

# FE376

Diagram No. 1210-4

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE

## DESCRIPTIVE REPORT

Type of Survey ... Field Examination  
Field No. .... RU-20-6-92  
Registry No. .... FE-376SS

### LOCALITY

State ..... Massachusetts  
General Locality .. Rhode Island Sound  
Sublocality ..... 2.2 and 5.2 NM West  
..... of Sow Pigs Reef  
..... 1993  
CHIEF OF PARTY  
..... LCDR N.E. Perugini

### LIBRARY & ARCHIVES

DATE ..... September 3, 1993

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CP-2  
13229 'E'  
13218  
13200  
12300

(13009 N.C.)

FE376



## HYDROGRAPHIC TITLE SHEET

FE-376SS

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.

RU-20-6-92

State MassachusettsGeneral locality Rhode Island SoundLocality 2.2 and 5.2 Nm West of Sow and Pigs ReefScale 1:20,000Date of survey Aug 05 to Sep 15, 1992Instructions dated 12 February, 1992Project No. OPR-B660-RU-92Vessel NOAA Ship RUDE (9040)Chief of party LCDR Nicholas E. Perugini, NOAASurveyed by N. E. Perugini, P. L. Schattgen, J. A. Illg, R.T. Brennan, D. E. WilliamsSoundings taken by echo sounder, hand lead, pole Pneumatic Depth GaugeGraphic record scaled by NEP, PLS, JAI, RTB, DEWGraphic record checked by NEP, PLS, JAI, RTB, DEWProtracted by N/AAutomated plot by N/AVerification by N/A ATLANTIC HYDROGRAPHIC SECTION PERSONNELSoundings in ~~feet~~ <sup>meters</sup> at ~~MLW~~ <sup>MLLW</sup>REMARKS: All times recorded in UTCNOTES IN THE DESCRIPTIVE REPORT WERE MADE IN RED DURING  
OFFICE PROCESSING.SURF/AWOIS 9/22/93  
MLRWW 7/19/94



05'

71°

NOTE E  
PRECAUTIONARY AREASfrom Chart 13218  
Martha's Vineyard  
to

Block Island

NAD 83 Scale 1:80,000  
Sounds in FEET at MLLW  
31st Ed. JAN 11/92list of  
Buz-  
zards  
in

Slocuma River

Zack

Round Hill Pt.

JOINS CHART 13237

FE-376SS (1992)

RU-20-6-92

OPR-B660-RU-92

MASSACHUSETTS

RHODE ISLAND SOUND

2.2 AND 5.2 NM WEST

OF SOW AND PIGS REEF

30'

41°

25'

AWOIS  
1886AWOIS  
1887

Wreckage

Wreckage

BUZZARDS  
FI 2.5sec 101R 22M  
HORN  
R Bn 314

43930

05'

71°



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## **A. PROJECT**

**A.1** This survey was conducted in accordance with Hydrographic Project Instructions OPR-B660-RU, Southern New England Coast, Connecticut and New York.

**A.2** The original date of the instructions is February 12, 1992.

**A.3** The following changes are relevant to this project:

Change No. 1, dated April 2, 1992, authorized the implementation of the Pilot Partnership Processing Project.

Change No. 2, dated April 14, 1992, states that all AWOIS item surveys shall be at the scale of 1:20,000 when the largest scale chart of the area is smaller than 1:20,000. When the largest scale chart of the area is 1:20,000 or larger, the scale of the survey shall be 1:10,000.

**A.4** A sheet letter was not specified in the project instructions.

**A.5** Project OPR-B660-RU responds to requests from the Northeast Marine Pilots, Inc., of Newport, Rhode Island, to verify or disprove certain wrecks and obstructions in Long Island, Block Island, and Rhode Island Sounds. The U.S. Navy, as well as state and local governments, have also requested updated bathymetric and hydrographic survey data of the area.



## **B. AREA SURVEYED**

**B.1** This survey consists of two AWOIS items, 1887 and 1886, located 2.2 and 5.2 nautical miles, respectively, West of Sow and Pigs Reef, Massachusetts. These items are identified on the chartlet preceding the table of contents of this descriptive report.

**B.2** The approximate limits of this survey are as follows:

AWOIS 1886	41° 23' 44.38" N
(charted "wreckage")	71° 05' 28.14" W
	300 Meter search radius
AWOIS 1887	41° 23' 47.78" N
(charted submerged	71° 01' 10.73" W
dangerous wreck)	200 Meters search radius

**B.3** Data acquisition began on August 5, 1992 (DN 218) and concluded on September 15, 1992 (DN 255).

## **C. SURVEY VESSELS**

**C.1** The following vessels were used during this project:

<b><u>VESSELS</u></b>	<b><u>ELECTRONIC DATA PROCESSING NUMBER</u></b>	<b><u>PRIMARY FUNCTION</u></b>
NOAA Ship RUDE (S590)	9040	Hydrography/ Side Scan Operations
RUDE Launch (RU3)	1290	Diving Operations

**C.2** No unusual vessel configurations or problems were encountered.



#### **D. AUTOMATED DATA ACQUISITION AND PROCESSING**

**D.1** Survey data acquisition and processing were accomplished using the HDAPS system with the following software versions:

<b>Program</b>	<b>Version</b>	<b>Dates Used</b>
SURVEY	6.11	DN 218 - 255
DAS_SURV	6.23	DN 218 - 255
POSTSUR	5.21	DN 218 - 255

**D.2** Other software includes VELOCITY 1.11 dated March 9, 1990 used to generate sound velocity corrector tables, and MTEN (dated between 1985 and 1986) for horizontal control verification and establishment.

**D.3** No non-standard automated acquisition or processing methods were used.



## **E. SONAR EQUIPMENT**

**E.1** Side scan sonar operations were conducted using an EG&G Model 260 slant range corrected side scan sonar recorder, and two Model 272-T (single freq) towfish. All side scan operations were conducted from the RUDE (vessel # 9040). The following list shows equipment serial numbers and corresponding dates used:

<b>Equipment Type</b>	<b>Serial Number</b>	<b>Dates Used</b>
Recorder	0011443	Entire Survey
Towfish	11908 (Single Freq)	DN 218 - 224
	11902 (Single Freq)	DN 225 - <sup>246</sup> <del>255</del>

**E.2** The side scan sonar towfish was configured with a 20° beam depression, which is the normal setting and which yields the best beam correction.

**E.3** The 100 Khz frequency was used throughout this survey.

**E.4 a)** The 100 meter range scale was used to investigate the search radius for all items. Given the depth of water in the search area, this range scale was used to provide optimum contact resolution.

The current FPM specification was used to determine maximum line spacing:

$$LS_{max} = 2RS - 2ECR_{max}$$

where RS = range scale (100m)  
and ECR = error circle radius

Predicted ECR values were generated using the HDAPS function "Predict ECR" for control station configurations used in this survey. No predicted ECR value was greater than 6 meters for the entire survey area. Thus the maximum line spacing computed by the above equation was 188 meters. RUDE used a 170 meter line spacing which yielded an effective swath overlap of 30 meters. Printouts of "Predict ECR" values supporting the above ECR values are included in SEPARATE V.



b) Confidence checks were obtained by noting recognizable bottom characteristics at the edges of the sonar range scale in use. These confidence checks are noted on the sonagram and on the daily abstract sheets.

c) A full 400% side scan sonar coverage was carried out on AWOIS 1886 (sheet 13). On AWOIS 1887 (sheet 12) the object of the investigation was found and therefore 100% coverage of the search radius was not required.

d) There were no factors adversely affecting side scan sonar operations or the quality of the sonar records.

e) The towfish was deployed from the stern during the entire survey.

#### **E.5 Methods used to examine contacts:**

##### **AWOIS 1886:**

All side scan sonar contacts were evaluated on the following criteria:

- \* height of the contact
- \* observance of the contact on different side scan passes
- \* appearance, wreckage or a natural feature

All significant contacts were entered into the contact tables.

Five and ten meter echo sounder lines were run over the positions of these significant contacts to determine a more precise least depth. The shoalest contacts and contacts which resembled wreckage were investigated by the ships divers and least depths were measured with a pneumatic depth gauge. Refer to section N.5 of the individual development for specific contact development procedures and dive investigation reports.

##### **AWOIS 1887:**

This item was found and investigated with echo sounder and diver investigations.

**E.6** Side scan sonar coverage overlap was checked on-line by observing the on-line swath plot. The edited swath plot was used to identify holidays.



## **F. SOUNDING EQUIPMENT**

**F.1** All hydrographic soundings were acquired using a Raytheon 6000N Digital Survey Fathometer (DSF). One DSF 6000N was used during the entire survey: S/N B050N.

**F.2** When diver investigations were conducted, least depths were measured with a 3-D Instruments, Inc. precision direct drive depth gauge:

0 - 70 fsw (feet salt water)	S/N 201637 12
0 - 140 fsw (feet salt water)	S/N <sup>86068 22</sup> <del>201637 12</del>

These gauges were checked each day they were used by comparing them with lead line s/n RUDE-100-1-1991. Pneumatic depth gauge readings varied from the lead line depths by more than the 0.5 ft specified in the FPM. This difference can be attributed to large line angles in the lead line (10 to 15°), choppy seas and currents on the days dive operations were conducted. Calibration and check documentation for this equipment can be found in Separate IV.DATA FILED WITH FIELD RECORDS.

**F.3** There were no faults in sounding equipment that affected the accuracy or quality of the data.

**F.4** Both the high (100 Khz) and low (24 Khz) frequency sounding data were recorded during data acquisition. Only high frequency soundings were plotted.

## G. CORRECTIONS TO SOUNDINGS

G.1 a) The velocity of sound through water was determined using a Digibar Sound Velocity Probe (S/N 169), manufactured by Odom. A Data Quality Assurance Test was conducted before each velocity cast to ensure the meter was within tolerance. Velocity casts were conducted once per week. The velocity correctors from these casts were applied to all data.

All data were processed using Velocity 1.11 software. The computed velocity correctors were entered into the HDAPS sound velocity table and applied on-line to both high and low frequency soundings. The sound velocity correctors applied to this survey are based on the cast recorded on the following date:

Cast Number	DN	Latitude	Longitude	HDAPS Table #	Applied to Days
13	219	41° 23.9' N	071° 06.9' W	13	218-220
<del>15</del>	<del>232</del>	<del>41° 21.9' N</del>	<del>070° 57.0' W</del>	<del>15</del>	<del>246</del>
16	234	41° 27.9' N	071° 04.1' W	16	246
17	254	41° 22.3' N	071° 03.8' W	17	255
18	264	41° 26.3' N	071° 00.7' W	18	258-259

b) There was no variation in the DSF-6000N instrument initial.

c) No instrument correctors to the DSF-6000N were required.

d) A dual lead line comparison with the DSF-6000N was made in the project area.

DOY 224 at 41° 26.5' N 70° 53.8' W (35 ft depths)

The greatest variation between leadline and DSF soundings was 0.1 meters. Considering the ship's motion and the wire angle in the leadline from current (approximately 5°), this is excellent agreement and provides an adequate check that the echosounder was functioning properly. Data from these comparisons are found in Separate IV. DATA FILED WITH FIELD RECORDS.

Both of the leadlines used in the leadline to DSF 6000 comparison were calibrated by steel tape prior to the above comparison. An average leadline correction of -0.3 feet was applied in comparisons between the DSF-6000 and the ship's leadlines.

e) All sounding correctors were applied to both the narrow (100 kHz) and wide (24 kHz) DSF 6000N beams.



f) During the winter 1988 dry dock period, an exact vertical measurement was taken from the DSF transducer to a fixed point on the bridge wing. After the ship was re-floated, the height above the waterline was determined for this point. The ship's static draft was thereby calculated to be exactly 2.26 meters (7.4 feet). This draft value was applied to the sounding data via the HDAPS offset table.

g) Settlement and squat correctors for the RUDE were determined on the Elizabeth River, Norfolk, Virginia on March 13, 1991. An observer, stationed with a level on a pier, measured changes in relative height by sighting to a staff held at the longitudinal position of the ship's transducer. The ship steamed directly toward and then away from the observer. The toward and away runs were averaged and applied to soundings through the HDAPS offset table.

h) Heave data were acquired by a Datawell heave, roll and pitch sensor (S/N 19128-C), and were applied to soundings in real time. Only the heave corrections were applied to the plotted soundings.

G.2 There were no unusual or unique methods or instruments used for correcting echo soundings.

G.3 The sound velocity correctors resulting from velocity casts were applied to the data. Section G.1 a) gives the periods that each velocity cast correctors were used for.

G.4 During this survey both the 0 to 70 fsw (s/n 201637 12) and the 0 to 140 fsw (s/n 8606822) pneumatic depth gauges were used.

The shallow water (0-70 fsw) pneumatic depth gauge was calibrated on January 16, 1992. This gauge was bought new prior to the start of the 1992 field season and calibrated by the manufacturer. Corrector data from the calibration was not applied to pneumatic depths because it was less than 0.1 meters.

The deep water (0-140 fsw) gauge was calibrated on October 30, 1991 by Instruments Inc., Norfolk, VA.

On each day that a pneumatic depth gauge was used a system check was performed. This was to insure the validity of pneumatic depth gauge measurements. These system checks are included in Separate IV.\* Hydrographic Survey Guideline No. 55 mandates that agreement between the leadline and observed gauge values must not exceed 0.5 feet. Often values did exceed this limit. However, during these comparisons the observed wire angle of the leadline and pneumatic depth gauge hose was unavoidably excessive and therefore the comparison values were viewed with suspicion. No correctors were applied to measured pneumatic depth gauge values.

\* DATA FILED WITH FIELD RECORDS.

On August 27, 1992, (DN 240) both of the ship's pneumatic depth gauges were again calibrated, by Instruments East, Inc. of Norfolk, VA. The new corrector data from the calibration was not applied to measured depths because it was less than 0.1 meters.

Least depth measurements were conducted on August 07 (DN 220), September 14 (DN 258), and September 15 (DN 259).

G.5 Generally, sea conditions greater than one meter affected the sounding record, creating a trace of constant peaks and ~~dips~~<sup>DEEPS</sup>. Application of heave correctors to raw echo soundings appeared to accurately represent true depths.

G.6 a) The tidal datum for this project is Mean Lower Low Water. The operating tide station at Newport, Rhode Island (845-2660) served as direct control for datum determination. This station also served as the reference station for predicted tides. Data for predicted tides were provided on floppy magnetic disk before the start of the project.

b). Tidal data used during data acquisition were obtained from Table 2 of the East Coast of North and South America Tide Predictions, and applied to the digital tide data using the HDAPS software. The subordinate station for predicted tides was:

NO.	PLACE	POSITION	TIME		HEIGHT	
			High water	Low water	High water	Low water
1145	Westport Harbor	41° 30'N 71° 06'N	+0 09	+0 33	*0.85	*0.85

Tidal correctors were applied on-line using the HDAPS predicted tide tables numbers 8 and 9. A listing of the tide tables can be found in Separate IV. *DATA FILED WITH FIELD RECORDS.*

c) Zoning for this project is consistent with the project instructions.

The request for Approved Tides was mailed on September 20, 1992.

*APPROVED TIDES WERE APPLIED DURING OFFICE PROCESSING.*



**H. CONTROL STATIONS** SEE ALSO SECTION 2.9. OF THE EVALUATION REPORT.

**H.1** The horizontal datum for this project is the North American Datum of 1983 (NAD 83).

**H.2** The list of Horizontal Control Stations is located in Appendix III.

**H.3** No horizontal control stations were established for this survey. Existing NGS stations were used. All horizontal control stations used during this survey are third-order.

**H.4** All horizontal control stations are within NGS Quadrants N0410703, N0410711 and N0410712. All are referenced to the NAD 83 Horizontal Datum.

**H.5** Verification of horizontal control was accomplished by standard ground survey techniques. Field records have been forwarded to Coastal Surveys Unit in Norfolk.

**H.6** There are no photogrammetric problems, positioning problems or unconventional survey methods pertinent to this survey.

**I. HYDROGRAPHIC POSITION CONTROL** SEE ALSO SECTION 2.9. OF THE  
EVALUATION REPORT.

**I.1** This survey was conducted using Falcon Mini-Ranger system  
and Differential GPS.

**I.2** Accuracy requirements were met as specified by the  
Hydrographic Manual and Field Procedures Manual (FPM).

**I.3 Control Equipment:**

Mini-Ranger:

Falcon 484 by Motorola Inc.

Serial Numbers:

Baseline Calibration 3, C-O Table 4

DN: 156 - 171

S/N

RPU F-0244  
R/T F-3409  
R/S: F-3296 (code 5)  
D-2123 (code 7)  
F-3217 (code 9)

Baseline Calibration 4, C-O Table 5

DN: ~~174-188~~

258-259

S/N

RPU F-3411  
R/T E-0138  
R/S: E-2915 (code 2)  
F-3296 (code 5)  
D-2123 (code 7)  
F-3217 (code 9)

DGPS

Unit A:

Ashtech GPS Sensor

S/N CD0000458766

Receiver Version: TD08

Firmware Version: 1E03

Unit B:

Ashtech GPS Sensor

S/N CD0000458769

Receiver Version: TD08

Firmware Version: 1E03

Magnavox MX50R DGPS Receiver

S/N 036

Correctors received from Montauk, New York radio beacon.



I.4 Calibration procedures and performance checks for the positioning systems are as follows:

FALCON:

As stated in section 3.1.3.3 of the Field Procedures Manual for Hydrographic Surveying, a continuous critical system check is obtained "when data are acquired with three or more LOP's and ECR and maximum residual criteria are being met as required in section 3.1.3.1" (of the same manual). RUDE routinely conducted survey operations using at least three LOP's, and all other positioning criteria were met as required (see section I.2).

Baseline calibrations #3 and #4 were conducted in New Bedford, Mass. on DN's 143 and 171 respectively. The results of these baseline calibrations can be found in SEPARATE III.\*

DGPS:

As specified in section 3.4 of the FPM, never during survey activities did the expected positional error (EPE) exceed 14.3 meters. This is within the authorized maximum of 1.5 mm at the scale of the survey or 35 meters for this survey. The HDOP never exceeded 3.5 while the authorized maximum is 7.8, as derived by the formula in the FPM. At all times at least four satellites were used for positioning.

DGPS system performance checks were conducted on DN 189, DN 254 and DN 258. This procedure was completed near the search radius for this survey in an area with an established Falcon Mini-Ranger network. By using HDAPS' Position Data and Quality Figures program within the Survey environment, three consecutive DGPS performance checks were obtained. All three recorded DGPS/Falcon positions compared to each other within the maximum allowable inverse distance ( $\Delta P_{max}$ ) between the two as computed by HDAPS. Although the scale of the survey was 1:20,000, the performance checks were conducted to 1:10,000 scale standards. These performance checks are included in Separate III.\*

I.5 The Falcon system required calibration data to be applied to raw ranges. The range corrector and minimum acceptable signal strength (MASS) for each Mini-Ranger Reference Station was entered into the HDAPS system using the Pre-Survey C-O Table. This table provided the mechanism by which HDAPS automatically applies the proper range corrector and removes from the position computation those LOP's with signal strengths below MASS. Overall, calibration data applied to the raw Mini-Ranger ranges was adequate and effective.

The DGPS system performance check indicated that the system accuracy was within the allowable tolerances. (See Separate III)\*  
\*DATA FILED WITH FIELD RECORDS.

I.6 a) There were no unusual methods used to calibrate or operate the electronic positioning equipment.

b) There were isolated occurrences of equipment malfunctions. However, these occurrences, usually Mini Ranger Reference Station failures, were detected immediately. The solution was to replace the failed station with another reference station from the spares on hand.

c) There were no occurrences of unusual atmospheric conditions that may have affected data quality.

d) There were isolated instances when the ship would run on only two Mini Ranger Stations. The dropout of the third station was attributed to unexplained interference. These station "drop outs" were infrequent, brief in duration (noted only during one selected), and considered inconsequential.

e) No systematic errors were detected that required adjustments.

f) Antenna positions were corrected for offset and layback, and referenced to the position of the DSF 6000N transducer. These correctors were located in the HDAPS Offset table, and applied on-line to the positioning algorithm. Refer to Separate III for a copy of offset table 1.\*

g) Offset and layback distances for the A-frame (tow point) were located in the HDAPS Offset table and applied on-line. These offsets, along with the cable length, towfish height, and depth of water, were used by the HDAPS system to compute the position of the towfish. Refer to Separate III for a copy of offset table 1.\*

\* DATA FILED WITH FIELD RECORDS.



J. SHORELINE SEE SECTION 2.6. OF THE EVALUATION REPORT.

No field sheets encompassed any shoreline.

K. CROSSLINES SEE ALSO SECTION 3.9. OF THE EVALUATION REPORT.

AWOIS 1886

A comparison of soundings from crosslines and along lines reveals variations of up 1.4 meters. This variation can be attributed to the rugged nature of the bottom, which is strewn with boulders. The area of the survey is too small to determine by contouring if a portion of the 1.4 meter difference is related to tides.

AWOIS 1887

A comparison of sounding from crosslines and along lines is difficult to conduct on a small survey area which is centered around a wreck. However, the along line soundings compare to within 0.1 meters of the crossline soundings in the areas adjacent to the wreckage. CONCUR

L. JUNCTIONS SEE SECTION 5. OF THE EVALUATION REPORT.

This survey does not junction with any current surveys.

M. COMPARISON WITH PRIOR SURVEYS SEE SECTION 6. OF THE EVALUATION REPORT.

In accordance with Change No. 1 the comparison between soundings from this survey and prior surveys is to be addressed by the Atlantic Hydrographic Section. However, soundings from this survey were compared with presently charted depths on the largest scale charts of the area. This comparison can be found in section N.11 and N.12 for each survey area.

**N. COMPARISON WITH THE CHART** SEE ALSO SECTION 7.9 OF THE EVALUATION REPORT  
**AWOIS 1887**

A CHARTED DANGEROUS SUNKEN WRECK WITH A WIRE DRAG CLEARANCE OF 46 FT, AND A DANGER CURVE.

**N.1** The object of this investigation is the wreck of the Vineyard Lightship which sank, September 24, 1944, while on station in a hurricane. The book Unfinished Voyages (first addition 1989) by John Perry Fish, gives a detailed explanation of the sinking of the Vineyard Lightship.

**N.2 Item Location**

Geographic position provided was: 41° 23' 47.78" N  
71° 01' 10.73" W

**N.3 Source of Item**

<u>Prior Survey</u>	<u>Year</u>
FE194WD	1964

**N.4 Largest Scale Chart Affected**

Chart 13218, scale 1:80,000, <sup>31st.</sup> 9th ED, dated <sup>JAN 11</sup> ~~JUN 13~~, 1992.

The entire search radius of AWOIS item <sup>1887</sup> ~~1913~~ falls on chart 13218.

**N.5 Investigation Procedures**

Survey requirements called for 200% side scan sonar coverage in conjunction with echosounder development in a 200 meter search radius. Diver investigations were also required, if appropriate.

Two hundred percent side scan coverage was not completed on this item. The wreck was located during the first 100% of side scan coverage. A dive investigation was conducted on this item and a least depth was determined by pneumatic depth gauge. An Echo sounding development, consisting of 10 meters spaced cross lines, was conducted over the entire wreck.

**N.6 Investigation Results**

AWOIS item 1887 was located during this survey and a diver investigation was conducted. The divers were able to sufficiently cover the wreck and determine the least depth.

The Vineyard Sound Light Ship was identified by its bull nose, which had the anchor chain leading out of it and into the sediment. The bow and stern sections of the hull are <sup>THE</sup> only easily recognizable structures. The super structure is completely collapsed and there are no masts or other rigging rising up from the wreckage. The divers determined the least depth to be on a vertical beam extending six feet above the main body of the wreckage. This beam appeared to be part of the super structure

at one time. Only small sections of the weather deck were still intact.

The wreck rests on her keel and is silted in approximately 10 feet. Her longitudinal access is lying on a 095°-275° orientation with her bow to the east. The depth around the wreck was 70 feet as measured by the divers depth gauge. The bottom consisted of coarse brown sand and broken shells.

#### N.7 Explanation for Position Difference

The position provided in the AWOIS listing differs from the position of the least depth of this survey by 62.7 meters. This small difference can be attributed to further deterioration of the wreck and the accuracy of the positioning system. CONCUR

#### N.8 Least Depth Information

The least depth for this item is <sup>18.2</sup>~~15.5~~ meters as determined by ~~echo-sounder~~ using predicted tides.  
PNEUMATIC DEPTH GAUGE

#### N.9 Charting Recommendation

This item should be charted as a dangerous wreck with a least depth of 18.1<sup>2</sup> meters, ~~(pending the application of approved tides),~~  
AND A DANGER CURVE.

41° 23' 49.8<sup>3</sup>" N  
71° 01' 09.5<sup>4</sup>" W

CONCUR

#### N.10 Danger to Navigation Report

This item is currently charted as a dangerous wreck and findings from this survey do not warrant a danger to navigation report.

#### N.11

The only charted depth covered by this survey was the 46 foot sounding associated with the wreck symbol. The least depth from this survey was 18.1<sup>2</sup> M or 59 feet. This difference can be attributed to further deterioration of the wreck.\* See section N.

\*CONCUR



## N. COMPARISON WITH THE CHART (continued)

### AWOIS 1886

A CHARTED 58 FT SOUNDING WITH NOTATION "WRECKAGE".

N.1 The object of this investigation is described as wreckage. A wire drag depth of 58 feet was carried forward from H3668A/14-17, to H6445/39. No other information was given in the AWOIS listing.

### N.2 Item Location

Geographic position provided was:  $41^{\circ} 23' 44.38''$  N  
 $71^{\circ} 02' 07.14''$  W  
05' 28.14"

### N.3 Source of Item

The AWOIS listing references H3668A/14-17 and H6445/39.

### N.4 Largest Scale Chart Affected

Chart 13218, scale 1:80,000, <sup>31st.</sup> 9th edition, dated <sup>JAN. 11</sup> ~~June 13~~, 1992.

The entire search radius of AWOIS item 1886 falls on chart 13218.

### N.5 Investigation Procedures

Survey requirements called for 400% side scan sonar coverage in conjunction with echosounder development in a 300 meter search radius. Diver investigations were conducted on significant peaks, and items which resembled wreckage. No wreckage was found.

400% side scan coverage was conducted on this item. All side scan sonar contacts were evaluated on the following criteria:

- \* height of the contact
- \* observance of the contact on different side scan passes
- \* appearance, wreckage or a natural feature

All side scan sonar contacts were entered into the contact tables.

Five and ten meter echo sounder lines were run over the positions of these significant contacts to determine a more precise least depth. The shoalest contacts and contacts which resembled wreckage were investigated by the ships divers and least depths were measured with a pneumatic depth gauge. No contacts resembling wreckage were identified. The development results, as well as dive investigation results, are tabulated on page 22.

## N.6 Investigation Results

Diver investigations were conducted on three significant features. The divers reported these features to be large boulders. No evidence of wreckage was seen on the sonograms.

## N.7 Explanation for Position Difference

This item was disproved. CONCUR

## N.8 Least Depth Information

See Table in section N.6.

## N.9 Charting Recommendation

Charting Recommendations are as follows:

### REMOVE

wreckage <sup>NOTATION</sup> ~~symbol~~ at: 41° 23.70'N, 71° 5.30'W

AND

58 foot sounding at 41° 23.7<sup>4</sup>~~5~~'N, 71° 5.4<sup>7</sup>~~8~~'W

### ADD

CHART A ROCK WITH A KNOWN DEPTH OF  
17.6 m (58 ft.), ~~sounding~~ at 41° 23' 42.82"N, 71° 05' 27.07"W\*  
(176 RK)

~~16.3 m (53 ft.) sounding at 41° 23' 53.36"W, 71° 05' 15.08"W~~

\* AND A DANGER CURVE.

## N.10 Danger to Navigation Report

This item is not a danger to navigation and no danger to navigation report was submitted.

## N.11

The area surveyed for AWOIS 1886 was compared to its corresponding charted area on chart 13228 by transferring the charted depth onto a copy of the excessed sounding plot in feet (see next page). The charted depth of 58 feet compares well with a 57 foot (17.6 meter) sounding from this survey which lies approximately 30 meters to the south-southeast. The difference in position can be attributed to scaling error induced when the charted depth was scaled from the 1:80,000 chart, 13228.

**O. ADEQUACY OF SURVEY SEE ALSO SECTION 9, OF THE EVALUATION REPORT.**

**O.1** All items investigated during this survey have been addressed.

**O.2** There are no parts of the survey that are considered incomplete or substandard.

**P. AIDS TO NAVIGATION**

**P.1** The RUDE conducted no correspondence with the U.S. Coast Guard regarding floating aids to navigation.

**P.2** No aids to navigation fell within or near the confines of this survey.

**P.3** No aids not already listed in the Light List were located during this survey.

**P.4** No bridges, overhead cables or overhead pipelines are located within the survey area.

**P.5** No pipelines or ferry routes are located within the survey area. There is a cable area which runs from Gooseberry Point, Massachusetts to Cuttyhunk Island, Massachusetts, and AWOIS item 1887 lies within this cable area. No investigation of this cable area was made because the search radius of AWOIS does not include any shoreline.

**P.6** No ferry terminals are located within the survey area.



**Q. STATISTICS**

**Q.1 a) Number of positions**

- b) Lineal nautical miles of sounding lines
- nautical miles of survey with the use of the side scan sonar 8.6
  - nautical miles of survey without the use of the side scan sonar 11.5

**Q.2 a) square nautical miles of hydrography 0.14**

- .07 square nautical miles - AWOIS 1886
- .07 square nautical miles - AWOIS 1887

b) days of production 9

c) detached positions 4

- 4 for diver investigation
- 0 for developments

d) bottom samples 0

e) tide stations 1

f) current stations 0

g) velocity casts 4

h) magnetic stations 0

i) XBT drops 0

## **R. MISCELLANEOUS**

**R.1 a)** No evidence of silting was found during this survey.

b) No evidence of unusual submarine features was found during this survey.

c) No evidence of anomalous tidal conditions was found during this survey.

d) The tidal current table predictions appeared to be accurate when used for planning dive operations around slack water. The divers consistently reported conditions that matched the predictions.

e) No evidence of magnetic anomalies was found during this survey.

**R.2** No bottom samples were obtained during this survey.

BOTTOM SAMPLES WERE LABELED ON THE PAGE SIZE PLOTS FROM DIVE REPORTS.

**S. RECOMMENDATIONS** SEE ALSO SECTION 9. OF THE EVALUATION REPORT.

**S.1** No survey inadequacies have been noted.

**S.2** The RUDE is aware of no construction or dredging that will affect results of this survey.

**S.3** No further investigation of the survey area is recommended. CONCUR

## **T. REFERRAL TO REPORTS**

As of the date of completion of this survey, three horizontal control reports have been submitted and forwarded to Atlantic Hydrographic Section via the Coastal Surveys Unit. Each was submitted under separate cover to request verification of horizontal control pertaining to this survey. The dates of these reports are:

May 4, 1992  
May 11, 1992  
July 27, 1992

The electronic control report pertaining to this survey has been submitted directly to Atlantic Hydrographic Section. Four updates to that report have since been forwarded. The dates of these updates are:

March 16, 1992  
April 2, 1992  
June 1, 1992  
June 26, 1992

AWOIS ITEM 1887  
RU-20-6-92, FE-376SS  
DIVE INVESTIGATION REPORT

DATE: 07 AUGUST 92 DOY: 220 TIME: 1302 UTC

PERSONNEL:

DIVEMASTER - LT SCHATTGEN  
COXSWAIN\TENDER- J. BRAWLEY

DIVERS- LT SCHATTGEN  
- ENS ILLG

VISIBILITY: 15 FEET

CURRENT: 1.0 KNOTS

MAXIMUM DEPTH: 70 FEET

BOTTOM TIME: 28 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: FIX 2006

EASTING: 176260.0

NORTHING: 266220.3

LATITUDE: 41° 23' 49.<sup>3</sup>81"N

LONGITUDE: 71° 01' 09.<sup>4</sup>53"W

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 18.3

TIME OF READING: 1302 UTC

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0

~~PREDICTED~~ TIDAL ZONE CORRECTOR: -0.<sup>1</sup>2 METERS

LEAST DEPTH DETERMINED @MLLW 18.<sup>2</sup>7 METERS

NARRATIVE REPORT: The object of this investigation was the wreck of the Vineyard Sound, Light ship. The vessel was identified by its bull nose, which had the anchor chain leading out of it and into the sediment. The divers thoroughly investigated the entire wreck and found the least depth to be on a vertical beam extending upward from the stern of the wreck. The depth around the wreck was 70 feet as measured by the divers depth gauge. The bottom consisted of coarse brown sand and broken shells.

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NOAA SHIP RUDE  
LEAST DEPTH DIVE OPERATIONS

DIVE # 1

Date <u>Aug 7 1992</u>		DN <u>220</u>	
AWOIS Item No.		Survey No.	
Pneumatic Depth Gauge			
0 - 21 M s/n 201637 12		<input checked="" type="checkbox"/> 0 - 42 M s/n 8606822	
Time of readings <u>1302</u>		Tide Corrector <u>. - 2</u>	
Reading No. 1 <u>18.35</u>		Corrected Least Depth by Pneumatic Gauge <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 20px;"> <u>18.1<sup>2</sup></u> </div>	
Reading No. 2 <u>18.35</u>			
Reading No. 3 <u>18.35</u>			
Average Reading <u>18.35</u>			
<u>18.3</u> Dive Buoy Position Information			
Range of D.P.'s <u>2006 - 2010</u>			
Fix No.	<u>2006</u>	<u>2007</u>	<u>2008</u>
Raw Depth	<u>16.8</u>	<u>18.6</u>	<u>19.7</u>
Corrected	<u>18.1</u>	<u>20.7</u>	<u>21.7</u>
D.P. Selected Least Depth <u>2006</u> <div style="float: right; text-align: right;"> <del>LEAST DEPTH (ROCK)</del>          HDOP 1.2          LEAST DEPTH WRECK       </div>			
Easting	<u>176289.0</u>	Lat <u>41 23 49.84<sup>3</sup></u>	
Northing	<u>266207.0</u>	Lon <u>71 01 09.53<sup>4</sup></u>	
Loran-C Position on Dive Buoy			
Chain	<u>14287.7</u>	<u>25586.4</u>	<u>43931.3</u>
SNR	<u>750</u>	<u>944</u>	<u>730</u>
Master	<u>864</u>		

REMARKS:



AWOIS ITEM 1886  
RU-20-6-92, FE-376SS  
DIVE INVESTIGATION REPORT

DATE: 07 AUGUST 92 DOY: 220

PERSONNEL:

DIVEMASTER- LT SCHATTGEN

DIVERS- LT SCHATTGEN

ENS ILLG

COXSWAIN- J. BRAWLEY

TENDER- ENS BRENNAN

VISIBILITY: 12 FEET

CURRENT: 1 KNOT

MAXIMUM DEPTH: 74 FEET

BOTTOM TIME: 11 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: FIX 1049

EASTING: 170222.7

NORTHING: 265981.8

LATITUDE: 41° 23' 42.7<sup>2</sup><sub>1</sub>"N

LONGITUDE: 71° 05' 29.47"W

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 18.1 METERS

TIME OF READING: 1445 UTC

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0

~~PREDICTED~~ TIDAL ZONE CORRECTOR: 0.2

LEAST DEPTH DETERMINED @MLLW 17.9 METERS

NARRATIVE REPORT: The object of this investigation was a boulder which raises approximately 4.3 meters off the bottom. The overall shape of the boulder resembled an egg with a diameter of 3 meters a point 2.5 meters from the bottom. This boulder was slit into two pieces of nearly equal size. The crack between the two halves was 3/4 of a meter wide at the top and tapered together at the bottom.

The bottom around the boulder was 22.5 meters deep, as measured by the divers depth gauge. The bottom around this boulder was coarse white sand with a few small boulders within divers limit of visibility.

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DIVE #2  
NOAA SHIP RUDE  
LEAST DEPTH DIVE OPERATIONS

Date <u>Aug. 7 1992</u>				DN <u>220</u>			
AWOIS Item No. <u>1886</u>				Survey No.			
Pneumatic Depth Gauge							
<input checked="" type="checkbox"/>		0 - 21 M s/n 201637 12			0 - 42 M s/n 8606822		
Time of readings <u>1845 (UTC)</u>				Tide Corrector <u>+.2</u>			
Reading No. 1		<u>18.1</u>		Corrected Least Depth by Pneumatic Gauge <div style="border: 1px solid black; padding: 10px; display: inline-block; margin-top: 10px;">17.9</div>			
Reading No. 2		<u>18.2</u>					
Reading No. 3		<u>18.1</u>					
Average Reading		<u>18.1</u>					
Dive Buoy Position Information							
Range of D.P.'s <u>1045 - 1050</u>				<del>Tide Correction</del>			
Fix No.	<u>1045</u>	<u>1046</u>	<u>1047</u>	<u>1048</u>	<u>1049</u>	<u>1050</u>	
Raw Depth	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>16.4</u>	<u>16.4</u>	
Corrected	<del>NSP</del> <u>RE</u>	<del>NSP</del> <u>R</u>	<del>NSP</del> <u>R</u>	<del>NSP</del> <u>R</u>	<u>18.5</u>	<del>18.7</del>	
D.P. Selected Least Depth <u>1049</u>				<del>USE</del> <div style="display: flex; justify-content: space-around;"> <span><u>R</u></span> <span><u>USE</u></span> <span><del>NSP</del> <u>R</u></span> </div>			
Easting <u>170222.7</u>				Lat <u>41°23:42.72</u>			
Northing <u>265981.8</u>				Lon <u>71°05:29.48</u>			
Loran-C Position on Dive Buoy							
Chain	<u>14316.5</u>	<u>25624.7</u>	<u>43936.9</u>	<u>60165.7</u>			
SNR	<u>725</u>	<u>940</u>	<u>750</u>	<u>251</u>			
Master	<u>840</u>						

REMARKS:

6  
AWOIS 1887 FE-376SS  
DIVE INVESTIGATION REPORT

DATE: 14 SEPTEMBER 92 DOY: 258

PERSONNEL:

DIVEMASTER - LT SCHATTGEN

DIVERS - LT SCHATTGEN

- ENS ILLG

COXSWAIN - A. STYRON

TENDER - ST WILLIAMS

VISIBILITY: 10 FEET

CURRENT: < 1/2 KNOT

MAXIMUM DEPTH: 76 FEET

BOTTOM TIME: 21 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: FIX 1186

EASTING: 265985.5

NORTHING: 170278.4

LATITUDE: 41° 23' 42.8<sup>4</sup>2" N

LONGITUDE: 71° 05' 27.07" W

TIME OF READING: 1721 UTC

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 17.90

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0

~~PREDICTED~~ TIDAL ZONE CORRECTOR: -0.3

LEAST DEPTH DETERMINED @MLLW: 17.6 METERS

NARRATIVE REPORT: The object of this investigation was a large boulder which rose 16 feet of the bottom and had a diameter of approximately 15 feet. The highest point on this boulder was on the south side with the top of the boulder sloping down to the north at a 45° angle. The bottom around this boulder was brown sand. There were four smaller boulders in the area around the object boulder. The shoalest of these neighboring boulders was 10 meters to the south and had a least depth of 68 feet as measured with the diver's depth gauge.

NOAA SHIP RUDE  
LEAST DEPTH DIVE OPERATIONS

DEVELOPMENT # 1

Date 14 SEPT 92		DN 258	
AWOIS Item No. 1886		Survey No. FE-376 SS	
Pneumatic Depth Gauge			
0 - 21 M s/n 201637 12		X   0 - 42 M s/n 8606822	
Time of readings 1721Z		Tide Corrector -0.4 -0.3	
Reading No. 1 17.9		Corrected Least Depth by Pneumatic Gauge <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <del>+7.5</del> 17.6         </div>	
Reading No. 2 17.9			
Reading No. 3 17.95			
Average Reading 17.9			
Dive Buoy Position Information			
Range of D.P.'s 1183 - 1188			
Fix No.	1183	1184	1185
Raw Depth	20.9	20.9	16.2
Corrected	22.9	23.0	18.4
	NSP	REJECT	NSP
			USE
			NSP
			NSP
D.P. Selected Least Depth 1186			
Easting	265985.5		Lat 041: 23: 42.87 <sup>4</sup>
Northing	170278.4		Lon 071: 05: 27.07
Loran-C Position on Dive Buoy			
Chain	60165.4	43936.9	14316.3
SNR	416	787	740
Master	838		

REMARKS:



AWOIS 1887 FE-376SS  
DIVE INVESTIGATION REPORT

DATE: 15 SEPTEMBER 92 DOY: 259

PERSONNEL:

DIVEMASTER - LT SCHATTGEN

DIVERS - LT SCHATTGEN

- ENS ILLG

COXSWAIN - A. STYRON

TENDER - ST WILLIAMS

VISIBILITY: 4 FEET

CURRENT: 1/2 KNOT

MAXIMUM DEPTH: 76 FEET

BOTTOM TIME: 10 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: FIX 1236

EASTING: 170318.6

NORTHING: 266332.0

LATITUDE: 41° 23' 54.0<sup>1</sup>5" N

LONGITUDE: 71° 05' 25.30" W

TIME OF READING: 1353 UTC

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 18.5

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0

~~PREDICTED~~ TIDAL ZONE CORRECTOR: ~~-1.0~~ -0.9

LEAST DEPTH DETERMINED @MLLW: 17.5<sup>6</sup> METERS

NARRATIVE REPORT: The object of this investigation was a large boulder lying on a brown sand bottom. The top of the rock was angular and the least depth was measured on the crest or peak of this boulder. The top of the boulder was at 60 feet and the bottom around the boulder was at 68 feet, as measured by the diver's depth gauges.

NOAA SHIP RUDE  
LEAST DEPTH DIVE OPERATIONS

DIVE #1 ~~AWT~~

Date: 15 SEPT. '92		DN 259				
AWOIS Item No. 1886		Survey No. FE-376 SS				
Pneumatic Depth Gauge						
0 - 21 M s/n 201637 12		X	0 - 42 M s/n 8606822			
Time of readings 1353Z		Tide Corrector - 1.0				
Reading No. 1 18.5		Corrected Least Depth by Pneumatic Gauge <div style="border: 1px solid black; padding: 5px; display: inline-block;">17.5<sup>6</sup>m.</div>				
Reading No. 2 18.5						
Reading No. 3 18.5						
Average Reading 18.5m.						
Dive Buoy Position Information						
Range of D.P.'s						
Fix No.	1231	1232	1233	1234	1235	1236
Raw Depth	16.6	16.5	16.6	16.4	16.6	16.3
Corrected	17.8R	18.0R	18.1R	17.9R	17.8R	17.7
<del>NSP Rejected</del> <del>NSP</del> <del>NSP</del> <del>NSP</del> <del>NSP</del> <del>NSP</del> <del>USE</del>						
D.P. Selected Least Depth 1236 (Pos. ONLY)						
Easting 170318.6			Lat 41:23:54.0 <sup>07</sup> 49			
Northing 266332.0			Lon 71:05:25.2 <sup>30</sup> 98			
Loran-C Position on Dive Buoy						
Chain	25624.6	14315.4	43938.1	60166.0		
SNR	942	791	808	470		
Master	888					

REMARKS:

CONTROL STATIONS as of 30 Oct 1992

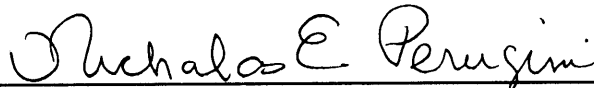
No	Type	Latitude	Longitude	H Cart	Freq	Vel	Code	MM/DD/YY	Station Name
<del>121</del>	F	<del>041:26:57.711</del>	<del>071:23:57.707</del>	<del>20</del>	<del>250</del>	<del>0.0</del>	<del>0.0</del>	<del>04/01/92</del>	<del>BEAVERTAIL LIGHT OFFSET, 1980</del>
<del>130</del>	F	<del>041:20:37.723</del>	<del>071:14:27.574</del>	<del>17</del>	<del>250</del>	<del>0.0</del>	<del>0.0</del>	<del>04/02/92</del>	<del>SAGHUEST, 1940</del>
131	F	041:27:40.811	071:10:19.818	19	250	0.0	0.0	2 04/02/92	WARREN RESET, 1934
132	F	041:24:52.193	070:56:58.452	10	250	0.0	0.0	6 06/17/92	CUTTYHUNK LIGHTHOUSE, 1961-1904
<del>133</del>	F	<del>041:30:26.413</del>	<del>071:05:17.106</del>	<del>18</del>	<del>250</del>	<del>0.0</del>	<del>0.0</del>	<del>4 08/10/92</del>	<del>WESTPORT LIGHT, 1934</del>
134	F	041:27:03.916	070:55:24.393	20	250	0.0	0.0	5 03/01/91	PENIKESSE, 1948
200	G	041:04:02.047	071:51:38.274	0	0	0.0	0.0	09/09/92	GPS MPRE, 1992
<del>201</del>	G	<del>043:04:15.064</del>	<del>070:42:36.005</del>	<del>0</del>	<del>0</del>	<del>0.0</del>	<del>0.0</del>	<del>09/20/92</del>	<del>GPS PORTSMOUTH, N.H. RD, 1992</del>

**APPENDIX VII. APPROVAL SHEET**

**LETTER OF APPROVAL**

**REGISTRY NO. FE-376SS**

Field operations contributing to the accomplishment of this survey were conducted under my supervision with frequent personal checks of progress and adequacy. This report and field sheets have been closely reviewed and are considered complete and adequate for charting.

A handwritten signature in cursive script, reading "Nicholas E. Perugini". The signature is written in dark ink and is positioned above a horizontal line.

Nicholas E. Perugini, LCDR NOAA  
Commanding Officer  
NOAA Ship RUDE





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Office of Ocean and Earth Sciences  
Rockville, Maryland 20852

# TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: November 24, 1992

MARINE CENTER: Atlantic

OPR: B660-RU-92

HYDROGRAPHIC SHEET: FE-376SS

LOCALITY: Massachusetts, Rhode Island Sound, 2.2 and 5.2  
Nautical Miles West of Sow and Pigs Reef

TIME PERIOD: August 5 - September 15, 1992

TIDE STATION USED: 845-0768 Sakonnet Yacht Club, Rhode Island  
Lat. 41° 27.9'N Lon. 71° 11.6'W

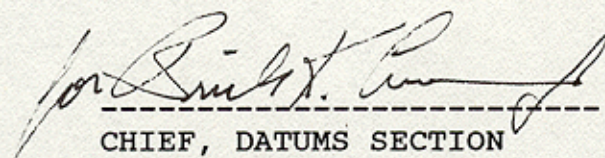
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 8.14 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.4 ft.

## REMARKS: RECOMMENDED ZONING

Apply a +10 minute time correction and a x0.90 range ratio to  
Sakonnet Yacht Club, Rhode Island (845-0768).

Note: Times are tabulated in Eastern Standard Time.

  
CHIEF, DATUMS SECTION



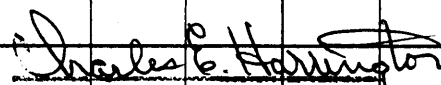


## GEOGRAPHIC NAMES

FE-376 SS

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
MASSACHUSETTS (title)									1
RHODE ISLAND SOUND (title)									2
SOW AND PIGS REEF (title)									3
									4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25

Approved:

  
Chief Geographer - N/CG 275

NOV - 4 1992

08/26/93

HYDROGRAPHIC SURVEY STATISTICS  
REGISTRY NUMBER: FE-376SS

NUMBER OF CONTROL STATIONS	4
NUMBER OF POSITIONS	247
NUMBER OF SOUNDINGS	659

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	57	/ /
VERIFICATION OF FIELD DATA	67	03/24/93
ELECTRONIC DATA PROCESSING	11	
QUALITY CONTROL CHECKS	11	
EVALUATION AND ANALYSIS	41	03/31/93
FINAL INSPECTION	8	08/24/93
TOTAL TIME	195	
ATLANTIC HYDROGRAPHIC SECTION APPROVAL		08/26/93

**COAST AND GEODETIC SURVEY  
ATLANTIC HYDROGRAPHIC SECTION  
EVALUATION REPORT**

SURVEY NO.: FE-376SS

FIELD NO.: RU-20-6-92

Massachusetts, Rhode Island Sound, 2.2 NM and 5.2 NM West of  
Sow and Pigs Reef

SURVEYED: 5 August through 15 September 1992

SCALE: 1:20,000

PROJECT NO.: OPR-B660-RU-92

SOUNDINGS: EG&G Model 260 Side Scan Sonar, Pneumatic Depth  
Gauge, and RAYTHEON DSF 6000N Fathometer

CONTROL: ASHTECH and MAGNAVOX (Differential Global Positioning  
Systems), MOTOROLA Falcon 484 Mini-Range  
(Range/Range)

Chief of Party.....N. E. Perugini

Surveyed by.....P. L. Schattgen  
.....J. A. Illg  
.....R. T. Brennan  
.....D. E. Williams

Automated Plots by.....XYNETICS 1201 Plotter (AHS)

**1. INTRODUCTION**

a. This is primarily a side scan sonar survey. A RAYTHEON DSF-6000N fathometer was operated concurrently with the side scan sonar. A pneumatic depth gauge was used to determine least depths during dive operations.

b. This survey is 1:20,000 scale, but all data are smooth plotted at the scale of 1:5,000 for survey clarity. Two 1:5,000 scale page size plots with accompanying overlays were generated during office processing.

c. No unusual problems were encountered during office processing.

d. Notes in the Descriptive Report were made in red ink during office processing.

**2. CONTROL AND SHORELINE**

a. Control is adequately discussed in Section H., I., and T. of the Descriptive Report.

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. The page size plots have been annotated with ticks showing the computed mean shift between the North American Datum of 1983 (NAD 83) and the North American Datum of 1927 (NAD 27).

To place the smooth plots on the NAD 27 move the projection lines 0.383 seconds (11.81 meters or 0.59 mm at the scale of 1:20,000 or 2.36 mm at the scale of 1:5,000) north in latitude and 1.859 seconds (43.19 meters or 2.16 mm at the scale of 1:20,000 or 8.64 mm at the a scale of 1:5,000) east in longitude.

b. There is no shoreline within the limits of the present survey.

### 3. HYDROGRAPHY

a. Where crossings occur in the areas investigated, there is adequate agreement.

b. The standard depth curve was drawn in its entirety.

c. The development of the bottom configuration and determination of least depths is considered adequate.

### 4. CONDITION OF SURVEY

The smooth plots and accompanying overlays, survey records, and reports adequately conform to the requirements of the HYDROGRAPHIC MANUAL, SIDE SCAN SONAR MANUAL, and FIELD PROCEDURES MANUAL.

### 5. JUNCTIONS

There are no junctional requirements for this survey.

### 6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-6445 (1939) 1:40,000

Prior survey H-6445 (1939) covers the present survey in its entirety. Depths from the prior survey show a general trend of being 0<sup>3</sup> meters (1 ft) shoaler than present survey soundings.

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

b. Wire Drag

FE-194 (1963) 1:20,000, 1:40,000, and 1:80,000  
H-3668aWD (1914-17) 1:30,000

Prior survey FE-194 (1963) is common only to the present survey investigation of AWOIS Item #1887. The AWOIS item is adequately discussed in section N., pages 16-17 of the Descriptive Report.

There are no conflicts between prior survey effective clearance depths and present survey soundings.

Prior survey H-3668aWD (1914-17) is common only to the present survey investigation of AWOIS Item #1886. The AWOIS item is adequately discussed in section N., pages 20-21 of the Descriptive Report.

There are no conflicts between prior survey effective clearance depths and present survey soundings.

7. COMPARISON WITH CHART 13218 (31<sup>st</sup> Edition, Jan. 11, 1992)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys and require no further consideration. An adequate chart comparison is discussed in section N. of the Descriptive Report.

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

b. Dangers to Navigation

There were no dangers to navigation submitted by the field unit. No dangers were noted during office processing.

8. COMPLIANCE WITH INSTRUCTIONS

This survey adequately complies with the Project Instructions.



9. ADDITIONAL FIELD WORK

This is a very good side scan sonar survey. No additional field work is recommended.

RUDE Processing Team  
Verification and Evaluation and Analysis

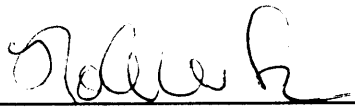
  
\_\_\_\_\_  
Douglas V. Mason  
Cartographic Technician

  
\_\_\_\_\_  
Maurice B. Hickson, III  
Cartographer

APPROVAL SHEET  
FE-376SS

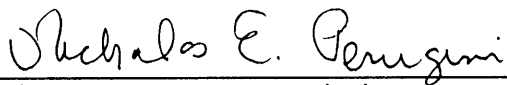
Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproof of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts of the survey have been made. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

  
\_\_\_\_\_  
N. A. Wike  
Cartographer  
Atlantic Hydrographic Section

Date: 8/24/93

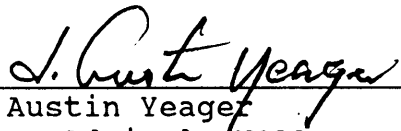
I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

  
\_\_\_\_\_  
Nicholas E. Perugini, LCDR, NOAA  
Chief, Atlantic Hydrographic Section

Date: 8/26/93

\*\*\*\*\*

Final Approval:

Approved:   
\_\_\_\_\_  
J Austin Yeager  
Rear Admiral, NOAA  
Director, Coast and Geodetic Survey

Date: 7/18/94

71° 06' 00"

71° 05' 45"

71° 05' 30"

71° 05' 15"

71° 05' 00"

71° 05' 00"

NAD 27

XYNETICS 1201

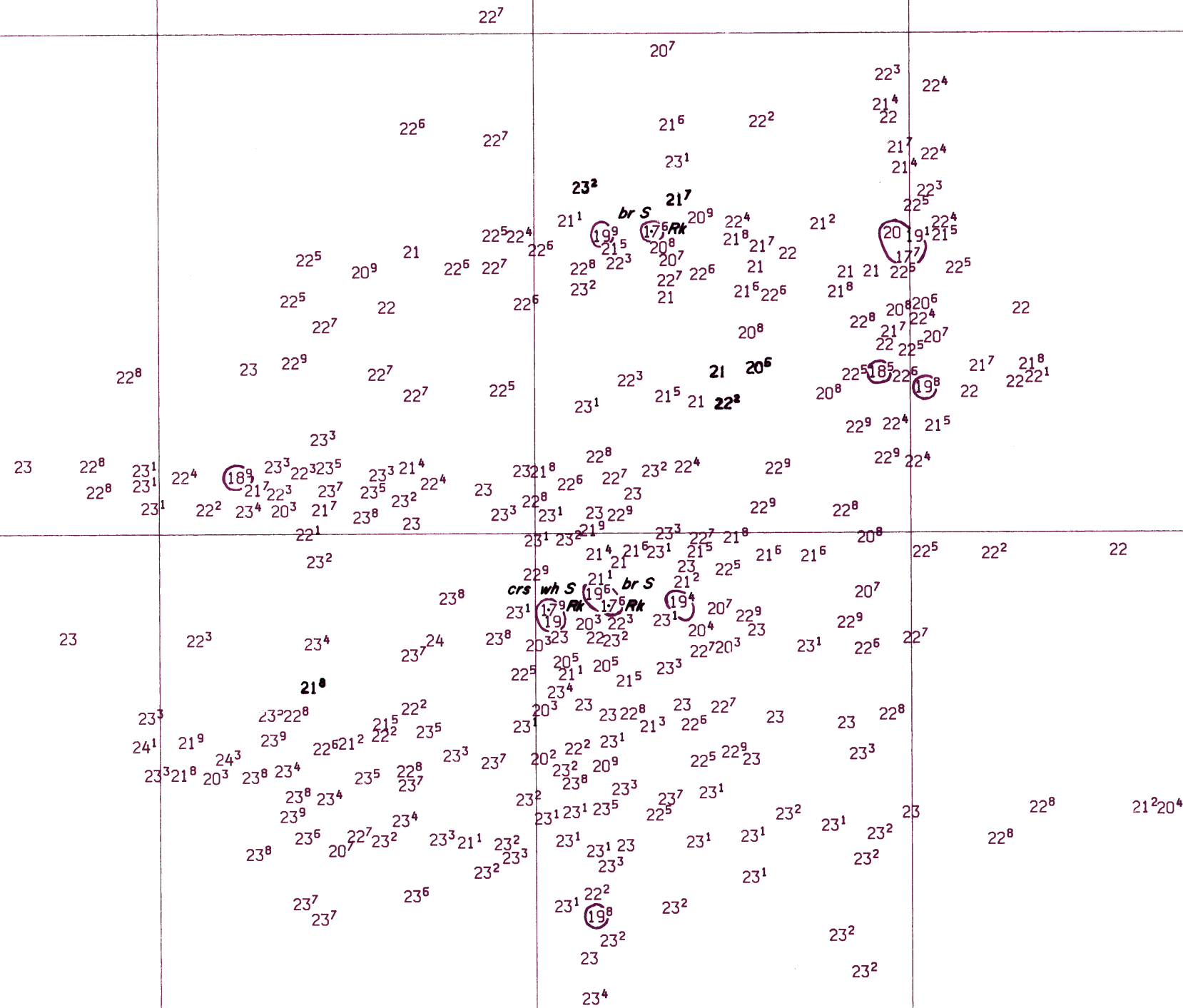
✓ 3/25/93 MBH

41° 24' 00"

41° 24' 00"

41° 23' 45"

41° 23' 30"



FE-376SS  
MASSACHUSETTS  
RHODE ISLAND SOUND  
5.2 NM WEST OF SOW AND PIGS REEF  
DATE OF SURVEY: 05 AUG 1992 TO 15 SEP 1992  
SCALE: 1:5000  
SOUNDINGS IN METERS AT MLLW  
HORIZONTAL DATUM: NAD 1983  
SHEET 1 OF 2  
A0015 ITEM NUMBER 1886



71° 01' 00"

41° 24' 00"

A scatter plot showing data points with various numerical labels. The points are distributed across the plot area, with some labels appearing multiple times. A specific point is circled and labeled with a circled '182'.

Labels visible on the plot include:

- $20^7$
- $20^9$
- $20^8$
- $20^9$
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- $20^9$
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- $20^9$
- $20^8$
- $20^9$
- $20^8$
- $20^6$
- $20^8$
- $21$
- $21^1$
- $21^2$
- $21^3$
- $21^4$
- $21^5$
- $21^6$
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- $21^{95}$
- $21^{96}$
- $21^{97}$
- $21^{98}$
- $21^{99}$
- $21^{100}$

The circled point is labeled  $182$ .

Text labels on the plot include:

- crs br S brk Sh*
- WK "VINEYARD SOUND LIGHTSHIP"*

41° 23' 45"

 $21^3$ 

71° 01' 00"

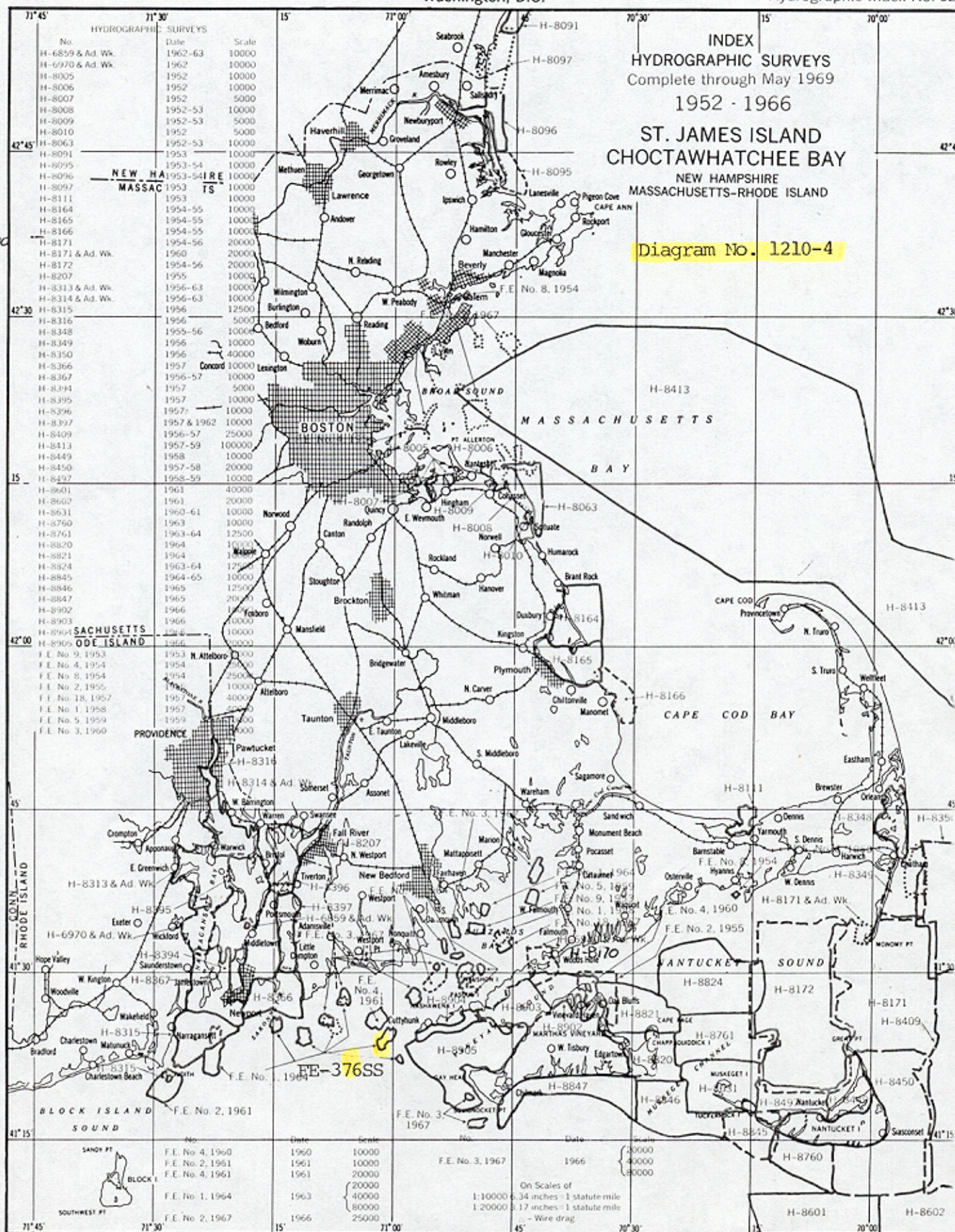
NAD 27 41° 23' 30" 41° 23' 30"  
XYNETICS 1201  
✓3/25/93 MBH

FE-376SS  
MASSACHUSETTS  
RHODE ISLAND SOUND  
2.2 NM WEST OF SOW AND PIGS REEF  
DATE OF SURVEY: 06 AUG 1992 TO 02 SEP 1992  
SCALE: 1:5000  
SOUNDINGS IN METERS AT MLLW  
HORIZONTAL DATUM: NAD 1983  
SHEET 2 OF 2  
AWOIS ITEM NUMBER 1887



DEPARTMENT OF COMMERCE  
Environmental Science Services Administration  
U.S. Coast and Geodetic Survey  
Washington, D.C.

Hydrographic Index No. 62





FE-376SS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. \_\_\_\_\_

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.

[illegible]