

H10720

| | |
|--|---------------------------------|
| 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-10-6-96 |
| Registry No. | H-10720 |
| LOCALITY | |
| State | Rhode Island |
| General Locality | Narragansett Bay |
| Sublocality | Conanicut Park to Davisville |
| Depot | |
| 19 96 | |
| CHIEF OF PARTY CDR S. P. De Bow | |
| LIBRARY & ARCHIVES | |
| DATE | JUN 18 1998 |

NOAA FORM 77-28
(11-72)

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

REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-10720

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-10-6-96

State Rhode Island

General locality Narragansett Bay

Locality ~~Quonset Point and Davisville Depot Channel~~ CONANICUT PASS TO DAVISVILLE DEPOT

Scale 1:10,000

Date of survey 23 September - 05 November, 1996

Instructions dated 08 October 1996

Project No. OPR-B302-RU

Vessel NOAA Ship RUDE, EDP 9040

Chief of party Commander Samuel P. De Bow, NOAA

Surveyed by CDR S.P. De Bow, LT C.L. Thacker, LTJG J.M. Klay, LT J.G. Evjen, LCDR J.E. Lowell

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

Graphic record scaled by SPD, CLT, JMK, ST M.T. Lathrop, ST C.A. Neely

Graphic record checked by SPD, CLT, JMK, JGE, MTL, CAN, JEL

Protracted by _____ Automated plot by Bruning Zeta Model 936 (FIELD)

Verification by ATLANTIC HYDROGRAPHIC BRANCH PERSONNEL

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

REMARKS: _____

All times recorded in UTC.

The DSF-6000N echosounder was used as the primary sounding instrument.

The SEABAT 9001 shallow water multibeam sonar system was employed for item investigations.

NOTES IN RED WERE MADE IN THE D.A. DURING OFFICE PROCESSING

AWOIS & SUITE, 6/15/98
mcr

GRAPHIC SCALE
OPER-B302-RU
1996 EXTENSION TO

**RHODE ISLAND SOUND CORRIDOR
SHEET LAYOUT AND
PROJECT LIMITS SKETCH**

Approved: JWH 9/18/96

"K"

**76cm X 76cm
1:10,000**

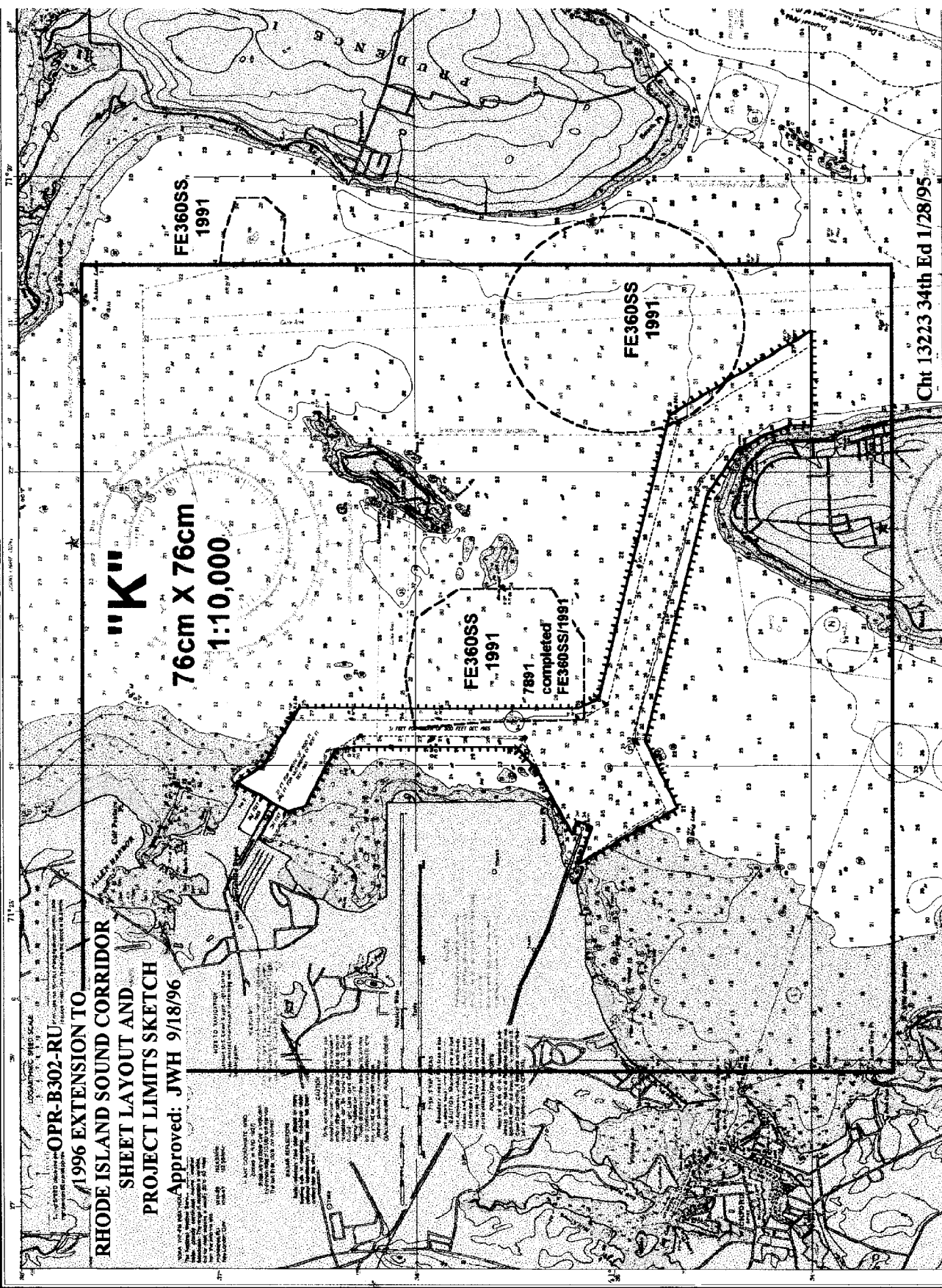


TABLE OF CONTENTS

A. PROJECT 1

B. AREA SURVEYED 2

C. SURVEY VESSELS 3

D. AUTOMATED DATA ACQUISITION AND PROCESSING 3

E. SONAR EQUIPMENT 4

F. SOUNDING EQUIPMENT 5

G. CORRECTIONS TO SOUNDINGS 6

H. CONTROL STATIONS 8

I. HYDROGRAPHIC POSITION CONTROL 8

J. SHORELINE 9

K. CROSSLINES 9

L. JUNCTIONS 10

M. COMPARISON WITH PRIOR SURVEYS 10

N. ITEM INVESTIGATION REPORTS 11

O. COMPARISON WITH THE CHART 15

P. ADEQUACY OF SURVEY 15

Q. AIDS TO NAVIGATION 15

R. STATISTICS 16

S. MISCELLANEOUS 16

T. RECOMMENDATIONS 16

U. REFERRAL TO REPORTS 16

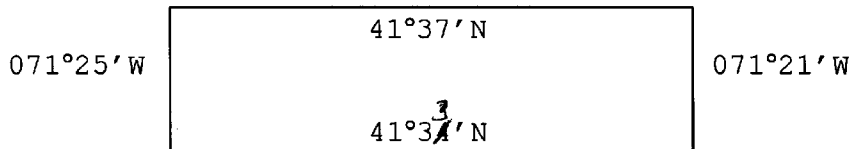
APPENDICES } FILED WITH THE ORIGINAL FIELD RECORDS
SEPARATES }

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 four amendments to the instructions:
Change #1, dated ~~May 10~~^{Apr 27}, 1995
Change #2, dated ~~July 13~~^{July 12}, 1995
Change #3, dated June 24, 1996
Change #4, dated October 08, 1996.
- A.4 This Descriptive Report covers the navigable area survey conducted on sheet "K" of project OPR-B302-RU in Rhode Island Sound Corridor as specified in the Project Instructions.
- A.5 This survey responds to requests from the Northeast Marine Pilots to survey approaches to Davisville Depot. The area was previously surveyed in the mid-1960's when the approach channel was maintained by the US Navy. Although the channel is no longer maintained, recent industrial development of the area has dramatically increased the frequency of deep draft (28 feet) shipping to the Depot. RUDE conducted item investigations in the vicinity in 1991.

B. AREA SURVEYED

- B.1 The area surveyed is the 3.5 nm buoyed channel between Conanicut Point and Davisville Depot in Narragansett Bay.
- B.2 The survey is comprised of one sheet with the following approximate boundaries:



- B.3 Data acquisition for this survey began on September 23, 1996 (DN 267) and ended on November 05, 1996 (DN 310).

C. SURVEY VESSELS

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

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

D.1 Coastal Oceanographics' **HYPACK for Windows** (Version 5.9) was used for data acquisition and the following HDAPS software versions were used for data processing:

| Program | Version | Program | Version |
|----------------|----------------|----------------|----------------|
| BACKUP | 2.00 | LSTAWOIS | 3.12 |
| BLKEDIT | 2.03 | MAINMENU | 1.30 |
| CARTO | 2.18 | MAN_DATA | 3.05 |
| CLASSIFY | 2.14 | NEWPOST | 6.13 |
| CONTACT | 2.49 | PLOTALL | 2.37 |
| CONVERT | 3.67 | PREDICT | 2.01 |
| DAS_SURV | 6.83 | PRESURV | 7.14 |
| DP | 2.19 | QUICK | 2.09 |
| EXCESS | 4.33 | RAMSAVER | 1.02 |
| FILESYS | 3.46 | REAPPLY | 2.13 |
| GRAFEDIT | 1.10 | ZOOMEDIT | 2.36 |
| 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 Triton Corporation's **ISIS** software (Version 2.16) was used to acquire SEABAT multibeam and digital side scan sonar data. SEABAT data was processed onboard the RUDE using the XTFRUDE software developed by HTP. A single least depth was generated for each SEABAT investigation and later entered into HDAPS via the **HSDUtils** Convert 15 point files program. Graphic plots of the SEABAT imagery were created using **SURFER for Windows** (Version 6.00), a commercial off-the-shelf graphics package.

The conversion software to translate HYPACK data into HDAPS-compatible format was supplied by NOAA's Hydrographics Surveys Division. The **HSDUtils Convert Hypack Data** program was revised numerous times during the course of the survey.

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 75-meter range scale was used at a line spacing of 60 meters to obtain complete 200% area coverage. Data collected with an EPE of 15 or greater were either rejected or smoothed during post-processing, so the maximum line spacing was never exceeded.
- 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. Areas of reduced coverage occasionally occurred when the ship was forced to maneuver for traffic or obstacles in the water, such as 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 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. Any data degraded by towfish instability, thermocline, or prop wash were rejected and reacquired.
 - e. The towfish was deployed exclusively from the stern during this survey.
- E.5 All side scan sonar contacts with heights greater than 0.5 meter were deemed significant. All significant contacts were developed with echo sounder, SEABAT, or diver investigations. Investigations of significant side scan sonar contacts were conducted using both the echo sounder and the SEABAT to acquire data.

Since the accuracy of the SEABAT unit was verified in previous field seasons through rigorous echo sounder/SEABAT comparisons, a greater reliance was placed upon the unit during this survey. If the imagery showed that a contact had been fully ensonified by the SEABAT, the investigation would typically be called complete, even without an exhaustive echo sounder development. Some items were developed more than once with the SEABAT. Generally all of these developments produced an HDAPS Detached Position (DP), several of which may be on the same feature. The data for these investigations are summarized in the Development Abstract and the DP/Remarks Listing in Separate V* of this report.

F. SOUNDING EQUIPMENT

- F.1 All hydrographic soundings were acquired using a Raytheon Model 6000N Digital Survey Echo sounder (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-10686, section F.1, 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.*

** FILED WITH THE ORIGINAL FIELD RECORDS*

- F.2 During dive investigations, least depths were measured with a MOD III diver gauge (s/n 68336) supplied by the Electronic Engineering Division at the Atlantic Marine Center.
- 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 1251). Velocity casts were conducted weekly without exception. Seacat Data Quality Assurance Tests were conducted after each respective velocity cast to ensure that the units were operating within tolerance.

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 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 # | HDAPS Table # | DN | Applied to Days |
|--------|---------------|-----|--------------------|
| 09 | 09 | 267 | 267 |
| 14 | 14 | 285 | 285, 289 |
| 16 | 16 | 295 | 295, 298 |
| 19 | 19 | 304 | 304, 305, 306, 310 |

G.1b A dual leadline comparison with the DSF-6000N was conducted on May 21, 1996 (DN 142) at 40°31.05'N and 073°51.27'W in 41 ft depths.

The greatest variation between leadline and DSF-60 soundings was 0.44 meters, and averaged .19 meters.

Considering the ship's motion and the wire angle (approximately 5°) in the leadline from the current, both comparisons were considered a good agreement value and provided an adequate check that the echo sounder was functioning properly. Data from these comparisons can be found in Separate IV.*

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. Measurements taken on May 14, 1996 confirmed the accuracy of this draft value. 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, VA, on March 13, 1996. 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.

e. Heave, Roll, and Pitch Correctors

Heave, roll, and pitch data were acquired by a **TSS Model 335B Motion Sensor (s/n 542)**. Heave corrections were applied to HYPACK soundings during the HYPACK-to-HDAPS conversion. 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)

* FILED WITH THE ORIGINAL FIELD RECORDS

served as both direct control for datum determination and as the reference station for predicted tides. Tide correctors were developed by applying a +6 minute time correction and a x1.08 range ratio to the predicted tides at Newport, RI. Data for predicted tides were provided on floppy disk before the start of the project. Tidal data used during data processing 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 in post processing using HDAPS predicted tide tables numbers.

APPROVED TIDES AND ZONING WERE APPLIED DURING OFFICE PROCESSING
Zoning for this project is consistent with the Project Instructions. A request for smooth tides was mailed on December 20, 1996.

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 Position control for this survey was provided by the NAVSTAR Global Positioning System (GPS) augmented with the U.S. Coast Guard Differential GPS service. The following differential sites were used:

PRIMARY SITE: Montauk, NY 41°04'N, 071°52'W
CHECK SITE: Chatham, MA 41°40'N, 069°57'W

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 080 |

- 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 weekly system checks. The program MONITOR was run twelve (12) hours recording data from the Montauk DGPS beacon. Refer to Separate III* for plots.
- 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 of 3.55 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 during post-processing. 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 during post-processing. 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.

K. CROSSLINES

- K.1 A total of 2.66 nm of crosslines were acquired for this survey, 8.9% of the first 100% mainscheme coverage.
- K.2 A mainscheme sounding plot was superimposed with crosslines to conduct sounding comparisons. Crossline soundings were compared to all mainscheme soundings within 5 mm (50 meters). The overall agreement between

** FILED WITH THE ORIGINAL FIELD RECORDS*

soundings is excellent, with average differences of about one foot.

L. JUNCTIONS *SEE ALSO THE EVALUATION REPORT.*

- L.1 This survey junctions with FE360SS, a 1:10,000-scale survey on the eastern edge of this survey, completed by RUDE in 1991. *SURVEY IS CONSIDERED A REUR SURVEY*
- L.2 The overall agreement of all junctions was excellent: the average difference in soundings was less than 0.5 meters.

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

A comparison with prior surveys will be performed by the Atlantic Hydrographic Branch.

N. ITEM INVESTIGATION REPORTS

Not AWOIS

Item Description: Obstruction
Source: Side Scan Sonar Contact 2505.8S
AWOIS Position: N/A
Required Investigation: N/A
Charts Affected: 13221, 13223

Investigation

Date (s)/DN (s): 10-31-96 / DN 305
Position Numbers: 3605-3614, 40059

Positioned Determined by: DGPS

Investigation Summary: 200% side scan sonar, echo sounder, SEABAT developments, and diver investigation made. Divers found a 10-12 foot section of steel dredge pipe angling up approximately 6 feet out of a soft, muddy bottom. Diver least depth data was determined to be unusable for this item therefore the SEABAT least depth should be charted.

| METHOD | DEPTH | DEPTH | FIX # | LATITUDE | LONGITUDE |
|--------------|---------|----------------------|--------|--------------|--------------|
| | (M) | (FT) | | (N) | (W) |
| Echo Sounder | 4.9 6.2 | 19.3 20.3 | 3606.0 | 41/36/28.247 | 71/23/32.975 |
| SEABAT | 5.5 5.8 | 19.0 18.0 | 40059 | 41/36/28.240 | 71/23/32.944 |

Charting Recommendation

Hydrographer recommends charting the ¹⁸~~19~~ foot least depth, annotated as Obstruction (Obstr), in position 41°36'28.240"N and 71°23'32.944"W. *CONCOR.*

COMPILATION NOTES

CHART AS 18' Obstr

Not AWOIS

Item Description: Obstruction
Source: Side Scan Sonar Contact 2515.3P
AWOIS Position: N/A
Required Investigation: N/A
Charts Affected: 13221, 13223

Investigation

Date (s)/DN (s): 10-31-96 / DN 305

Position Numbers: 3615-3624, 40053, Dive DP 602

Positioned Determined by: DGPS

Investigation Summary: : The contact was discovered during mainscheme side scan sonar lines approximately 165 feet SE of the SE corner of berth #2 at Davisville Depot. Divers found a solitary rock rising approximately 2 feet off the bottom.

| METHOD | DEPTH | DEPTH | FIX # | LATITUDE | LONGITUDE |
|--------------|-------------------|-----------------------------------|--------|--------------|--------------|
| | (M) | (FT) | | (N) | (W) |
| Echo Sounder | 9.7# | 31.82 ^{28.82} | 3615.1 | 41/36/46.212 | 71/24/10.909 |
| Diver | 9.13 ₂ | 29.95 ^{28.82} | 602 | 41/36/46.371 | 71/24/10.931 |
| SEABAT 8.8 | 9.12 | 29.92 | 40053 | 41/36/46.348 | 71/24/10.914 |

Charting Recommendation

Hydrographer recommends charting the SEABAT ²⁹~~30~~ foot least depth, annotated as Rock (Rk), in position 41°36'46.348"N and 71°24'10.914"W. *DO NOT CONCOR, FALLS WITHIN A DREDGED CHANNEL OF 27 FEET*

COMPILATION NOTES

Not AWOIS

Item Description: Obstruction
Source: Side Scan Sonar Contact 2518.2P
AWOIS Position: N/A
Required Investigation: N/A
Charts Affected: 13221, 13223

Investigation

Date (s)/DN (s): 10-31-96 / DN 305

Position Numbers: 3625-3634, 40057, Dive DP 600

Positioned Determined by: DGPS

Investigation Summary: : The contact was discovered during mainscheme side scan sonar lines within the slip between Berth #1 and berth #2 at Davisville Depot. Diver investigation found a cluster of boulders, the largest rising approximately 2 feet off the bottom (See drawing). The least depth was taken on the largest boulder which had approximate dimensions of 3' X 4' X 2'.

| METHOD | DEPTH | DEPTH | FIX # | LATITUDE | LONGITUDE |
|-----------------------------|-------|------------------|--------|--------------|--------------|
| | (M) | (FT) | | (N) | (W) |
| Echo Sounder 9.9 | 10.2 | 33.5 | 3633.0 | 41/36/48.782 | 71/24/17.309 |
| Diver 9.0 | 8.95 | 29.53 | 600 | 41/36/48.918 | 71/24/17.214 |
| SEABAT 8.8 | 9.01 | 29.56 | 40057 | 41/36/49.889 | 71/24/18.791 |

~~28.9~~

Charting Recommendation

Hydrographer recommends charting a 29 foot diver least depth, annotated as Rock (Rk), in position 41°36'48.918"N and 71°24'17.214"W. *DO NOT CONCUR, FALL IN AREA BETWEEN PIERS WHERE DEPTHS OF 23 FEET WERE FOUND.*

COMPILATION NOTES

Not AWOIS

Item Description: Obstruction
Source: Side Scan Sonar Contact 1205.2S
AWOIS Position: N/A
Required Investigation: N/A
Charts Affected: 13221, 13223

Investigation

Date (s)/DN (s): 10-31-96 / DN 305

Position Numbers: 3590-3604

Positioned Determined by: DGPS

Investigation Summary: The contact was discovered during mainscheme side scan sonar lines and developed with echo sounder, and SEABAT. The SEABAT investigation found a 6.0 m (19.7 ft) sounding, HDAPS DP 40047.

| Method | Depth (m) | Depth (ft) | Fix # | Latitude (N) | Longitude (W) |
|--------|-------------------|------------|-------|--------------|---------------|
| SEABAT | 5.86.0 | 19.70 | 40047 | 41°36'28.813 | 71°23'40.490 |

Charting Recommendation

Hydrographer recommends charting the 19 foot least depth, surrounded by a danger curve and annotated as an obstruction (Obstn) in position 40°36'28.813" N, 071°23'40.490" W. *Conclude*

COMPILATION NOTES

CHART AS (29) OBSTN

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 13223
"Narragansett Bay"
34th ed. January 28, 1995
Scale: 1:20,000

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

O.3a The overall agreement between charted soundings and survey depths is excellent, with average differences of about one foot.

O.3b There is some shoaling at the southwestern part of the Davisville Depot dredged channel.

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

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

Q. AIDS TO NAVIGATION *SEE ALSO THE EVALUATION REPORT*

Q.1 Detached positions were taken on 19 floating aids to navigation located in or near the boundaries of this survey.

Q.2 A comparison was made between the detached positions, the 1997 edition of Light List, 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 aid adequately serves the apparent purpose for which it was established.

- Q.3 All aids located during the survey are shown in the Light List.
- Q.4 There were no submarine or overhead pipelines, cables, tunnels, bridges, or ferry routes found in the survey area.

R. STATISTICS

| | | |
|------|---|-------|
| R.1a | Number of Positions | 2750 |
| b | Lineal Nautical Miles of Sounding Lines | 67.43 |
| R.2a | Square Nautical Miles of Hydrography | 1.5 |
| b | Days of Production | 9 |
| c | Detached Positions | 25 |
| d | Bottom Samples | 29 |
| e | Tide Stations | 1 |
| g | Velocity Casts | 4 |
| j | SEABAT Item Investigations | 20 |

S. MISCELLANEOUS *SEE ALSO THE EVALUATION REPORT.*

- S.1 No evidence of silting, unusual submarine features, anomalous tide or tidal current conditions, or magnetic anomalies were detected during this survey.
- S.2 Bottom samples were inspected and recorded but not submitted to the Smithsonian Institution.

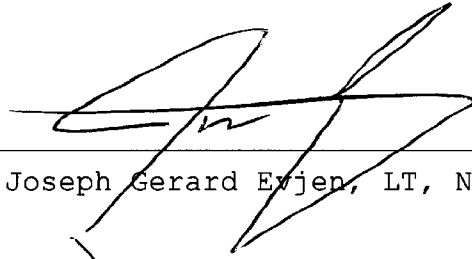
T. RECOMMENDATIONS

- T.1 No additional field work is required.
- T.2 The hydrographer is aware of no construction or dredging which will affect the results of this survey.
- T.3 No further investigation of the survey area is recommended.

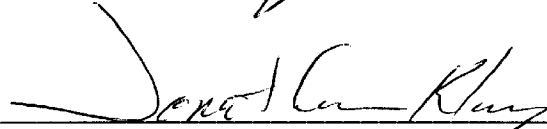
U. REFERRAL TO REPORTS

See the H-10686 Descriptive Report for a detailed explanation of the SEABAT System.

This report and the accompanying field sheets are respectfully submitted.



Joseph Gerard Evjen, LT, NOAA



Jonathan Klay, LT, NOAA
Field Operations Officer
NOAA Ship RUDE

APPENDIX VII

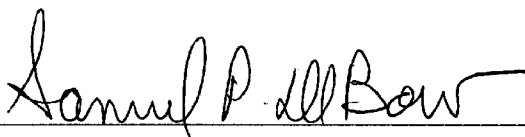
APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. H-10720

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

This survey 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



**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**

March 26, 1998

Memorandum For: Commander Nicholas Perugini, NOAA
Chief, Atlantic Hydrographic Branch

From: *David A. Cole*
Lieutenant Commander David A. Cole, NOAA
Commanding Officer, NOAA Ship RUDE

Jonathan M. Klay
Lieutenant Jonathan M. Klay, NOAA
Executive Officer, NOAA Ship RUDE

Subject: H-10720 1997 Field Work

During 1997, RUDE re-investigated two items from the 1996 field season on survey H-10720. These 1996 shoal soundings were acquired with SEABAT 9001 shallow water multibeam and processed with in-house software, before RUDE had CARIS processing capabilities. Both were within the channel limits and nearly 20 feet shoaler than surrounding depths. During this 1997 re-investigation, the two sounding positions were thoroughly covered by SEABAT 9003 multibeam, and no significant bottom features were revealed. The hydrographer recommends rejecting the 1996 SeaBat data for the two items. Representative multibeam depths from the current survey corrected with smooth tides should be charted.

RUDE also re-investigated four significant contacts from 1996 in order to process the data in Caris and confirm their presence. All four features were reconfirmed with 100% multibeam coverage. Least depths were approximately one foot deeper than smooth sheet soundings from 1996. Predicted tides only were applied to 1997 soundings. The hydrographer recommends applying smooth tides to the 1997 data and comparing these depths to the 1996 sounding depths on these four items.

A CD-ROM containing both CARIS and HPS digital data for all 1997 investigations, processed with predicted tides only, is submitted with this package.

Attachments





**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**

Aug. 18, 1997

MEMORANDUM FOR: Commander Nicholas Perugini, NOAA
Chief, Atlantic Hydrographic Branch

THROUGH: Lieutenant Commander David A. Cole, NOAA
Commanding Officer, NOAA Ship RUDE

MEMORANDUM FROM: Lieutenant Jonathan M. Klay, NOAA
Executive Officer, NOAA Ship RUDE

SUBJECT: H-10720 Fieldwork

In reference to the two anomalous soundings on K sheet, H-10720, my best guess is that these HDAPS fixes were to have been rejected, with an explanation of the noise present, before the survey was submitted. Due to software problems (both in Seabat processing, conversion to HDAPS format, and HDAPS corrector application), these files were processed 3 times, and entered into HDAPS twice, probably lending some confusion. I have reviewed the Descriptive Report, and have the following comments.

Contact 2412.7s had 4 Seabat development lines across it. The fourth line yielded the least depth, approximately 70 meters from the contact position. This depth was from beam 60, while supporting depths nearby (7 hits) were from beams 1 through 8. The spread of these 8 soundings, vertically and horizontally, suggests noise. Fixes from other lines (40000, 40001) are closer to the contact position and closer to nadir, and should be the multibeam least depths for the development.

Contact 2688.9s was developed with 2 lines. The first line, file 26889_1.xtf, generated 2 fixes on separate features, the shoalest of which was rejected as noise in HDAPS. It apparently wasn't recognized that a second fix existed from that line which was also noise. The file 26889_2.xtf already had the 9 shoalest hits rejected as noise during conversion to HDAPS format. Fix 40024 from this line, corrected depth 10.5m, is the only sounding left available to be the Seabat least depth.



I believe fixes 40004, 40022, and 40023 should be rejected. I concur that side scan contact heights should be examined to check if remaining Seabat data, or echo sounder data, correlates to expected least depths. To further investigate these soundings, RUDE includes the Daily Data Acquisition sheets with the data, which generally contain some comments on development lines. Also, two 4mm DAT tapes are being sent to AHD containing mainscheme ISIS data, which will have digital side scan and Seabat data they may wish to review in Caris. Mainscheme Seabat may have additional coverage of the items in question. This data was archived by RUDE during the field season, but not processed.

cc: N/CS31 (DeBow)

14 October 1997

H-10720

| | | | | | | |
|--------------|-----------------------------|---------|---------|--------------|--------------|-----------|
| SSS contact | 2412.7s | 16888.5 | 38232.5 | | | |
| Seabat 40004 | 16 ft obstr | 16844.4 | 38275.2 | 41/35/40.629 | 71/23/42.616 | DELETED ✓ |
| SSS contact | 2688.9s | 18386.8 | 36663.9 | | | |
| Seabat 40023 | 18ft obstr | 18433.6 | 36621.5 | 41/34/47.057 | 71/22/33.960 | DELETED ✓ |
| Seabat 40047 | 19 ft obstr | 16894.7 | 39761.7 | 41/36/28.813 | 71/23/40.490 | CHART ✓ |
| Seabat 40059 | 18 ft obstr | 17069.4 | 39743.9 | 41/36/28.240 | 71/23/32.944 | CHART ✓ |
| Seabat 40033 | 24.6 ft obstr rocky area | 19500.4 | 35763.4 | 41/34/19.257 | 71/21/47.894 | CHART |
| Seabat 40009 | 20 ft obstr | 16506.0 | 37922.6 | 41/35/29.192 | 71/23/57.217 | CHART |

~~H-10616 Mooring buoy~~

| | | | | | | |
|--------------------------------------|--|--------------------|--------------------|-------------------------|-------------------------|--|
| Fix 12001 Least depth | | | | 41/29/18.025 | 71/20/07.130 | |
| SSS contact | | 21833.3 | 26471.7 | 41/29/18.087 | 71/20/07.186 | |
| (dive buoy drop position) | | | | | | |

R



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Silver Spring, Maryland 20810

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: May 19, 1997

MARINE CENTER: Atlantic

HYDROGRAPHIC PROJECT: OPR-B302-RU

HYDROGRAPHIC SHEET: H-10720

LOCALITY: Rhode Island, Rhode Island Sound,
Approaches to Quonset Point

TIME PERIOD: September 23 - November 5, 1996

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): 0.000 m
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.116 m

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: R8 & R10A

Refer to attachment(s) for zoning information.

Note: Provided time series data are tabulated in metric
units (meters) and on Greenwich Mean Time.



CHIEF, TIDAL ANALYSIS BRANCH



N/CS33-50-98

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 Group, N/CS3x1
 SSMC3, Station 6815
 1315 East-West Highway
 Silver Spring, MD 20910-3282

DATE FORWARDED

June 11, 1998

NUMBER OF PACKAGES

1 Box, 1 Tube

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-10720

Rhode Island, Narragansett Bay, Conanicut Park to Davisville Depot

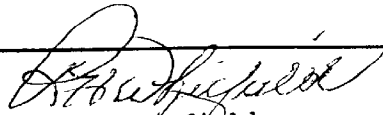
1 Box Containing:

- 1 Original Descriptive Report for H-10720
- 1 Envelope with one (1) HISTORY OF CARTOGRAPHIC WORK (NOAA form 76-71) for H-10720 for chart 13223

1 Tube Containing:

- 1 Original Smooth Sheet for H-10720
- 1 Paper Composite plot of survey H-10720 for chart 13223
- 1 Mylar H-Drawing of H-10720 for NOS chart 13223

FROM: (Signature)



Richard H. Whitfield

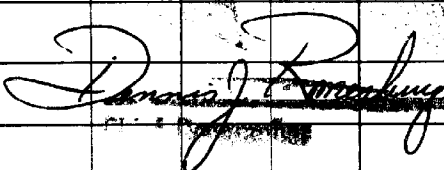
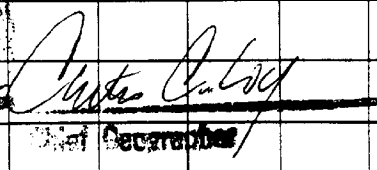
RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch N/CS331
 439 W. York Street
 Norfolk, VA 23510-1114

GEOGRAPHIC NAMES

| Name on Survey | ON CHART NO. 13225, 13221 | | ON PREVIOUS SURVEY | | CON U.S. QUADRANGLE MAPS | | FROM LOCAL INFORMATION | | ON LOCAL MAPS | | P.O. GUIDE OR MAP | | GRAND McNALLY ATLAS | | U.S. LIGHT LIST | |
|----------------------------|---------------------------|---|--------------------|---|--------------------------|---|------------------------|---|---------------|---|-------------------|---|---------------------|---|-----------------|----|
| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| CONANICUT PARK | X | | X | | | | | | | | | | | | | 1 |
| CONANICUT POINT | X | | X | | | | | | | | | | | | | 2 |
| DAVISVILLE DEPOT | X | | X | | | | | | | | | | | | | 3 |
| HOPE ISLAND | X | | X | | | | | | | | | | | | | 4 |
| NARRAGANSETT BAY (title) | X | | X | | | | | | | | | | | | | 5 |
| QUONSET POINT | X | | X | | | | | | | | | | | | | 6 |
| RHODE ISLAND (title) | X | | X | | | | | | | | | | | | | 7 |
| WEST PASSAGE, NARRAGANSETT | | | | | | | | | | | | | | | | 8 |
| BAY | X | | X | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | | | 10 |
| | | | | | | | | | | | | | | | | 11 |
| | | | | | | | | | | | | | | | | 12 |
| | | | | | | | | | | | | | | | | 13 |
| | | | | | | | | | | | | | | | | 14 |
| | | | | | | | | | | | | | | | | 15 |
| | | | | | | | | | | | | | | | | 16 |
| | | | | | | | | | | | | | | | | 17 |
| | | | | | | | | | | | | | | | | 18 |
| | | | | | | | | | | | | | | | | 19 |
| | | | | | | | | | | | | | | | | 20 |
| | | | | | | | | | | | | | | | | 21 |
| | | | | | | | | | | | | | | | | 22 |
| | | | | | | | | | | | | | | | | 23 |
| | | | | | | | | | | | | | | | | 24 |
| | | | | | | | | | | | | | | | | 25 |



 Approved: _____
 Date: MAY 6 1998 Date: AUG 7 1997

06/04/98

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H10720

| | |
|----------------------------|------|
| NUMBER OF CONTROL STATIONS | 2 |
| NUMBER OF POSITIONS | 2750 |
| NUMBER OF SOUNDINGS | 2750 |

| | TIME-HOURS | DATE COMPLETED |
|---------------------------------------|------------|----------------|
| PREPROCESSING EXAMINATION | 17 | 05/27/97 |
| VERIFICATION OF FIELD DATA | 52 | 05/07/98 |
| EVALUATION AND ANALYSIS | 13.50 | |
| FINAL INSPECTION | 16 | 05/12/98 |
| COMPILATION | 42 | 05/26/98 |
| TOTAL TIME | 144 | |
| ATLANTIC HYDROGRAPHIC BRANCH APPROVAL | | 05/13/98 |

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10720 (1996)**

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.

During office processing of the present survey, six items were identified that required additional field work for verification or disapproval. The Addendum to the Descriptive Report for the 1997 field work for this item is appended to 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
MicroStation 95, version 5.0
SiteWorks, version 02.01
I/RAS B, version 5.01
NADCON, version 2.10

The smooth sheet was plotted using a Hewlett Packard Design Jet 350C 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 the survey on the NAD 27 datum, move the projection lines 0.366 seconds (11.288 meters or 1.13 mm at the scale of the survey) north in latitude and 1.805 seconds (41.811 meters or 4.18 mm at the scale of the survey) east in longitude.

K. SHORELINE

Brown shoreline originates with NOS chart 13223 (34th Edition, January 28, 1995) and is for orientation purposes only.

L. JUNCTIONS

There are no contemporary junction surveys to the north, south, east or west. Present survey depths are in harmony with the charted hydrography in this area.

M. COMPARISON WITH PRIOR SURVEYS

A comparison with prior surveys was not done during office processing in accordance with section 4. of the memorandum titled *Changes to Hydrographic Survey Processing*, dated May 24, 1995.

**O. COMPARISON WITH CHARTS 13221 (50th Edition, Apr 15/95)
13223 (34th Edition, Jan 28/95)****Hydrography**

The charted hydrography originates with prior surveys and miscellaneous sources, and requires no further consideration. The hydrographer makes an adequate chart comparison in Section O.3a. A chart comparison was made during office processing. Attention is directed to the following:

1. A charted dangerous submerged obstruction with a depth of 32 feet, in Latitude 41°35'30.08"N and Longitude 71°23'42.24"W originates with Notice to Mariners No. 41 in 1976 (NM41/76) as Automated Wreck and Obstruction System (AWOIS) item #7891 and was investigated by FE-360SS (1991). The obstruction was located by the present survey with a depth of 31 feet in Latitude 41°35'29.657"N and Longitude 71°23'41.850"W. It is recommended that the charted dangerous submerged obstruction with a depth of 32 feet be revised and charted as a dangerous submerged obstruction with a depth of 31 feet (31Obstn) as shown on the present survey.

2. The following uncharted obstructions were located by the present survey.

| <u>Obstruction</u> | <u>Latitude (N)</u> | <u>Longitude (W)</u> |
|--------------------|---------------------|----------------------|
| 20-ft | 41°35'29.192" | 71°23'57.217" |
| 24-ft | 41°34'19.257" | 71°21'47.894" |

It is recommended that these obstructions be charted as shown on present survey.

3. A charted dolphin in Latitude 41°35'11"N, Longitude 71°24'21"W, originates with an unknown source. This feature was neither verified nor disproved by the field unit. It is recommended that the dolphin remain as charted.

4. Two charted depths, 16-ft and 27-ft, in Latitude 41°34'44.0"N, Longitude 71°24'20.8"W and Latitude

41°34'55.0"N, Longitude 71°23'53.0"W respectively, originate with an unknown source. These two depths are not considered adequately developed by the present survey. It is recommended that the 16-ft and 27-ft depths be retained on the chart.

Except as noted above, the present survey is adequate to supersede the charted hydrography within the common area.

O.3b. Controlling Depths

A conflict exists with the charted controlling depth of 27 feet in Davisville Depot channel in the vicinity of Latitude 41°36'36"N, Longitude 71°24'13"W. The present survey shows depths of 22 to 26 feet. It is recommended that the charted notation *27 FT FOR WIDTH OF 1500 FT* be revised to 22 ft rep for width of 1500 ft.

A conflict exists with the charted controlling depth of 28½ feet in Davisville Depot channel in the vicinity of Latitude 41°36'36"N, Longitude 71°24'13"W. The present survey shows depths of 24 to 28 feet. It is recommended that the charted notation *28½ FT FOR MID-WIDTH OF 800 FT DEC 1965* be revised to 24 ft rep for mid-width of 800 ft, 1996.

A conflict exists with the charted controlling depth of 29½ feet at Davisville Depot between piers 1 and 2. in the vicinity of Latitude 41°36'51"N, Longitude 71°24'25"W. The present survey shows depths of 23 to 29 feet. It is recommended that the charted notation *29½ FEET 1965* be revised to 23 ft rep 1996.

A conflict exists with the charted controlling depth of 29½ feet in Davisville Depot south of pier 1 in the vicinity of Latitude 41°36'41"N, Longitude 71°24'19"W. The present survey shows depths of 29 feet. It is recommended that the charted notation *29½ FEET* be revised to 29 ft rep 1996.

P. ADEQUACY OF SURVEY

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

Q. AIDS TO NAVIGATION

The hydrographer located 19 floating aids to navigation. These appear adequate to serve their intended purposes.

The charted floating aid to navigation buoy W Or "G" Navy in Latitude 41°33'05.2"N, Longitude 71°21'09.0"W was

not located by the field unit. It is recommended that the aid to navigation be retained as charted unless other information indicates otherwise.

S. MISCELLANEOUS

Chart compilation using the present survey data was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compiled data will be forwarded to Hydrographic Survey Division, Silver Springs, Maryland upon completion of the project.

The following NOS chart was used for compilation of the present survey: 13223 (35th Ed., Mar 29/97)

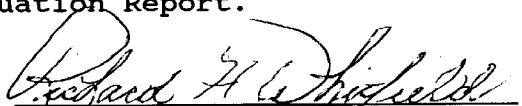
A handwritten signature in cursive script, reading "Maxine Fetterly". The signature is written in black ink and is positioned above a horizontal line.

Maxine Fetterly
Cartographer
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H10720

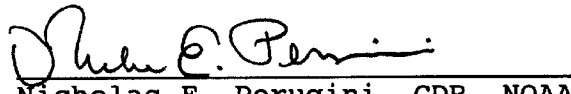
Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disapproval 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.


Richard H. Whitfield
Cartographer
Atlantic Hydrographic Branch

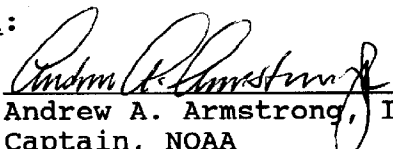
Date: 13 May 1998

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, CDR, NOAA
Chief, Atlantic Hydrographic Branch

Date: May 13, 1998

Final Approval:

Approved: 
Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division

Date: June 19, 1998

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H10720

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 |
|--------|---------|---------------------|--|
| 1322.3 | 5/20/98 | <i>K.H. Higgels</i> | 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. |
| | | | 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. |
| | | | 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