9064

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 20-3-69 Office No. H-9064

LOCALITY

State MASSACHUSETTS

General locality MASSACHUSETTS BAY

Locality ~~GLOUCESTER SOUTH TO NAHANT~~ OFF MARBLEHEAD

19 69

CHIEF OF PARTY

J. AUSTIN YEAGER

LIBRARY & ARCHIVES

DATE MAY 5 1972

USCOMM-DC 37022-P66

9064

Charts
70 13006 675,000
71 13009 500,000
240 13275 25,000
241 ~~13274~~ ✓
613SC 13274 SC 40,000
1000 13007 1,200,000
1106 13260 371,638
1107 13200 400,000
1207 13267 80,000
243 13279 20,000

FORM C&GS-537 (5-66)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO.

H-9064

FIELD NO.

PE 20-3-69

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

State MASSACHUSETTS

General locality ~~NORTH~~ MASSACHUSETTS BAY

Locality OFF MARBLEHEAD ~~GLOUCESTER, MASS. SOUTH TO NAHANT, MASS.~~

Scale 1:20,000 Date of survey 7-9-69 to 9-11-69

Instructions dated May 16, 1969 Project No. OPR-473

Vessel USC&GS SHIP PEIRCE

Chief of party J. AUSTIN YEAGER

Surveyed by SHIPS OFFICERS

Soundings taken by echo sounder, ~~hand lead, pole~~ ECHO SOUNDER

Graphic record scaled by SHIPS PERSONNEL

Graphic record checked by SHIPS OFFICERS

Protracted by GERBER DIGITAL PLOTTER Automated plot by PACIFIC MARINE CENTER

Soundings penciled by GERBER DIGITAL PLOTTER

Soundings in ~~fathoms~~ feet at MLW ~~MLLW~~

REMARKS: VERIFICATION BY ATLANTIC MARINE CENTER

Applied to chts 5/1/72
cab.

LVZ

USCOMM-DC 37009-P66

DESCRIPTIVE REPORT

TO ACCOMPANY

HYDROGRAPHIC SURVEY PE 20-3-69 H-9064

USC&GSS PEIRCE — SCALE: 1:20,000

J. AUSTIN YEAGER, CDR USESSA — CHIEF OF PARTY

A. PROJECT:

This survey was accomplished under Project OPR-473, Cape Ann - Cape Cod, Mass. INSTRUCTIONS dated May 16, 1969, CFN2 supercede all previous instructions.

B. AREA SURVEYED:

Field work began on July 09 and was completed on September 11, 1969. General locality is Massachusetts Bay between Gloucester and Nahant, Mass. This survey is bounded on the east by prior survey H-8938, EXPLORER 1967, junctioning along λ 70°40'W. It junctions with contemporary survey PE 10-1-69 along φ 42°33.5'N on the north. On the west it is bounded by contemporary surveys PE 10-1-69 and PE 10-2-69 along λ 70°45'W south to φ 42°30.5'N, and then southwest to φ 42°27'N, λ 70°51'W. On the south it is bounded by contemporary survey PE 20-4-69 along φ 42° 26.5'N.

H-9089 1969 H-9094 1969 H-9063, 1969

C. SOUNDING VESSEL:

All soundings were observed with the Raytheon Fathometer, Model 723, Serial No. 246. All soundings were observed in feet. Echo sounder corrections are discussed in another section and are the result of phase and lead line comparisons.

E. SMOOTH SHEET:

The smooth sheet will be computer plotted by the Processing Section at the Pacific Marine Center, Seattle, Washington.

F. CONTROL:

Hi-Fix electronic horizontal control was used for all positional information on this survey. Stations were located at Strawberry Point, near Cohasset, Mass. and Deer Island, near Boston Harbor entrance, on second-order triangulation stations established by the Ship PEIRCE in 1968. Calibration was by three-point sextant fixes plotted on a calibration sheet. No unusual methods of calibration or control were used.

G. SHORELINE:

Shoreline was applied to smooth sheet from Advanced Manuscript T-12980 T-12979, T-12983, T-12967, T-12966, and T-12968 ~~There was no shoreline within the limits of this survey. Shoreline on the sheet will be covered by prior and contemporary launch surveys.~~

H. CROSSLINES:

Crosslines were run at 13% of total hydrographic mileage on the sheet. ✓ Agreement was within 1'. Draft and velocity corrections should improve the agreement.

I. JUNCTIONS:

Junction with H-8938, EXPLORER 1967, was satisfactory with little or ✓ no distortion of depth curves. Slight disagreement was found in some areas but the fact that H-8938 was run in fathoms and this survey in feet would account for the small differences.

Junctions with contemporary launch survey PE 10-1 & 2-69 and with ship ✓ survey PE 20-4-69 were satisfactory with practically no distortion in depth curves. H-9090 & H-9094, 1969 H-9063, 1969 & H-9133 (1970)

J. COMPARISON WITH PRIOR SURVEYS:

Pre-Survey Review Item # 63B fell within survey limits. The 51.5' wire drag was indicated by a 58' sounding very near the charted wire drag at Lat. 42° 27.64'N, Long. 70° 49.50'W.

Questionable Sounding	Charted Position	Search/Recommendations
86'	Lat. 42° 33.13'N 31.25'N Long. 70° 41.25'W 40'W	Development of this area produced an 85' sounding 0.09 mi. south of the charted position. Position #1088.
83'	Lat. 42° 32.90'N Long. 70° 41.00'W	Development of this area produced an 84' sounding 0.05 mi. south of the charted position, # 1089.
52'	Lat. 42° 32.5'N Long. 70° 40.8'W	Extensive development of this shoal produced a 54' sounding 0.09 mi. south , position #1090.

Questionable Sounding	Charted Position	Search/Recommendations
68'	Lat. 42° 32.60'N Long. 70° 41.00'W	Development produced a 65' sounding 0.08 mi. south.

NOTE: The above soundings indicate a position shift between shoal soundings on this survey and the prior survey. Recommend that depths and positions from this survey be charted and the older soundings be removed from the chart.

74'	Lat. 42° 32.02'N Long. 70° 41.40'W	Development produced a 75' sounding 0.05 mi. west, position #1092. Recommend new position and depth be charted.
56'	Lat. 42° 32.65'N Long. 70° 42.01'W	Development produced a 57' sounding 0.05 mi. northwest. Recommend new depth and position be charted.
88'	Lat. 42° 32.7'N Long. 70° 43.8'W	Shoalest depth produced by development in this area was 107' Recommand this sounding be removed from the chart.
72'	Lat. 42° 31.80'N Long. 70° 43.85'W	70' sounding recorded 0.05 mi. southeast. Recommend this be charted and 72' sounding deleted.
88'	Lat. 42° 31.84'N Long. 70° 44.35'W	Ship and launch survey junctioned in this area. 87' sounding found 0.03 mi. north. Recommend this be charted.
90'	Lat. 42° 31.30'N Long. 70° 46.25'W	Development produced an 87' sounding 0.05 mi. northwest. Recommend charting 87'.
99'	Lat. 42° 31.10'N Long. 70° 46.35'W	Development in this area produced a 62' sounding 0.06 mi. northwest.
102'	Lat. 42° 29.25'N Long. 70° 45.45'W	Development failed to indicate the existance of 102' sounding. Recommend it be deleted from the chart.
96'	Lat. 42° 28.14'N Long. 70° 48.05'W	87' sounding found 0.02 north. Recommend it be charted.

Questionable Sounding	Charted Position	Search/Recommendations
99'	Lat. 42° 28.15'N Long. 70° 47.92'W	91' sounding found 0.09 mi. north. Recommend it be charted. concur
115'	Lat. 42° 26.58'N Long. 70° 42.55'W	This questionable sounding of 115' is in general depths of 185'. No indication of it could be found and recommend it be deleted from the chart. 0.25 mi. southeast of the reported 115', a shoal (least depth 124') was located in general depths of 180'. Extensive development failed to produce any shoaler soundings, position #1093. See review
48'	Lat. 42° 27.46'N Long. 70° 50.50'W	Development in this area produced a 48' sounding. 58' 0.1 mile west

K. COMPARISON WITH EXISTING CHARTS:

Chart: C&GS - 1207 13267 (New)

Soundings on Chart 1207 within survey limits were generally verified although slight displacements were noted on most of them. Exceptions and wide variations are noted below.

1. The 49' shoal "MIDDLE GROUND", Lat. 42° 33.25'N, Long. 70° 42.7'W was located, however it is about 0.08 mi. northeast of its charted position. ✓

2. An ~~83~~ 124' sounding was found in general depths of 120' at Lat. 42° 32.45'N, Long. 70° 42.50'W. Development and crossline failed to show a shoaler sounding. Rescanned - See Review ✓

3. A ~~99~~ 101' sounding found in general depths of 130' at Lat. 42° 32.48'N Long. 70° 40.45'W. ✓

4. A ~~104~~ 105' sounding in general depths of 125'; unplotted 1/2 hr. search failed to produce a shoaler sounding, Lat. 42° 33.25'N, Long. 70° 40.50'W. ✓

5. A shoal, least depth of ~~123~~ 124', Lat. 42° 31.65'N, Long. 70° 40.80'W, not indicated on the chart was found. Recommend charting ✓

6. Between Lat. 42° 26-27'N and Long. 70° 40-42'W several shoals were found not indicated on the chart. Shoalest depth after extensive development was ~~101~~ 102' at Lat. 42° 26.51'N, Long. 70° 41.40'W. ✓

Chart C&GS - 240

Soundings on chart 240 within survey limits were generally verified with a slight position displacement in some cases. Exceptions and wide variations are noted below.

1. A shoal (least depth 10~~8~~6') was located at Lat. 42° 26.78'N, Long. 70° 47.57'W.

2. A ~~58~~60' sounding located at Lat. 42° 28.57'N, Long. 70° 48.20'W, charted depth was 69'.

3. Generally shoaler depths, least depth of 10~~3~~4', were found near Lat. 42° 28.5'N, Long. 70° 47.3'W.

4. A shoal with least depth of 13~~8~~9' found at Lat. 42° 28.46'N, Long. 70° 44.50'W.

5. A ~~129~~131' sounding found at Lat. 42° 27.12'N, Long. 70° 44.50'W.

6. Overall depths were generally shoaler in the dumping ground and disposal areas outlined between Lat. 42° 26-30'N, and east of Long. 70° 49'W.

L. ADEQUACY OF SURVEY:

This survey is adequate to supercede prior surveys with the exceptions and recommendations noted in sections J, K, and P.

M. AIDS TO NAVIGATION:

One floating aid to navigation, NEWCOMB LEDGE WHISTLE BUOY NO. 1, Fl G 4 sec. was located at its charted position of Lat. 42° 30.46'N, Long. 70° 44.42'W, detached position no. 695, day 204.

N. STATISTICS:

Total number of positions	1198
Total nautical miles sounding lines	375.0
Total square nautical miles	37.1
Nansen casts	3
Bottom samples	31

O. MISCELLANEOUS:

None.

P. RECOMMENDATIONS:

No recommendations made other than those in sections J and K.

Q. REFERENCES TO REPORTS:

1. Seasons Report, Ship PEIRCE, 1969
2. Electronic Control Calibration Report, OPR-473, Ship PEIRCE, 1969.
3. Report on Corrections to Echo Sounders, Ship PEIRCE, 1969.

APPROVAL SHEET

FIELD NUMBER PE - 20 - 3 - 69

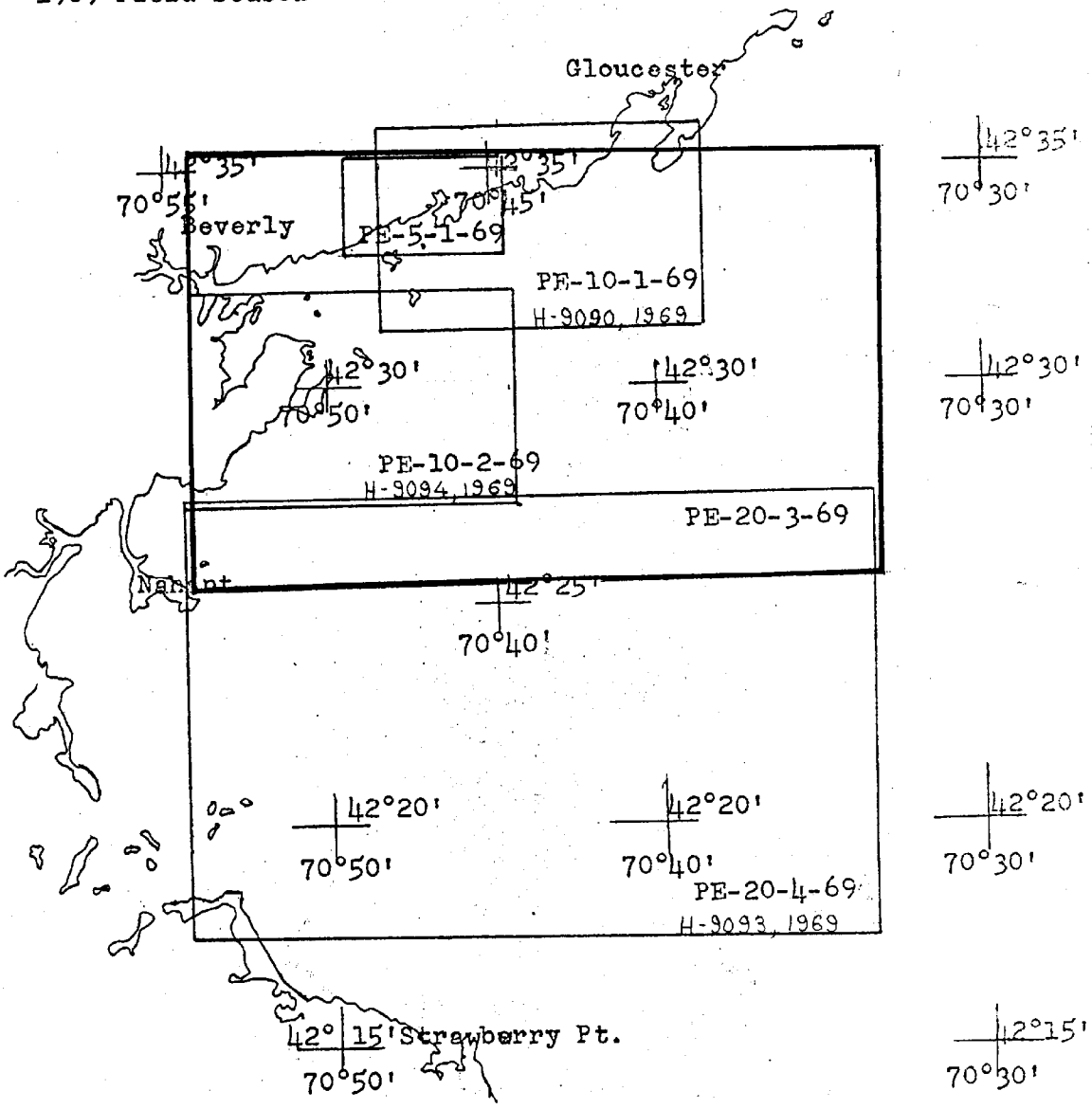
H-9064, 1969

Field work and data processing on this survey was under my immediate daily supervision. The Boat Sheet and all records have been reviewed and approved by me. It is believed this survey is complete and adequate to supercede prior surveys with the recommendations in Sections J and K.

J. Austin Yeager

J. AUSTIN YEAGER
CDR, USESSA
Chief of Party

SHEET LAYOUT
OPR 473
USC&GSS PEIRCE
1969 Field Season



COAST & GEODETIC SURVEY - DON A. JONES DIRECTOR

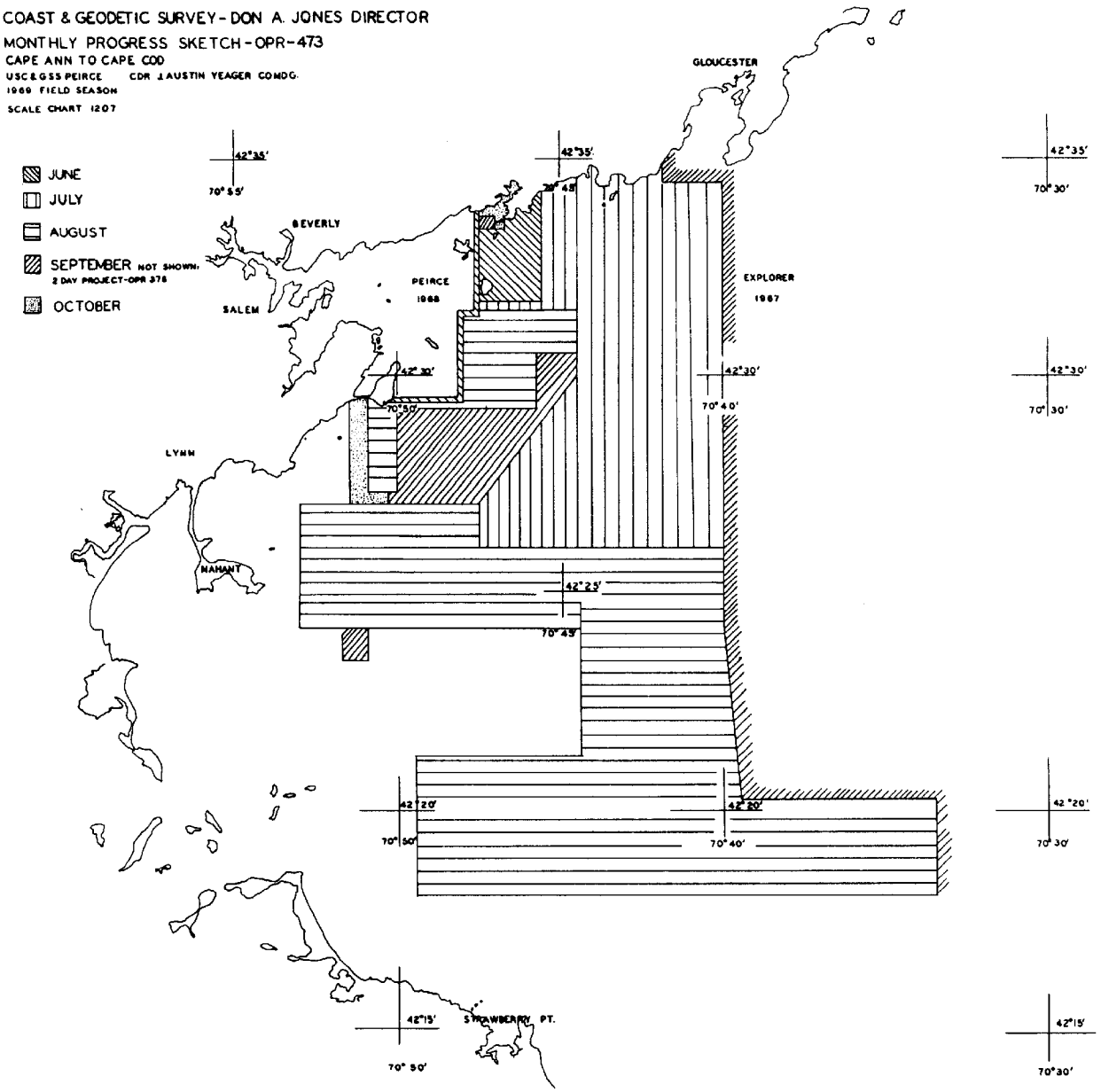
MONTHLY PROGRESS SKETCH - OPR-473

CAPE ANN TO CAPE COD

USC&GSS PEIRCE CDR J.AUSTIN YEAGER COMDG.

1968 FIELD SEASON

SCALE CHART 1207



FORM # 1 FIG. 15

PARAMETERS FOR DIGITAL COMPUTING
POLYCONIC PROJECTION

(1) PROJECT No. OPR 473
(2) H No. H-9064
(3) FIELD No. PE-20-3-69
(4) REQUESTED BY Ship PEIRCE
(5) SHIP OR OFFICE
(6) DATE REQUIRED ASAP
(7) VISUAL ☐
(8) ELECTRONIC ☒ (FILL OUT FORM #3)

(10) XKN (SP 5) DISTANCE FROM CMER TO EAST EDGE (NYX = 1) OR WEST EDGE (NYX = 0). 15,426.1 METERS

(11) YKN (SP 241) DISTANCE FROM EQUATOR TO SOUTH EDGE OF SHEET. 4,698,815.67 METERS

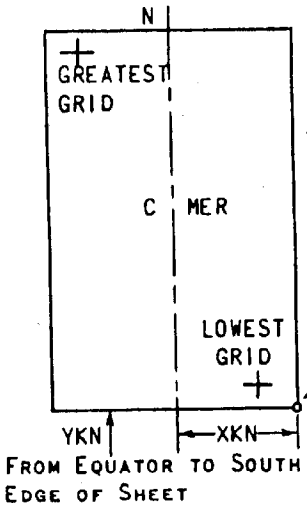
(12) CENTRAL MERIDIAN 70 ° 44 ' 00 "

(13) SURVEY SCALE 1:20,000

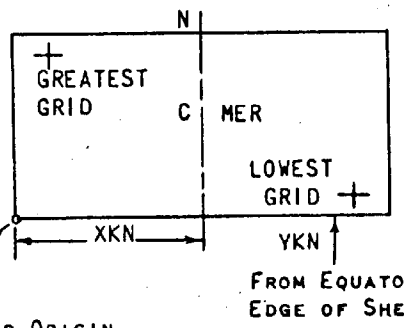
(14) SIZE OF SHEET (CHECK ONE) 36x54 ☒ 42x60 ☐ OTHER ☐

(15) NYX, ORIENTATION OF SHEET (CHECK ONE)

NYX = 1 ☐



NYX = 0 ☒



(9) PLOTTER ORIGIN (CORNER OF SHEET)

LATITUDE 42 ° 25 ' 36 "
LONGITUDE 70 ° 32 ' 54 "

GRID LIMITS

(16) GREATEST LATITUDE 42 ° 35' 00" (PROJECTION LINE
(17) LOWEST LATITUDE 42 ° 26' 00" INTERVAL, PAGE 4
(18) DIFFERENCE 0 ° 09' 00" HYDRO MANUAL)

(19) 1 ' 00 "
(20) 9 YSN

(21) GREATEST LONGITUDE 70° 54'00 "
(22) LOWEST LONGITUDE 70° 34'00 "
(23) DIFFERENCE 0° 20'00 "

(24) 1 ' 00 "
(25) 20 XSN

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

FORM # 3 FIG. 7

COMPUTER PARAMETERS FOR ELECTRONICALLY CONTROLLED SURVEYS

(RANGE - RANGE)

(1) PROJECT No. OPR 473 (2) H- No. 9064 (3) FIELD No. PE-20-3-69

(4) TYPE OF CONTROL: ____ SHORAN, ____ RAYDIST, X HI-FIX, ____ RADAR
FREQUENCY (FOR CONVERSION OF RAYDIST OR HI-FIX LANES TO METERS) 1718.59 kc

(5) RANGE ONE (R1)
STATION NAME DEER TS. LATITUDE 42 ° 20 '59.32"
LONGITUDE 70 ° 57 '17.99"

(6) RANGE TWO (R2)
STATION NAME STRAWBERRY PT. LATITUDE 42 ° 15 '12.05"
LONGITUDE 70 ° 46 '07.22"

(7) AZIMUTH FROM R1 TO R2 304 ° 49 '42.01"

(8) BASELINE LENGTH IN METERS 18,731.91 M.

(9) LOCATION OF SURVEY WITH RESPECT TO ELECTRONIC BASELINE: CHECK ONE
(TO DETERMINE: IMAGINE AN OBSERVER STANDING AT R1 AND LOOKING DIRECTLY AT R2 --- IF THE SURVEY AREA IS TO THE OBSERVER'S LEFT THEN A IS NEGATIVE; IF THE SURVEY AREA IS TO THE OBSERVER'S RIGHT THEN A IS POSITIVE.)

X -A (MINUS) _____ +A (PLUS)

(10) IF SHORAN CORRECTIONS ARE APPLIED BY THE EQUATION, K(X) + C = D, WHERE X IS SHORAN DISTANCE AND D IS TRUE DISTANCE, ENTER THE CONSTANT COEFFICIENTS OF THE EQUATIONS HERE:

K(R1) _____, C(R1) _____, K(R2) _____, C(R2) _____

(11) NUMBER OF VELOCITY TABLES TO BE USED:
___NONE, ___ONE, X MORE THAN ONE.

(12) _____THIS FORM IS SUBMITTED ONLY AS AN AID IN PREPARING A BOAT SHEET PROJECTION.

X THIS FORM APPLIES TO ALL DATA ON THIS SURVEY.

_____THIS FORM APPLIES TO PART OF THE DATA ON THIS SURVEY -

TIME AND DATE LIMITATIONS: FROM _____ TO _____

POSITION NUMBER LIMITATIONS: FROM _____ TO _____

THIS IS FORM #3 SHEET # 1 OF 1 SHEETS FOR THIS SURVEY.

(13) OTHER REMARKS:

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 CORRECTIONS

E. ABSTRACT OF DAILY CONSECUTIVE POSITION NUMBERS

F. ABSTRACT OF STANDARD FORMAT COLUMN HEADINGS

G. ABSTRACT OF HYDROGRAPHIC DATA LOCATED IN THE SURVEY

APPENDIX A

TIDAL NOTE

Tidal heights for this survey were obtained from marigrams at the portable tide gage the USC&GS Ship PEIRCE established at Salem Massachusetts harbor ($\varphi 42°$ 31' 18"N, $\lambda 70°$ 52' 46"W). Tides for the periords of time when hydrography was run but no marigrams obtained were supplied directly by the Tides & Currents Branch, Oceanography Division.

As per telephone conversation with L.C. Wharton of the Tides & Currents Branch, there are no zonal tide corrections.

All times for the station and times for hydrography were smooth logged on the 60°W time zone.

The staff reading at the Salem, Mass. gage for MLW was 3.7 feet.

An abstract of Tides follows as a copy of the Tide Tape Printout. It is printed according to the standard Tide Tape format as detailed in Appendix F - Standard Format Column Headings.

FORM C&GS-712
(10-67)

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

January 30, 1970

~~Nautical Chart Division~~ Atlantic Marine Center

Plane of reference approved ~~in~~ ~~for~~ for Tide tape printouts

HYDROGRAPHIC SHEET 9090, 9094, 9095, 9063, and 9064

Locality: Salem Harbor, Mass.

~~Locality~~ Year: 1969

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:

8.8 feet

Remarks Tide reducers for day 195 (08:00-08:15) have been revised and verified.

N.B. Day 195 is included on surveys H-9090, 9064 only.
JHS

J. M. Symons
Chief, Tides and Currents Branch

Tide Tape Printout

USC&GS Ship PEIRCE Field No. PE-20-3-69

Reg. No. H-9064

Time Mer. 60°W Tide Station Salem, Mass.

Tide Data For 1969 Corrections In Feet

File printout with figures

```
083300 0 1072
085400 0 1070
090900 0 1068
092100 0 1066
093000 0 1064
093900 0 1062
094800 0 1060
095700 0 1058
100500 0 1056
101300 0 1054
102100 0 1052
102900 0 1050
103600 0 1048
104200 0 1046
104900 0 1044
105600 0 1042
110500 0 1040
111300 0 1038
112000 0 1036
112800 0 1034
113600 0 1032
114300 0 1030
115100 0 1028
120000 0 1026
120800 0 1024
121600 0 1022
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123200 0 1018
124200 0 1016
125300 0 1014
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132300 0 1010
141700 0 1012
143300 0 1014
144800 0 1016
145900 0 1018
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152000 0 1022
152900 0 1024
153700 0 1026
154500 0 1028
155400 0 1030
030000 0 1070 0000 191 000000 000000
040500 0 1072
093700 0 1070
100000 0 1068
101500 0 1066
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104200 0 1062
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115400  0 1046
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141100  0  1068
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152300  0  1052
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082900  0  1008
084000  0  1010
084800  0  1012
085600  0  1014
090700  0  1016
091300  0  1018
092100  0  1020
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093600  0  1024
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095000  0  1028
095600  0  1030
100500  0  1032
101200  0  1034
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103300  0  1040
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125200  0  1076
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091100  0  1010
092100  0  1012
093000  0  1014
093800  0  1016
094400  0  1018
095100  0  1020
```

```
095700  0  1022
100500  0  1024
101200  0  1026
101800  0  1028
102500  0  1030
103200  0  1032
103800  0  1034
104500  0  1036
105100  0  1038
105800  0  1040
110400  0  1042
111100  0  1044
111700  0  1046
112400  0  1048
113000  0  1050
113700  0  1052
114400  0  1054
115000  0  1056
115600  0  1058
120400  0  1060
121200  0  1062
121900  0  1064
122700  0  1066
123600  0  1068
124500  0  1070
125500  0  1072
130600  0  1074
131800  0  1076
133400  0  1078
145800  0  1076
150600  0  1074
152100  0  1072
153200  0  1070
154200  0  1068
155200  0  1066
080000  0  1062  0000 204 000000 000000
080400  0  1060
081200  0  1058
081900  0  1056
082700  0  1054
083300  0  1052
084100  0  1050
084800  0  1048
085400  0  1046
090000  0  1044
090700  0  1042
091400  0  1040
092000  0  1038
092800  0  1036
093400  0  1034
094100  0  1032
094700  0  1030
095400  0  1028
100000  0  1026
100600  0  1024
101300  0  1022
101900  0  1020
102900  0  1018
103800  0  1016
104800  0  1014
110000  0  1012
111500  0  1010
113700  0  1008
122500  0  1010
124800  0  1012
```

131600 0 1016
132500 0 1018
133400 0 1020
134600 0 1022
135100 0 1024
135700 0 1026
140500 0 1028
141200 0 1030
142000 0 1032
142800 0 1034
143400 0 1036
144100 0 1038
144800 0 1040
145500 0 1042
150200 0 1044
150800 0 1046
151400 0 1048
151900 0 1050
152600 0 1052
153100 0 1054
153800 0 1056
154300 0 1058
154900 0 1060
155500 0 1062
080000 0 1074 0000 205 000000 000000
080600 0 1072
081700 0 1070
082800 0 1068
083600 0 1066
084700 0 1064
085600 0 1062
090400 0 1060
091200 0 1058
092000 0 1056
092900 0 1054
093600 0 1052
094300 0 1050
095100 0 1048
095700 0 1046
100400 0 1044
101100 0 1042
101800 0 1040
102600 0 1038
103300 0 1036
103900 0 1034
104700 0 1032
105400 0 1030
110100 0 1028
110900 0 1026
111600 0 1024
112400 0 1022
113100 0 1020
114000 0 1018
115000 0 1016
120000 0 1014
121200 0 1012
122600 0 1010
132300 0 1012
134200 0 1014
135400 0 1016
140400 0 1018
141400 0 1020
142200 0 1022
143000 0 1024
143600 0 1026

145000 0 1030
145600 0 1032
150300 0 1034
150900 0 1036
151600 0 1038
152200 0 1040
152900 0 1042
153600 0 1044
154200 0 1046
154800 0 1048
155400 0 1050
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080200 0 1066
080800 0 1068
081400 0 1070
082000 0 1072
082700 0 1074
083200 0 1076
083900 0 1078
084700 0 1080
085500 0 1082
090400 0 1084
091700 0 1086
093600 0 1088
102600 0 1086
104200 0 1084
105500 0 1082
110600 0 1080
111400 0 1078
112400 0 1076
113300 0 1074
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115400 0 1068
120000 0 1066
120700 0 1064
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122400 0 1058
123000 0 1056
123500 0 1054
124000 0 1052
124500 0 1050
125000 0 1048
125500 0 1046
130000 0 1044
130600 0 1042
131200 0 1040
131700 0 1038
132300 0 1036
132800 0 1034
133300 0 1032
133800 0 1030
134400 0 1028
135100 0 1026
135700 0 1024
140300 0 1022
140900 0 1020
141500 0 1018
142200 0 1016
142800 0 1014
143500 0 1012
144200 0 1010
145000 0 1008
145900 0 1006
151000 0 1004

```
152300 0 1002
080000 0 0000 0000 211 000000 000000
080500 0 1002
081100 0 1004
081700 0 1006
082200 0 1008
082800 0 1010
083300 0 1012
083900 0 1014
084300 0 1016
084700 0 1018
085300 0 1020
085800 0 1022
090300 0 1024
090700 0 1026
091100 0 1028
091500 0 1030
092100 0 1032
092600 0 1034
093100 0 1036
093600 0 1038
094100 0 1040
094600 0 1042
095000 0 1044
095400 0 1046
095900 0 1048
100300 0 1050
100700 0 1052
101100 0 1054
101500 0 1056
102000 0 1058
102500 0 1060
102900 0 1062
103400 0 1064
103900 0 1066
104300 0 1068
104800 0 1070
105400 0 1072
110000 0 1074
110500 0 1076
111100 0 1078
111600 0 1080
112200 0 1082
112800 0 1084
113400 0 1086
114100 0 1088
114700 0 1090
115400 0 1092
120000 0 1094
121500 0 1096
133300 0 1094
135300 0 1092
140500 0 1090
141500 0 1088
142100 0 1086
142700 0 1084
143300 0 1082
143900 0 1080
144400 0 1078
144900 0 1076
145300 0 1074
145800 0 1072
150300 0 1070
150700 0 1068
151100 0 1066
151600 0 1064
```

```
152000  0  1062
152500  0  1060
152900  0  1058
153300  0  1056
153800  0  1054
154300  0  1052
154700  0  1050
155200  0  1048
155700  0  1046
080000  0  0014 0000 212 000000 000000
080800  0  0012
081700  0  0010
082400  0  0008
083100  0  0006
083900  0  0004
084500  0  0002
085100  0  0000
085700  0  1002
090400  0  1004
090900  0  1006
091500  0  1008
092100  0  1010
092600  0  1012
093100  0  1014
093600  0  1016
094100  0  1018
094500  0  1020
095000  0  1022
095500  0  1024
095900  0  1026
100300  0  1028
100700  0  1030
101200  0  1032
101600  0  1034
102100  0  1036
102500  0  1038
103000  0  1040
103400  0  1042
103800  0  1044
104200  0  1046
104600  0  1048
105000  0  1050
105500  0  1052
110000  0  1054
110400  0  1056
110800  0  1058
111200  0  1060
111700  0  1062
112100  0  1064
112600  0  1066
113100  0  1068
113600  0  1070
114000  0  1072
114400  0  1074
114800  0  1076
115300  0  1078
115900  0  1080
120400  0  1082
120900  0  1084
121600  0  1086
122600  0  1088
123700  0  1090
124800  0  1092
125900  0  1094
131600  0  1096
140000  0  1094
```

```
141500  0  1092
142800  0  1090
144000  0  1088
145100  0  1086
145900  0  1084
150600  0  1082
151500  0  1080
152100  0  1078
152700  0  1076
153400  0  1074
153900  0  1072
154400  0  1070
155000  0  1068
155500  0  1066
080000  0  1070  0000 219 000000 000000
080300  0  1068
082600  0  1066
084100  0  1064
085400  0  1062
090500  0  1060
091500  0  1058
092400  0  1056
093300  0  1054
094200  0  1052
095100  0  1050
100000  0  1048
100800  0  1046
101800  0  1044
102700  0  1042
103500  0  1040
104300  0  1038
105300  0  1036
110100  0  1034
111100  0  1032
112000  0  1030
112900  0  1028
113800  0  1026
114900  0  1024
120000  0  1022
121200  0  1020
122400  0  1018
124300  0  1016
140000  0  1018
141400  0  1020
142600  0  1022
143700  0  1024
144700  0  1026
145500  0  1028
150500  0  1030
151300  0  1032
152100  0  1034
153000  0  1036
153800  0  1038
154600  0  1040
155500  0  1042
080000  0  1048  0000 253 000000 000000
080300  0  1050
080900  0  1052
081500  0  1054
082200  0  1056
082800  0  1058
083400  0  1060
084100  0  1062
084700  0  1064
085400  0  1066
090000  0  1068
```

```
141500  0  1092
142600  0  1090
144000  0  1088
145100  0  1086
145900  0  1084
150600  0  1082
151500  0  1080
152100  0  1078
152700  0  1076
153400  0  1074
153900  0  1072
154400  0  1070
155000  0  1068
155500  0  1066
080000  0  1070  0000 219 000000 000000
080800  0  1068
082600  0  1066
084100  0  1064
085400  0  1062
090500  0  1060
091500  0  1058
092400  0  1056
093300  0  1054
094200  0  1052
095100  0  1050
100000  0  1048
100800  0  1046
101600  0  1044
102700  0  1042
103500  0  1040
104300  0  1038
105300  0  1036
110100  0  1034
111100  0  1032
112000  0  1030
112900  0  1028
113800  0  1026
114900  0  1024
120000  0  1022
121200  0  1020
122400  0  1018
124300  0  1016
140000  0  1018
141400  0  1020
142600  0  1022
143700  0  1024
144700  0  1026
145500  0  1028
150500  0  1030
151300  0  1032
152100  0  1034
153000  0  1036
153800  0  1038
154600  0  1040
155500  0  1042
080000  0  1048  0000 253 000000 000000
080300  0  1050
080900  0  1052
081500  0  1054
082200  0  1056
082800  0  1058
083400  0  1060
084100  0  1062
084700  0  1064
085400  0  1066
090000  0  1068
```

```
090700  0  1070
091400  0  1072
092200  0  1074
093100  0  1076
094000  0  1078
095000  0  1080
100000  0  1082
101400  0  1084
103300  0  1086
110000  0  1084
113100  0  1082
114600  0  1080
120000  0  1078
121200  0  1076
122100  0  1074
123000  0  1072
123600  0  1070
124500  0  1068
125200  0  1066
130000  0  1064
130800  0  1062
131400  0  1060
132200  0  1058
132900  0  1056
133500  0  1054
134200  0  1052
134800  0  1050
135400  0  1048
140000  0  1046
140600  0  1044
141200  0  1042
141800  0  1040
142400  0  1038
142900  0  1036
143400  0  1034
143900  0  1032
144500  0  1030
145000  0  1028
145400  0  1026
150000  0  1024
150600  0  1022
151200  0  1020
151800  0  1018
152500  0  1016
153300  0  1014
154200  0  1012
155400  0  1010
030000  0  1032  0000 254  000000 000000
030700  0  1034
031400  0  1036
032100  0  1038
032700  0  1040
033300  0  1042
034000  0  1044
034600  0  1046
035300  0  1048
090000  0  1050
090500  0  1052
091100  0  1054
091800  0  1056
092400  0  1058
093000  0  1060
093600  0  1062
094300  0  1064
094900  0  1066
095700  0  1068
```

100400	0	1070
101200	0	1072
102100	0	1074
103000	0	1076
104100	0	1078
105200	0	1080
110600	0	1082
112400	0	1084
120000	0	1082
122000	0	1080
123400	0	1078
124500	0	1076
125600	0	1074
130500	0	1072
131400	0	1070
132200	0	1068
133000	0	1066
133700	0	1064
134500	0	1062
135100	0	1060
135700	0	1058
140200	0	1056
140800	0	1054
141400	0	1052
141900	0	1050
142500	0	1048
143600	0	1044
144200	0	1042
144800	0	1040
145400	0	1038
150000	0	1036
150600	0	1034
151200	0	1032
151800	0	1030
152400	0	1028
153000	0	1026
153600	0	1024
154200	0	1022
154900	0	1020
155700	0	1018

APPENDIX B

ABSTRACT OF CORRECTIONS TO ECHO SOUNDINGS

FIELD NUMBER PE - 20 - 3 - 69

H-9064, 1969

Velocity corrections for this survey were determined from temperature and salinity observations (Nansen casts) made throughout the survey period. Reference is made to the Special Report on corrections to Echo Soundings, OPR 473, 1969 Field Season, Ship PEIRCE, which describes the methods and computations.

VELOCITY TABLES

PE- 20 - 3 - 69

DAYS APPLICABLE	TABLE NUMBER
189 through 198	1
203 through 205	2
219	2
208, 211, 212	3
253, 254	4

TABLE # 1

DEPTH FROM	TO	CORRECTOR
0.0	14.0	± 0.0
14.1	22.7	± 0.2
22.8	31.1	+ 0.4
31.2	43.0	+ 0.6
43.1	61.0	+ 0.8
61.1	97.0	+ 1.0
97.1	165.0	+ 1.2
165.1	999.9	+ 1.4

TABLE # 2

DEPTH FROM	TO	CORRECTOR
0.0	10.0	± 0.0
15.1	23.0	±0.2
23.1	40.0	+ 0.4
40.1	72.0	+ 0.6
72.1	119.0	+ 0.8
119.1	192.0	+ 1.0
192.1	999.9	+ 1.2

APPENDIX B

VELOCITY TABLES (CON'T)

TABLE # 3

DEPTH FROM	TO	CORRECTOR
0.0	13.4	+ 0.0
13.5	20.0	+ 0.2
20.1	27.0	+ 0.4
27.1	34.3	+ 0.6
34.4	42.4	+ 0.8
42.5	52.0	+ 1.0
52.1	64.8	+ 1.2
64.9	85.8	+ 1.4
85.9	120.0	+ 1.6
120.1	167.0	+ 1.8
167.1	999.9	+ 2.0

TABLE # 4

0.0	13.0	+ 0.0
13.1	21.0	+ 0.2
21.1	28.5	+ 0.4
28.6	36.0	+ 0.6
36.1	43.2	+ 0.8
43.3	50.6	+ 1.0
50.7	58.5	+ 1.2
58.6	67.0	+ 1.4
67.1	76.1	+ 1.6
76.2	85.7	+ 1.8
85.8	95.5	+ 2.0
95.6	105.8	+ 2.2
105.9	116.5	+ 2.4
116.6	128.4	+ 2.6
128.5	140.0	+ 2.8
141.1	152.0	+ 3.0
152.1	164.0	+ 3.2
164.1	999.9	+ 3.4

APPENDIX C

ABSTRACT OF CORRECTIONS TO ELECTRONIC DISTANCE MEASUREMENTS

HIFIX electronic positional control was used throughout the survey. No new or unusual methods of calibration were used. Reference is made to the Special Report on Calibration of Electronic Control, OPR 473, 1969 Field Season, Ship PEIRCE, for a discussion of methods and computations.

ABSTRACT OF HI-FIX CORRECTIONS
SHIP PEIRCE SHEET PE 20-3-69
H-9064, 1969

NOTE: - These corrections apply to all positions on Sheet PE 20-3-69.

DAY	TIME (FROM)	CORR'N PAT. 1	CORR'N PAT. 2	REMARKS
190	105500	+ 0.13	- 0.13	
191	102300	- 0.12	- 0.13	
195	102400	- 0.02	- 0.09	
196	103300	+ 0.17	- 0.13	Days 196 through 198 are average of calibrations on days 196 and 198
197	084830	+ 0.17	- 0.13	
198	083130	+ 0.17	- 0.13	
204	093330	- 0.01	- 0.10	Calibration on day 204 covers days 204 and 205
205	100330	- 0.01	- 0.10	
208	102500	+ 0.08	- 0.08	Calibration on day 208
211	104030	+ 0.03	- 0.14	
	120500	- 8.97	- 0.11	Calibrations on day 211
212	083700	+ 0.12	- 0.11	Calibration on day 212
219	092900	- 0.02	- 0.30	Calibration on day 219
253	143400	+ 0.02	- 0.31	Calibration on day 253 covers days 253 and 254
254	083700	+ 0.02	- 0.31	

APPENDIX D

ABSTRACT OF TRA CORRECTORS

The TRA Corrector is a combination of various correctors applied to soundings obtained by electronic means and is comprised by the following:

Transducer draft corrections	Initial corrections
Phase corrections	Fathometer speed error
Settlement and Squat corrections	Instrument error

For this survey only Transducer Draft and Initial Corrections are necessary. All others were nonexistent or were kept below the level to be applied.

Reference is made to the Special Report on corrections to Echo Soundings, 1969 Field Season, OPR 473, Ship PEIRCE, for a discussion of the methods and computations.

ABSTRACT OF DRAFT CORRECTIONS

SHIP PEIRCE OPR-473, 1969

SURVEY: PE 20-3-69 H-9064, 1969

DAY 1969	TIME FROM	CORRECTION (FT)
190	105500	+ 0.2
191	102300	+ 0.2
195	102400	+ 0.2
196	103300	+ 0.2
197	084830	+ 0.2
198	083130	+ 0.2
204	093330	+ 0.2
205	100330	+ 0.2
208	102500	+ 0.2
211	104030	0.0
212	083700	0.0
219	092900	+ 0.4
253	143400	+ 0.2
254	083700	+ 0.2

APPENDIX D

INITIAL CORRECTION

DAY #	TIME FROM	CORRECTOR
190	105500	+ 0.0
191	102300	+ 0.0
195	102400	+ 0.0
	151700	- 0.5
	153800	0.0
196	103300	+ 0.0
197	084830	+ 0.0
198	083130	+ 0.0
204	093330	+ 0.0
205	100330	+ 0.0
208	102500	+ 0.0
211	104030	0.0
	114345	+ 0.2
	131600	0.0
	134030	- 0.3
	140830	0.0
212	083700	0.0
219	092900	0.0
253	143400	0.0
	144400	- 0.2
	150630	0.0
254	083700	0.0
	092330	- 0.2
	092900	0.0
	095030	- 0.2
	095400	0.0

TC/TI TAPE PRINTOUT
OPR 473, SHIP PEIRCE
PE-20-3-69

```
105500 0 0002 0001 190 000000 000000
102300 0 0002 0001 191 000000 000000
102400 0 0002 0001 195 000000 000000
151700 0 1003
153800 0 0002
103300 0 0002 0001 196 000000 000000
084330 0 0002 0001 197 000000 000000
083130 0 0002 0001 198 000000 000000
093330 0 0002 0002 204 000000 000000
100330 0 0002 0002 205 000000 000000
102500 0 0002 0003 208 000000 000000
104030 0 0000 0003 211 000000 000000
114345 0 0002
131600 0 0000
134030 0 1003
140830 0 0000
083700 0 0000 0003 212 000000 000000
092900 0 0004 0002 219 000000 000000
143400 0 0002 0004 253 000000 000000
144400 0 0000
150630 0 0002
083700 0 0002 0004 254 000000 000000
092330 0 0000
092900 0 0002
095030 0 0000
095400 0 0002
```

APPENDIX E

ABSTRACT OF
DAILY CONSECUTIVE POSITION NUMBERS
SHIP PEIRCE SHEET PE 20-3-69

H-9064 1969

DATE 1969	DAY	POSITION NUMBERS
07/09	190	001 - 102
07/10	191	103 150
07/14	195	151 287
07/15	196	288 384
07/16	197	385 555
07/17	198	556 620
07/23	204	621 763
07/24	205	764 906
07/27	208	907 996
07/30	211	997 1051
07/31	212	1052 1087
08/07	219	1088 1101
09/10	253	1102 1126
09/11	254	1127 1190

APPENDIX F

ABSTRACT OF STANDARD FORMAT COLUMN HEADINGS

RAW DATA TAPES

TIME	IND.	SDG.	POS. #	DAY	R-1	R-2
143500	1	1232	0001	129	069954	078467

CORRECTOR TAPE

TIME	IND.	SDG.	POS. #	DAY	R-1 CALIB.	R-2 CALIB.	TIDE	TRA
143500	0	1254	0001	129	100050	000150	1012	005000

TRA CORRECTION/TABLE INDICATOR (TC/TI) TAPE

TIME		TRA	VEL TAB IND.	DAY		
105200	0	1002	0002	198	000000	000000

TIDE TAPE

TIME		TIDE		DAY		
090000	0	0060	0000	187	000000	000000

VELOCITY TABLE TAPE

DEPTH		(**)	(*)			
000100	0	0004	0001	000	000000	000000

(**) = Velocity correction
(*) = Velocity table

ABSTRACT OF HYDROGRAPHIC DATA
LOCATED ON SHEET PE 20-3-69
H-9064, 1969

Position Number	Day	
139	191	Bottom Sample - fne gy S, M
140	"	" " rky
141	"	" " rky
142	"	" " rky & M
143	"	" " rky
144	"	" " fne gy S, M
145	"	" " fne gy S, M
146	"	" " fne gy S, M
147	"	" " fne gy S, M
148	"	" " fne gy S, M
149	"	" " rky
150	191	" " fne gy S, M
695	204	NEWCOMB LEDGE WHISTLE BUOY NO. 1 Fl G 4 sec. Agrees with charted position of Lat. 42° 30.46'N, Long. 70° 44.42'W.
1019	211	Bottom Sample - fne br S, P
1020	"	" " fne br S
1021	"	" " rky
1022	"	" " rky
1031	"	" " rk
1045	"	" " fne br S, Sh
1046	"	" " rky
1047	"	" " rky
1048	"	" " rky & Sh
1049	"	" " fne br S
1050	"	" " rky
1051	"	" " rky
1075	212	" " rky
1076	"	" " rky, Sh
1077	"	" " br S
1078	"	" " rky
1079	"	" " rky
1086	"	" " rky
1087	"	" " fne br S, Sh

FIG. 18.

DESCRIPTIVE REPORT DATA RECORD		
PART I SMOOTH SHEET PREPARATION	PREPARED BY/OPERATOR	DATE
A. PLOTTER OPERATOR	EDAT-PMC	
B. DISTORTION MARKS PLOTTED	EDAT-PMC	
C. PROJECTION INTERSECTIONS PLOTTED	EDAT-PMC	
D. POINTS OF ELECTRONIC CONTROL ARCS PLOTTED	BTD	4-18-72
E. OVERLAYS PREPARED BY	EDAT-PMC	
1. POSITION NUMBER	EDAT-PMC	
2. EXCESS SOUNDINGS	EDAT-PMC	
3. PRELIMINARY SMOOTH PLOT	EDAT-PMC	
4. LIST OTHERS		
A.		
B.		
F. SOUNDING SELECTION BY	EDAT-PMC	
G. PLOTTER INPUT PREPARED	EDAT-PMC	
H. CHECKED	EDAT-PMC	
I. DESCRIPTIVE REPORT ADDENDUMS	BTD	4-28-72
PART II SMOOTH SHEET COMPLETION		
	CARTOGRAPHER	DATE
A. DISTORTION SCALE TICKS IDENTIFIED BY NOTE	BTD	4-14-72
B. PROJECTION INTERSECTIONS VERIFIED BY	BTD	4 -11-72
C. PROJECTION LINES RULED BY	BTD	4-11-72
D. ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED	BTD checked by WLJ	4-18-72
E. OVERLAYS COMPLETED BY		
1. POSITION NUMBER LEADERS ADDED	BTD	4-19-72
2. EXCESS SOUNDING OVERLAY COMPARED	BTD	4-27-72
3. PRELIMINARY SMOOTH PLOTS COMPARED	BTD	4-27-72
4. OTHERS UTILIZED	H.R.SMITH	
A.		
B.		
F. DESCRIPTIVE REPORT ADDENDUM	BTD	4-28-72
G. CONTROL STATIONS VERIFIED		
H. POSITIONS MANUALLY PLOTTED		
I. MANUAL PLOT VERIFIED		
J. SHORELINE APPLIED	BTD	4-27-72
K. [illegible] ADDED	BTD	4-19-72
L. SHOALS AND DEPTH CURVES ADDED	BTD	4-27-72

FORM 197
(3-16-55)

GEOGRAPHIC NAMES

Survey No. H-9064

Name on Survey	A On Chart No.	B On previous survey No.	C On U. S. quadrangle Maps	D From local information	E On local Maps	F P. O. Guide or Map	G Rand McNally Atlas	H U. S. Light List	K	
Halfway Rock		✓								1
Marblehead Neck		✓								2
Massachusetts Bay										3
Burnham Rocks ✓										4
Cat Island ✓										5
Cole Ridge ✓										6
Gloucester Harbor ✓										7
Great Egg Rock ✓										8
Great Misery Island ✓										9
Great Pig Rocks ✓										10
House Island ✓										11
Kettle Island ✓										12
Kettle Ledge ✓										13
Manchester ✓										14
Middle Breakers ✓										15
Middle Ground ✓										16
Newcomb Ledge ✓										17
Outer Breakers ✓										18
Ram Island ✓										19
Saturday Night Ledge ✓										20
Tinkers Island ✓										21
Tinkers Ledge ✓										22
Bakers Island ✓										23
Eastern Point ✓										24
										25
										26
										27

PREPARED BY

Franklin Wright

CARTOGRAPHIC TECHNICIAN

C&H 4-27-11

APPROVED BY

A. D. Wright

CHIEF GEOGRAPHER

by FWP

FIG. 20

FORM C&GS-946A
(REV. 11-65)
(PRES. BY HYDROGRAPHIC MANUAL, 6-94)

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

VERIFIER'S REPORT

HYDROGRAPHIC SURVEY, H 9064 (PE-20-3-69)

INSTRUCTIONS - This form serves to identify items of a check list 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
Note: The verifier should first read the Descriptive Report for general information and problems.		
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	X	
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	X	
3. All reference to survey sheets mentioned in the Descriptive Report should include registry number and year. Remarks Required: -- None	X	
Part II - SHORELINE AND SIGNALS		
4. Source of shoreline signals T-12980 T-12979 T-12983 Remarks Required: -- List all surveys		
a. Give earliest and latest dates of photographs 1965		
b. Field inspection date none T-12967 T-12966		
c. Field Edit date 1967-1969 T-12965		
d. ~~Reviewed~~ Unreviewed		
5. The transfer of contemporary topographic information was carefully examined and reconciled with the hydrography. Remarks Required: -- Discuss remaining differences	X	
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	X	
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 unidentified.	N.A.	
Part III - JUNCTIONS		
Note: Make a cursory comparison preliminary to inking soundings in area of overlap.		
8. All junctions of contemporary or overlapping sheets were transferred in colored ink and verified, curves were made identical. Remarks Required: -- None	X	
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	X	

Part III - JUNCTIONS (Continued)	CL	R
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.	X	
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	N.A.	
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	X	
(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		
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	N.A.	
14. The protracting and plotting of all unsatisfactory crossings were verified. Remarks Required: -- None	X	
15. All detached positions locating critical soundings, rocks, buoys, breakers, obstructions, kelp, etc., were verified and the position numbers are legible. Remarks Required: -- None	X	

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

Part V - PROTRACTING (Continued)	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 replotting or adjustments.	N.A.	
17. The protractor has been checked within the last three months. Remarks Required: -- Date of check, type of protractor and number.	N.A.	
Part VI - SOUNDINGS		
18. All soundings are clear and legible, and critical soundings are a little larger than adjacent soundings. Remarks Required: -- None	X	
19. Sounding line crossings were satisfactory except as follows: Remarks Required: -- Discuss adjustments.	X	
20. The spacing of soundings as recorded in the records was closely followed; Remarks Required: -- None	X	
21. The scanning, reduction, spacing, plotting of questionable soundings have been verified. Remarks Required: -- None	X	
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.	X	
Part VII - CURVES		
23. The depth curves have been inspected before inking. Remarks Required: -- By whom was the pencilled curves inspected. G.F.T.	X	
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 is dashed orange d. Approximate position of shoal area not sounded in black dashed Remarks Required: -- None	N.A.	
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.	X	

Part VIII - AIDS TO NAVIGATION	CL	R
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.	N.A.	
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	X	
Part IX - BOATSHEET		
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	X	
29. Heights of rocks awash were correctly reduced and compared with topographic information. Remarks Required: -- Note excessive conflicts with topographic information.	N.A.	
Part X - GENERAL		
30. All information on the sheet is shown in accordance with figures 82 and 84 in the Hydrographic Manual (Pub. 20-2). Remarks Required: -- None	X	
31. Unnecessary pencil notes have been removed from the sheet. Remarks Required: -- None	X	
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	X	
33. The bottom characteristics are adequately shown. Remarks Required: -- None	X	
Part XI - NOTES TO THE REVIEWER		X
34. Unresolved discrepancies and questionable soundings.		
35. Notation of discrepancies with photogrammetric survey inserted in report of unreviewed photogrammetric survey or its copy.	N.A.	
36. Supplemental information.	X	

Verified by Bernie T Davis
Bernie T. Davis

Date 4-28-72

FORM CACS-946A (11-69)

USCOMM-DC 36272-P65

FIG. 19

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-9064 (PE-20-3-69)

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET & PNO	1	BOAT SHEETS	1
DESCRIPTIVE REPORT	1	OVERLAYS	3

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS / SOURCE DOCUMENTS
ENVELOPES	[illegible]					
CAHIERS	1		[illegible]			
VOLUMES						
BOXES			1			

T-SHEET PRINTS (List)
[illegible]

SPECIAL REPORTS (List)
[illegible] Control Report & Report on Corrections to Echo Sounder

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				1198
POSITIONS CHECKED		200		
POSITIONS REVISED		12		
DEPTH SOUNDINGS REVISED		130		
DEPTH SOUNDINGS ERRONEOUSLY SPACED				
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED				
[illegible]	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		12		
JUNCTIONS		4		
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		45		
SPECIAL ADJUSTMENTS				
ALL OTHER WORK		128		
TOTALS		189		

	BEGINNING DATE	ENDING DATE
PRE-VERIFICATION BY		
VERIFICATION BY Bernie T. Davis Bernie T. Davis	5-3-71	4-28-72
REVIEW BY L. Quinlan L	4-18-77	

H-9064

A. Additions and corrections have been furnished the plotter center by the verification unit. Except those marked for submission by Review

Signed [signature]

Date May 1, 1972 Title Chief, Verification Br., AMC

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

Signed [signature]

Date May 1, 1972 Title Chief, Verification Br., 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 [signature]

Date May 1, 1972 Title Chief, Verification Br., AMC

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

Date May 2, 1972.

VERIFIER: H. L. Smith

Norfolk, Va.
March 3, 1972

AMC PLOTTER NOTE TO EDAT
H-9046 (PB 2043-69)

During verification of the sounding overlay of this survey it was found that the sounding corrections listed onthe raw data corrector tape printout using indicator 6 was not applied unless it was on a position.

The corrector tape printout was checked by this office with the fathograms and about 30 deletions were made in red pencil, 27 using an indicator 6, and 3 using indicator 8. These changes should be considered if the corrector tape is to be used.

The sounding card printout shows all changes to be made. Those corrections that will be incorporated with the use of the corrector tape are made with blueprint pencil, and other corrections are made with red pencil.

The wrong ft/fm indicator was used on day 253, times 143600 thru 143645.

It was found that many sounding cards are out of sequence.

When the above changes have been made please furnish this office with a smooth sheet.

Mark L. Griffith
Chief, Verification Br., C32

VERIFICATION NOTES
H-9064

Except for widely spaced sounding lines and the rather sparce development on the many shoal indications, this appears to be an excellent survey. Soundings are in good agreement at crossings and depth curves form normal configurations in this area of very irregular bottom.

Other minor problems experienced during verification are listed in the enclosed "Plotter Notes to EDAT".

SOUNDINGS

The boat sheet depths of 68', 62' and 63' (Lat. 42-31.15' and Long. 70-44.12') between positions 1072 and 1073, appear to be too shoal by about 40 ft. It is believed the error was caused by reading soundings on the wrong scale. Depths on adjoining survey H-9094 tend to disprove the shoal depths on the boat sheet. Also, the 74' sounding between positions 1072 and 1073 could be shoaler as the trace ran off the top of fathogram.

Hugh L. Proffitt
Chief, Verification Branch, AMC

Norfolk, Va.
May 1, 1972

VERIFIER: Bernie T. Davis

Norfolk, Va.
May 5, 1971

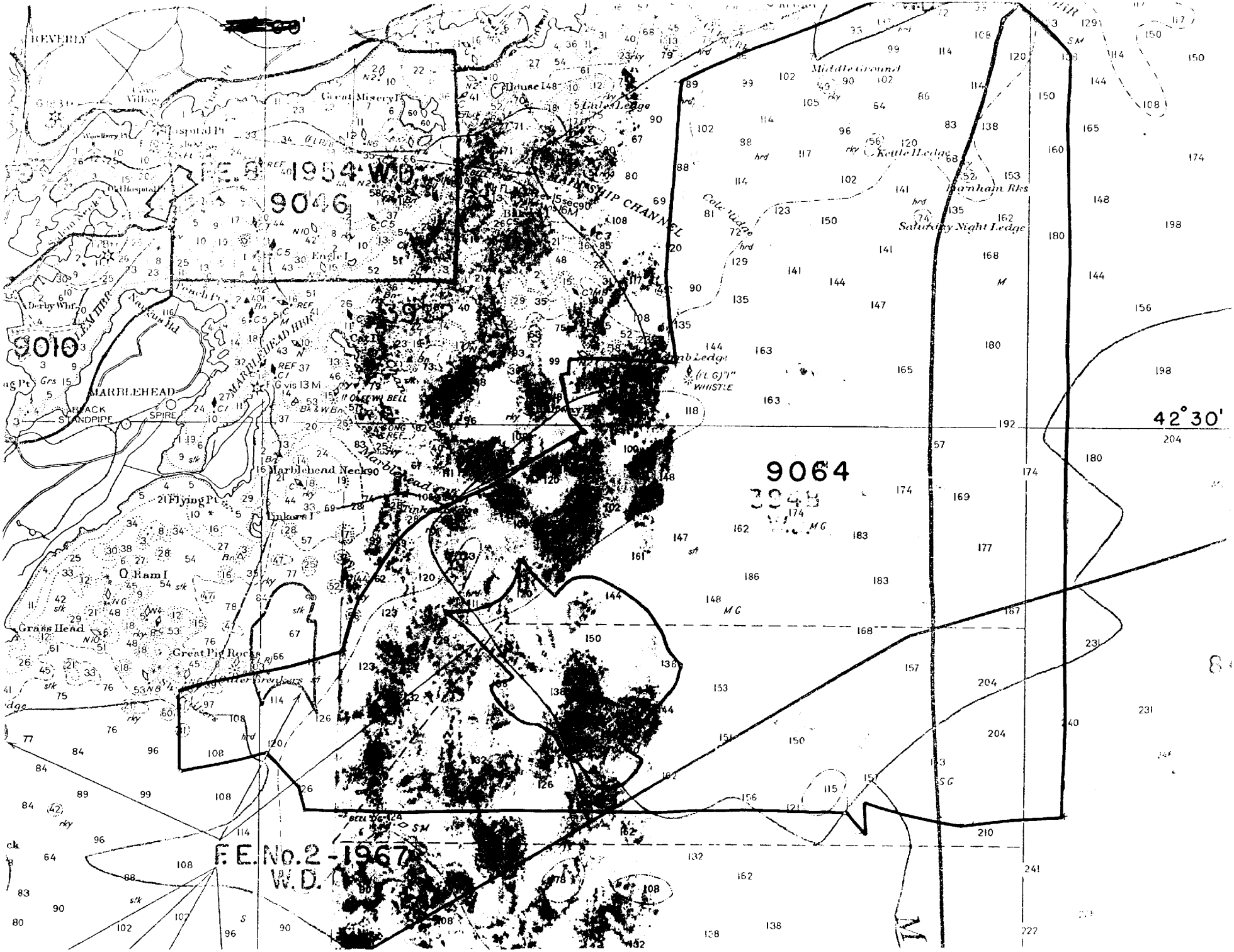
AMC PLOTTER NOTE TO EDAT

SURVEY H-9064 (Pe 20-3-69)

This office has completed verification of the preliminary position overlay for this survey. The changes needed are marked in red pencil on the position card printout. They are few and scattered except for positions 1019 thru 1024 where the wrong Hi-Fix correctors were applied.

Please furnish a sounding overlay after the above mentioned changes have been made.

Hugh L. Proffitt
Chief, Verification Br., AMC


F.E. 1954 W.D.
9046
9010
9064
F.E. No. 2 - 1967
W.D.
42°30'
MARBLEHEAD
Marblehead Neck
Flying Pt
Tinkers I
O. Ram I
Grass Head
Great Pig Rocks
Great Misery I
Middle Ground
Kettle Ledge
Barnham Rks
Saturday Night Ledge
Cole Ridge
Crab Ledge
MARBLEHEAD CHANNEL
MARBLEHEAD HBR
SALEM HBR
BLACK STANDPIPE
SPIRE
WHISTLE
BELL
SM
MG
SG

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9064

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	6-3-72	Jo Blevrich	~~Full~~ Part ~~Before~~ After Verification ~~Review Inspection~~ Signed Via Drawing No. 21 Critical corrections only. Changed one sounding
240	6-8-72	Ralph B. Ross	~~Full~~ Part ~~Before~~ After Verification ~~Review Inspection Signed Via~~ Drawing No. Dwg #22 Critical Corr. only
1106	6-26-72	James A. Graham	~~Full~~ Part ~~Before~~ After Verification before Review Inspection Signed Via Drawing No. 27 Examined for critical corrections only. ~~No corrections.~~ Added 19 Deleted 24 42°26'30"N 70°46'10"W
1107	6/29/72	James Graham	before Added 12, deleted 17 ~~Full~~ Part ~~Before~~ After Verification Review Inspection Signed Via Drawing No. 25 Examined for critical corrections only. ~~No corrections.~~ Added 12 Deleted 17 Added 19 Deleted 24 42°26'30" 70°46'10"
1000	7-25-72	J. Bailey	~~Full~~ Part ~~Before~~ After Verification before Review Inspection Signed Via Drawing No. 49 Examined for critical corrs. only. Revised 20 fm depth curve
1207	Vennon	8-4-72	~~Full~~ Part ~~Before~~ After Verific~~ation Review Inspection Signed Via~~ Drawing No. Added 8 sdgs - revised and 120' curve thru chart 240 #22 proof
Re-applied		added	
1207	9-19-72	H. Ladden	~~Full~~ Part ~~Before~~ After Verification before Review Inspection Signed Via Drawing No. #32 Re-applied critical corr only. Five Soundings
613-SC	9-21-72	W. Chandler	~~Full~~ Part ~~Before~~ After Verification Before Review Inspection Signed Via Drawing No. Exam. for Critical Corr. only. Added 25 sdgs. Revised 60-ft curve
71	9-22-72	H. Ladd	~~Full~~ Part ~~Before~~ After Verification before Review Inspection Signed Via Drawing No. 26 Critical corr only thru cht. 1207 #32
70	1-10-73	O Chapman	~~Full~~ Part ~~Before~~ After Verification before Review Inspection Signed Via Drawing No. 37 Critical Corr. only thru Cht. 71 #26
240	12-22-77	D.C. Ross	PARTIAL ~~Final~~ Application after VERIFICATION ~~review~~ before REVIEW ~~Inspection~~ (~~Category I~~) on DRAWING NO. 1?. Applied by revising and adding critical soundings ~~and approximate soundings~~.
613SC	12-22-77	D.C. Ross	PARTIAL ~~Final~~ Application after VERIFICATION ~~review~~ before REVIEW ~~inspection~~ (~~Category I~~) on Drawing No 9. Applied partly thru reduction of chart 240 & the rest thru direct reduction of Hydro sheet. Revised soundings.

FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9064

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
13267	8-19-82	James T. Cornett	~~Full~~ Part ~~Before~~ After Verification ~~Review Inspection Signed~~ Via
			Drawing No. 42 Revised and applied critical soundings
			through chart 13275 dig. # 31
13006	2-13-90	Russell P Kennedy	~~Full Part Before~~ After Verification Review Inspection Signed Via
#			Drawing No. 47 Adequately applied
13280	2-22-90	Russell P Kennedy	~~Full Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 39 Adequately applied
			ADEQUATELY BEFORE
13267	4-16-91	Dan Clarke	~~Full Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 44
			ADEQUATELY before
13279	5-9-91	B Szatkowski	~~Full Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 33
			Adequately Appld before
13279	6-20-94	John Barker	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 35 Consider adequately appld
			no further processing necessary
13274B	6-21-94	John Barker	~~Full Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 20 Consider adequately appld -
			no further processing necessary thru #13275
13275	6-24-94	John Barker	~~Full Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 36 Consider adequately appld -
			no further processing
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8558-P63