

H10633

NOAA FORM 76-35A

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-10-5-95.....
Registry No. H-10633.....

LOCALITY

State Rhode Island.....
General Locality . Narragansett Bay.....
Sublocality Rumstick Neck Reach.....

19 95

CHIEF OF PARTY

..... CDR. S. P. De Bow.....

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DATE SEP 18 1996.....

NOAA FORM 77-28
(11-72)

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

REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-10633

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-10-5-95

State Rhode Island

General locality Narragansett Bay

Locality Rumstick Neck Reach

Scale 1:10,000

Date of survey August 21-September 6, 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 S.P. De Bow, LT C.L. Callahan, ENS T.A. Haupt, ENS J.J. Walker, ST M.T. Lathrop

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

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

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

Protracted by _____ Automated plot by ENCAD NOVAJET III (AMB)

Verification by ATLANTIC HYDROGRAPHIC BRANCH PERSONNEL

Soundings in (fathoms, feet, or meters at MLW or MLLW) FEET
Meters at MLLW

REMARKS: All times recorded in UTC.

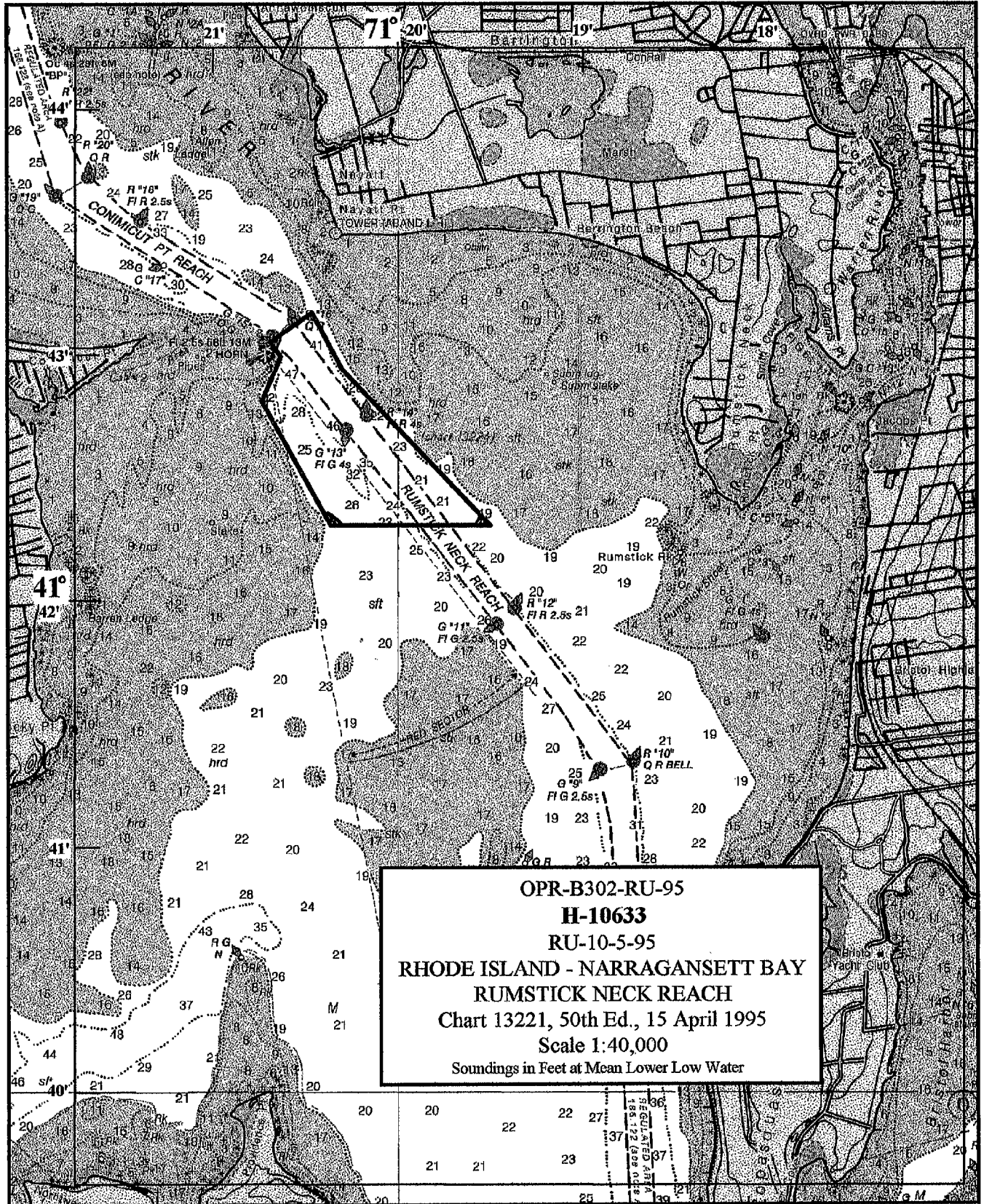
The DSF-6000N was used as the primary sounding instrument; however, as warranted,
the SEABAT 9001 shallow-water multibeam sonar system was employed for distinct
item investigations and is documented as such.

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

SEP 18 1996 SC

SURF/AW01S 9/25/96 MCR

9/26/96 GKM



OPR-B302-RU-95
 H-10633
 RU-10-5-95
 RHODE ISLAND - NARRAGANSETT BAY
 RUMSTICK NECK REACH
 Chart 13221, 50th Ed., 15 April 1995
 Scale 1:40,000
 Soundings in Feet at Mean Lower Low Water

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APPENDICES

SEPARATES - DATA FILED 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~~, *April 27*, 1995, and Change No. 2, dated ~~July 13~~, *JUNE 26*, 1995.

A.4 This Descriptive Report covers the navigable area survey conducted on sheet "J" 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 shipping corridor is heavily used by a variety of deep-draft vessels, such as tankers, freighters, and barges. The average draft of the vessels is between 32 and 38 feet, with maximum drafts of up to 40 feet.

B. AREA SURVEYED

B.1 The area surveyed was the northern half of Rumstick Neck Reach, Narragansett Bay, RI. Rumstick Neck Reach is a federally-maintained channel with a controlling depth of 40.2 feet. It was last surveyed by the Corps of Engineers in January, 1993.

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

NE Corner - 41°43'15"N, 071°20'³/₁₀"W
NW Corner - 41°43'05"N, 071°20'50"W
SW Corner - 41°42'15"N, 071°20'35"W
SE Corner - 41°42'15"N, 071°19'20"W

Section 1.8 of the Project Instructions stipulated the inshore limit of hydrography to be the 18-foot curve. However, the operational constraints of maneuvering a 90-foot long, 7-foot draft vessel in rapidly shoaling water often ruled out the possibility of attaining 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 21, 1995 (DN 233) and ended on September 6, 1995 (DN 249).

C. SURVEY VESSELS

C.1 The following vessel was used during this survey:

Vessel	EDP Number	Primary Function
NOAA Ship RUDE (S590)	9040	Hydrography, Side Scan Operations and SEABAT Investigations

C.2 During the RUDE's January 1994 dry-dock period, the ship 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, 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 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

Program	Version	Program	Version
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 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 corrections. **VELOCITY's REFRACT** subroutine was used to correct SEABAT multiple slant-range depths for sound velocity, and 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, 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 **LSTDRUD** (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. Graphic plots of the SEABAT imagery were created using **SURFER for Windows** (Version 5.03), a commercial off-the-shelf graphics package.

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 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 buoy anchors or sand waves were encountered. These features were routinely annotated on the sonar grams.

c. Two hundred percent side scan coverage was completed for this survey. Areas of reduced coverage occasionally occurred when the ship was forced to maneuver around buoys, lobster pots, or small clam boats. 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. Data degraded by thermocline or prop wash were collected during portions of this survey. All affected data were subsequently rejected and re-run, depending on the quality of the return.

e. The towfish was deployed exclusively from the stern.

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.

Most of the contacts were boulders which required a number of development lines to be fully ensonified. 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 obtain 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 the associated 3-D graphic images are included in Separate V. (*DATA FILED WITH ORIGINAL FIELD RECORDS*)

F.2 No other sounding equipment was used.

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). Velocity casts were conducted weekly without exception. Seacat Data Quality Assurance Tests were conducted after each respective velocity cast to ensure that the unit was operating within tolerance.

All sound velocity 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 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
29	233	29	233-234 236-237
31	241	31	241-242
33	249	33	249

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 (47⁵ ft depths)

The greatest variation between leadline and DSF soundings was 0.1³/₈ 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~~^{up to} the 45 foot mark and 0.26 feet for depths greater than 45 feet. Refer to ^{*}Separate IV for data records.

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 measured. The ship's static draft was 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 through 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, Virginia 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

* DATA FILED WITH ORIGINAL FIELD RECORDS

The RUDE employed no unusual or unique methods or instruments to correct echo soundings.

All sounding correctors were applied to both the narrow (100 kHz) and wide (24 kHz) DSF-6000N beams. Zoning for this project is consistent with the Project Instructions.

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.

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 program ("SHIPDIM", Version 2.1), according to section 3.4.5 of the FPM. See SHIPDIM PERFORMANCE CHECKS in*Separate III for daily 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.

b. There were no equipment malfunctions.

c. No systematic errors were detected which required adjustments.

d. The maximum allowed HDOP value of 3.58 was never exceeded.

e. Antenna positions were corrected for offset and layback, and referenced to the position of the DSF-6000N echo sounder 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.

** DATA FILED WITH ORIGINAL FIELD RECORDS*

K. CROSSLINES

A combined total of 1.75 nautical miles of crosslines was acquired for this survey, representing 15% of the 11.62 nautical miles of the first 100% side scan mainscheme coverage.

An excessed plot of mainscheme soundings, superimposed with crosslines, 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. The majority of compared soundings fell within one foot of each other, with only an occasional difference of two or three feet noted.

L. JUNCTIONS *SEE ALSO THE EVALUATION REPORT*

H-10633 does not junction with any contemporary survey. *concur*

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

No AWOIS items were assigned for this survey.

Information pertaining to the SEABAT 9001 multibeam sonar investigations is contained in the following SEABAT 9001 Development Addendum.

SEABAT 9001 DEVELOPMENT ADDENDUM

FIX #	Contact	DEV	FILE .LST	VEICAST	DN	GMT	RAW DEPTH (m)	*TIDE CORR (m)	*LEAST DEPTH (m)	LATITUDE (N)	LONGITUDE (W)
13001	133.27P	#3	24258359	95241130	242	161305	14.5	-1.87	12.98	41-42-57.086	71-20-24.620
13002	31.51S	#8	24259786	95241130	242	163634	8.4	-1.96	6.98	41-42-49.109	71-20-13.635
13003	131.02P	#16	24260090	95241130	242	164138	11.0	-1.96	9.94	41-42-43.920	71-20-08.704
13004	91.37S	#34	24260558	95241130	242	164926	10.0	-1.45	8.85	41-42-29.350	71-20-04.503
13005	24.42S	#22	24964709	95249130	249	175840	6.9	-0.43	6.86	41-42-38.021	71-20-02.024

FEET
42
22
31
28
21

* CORRECTED FOR APPROVED TIDES

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

O.1 Two charts are affected by this survey:

Chart 13221
"Narragansett Bay"
50th ed. April 15, 1995
Scale: 1:40,000

Chart 13224
"Providence River"
34th ed. February 12, 1994
Scale: 1:20,000

O.2 No Danger to Navigation reports were submitted for this survey.

O.3 a. 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*

b. No shoaling or deepening trends were found in the survey - *Do NOT CONCUR.*
area. However, the shoal area west of Conimicut Light appeared to extend to a point just southwest of the Light, significantly farther than its depiction on the chart. This discrepancy was observed from the RUDE on the afternoon of Friday, August 25. The extent of the shoal was unusually visible due to the extreme tide range caused by Spring tide conditions. The RUDE was instructed by the Hydrographic Surveys Division not to conduct a further investigation of the area.

c. The controlling depths for Rumstick Neck Reach, as listed on chart 13224, are as follows:

Controlling Depths from Seaward in Feet at Mean Lower Low Water

Left Outside Quarter	Left Inside Quarter	Right Inside Quarter	Right Outside Quarter
35.8	40.2	40.4	34.8

All soundings in the channel were within specified parameters. *Do Not Concur*
The majority of the significant contacts were at the edges of the channel, and were most likely debris generated from the creation of the channel.

P. ADEQUACY OF SURVEY *SEE ALSO THE EVALUATION REPORT*

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

Q. AIDS TO NAVIGATION

Non-Floating

One non-floating aid to navigation exists adjacent to the limits of the survey area. It was not physically located during this survey. Conimicut Light (Light List #18305) adequately marks the offshore limit of Conimicut Pt. shoal.

Floating

Detached positions were taken on 4 floating aids to navigation located in, or near, 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 more than a few meters. Each floating aid adequately serves the apparent purpose for which it was established.

R. STATISTICS

R.1 a. Number of Positions	627
b. Lineal Nautical Miles of Sounding Lines:	
Nautical Miles of Survey With the Use	
of Side Scan Sonar	23.03
Nautical Miles of Survey Without the Use	
of Side Scan Sonar	29.99

R.2 a. Square Nautical Miles of Hydrography per 100% of Coverage	0.36
b. Days of Production7
c. Detached Positions4
d. Bottom Samples8
e. Tide Stations	1
g. Velocity Casts3
j. SEABAT Item Investigations5

S. MISCELLANEOUS

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

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

S.2 Eight (8) 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 No additional field work is required.


T.2 The hydrographer is aware of no construction or dredging that will affect results of this survey. Rumstick Neck Reach is a federal channel maintained by the U.S. Corps of Engineers. A copy of the most recent condition survey is included in the graphic records cahier.

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

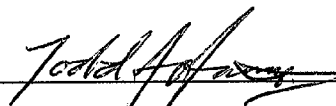
U. REFERRAL TO REPORTS

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.



Jessica J. Walker, ENS, NOAA



Todd A. Haupt, ENS, 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 (MPPB)

41°04'02.04⁷"N
071°51'38.268²⁷⁴"W

Chatham, MA

41°40'16.297"N
069°57'00.162"W

APPENDIX VII

APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. H-10633

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

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 20, 1996

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-B302

HYDROGRAPHIC SHEET: H-10633

LOCALITY: Rhode Island, Narragansett Bay Rumstick Neck Reach

TIME PERIOD: August 21 - September 6, 1995

TIDE STATION USED: 845-1929 Bristol Harbor, R.I.
Lat. $41^{\circ} 40.1'N$ Lon. $71^{\circ} 16.7'W$

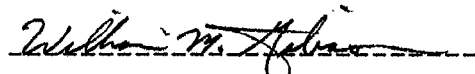
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 3.24 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.2 ft.

REMARKS: RECOMMENDED ZONING

1. In Bristol Harbor and the head of Narragansett Bay south of $41^{\circ} 40.9'N$, times and heights are direct using Bristol Harbor, R.I. (845-1929).
2. In the head of Narragansett Bay north of $41^{\circ} 40.9'N$, and south of $41^{\circ} 42.4'N$, times are direct, and apply a X1.04 range ratio to heights using Bristol Harbor, R.I. (845-1929).
3. In the head of Narragansett Bay and entrance of the Providence River, north of $41^{\circ} 42.4'N$, times are direct and apply a X1.12 range ratio to heights using Bristol Harbor, R.I. (845-1929).

Notes: 1. Times are tabulated in Greenwich Mean Time.
2. Data for Bristol Harbor, R.I. (845-1929) are temporarily stored in file #645-1929.


CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 13221 B ON PREVIOUS SURVEY NO. 13221 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											
	CONIMICUT POINT	X		X								
CONIMICUT POINT REACH	X		X									2
NARRAGANSETT BAY (title)	X		X									3
NAYATT POINT	X		X									4
PROVIDENCE RIVER	X		X									5
RHODE ISLAND (title)	X		X									6
RUMSTICK NECK	X		X									7
RUMSTICK NECK REACH	X		X									8
RUMSTICK POINT	X		X									9
												10
												11
												12
												13
												14
												15
												16
												17
												18
												19
									Approved			20
									<i>Chris A. ...</i>			21
									Chief Geographer			22
												23
									AUG 9 1996			24
												25

09/11/96

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10633

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		627
NUMBER OF SOUNDINGS		3511
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	28	11/21/95
VERIFICATION OF FIELD DATA	37.50	08/19/96
QUALITY CONTROL CHECKS	0	
EVALUATION AND ANALYSIS	13.50	
FINAL INSPECTION	3	07/18/96
COMPILATION	23	09/05/96
TOTAL TIME	105	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		08/29/96

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10633 (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 North American Datum of 1983 (NAD 83) and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27 datum, move the projection lines 0.365 seconds (11.263 meters or 1.13 mm at the scale of the survey) north in latitude and 1.813 seconds (41.915 meters or 4.19 mm at the scale of the survey) east in longitude.

J. SHORELINE

The brown shoreline originates with NOS chart 13221 (50th Edition, April 15, 1995) 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 the 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.

**N. COMPARISON WITH CHARTS 13221 (50th Edition, Apr 15/1995)
13224 (34th Edition, Feb 12/1994)**

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:

The 18-foot curve has migrated southwest in the vicinity of Latitude 41°42'30"N, Longitude 71°19'45"W and Latitude 41°42'50"N, Longitude 71°20'12"W. The 30-foot curve between Latitude 41°42'27"N, Longitude 71°20'12"W and Latitude 41°42'45"N, Longitude 71°20'27"W has migrated in a northeast direction.

O.3.c. Controlling Depths

1) An uncharted obstruction with a depth of 39 feet (11⁹ m), in Latitude 41°42'45.69"N, Longitude 71°20'16.64"W, was located by the field unit. The charted project depth for Rumstick Neck Reach channel is 40 feet (12² m). The charted controlling depth for the left outside quarter of this channel is 40.2 feet (12² m) in January, 1993. It is recommended that the obstruction be charted as shown on the present survey unless subsequent information indicates otherwise.

2) Shoaling to 22 feet (6⁷ m) has occurred in Rumstick Neck Reach between Latitude 41°42'35"N and Latitude 41°42'55"N. The charted project depth for Rumstick Neck Reach channel is 40 feet (12² m). The charted controlling depth for the right outside quarter of this channel is 34.8 feet (10⁶ m) in January, 1993. It is recommended that the area be charted as shown on the present survey unless subsequent information indicates otherwise.

A letter, dated 15 July 1996, was sent to Mr. Andrew Lamberghini, New England District, U.S. Army Corps of Engineers (USACE), to notify the USACE of these situations.

A copy of the letter is appended to this report.

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

Richard W. Blevins
Richard W. Blevins
Cartographer
Verification of Field Data

Maxine Fetterly
Maxine Fetterly
Cartographer
Evaluation and Analysis

APPROVAL SHEET
H-10633

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: August 29, 1996
Robert G. Roberson
Cartographer
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: August 29, 1996
Nicholas E. Perugini
Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: Andrew A. Armstrong, III Date: Sept 30, 1996
Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEANIC SERVICE
Coast and Geodetic Survey
Norfolk, Virginia 23510-1114

July 15, 1996

Mr. Andrew Lamberghini
Department of the Army
New England Division
U.S. Army Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02254

Dear Mr. Lamberghini,

Enclosed is a preliminary plot showing hydrographic survey data collected by the NOAA Ship RUDE in the vicinity of Rumstick Neck Reach on the Providence River. The side scan sonar survey was conducted by the RUDE in August, 1995. A small feature was detected on both the echo sounding and the side scan sonar records which indicates a least depth shoaler than the tabulated 40.2 foot controlling depth of the inside quarter of the channel. The least depth on this feature was determined to be 39.7 feet at Mean Lower Low Water (MLLW). The feature is located at the following NAD83 geographic coordinates:

Lat: 41° 42' 45.69" N,
Lon: 71° 20' 16.63" W.

It should also be noted that the 30 foot contour has encroached on the right outside quarter of the channel between buoys R"14" and R"16." Depths shoaler than 30 feet have been noted in this area.

If you have further questions concerning this survey, please contact me at 757-441-6746.

Sincerely,

Nicholas E. Perugini, CDR, NOAA
Chief, Atlantic Hydrographic Branch

Enclosures

cc. N/CS31 - Humphrey
Northeast Pilots - Captain Fisher





PROVIDENCE RIVER CHANNEL DEPTHS

AS SURVEYED BY THE CORPS OF ENGINEERS, REPORT OF JAN 1993

AND SURVEYED BY THE CORPS OF ENGINEERS, REPORT OF JAN 1993

AS SURVEYED BY THE CORPS OF ENGINEERS, REPORT OF JAN 1993

STATION	ELEVATION	DEPTH	DATE OF SURVEY	PROJECT DIMENSIONS		
					ADJ. TO	LENGTH
				(FEET)	(MILES)	(FEET)
100+00	42.2	16.0	1-93	600-1700	5.4	4.0
100+20	42.2	14.0	1-93	600	2.2	4.0
100+40	42.2	12.0	1-93	600	1.0	4.0
100+60	42.2	10.0	1-93	600	2.1	4.0
100+80	42.2	8.0	1-93	600-1000	1.0	4.0
101+00	42.2	6.0	1-93	600-1700	1.5	4.0

THE CORPS OF ENGINEERS FOR CHANGES SUBSEQUENT TO THE ABOVE INFORMATION

BY THE CORPS OF ENGINEERS

SUPPLEMENTARY BARRIERS

THE BARRIERS WERE DESIGNED TO PROTECT THE

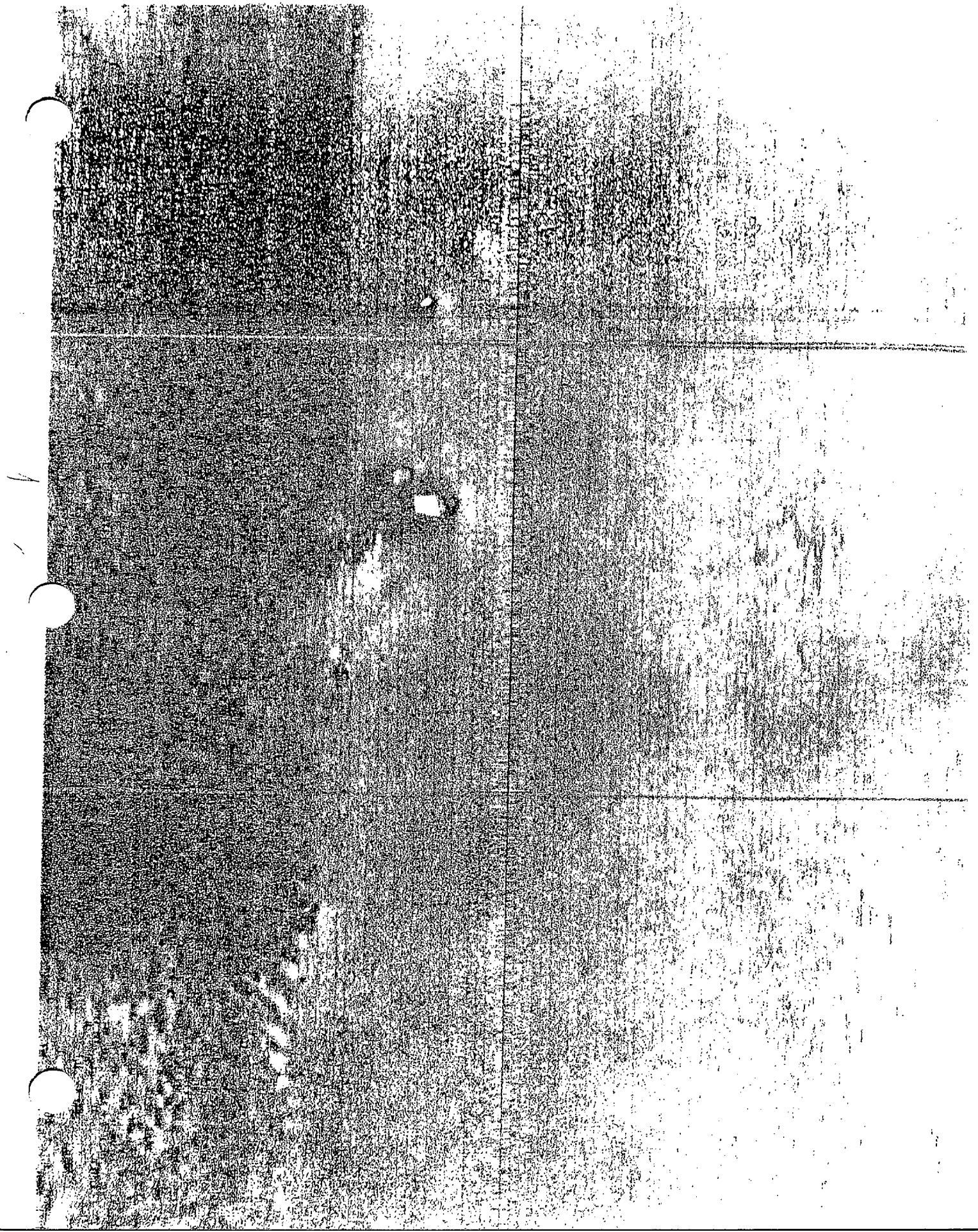
FROM THE RIVER CHANNEL DEPTHS

AND TO MAINTAIN THE WATER LEVEL OVER THE

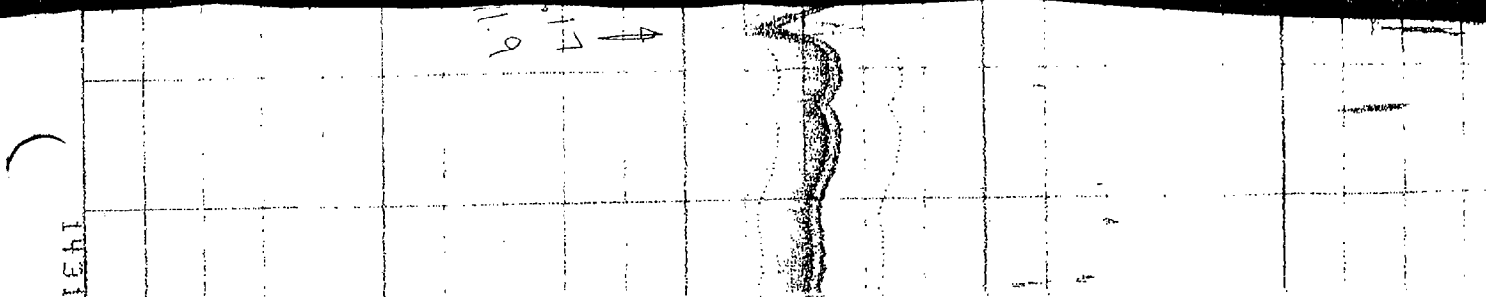
AT MEAN LOWER LOW

HORIZONTAL DATUM

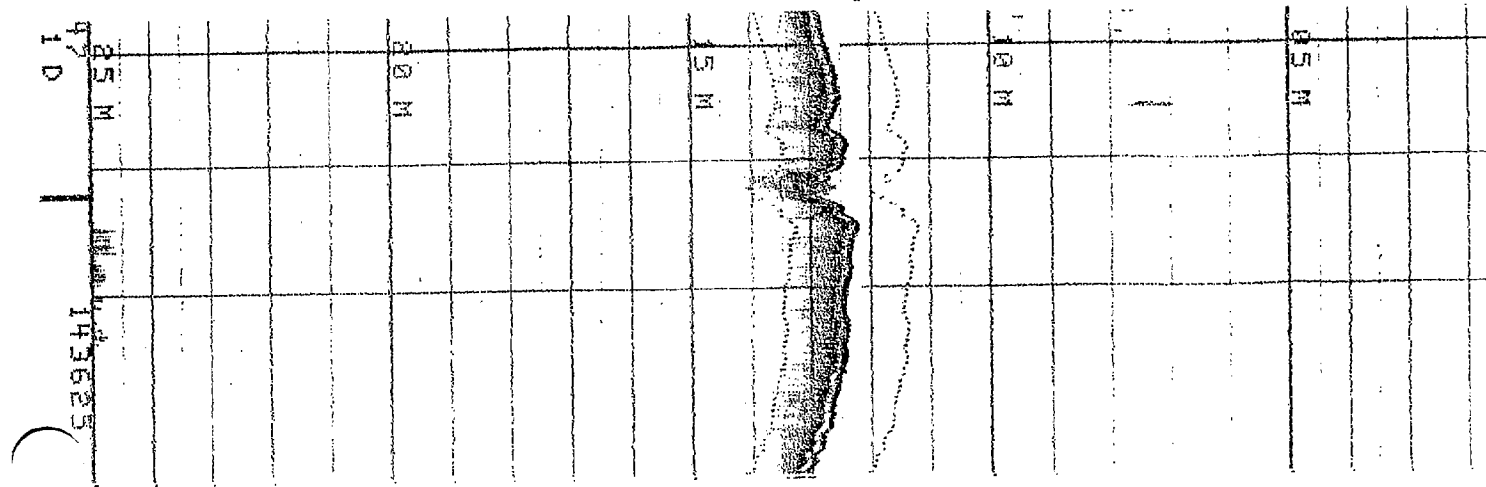
The horizontal reference datum of this chart is North American Datum of 1983 (NAD 83) which for charting purposes is considered equivalent to the World Geodetic System of 1984 (WGS 84). Geographic positions referred to the North American Datum of 1927 must be corrected an average of 365' northward and 804' eastward to agree with the datum of 1983.



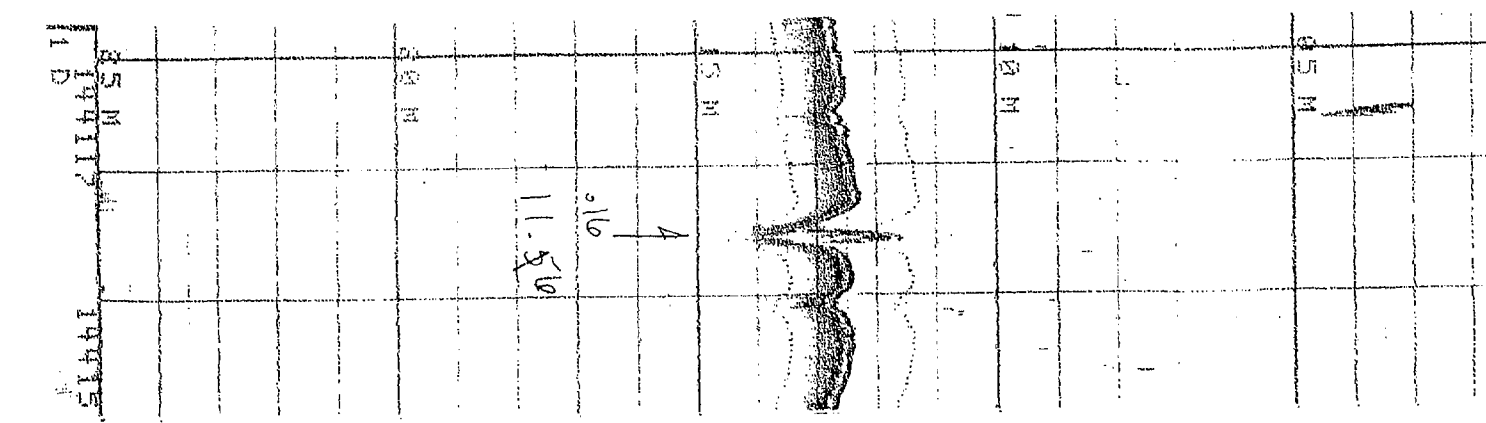
11.7
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LTLA UR 317°T 592A

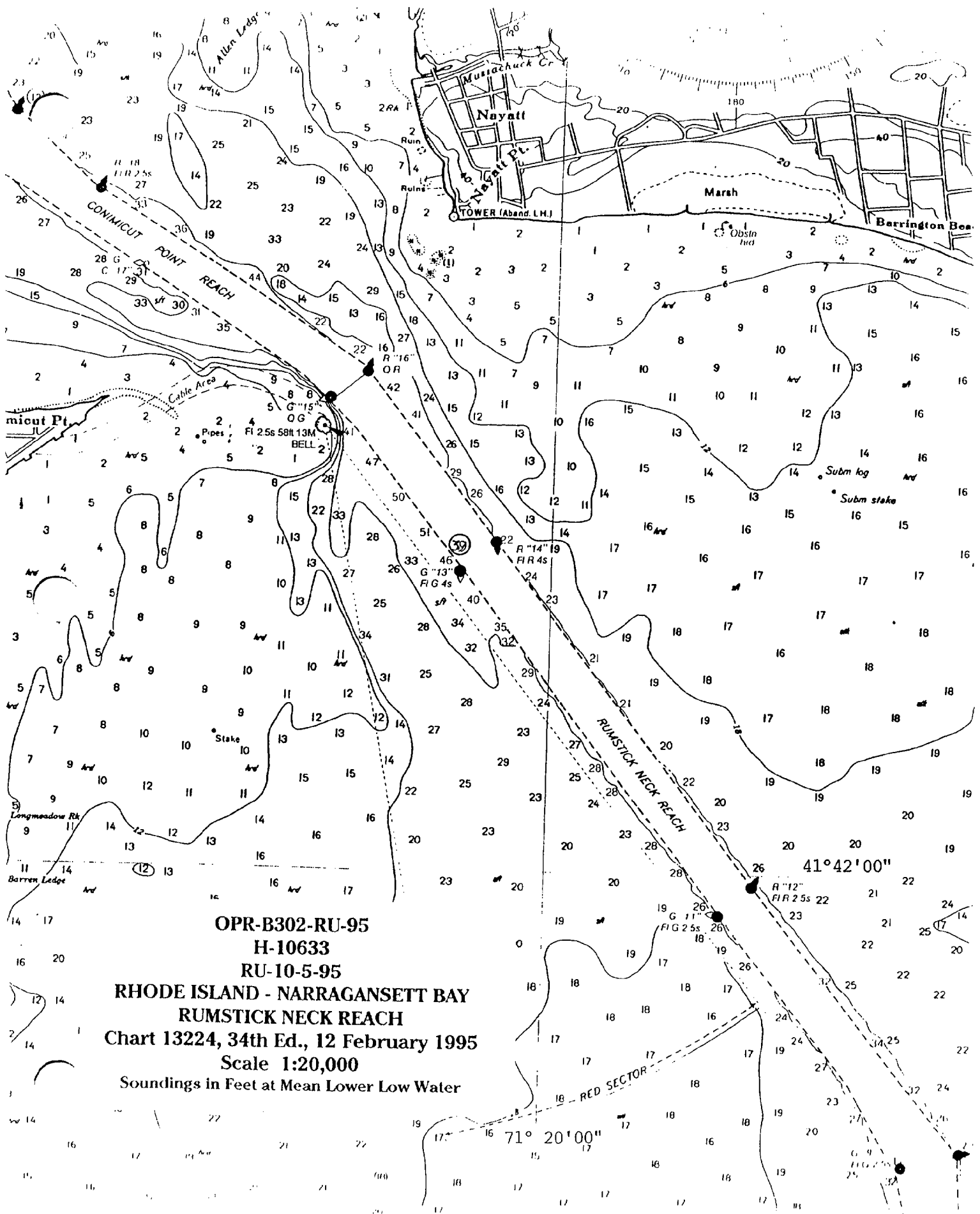


LTLA UR 137°T 590A



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OPR-B302-RU-95
H-10633
RU-10-5-95
RHODE ISLAND - NARRAGANSETT BAY
RUMSTICK NECK REACH
 Chart 13224, 34th Ed., 12 February 1995
 Scale 1:20,000
 Soundings in Feet at Mean Lower Low Water

