

H10641

NOAA FORM 78-35A	
U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL OCEAN SERVICE	
DESCRIPTIVE REPORT	
Type of Survey	Hydrographic/Side Scan Sonar
Field No.	RU-10-6-95
Registry No.	H-10641
LOCALITY	
State	Rhode Island
General Locality	Narragansett Bay
Sublocality	Vicinity of Dutch Island
19 95	
CHIEF OF PARTY	
CDR. S. P. DeBow	
LIBRARY & ARCHIVES	
DATE	OCT 28 1996

NOAA FORM 77-28  
(11-72)

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

REGISTER NO.

**HYDROGRAPHIC TITLE SHEET**

H-10641

**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-10-6-95

State Rhode Island

General locality Narragansett Bay

Locality Vicinity of Dutch Island

Scale 1:10,000

Date of survey August 28 - November 8, 1995

Instructions dated February 16, 1995

Project No. OPR-B302-RU-95

Vessel NOAA Ship RUDE S590 (VESNO 9040)

Chief of party CDR S.P. De Bow

Surveyed by CDR SP De Bow, LT CL Thacker, LTJG TA Haupt, ENS JJ Walker, ST MT Lathrop

Soundings taken by: (echo sounder, hand lead, pole) Raytheon DSF-6000N Echosounder, SEABAT 9001

Graphic record scaled by SPD, CLT, TAH, JJW, & MTL

Graphic record checked by SPD, CLT, TAH, JJW, & MTL

Protracted by \_\_\_\_\_ Automated plot by ENCAD NOVAJET III (AHB)

Verification by ATLANTIC HYDROGRAPHIC BRANCH PERSONNEL

Soundings in (fathoms, feet, or meters at MLW or MLLW) <sup>FEET</sup> Meters at MLLW

REMARKS: All times recorded in UTC.

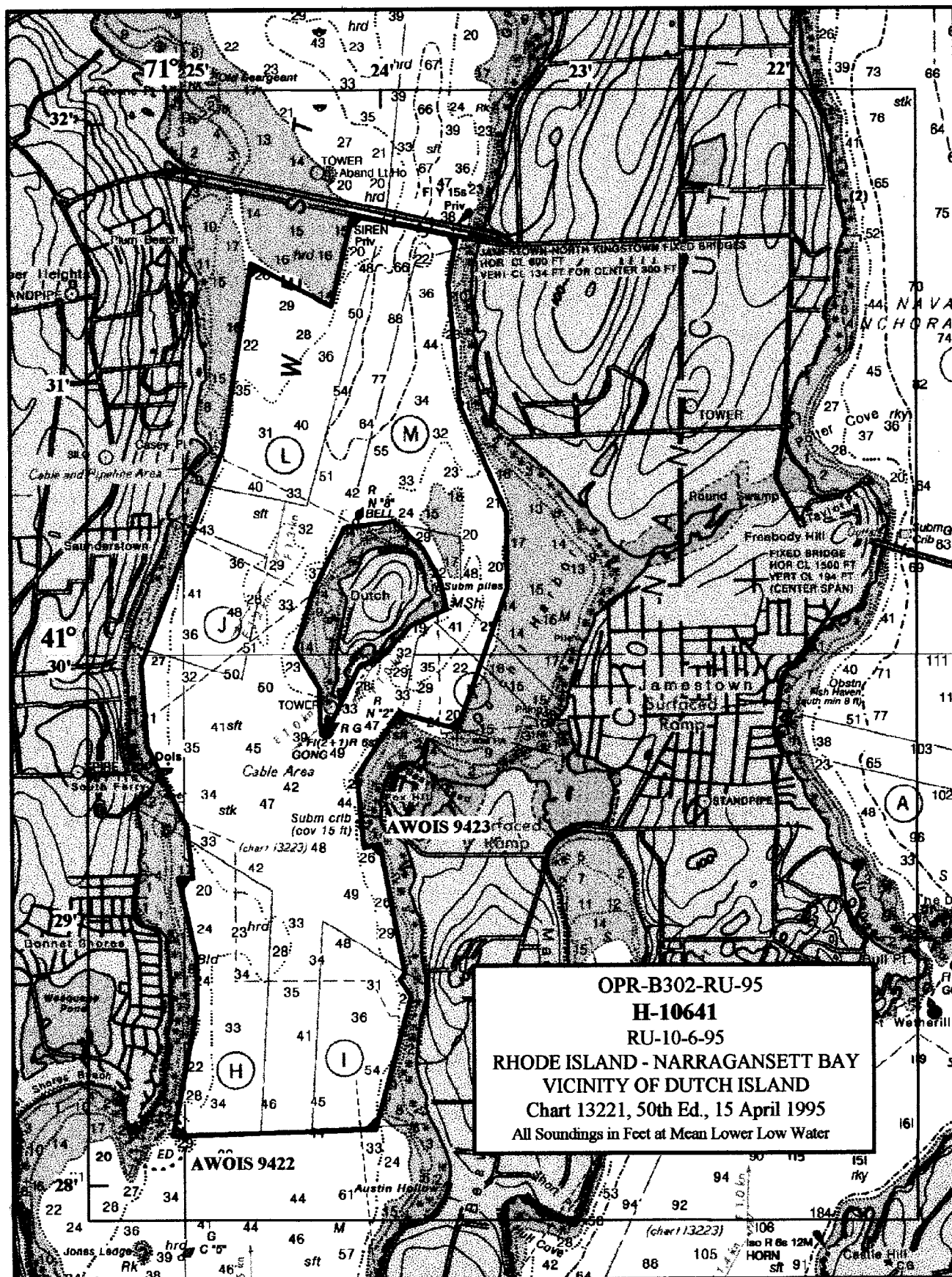
The DSF-6000N was used as the primary sounding instrument; however, as warranted  
the SEABAT 9001 shallow-water multibeam sonar system was employed for distinct  
item investigations and is documented as such.

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

OCT 28 1996

013-1396

Surf/Awais chk 11/15/96  
MCR



## TABLE OF CONTENTS

	<u>Page</u>
A. PROJECT . . . . .	2
B. AREA SURVEYED . . . . .	2
C. SURVEY VESSELS. . . . .	3
D. AUTOMATED DATA ACQUISITION AND PROCESSING . . . . .	4
E. SONAR EQUIPMENT . . . . .	5
F. SOUNDING EQUIPMENT. . . . .	7
G. CORRECTIONS TO SOUNDINGS. . . . .	7
H. CONTROL STATIONS. . . . .	10
I. HYDROGRAPHIC POSITION CONTROL . . . . .	11
J. SHORELINE . . . . .	12
K. CROSSLINES. . . . .	12
L. JUNCTIONS . . . . .	13
M. COMPARISON WITH PRIOR SURVEYS . . . . .	13
N. ITEM INVESTIGATION REPORTS. . . . .	13
O. COMPARISON WITH THE CHART . . . . .	17
P. ADEQUACY OF SURVEY. . . . .	23
Q. AIDS TO NAVIGATION. . . . .	23
R. STATISTICS. . . . .	24
S. MISCELLANEOUS . . . . .	24
T. RECOMMENDATIONS . . . . .	24
U. REFERRAL TO REPORTS . . . . .	25

### APPENDICES

SEPARATES (DATA FILES WITH ORIGINAL FIELD RECORDS)

## **A. PROJECT**

A.1 This survey was conducted in accordance with Hydrographic Project Instructions OPR-B302-RU, Rhode Island Sound Corridor, Rhode Island and Massachusetts.

A.2 The original instructions are dated February 16, 1995.

A.3 There have been two changes to the original instructions, both of which affect this survey: Change No. 1, dated ~~May 10,~~ 1995, and Change No. 2, dated ~~July 13,~~ 1995. *APRIL 27,*  
*JUNE 26,*

A.4 This Descriptive Report covers the navigable area survey conducted on sheet "G" of project OPR-B302-RU in Narragansett Bay as specified in the Project Instructions.

A.5 This portion of OPR-B302-RU responds to requests from the Northeast Marine Pilots to survey anchorage areas and non-maintained channels in Narragansett Bay. The areas have been deemed critical by the Pilots for the safe navigation of a variety of deep-draft vessels.

The area was last surveyed by the Coast and Geodetic Survey between 1957 and the mid-1960's.

## **B. AREA SURVEYED**

B.1 This survey area comprised six general purpose anchorages and the waters in between: anchorages H, I, J, K, L (southern portion only), and M, located in the southern half of the West Passage in Narragansett Bay, RI. The survey's northern limits are the Jamestown Bridge and the southern limits are the southern edges of anchorages H and I. The area to the east of Dutch Island, RI was added to the project at the request of the command. All work done in this additional area is at the discretion of the command.

B.2 The survey comprised one sheet with the following approximate boundaries:

NW Corner - 41°31'39"N, 071°24'09"W

NE Corner - 41°31'35"N, 071°23'37"W  
SE Corner - 41°28'12"N, 071°24'03"W  
SW Corner - 41°28'11"N, 071°25'03"W

Section 1.8 of the Project Instructions stipulated the inshore limit of hydrography to be the 18-foot curve. This inshore limit was achieved whenever practical. However, the operational constraints of maneuvering a 90-foot long, 7-foot draft ship in rapidly shoaling water close to shore often ruled out the possibility of surveying to that limit. Since the Command did not have a small boat acquisition platform for use on this project, discretion opted for the safety of the vessel at all times.

B.3 Data collection for this survey began on August 28, 1995 (DN 243) and ended on November 8, 1995 (DN 312).

#### **C. SURVEY VESSELS**

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

<b>Vessel</b>	<b>EDP Number</b>	<b>Primary Function</b>
NOAA Ship RUDE (S590)	9040	Hydrography, Side Scan Operations and SEABAT Investigations
RUDE Launch (SISU)	1290	Diving Operations

C.2 During the ship's January 1994 dry-dock period, the RUDE was outfitted with a pivoting armature to carry the transducers for the Reson SEABAT 9001 shallow-water multibeam sonar system. This armature was mounted on the port side of the ship, approximately amidships. Since the transducers were not designed for permanent deployment, the arm was rotated into the down, or operating, position only during times of data acquisition.

#### D. AUTOMATED DATA ACQUISITION AND PROCESSING

*SEE ALSO SECTION D.  
OF THE EVALUATION REPORT*

D.1 The following HDAPS software versions were used for data acquisition and processing on this survey:

Program	Version	Program	Version
BACKUP	2.00	LSTAWOIS	3.10
BLKEDIT	2.02	MAINMENU	1.20
CARTO	2.17	MAN_DATA	3.03
CLASSIFY	2.12	NEWPOST	6.13
CONTACT	2.48	PLOTALL	2.32
CONVERT	3.65	PREDICT	2.01
DAS_SURV	6.80	PRESURV	7.11
DP	2.18	QUICK	2.07
EXCESS	4.32	RAMSAVER	1.02
FILESYS	3.31	REAPPLY	2.12
GRAFEDIT	1.06	ZOOMEDIT	2.33
INVERSE	2.02		

D.2 The SEABIRD SBE-19 sound velocity profile unit was utilized in conjunction with **SEASOFT 3.3M** and **SEACAT 2.0** software. The program **VELOCITY** (Version 2.11, September 21, 1994) was used to process the collected data and calculate velocity correctors. The **REFRACT** subroutine corrects SEABAT multiple slant range depths for sound velocity and corrects position of soundings (cross track distance) for refraction.

D.3 SEABAT multibeam data were acquired exclusively on the SEABAT 9001 data acquisition 486 personal computer using the Coastal Oceanographics **HYPACK** software package (Version 1.0, dated March 1, 1994). Gyro and predicted tide input were received from HDAPS, heave/roll/pitch data were received directly from the Datawell HRP sensor, and positioning input was received from the Ashtech GPS receivers. SEABAT data were processed on one of two personal computers equipped with the NOAA **LSTDRED** (Version 3.0, 1995) post-processing software. A single least depth was generated for each SEABAT investigation and later entered into HDAPS via the **MANUAL DATA ENTRY** program. Three dimensional graphic plots of the SEABAT imagery were created using a commercial-off-the-shelf software package called Surfer for Windows, version 5.03.

## **E. SONAR EQUIPMENT**

E.1 The RUDE conducted all side scan sonar operations, using an EG&G Model 260 image-corrected side scan sonar recorder and a 100 kHz Model 272-T towfish.

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

E.3 The 100 kHz frequency was used throughout the survey.

E.4 a. The 50-meter range scale was used at a line spacing of 80 meters to obtain complete area coverage and provide optimal contact resolution. The 80-meter line spacing was chosen to allow an even number of lines to be run during hydro splits. Although the spacing was 10 meters more than the value specified in section 7.3.2.1 of the Field Procedures Manual (FPM), it was considered acceptable since the EPE rarely exceeded 5 meters, and the required overlap was attained on all lines. Data collected with an EPE of 15 or greater were either rejected or smoothed during post-processing.

b. Confidence checks were obtained whenever features such as sand waves, buoy anchors and lobster pots were encountered. These features were routinely annotated on the sonar grams.

c. Two hundred percent side scan coverage was completed for this survey, wherever safely possible. However, after running the first 100 percent side scan coverage in the area east of Dutch Island, the command decided this area did not merit running the second hundred percent. In addition, areas of reduced coverage occasionally occurred when the ship was forced to avoid buoys or lobster pots. These areas were easily recognized because the swath plot clearly showed the lack of overlap between adjoining swaths. Holiday coverage was run to fill in these gaps, and all side scan coverage was ultimately checked with smooth plots to ensure proper overlap between adjoining lines.

d. There were times when the echo sounder trace contained returns on items in the water column or very near the bottom.



These areas were compared to the side scan sonar trace and the contact plot and determined that these returns were not true hard bottom returns and therefore must be biological in nature.

e. There were occasions when the side scan sonar towfish became entangled in lobster trap buoy lines, temporarily whiting out the sonar gram. On these occasions, the towfish was brought on board, inspected, and serviced as necessary. All affected data were subsequently rejected and re-run.

f. The towfish was deployed exclusively from the stern during this survey.

E.5 All side scan sonar contacts greater than 1 meter were deemed significant. The majority were investigated using conventional hydrographic "splits" routinely run at 2-meter line spacing to ensure 100% vertical echo sounder coverage. A few contacts were not investigated due to their proximity to shore.

During the developments the SEABAT system operated in passive mode. This enabled the operator to "see" the bottom contours of the swath ensonified by the SEABAT, without actively collecting data. This capability was used to determine efficiently which way to turn when a contact was not directly below the single-beam echo sounder. Contacts warranting more precise depth determination were investigated using the SEABAT multibeam sonar system in acquisition mode. Since the system acquires data at an enormous rate it was brought on-line approximately 50 meters before the contact and turned off immediately after the contact had passed. The data for these investigations are summarized in the SEABAT Development Addendum in Section N of this report.

E.6 Overlap was checked on-line using the real-time swath plot, while the edited swath plot was used to identify holidays.

## **F. SOUNDING EQUIPMENT**

F.1 All hydrographic soundings were acquired using a Raytheon Model 6000N Digital Survey Echosounder (DSF-6000N). As authorized by the Project Instructions, the Reson SEABAT 9001 shallow-water multibeam sonar system was used to determine precise least depths over significant contacts discovered during routine side scan sonar operations. (Refer to the Descriptive Report for H-10605, section F.5, for a detailed description of the SEABAT system.) A summary of all SEABAT investigations conducted for this survey is contained in the SEABAT 9001 Development Addendum in Section N. Copies of all 15 least depth listings and 3-D graphic images associated with these investigations are included in Separate V.\*

F.2 Diver investigations were conducted on two items that were deemed hazardous to surface navigation. The remaining significant contacts were investigated using 100% echo sounder coverage and the SEABAT to obtain precise least depths over all potentially hazardous bottom features.

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

F.4 Both 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. Sound Velocity Correctors**

The velocity of sound through water was measured using a Sea-Bird SBE 19 Seacat Profiler (s/n 1448). Seacat Data Quality Assurance Tests were conducted after each respective velocity cast to ensure that the units were operating within tolerance. Velocity casts were conducted weekly without exception.

All data were processed using program **VELOCITY**. Computed velocity correctors were entered into the HDAPS sound velocity table and re-applied during post-processing to both high and

\* DATA FILED WITH ORIGINAL FIELD RECORDS

low frequency soundings. SEABAT sound velocity and refraction correctors were generated through the **REFRACT** subroutine and applied during post-processing.

The following velocity casts supplied correctors for this survey:

Cast Number	DN	HDAPS Table	Applied to Days
30	240	30	243-244
32	248	32	248-251
35	254	35	254-25 <del>8</del> 7
36	261	36	<del>258</del> 261-263
38	268	38	268-270
42	279	42	279
44	290	44	289-290
49	306	49	306, 312

A Mod III Diver Least depth gauge (S/N 68336 ) was used for this survey to determine the least depth on two contacts located in Dutch Harbor. The gauge was operated in accordance with section 7.2.2 of the FPM. Data Quality Assurance tests were conducted daily as well as just before and just after the dive; none exceeded the acceptable limits.

b. Leadline Comparison

A dual leadline comparison with the DSF-6000N was conducted during special project S-B900-RU-95 on:

DN 082 at 41°21.53'N and 070°46.91'W (41 ft depths)

The greatest variation between leadline and DSF soundings was 0.16 meters. Considering the ship's motion and the wire angle (approximately 5°) in the leadline from the current, this was an excellent value agreement and provided an adequate check

that the echo sounder was functioning properly. Data from these comparisons can be found in Separate IV.\*

Two types of leadline were used during the leadline-to-DSF-6000N comparison. The starboard leadline was a steel surveyor's tape graduated in feet with a fixed 5 lb weight at its end. A leadline corrector of 0.0 meters was assumed for this leadline. The port leadline was a traditional leadline made of cotton tiller with a stainless steel cable core. This leadline had a corrector of 0.25 feet up to the 45 foot mark and 0.26 feet for depths greater than 45 feet. Refer to Separate IV\* for data records.

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

c. Static Draft

During the ship's winter 1994 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 point's height above the waterline was determined. The ship's static draft was thereby calculated to be exactly 2.12 meters (7.0 feet). Refer to Separate IV\* for data records. This draft corrector was applied to all sounding data via the HDAPS offset table.

d. Dynamic Draft (Settlement and Squat Correctors)

Settlement and squat correctors for the RUDE were determined on the Elizabeth River, Norfolk, VA on January 25, 1995. 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 values obtained from the toward and away runs were averaged and applied to soundings through the HDAPS Offset Table #1. Refer to Separate IV\* for data records.

*\* DATA FILED WITH ORIGINAL FIELD RECORDS*

e. Heave, Roll, and Pitch Correctors

Heave data were acquired by a Datawell heave, roll and pitch sensor (s/n 19128-C), and applied to HDAPS soundings in real time. Only the heave corrections were applied to the plotted soundings. Heave, roll and pitch correctors were collected on line and applied to all SEABAT soundings during post-processing. Refer to Separate IV\* for data records.

f. Tide Correctors

The tidal datum for this project is Mean Lower Low Water. The operating tide station at Newport, RI (845-2660) served as both direct control for datum determination and as the reference station for predicted tides. Data for predicted tides were provided on floppy disk before the start of the project. These data were obtained from Table 2 of the East Coast of North and South America Tide Predictions and applied to the digital tide data using HDAPS software. Tidal correctors were applied on-line using HDAPS predicted tide tables numbers.

Since this sheet is located close to Newport, both the time and height correctors were direct on the predicted tides at Newport; no subordinate station was required.

Zoning for this project is consistent with the Project Instructions. A request for smooth tides was mailed on November 14, 1995. *APPROVED TIDES AND ZONING WERE APPLIED DURING OFFICE PROCESSING.*

G.2 Generally, sea conditions greater than one meter affected the graphic sounding record by creating a trace of constant peaks and deeps. Application of heave correctors to raw echo soundings appeared to represent true depths accurately.

H. CONTROL STATIONS *SEE ALSO THE EVALUATION REPORT*

The horizontal datum for this survey is the North American Datum of 1983 (NAD 83). No horizontal control stations were used or established for this survey.

\* DATA FILED WITH ORIGINAL FIELD RECORDS

NOAA Ship RUDE

Descriptive Report

H-10641

## I. HYDROGRAPHIC POSITION CONTROL

I.1 This survey was conducted exclusively using the Global Positioning System (GPS) corrected by the U.S. Coast Guard Differential GPS reference station network. Differential correctors were supplied from USCG radiobeacon transmitters, precluding the need for shore-based horizontal control stations.

I.2 Accuracy requirements were met as specified by the Hydrographic Manual and Field Procedures Manual (FPM). The Horizontal Dilution of Precision (HDOP) and Expected Position Error (EPE) specified by the FPM were monitored during on-line data collection. If the positioning degraded beyond the acceptable limits while on-line, the data were either smoothed or rejected, depending on the extent of the affected data.

### I.3 Differential GPS Equipment:

<u>Unit A</u>	<u>Unit B</u>
Ashtech GPS Sensor	Ashtech GPS Sensor
s/n 700417B1083	s/n 700417B1003
Firmware Version 1E89D-P	Firmware Version 1E89D-P
Magnavox MX50R	Magnavox MX50R
DGPS Receiver s/n 078	DGPS Receiver s/n 160

Correctors were received from the Montauk, NY, and Chatham, MA radiobeacons for the entire survey.

I.4 Daily performance checks were conducted using the Shipboard Data Integrity Monitor, or "**SHIPDIM**", (version 2.1), according to section 3.4.5 of the FPM. See SHIPDIM PERFORMANCE CHECKS in Separate III\* for weekly system checks.

I.5 The application of calibration data to the raw positioning data was not required, since DGPS was the primary positioning system.

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

*\* DATA FILED WITH ORIGINAL FIELD RECORDS*

- b. There were no equipment malfunctions.
- c. No systematic errors were detected which required adjustments.
- d. The maximum allowed HDOP of 3.55 was never exceeded.
- e. Antenna positions were corrected for offset and layback, and referenced to the position of the DSF-6000N echosounder transducer. These correctors are located in HDAPS Offset Table\* #1, and were applied on line to the positioning algorithm. A copy of Offset Table #1 is contained in Separate III.\*
- f. Offset and layback distances for the A-frame (tow point) are located in HDAPS Offset Table #1 and were 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.

**J. SHORELINE** *SEE ALSO THE EVALUATION REPORT*

No shoreline is contained within the boundaries of this survey. Shoreline information was transferred from the largest scale chart of the area to the field sheet for orientation purposes only.

**K. CROSSLINES**

A combined total of 7.41 nautical miles of crosslines was acquired for this survey, which represents 9.5% of the 79.28 nautical miles of the first 100% side scan mainscheme coverage.

An excessed plot of mainscheme soundings with crosslines superimposed was used to conduct mainscheme to crossline comparisons. Soundings at intersections were compared to all other soundings within a 5 mm (50 meter) radius. Based on this procedure, agreement between mainscheme and crossline soundings was found to be excellent, especially in areas of flat or slightly sloping relief. The majority of compared soundings

*\* DATA FILED WITH ORIGINAL FIELD RECORDS*

fell within one foot of each other, with only an occasional difference of three feet noted.

**L. JUNCTIONS** *SEE ALSO THE EVALUATION REPORT*

H-10641 does not junction with any contemporary survey.

**M. COMPARISON WITH PRIOR SURVEYS** *SEE ALSO THE EVALUATION REPORT*

A comparison with prior surveys will be performed by the Atlantic Hydrographic Branch as part of the office verification process.

**N. ITEM INVESTIGATION REPORTS** *SEE*

**N.1 Area of Investigation**

AWOIS 9422 ✓

Narragansett Bay

Reported Position:

41°28'10.36"N

071°25'08.19"W

Datum: NAD83

Feature: Wreck *ARNIE BOY*

**Description and Source of Item**

AWOIS 9422 is located just off of Bonnet Point, at the southwestern corner of the survey limits. It is marked on the chart with a dangerous wreck symbol surrounded by a danger curve and annotated as existence doubtful (ED). See the Automated Wreck and Obstruction Information System (AWOIS) listing for project OPR-B302-RU for a detailed description.

*SOURCE: NM 38/65*



## Results of Investigation

No evidence of a wreck was discovered during mainscheme side scan coverage. Due to the depth of water and the close proximity to the shore, the command decided it was unwise to investigate the item any further. Research personnel from University of Rhode Island were contacted for information pertaining to this AWOIS item, but they had no knowledge of this AWOIS. *NO CHANGE IN CHARTING STATUS IS RECOMMENDED.* ✓

## N.2 Area of Investigation

AWOIS 9423 ✓

Narragansett Bay

Reported Position:

41°29'22.36"N

071°24'05.69"W

Datum: NAD83

Feature: Obstruction

## Description and Source of Item

AWOIS 9423 is located west of Fox Hill in 15 feet of water, just outside the eastern survey limits. It is marked on the chart with a submerged crib symbol and annotated as Subm crib (cov 15Ft). See the Automated Wreck and Obstruction Information System (AWOIS) listing for project OPR-B302-RU for a detailed description. *SOURCE: H-1790 (1887)*

## Results of Investigation

AWOIS 9423 is assigned as Informational Only. No evidence of AWOIS 9423 was discovered during mainscheme side scan coverage. Several contacts in the general vicinity were found in the waters off shore from AWOIS 9423. Due to the depth of water and the close proximity to shore, it was deemed unsafe to investigate any further. *NO CHANGE IN CHARTING STATUS IS RECOMMENDED.* ✓

Information pertaining to the hydrographic development of significant side scan sonar contacts, including SEABAT 9001 multibeam sonar investigations, is contained in the following SEABAT 9001 Development Addendum.

H-10641  
SEABAT 9001 DEVELOPMENT ADDENDUM

FIX #	Contact	DEV	FILE .LST	VELOCITY	DN	GMT	RAW DEPTH (m)	TIDE CORR *(m)	LEAST DEPTH *(m)	LATITUDE (N)	LONGITUDE (W)
13001	120.25P	#5	27948902	95279121	279	133543	4.9	-0.6	4.3	41-30-30.966	071-23-23.787
13002	119.02S	#6	279106M	95279121	279	141713	3.7	-0.4	3.3	41-30-20.797	071-23-21.898
13003	705.26S	#13	27960301	95279121	279	164525	8.4	0.1	8.5	41-30-31.954	071-24-07.579
13004	966.16S	#15	27961352	95279121	279	170250	7.2	0.81	7.23	41-30-30.705	071-24-08.195
13005	926.07S	#20	28952082	95290130	289	142819	10.7	-0.6	10.1	41-30-21.619	071-24-57.649
13006	950.53P	#56	28970140	95290130	289	192916	7.8	-0.8	7.0	41-28-46.229	071-24-54.385
13007	579.53P	#8	29069540	95290130	290	191916	7.8	-0.9	6.9	41-30-06.111	071-23-48.559
13008	1150.08P	#27	29071121	95290130	290	194535	6.0	-0.9	5.1	41-29-56.362	071-24-24.236
13009	1169.26P	#30	29071539	95290130	290	195229	5.4	-0.9	4.5	41-29-54.863	071-24-21.182
13010	1903.42P	#41	30662491	95306163	306	172147	18.8	-0.5	18.3	41-29-25.121	071-24-14.040

FEET \*

14  
11  
28  
24  
33  
23  
22  
16  
15  
60

\* CORRECTED FOR APPROVED TIDES

O. COMPARISON WITH THE CHART *SEE ALSO THE EVALUATION REPORT*

O.1. The following charts are affected by this survey:

Chart 13218

"Martha's Vineyard to Block Island"

32<sup>nd</sup> ed. June 26, 1993

Scale: 1:80,000

Chart 13221

"Narragansett Bay"

50<sup>th</sup> ed. April 15, 1995

Scale: 1:40,000

Chart 13223

"Narragansett Bay Including Newport Harbor"

34<sup>th</sup> ed. January 28, 1995

Scale: 1:20,000

O.2 On November 14, 1995, a Danger to Navigation Report was sent to the Commander, First Coast Guard District, outlining the charting discrepancy found during this survey.

See Appendix I\* for a complete copy of the Danger to Navigation Report, the details of which are summarized in the following table:

<p>* THESE DEPTHS AFFECT THE FOLLOWING CHARTS:</p> <p>Chart 13223 (34<sup>th</sup> Ed. 28 January 95) Chart Scale 1:20,000</p> <p>Chart 13221 (50<sup>th</sup> Ed. 15 April 95) Chart Scale 1:40,000</p> <p>Chart 13218 (32<sup>nd</sup> Ed. 26 June 93) Chart Scale 1:80,000</p>			
** DEPTH (ft)	LATITUDE (N)	LONGITUDE (W)	HDAPS FIX #
(2.7m) 9	41°30'20.455"	71°23'22.088"	12004
(3.8m) 13 1/2	41°30'30.840"	71°23'23.981"	12003

\* Updated depths should be viewed as preliminary information, subject to office review.

\*\* Depths reduced to feet at MLLW using ~~predicted~~ tides.

APPROVED

### 0.3 Comparison of Soundings

The overall correlation between charted soundings and survey depths is excellent, with average differences of approximately one foot in flat and slightly sloping areas and no more than two to three feet in areas with irregular bottoms. *CONCUR*

The correlation between charted shoal areas and corresponding soundings from this survey is excellent.

There were two charted soundings that did not match the survey depths and required investigation. Detailed results of the investigations are listed below:

#### 0.3.1 - Area of Investigation

29 Foot Charted Sounding

Approximate Charted Sounding Location:

41°24'10"N

071°25'00"W

\* APPENDED TO REPORT

NOAA Ship RUDE

Descriptive Report

H-10641

### Results of Investigation

A 100-meter search radius around the 29' charted sounding was fully developed using the echo sounder at 10-meter line spacing.

Results from this development are listed below:

METHOD	DEPTH	DEPTH	FIX #	LATITUDE	LONGITUDE
	(M)	(FT)		(N)	(W)
ECHO SOUNDER	9.5	31.1	2810.0	41°28'13.073"	71°25'02.200"

### Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13223

"Narragansett Bay Including Newport Harbor"

34<sup>th</sup> ed. January 28, 1995

Scale: 1:20,000

It is the recommendation of the hydrographer that a <sup>APPROVED</sup> ~~predicted~~ tide corrected depth of 31 feet should be charted in position 41°28'13.073"N and 71°25'02.200"W and the 29' sounding be removed from the chart. CONCUR ✓

### 0.3.2 - Area of Investigation

31 Foot Charted Sounding

Approximate Charted Sounding Location:

41°28'43"N

71°24'04"W

### Results of Investigation

A 100-meter search radius surrounding the 31' charted sounding was fully developed using the echo sounder at 10 meter line spacing.

Results from this development are listed below:

METHOD	DEPTH	DEPTH	FIX #	LATITUDE	LONGITUDE
	(M)	(FT)		(N)	(W)
ECHO SOUNDER	10.88	35.74	2833.6	41°28'46.166"	71°24'07.299"

#### Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13223

"Narragansett Bay Including Newport Harbor"

34<sup>th</sup> ed. January 28, 1995

Scale: 1:20,000

It is the recommendation of the hydrographer that a <sup>APPROVED</sup> ~~predicted~~ tide corrected depth of 35 feet should be charted in position 41°28'46.166"N and 71°24'07.299"W and the 31' sounding be removed. *CONCUR ✓*

#### 0.4 Comparison of Non-Sounding Features *SEE ALSO EVALUATION REPORT*

A dangerous wreck symbol surrounded by a danger curve located in position 41°30'18"N 71°24'30"W is charted on chart 13218, but not on the other two larger scale charts of the area. This item was not assigned nor was it seen during mainscheme side scan coverage. No further investigation was done. ~~See~~

Two obstructions were discovered during the course of this survey, both of which are dangerous to surface navigation. Detailed results of the investigations are listed below:

##### 0.4.1 - Area of Investigation

###### Obstruction

West Passage, Narragansett Bay

### Description and Source of Item

The uncharted obstruction was discovered during mainscheme side scan sonar coverage.

### Results of Investigation

The remains of an old anchor was first logged on side scan sonar as contact #120.25P It was fully developed with the echo sounder during development #5 and later investigated with SEABAT (Fix #13001) and by diver investigation (<sup>Fix 12003</sup>~~306.1~~). The obstruction was determined by diver investigation to be a large anchor embedded in the bottom. See dive report in Separate VI\* for further details.

Results from this development are listed below:

METHOD	DEPTH (m)	DEPTH (FT)	FIX #	LATITUDE (N)	LONGITUDE (W)
ECHO SOUNDER	4.2	13.8	2581.3	41°30'30.879"	71°23'23.787"
SEABAT	4.3	14.1	13001	41°30'30.966"	71°23'23.787"
DIVER	3. <del>98</del>	12. <del>95</del>	12003	41°30'30.840"	71°23'23.981"

### Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13223  
"Narragansett Bay Including Newport Harbor"  
34<sup>th</sup> ed. January 28, 1995  
Scale: 1:20,000

It is the recommendation of the hydrographer that a <sup>APPROVED</sup> predicted tide corrected depth of ~~13~~ feet, surrounded by a danger curve, should be charted in position 41°30'30.840"N and 71°23'23.981"W <sup>CONCUR</sup> and annotated as an obstruction (Obstn). ~~APPROVED~~ <sup>CONCUR</sup>

Chart 12: Obstn

*9/16/96*

\* DATA FILED WITH ORIGINAL FIELD RECORDS

NOAA Ship RUDE

Descriptive Report

H-10641



#### 0.4.2 - Area of Investigation

##### Obstruction

West Passage, Narragansett Bay

##### Description and Source of Item

The uncharted obstruction was discovered during mainscheme side scan sonar coverage.

##### Results of Investigation

The remains of what appears to be a metal chute was first logged on side scan as contact #119.02S. This contact was fully developed using echo sounder during development #6 and later investigated with SEABAT (#13002) and by diver investigation (306.2). Divers discovered an object protruding up out of the bottom for 9 feet and then bent over at an angle and extending another 28 feet before resting on the bottom. For further details see the dive report in Separate IV.\*

Results from this development are listed below:

METHOD	DEPTH (m)	DEPTH (FT)	FIX #	LATITUDE (N)	LONGITUDE (W)
ECHO SOUNDER	5.1	16.7	2593.2	41°30'20.225"	71°23'21.980"
SEABAT	3.3	10.8	13002	41°30'20.3297"	71°23'21.898"
DIVER	2.87	9.2 28.8	12004	41°30'20.455"	71°23'22.088"

##### Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13223

"Narragansett Bay Including Newport Harbor"

34<sup>th</sup> ed. January 28, 1995

Scale: 1:20,00

*\* DATA FILED WITH ORIGINAL FIELD RECORDS*

NOAA Ship RUDE

Descriptive Report

H-10641

It is the recommendation of the hydrographer that an <sup>APPROVED</sup> predicted tide corrected depth of 9 feet, surrounded by a danger curve, should be charted in position  $41^{\circ}30'20.455''\text{N}$  and  $71^{\circ}23'22.088''\text{W}$  and annotated as an obstruction (Obstn). CONCUR ✓

Chart 13223: Obstn

O.5 A 60' contour line should be added to chart 13223 in two locations, approximately in positions:  $41^{\circ}29'39''\text{N}$   $71^{\circ}24'20''\text{W}$  (just south of Dutch Island) and  $41^{\circ}28'10''\text{N}$   $71^{\circ}24'10''\text{W}$  (just west of Beaver Neck). See the excess depth plot for the exact locations. No other changes should be made to the scale, coverage, or format of the published charts for this area are recommended. CONCUR

#### P. ADEQUACY OF SURVEY

This survey is complete and fully adequate to supersede prior survey data in common areas.

#### Q. AIDS TO NAVIGATION

##### Non-Floating

No non-floating aids to navigation exist within the limits of this survey.

##### Floating

Detached positions were taken on two (2) floating aids to navigation located in the boundaries of this survey. A comparison was made between the detached positions, the 1995 edition of Light List, Volume I, and the largest scale chart of the area. No floating aid was found to deviate from its published or charted position by no more than a few meters. All floating aids adequately serve the apparent purpose for which they were established.

## **R. STATISTICS**

R.1 a.	Number of Positions . . . . .	2870
b.	Lineal Nautical Miles of Sounding Lines:	
	Nautical Miles of Survey With the Use of Side Scan Sonar . . . . .	.146.56
	Nautical Miles of Survey Without the Use of Side Scan Sonar . . . . .	.146.80
R.2 a.	Square Nautical Miles of Hydrography per 100% of Coverage . . . . .	2.80
b.	Days of Production . . . . .	20
c.	Detached Positions . . . . .	40
	38 Bottom Samples	
	2 Buoys Detached Positions	
d.	Bottom Samples . . . . .	38
e.	Tide Stations . . . . .	0
g.	Velocity Casts . . . . .	8
j.	SEABAT Item Investigations . . . . .	10

## **S. MISCELLANEOUS *SEE ALSO THE EVALUATION REPORT***

S.1 No evidence of silting was found during this survey.

No evidence of anomalous tides or tidal current conditions was found during this survey.

S.2 Thirty-eight (38) bottom samples were obtained during this survey. As directed by the Project Instructions, all bottom samples were inspected and recorded, but none were submitted to the Smithsonian Institution.

## **T. RECOMMENDATIONS**

T.1 See Section O.2 for a danger to navigation noted during this survey.

T.2 The RUDE is not aware of any construction or dredging that will affect results of this survey.

T.3 No further investigation of the survey area is recommended.

**U. REFERRAL TO REPORTS**

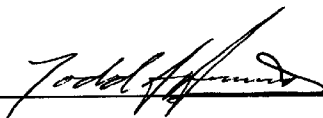
Reference is made in section F to the Descriptive Report for H-10605 for an explanation of the SEABAT System.

This report and the accompanying field sheets are respectfully submitted.



---

Cheryl L. Thacker, LT, NOAA  
Executive Officer  
NOAA Ship RUDE



---

Todd A. Haupt, LTJG, NOAA  
Field Operations Officer  
NOAA Ship RUDE

### APPENDIX III

#### LIST OF HORIZONTAL CONTROL STATIONS

No horizontal control stations were needed for this survey since Differential GPS was employed exclusively for all positioning control. The geographic positions for the two Differential GPS radio beacons used during this survey are as follows:

Montauk Point, NY	<sup>.0814</sup> 41°04'02. <del>046</del> "N 071°51'38. <del>268</del> "W <sup>.4588</sup>
Chatham, MA	41°40'16.297"N 069°57'00.162"W

---



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Office of NOAA Corps Operations  
NOAA Ship RUDE S-590  
439 W. York Street  
Norfolk, VA 23510-1114

November 14, 1995

Commander  
First Coast Guard District  
Aids To Navigation Office  
408 Atlantic Avenue  
Boston, Massachusetts 02110-3350

### REPORT OF DANGER TO NAVIGATION

Dear Sir:

The NOAA Ship RUDE recently completed a hydrographic survey centered approximately 1.50 nautical miles south of the Jamestown Bridge in the West Passage of Narragansett Bay, Rhode Island. During the course of this survey, two obstructions were found which are not shown on the three charts which affect the area: chart 13223 (34th Ed. 28 January 1995), chart 13221 (50th Ed. 15 April 1995) and chart 13218 (32nd Ed. 26 June 1993). It is requested that these discrepancies be published in the Local Notice to Mariners.

The updated depths are given in the following table. The attached chartlet shows the survey boundaries and the plotted position of the depths. The two least depths should be depicted as shown on the chartlet, surrounded by the "danger curve" with a "Obstn" symbol attached. All information is preliminary and subject to office review.

These items were subject to hydrographic development using a Raytheon DSF-6000N survey echo sounder, a Reson SEABAT 9001 shallow-water multibeam sonar system, and a dive investigation using a diver least depth gauge. The resultant least depths were obtained from the dive investigations. All depths have been reduced to Mean Lower Low Water (MLLW) by applying predicted tide corrections. The horizontal datum is NAD 83.

This investigation was performed in support of the following hydrographic survey:

Hydrographic Survey Registry No....H-10641  
State.....Rhode Island  
General Locality.....Narragansett Bay  
Locality.....Vicinity of Dutch Island  
Project Number.....B302-RU-95  
Surveyed by.....NOAA Ship RUDE



\* THESE DEPTHS AFFECT THE FOLLOWING CHARTS:

Chart 13223 (34<sup>th</sup> Ed. 28 January 95)  
Chart Scale 1:20,000

Chart 13221 (50<sup>th</sup> Ed. 15 April 95)  
Chart Scale 1:40,000

Chart 13218 (32<sup>nd</sup> Ed. 26 June 93)  
Chart Scale 1:80,000

** DEPTH (ft)	LATITUDE	LONGITUDE
9 Obsdn	41°30'20.45"N	071°23'22.09"W
12 1/2 Obsdn	41°30'30.84"N	071°23'23.98"W

\* Updated depths should be viewed as preliminary information, subject to office review.

\*\* Depths reduced to feet at MLLW using <sup>APPROVED</sup> predicted tides.

Contact either of the following personnel for further information:

Commanding Officer  
NOAA Ship RUDE  
439 West York St.  
Norfolk, VA 23510  
804-441-6386

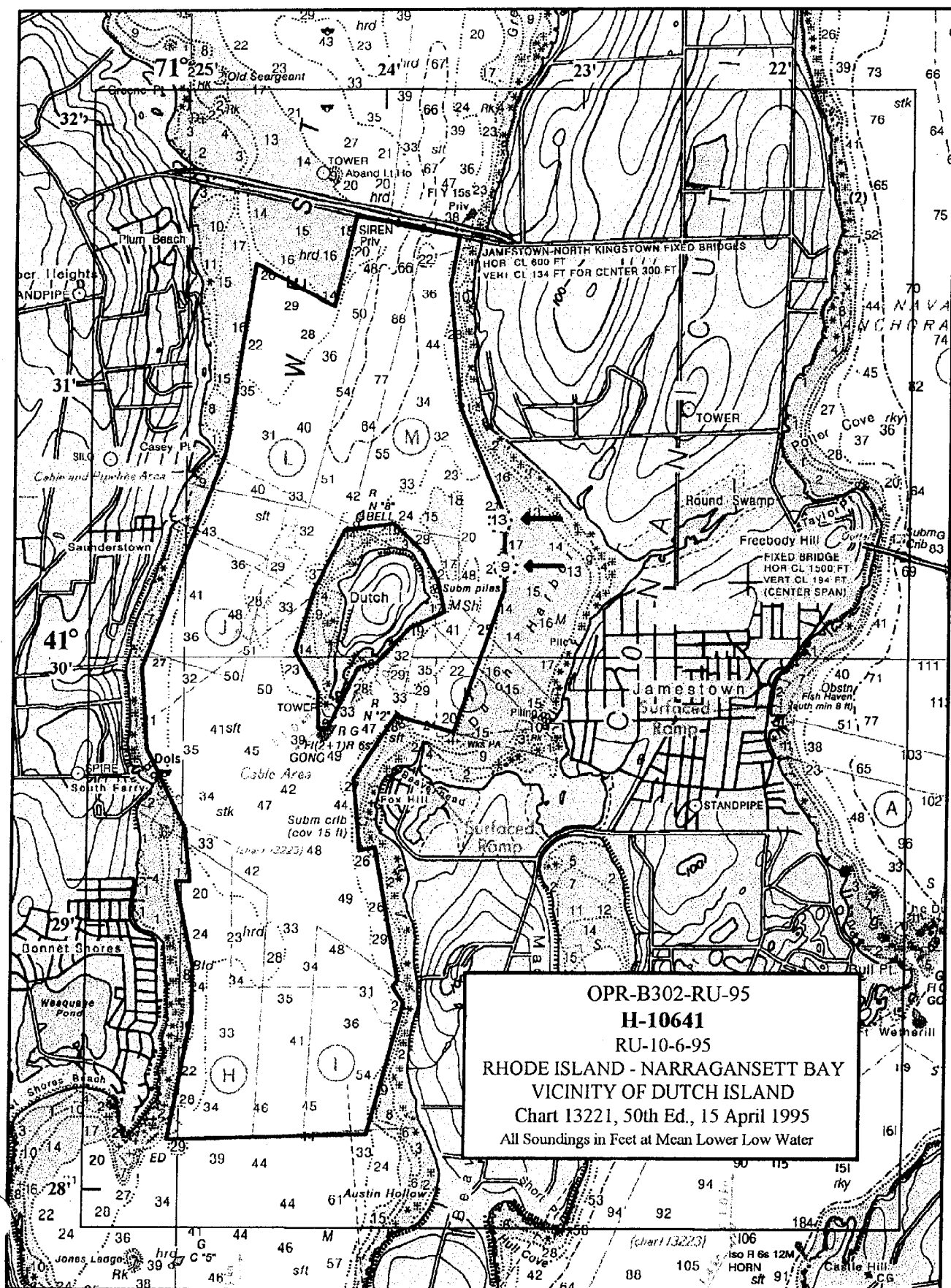
Chief, Atlantic Hydrographic Branch  
Atlantic Marine Center  
439 W. York St.  
Norfolk, VA 23510  
804-441-6746

Sincerely,

*Samuel P. De Bow*

Samuel P. De Bow  
Commander, NOAA  
Commanding Officer, NOAA Ship RUDE





APPENDIX VII

APPROVAL SHEET

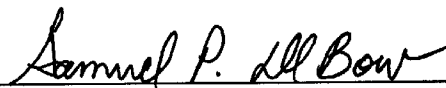
LETTER OF APPROVAL

REGISTRY NO. H-10641

This report and the accompanying field sheets are respectfully submitted.

Field operations contributing to the accomplishment of this Navigable Area survey were conducted under my direct supervision with frequent personal checks of progress and adequacy. All field sheets and reports were reviewed in their entirety and all supporting records were checked as well.

This survey was completed with 200% side scan sonar coverage and is more than adequate to supersede ALL prior surveys in common areas. The survey is considered complete and adequate for nautical charting.



---

Samuel P. De Bow, CDR, 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  
Silver Spring, Maryland 20910

### TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: March 21, 1996

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-B302

HYDROGRAPHIC SHEET: H-10641

LOCALITY: Rhode Island, Narragansett Bay In the vicinity of  
Dutch Island

TIME PERIOD: August 31 - November 8, 1995

TIDE STATION USED: 845-2660 Newport, R.I.  
Lat.  $41^{\circ} 30.3'N$  Lon.  $71^{\circ} 19.6'W$

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. In West Passage, Narragansett Bay, north of  $41^{\circ} 31.0'N$ , apply a +6 minute time correction, and a X0.97 range ratio to heights using Newport, R.I. (845-2660)
2. In West Passage, Narragansett Bay, south of  $41^{\circ} 31.0'N$ , and north of  $41^{\circ} 28.5'N$ , times and heights are direct on Newport, R.I. (845-2660).
3. In West Passage, Narragansett Bay, south of  $41^{\circ} 28.5'N$ , times are direct, and apply a X0.97 range ratio to heights using on Newport, R.I. (845-2660).

Notes: 1. Times are tabulated in Greenwich Mean Time.  
2. Data for Newport, R.I. (845-2660) are temporarily stored in file #645-2660.  
3. Zoning is not provided for East Passage on this tide note. If needed, refer to H-10616.

*William M. Johnson*  
CHIEF, DATUMS SECTION



## GEOGRAPHIC NAMES

H-10641

Name on Survey	CHART NO. 13218 ON PREVIOUS SURVEY									
	A	B	C	D	E	F	G	H	K	
	ON U.S. QUADRANGLE MAPS									
	FROM LOCAL INFORMATION									
	ON LOCAL MAPS									
	P.O. GUIDE OR MAP									
	RAND McNALLY ATLAS									
	U.S. LIGHT LIST									
BEAVERHEAD (cape)	X		X							1
BONNET, THE (cape)	X		X							2
BONNET POINT	X		X							3
BONNET SHORES (pp1)	X		X							4
CASEY POINT	X		X							5
CONANICUT ISLAND	X		X							6
DUTCH ISLAND	X		X							7
DUTCH ISLAND HARBOR	X		X							8
FOX HILL	X		X							9
GREAT CREEK	X		X							10
NARRAGANSETT BAY (title)	X		X							11
PLUM BEACH (pp1)	X		X							12
PLUM BEACH POINT	X		X							13
RHODE ISLAND (title)	X		X							14
SAUNDERSTOWN	X		X							15
SHEFFIELD COVE	X		X							16
SLOCUM LEDGE	X		X							17
SOUTH FERRY (pp1)	X		X							18
WEST PASSAGE	X		X							19
										20
										21
										22
										23
										24
										25

Approved

Chief Geographer

AUG 7 1996

## LETTER TRANSMITTING DATA

N/CS33-114-96

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY  
(Check):☐ ORDINARY MAIL☐ AIR MAIL☐ REGISTERED MAIL☒ EXPRESS☐ GBL (Give number) \_\_\_\_\_

DATE FORWARDED

25 OCT 1996

NUMBER OF PACKAGES

ONE TUBE

TO:

Chief, Data Control Group, N/CS3x1  
NOAA/National Ocean Service  
Station 6815, SSMC3  
1315 East-West Highway  
Silver Spring, Maryland 20910-3282

**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.

H-10641

RHODE ISLAND, NARRAGANSETT BAY, VICINTY OF DUTCH ISLAND

1 (ONE) Tube containing the following:

1 SMOOTH SHEET (H-10641)

1 ORIGINAL DESCRIPTIVE REPORT

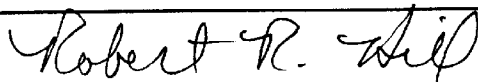
1 Composite Drawing for chart #13223

1 H-Drawing for chart #13223

1 Drawing History Form #76-71 for chart # 13223

FROM: (Signature)

Robert R. Hill Jr.

RECEIVED THE ABOVE  
(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch  
N/CS33  
439 West York Street  
Norfolk, VA 23510-1114

10/25/96

HYDROGRAPHIC SURVEY STATISTICS  
REGISTRY NUMBER: H-10641

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	2870
NUMBER OF SOUNDINGS	15068

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	5	12/12/95
VERIFICATION OF FIELD DATA	53	07/30/96
QUALITY CONTROL CHECKS	0	
EVALUATION AND ANALYSIS	14	
FINAL INSPECTION	6	09/07/96
COMPILATION	19	10/24/96
TOTAL TIME	97	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		09/13/96

---

**ATLANTIC HYDROGRAPHIC BRANCH  
EVALUATION REPORT FOR H-10641 (1995)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

**D. AUTOMATED DATA ACQUISITION AND PROCESSING**

The following software was used to process data at the Atlantic Hydrographic Branch:

Hydrographic Processing System  
AutoCAD, Release 12  
QUICKSURF, version 5.1  
NADCON, version 2.10  
MicroStation, version 5.0  
I/RAS B, version 5.01

The smooth sheet was plotted using an ENCAD NovaJet III plotter.

**H. CONTROL STATIONS**

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27 datum, move the projection lines 0.367 seconds (11.321 meters or 1.13 mm at the scale of the survey) north in latitude and 1.803 seconds (41.812 meters or 4.18 mm at the scale of the survey) east in longitude.

**J. SHORELINE**

Brown shoreline originates with NOS chart 13221 (50<sup>th</sup> Edition, Apr. 15/95) and is for orientation purposes only.

**L. JUNCTIONS**

There are no junctional surveys adjacent to the present survey. Present survey depths are in general harmony with charted depths in the junctional areas.



**M. COMPARISON WITH PRIOR SURVEYS**

A comparison with prior surveys was not made in accordance with section 4. of the memorandum titled, "Changes to Hydrographic Survey Processing," dated May 24, 1995.

Data was acquired east of Dutch Island; however, only 100% side scan sonar coverage was obtained in this area. A comparison was made with prior surveys H-8367 (1956-57) and H-8367 Ad. Wk. (1963-64) where only 100% side scan sonar coverage was obtained. These two prior surveys compare favorably with present survey depths being 1-2 feet ( $0^3-0^6$  m) deeper than prior survey depths. These changes may be attributed to natural change and improved surveying technology.

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

**O. COMPARISON WITH CHARTS 13218 (32<sup>nd</sup> Edition, Jun 26/93)  
13221 (50<sup>th</sup> Edition, Apr 15/95)  
13223 (34<sup>th</sup> Edition, Jan 28/95)**

The charted hydrography originates with prior surveys and miscellaneous sources. An adequate comparison with the charted depths is made by the hydrographer in section O. of the Descriptive Report and requires no further consideration. Attention is directed to the following:

1. An uncharted obstruction with a depth of 24 feet ( $7^3$  m), in Latitude  $41^{\circ}30'30.71''N$ , Longitude  $71^{\circ}24'08.19''W$ , was located by the field unit. It is recommended that this feature be charted as shown on the present survey.

2. An uncharted obstruction with a depth of 22 feet ( $6^9$  m), in Latitude  $41^{\circ}30'06.11''N$ , Longitude  $71^{\circ}23'48.56''W$ , was located by the field unit. It is recommended that this feature be charted as shown on the present survey.

3. A charted rock with a depth of 37 feet ( $11^3$  m), in Latitude  $41^{\circ}30'17.88''N$ , Longitude  $71^{\circ}24'19.05''W$ , originates

with prior survey FE-368SS (1992) and is shown on chart 13223. This feature was not investigated by the field unit. A charted 37 foot depth (11<sup>3</sup> m), in the same position, is shown on chart 13221. This feature is not currently shown on chart 13218. It is recommended that this feature be retained on chart 13223. It is also recommended that charts 13218 and 13221 be revised to show this feature as shown on chart 13223.

#### **O.4. COMPARISON OF NON-SOUNDING FEATURES**

AWOIS Item #2414, a charted dangerous wreck, PA with a danger curve, located in Latitude 41°30'18.36"N, Longitude 71°24'28.19"W, on chart 13218, originates with Local Notice to Mariners 42 of 1976 (LNM42/76). This feature was disproved by prior survey FE-368SS (1992). There was no requirement to investigate this item. It is recommended that the dangerous wreck, PA be removed from chart 13218.

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

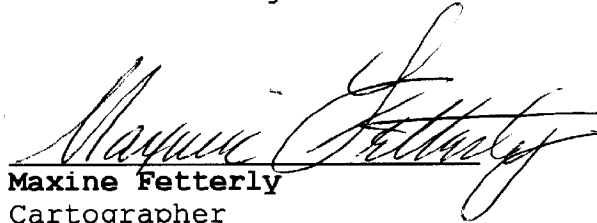
#### **P. ADEQUACY OF SURVEY**

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

#### **S. MISCELLANEOUS**

Chart compilation was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compiled data will be forwarded to Marine Chart Division, Silver Spring, Maryland.

RUDE Processing Team

A handwritten signature in cursive script, reading "Maxine Fetterly", written over a horizontal line.

**Maxine Fetterly**  
Cartographer  
Verification of Field Data  
Evaluation and Analysis

APPROVAL SHEET

H-10641

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 digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Robert G. Roberson Date: 13 SEPTEMBER 1996  
Robert G. Roberson  
Chief, Cartographic 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 Date: September 13, 1996  
Nicholas E. Perugini  
Commander, NOAA  
Chief, Atlantic Hydrographic Branch

\*\*\*\*\*

Final Approval:

Approved: Andrew A. Armstrong, III Date: Dec. 9, 1996  
Andrew A. Armstrong, III  
Captain, NOAA  
Chief, Hydrographic Surveys Division

MARINE CHART BRANCH  
**RECORD OF APPLICATION TO CHARTS**

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10641

## 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.

[illegible]