FE368

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-10-7-91

Registry No. FE-368SS

LOCALITY

State ..... Rhode Island

General Locality ..... Narragansett Bay

Sublocality ..... Lower East & West Passages

1991-92

CHIEF OF PARTY
LCDR N.E. Perugini

LIBRARY & ARCHIVES

DATE ..... December 20, 1993

☆U.S. GOV. PRINTING OFFICE: 1987—756-980

FE368

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO.

FE-368SS

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-10-7-91

State Rhode Island

General locality Narragansett Bay

Locality Lower East and West Passages

Scale 1:10,000 Date of survey Sept 27 to ~~Nov 20, 1991~~ Nov 16, 1992

Instructions dated March 11, 1991 Project No. OPR-B660 - RU-91

Vessel NOAA Ship RUDE (9040)

Chief of party LCDR Nicholas E. Perugini

Surveyed by N. E. Perugini, P.L. Schattgen, M.J. Oberlies, J.A. Illg
D.E. Williams

Soundings taken by echo sounder, [illegible] Pneumatic depth gage

Graphic record scaled by NEP, PLS, MJO, JAI, DEW

Graphic record checked by NEP, PLS, MJO, JAI, DEW

Protracted by NA Automated plot by ~~NA~~ XYNETICS 1201 PLOTTER (AHS)

Verification by ~~NA~~ ATLANTIC HYDROGRAPHIC SECTION (AHS)

Soundings in meters at [illegible] MLLW

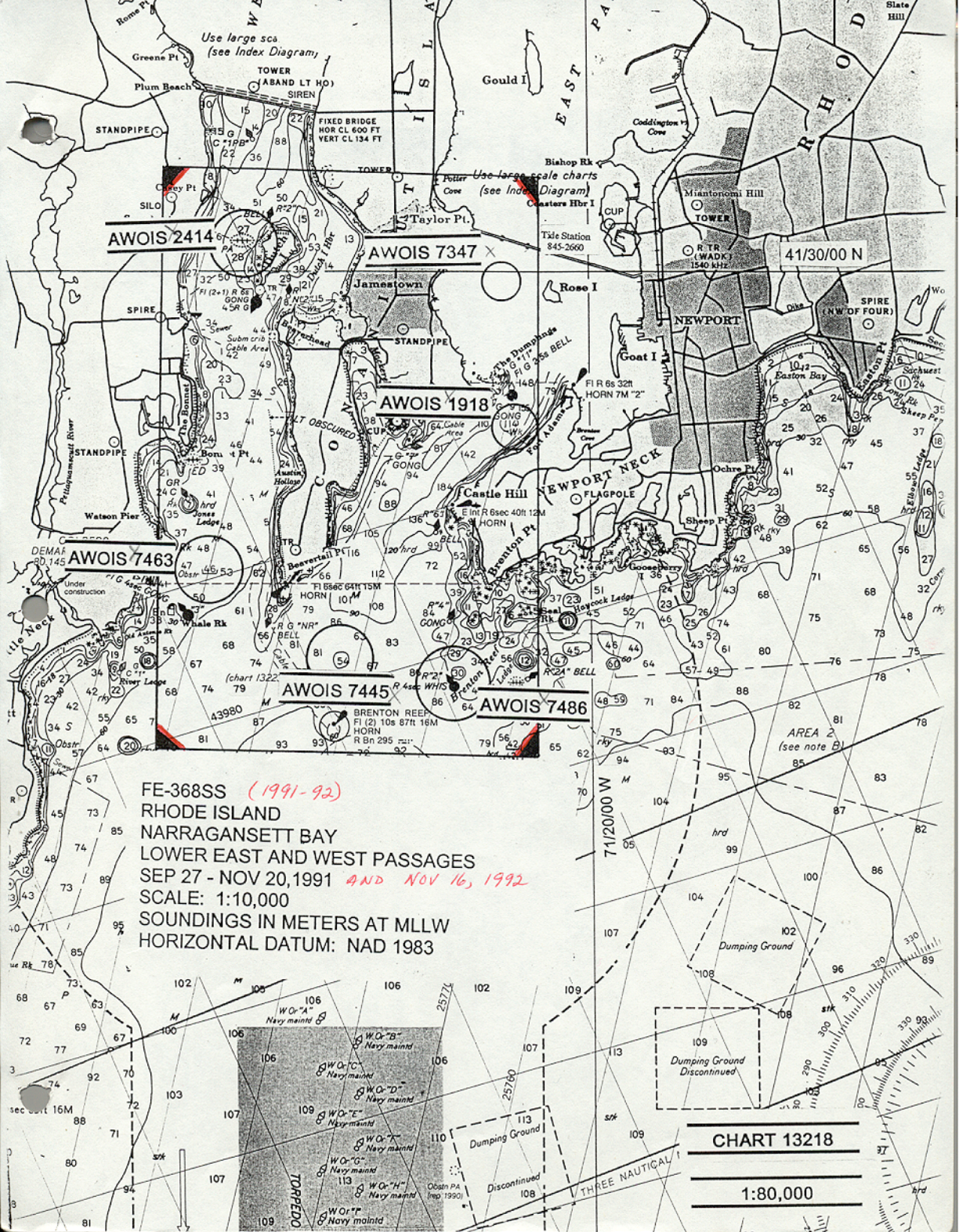
REMARKS: All times recorded in UTC

NOTES IN THE DESCRIPTIVE REPORT WERE MADE IN RED DURING OFFICE PROCESSING.

AWOIS/SURF 2/22/94 MCR

KWW 3/16/94

U.S. GOVERNMENT PRINTING OFFICE: 1986 - 652-007/41215



FE-368SS (1991-92)
RHODE ISLAND
NARRAGANSETT BAY
LOWER EAST AND WEST PASSAGES
SEP 27 - NOV 20, 1991 AND NOV 16, 1992
SCALE: 1:10,000
SOUNDINGS IN METERS AT MLLW
HORIZONTAL DATUM: NAD 1983

TABLE OF CONTENTS

A. PROJECT

A.1 This survey was conducted in accordance with Hydrographic Project Instructions OPR-B660-RU-91, Southern New England Coast, Connecticut and New York.

A.2 The original date of the instructions is March 11, 1991.

A.3 The following changes to the original instructions are relevant to this survey:

Change # 1	August 8, 1991
Change # 2	September 3, 1991

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

A.5 Project OPR-B660-RU-91 responds to requests from the Northeast Marine Pilots, Inc., of Newport, Rhode Island to disprove or verify and provide least depths for certain wrecks and obstructions in Long Island, Block Island, and Rhode Island Sounds. Also, the U.S. Navy, as well as state and local governments have requested updated bathymetric and hydrographic survey data of this area for use in proposed studies and in the construction of new charts.

B. AREA SURVEYED

B.1 This survey encompasses items located in the lower East and West passages of Narragansett Bay. One other item included in this survey, referred to as Development No. 1, was discovered during reconnaissance hydrography in Rhode Island Sound (survey D-111).

Primary traffic in the area includes tugs and deep draft ships transiting to Providence RI and other points in the Northern Bay. Small pleasure craft transit the area as well.

B.2 The items extend from latitude 41° 26.0' to 41° 30.3' North and from longitude 071° 21.0' to 071° 25.3' West. Development 1 is located at latitude 41° 19' 19.20" N, longitude 071° 12' 16.58" W.

B.3 Data acquisition began on September 27, 1991 (DOY 270) and concluded on November 20, 1991 (DOY 324). ADDITIONAL WORK WAS COMPLETED ON NOVEMBER 16, 1992.

C. SURVEY VESSELS

C.1 The following vessels were used during this survey:

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

C.2 Side scan operations on AWOIS item 2414 in the West passage utilized the "bow tow" aboard the RUDE. All other side scan operations towed the fish from the stern.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

Program	Version	Dates Used
SURVEY	6.03	September 27 - November 20
DAS_SURV	6.04	September 27 - November 20
POSTSUR	5.14	September 27 - November 20

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 nonstandard automated acquisition or processing methods were used during this survey.

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 a Model 272-T (single frequency) towfish. All side scan operations were conducted from the RUDE (vessel # 9040). The following list shows equipment serial numbers and corresponding dates used:

Equipment Type	Serial Number	DOY Used
Recorder	0012105	270 - 275
Recorder	0011443	283 - 324
Towfish	0011908 (Single Freq)	270 - 324

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 for all main scheme side scan coverage, except AWOIS item 2414 (bow tow) utilized the 75 meter range scale for its main scheme.

The Differential Global Positioning System (DGPS) was used as the primary positioning system for a majority of this survey. Section 7.3.2.1 of the Field Procedures Manual specifies that side scan sonar line spacing be computed as a function of Error Circle Radius (ECR). Because the ECR has no relevance to DGPS positions and no other specific guidance was offered in Change #2 to the project instructions, a different specification was invoked.

RUDE used a swath overlap of 2 mm at the scale of the survey (20 meters) as the minimum overlap requirement. This specification was taken from an older version of the FPM and has more relevance to DGPS positioning data. In order to meet or exceed this specification, a basic line spacing of 170 meters was used for the 100 meter range scale, and 130 meters for the 75 meter range scale (AWOIS 2414). This provided for a 3 mm (30 meter) swath overlap on all items except AWOIS 2414 (20 meter overlap).

For positioning controlled by Falcon, the current FPM line spacing specification was utilized:

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

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

The predicted ECR did not exceed 10 meters for any of the search areas, yielding a maximum line spacing of 180 meters for the 100

meter range and 130 meters for the 75 meter range. So a conservative spacing of 170 meters was used for all main scheme coverage (except AWOIS 2414) when Falcon was the primary positioning system.

b) Daily confidence checks were obtained by towing the fish past previously located contacts or noting recognizable bottom characteristics at the edges of the sonar record.

c) Refer to the individual AWOIS investigation procedures (section N) for required and actual side scan coverage.

d) No other factors affected side scan operations or quality of sonar records.

e) The towfish was deployed from the stern for all items except AWOIS 2414 on which the "bow tow" was utilized.

E.5 Refer to the individual AWOIS discussions in section N for contact investigation procedures.

E.6 Contact selection for development required no analysis because of the limited number of side scan contacts, and the fact that 3 of the 4 items investigated (with side scan sonar) were found. Early development was achieved using the 50 and 75 meter range scales.

Overlap was checked on-line using the real-time plot and the edited swath plot for holidays. All holidays were filled in by running additional side scan sonar lines.

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 A106N.

F.2 All diver-determined least depths were measured with a pneumatic depth gauge. RUDE is equipped with two 3-D Instruments Inc. Precision Direct Drive Depth Gauges:

1) 0- 70 fsw (feet salt water)	S/N 142697
2) 0-140 fsw	S/N 8606822

The 0-70 fsw gauge was used in water depths less than 20 meters (approx. 70 feet), and the 0-140 fsw gauge was used when the water depth exceeded 20 meters.

F.3 Refer to section G.4 for information on pneumatic depth gauge system checks.

F.4 Both the high (100 kHz) and the low (24 kHz) frequency sounding data were recorded during data acquisition. Only high frequency soundings were selected for plotting.

G. CORRECTIONS TO SOUNDINGS

G.1 a) The velocity of sound through water was determined using a Digibar Sound Velocity Probe (S/N 169), made by Odom. Data Quality Assurance Tests were conducted before each velocity cast to ensure the meter was within tolerance.

All data were processed using Velocity 1.11 software. The computed velocity correctors were entered into the HDAPS sound velocity tables and applied on-line to both high and low frequency soundings. Sound velocity correctors were obtained on the following dates:

Cast Number	DOY	Latitude	Longitude	HDAPS Table #	Applied to Days
15	276	41° 23.4' N	71° 23.6' W	15	270
16	281	41° 29.0' N	71° 21.0' W	16	275-291
17	294	41° 22.7' N	71° 19.1' W	17	296
19	322	41° 25.8' N	71° 24.3' W	19	319-324
18	308	41° 22.4' N	71° 19.9' W	18	309-310

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

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

d) Two dual lead line comparisons with the DSF-6000N were made:

April 25, 1991 at 41° 35.6'N 71° 21.3'W (25 ft depths)
July 22, 1991 at 41° 20.9'N 71° 29.1'W (35 ft depths)

The greatest variation between leadline and DSF soundings was less than 0.2 meters for both comparisons. Considering the ship's motion and the scope in the leadline from current, this is excellent agreement and provides an adequate check that the echosounder was functioning properly. Also, comparisons between diver determined least depth by pneumatic depth gauge and DSF soundings over particular items (with prominent features) were normally within 0.5 meters after reduction. Therefore, correctors from direct comparison were determined to be zero.

e) All sounding correctors were applied to both the narrow (100 kHz) and wide (24 kHz) 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), and checked periodically during this survey for agreement. 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. Both runs were averaged and applied to soundings through the HDAPS offset table.

However, the actual corrector values derived from these data were computed incorrectly and consequently used for this survey. This problem was resolved by using the HDAPS program "REAPPLY". See section G.2 for an explanation of this situation.

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 The HDAPS program "REAPPLY" was used to reapply corrector tables to soundings. An evaluation of the most appropriate tables for each day's data was made, and compared to the tables actually used. New tables were then applied to those days which differed.

As stated in section G.1.g, settlement and squat values were computed incorrectly and used in the HDAPS offset table during this survey. The "REAPPLY" program was used to correct this problem. Offset table #3 was changed to show the adjusted settlement and squat correctors, and then the table was reapplied to all soundings acquired during this survey.

G.3 As stated in G.2, corrector tables were reapplied to soundings during processing, so that the most relevant correctors were applied to plotted soundings. The corrected offset table #3 was reapplied to all soundings.

G.4 The ship's shallow water (0-70 fsw - feet sea water) and deep water (0-140 fsw) pneumatic depth gauges were calibrated by Instruments East, Inc. of Norfolk, VA on January 31, 1991. Corrector data from the calibrations were plotted graphically, but were not applied to pneumatic depths because they were less than 0.1 meters (see plots in SEPARATE IV). DATA FILED WITH FIELD RECORDS.

Periodic system checks were performed on the gauges as illustrated HSG 55. Rarely did the gauges check when substantial currents were present. Since currents in the survey area were fairly strong and seemingly constant, it became practice to perform system checks on the gauges during times of ideal conditions. Therefore, days of use do not correspond to days on which the checks were performed.

In late October, the ship's 0-70 fsw gauge (S/N 142697) was damaged. Both gauges were sent back to Instruments East Inc. in Norfolk; the 0-70 fsw for repairs and the 0-140 fsw for a

critical system check. The shallow water gauge was found beyond repair, and therefore not used during the remainder of the survey. The 0-140 fsw gauge (S/N 8606822) tested within 0.25 of one percent of the full-face reading (0.35 feet), meeting the accuracy requirement prescribed in HSG 55. This gauge was recalibrated after testing.

Five dives were made during this survey: least depth determinations were made with the 0-70 fsw gauge (S/N 142697) for the three conducted on DOY 296, and the 0-140 fsw gauge (S/N 8606822) for dives conducted on DOY 310 and 324. According to the FPM the 0-140 fsw gauge should be used only in water depths greater than 20 meters. Because the 0-70 fsw gauge was not functioning, the 0-140 fsw gauge measured least depths for dives on DOY 310 and 324.

Overall agreement between the pneumatic depth gauges, diver console depth gauge, and echosounder least depths was excellent, generally less than 0.3 meters. Considering this agreement and the closing critical check on the 0-140 fsw gauge, the RUDE is confident that all least depths determined by pneumatic depth gauge are correct.

G.5 Generally, sea conditions greater than one meter affected the fathogram, creating a trace of constant peaks and deeps. But the 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 Newport tides was provided on floppy magnetic disk before the start of the project, and input into the HDAPS tide tables for application to soundings. * APPROVED TIDES AND ZONING HAVE BEEN APPLIED DURING OFFICE PROCESSING.

b) Since the survey area was located near the Newport tide gauge, no height and time corrections were applied to the (Newport) digital tide data. Therefore, predicted tide values are consistent with the uncorrected data from station # 1157 found in Table 2 of the East Coast of North and South America Tide Predictions. These correctors were applied on-line through HDAPS tide tables 9, 10, and 11.

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

A request for smooth tides was mailed on December 6, 1991. * DEC 8, 1992.

Copies of all data sheets, tables, calibrations, etc., referred to in this section are provided in APPENDIX V. DATA FILED WITH FIELD RECORDS.

H. CONTROL STATIONS SEE ALSO SECTION 2.a. 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. DATA APPENDED TO THIS REPORT.

H.3 Newly established horizontal control stations were surveyed using standard NGS approved surveying techniques; primarily the Geodetic Direct and Resection procedures. These data were then entered into the NGS software "MTEN", which computed the Latitude and Longitude of the new station using the NAD 83 ellipsoid.

Existing stations were verified by comparing observed horizontal angles and distances (to known stations) with angles and distances provided by inverse computations using "MTEN".

All horizontal control stations used during this survey are Third-order, Class I.

H.4 All horizontal control work was conducted within the "Providence" NGS Quadrant.

H.5 Refer to the Horizontal Control Report (submitted to N/CG 233 under separate cover) for specific procedures and sites surveyed by the RUDE.

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

I. HYDROGRAPHIC POSITION CONTROL

SEE ALSO SECTION 2.a. OF THE EVALUATION REPORT.

I.1 Two systems were used for vessel positioning during the survey: Falcon Mini-Ranger, and the Differential Global Positioning System (DGPS). A detailed discussion of DGPS navigation is contained in Section I.4. The operating dates of the systems are as follows:

DOY	HDAPS SHEET	AWOIS NUMBER	DGPS* POSITIONS	FALCON POSITIONS
270	71	7445	Entire Day	-
275	73	7347	Entire Day	-
283	72	1918	Entire Day	-
284	74	7486	Entire Day	-
288	74	7486	4093-4150	4151-4181
291	76	2414	Entire Day	-
296	74	7486	Entire Day	-
309	67	none	-	Entire Day
310	67	none	-	Entire Day
319	75	7463	5001-5049	5050-5086
322	75	7463	-	Entire Day
324	75	7463	-	Entire Day

* DGPS acquisition with 2-3 Falcon LOP check

I.2 Accuracy requirements were met when either positioning system was primary, as specified by the Hydrographic Manual, Field Procedures Manual (FPM), and change # 2 to the project instructions regarding DGPS.

I.3 Control Equipment:

Mini-Ranger:
Falcon 484 by Motorola Inc.
Serial Numbers:

RPU	F-0246	
R/T	F-3409	
R/S:	E-2926	(code 8)
	E-2969	(code 6)
	F-3241	(code 4)
	F-3297	(code 2)
	E-2907	(code 3)
	F-3244	(code 5)

GPS:
Both by Magnovox: MX 4200D Differential GPS Receiver
S/N 199
MX 50R DGPS Receiver (correctors)
S/N 036

I.4 Calibration descriptions for each of the two positioning systems follow:

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 (when Falcon was primary), and all other positioning criteria were met as required (see section I.2).

A pre-project baseline calibration of the Mini-Ranger system was conducted at the Atlantic Marine Center on March 6, 1991. Two baseline calibrations were conducted in Bristol, RI on June 2 and July 14, 1991 and one in Newport, RI on October 19, 1991. See the Electronic Control Report submitted under separate cover for data records of the calibrations. DATA FILED WITH FIELD RECORDS.

GPS

As stated in section 6.2 of the Project Instructions (change No. 2 dated 3 September 1991), "Differential GPS ... can be used for this project as the Primary positioning system" with the following 1:10,000-scale accuracy requirements:

1. As a DGPS system check, at least one Falcon range is to be recorded twice daily in a static mode, and must agree within 5 meters of the DGPS position.
2. During data acquisition, at least one Falcon range must be recorded and the computed residual must be less than 10 meters.
3. Survey operations may not be conducted when the HDOP exceeds 3.0.
4. Four satellites must be used for the DGPS position computation.

As DGPS was relatively new (during this survey) as the primary positioning system, extreme care was taken by the RUDE to insure the above requirements were met. The following are some observations on the acquisition procedures and actual performance of the DGPS system:

1. The HDAPS survey acquisition program (DAS_SURV) was modified so that the HDOP was recorded and printed out with every selected sounding. Also, an extra line was added to the header information preceding each survey line, stating that DGPS is the primary positioning system. This information is found on the raw data printout.

2. One to three Falcon ranges were recorded simultaneously with all data collected when DGPS was the primary

positioning system. The maximum residual of these ranges was recorded on the raw data printout (as well as electronically), and scanned off-line for residuals greater than 10 meters. Normally, the maximum residual was below 5 meters and never consistently exceeded 10 meters.

3. Survey operations were suspended when the HDOP value consistently exceeded 3.0. Generally, whenever this value exceeded 2.5, the position would begin to deteriorate. High HDOP values were not a significant positioning problem, as the duration was relatively short (several seconds) and the condition would correct itself.

4. Whenever less than four satellites were being tracked by the DGPS unit, the HDOP would normally rise above 3.0, the residuals would climb, and the position would generally degrade. Generally, 5 to 6 satellites were visible and the same number were used in the position solution. Rarely were there too few satellites to survey.

5. Overall, it was obvious when the DGPS position was in error, because any (usually several) of the following conditions would occur: the position would jump, the HDOP would climb, the residuals would climb, the number of satellites would drop below four, or the DGPS system would switch from "NAV" (navigating) to "TRK" (tracking). However, these conditions were not overly common, and rarely did a positioning problem with this system cause substantial "downtime". Whenever poor DGPS positioning was persistent, the Falcon system was selected as primary or operations were suspended until the DGPS system was operational.

See SEPARATE III for all positioning calibration data. DATA FILED WITH FIELD RECORDS.

I.5 Only 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 Computed-Observed (C-O) table. These tables 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.

Problems were encountered in the application of correctors to raw Falcon ranges when the C-O table was not updated after DOY 292 (the fourth baseline calibration). When Falcon was the primary positioning system prior to DOY 292 (DOY 288), positions were accurate.

Data were acquired during operations on AWOIS items 7486, 7463, and Development 1 using the incorrect C-O table. However:

- AWOIS 7486 used DGPS as the primary navigation system,
- AWOIS 7463 was located and the least depth position was recomputed, and
- Development 1 was located and the least depth position was recomputed.

The following table illustrates the problem data:

AWOIS #	DOY	Codes with Incorrect Correctors	Primary Navigation System	Remarks
7486	296	4,6,8	DGPS	no effect on positioning
DEV 1	309	2,4,8	Falcon	positioning in error - echosounder development over the located item
	310	2,4,8	Falcon	positioning in error - diver investigation and least depth DP position recomputed
7463	319	3,4,8,6	Both	Falcon positions in error - side scan sonar operations. Item found (positions not recomputed)
	322	3,4,7,8	Falcon	positioning in error - side scan sonar operations. Item found (positions not recomputed)
	324	4,5,8	Falcon	positioning in error - diver investigation and least depth DP position recomputed

Positioning was not effected by erroneous correctors when DGPS was primary, since the Falcon ranges were used solely for comparison. Therefore, only DOY's 309-324 were effected by incorrect C-O values.

AWOIS item 7463 (sheet 75) and Development 1 (sheet 67) were both located and investigated by divers. Detached positions (DP) were obtained using the Falcon system (with erroneous correctors), and were therefore in error. To resolve this problem, the final

positions for these two items were recomputed using the HDAPS utility "Point Recomputation", which allows the user to change the corrector values for the individual Falcon ranges used in the position solution. The position numbers and magnitude of change follow:

	Position #	Delta Position
AWOIS 7463	5121	3.5 meters
Development 1	741	1.1 meters

Since both items are "point" features and the position differences are less than 5 meters, only the final DP's of the items were recomputed. Refer to section N for final least depth and position data.

I.6 a) See section I.4 for DGPS operating procedures and adequacy standards.

b) There were no occurrences of equipment malfunctions or substandard operation.

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

d) There were no occurrences of weak signals or poor geometric configurations of a duration to significantly compromise data quality.

e) Refer to section I.5 for an explanation of problems encountered due to incorrect C-O table values.

f) Antenna positions were corrected for offset and layback, and referenced to the position of the DSF 6000N transducer. These correctors were entered in the HDAPS Offset table, and applied on-line to the positioning algorithm. Refer to SEPARATE III for a copy of offset table 3, which was the only table used during this survey. DATA FILED WITH FIELD RECORDS.

g) Offset and layback distances for the A-frame (tow point) were entered 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 offset table number 3. DATA FILED WITH FIELD RECORDS.

J. **SHORELINE** SEE SECTION 2.b. OF THE EVALUATION REPORT.

No field sheets encompassed any shoreline.

K. **CROSSLINES** SEE ALSO SECTION 3.a. OF THE EVALUATION REPORT

K.1 The percentage of cross-lines to main scheme lines varies between each AWOIS investigation. An overall computation of this percentage was not made.

K.2 Sounding methods utilized during this survey (ie. echosounder development with small line spacing) did not provide contrast between mainsheme and crosslines for comparison. Rather, plots were examined for discrepancies between adjacent soundings. No unaccountable differences were noted.

K.3 No significant differences between mainscheme and crosslines were noted.

K.4 The same sounding equipment was used to run both the mainscheme and crosslines.

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

This survey does not junction with any current surveys.

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

M.1 The following prior surveys are applicable to this survey:

Survey Registry #	Date	Scale			
H-8367	1956-57	1:10,000	H-4006WD	1917	1:20,000
H-8315	1956	1:12,500			
H-6444	1939	1:40,000			

M.2 AWOIS investigation information can be found in section N.

M.3 Two overlays generated for prior survey and chart comparison can be found with the sheets submitted with this survey: the first at 1:10,000 (for H-8367 and H-8315) on which soundings from all AWOIS items except 7486 were plotted. The second at 1:20,000 (for chart 13223) with soundings from AWOIS 7486. These overlays were the primary tool utilized for prior survey and chart comparison.

The quality of agreement across the entire survey area varies substantially between different AWOIS items in the different areas of the bay. Due to the limited number of soundings in each (relatively small) area, a thorough comparison was not possible. General comparisons from each AWOIS item are shown below:

AWOIS 7445: (HDAPS Sheet 71) (1956)
Comparison to prior survey (H-8315) showed soundings within 1 meter (3 feet), and normally within 0.5 meters (1-2 feet), although the rapidly changing slope of the bottom and concentration of soundings from this survey made the comparison difficult. CONCUR

AWOIS 1918: (HDAPS Sheet 72)
The 1:10,000 scale overlay showed ~~rather large differences~~ GENERAL AGREEMENT with survey H-8367 (1956-57), ~~soundings from this survey as much as 3 meters (10 feet) deeper, particularly near the shoreline.~~ * DEPTHS BEING 1 TO 2 FT. (0^3 TO 0^6 m) SHOALER THAN PRESENT SURVEY SOUNDINGS.

AWOIS 7347: (HDAPS Sheet 73)
The 1:10,000 scale overlay showed substantial differences with survey H-8367 (1956-57), soundings from ~~this~~ survey as much as 2 meters (6 feet) deeper. CONCUR PRESENT

AWOIS 7486: (HDAPS Sheet 74) * PRIOR SURVEYS H-8367 (1956-57) AND H-8315 (1956)
~~The 1:20,000 scale overlay on chart 13223~~ showed a general agreement with ~~charted~~ PRESENT SURVEY depths, within 1 meter (3 feet). Of the three peaks identified during this survey, only the northern most (30 feet) is charted.

AWOIS 7463: (HDAPS Sheet 75)
The 1:10,000 scale overlay showed excellent agreement with soundings from survey H-8367 (1956-57) generally within 0.6 meters (1 foot) and never exceeding 1 meter (3 feet). CONCUR

AWOIS 2414: (HDAPS Sheet 76)
The 1:10,000 scale overlay showed varying differences with survey H-8367 (1976-77): within 1 meter (3 feet) toward the center of the channel and increasing to 2-3 meters (6-9 feet) deeper approaching the shoreline of Dutch Island. CONCUR

Development 1: (HDAPS Sheet 67)
~~A comparison to prior survey or charted depths was not made for this survey. Refer to survey D-111 (1991) for comparison in this area.~~ ONE DEPTH WAS COMPARED FROM PRIOR SURVEY H-6444 (1939) THIS DEPTH AGREED WITHIN ONE FOOT (0.3m).

M.4 Soundings acquired during this survey are generally deeper than depths from prior surveys and chart 13223. Again, the limited number of soundings and small areas did not facilitate a thorough evaluation of trends. However, the greatest differences seem to be near the shoreline, where the bottom rises sharply. After the application of approved tides, the magnitude of some discrepancies may be reduced.

M.5 Refer to section N for discussions on significant features investigated as AWOIS items. No other individual features were disproved during this survey.

~~**M.6** Refer to section N for discussions on significant features investigated as AWOIS items. No other individual features were investigated during this survey.~~

M.6 The RUDE is aware of no authoritative non-NOS surveys of the area covered during this survey.

N. COMPARISON WITH THE CHART SEE ALSO SECTION 7.a. OF THE EVALUATION REPORT.

Each AWOIS item is addressed separately. This project consists of seven items:

AWOIS 7445
1918
7347
7486
7463 were located.

AWOIS 2414 was disproved.

A large boulder discovered during survey D-111 is included in this survey as well, titled "Development 1".

Refer to section M.3 for comparisons with prior survey and charted depths (sections N.11 and N.12).

AWOIS 7445 Plot 1 of 7 Sheet 71

N.1 Item Description
A Charted Shoal to 54 ft. (16.5m)
An obstruction (shoal) approximately 40 to 50 feet below the water surface.

N.2 Item Location

Geographic position provided was: 41° 26' 14.76" N
71° 23' 13.19" W

N.3 Source of Item

Survey H-8315 (1956) first reported this item as a 54 foot sounding. In 1960, a skin diver reported a submerged tower made of quarried blocks located on the charted shoal.

N.4 Largest Scale Chart Affected

Chart 13223, scale 1:20,000, 31st edition, dated June 23, 1990.

N.5 Investigation Procedures

Survey requirements called for 200% side scan sonar coverage about a 100 meter search radius, echosounder development, and diver investigation. Side scan sonar was not used to investigate this item because of its large size and distorted contrast with the surrounding bottom. The area was developed by echosounder using 10 meter line spacing.

N.6 Investigation Results

The shoal was extensively developed using the DSF 6000N echosounder. This development showed a shoal with an approximate orientation of Northeast (045° True), and length of 75 meters. A

least depth was determined from this development, and is shown below. No diver investigation of this item was conducted since a unique least depth was not discernable on the ridge.

Least depth information for the item is as follows:

FIX NUMBER-	47.4
LATITUDE-	41° 26' 11.~~58~~ .60" N
LONGITUDE-	71° 23' 15.06" W
LEAST DEPTH (MLLW)-	16.~~5~~ 6 meters (54 feet)

N.7 Explanation for Position Difference

The listed position of the sounding is approximately 110 meters Northeast of the new position shown above. The positioning used during survey H-8315 was probably less accurate than the current system, or the individual sounding may have been on a different area of the shoal.

N.8 Least Depth Information

See section "N.6".

N.9 Charting Recommendation

The least depth obtained through echosounder development agreed with the currently charted depth (54 feet) exactly. Delete the currently charted depth, and chart the sounding from this survey ~~(after application of~~ approved tides) in the position given above. CONCUR

N.10 Danger to Navigation Report

This item was not reported as a danger to navigation.

AWOIS 1918 Plot 3 of 7 **Sheet 72**

N.1 Item Description
A charted Non-Dangerous Sunken wreck with a ~~least~~ depth of 114 ft. (114WK)
A 266 foot concrete freighter "Cape Fear", which sank October 29, 1920 in 160 feet of water.

N.2 Item Location

Geographic position provided was: 41° 28' 31.36" N
71° 21' 03.18" W

N.3 Source of Item

Reported as an uncharted obstruction by a U.S. Navy survey vessel in 1954, and later identified as the "Cape Fear".

N.4 Largest Scale Chart Affected

Chart 13223, scale 1:20,000, 31st edition, dated June 23, 1990.

N.5 Investigation Procedures

Survey requirements called for 200% side scan sonar coverage about a 200 meter search radius, echosounder development, and diver investigation. The wreck was located on the first 100 percent side scan coverage and then developed by echosounder. A diver investigation was not conducted due to the depth, current, and traffic associated with the area.

N.6 Investigation Results

The wreck was thoroughly developed using 5 and 10 meter spaced echosounding lines. An inserted echosounder peak provided the least depth for the item:

FIX NUMBER- ~~2202.20~~ 2022.30

LATITUDE- 41° 28' 28.8~~6~~8" N

LONGITUDE- 71° 21' 04.2~~0~~1" W

LEAST DEPTH (MLLW)- ~~34~~ 33.95 meters (111 feet)
34.0 PLOTTED (111 feet)

N.7 Explanation for Position Difference

The listed position of the wreck is approximately 80 meters from the new position listed above. Considering the circumstances and age of the original report, this difference is minimal. CONCUR

N.8 Least Depth Information

See section "N.6".

N.9 Charting Recommendation

~~**Move the presently charted "Wk" symbol to the position listed above, and replace the 114 foot depth with the least depth determined from this investigation (after application of approved tides).** *~~

N.10 Danger to Navigation Report

This item was not reported as a danger to navigation.

* IT IS RECOMMENDED THAT THE CHARTED NON-DANGEROUS SUNKEN WRECK WITH A DEPTH OF 114 FT. (114 WK), BE DELETED, AND A NON-DANGEROUS SUNKEN WRECK WITH A KNOWN DEPTH OF 34m (111 FT.), 34 WK, BE CHARTED IN PRESENT SURVEY LOCATION.

N.1 Item Description

A CHARTED NON-DANGEROUS SUNKEN WRECK WITH A DEPTH OF 98 FT., (98 WK)
The U.S. Navy submarine "G-1", 161 feet long, intentionally sunk June 21, 1921 with experimental torpedoes in Narragansett Bay.

N.2 Item Location

Geographic position provided was: 41° 29' 30.86" N
71° 21' 00.18" W

N.3 Source of Item

Reported by a U.S. Navy survey vessel in 1954 and later identified as "G-1".

N.4 Largest Scale Chart Affected

Chart 13223, scale 1:20,000, 31st edition, dated June 23, 1990.

N.5 Investigation Procedures

Survey requirements called for 200% side scan sonar coverage about a 200 meter radius, echosounder development, and diver investigation. The wreck was located during the first 100 percent side scan sonar coverage, and developed by echosounder for least depth determination. A diver investigation was not conducted due to the depth, current, and traffic associated with the area.

N.6 Investigation Results

The wreck was thoroughly developed using 10 meter spaced echosounding lines. An inserted echosounder peak provided the least depth for the item:

FIX NUMBER-	3028.20
LATITUDE-	41° 29' 30.92" N
LONGITUDE-	71° 21' 00.78" W
LEAST DEPTH (MLLW)-	~~32.1~~ 32.9 meters (107 feet)
	33.0 PLOTTED (108 FEET)

N.7 Explanation for Position Difference

The listed position of the wreck is approximately ~~18~~ 25 meters from the new position listed above. This is excellent agreement. CONCUR

N.8 Least Depth Information

See section "N.6".

N.9 Charting Recommendation

~~Move the currently charted "Wk" symbol to the above position, and replace the 98 foot depth with the least depth determined from this investigation (after application of approved tides).~~

N.10 Danger to Navigation Report

Not applicable.

* IT IS RECOMMENDED THAT THE CHARTED NON-DANGEROUS SUNKEN WRECK WITH A DEPTH OF 98 FT, (98WK) BE DELETED, AND A NON-DANGEROUS SUNKEN WRECK WITH A KNOWN DEPTH OF 33m (108 FT), 33 WK, BE CHARTED IN PRESENT SURVEY LOCATION.

AWOIS 7486 Plot 4 of 7 **Sheet 74**

N.1 Item Description

A 21 foot sounding from survey H-8367 in 1957. The 21 foot sounding was deleted from the chart after survey H-8367AD.WK (1963) cleared the position to 30 feet, but the 30 foot clearance was not added.

After an oil tanker ran aground near this item in 1989, the 30 foot clearance was charted. Do Not Concur
No 30 FT Clearance Depth is shown on Chart 13223, 32nd Ed, 19 Oct 91.

N.2 Item Location

Geographic position provided was: 41° 25' 59.77" N
71° 21' 44.98" W

N.3 Source of Item

Survey H-8367 in 1957, and additional work from H-8367AD.WK in 1963.

N.4 Largest Scale Chart Affected

Chart 13223, scale 1:20,000, 31st edition, dated June 23, 1990.

N.5 Investigation Procedures

Survey requirements called for 200% side scan sonar coverage about a 200 meter radius, echosounder development, and diver investigation.

Side scan sonar was not used to investigate this item due to the rapidly changing bottom and proximity of buoy "R2". The area was thoroughly developed by echosounder using 25 meter line spacing both in the North-South and East-West directions. Areas requiring further development were identified during processing, and 12 meter "splits" were run.

After the area was fully developed, the three most prominent peaks were investigated by divers and least depths were determined by pneumatic depth gauge. Detached positions were obtained by positioning the ship directly over the dive buoy which divers had placed on the least depths.

N.6 Investigation Results

Divers identified the three peaks as rock outcroppings, similar to land formations common in the area. After all sounding data had been edited and plotted, least depths were identified and compared to diver determined least depths. In all cases, soundings by echosounder compared shoaler or equal to diver least depths. All least depth information follows, referenced to each peak:

Peak 1:

	Dive #1	Sounding
FIX NUMBER-	4188 (DP)	4162 (DP)
LATITUDE-	41° 26' 03.98" N	41° 26' 04.08" N
LONGITUDE-	71° 21' 43.62" W	71° 21' 43.83" W
LEAST DEPTH (MLLW)-	9.5 m (31 ft)	9.5 m (31 ft)

Peak 2:

	Dive #2	Sounding
FIX NUMBER-	4196 (DP)	4000.4
LATITUDE-	41° 26' 00.12" N	41° 26' 00.48" N
LONGITUDE-	71° 21' 44.64" W	71° 21' 44.64" W
LEAST DEPTH (MLLW)-	9.8 m (32 ft)	9.3 m (30 ft)

Peak 3:

	Dive #3	Sounding
FIX NUMBER-	4199 (DP)	4105.2
LATITUDE-	41° 25' 58.08" N	41° 25' 58.08" N
LONGITUDE-	71° 21' 45.06" W	71° 21' 44.64" W
LEAST DEPTH (MLLW)-	10.2 m (33 ft)	9.5 m (31 ft)

N.7 Explanation for Position Difference

The listed position for the sounding was compared to the position of Peak #3 (closest peak): the charted sounding (30 feet) is approximately 50 meters North of Peak #3. This is an excellent check, given the differences in positioning systems and datum shifts since the prior survey in 1957. DO NOT CONCUR

N.8 Least Depth Information

See section "N.6".

N.9 Charting Recommendation

~~After application of approved tides all sounding and diver least depths should be evaluated, and the shoalest should be charted.~~ *

N.10 Danger to Navigation Report

~~This item was not reported as a danger to navigation.~~ *

* IT IS RECOMMENDED THAT THE CHARTED DANGEROUS SUBMERGED OBSTRUCTIONS WITH KNOWN DEPTHS OF 30 FT AND 31 FT. (30 Obstr), (31 Obstr) AND DANGER CURVES, BE DELETED, AND THE AREA CHARTED AS SHOWN ON PRESENT SURVEY.

* THESE ~~OBSTRUCTIONS~~ ARE SHOWN ON CHART 13223, 33rd Ed., 31 OCT 1992.

N.1 Item Description

A CHARTED OBSTRUCTION WITH A WIRE DRAG CLEARANCE DEPTH OF 46 FT.
The 183 foot wood-hulled four masted schooner "Addie Anderson", which sank in 1899. Demolished with dynamite that same year by the Army Corps of Engineers.

N.2 Item Location

Geographic position provided was: 41° 27' 06.36" N
71° 24' 55.19" W

N.3 Source of Item

Discovered during survey H-4006WD in 1917 and charted as a 32 foot sounding. Later cleared to 46 feet during survey H8367AD.WK in 1963, and identified as the "Addie Anderson".

N.4 Largest Scale Chart Affected

Chart 13223, scale 1:20,000, 31st edition, dated June 23, 1990.

N.5 Investigation Procedures

Survey requirements called for 400% side scan sonar coverage about a 500 meter search radius, echosounder development, and diver investigation. The item was located during side scan sonar coverage, and investigated by divers with a positive identification as the remains of a schooner.

N.6 Investigation Results

Although a least depth was determined during the dive investigation by pneumatic depth gauge, the entire wreck was not investigated due to poor conditions and the distance between the three portions of wreckage.

While obtaining a detached position over the dive buoy, a DSF 6000N sounding produced a shoaler least depth than the dive least depth. Although unclear that the echosounding returned from the wreck (versus fish or noise on the wreck), the shoaler least depth was used, and is shown below:

FIX NUMBER- ~~2151~~ 5121

LATITUDE- 41° 27' 06.2~~0~~4" N

LONGITUDE- 71° 24' 55.3~~5~~6" W

LEAST DEPTH (MLLW)- ~~14.8~~ 15.8 meters ~~(48 feet)~~ (52 FT)

NOTE: As stated in section I, the DP for this development was recomputed using updated Falcon corrector values.

N.7 Explanation for Position Difference

The listed position of the wreck is approximately 5 meters from the new position listed above. This is excellent agreement. CONCUR

N.8 Least Depth Information

See section "N.6".

N.9 Charting Recommendation

Delete the "Obstruction" symbol with cleared depth of 46 feet from chart 13223, and chart a "Wk" symbol with ~~depth from this survey (after application of approved tides)~~. A KNOWN DEPTH OF 15.8m (51 FT) 15.8 WK, AND A DANGER CURVE, IN PRESENT SURVEY LOCATION.

N.10 Danger to Navigation Report

This item was not reported as a danger to navigation.

N.1 Item Description

A CHARTED DANGEROUS SUNKEN WRECK, PA, AND A DANGER CURVE
An unknown sailboat, 17 feet in length sunk in 30 feet of water West of Dutch Island in Narragansett Bay.

N.2 Item Location

Geographic position provided was: 41° 30' 18.36" N
71° 24' 28.19" W

N.3 Source of Item

Reported through Local Notice to Mariners No. 42 in 1976.

N.4 Largest Scale Chart Affected

Chart 13223, scale 1:20,000, 31st edition, dated June 23, 1990.

N.5 Investigation Procedures

Survey requirements called for 200% side scan sonar coverage about a 500 meter search radius, bordered to the East by the 18-foot curve. Echosounder development and diver investigation were also required if the item was located.

The ship steamed parallel to the shoreline of Dutch Island on a heading of 020° True, near the 18 foot curve to determine the Eastern limit of the investigation. Two hundred percent side scan coverage was then obtained up to that controlling line.

N.6 Investigation Results

The area West of the controlling line was covered by 200 percent side scan sonar on a range scale of 75 meters (towed from the bow mount). No significant contacts were discovered in this area.

One contact outside the area was seen twice (in one direction) and is thought to be the AWOIS item, because of the appropriate size and absence of other contacts in the area. However, because the location of the contact was East of the controlling line, the RUDE was unable to investigate further without endangering the ship.

Two positions were computed from the side scan data, less than 4 meters apart:

Contact Name	Latitude	Longitude	Height
6006.12S	41° 30' 18.0" N	71° 24' 18.6"W	1.5 m
6042.00S	41° 30' 17.9" N	71° 24' 18.6"W	2.0 m

The depth surrounding this contact is unknown, except for the charted depth from chart 13223 of ~~30~~ 27 feet.

N.7 Explanation for Position Difference

The suspected contact is approximately 225 meters due East of the reported AWOIS position. This difference probably stems from the owner's uncertainty of position when the boat sank.

N.8 Least Depth Information

Although a least depth was not determined, the scaled side scan height off the bottom is approximately 1.7 meters, in what is charted as 30 feet of water (chart 13223).

N.9 Charting Recommendation

The AWOIS item has been disproved for the area searched using side scan sonar (West of the 18 foot curve). However, since the area adjacent to the shore could not be adequately searched, and the feature listed above seems to match the profile of a small sailboat, the RUDE recommends the "Dangerous Wreck" symbol and "PA" be deleted from chart 13223, and a "Sunken Wreck, not dangerous to surface navigation" symbol be charted at the position listed in section N.6. DO NOT CONCUR.
SEE PAGE 44 OF THIS REPORT FOR CHARTING RECOMMENDATION.

N.10 Danger to Navigation Report

This item was not reported as a danger to navigation.

Development Number 1 Plot 5 of 7 **Sheet 67**

N.1 Item Description

A feature discovered during the Reconnaissance Hydrography survey D-111, in Rhode Island Sound. Eventually identified as a large "eccentric" boulder.

N.2 Item Location

The feature is located approximately 10 nautical miles South of Sakonnet Point, Rhode Island (the exact position is given below).

N.3 Source of Item

The item was discovered by the RUDE during a 10 mile long reconnaissance hydrography line from survey D-111 (September - November 1991).

N.4 Largest Scale Chart Affected

Chart 13218, scale 1:80,000, 30st edition dated July 7, 1990.

N.5 Investigation Procedures

The feature was located during normal testing of the side scan sonar equipment before the start of a reconnaissance line. Once a position was determined from the side scan record, the feature was developed by echosounder using 10 meter line spacing. At a later date, the feature was investigated by divers and a least depth was determined by pneumatic depth gauge. The position was determined by taking a detached position over the dive buoy when the feature showed up on the echosounder.

N.6 Investigation Results

The divers reported a large boulder, approximately 10 meters across, and rising from the bottom approximately 6 meters. Least depth information for the item follows:

FIX NUMBER- 741

LATITUDE- 41° 19' 18.61" N

LONGITUDE- 71° 12' 16.59" W

LEAST DEPTH (MLLW)- 25.7 meters (84 feet)

NOTES: 1) The time for the DP (position # 741) was edited to show the dive time (least depth determination).

2) As stated in section I, the detached position for this development was recomputed using updated Falcon corrector values.

LORAN-C Rates were also recorded: (Chain 9960)

	TD	SNR
W-	14374.3	830
X-	25673.6	998
Y-	43916.8	780
Z-	60153.7	340
Master		870

N.7 Explanation for Position Difference

No original position exists for this development.

N.8 Least Depth Information

See section "N.6".

N.9 Charting Recommendation

The boulder rises 6 meters off the bottom in 33 meters of water.* Since this represents only 18 percent of the water depth, this feature should be charted as a sounding only, after application of approved tides.* DO NOT CONCUR

* IT IS RECOMMENDED THAT A ROCK WITH A KNOWN DEPTH OF 25.7m (84 FT.) 25.7 RK, BE CHARTED IN PRESENT SURVEY LOCATION.

N.10 Danger to Navigation Report

This item was not reported as a danger to navigation.

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

O.1 All AWOIS items included in this survey have been resolved.

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

P. AIDS TO NAVIGATION SEE ALSO SECTION 7.C. OF THE EVALUATION REPORT.

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

P.2 The position of one aid was determined during the investigation of AWOIS item 7486 near Brenton Reef. Buoy "R2" was located by detached position number 4190 at the following location:

Latitude: 41° 25' 56.8~~2~~4" N
Longitude: 71° 21' 47.8~~8~~9" W

The Light List shows the position as:

Latitude: 41° 25.9' N
Longitude: 71° 21.8' W

P.3 No other aids were located during the survey.

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

P.5 Two cable areas are charted near investigated item: one between Fort Adams and Bull Point in the East passage (sheet 72), and the other between Dutch Island and Sounderstown in the West passage (sheet 76). Side scan investigations in both of these areas showed no signs of submarine cables or pipelines, and no signs or other evidence was noted on land.

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

Q. STATISTICS

Q.1	a)	Number of positions	575
	b)	Lineal nautical miles of sounding lines	
		Side scan sonar	21
		Echosounder (only)	18
Q.2	a)	square nautical miles of hydrography	0.5
	b)	days of production	12
	c)	detached positions	7
	d)	bottom samples	~~0~~ 2
	e)	tide stations	1
	f)	current stations	0
	g)	velocity casts	~~X~~ 5
	h)	magnetic stations	0
	i)	XBT drops	0

R. MISCELLANEOUS

R.1 No other information of scientific or practical value resulted from this survey.

R.2 Bottom samples were not required for this project.

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 Provided that the application of approved tides will not substantially alter survey data, no further investigation of the survey area is recommended. The area coverage and quantity of sounding data acquired during this survey did not support an adequate comparison with the chart and prior surveys. Therefore, a basic survey of the area is not recommended. CONCUR

T. REFERRAL TO REPORTS

RUDE Electronic Control Report - 1991 Field Season
(submitted to N/CG244 concurrent with this survey)

Horizonal Control Report - 1991 Field Season
(submitted to N/CG23322)

RU9-91 AWOIS ITEM 7486 (DIVE #1)
DIVE INVESTIGATION REPORT
PLOT 4 of 7

DATE: 23 OCT 1991 DOY: 296 TIME: 1343Z

PERSONNEL:

DIVEMASTER\TENDER- LTJG OBERLIES DIVERS- LT SCHATTGEN

COXSWAIN\TENDER- J. BRAWLEY - ENS ILLG

VISIBILITY: 15 FEET CURRENT: 1.5 KNOT SE

MAXIMUM DEPTH: 12.2 METERS BOTTOM TIME: 24 MIN.

METHOD OF POSITION DETERMINATION: THREE DETACHED POSITIONS

HDAPS POS. NUMBER: ~~4186, 4187,~~ 4188*

AVERAGE EASTING: 147596.2 COMPUTED LATITUDE: 41-26-03.98N*

AVERAGE NORTHING: 270314.1 COMPUTED LONGITUDE: 71-21-43.63W*

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 10.6 METERS

TIME OF READING: 1343Z

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0

~~PREDICTED~~ TIDAL ZONE CORRECTOR: -1.0

LEAST DEPTH DETERMINED @MLLW 9.6 METERS (31 Ft)

NARRATIVE REPORT: This was the first of three dives within AWOIS 7486 on what was considered to be the most significant shoals. The entire search radius is characterized by extensive areas of significant bottom relief. This dive was on one of the many plateaus that rise from the bottom and have a surface area extending beyond the capabilities of divers to fully determine. In fact, on this dive as well as the two others that occurred within this AWOIS item, the bottom was never encountered. The divers simply explored the upper, very irregular surface of the plateau to find the point of least depth. With the exception of kelp the rocks are devoid of marine life. The least depth for this feature was determined by three consecutive readings with a pneumofathometer. This depth was 10.6 meters at the time of the survey. Diver's depth gauges found the depth of this point to be 35 feet (10.7 meters). SEE SECTION N., PAGE 27 of this Report FOR CHARTING RECOMMENDATION.

RU9-91 AWOIS ITEM 7486 (DIVE #2)
DIVE INVESTIGATION REPORT
PLOT 4 of 7

DATE: 23 OCT 1991 DOY: 296 TIME: 1800Z

PERSONNEL:

DIVEMASTER\TENDER- LTJG OBERLIES DIVERS- LT SCHATTGEN

COXSWAIN\TENDER- J. BRAWLEY - ENS ILLG

VISIBILITY: 15 FEET CURRENT: 0.5 KNOT SE

MAXIMUM DEPTH: 12.2 METERS BOTTOM TIME: 18 MIN.

METHOD OF POSITION DETERMINATION: THREE DETACHED POSITIONS

HDAPS POS. NUMBER: ~~4195~~, 4196*, ~~4197~~

AVERAGE EASTING: 147569.6 COMPUTED LATITUDE: 41-26-00.12N* (4)

AVERAGE NORTHING: 270192.6 COMPUTED LONGITUDE: 71-21-44.64W* (5)

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 9.9 METERS

TIME OF READING: 1800Z

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0

~~PREDICTED~~ TIDAL ZONE CORRECTOR: -0.1 (0)

LEAST DEPTH DETERMINED @MLLW 9.8 (9) METERS (32 FT)

NARRATIVE REPORT: This was the second of three dives within AWOIS 7486 on what was considered to be the most significant shoals. The entire search radius is characterized by extensive areas of significant bottom relief. This dive was on one of the many plateaus that rise from the bottom and have a surface area extending beyond the capabilities of divers to fully determine. In fact, on this dive as well as the two others that occurred within this AWOIS item, the bottom was never encountered. The divers simply explored the upper, very irregular surface of the plateau to find the point of least depth. With the exception of kelp the rocks are devoid of marine life. The least depth for this feature was determined by three consecutive readings with a pneumofathometer. This depth was 9.9 meters at the time of the survey. Diver's depth gauges found the depth of this point to be 32 feet (9.8 meters). SEE SECTION N, PAGE 27 OF THIS REPORT FOR CHARTING RECOMMENDATION.

RU9-91 AWOIS ITEM 7486 (DIVE #3)
DIVE INVESTIGATION REPORT

PLOT 4 of 7

DATE: 23 OCT 1991 DOY: 296 TIME: 1852Z

PERSONNEL:

DIVEMASTER\TENDER- LTJG OBERLIES DIVERS- LT SCHATTGEN

COXSWAIN\TENDER- J. BRAWLEY - ENS ILLG

VISIBILITY: 15 FEET CURRENT: 1.5 KNOT SE

MAXIMUM DEPTH: 18.3 METERS BOTTOM TIME: 19 MIN.

METHOD OF POSITION DETERMINATION: THREE DETACHED POSITIONS

HDAPS POS. NUMBER: ~~4198~~, 4199*, ~~4200~~

AVERAGE EASTING: 147559.9 COMPUTED LATITUDE: 41-25-58.~~08~~10N*

AVERAGE NORTHING: 270121.0 COMPUTED LONGITUDE: 71-21-45.06W*

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 10.2 METERS

TIME OF READING: 1852Z

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0

~~PREDICTED~~ TIDAL ZONE CORRECTOR: 0.0

LEAST DEPTH DETERMINED @MLLW 10.2 METERS (33 FT)

NARRATIVE REPORT: This was the third of three dives within AWOIS 7486 on what was considered to be the most significant shoals. The entire search radius is characterized by extensive areas of significant bottom relief. This dive was on one of the many plateaus that rise from the bottom and have a surface area extending beyond the capabilities of divers to fully determine. In fact, on this dive as well as the two others that occurred within this AWOIS item, the bottom was never encountered. The divers simply explored the upper, very irregular surface of the plateau to find the point of least depth. With the exception of kelp the rocks are devoid of marine life. The least depth for this feature was determined by three consecutive readings with a pneumofathometer. This depth was 10.2 meters at the time of the survey. Diver's depth gauges found the depth of this point to be 34 feet (10.4 meters). SEE SECTION N., PAGE 27 OF THIS REPORT FOR CHARTING RECOMMENDATION

DEVELOPMENT # 1
DIVE INVESTIGATION REPORT
PLOT 5 of 7

DATE: 06 NOV 1991 DOY: 310 TIME: 1715Z

PERSONNEL:

DIVEMASTER\TENDER- ENS ILLG DIVERS- LT SCHATTGEN

COXSWAIN\TENDER- J. BRAWLEY - LTJG OBERLIES

VISIBILITY: 20 FEET CURRENT: 0 KNOT

MAXIMUM DEPTH: 32.0 METERS BOTTOM TIME: 18 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: FIX 745 1

EASTING: 160777.4 6.8 NORTHING: 257832.4 16.6

LATITUDE: 41-19-19.20 N 18.61 LONGITUDE: 71-12-16.58 W 9

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 25.8 METERS

TIME OF READING: 1715Z

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0

~~PREDICTED~~ TIDAL ZONE CORRECTOR: -0.2 1

LEAST DEPTH DETERMINED @MLLW 25.6 7 METERS (84 FT)

NARRATIVE REPORT: The object of this investigation was a tremendous boulder found just prior to the start of reconnaissance line 64. It lies alone on a relatively clean bottom except for one much smaller boulder in close proximity to the Northwest. The larger boulder has a distinct point on top. It was at this point that a least depth was determined three consecutive times with a pneumofathometer. This depth was 25.8 meters at the time of the survey. Diver's depth gauges found this same point to be 85 feet (25.9 meters) and the base of the boulder to be 105 feet (32.0 meters). The bottom in this area is composed of coarse grain sand and characterized by large, regular sand waves. SEE SECTION N., PAGE 33, OF THIS REPORT FOR CHARTING RECOMMENDATION

RU9-91 AWOIS ITEM 7463
DIVE INVESTIGATION REPORT
PLOT 7 OF 7

DATE: 20 NOV 1991 DOY: 324 TIME: 1526Z

PERSONNEL:

DIVEMASTER\TENDER- ENS ILLG DIVERS- LT SCHATTGEN

COXSWAIN\TENDER- J. BRAWLEY - LTJG OBERLIES

VISIBILITY: 10 FEET CURRENT: 1 KNOT N

MAXIMUM DEPTH: 17.4 METERS BOTTOM TIME: 32 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: FIX 5121

EASTING: 143145.6 NORTHING: 272233.2

LATITUDE: 41-27-06.~~16~~ 24 N LONGITUDE: 71-24-55.3~~2~~ 6 W

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 15.8 METERS

TIME OF READING: 1555Z

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0

~~PREDICTED~~ TIDAL ZONE CORRECTOR: 0.0

LEAST DEPTH DETERMINED @MLLW 15.8 METERS (52 FT)

NARRATIVE REPORT: The object of this investigation was debris from a wrecked vessel. The wreck is so deteriorated that the debris is almost unrecognizable. It appears to resemble the keel of a vessel with the vessel's ribs rising no more than three feet off the bottom. A least depth was determined by use of three consecutive readings with a pneumatic depth gauge. This least depth was determined to be 15.8 meters at the time of the survey. Diver's depth gauges found this same point to be 52 feet (15.8 meters). Divers were hampered by zero visibility and a strong current. SEE SECTION N., PAGE 29 OF THIS REPORT FOR CHARTING RECOMMENDATION.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
Atlantic Marine Center
439 W. York Street
Norfolk, VA 23510-1114
December 8, 1992

MEMORANDUM FOR: Commander Christopher B. Lawrence, NOAA
Chief, Atlantic Hydrographic Section

FROM: Nicholas E. Perugini
Lieutenant Commander Nicholas E. Perugini, NOAA
Commanding Officer, NOAA Ship RUDE

SUBJECT: Disproval of AWOIS 2414 ADDENDUM TO FE-368SS (1991-92)

REFERENCES:
A) Descriptive Report FE-368SS, RU-10-7-91
B) Preprocessing Examination Report for FE-368SS dated October 1, 1992

This letter details the investigation conducted for AWOIS 2414, formerly an item from survey FE-368SS, RU-10-7-91, (reference A). Follow up work was requested by your office (reference B) for this item because during the initial investigation the item had not been examined by dive investigation. This was due to the fact that the item was located close to the shoreline in water depths that were unsafe for RUDE to enter. This prevented the ship from dropping a dive buoy and obtaining detached positions on the item, once located by divers.

On Nov. 16, 1992 (DN 321) the RUDE returned to this item to relocate it and conduct a dive investigation. The following information is provided as an addendum to the descriptive report originally submitted for this survey.

Item Description

An unknown sailboat, 17 feet in length sunk in 30 feet of water west of Dutch Island in the west passage of Narragansett Bay. It was investigated in contemporary survey FE-368SS which found what it thought to be the sailboat in position:

41°30'17.95" N
71°24'18.60" W

See Attachment 1.

Item Location

Geographic position provided (see above) was that computed by contemporary survey FE-368SS.

Source of Item

Originally reported through Local Notice to Mariners No. 43 in 1976. Reference B required a dive investigation to positively identify the contact.

42

Largest Scale Chart Effected

Chart 13223, scale 1:20,000, 31st edition, dated June 23, 1990.

Investigation Procedures

Using the position computed in the original investigation, this item was immediately located by side scan sonar. Horizontal control was solely by DGPS. See Attachment 2 for the DGPS performance check conducted on DN 317. The dive launch, at the direction of RUDE, dropped a dive buoy and acoustic pinger on the suspected position of the item. The bow of the RUDE was used as a reference by the dive boat. This operation could not be conducted directly from the RUDE due to the water depth.

After deploying the buoy and pinger, the ship made several side scan sonar passes on the buoy. After each pass the personnel in the dive launch moved the buoy closer to the exact site of the contact as directed by RUDE. This continued until the buoy was in close proximity to the item. When it was thought to be close enough, divers were deployed for an investigation. The visibility proved to be so limited that the divers could not find the item after three circle searches around the buoy. Circle searches were conducted at 10, 20 and 30 meters around the buoy.

The divers surfaced, were recovered by the dive launch and cleared the area. The RUDE made more side scan passes and the position of the dive buoy was fine tuned so that it lay on top of the contact. A second dive investigation was conducted with the divers finding the contact as soon as they descended the buoy line. To insure that the contact they found was the one in question, the divers conducted 10 and 20 meter circle searches around the item. No other contacts were found. The divers obtained a least depth for the item by three consecutive readings by pneumatic depth gauge. See Attachment 3 for the diver investigation report and Attachment 4 for the pneumatic depth gauge system check conducted after that dive.

Investigation Results

The item that was found previously and thought to be the sailboat is actually a rock that rises off the bottom approximately 1.2 meters (3.9 feet) in 43 feet of water. Divers obtained a least depth measurement of this rock of ~~12.0~~ 12.4 meters (~~39.4~~ 39.6 feet) ~~uncorrected~~ for tide. The reference station at Newport, Rhode Island was used for ~~predicted~~ tides for a corrected reading @MLLW to:

* 11.~~3~~ 4 meters (37.~~1~~ 4 feet)

The ship could not get right over the position of this item for a detached position because of the item's proximity to shoal water.

Instead, the ship got within five meters of the buoy with it steady on the starboard beam. As the ship remained in place several detached positions were obtained. These positions were then corrected for the position of the ship relative to the buoy, and a position computed. See Attachment 5 for the computed position. This was the only way to obtain a position on this item. That position is;

41°30'17.~~911~~88" N
71°24'19.051" W

Charting Recommendation

Delete the presently charted dangerous wreck symbol, position approximate. This was the recommendation of the descriptive report for FE-368SS and it remains true. This is based on the survey work accomplished for that survey. That survey completed 200% side scan sonar coverage in a 500 meter search radius centered on the charted position of the sailboat. No significant contacts were found in that area. CONCUR

It is ~~not~~ recommended that the rock investigated be charted,* ~~That item rises off the bottom less than four feet and is not a hazard to navigation in 43 feet of water. Instead,~~ Supersede currently charted depths with the soundings from this survey. CONCUR

* AS A ROCK WITH A KNOWN DEPTH OF 11.4 (37 FT.), 11.4 RK, AND A DANGER CURVE, IN PRESENT SURVEY LOCATION.

Attachment 1: Chartlet of Survey Area
2: DGPS Performance Check
3: Diver Investigation Report
4: Pneumatic Depth Gauge System Check
5: Detached Position/Least Depth Sheet
6: Daily Data Acquisition and Processing Abstract
7: Raw Data Printout
8: Side Scan Sonar Record
9: DSF 6000 Echogram
10: On-Line Swath Plot
11: (1) Each Edited Swath, Depth (meters), Depth (feet), Track and Contact Plots
12: 3.5" Floppy Disc with Project Tables
13: 32 Track Edited Data Tape

FE-368SS
AWOIS ITEM 2414
DIVE INVESTIGATION REPORT
PLOT 6 of 7

DATE: 16 NOVEMBER 92 DN: 321

PERSONNEL:

DIVEMASTER\TENDER- LTJG ILLG DIVERS- LT SCHATTGEN

COXSWAIN\TENDER- J. BRAWLEY - ENS BRENNAN

VISIBILITY: 10 FEET CURRENT: 1.5 KT

MAXIMUM DEPTH: 15 METERS BOTTOM TIME: 25 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: FIX ~~18~~ 8000

EASTING: 278148.2 NORTHING: 143992.3

LATITUDE: 41-30-17.~~911~~ 88 N LONGITUDE: 71-24-19.051 W

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 12.0 METERS

TIME OF READING: 1935Z

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0

~~PREDICTED~~ TIDAL ZONE CORRECTOR: -0.7 6 METERS

LEAST DEPTH DETERMINED @MLLW 11.3 4 METERS (37 FT)

NARRATIVE REPORT: The suspected object of these dives was a ~~3~~7 1 foot sailboat. mcR Two consecutive dives were conducted. The first dive consisted of a series of circle searches around the dive buoy at 10, 20, and 30 meters. These searches yielded no results. With the aid of the side scan sonar and an acoustic pinger, the dive buoy was positioned closer to the target in question. Dive two was executed with the divers descending directly onto the target in question.This target was found to be a large flat boulder rising approximately 1.2 meters off the bottom and was approximately 4.6 meters long by 1.8 meters wide.The bottom surrounding the boulder was fine brown sand with patches of broken shells. To insure that this boulder was the object in question, a circle search was conducted at both 10 and 20 meters. No subsequent objects were found. The least depth on this boulder as determined by pneumatic depth gage was 12.0 meters (39.4 ft) and a depth of 11.25 meters (36.8 ft) was acquired on this boulder by divers depth gage. The pneumatic depth gage should be considered more accurate. CONCUR.

SEE PAGE 44 OF THIS REPORT FOR CHARTING RECOMMENDATION.

CONTROL STATIONS as of 3 Apr 1992

No	Type	Latitude	Longitude	H Cart	Freq	Vel	Code	MM/DD/YY	Station Name
120	F	041:21:39.717	071:28:52.946	20	2504	0.0	0.0	8 09/27/91	PT JUDITH LIGHT OFFSET 3, 1991
121	F	041:26:57.711	071:23:57.797	20	2504	0.0	0.0	4 09/27/91	BEAVERTAIL LIGHT OFFSET, 1991
122	F	041:27:43.708	071:21:46.539	12	2504	0.0	0.0	6 09/30/91	CASTLE HILL LIGHT OFFSET, 1991
123	F	041:29:35.890	071:19:37.473	12	2504	0.0	0.0	2 10/02/91	GOAT ISLAND LIGHT OFFSET 1991
124	F	041:29:48.141	071:24:15.524	5	250	0.0	0.0	5 10/18/91	DUTCH ISLAND LIGHTHOUSE 1868
126	F	041:26:57.639	071:23:57.893	20	2504	0.0	0.0	4 11/14/91	BEAVERTAIL LIGHT OFFSET 2 1991
125	F	041:27:42.566	071:10:22.144	12	2504	0.0	0.0	2 10/21/91	WARREN OFFSET 1991

200 G 41°04'02.047" 71°51'38.374" 250 MPRB, 1992

ANTENNA HEIGHT

ALL STATIONS ARE FIELD POSITIONS EXCEPT:

STA 124 DUTCH ISLAND LIGHTHOUSE

NGS #: 41071244 0101

APPENDIX VII. APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. FE-368SS

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.

Nicholas E. Perugini

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: December 29, 1992

MARINE CENTER: Atlantic

OPR: B660-RU-92

HYDROGRAPHIC SHEET: FE-368SS

LOCALITY: Rhode Island, Narragansett Bay, Lower East and West Passages

TIME PERIOD: November 16, 1992

TIDE STATION USED: 845-2660 Newport, Rhode Island
Lat. 41° 30.3'N Lon. 71° 19.6'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 1.67 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.7 ft.

REMARKS: RECOMMENDED ZONING

1. North of Latitude 41° 28.0'N, times and heights are direct on Newport, Rhode Island (845-2660).

2. South of Latitude 41° 28.0'N, apply a -6 minute time correction and a x0.94 height ratio to Newport, Rhode Island (845-2660).

Note: Times are tabulated in Eastern Standard Time.

for Richard L. Edwards
CHIEF, DATUMS SECTION

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: March 14, 1992

MARINE CENTER: Atlantic

OPR: B660-RU-91

HYDROGRAPHIC SHEET: FE-368SS

LOCALITY: Rhode Island, Narragansett Bay, Lower East and West Passages

TIME PERIOD: September 27 - November 20, 1991

TIDE STATION USED: 845-2660 Newport, Rhode Island
Lat. 41° 30.3'N Lon. 71° 19.6'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 1.67 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.7 ft.

REMARKS: RECOMMENDED ZONING

1. North of Latitude 41° 28.0'N, times and heights are direct on Newport, Rhode Island (845-2660).

2. South of Latitude 41° 28.0'N, apply a -6 minute time correction and a x0.94 height ratio to Newport, Rhode Island (845-2660).

Note: Times are tabulated in Eastern Standard Time.

CHIEF, DATUMS SECTION

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

FE-368 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	
EAST PASSAGE (title)										1
NARRAGANSETT BAY (title)										2
RHODE ISLAND (title)										3
RHODE ISLAND SOUND (title)										4
WEST PASSAGE (title)										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
				Approved:						16
										17
				Charles E. Harrington						18
				Chief Geographer - N/CG2x5						19
				JUL 19 1993						20
										21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

12/09/93

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: FE-368SS

NUMBER OF CONTROL STATIONS	7
NUMBER OF POSITIONS	515
NUMBER OF SOUNDINGS	1729

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	70	10/05/92
VERIFICATION OF FIELD DATA	98	08/21/92
ELECTRONIC DATA PROCESSING	47	
QUALITY CONTROL CHECKS	73	
EVALUATION AND ANALYSIS	151	12/03/93
FINAL INSPECTION	29	12/07/93
TOTAL TIME	468	

ATLANTIC HYDROGRAPHIC SECTION APPROVAL 12/08/93

NOAA FORM 61-29
(12-71)

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

REFERENCE NO.
N/CG244-141-93

LETTER TRANSMITTING DATA

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY *(Check):*

☐ ORDINARY MAIL ☐ AIR MAIL

☐ REGISTERED MAIL ☒ EXPRESS

☐ GBL *(Give number)* _____

TO:

NOAA/National Ocean Service
Chief, Data Control Section
N/CG243, Station 6813, SSMC3
1315 East-West Highway
Silver Springs, MD 20910

DATE FORWARDED
10 December 1993

NUMBER OF PACKAGES
One

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

FE-368SS
Rhode Island, Narragansett Bay
East and West Passages

1 Box

1 Original Descriptive Report with 7 original page size plots of the survey, appended to the D.R.
1 Binder containing Miscellaneous Data removed from the original D.R.
1 Envelope containing smooth position overlays and excess sounding overlays
1 Cahier with the final Position, Control file, Sounding and L-file listings
1 Accordian file containing: Fathograms, Sonargrams and daily printouts (1991 = Days 270-324 and 1992 = Day 321)

FROM: *(Signature)*

Maxine Fetterly

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Section
439 W. York St.
Norfolk, VA 23510-1114

COAST AND GEODETIC SURVEY
ATLANTIC HYDROGRAPHIC SECTION
EVALUATION REPORT

SURVEY NO.: FE-368SS FIELD NO.: RU-10-7-91

Massachusetts, Rhode Island Sound, Lower East and West Passages

SURVEYED: September 27, 1991 through November 16, 1992

SCALE: 1:10,000 PROJECT NO.: OPR-B660-RU-91

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

CONTROL: MAGNAVOX MX4200D Differential GPS Receiver/MAGNAVOX MX50R Differential Global Positioning Systems Receiver, and MOTOROLA Falcon 484 Mini-Ranger (Range/Range)

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

Surveyed by.....P. L. Schattgen
.....M. J. Oberlies
.....J. A. Illg
.....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. Three 1:10,000 scale and four 1:5,000 scale page size smooth plots, with accompanying overlays, were generated during office processing. These plots are considered the smooth sheet and final plots for this survey and are appended to this report.

c. No unusual problems were encountered during office processing.

d. Notes in the Descriptive Report were made in red 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 smooth 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 1:5,000 scale plots on the NAD 27 datum, for plots 1-4, move the projection lines 0.37 seconds (11.37 meters or 2.27 mm at the scale of the survey) north in latitude, and 1.81 seconds (41.95 meters or 8.39 mm at the scale of the survey) east in longitude.

To place the 1:10,000 scale plot on the NAD 27 datum, for plots 6-7, move the projection lines 0.37 seconds (11.37 meters or 1.14 mm at the scale of the survey) north in latitude, and 1.81 seconds (41.95 meters or 4.19 mm at the scale of the survey) east in longitude.

To place the 1:10,000 scale plot on the NAD 27 datum, plot 5, move the projection lines 0.38 seconds (11.75 meters or 1.18 mm at the scale of the survey) north in latitude and 1.84 seconds (42.89 meters or 4.29 mm at the scale of the survey) east in longitude.

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

3. HYDROGRAPHY

a. Where applicable, soundings at crossings are in adequate agreement.

b. Where applicable, the standard depth curves were drawn on the smooth plots. A brown curve was drawn to better delineate the shoal depth for Automated Wreck and Obstruction Information System (AWOIS)item #7445. (Plot 1 of 7)

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, hydrographic records and reports, conform to the requirements of the

HYDROGRAPHIC MANUAL, FIELD PROCEDURES MANUAL, and SIDE SCAN SONAR MANUAL.

5. JUNCTIONS

There are no contemporary surveys that junction with the present survey.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-8367	1956-57	1:10,000
H-8315	1956	1:12,500
H-6444	1939	1:40,000

The prior surveys listed above cover the present survey area in its entirety. These prior surveys are adequately discussed in section M., pages 18 and 19, of the Descriptive Report and need no further discussion.

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

Differences between the present and prior surveys can be attributed to a far more accurate, sophisticated and detailed present survey.

b. Wire Drag Surveys

H-4006WD	1917	1:20,000

Prior wire drag survey H-4006WD (1917) is common to the search area of AWOIS item #7463, and is adequately discussed in section N., pages 28 and 29, of the Descriptive Report.

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

7. COMPARISON WITH CHART 13223 (31st Edition, June 23, 1990) 13218 (30th Edition, July 7, 1990)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys and requires no further consideration.

The Hydrographer makes adequate chart comparisons in Section N., pages 20 through 33, of the Descriptive Report.

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

b. Danger to Navigation

There were no dangers to navigation submitted by the field unit on this survey. Two dangers to navigation were identified during office processing. Information was submitted for inclusion into a Local Notice to Mariners, to the Commander (oan), First Coast Guard District, Boston, Massachusetts, and to National Ocean Service (NOS), Chart Information Section, N/CG222, Silver Springs, Maryland. A copy of the letter is appended to this report.

c. Aids to Navigation

There is one floating aid to navigation within the limits of the present survey. This aid appears adequate to serve its intended purpose.

8. COMPLIANCE WITH INSTRUCTIONS

This survey complies with the Project Instructions.

9. Additional Field Work

This is an adequate side scan sonar survey. No additional work is recommended.

RUDE Processing Team
Verification and Evaluation and Analysis

Frank Saunders
Cartographic Technician
Verification of Field Data

Maxine Fetterly
Cartographic Technician
Evaluation and Analysis

APPROVAL SHEET
FE-368SS

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 disproval 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 Date: 12-7-93
N. A. Wike
Cartographer
Atlantic Hydrographic Section

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 Date: 12-8-93
Nicholas E. Perugini, LCDR, NOAA
Chief, Atlantic Hydrographic Section

****

Final Approval:

Approved: J. Austin Yeager Date: 3/15/94
J Austin Yeager
Rear Admiral, NOAA
Director, Coast and Geodetic Survey

Coast and Geodetic Survey
Norfolk, Virginia 23510-1114
OFFICE OF CHARTING AND GEODETIC SERVICES

April 17, 1992

Commander, First Coast Guard District
Aids to Navigation Office
408 Atlantic Ave.
Boston, MA 02110-3350

Dear Sir,

The following items were discovered during hydrographic and side scan sonar survey operations, and were considered dangers to navigation during office processing of the survey data:

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number...FE-368SS (1991)
State.....Rhode Island
General Locality.....Narragansett Bay
Sublocality.....Lower East and West Passages
Project Number.....OPR-B660
Surveyed by.....NOAA Ship RUDE

Objects discovered:

A uncharted shoal with a least depth of 9.3 meters (30 feet) at MLLW (predicted tides) was found in latitude 41°26'00.48"N, longitude 71°21'44.64"W (NAD83). The presently charted depths in this area are 36 feet.

Affected Nautical Charts:

CHART NUMBER	EDITION NO.	DATE	HORIZ. DATUM	GEOGRAPHIC POSITION LATITUDE	LONGITUDE
13218	31st	Jan 11/92	NAD83	41°26'00.48"N	71°21'44.64"W
13221	47th	Mar 23/91	NAD83	41°26'00.48"N	71°21'44.64"W
13223	32nd	Oct 19/91	NAD83	41°26'00.48"N	71°21'44.64"W

A uncharted shoal with a least depth of 9.5 meters (31 feet) at MLLW (predicted tides) was found in latitude 41°25'58.08"N, longitude 71°21'44.64"W (NAD83). The presently charted depths in this area are 36 feet.

Affected Nautical Charts:

CHART NUMBER	EDITION NO.	DATE	HORIZ. DATUM	GEOGRAPHIC POSITION LATITUDE	LONGITUDE
13218	31st	Jan 11/92	NAD83	41°25'58.08"N	71°21'44.64"W
13221	47th	Mar 23/91	NAD83	41°25'58.08"N	71°21'44.64"W
13223	32nd	Oct 19/91	NAD83	41°25'58.08"N	71°21'44.64"W

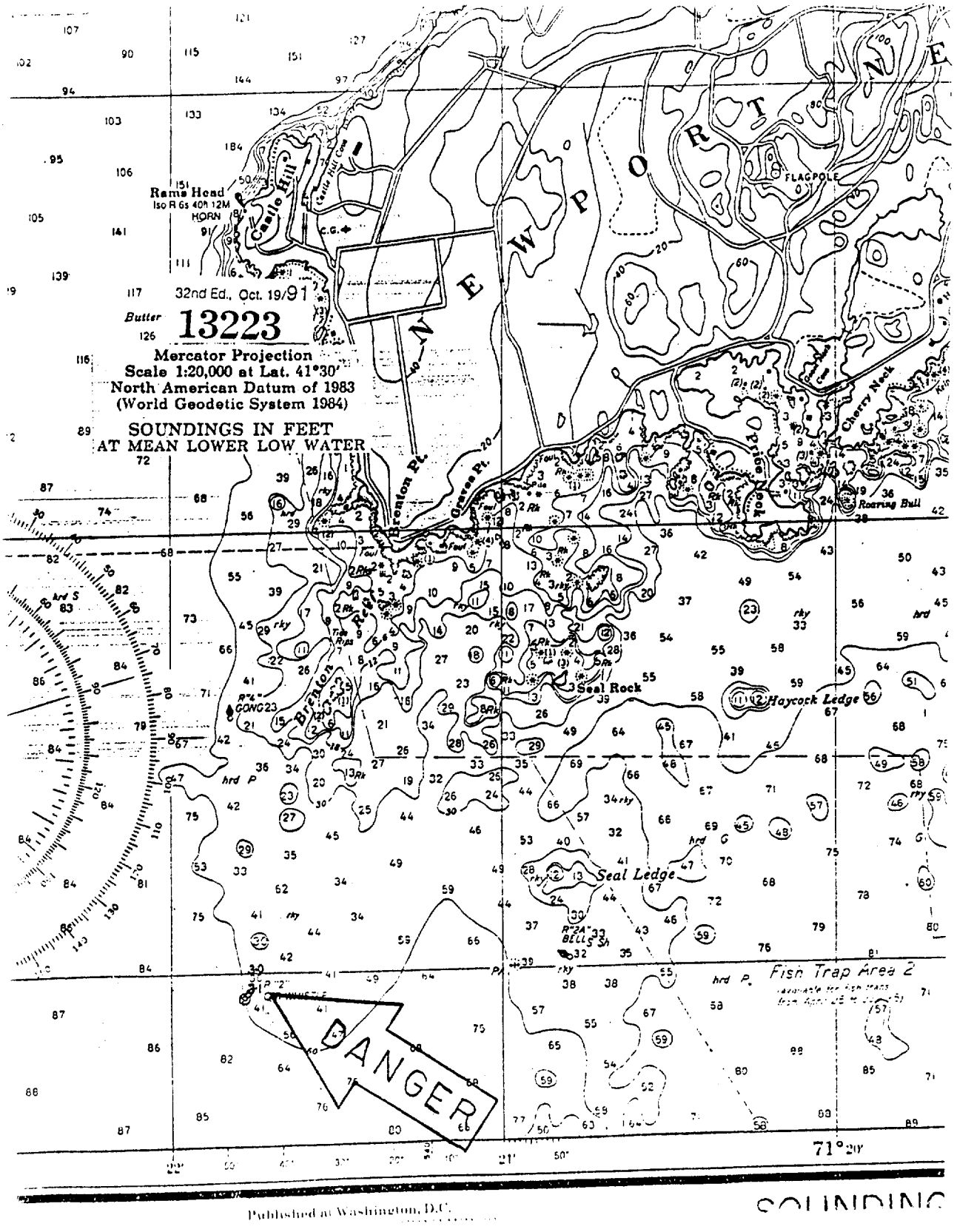
Questions concerning this report should be directed to the Office of Charting and Geodetic Services, Atlantic Hydrographic Section, by calling (804) 441-6746 or FTS 827-6746.

Sincerely,

Christopher B. Lawrence

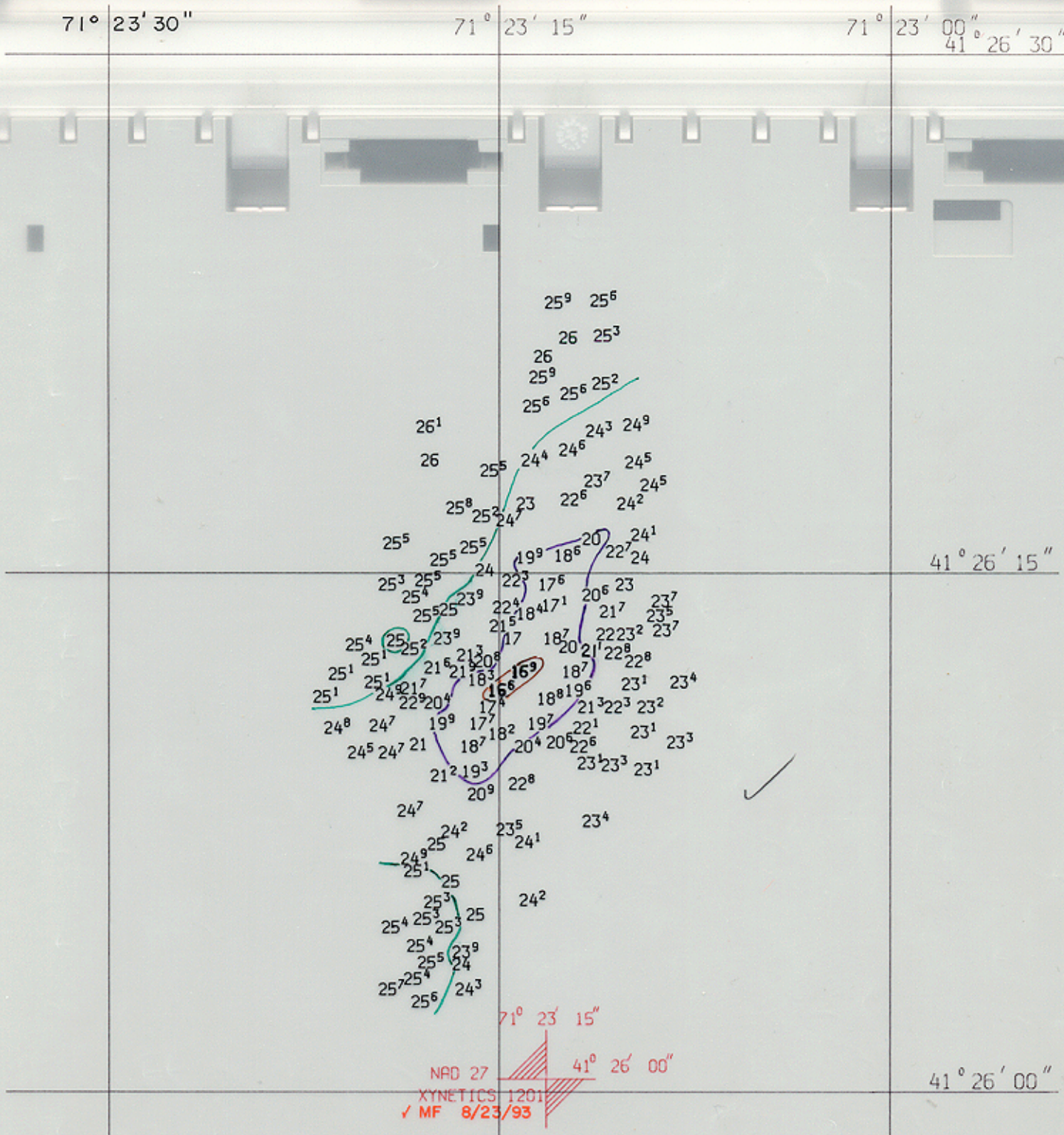
Christopher B. Lawrence, CDR, NOAA
Chief, Atlantic Hydrographic Section

Attachment

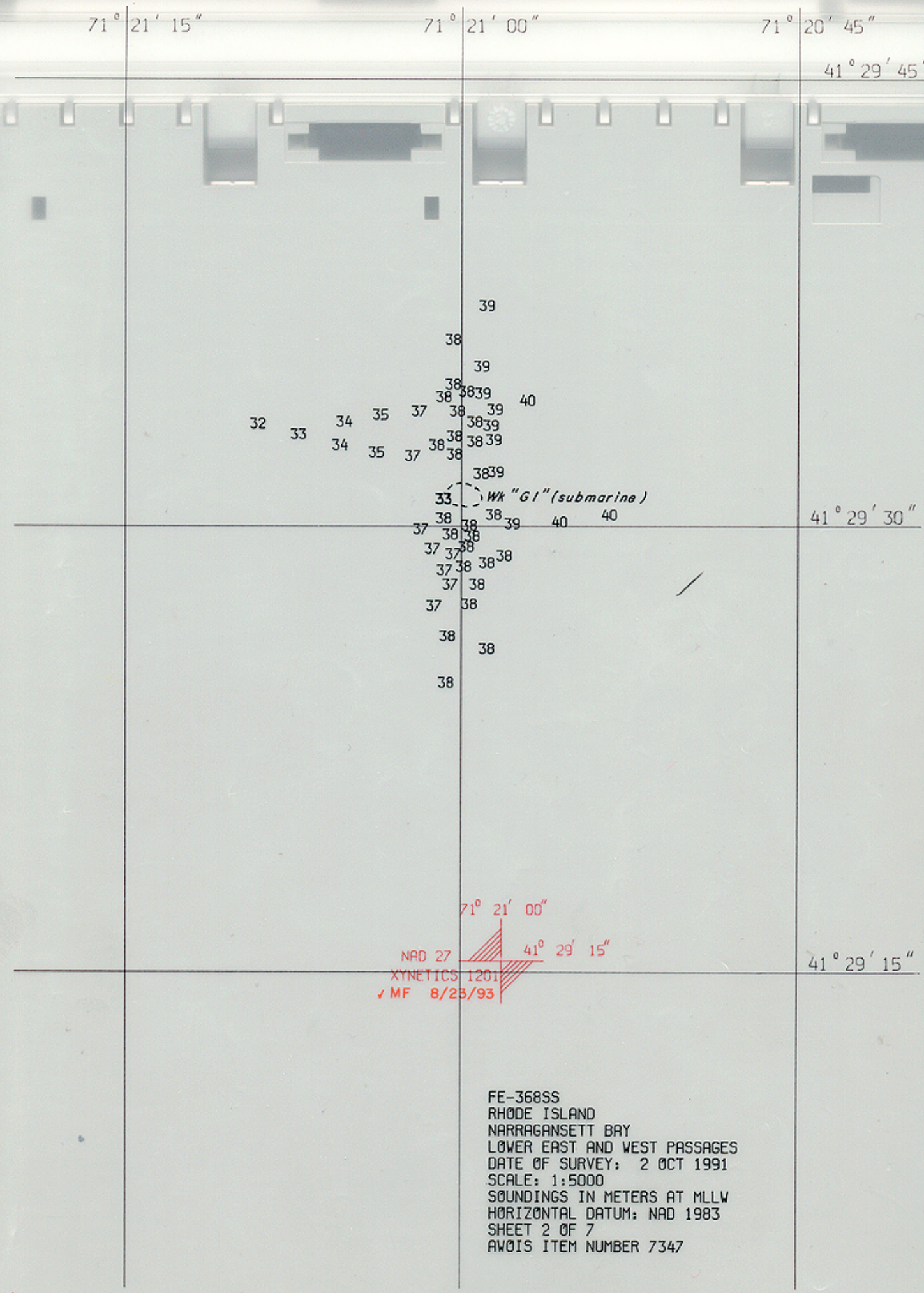


Published at Washington, D.C.

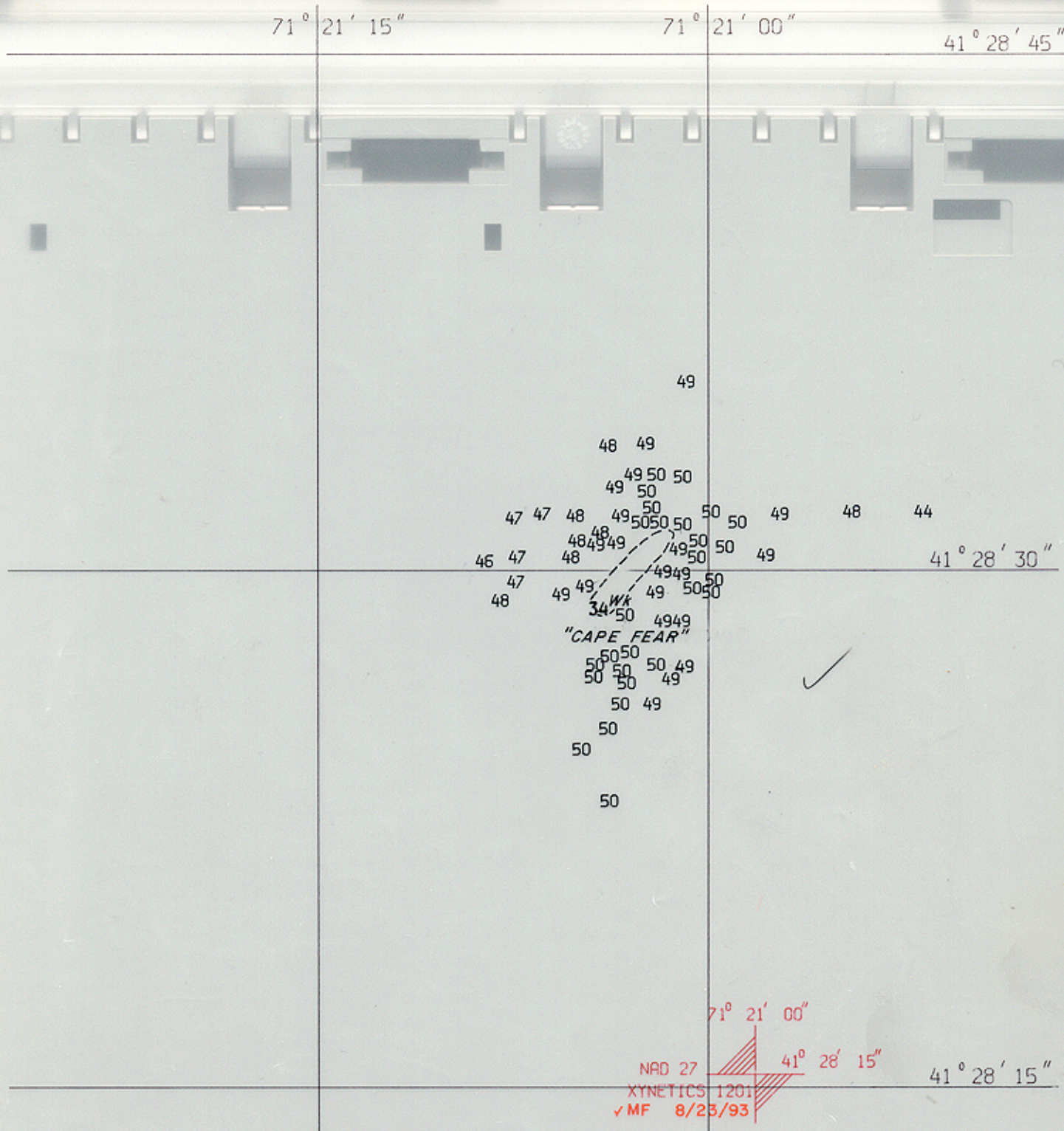
SOUNDING



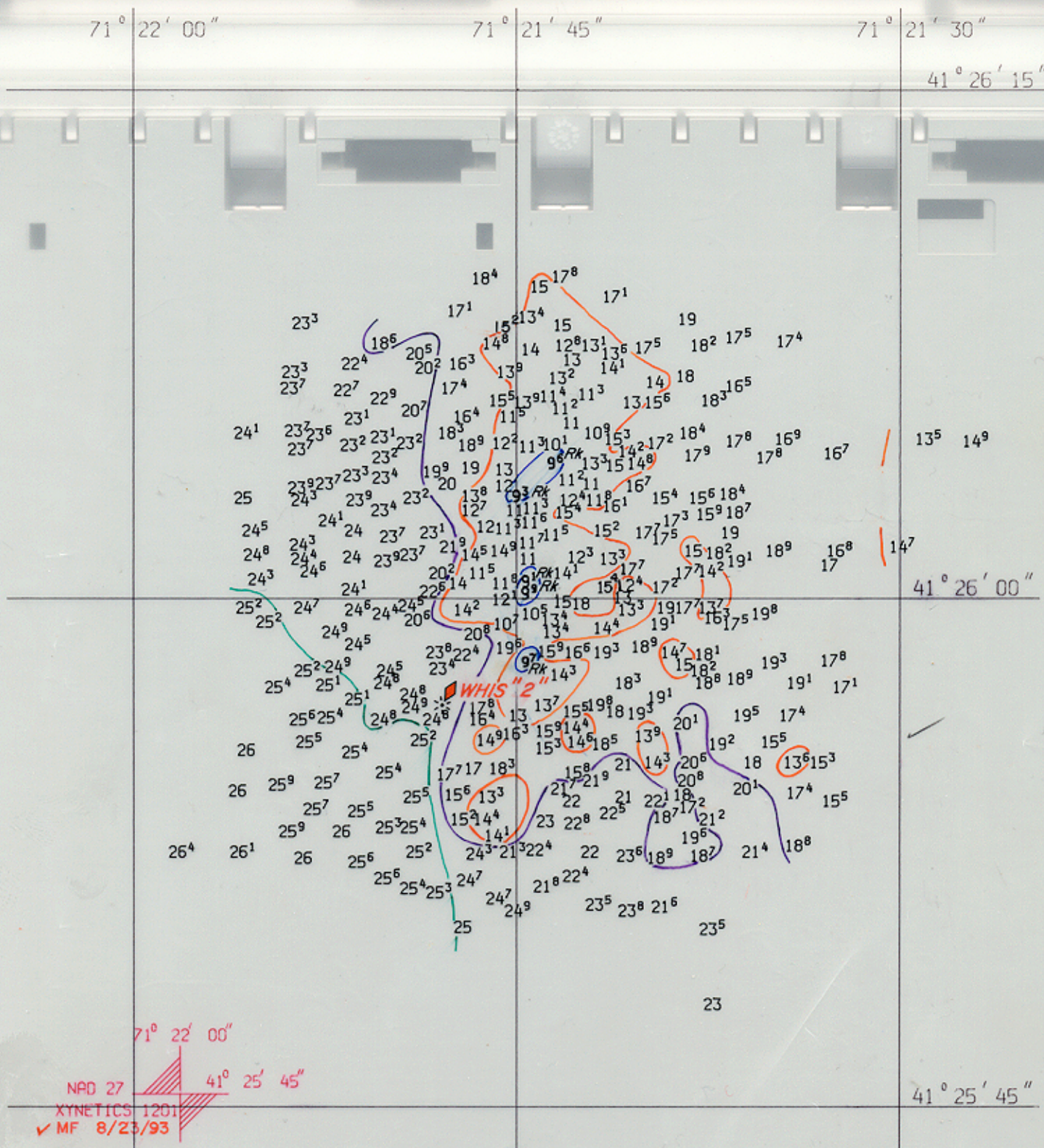
FE-368SS
RHØDE ISLAND
NARRAGANSETT BAY
LØWER EAST AND WEST PASSAGES
DATE ØF SURVEY: 27 SEP 1991
SCALE: 1:5000
SØUNDINGS IN METERS AT MLLW
HØRIZØNTAL DATUM: NAD 1983
SHEET 1 ØF 7
AWØIS ITEM NUMBER 7445



FE-368SS
RHODE ISLAND
NARRAGANSETT BAY
LOWER EAST AND WEST PASSAGES
DATE OF SURVEY: 2 OCT 1991
SCALE: 1:5000
SOUNDINGS IN METERS AT MLLW
HORIZONTAL DATUM: NAD 1983
SHEET 2 OF 7
AWOIS ITEM NUMBER 7347



FE-368SS
RHØDE ISLAND
NARRAGANSETT BAY
LØWER EAST AND WEST PASSAGES
DATE ØF SURVEY: 10 ØCT 1991
SCALE: 1:5000
SØUNDINGS IN METERS AT MLLW
HØRIZØNTAL DATUM: NAD 1983
SHEET 3 ØF 7
AWØIS ITEM NUMBER 1918



FE-368SS
RHODE ISLAND
NARRAGANSETT BAY
LOWER EAST AND WEST PASSAGES
DATE OF SURVEY: 11 OCT 1991 TO 23 OCT 1991
SCALE: 1:5000
SOUNDINGS IN METERS AT MLLW
HORIZONTAL DATUM: NAD 1983
SHEET 4 OF 7
AWOIS ITEM NUMBER 7486

71° 12′ 30″

71° 12′ 00″

41° 19′ 30″

32 32
32
32 32 32 32 crs S 33
32 32 25 Rk 33 33
32

71° 12′ 00″

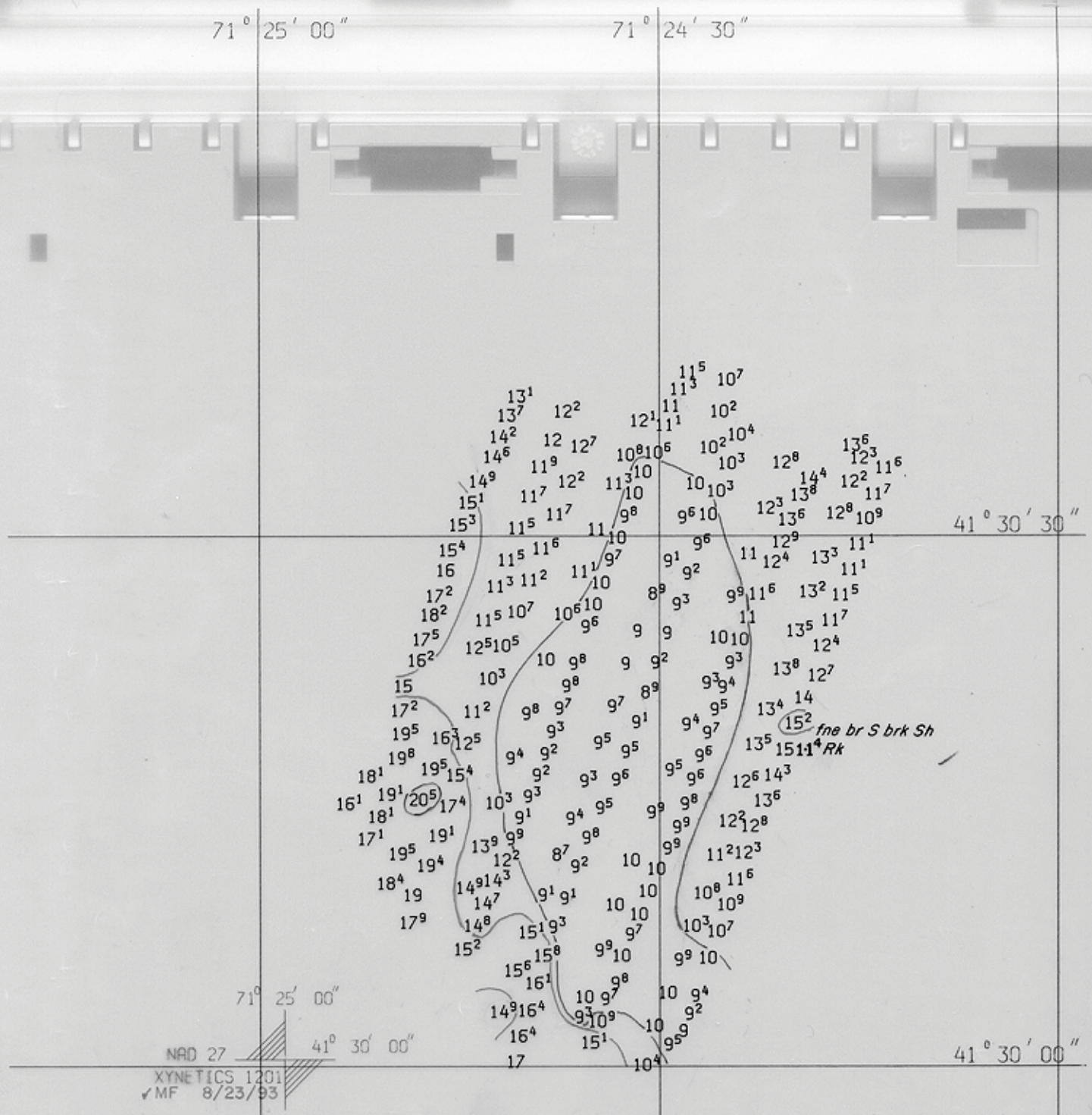
NAD 27 41° 19′ 00″

41° 19′ 00″

XYNETICS 1201
✓F.S. 8/5/1992

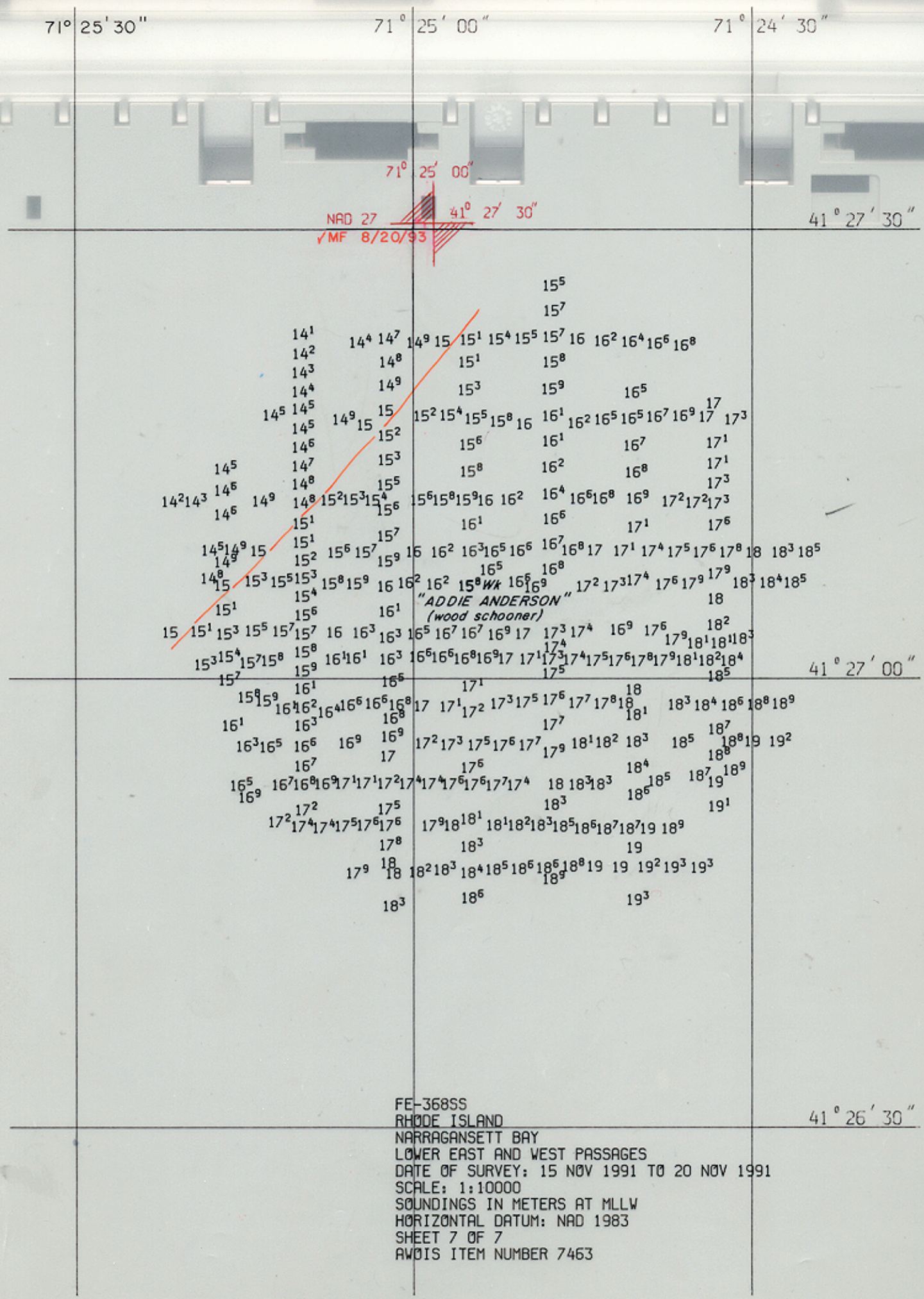
FE-368SS
RHODE ISLAND
NARRAGANSETT BAY
10 NM SOUTH OF SAKONNET BAY
DATE OF SURVEY: 5 NOV 1991 TO 6 NOV 1991
SCALE: 1:10000
SOUNDINGS IN METERS AT MLLW
HORIZONTAL DATUM: NAD 1983
SHEET 5 OF 7
SPECIAL INVESTIGATION

41° 18′ 30″



124 DUTCH ISLAND LIGHTHOUSE, 1868

FE-368SS
RHODE ISLAND
NARRAGANSETT BAY
LOWER EAST AND WEST PASSAGES
DATE OF SURVEY: 18 OCT 1991 AND 16 NOV 1992
SCALE: 1:10000
SOUNDINGS IN METERS AT MLLW
HORIZONTAL DATUM: NAD 1983
SHEET 6 OF 7
AWOIS ITEM NUMBER 2414



FE-368SS
RHODE ISLAND
NARRAGANSETT BAY
LOWER EAST AND WEST PASSAGES
DATE OF SURVEY: 15 NOV 1991 TO 20 NOV 1991
SCALE: 1:10000
SOUNDINGS IN METERS AT MLLW
HORIZONTAL DATUM: NAD 1983
SHEET 7 OF 7
AWOIS ITEM NUMBER 7463

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. FE-368SS

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
13223	3/22/94	L. Ackerman	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 54
13221	12/27/94	L. Ackerman	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 62
13218	4/14/95	L. Ackerman	
			Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 70 PARTIALLY THRU 13221
12300	6-21-95	L. Ackerman L.	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 57 thru Cht 13218
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED