0	0000	0000	241	000000	000000

FIELD NUMBER PE 5-1-68ABSTRACT OF DAILY CONSECUTIVE POSITION NUMBERS BY VESSEL

<u>VESSEL</u>	<u>DATE</u>	<u>DAY NO.</u>	<u>POSITION NO.</u>	
LAUNCH PE-2	April 16	107	01 - 106	
	17	108	107 - 207	
	18	109	208 - 312	
	19	110	313 - 424	
	23	114	425 - 558	
	24	115	559 - 607	
	25	116	608-686 - 688-715	
	26	117	716 - 821	
	29	120	822 - 958	
	30	121	959 - 1013	
	May 1	122	1014 - 1094	
	9	130	1095 - 1204	
	10	131	1205 - 1329	
	13	134	1330 - 1486	
	23	144	1487 - 1528	
	June 12	164	1529	
	August 29	242	1530 - 1535	
	SKIFF	April 23	114	4001 - 4027
		27	118	4028 - 4124
		28	119	4125 - 4192
29		120	4193 - 4235	
30		121	4236 - 4238	
May 2		123	4239 - 4293	
3		124	4294 - 4332	
14		135	4333 - 4406	
15		136	4407 - 4470	
23		144	4471 - 4513	
27		148	4514 - 4583	
28		149	4584 - 4665	
June 4		156	4666 - 4701	
5		157	4702 - 4717	
August 28		241	4718	

NORFOLK HYDROGRAPHIC PROCESSING BRANCH
 LIST OF
 TRIANGULATION STATIONS
 SURVEY H-9009

<u>SIG. NO.</u>	<u>NAME</u>	<u>TRIANGULATION STATION</u>
107	PIC	FORT PICKERING L.H., 1887-1935
200	CUP	SALEM, COURTHOUSE, CUPOLA, 1934
105	GAS	SALEM GAS CO., S.W. CHY., 1919-35
114	NEW	SALEM, NEW ENGLAND POWER CO., S. STACK, 1954
106	LEE	LEE (USE), 1914-35
104	LOB	LOBSTER ROCKS BEACON, 1914-35
103	ART	BEVERLY, STUARTS FACTORY, YEL. CHY., 1919-35
112	FIR	BEVERLY, FIRST BAPTIST CHURCH, 1934
101	BEV	BEVERLY, POWERHOUSE, 1848-1933
100	HOE	BEVERLY, UNITED SHOE MFG., STACK, 1934
102	PIT	HOSPITAL POINT L.H., 1877-1935
109	TON	ABBOT ROCK, STONE BN., 1848
108	MON	MONUMENT BAR BN., 1914-35
113	RAM	RAMSHORN BN., 1914
111	PAN	SALEM GAS CO., CUPOLA, 1919-35
193	DAN	DANVERS LAWRENCE STACK, 1919

APPENDIX F

LIST OF SIGNALS

<u>NAME</u>	<u>SOURCE</u>	<u>EDP #</u>
ABE	T-12972	115
ACE	972	110
AIM	972	183
AMP	972	175
ART	Geographic Position	103
AXE	972	153
BAG	972	116
BAT	972	134
BED	972	176
BEV	Geographic Position	101
BIG	972	184
BOB	972	154
CAB	972	135
CAR	972	155
CRY	972	177
CUP	Geographic Position	200
CUT	972	185
DAN	Geographic Position	193
DAW	972	117
DAY	972	136
DEB	972	178
DOC	972	156
DUD	972	186
EAR	972	118
EAT	972	137
EEL	972	179
END	972	157
EVA	972	187
FAT	972	119
FED	972	138
FIG	972	181
FIR	Geographic Position	112
FOX	972	158
FRY	972	188
GAD	972	120
GAG	972	139
GAS	Geographic Position	105
GIN	972	159
GOT	972	189
HAG	972	121
HAY	973	210
HEX	972	140

<u>Name</u>	<u>Source</u>	<u>EDP #</u>
HID	T-12973	306
HOE	Geographic Position	100
HUB	972	190
HUG	972	160
HUT	972	180
ICE	972	122
IDA	972	141
IRK	973	307
IVY	972	161
JAW	972	142
JIB	973	308
JOE	972	500
JUG	972	162
KEN	972	123
KEY	972	163
KID	972	143
KIM	972	191
LAD	972	124
LAM	972	144
LAX	972	164
LAY	972	192
LEE	Geographic Position	106
LEG	973	309
LIZ	973	211
LOB	Geographic Position	104
MAG	972	125
MAX	972	145
MET	973	310
MID	972	165
MON	Geographic Position	108
MUG	973	212
NAT	972	126
NEW	Geographic Position	114
NIG	972	146
NIX	972	166
NOD	972	182
OAK	972	127
ODD	972	147
OFF	973	213
OHM	972	167

<u>NAME</u>	<u>SOURCE</u>	<u>EDP #</u>
PAD	T-12972	128
PAN	Geographic Position	111
PEG	972	148
PEP	972	168
PIC	Geographic Position	107
PIE	973	214
PIT	Geographic Position	102
POR	Sextant Cut	199
RAG	973	215
RAM	Geographic Position	113
RIG	972	169
RIO	Sextant Cut	196
RIP	972	149
ROT	972	170
SAM	Sextant Cut	197
SIC	972	129
SIR	Sextant Cut	195
SKY	972	150
STY	972	171
TAP	972	130
TAX	972	172
TOM	972	151
TON	Geographic Position	109
TOY	973	216
VAN	972	173
VET	972	131
WAY	972	132
WIG	972	174
WIT	972	152
YAK	972	133
ZAP	Sextant Cut	198

APPENDIX G

ABSTRACT OF STANDARD FORMAT COLUMN HEADINGS

Position Tape

Time	Pos#	Day	Left Angle	Right Angle	Left Ctr Obj.	Rt. Obj
135800	0	0000	5000	189 035470	045450	0245 345 321

Sounding Tape

Time	Ind	Sdg	Tab.	Day	Vel.	Special Ind.
135100	1	0345	0002	189	000000 000000	0000 000 500

Transducer/Velociry Table Indicator (T/VTI) Tape

Time	TRA	Day
105200	0 1002	0000 195 000000 000000

Tide Tape

Time	Tide	Day
090000	0 0080	0000 135 000000 000000

Velocity Table Tape

Depth	Vel.	Corrn	Table
000100	0 0004	0003	000 000000 000000

Signal List Tape

EDP#	Latitude	Longitude	name
	° ' meters	° ' meters	
100	27 08 0899	080 09 0446	ANT

FIELD NUMBER PE 5-1-68ABSTRACT OF HYDROGRAPHIC DATA LOCATED ON THE SURVEY

<u>POSITION NUMBER</u>	<u>OBJECT</u>
0001	Black Can Buoy - No. 11
0002	" " " No. 9
0003	Red Nun Buoy No. 6
0004	" " " No. 2
0005	Black Can Buoy No. 7
0006	Red Nun " No. 4
0007	Black Can " No. 5
0008	Red Nun " No. 2
0009	Black Can " No. 3
0010	" " " No. 1
0011	Black & Red Can Buoy No. Number
0012	Red Nun Buoy No. 16
0105	" " " No. 4
0106	Black Can Buoy No. 1
0107	Red Nun " No. 18
0108	Red Lighted Buoy No. 22
0109	" Nun " No. 2
0110	Black Can " No. 1
0111	Red & Black Can Buoy No Number
0112	Red Nun Buoy No. 4
0113	Black Can " No. 5
0114	Red Nun " No. 6
0115	Black Can " No. 7
0116	" " " No. 9
0117	Red Nun " No. 2
0118	Black Can " No. 3
0119	Red Nun " No. 4
0120	Black Can " No. 5
0121	Red Nun " No. 6
0122	Black Can " No. 7
0330	" " " No. 21
0801	Red Nun " No. 8
0802	" " " No. 10
0803	Black Can " No. 11
1014	fne br, gy S
1015	blk M
1016	blk M

FIELD NUMBER PE 5-1-68

<u>POSITION NUMBER</u>	<u>OBJECT</u>
1017	blk M
1018	blk M
1019	blk M
1020	blk M w/leaves
1021	br S, brk Sh
1022	fne br S
1023	blk M
1024	Rk
1025	br M, brk Rk
1026	blk M
1027	v fne br S
1028	fne br S
1029	Sh & Rk
1030	v fne br S & brk S
1031	blk M
1032	M & Sh
1033	Sh
1034	blk M
1529	Wreck
4001-4027	Docks
4193	Bridge fender
4196	" "
4197	Bridge bulkhead
4199-4220	" "
4223-4227	Bridge
4228	Pier end
4230	Pier bulkhead
4231	Pier end
4234	End of pier
4294	blk M & Rk
4295	blk M
4296	blk M, brk Sh

FIELD NUMBER PE 5-1-68

<u>POSITION NUMBER</u>	<u>OBJECT</u>
4297	brk Sh
4298	fne gy M
4299	blk M, Sh
4300	blk M
4301	blk M
4302	blk M
4303	blk M
4304	blk M
4305	blk M, brk Sh
4306	br M, brk Sh
4307	blk M
4333	blk M
4334	blk M
4335	br M
4336	br M, Sh
4337	blk M
4338	blk M
4339	br M, Sh
4340	br M, Sh
4341	blk M
4342	br M
4343	br M
4344	blk M
4407	Piling
4408	Rocks (10' elevation)
4409	blk M, Rk
4410	blk M
4411	blk M
4412	blk M
4413	Wreck - wooden hull boat
4414	Rocks
4596-4601	Marina dock
4602-4608	Dock
4609	End of ramp on bulkhead

FIELD NUMBER PE 5-1-68

POSITION NUMBER

OBJECT

4610-4612

Dock

4666

Privately maintained Red Day
Marker (Hydro signal "ZAP")

4672

Hydro signal "POR"

4680

Piling

4701

Pipe

4718

Wooden crate

GEOGRAPHIC NAMES
Survey No. H-9009

Name on Survey	Source of Name										
	A	B	C	D	E	F	G	H	K		
Abbott Rock											1
Bass River											2
Beverly Harbor											3
Collins Cove											4
Cove Village											5
Crane River											6
Danversport											7
Danvers River											8
Foster Point											9
Hospital Point											10
Juniper Cove											11
Juniper Point											12
Lobster Rocks											13
Mackerel Cove											14
Massachusetts Bay											15
Monument Bar											16
North River											17
North Salem											18
Patch Beach											19
Porter River											20
Rams Horn Rock											21
Salem Neck											22
Salter Point											23
Tuck Point											24
Waters River											25
Winter Island											26
Woodbury Point											27

PREPARED BY

Frank W. Lockett
CARTOGRAPHIC TECHNICIAN

APPROVED BY

A. Joseph Wright
CHIEF GEOGRAPHER

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			
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	3/16/70
B. PROJECTION INTERSECTIONS VERIFIED BY		W.W. Feezel	3/6/70
C. PROJECTION LINES RULED BY		W.L. JONNS	3/16/70
D. ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED			
E. OVERLAYS COMPLETED BY			
1. POSITION NUMBER LEADERS ADDED		W.L. JONNS	4/10/70
2. EXCESS SOUNDING OVERLAY COMPARED		W.L. JONNS	11/3/69
3. PRELIMINARY SMOOTH PLOTS COMPARED		W.L. JONNS	11/20/69
4. OTHERS UTILIZED			
A.			
B.			
F. DESCRIPTIVE REPORT ADDENDUM		W.L. JONNS	4/15/70
G. CONTROL STATIONS VERIFIED		W.L. JONNS	5/14/69
H. POSITIONS MANUALLY PLOTTED		D.R. Mumford - W.L. JONNS	3/20/70
I. MANUAL PLOT VERIFIED		W.L. JONNS	3/20/70
J. SHORELINE APPLIED		W.L. JONNS	3/18/70
K. BOTTOM CHARACTERISTICS ADDED		W.L. JONNS	4/10/70
L. NOTES AND DEPTH CURVES ADDED		W.L. JONNS	4/14/70

FORM C&GS-946
(REV. 11-65)
(PREP. BY
HYDROGRAPHIC
MANUAL 20-2,
8-66, 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-9009 (PE-5-1-68)

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET & P.O.		1	BOAT SHEETS		1	
DESCRIPTIVE REPORT		1	OVERLAYS		3+7	
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS / SOURCE DOCUMENTS
ENVELOPES	3		(MISC.) 3			
CASIERS	1		3			
VOLUMES	10					
BOXES			2			
T-SHEET PRINTS (L.M.)						
Tex 2272x , Tex 2273 , Tex 2278						
SPECIAL REPORTS (L.M.)						

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				2250
POSITIONS CHECKED		280		
POSITIONS REVISED		182		
DEPTH SOUNDINGS REVISED		245		
DEPTH SOUNDINGS ERRONEOUSLY SPACED				
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED				
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		80		
JUNCTIONS		2		
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		25		
SPECIAL ADJUSTMENTS <i>Tide corrections</i>	26			
ALL OTHER WORK		332		
TOTALS	26	439		
PRE-VERIFICATION BY <i>D.R. Mumford - W.L. Jonns</i>	BEGINNING DATE 3-17-69	ENDING DATE 11-20-69		
VERIFICATION BY <i>W.L. Jonns</i>	BEGINNING DATE 3-16-70	ENDING DATE 4-15-70		
REVIEW BY	BEGINNING DATE	ENDING DATE		

FORM C&GS-946A
 (REV. 11-64)
 (PREP. BY HYDROGRAPHIC
 MANUAL, 6-64)

U.S. DEPARTMENT OF COMMERCE
 ESSA
 COAST AND GEODETIC SURVEY

VERIFIER'S REPORT
 HYDROGRAPHIC SURVEY, H 9009 (PE-5-1-68)

INSTRUCTIONS - This form serves to identify items of a checklist in verification together with items which are separately reported to the Reviewer. The form is not to be forwarded to the Reviewer. A report, which is prepared for the Reviewer, should identify items by number and letter and will be filed in the Descriptive Report until the survey is reviewed.

CL - Check List Items: should be checked as having been completed during the verification processes.

R - Report Item: This column refers to those items reported to the reviewer and is used to indicate the items discussed.

Part I - DESCRIPTIVE REPORT	CL	R	Part III - JUNCTIONS (Continued)	CL	R
<p>Note: The verifier should first read the Descriptive Report for general information and problems.</p> <p>1. The Descriptive Report was consulted, paragraphs checked if found satisfactory, and notations were made in soft black pencil regarding action taken. Remarks Required: -- None</p>	✓		<p>10. Junctions with contemporary surveys were satisfactory except as follows: Remarks Required: -- Consider conditions after adjustments have been made; note adjustments made. Make special notes of Butt junctions and areas which are SUPERSEDED.</p>	✓	
<p>2. Soundings originating with the survey and mentioned in the Descriptive Report have been verified and checked in soft black pencil, including latitude and longitude, together with position identification. Remarks Required: -- None</p>	✓		<p>Part IV - VOLUMES 11. 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 and exceptions noted in the volumes. Remarks Required: -- None</p>	✓	
<p>3. All reference to survey sheets mentioned in the Descriptive Report should include registry number and year. Remarks Required: -- None</p>	✓		<p>12. Condition of sounding records was satisfactory except as follows: Remarks Required: -- Mention deficiencies in completeness of notes or actions for the following: (a) rocks ✓ (b) line turns ✓ (c) position values of beginning and ending of lines ✓ (d) bar check or velocity correctors ✓ (e) time recording ✓ (f) notes or markings on fathograms ✓ (g) was reduction of soundings accurately done? ✓ (h) was scanning accurate? ✓ (i) were peaks at uneven intervals missed? ✓ (j) were stamps completed? ✓ (k) references to adjacent features ✓</p>		
<p>Part II - SHORELINE AND SIGNALS 4. Source of shoreline signals Remarks Required: -- List all surveys T-12972, T-12973, -T 12978 a. Give earliest and latest dates of photographs AUG-1965 b. Field inspection date NONE c. Field Edit date Sept-Oct 1967 d. Reviewed Unreviewed Adv. Man.</p>	✓				
<p>5. The transfer of contemporary topographic information was carefully examined and reconciled with the hydrography. Remarks Required: -- Discuss remaining differences.</p>	✓				
<p>6. The plotting of all triangulation stations, topographic stations and hydrographic signals has been checked and noted in processing stamp No. 42 on the smooth sheet. Remarks Required: -- None</p>	✓				
<p>7. Objects on which signals are located and which fall outside of the high-water line have been described on the sheet. Remarks Required: -- List those signals still under way.</p>	✓		<p>Part V - PROTRACTING 13. All positions verified instrumentally were check marked in color in the sounding records, and verifier initialed the processing stamp. Remarks Required: -- None</p>	✓	
<p>Part III - JUNCTIONS Note: Make a cursory comparison preliminary to inking soundings in area of overlap.</p> <p>8. All junctions of contemporary or overlapping sheets were transferred in colored ink and <i>vina</i>, <i>du</i>, curves were made identical. Remark. Required. -- None</p>	✓		<p>14. The protracting and plotting of all unsatisfactory crossings were verified. Remarks Required: -- None</p>	✓	
<p>9. The notation in slanted lettering "JOINS H---- (19)" was added in colored ink for all verified contemporary adjoining or overlapping sheets. Those not verified are shown in pencil. Remarks Required: -- None</p>	✓		<p>15. All detached positions locating critical soundings, rocks, buoys, breakers, obstructions, kelp, etc., were verified and the position numbers are legible. Remarks Required: -- None</p>	✓	

Fig. 20 (cont'd)
Form 946 A (back of form)

Part V - PROTRACTING (Continued)	CL	R	Part VIII - AIDS TO NAVIGATION	CL	R
16. The protracting was satisfactory except as follows: Remarks Required: -- Refers to protracting in general except for specific faults repeated often, or faults in control information, which required considerable reploting or adjustments.	✓		26. All fixed aids located together with those on the contemporary topographic sheets, have been shown on the survey. Remarks Required: -- Conflicts of any nature listed.	✓	
17. The protractor has been checked within the last three months. Remarks Required: -- Date of check, type of protractor and number.	✓		27. All floating aids listed in the Descriptive Report should be verified and checked in soft black pencil, including latitude and longitude and position identification. Remarks Required: -- None	✓	
Part VI - SOUNDINGS			Part IX - BOAT SHEET		
18. All soundings are clear and legible, and critical soundings are a little larger than adjacent soundings. Remarks Required: -- None	✓		28. The boat sheet was constantly compared with the smooth sheet with reference to notes, position of sounding lines and supplemental information. Remarks Required: -- None	✓	
19. Sounding line crossings were satisfactory except as follows: Remarks Required: -- Discuss adjustments.	✓		29. Heights of rocks awash were correctly reduced and compared with topographic information. Remarks Required: -- Note excessive conflicts with topographic information.	✓	
20. The spacing of soundings as recorded in the records was closely followed. Remarks Required: -- None	✓		Part X - GENERAL		
21. The scanning, reduction, spacing, plotting of questionable soundings have been verified. Remarks Required: -- None	✓		30. All information on the sheet is shown in accordance with figures 82 and 83 in the Hydrographic Manual (Pub. 20-2). Remarks Required: -- None	✓	
22. The smooth plotting of soundings was satisfactory except as follows: Remarks Required: -- Refer to legibility, errors in spacing, and errors in numbers - but not to errors in scanning.	✓		31. Unnecessary pencil notes have been removed from the sheet. Remarks Required: -- None	✓	
Part VII - CURVES			32. Degree, minute values and symbols have been checked; also electronic distance arcs have been properly identified and checked on the smooth sheet. Remarks Required: -- None	✓	
23. The depth curves have been inspected before inking. Remarks Required: -- By whom was the penciled curves inspected. <i>W.L.J.</i>	✓		33. The bottom characteristics are adequately shown. Remarks Required: -- None	✓	
24. The low-water line and delineation of shoal areas have been properly shown in accordance with the following: a. From T-Sheet in dotted black lines b. From soundings in orange c. Approximate position of sketched curve in dashed orange d. Approximate position of shoal area not sounded in black dashed Remarks Required: -- None	✓		Part XI - NOTES TO THE REVIEWER		
25. Depth curves were satisfactory except as follows: (This statement should not refer to the manner in which the curves were drawn). Remarks Required: -- Indicate areas where curves could not be drawn completely because of lack of soundings. For some inshore areas a general statement is sufficient.	✓		34. Unresolved discrepancies and questionable soundings.	✓	
			35. Notation of discrepancies with photogrammetric survey inserted in report of unreviewed photogrammetric survey or on copy.	✓	
			36. Supplemental information.		
Verified by <i>W.L. JOHNS</i>			Date <i>4-15-70</i>		

H-9009

A. Additions and corrections have been furnished the plotter
Except those marked for sub-
center by the verification unit. mission by Review
Signed Thyl J. Puffin
Date July 16, 1970 Title Chief, Verification Br.

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

Signed Thyl J. Puffin
Date July 16, 1970 Title Chief, Verification Br.

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 Thyl J. Puffin
Date July 16, 1970 Title Chief, Verification Br.

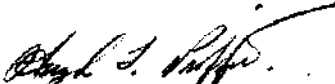
D. Smooth sheet and records forwarded to Rockville, Maryland
Office.

Date July 17, 1970

Norfolk, Va.
March 20, 1969

AMC PLOTTER NOTE TO EDAT
SURVEYS H-9009, H-9010 & H-9012

1. This Branch has reviewed the signal lists for these surveys which were compiled by the field party, and will have to ask for a third control overlay as there are a total of 19 errors in the positions of the signals on the three surveys.
2. Enclosed are three correction tapes and printouts, one for each survey, which should be used to correct your position data.
3. There was apparently a typographical error on the printout of signal names and those for OFF and MUG should be transposed. OFF should be number 213 and MUG should be number 212. Checks of the fixes you gave me by phone showed the positions to be logged correctly on the raw data tapes. *Applies to H-9009 & 9010 only -*
4. Signal correction tapes are logged in BCD code.
5. After these corrections have been made please furnish this Branch new signal printouts for the 3 surveys.


Hugh L. Proffitt
Chief, Hydro Br. AMC

VERIFIER: Dan Munford

Norfolk, Va.
May 14, 1969

AMC PLOTTER NOTE TO EDAT
H-9009

In our last "NOTE" we asked that the signal names for ~~xxxxxx~~ stations MUG and OFF be transposed due to a field typographical error. This was done but the G.P.'s were also changed and this left us with an identical situation. It is requested that the cards for these two stations be changed as follows:

09009 212 42315882 070520780 MUG
09009 213 42320113 070515543 OFF

rejected

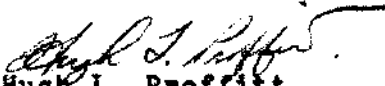
The positions plotted on these stations have been ~~xxxxxx~~ on the printouts for geographic position ~~xxxx~~ recomputation only. The original logged data is correct. There are 149 of them and they have been suitably noted on the printouts and are also marked with asterisks.

There are also 148 routine position "goofs". We are forwarding a tape and printout to correct these.

You will note that 156 positions have been rejected. These are soundings around piers and will be hand plotted.

When the above corrections have been made, please furnish us a complete new position overlay. After this has been checked we will request a sounding overlay.

Julian date on positions 0608 thru 0715 are shown on the printout as 115 Day. These positions should be 116 Day. Please change.


Hugh L. Proffitt
Chief, Hydr. Br. AMC

VERIFIER: Dan Munford

Norfolk, Va.
July 31, 1969

AMC PLOTTER NOTE TO EDAT
SURVEY H-9009

Verification of the preliminary position overlay has been completed and we find there are 17 positions which need correcting.

A tape and printout are inclosed for use in correcting these positions. The position printout is being held in this office.

There are two positions numbered 4439. Please destroy the one that has the following signal numbers; 147, 168 & 149.

After these corrections have been made, please furnish this office a sounding overlay for this survey.


Hugh L. Proffitt
Chief, Hydro^Br., AMC

VERIFIER: W.L. Jonns

Norfolk, Va.
Nov. 20, 1969

AMC PLOTTER NOTE TO EDAT
SURVEY H-9009

This office has completed the preliminary verification of the preliminary position and sounding overlays and the card printouts are enclosed with this note.

On the position card printout there are about 16 changes indicated in red pencil.

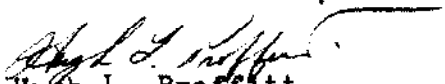
On the sounding card printout over 500 changes are indicated in red pencil. This large number can be attributed largely to the fact that this is a congested inshore survey.

Approximately 230 excess routine changes are needed to show the deeper soundings in dredged channels.

About 245 sounding changes are indicated to delineate channel edges and to correct field scanning errors. Eleven pole soundings were destroyed as they were obviously read incorrectly by the leadsman.

Sixty-eight sounding cards are to be destroyed because of erroneous logging of raw data.

When the above changes have been made, please furnish this office a smooth plot of this survey.


Hugh L. Proffitt
Chief, Hydro Branch, AMC

AMC VERIFICATION NOTES
SURVEY H-9009

GENERAL

This appears to be an excellent basic survey in an area of irregular bottom containing many dredged channels and natural sloughs. Numerous time consuming changes and adjustments were made to the survey data to delineate these features. Most are listed below and on the enclosed "Plotter Notes to EDAT".

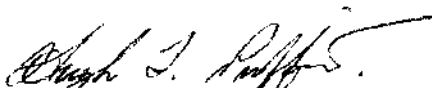
A development at Lat. 42-30'00" and Long. 70-51'38", positions 1330 thru 1349, investigating a charted 15 foot sounding, was not logged in the field. Since this shoal depth was not found, these positions were hand plotted on an overlay and attached to page 40, vol. 6.

An enlarged insert was made of the Beverly Harbor area to show soundings which were in addition to those we were able to plot at the scale of the survey. The extensions to piers, as shown in red, are floats located by the hydro party.

Detached positions 4196 thru 4227, locating bridges, pilings, etc., were hand plotted as these types of data are not readily adaptable to automation in congested areas.

Pole soundings on positions 443600 and 444303 to 444500 and 451701 to 451702 were rejected as they could not be reconciled with surrounding ~~hydro~~ hydro. It is believed that soundings were read incorrectly.

Buoy C-3, position 118, was not plotted as it appeared to be out of position at the time of location.


Hugh L. Proffitt
Chief, Verification Br.

Norfolk, Va.
July 16, 1970

TTS BAY

	High Water	Low Water	Low Water	Low Water
Gloucester	feet 8.7	feet 4.3	feet 0.0	feet -3.5
Salem	8.8	4.4	0.0	-3.5
Boston	9.5	4.7	0.0	-3.5
Boston Light	9.0	4.5	0.0	-3.0
Cohasset Harbor	8.8	4.4	0.0	-3.5
Provincetown	9.1	4.5	0.0	-3.5

(668)

Mass.

Anchorage regulations may be found at the office of the Commander, Coast Guard District in Boston, Mass.

Refer to section numbers for area designation.

on
42° 20'

FEET
ATER

High Water

Hydrographic Survey with additions
Geological Survey.

C.G.S. Chart No. 1

IN
portant

SMALL CRAFT WARNINGS

Year around small craft warnings will be displayed during daytime only on Metropolitan District Commission Police Patrol Boat, underway in Inner Boston Harbor from Nantasket Beach (42°16.2'N-70°51.5'W), to waters around Georges and Lovell Islands

VHF WEATHER BROADCASTS FOR MARINERS
FM Stations with frequency of 162.55 megahertz and range approximately 40 miles are in continuous operation 24 hours daily broadcasting weather warnings, forecasts and reports from the WEATHER BUREAU Office as follows:

KHB-35 Boston, Mass.
CAUTION

Improved channels shown by broken lines are subject to shoaling particularly at the edges

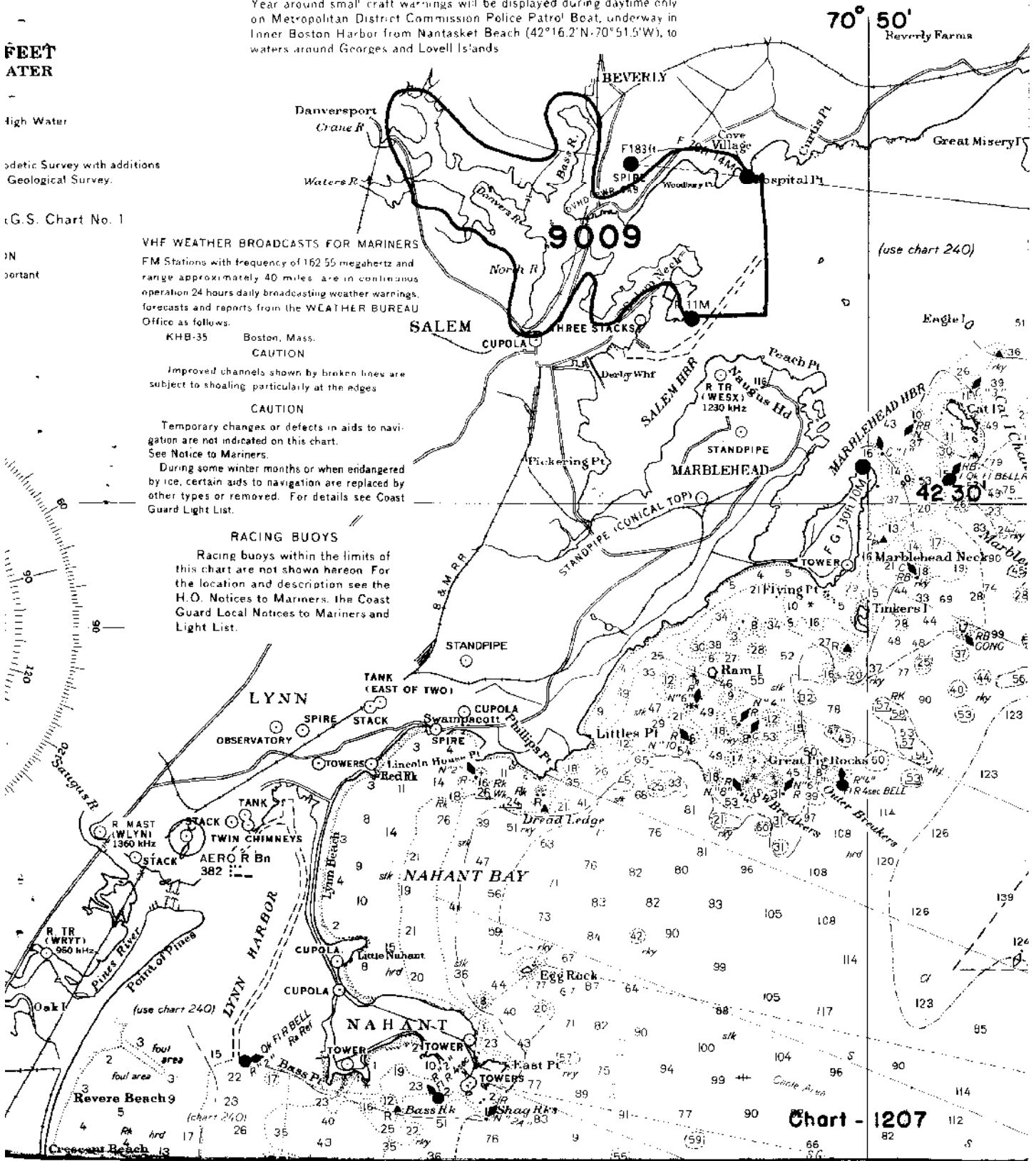
CAUTION

Temporary changes or defects in aids to navigation are not indicated on this chart. See Notice to Mariners.

During some winter months or when endangered by ice, certain aids to navigation are replaced by other types or removed. For details see Coast Guard Light List.

RACING BUOYS

Racing buoys within the limits of this chart are not shown hereon. For the location and description see the H.O. Notices to Mariners, the Coast Guard Local Notices to Mariners and Light List.



70° 50'
Beverly Farms

(use chart 240)

42° 30'

Chart - 1207

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9009

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
241	11-23-70	J. Graham	Full Part ^{before} After Verification Review Inspection Signed Via Drawing No. 14 Applied critical corrections
240	11-23-70	J. Graham	only in area of Beverly Harbor Full Part ^{before} After Verification Review Inspection Signed Via Drawing No. 21 Applied critical corrections thru Chrt. 241 dwg # 14
613-50	11-23-70	J. Graham	Full Part ^{before} After Verification Review Inspection Signed Via Drawing No. applied misc critical corrections thru Chrt. 241 dwg # 14 & Chrt. 240 dwg # 21
241	2-28-72	Jo Estreich	Full Part ^{before} After Verification Review Inspection Signed Via Drawing No. 15 Reapplied. changed Low Water Curve & added few soundings in Mackerel Cove Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
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