10004

Diagram No.s 905-2 & 920

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. MI-80-1-82

Office No. H-10004

LOCALITY

State U.S. Virgin Islands

General Locality St. Croix

Locality Offshore--Between St. Croix and St. John

19 82

CHIEF OF PARTY
CAPT J.A. Yeager

LIBRARY & ARCHIVES

DATE Janurary 7, 1985

☆U.S. GOV. PRINTING OFFICE: 1980—766-230

10004

Area 3
CNTG
25641
25640
25648
25645

To sign off see
Record of Application
This chart will be superseded by 25632

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO. H-10004

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. MI-80-1-82

State: U.S. VIRGIN ISLANDS

General locality: ~~CARIBBEAN SEA~~ ST. CROIX

Locality: OFFSHORE -- BETWEEN ST. CROIX ~~TO~~ AND ST. JOHN

Scale: 1:80,000

Date of survey: 7 MARCH - 7 APRIL 1982

Instructions dated: 27 NOVEMBER 1981

Project No.: OPR-I149-MI/PE-82

Vessel: NOAA SHIP MT MITCHELL S-222

Chief of party: CAPTAIN J. AUSTIN YEAGER, NOAA

Surveyed by: (SEE REMARKS)

Soundings taken by echo sounder, ~~XXXXXXXXXXX~~ RAYTHEON UGR ~~EDO~~ AND ROSS ECHO SOUNDER

Graphic record scaled by: RW, EM, RC

Graphic record checked by: KWP, ESV, RW, EM

Protracted by: N/A

Automated plot by: ~~SHIP'S HYDROPLOT~~ XYNETICS 1201 PLOTTER (AMC)

Verification by: M.H. Holloway

Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW FATHOMS AT MLLW

REMARKS: SURVEYED BY LCDR. L.A. LAPINE, LCDR. A.N. FLIOR, LT. K.W. PERRIN, LT. E.S. VARNEY, LT(jg) J. ZABITCHUCK, ENS. K.P. PETERS, ENS. F.W. ROSSMANN, ENS. R.D. HENEGAR, ENS. B.L. COAKLEY, ENS. A.E. ORRIS, ENS. C. MCLEAN, ENS. D.I. CREWS.

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

AWOIS - 2/20/85 MH

SURF - 2/20/85 MH

Appd to Atlas 1-11-85 [illegible]

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

☆ U.S. GPO: 1974-0-768-081/1207

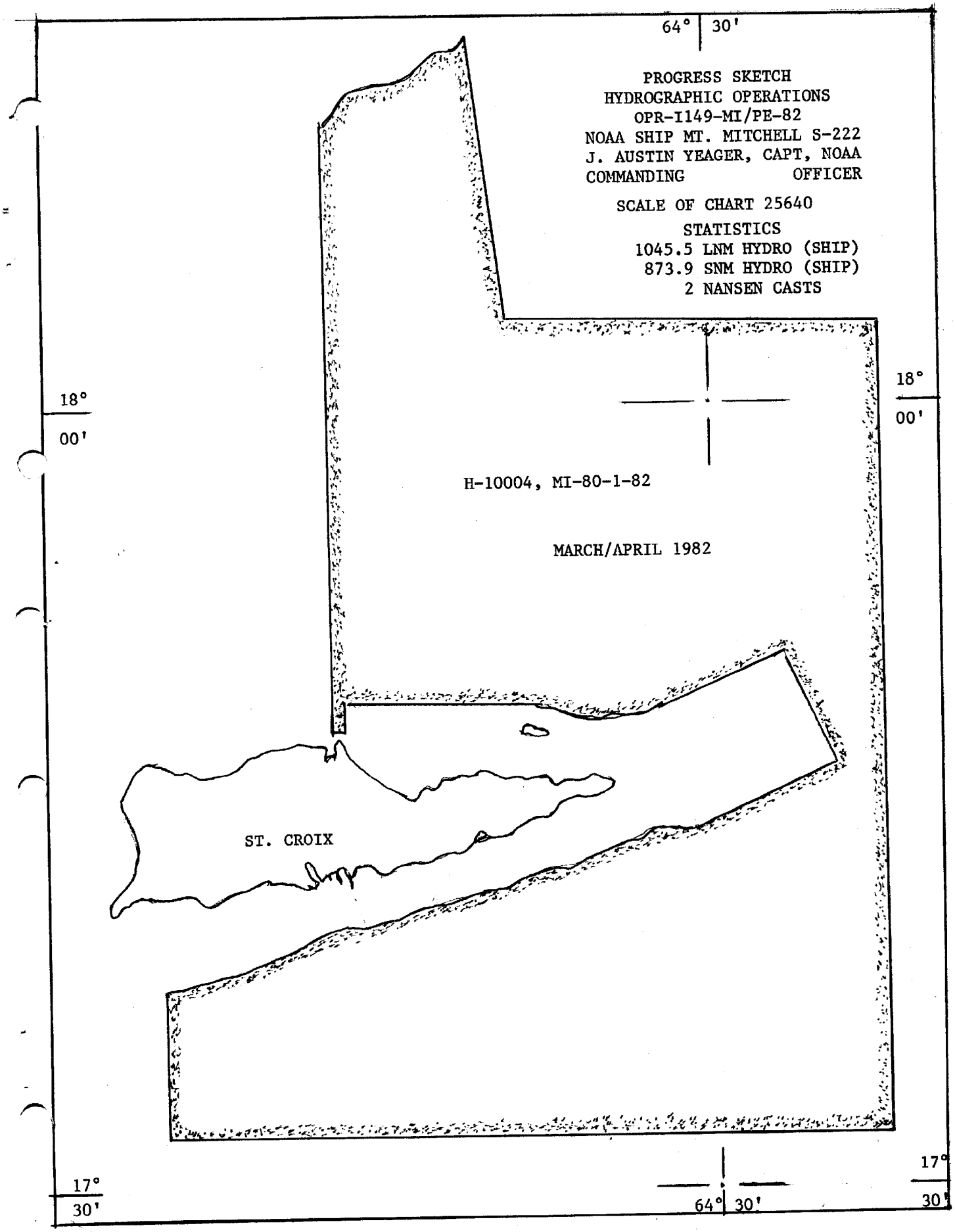
64° 30'
PROGRESS SKETCH
HYDROGRAPHIC OPERATIONS
OPR-I149-MI/PE-82
NOAA SHIP MT. MITCHELL S-222
J. AUSTIN YEAGER, CAPT, NOAA
COMMANDING OFFICER
SCALE OF CHART 25640
STATISTICS
1045.5 LNM HYDRO (SHIP)
873.9 SNM HYDRO (SHIP)
2 NANSEN CASTS
18° 00'
18° 00'
H-10004, MI-80-1-82
MARCH/APRIL 1982
ST. CROIX
17° 30'
64° 30'
17° 30'

TABLE OF CONTENTS

"APPENDICES"

* FILED WITH ORIGINAL FIELD DATA.

A. PROJECT

This survey was completed under instructions for project OPR-I-149-MI/PE-82 dated 27 November 1981; supplementary instructions, and changes 1, 2, 3, 4 were respectively dated 18 November 1981, 21 December 1981, 11 January 1982, 25 January 1982, and 02 March 1982. This survey is part of a series of basic hydrographic surveys of St. Croix and surrounding waters.

B. AREA SURVEYED

The area surveyed is offshore of the east part of St. Croix from Long Point on the south side eastward to East Point, then westward to Salt River, extending from the junction with the inshore survey sheets at about the 100 fathom curve southward to about 9 miles south of Long Point, eastward to about 12 miles east of East Point and Northward to either the US/British Fisheries Conservation Zone or the 100 fathom curve offshore of St. John whichever came first. The inclusive limits of the survey are as follows:

17°38.2'N, 064°52.1'W to 17°31.5'N, 64°52.1'W

17°31.5'N, 064°~~24.5~~ 52.1'W, to 17°30.~~5~~ 3'N, 64°2~~4.5~~ 2.7'W

17°30.3'N, 064°22.7'W, to 18°02.9'N, 64°22.7'W

18°02.9'N, 064°~~38.9~~ 22.7'W, to 18°~~14.0~~ 02.9'N, 64°38.9'W

18°02.9'N, 64°38.9'W to 18°14.0'N, 64°38.9'W

18°~~10.7~~ 14.2'N, 064°~~46.1~~ 38.9'W, to 18°18.7'N, ~~17°48.0'N~~, 64°46.1'W

18°10.7'N, 64°46.1'W to

17°38.2'N, 064°52.1'W

This survey was conducted between 07 March and 07 April 1982.

C. SOUNDING VESSEL

All soundings for this survey were taken by VESNO 2220, NOAA Ship MT MITCHELL. No unusual problems were encountered.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

THE NOAA Ship
A MT MITCHELL (VESNO 2220) used the following echo sounder equipment during this survey.

Manufacturer	Equipment Name	Model No.	Serial No.
Edo	Transceiver	248-1	219
Edo	Digitrak	261-C	226
Raytheon	Uni. Graphic Recorder	196C-23	170
Ross	Recorder	5000	1050
Ross	Digitizer	6000	1050

Raytheon/UGR
The ~~Edo~~ equipment was used throughout the survey area and the Ross equipment was used in shallow water (less than 50 fathoms) between positions 165-166 and positions 492-495.

The transducers used during this survey were located on the skeg (32.0 meters aft of the navigation antenna, ANDIST = 32.0) and in sounding room #2 (ANDIST =0.0). The Ross transducer is located on the skeg and the Edo transducer was also located on the skeg for positions 1 thru 132 and 389-432. The Edo transducer was located in sounding room #2 for positions 133-388 and 433-1005. The ANDIST is noted on the parameter tapes; different parameter tapes were used for processing those soundings

taken from each transducer location. The positional difference between the two locations is provided for when using the on-line (RK 111 and RK 112) programs and the off-line (RK 211) program through the ANDIST supplied on the parameter tape and with the digital gyro heading supplied on the master tape. Such positional differences should be noted during final processing.

Scale checks were made on the ~~Edo~~ UGR throughout the survey. When the depth was questionable, the lines were rejected and rerun. The fathograms were scanned and corrections were verified by trained, experienced survey technicians. Digitized depths were checked against the analog trace and corrected via the electronic corrector tape when necessary. Significant peaks and deeps were also inserted on the electronic corrector tape. All records were personnally checked by the author of this report.

The echo sounders used during this survey were calibrated for a velocity of 800 fathoms per second. Two Nansen casts were taken to determine velocity corrections. The first cast was taken on 20 February 1982 at LATITUDE 17°52.2'N, LONGITUDE 64°49.4'W to a depth of 4000 meters. The second cast was taken on 25 March 1982 at LATITUDE 17°53.9'N, LONGITUDE 64°41.3'W to a depth of 800 meters. The correctors derived from the two casts compared favorably. Consequently, the correctors from the first cast were used exclusively. The initial for the Raytheon/UGR and Ross echo sounders ~~is~~ WAS set at 0.0 and no corrections were applied. The transducer draft of 2.3 fathoms was determined by measuring the rail to water height and subtracting that measure from the rail to transducer height. Instrument error, which was determined to be 0.0 fathoms, and velocity corrections were verified by comparing leadline depths and echo sounder depths during a vertical cast taken on 03 April 1982. Predicted tides for the survey area have a range of 0.2 fathoms or less and were not applied during processing. Smooth tides have been requested and will be applied during final processing. Corrections for settlement and squat of the ship are 0.07 fathoms or less and a corrector of 0.0 fathoms is applicable.

The field sheet was plotted using velocity table 99, an abbreviated version of velocity table 1. Program RK 211, Range-Range Non-Real Time Plot, can only use a velocity table no longer than 75 records. Velocity table 1 is 99 records long. Table 99 was constructed by deleting every other corrector over 800 fathoms. For example:

Velocity Table 1		Velocity Table 99	
Fathoms Depth	Fathoms Correction	Depth Correction	
794.0	21.0	794.0	21.0
844.0	22.0	894.0	22.0
894.0	23.0	980	23.0
942.0	24.0	1060	26.0
980.0	25.0		
1020.0	26.0		
1060.0	27.0		
1100.0	28.0		

Further, an error was found in the velocity table that was used for plotting affecting depths greater than 1000 fathoms. The corrector increased about 0.5 fathoms, i.e. for a depth of 1061 fathoms the new corrector is 28 fathoms vice the old 27 fathoms.

The field sheets, produced off-line, are corrected for draft and velocity of sound. No corrections for instrument error or settlement and squat need be applied since it is 0.0 fathoms for both. Smooth tides will be applied during final processing at NOAA, Atlantic Marine Center, (Processing Division) CAM3, Norfolk, Virginia. A copy of the vertical cast report, settlement and squat test report, as well as other data supporting the above correctors, is included in the field records for this survey. A copy of the abstract of corrections to echo soundings is in Appendix D of this report.

E. HYDROGRAPHIC SHEETS

The field sheets for this survey were drawn aboard the NOAA Ship MT MITCHELL using a complot roll-bed plotter and program RK 201. The positions and soundings were plotted off-line using program RK 211 in conjunction with parameter and signal tapes, master tapes, electronic control corrector tapes, and velocity tapes. Soundings were corrected for draft and velocity of sound through the water. Soundings were not corrected for smooth tides. There are four field sheets. Sheet 1 has mainscheme sounding lines for the east sheet and sheet 2 has crossline soundings and mainscheme splits for the east sheet. Sheet 3 and 4 have mainscheme sounding lines and crosslines respectively, for the west sheet.

The field records, along with the field sheets and the following tapes, are forwarded with this report to NOAA Atlantic Marine Center, Processing Division, CAM3, Norfolk, Virginia for verification and smooth plotting:

Range-Range Master Tapes

Electronic Corrector Tapes

Velocity Corrector Tapes

TC/TI Tapes

Parameter Tapes

Signal Tape

Several parameter tapes for each field sheet were used to collect the data for this survey. The changes in the tapes were made a) to change for the "ANDIST" and b) to change the plotter origin. A copy of the final parameter tapes used are included with the field records. Additional information about projection and electronic control parameters is included in Appendix A of this report.

F. CONTROL STATIONS

The following control stations were used for this survey:

Station Number, Name	Latitude(N)	Longitude(N)
710, House RM3, 1980	17°59'24.458"	065°53'07.766"
720, BAKE ~~1918 Offset~~ ARGO, 1982	18°19'04.495"	064°47'21.847"
800, Grapetree, 1982	17°44'56.707"	064°35'39.299"
900, Long Point RM 1, 1982	17°40'54.556"	064°50'21.967"

Each station except BAKE ~~1918 Offset~~ ARGO, 1982 is monumented. (See "comments on...BAKE ARGO, 1982", included with supporting data.) The stations were established using Third-Order, Class I or better survey methods. They were recovered in February 1982 by personnel from Atlantic Marine Center, Norfolk, Virginia. Station positions and descriptions are filed with the National Geodetic Survey. A complete list of stations used for this project and their geographic positions ~~are~~ is in Appendix F of this report.

G. HYDROGRAPHIC POSITION CONTROL

Sounding line position control for this survey was obtained by equipment manufactured by Cubic Western Data, i.e. ARGO, in the Range-Range mode. The equipment used and their serial numbers follow:

Locations	Equipment Name, (Model DM-54)	S/N
Ship (VESNO 2220)	Control Display Unit	C037948
	Range Processing Unit	R047844
	Power Supply	V0478104
Sation 710	Antenna Loading Unit	A047859
	Range Processing Unit	R0379117
	Power Supply	V0379112
Station 720	Antenna Loading Unit	A0379120
	Range Processing Unit 3/07-3/5	R047859
	Range Processing Unit 3/16-3/24	R047864
	Power Supply	V03798100
Station 800	Antenna Loading Unit	A0379127
	Range Processing Unit	R047864
	Power Supply	V0379124
Station 900	Antenna Loading Unit	A047858
	Range Processing Unit	R047859
	Power Supply	V0379122

A sawtooth recorder was used to monitor the whole lane count while the ship was underway and the ARGO system was functioning properly. A digital readout of the lanes was monitored via the CDU and the whole lane count annotated on the saw tooth record(s). The few lane jumps observed were annotated in the records, and data resolved off-line. All system malfunctions occurred while off-line and were corrected before resuming hydrography.

Partial lane correctors were determined by two methods: sextant calibration and the Range-Azimuth method. The standard sextant calibration method was used with program RK 561. The Range-Azimuth method used a Hewlett-Packard (H-P) total station, Model No. 3810b, set directly above a control station and initialed on another control station. The distance from the station to the ship antenna was measured by a laser beam from the H-P to a multi-prism mirror held on the mast.

The angle from the ship, to the nearest 20 sec, was similarly (and simultaneously) measured. The ARGO rates at that time were noted and recorded. The position of the ship was computed using the Range-Azimuth data. The ranges in lanes to the ARGO stations were then computed and compared to determine the partial lane correctors. These computations can be made with program RK 300, utility computations. However, the computations were made with a Hewlett-Packard model 9815 A/S calculator using a program written specifically for this Range-Azimuth calibration by Lieutenant Junior Grade, John Zabitchuck, NOAA. (See separate report written by LT (j.g.) Zabitchuck describing the H-P program, previously submitted to Operations Division, CAMI.) Partial lane correctors were applied both on-line and off-line. Abstracts of electronic correctors are in Appendix E of this report. Calibration data is included with the field records.

H. SHORELINE

The survey is an offshore survey with no sounding data junctioning with the shoreline.

Shoreline on the field sheets was transferred from chart 25641. The shoreline, drawn in brown, is intended for orientation only. NOT USED ON THE SMOOTH SHEET.

I. CROSSLINES

A total of 174.2 miles of crosslines was run during this survey, which constitutes 20% of the mainscheme hydrography. Agreement between the crosslines and the mainscheme hydrography was excellent with 100% of the crossline soundings agreeing with the mainscheme hydrography within the tolerances listed below. Crosslines were generally run in depths of at least 200 fathoms.

Depth Range in Fathoms	Agreement In Fathoms
63-200	±1
201-500	±2
501-1500	±5
1501-2200	±10

J. JUNCTIONS See also section 5 of the Evaluation Report

This survey junctions with the following ten contemporary surveys and one prior survey. (Survey H-9935, 1:10,000 1981/1982, is considered a contemporary survey for the purpose of this section). Junction surveys: H-9935, (1:10,000 1981/1982); H-9936 (1:10,000 1981); H-9992 (PE 80-1-82); H-9993 (PE 80-2-82); H-9998 (PE-80-3-82); H-10002 (MI-10-1-82); H-10003 (MI-10-2-82); H-10006 (MI-10-5-82); H-10007 (MI-10-4-82) H-10008 (MI-10-5-82); H-10009 (MI-10-6-82). This survey does not have sufficient overlap with survey H-9352 (1:20,000 1973) to say they could junction at the north west corner of this survey. The tolerances mentioned below are allowable errors of depth taken from section 1.1.2.B.II.1 of the Hydrographic Manual for depths 11 to 55 fathoms: 0.5 fathom, and deeper than 55 fathoms: 1% of depth.

THERE IS SOFFICIENT OVERLAP FOR A JUNCTION.

The differences between this survey and the 1:10,000 scale surveys along the south shore of St. Croix (surveys H-10002, 10006, 10007, 10008 and 10009) are primarily the difference between the wide beam ship transducer and the narrow beam launch transducers. It is recommended that the present survey junction with those surveys at the 150 fathom curve. (The 1.5 mm shift mentioned below refers to a maximum allowable position error described in section 1.1.2.B.1.3 of the Hydrographic Manual.)

Junction Survey	Area of Junction Latitude (N)	Longitude(W)	Remarks
H-9993 (PE-80-2-82)	17°59.0' to 17°47.5'	64°45.8' 64°45.8'	Agreement very good with 2 soundings lines overlap; no shift in depth contours. About 5 sounding coincide. Agreement within 5 fathoms in 355 to 1388 fathoms.

Junction Survey	Area of Junction Latitude (N)	Longitude(W)	Remarks
H-9935 MI-10-1-81 Additional Work 1982	17°48.5' to 17°48.5'	64°39.5' 64°45.3'	Agreement very good with 82% of soundings agreeing within 1% of depth (279-1070 fathom) and 100% of soundings agreeing within 1% of depth utilizing a 1.5 mm shift at the scale of this survey.
H-9936 1:10,000 (1981)	17°48.8' to 17°49.4'	64°39.0' 64°38.9'	Agreement good with 100% of the soundings agreeing within tolerances using a 1.5 mm shift at the scale of this survey.
H-10002 MI-10-1-82	17°48.5' to 17°49.0' and 17°45.5' to 17°42.7'	64°34.8' 64°32.9' 64°30.4' 64°34.2'	Agreement very good with 100% of the soundings agreeing within tolerances utilizing a 1.5 mm shift at the scale of this survey.
H-10003 MI-10-2-82	17°49.0' to 17°51.5' to 17°47.4' to 17°45.5'	64°32.9' 64°26.5' 64°24.8' 64°30.4'	Agreement very good with 100% of the soundings agreeing within tolerances utilizing a 1.5 mm shift at the scale of this survey.
H-10006 MI-10-3-82	17°42.7' to 17°41.2'	64°34.2' 64°38.8'	Agreement very good with 90% of the soundings agreeing within tolerances and 100% of soundings agreeing within tolerances utilizing a 1.5 mm shift at the scale of this survey.
H-10007 MI-10-4-82	17°41.2' to 17°40.3'	64°38.8' 64°42.2'	Good agreement with 100% of depths agreeing within tolerances utilizing a 1.0 mm shift at the scale of this survey.
H-10008 MI-10-5-82	17°40.3' to 17°38.8'	64°42.4' 64°45.4'	Very good agreement with 100% of soundings agreeing within tolerances utilizing a 1.5 mm shift at the scale of this survey.
H-10009 MI-10-6-82	17°38.8' to 17°37.6'	64°45.4' 64°50.2'	Excellent agreement at 150 fathom curve and within 2 fm in soundings 150-200 fm. In soundings less than 150 fm., 100% agreement utilizing 1.0 mm shift at this scale of this survey.

Junction Survey	Area of Junction Latitude (N)	Longitude(W)	Remarks
H-9992 PE-80-1-82	17°38.4' to 17°32.0' to 17°32.0'	64°52.0' 64°52.0' 64°50.0'	Excellent (100%) agreement to within 2 fm in 57 to 660 fm with no shift in depth contours.
H-9998 PE-80-3-82	17°32.5' to 17°32.5'	64°50.0' 64°23.0'	Excellent agreement to within 2 fm or less along westside and 3 fm (in 1000 fm) to 10 fm (in 1600 fm).

K. COMPARISON WITH PRIOR SURVEYS See also sections 6.a. and 6.b. of the Evaluation Report

Comparison was made with H-4652a (1:20,000 1924-25) for the area around the east part of St. Croix. The area of comparison is bounded by the following points:

Latitude (N)	Longitude (W)
17°48.0'	64°42.0'
17°52.5'	64°42.0'
17°52.5'	64°25.0'
17°41.0'	64°25.0'
17°41.0'	64°37.0'
17°41.5'	64°40.0'

The comparison between the present and prior survey was poor with 56.1% of the soundings agreeing within the tolerances listed below utilizing a 1.5 mm shift at the scale of the present survey. The tolerences are listed in section 1.1.2.B.II.1 of the Hydrographic Manual, corrected thru June 1, 1981, i.e. within 0.5 fm for depths 11-55 fm and within 1% of depth for depths greater than 55 fms. Agreement was best for depths less than 150 fathoms along the south side of the island. For the area southeast and north of the island, the present survey is generally shallower by 20 to 200 fathoms with the greatest differences at the north part of the comparison area. These discrepancies may be attributed to poor control of the prior survey.

Comparison was made with survey H-4653a (1:20,000 1924-25). Comparison was good on the south side of the island with 45% of the soundings agreeing within 1 fathom and 100 % of the soundings agreeing within 1% of the depth utilizing a 1.5 mm shift at the scale of this survey. On the northside of the island, none (0%) of the soundings agree within 1% of depth even utilizing a 1.5 mm shift at the scale of this survey. The poor comparison on both sides of the island may be attibuted to poor control of the prior survey.

L. COMPARISON WITH THE CHART

See also section 7 of the Evaluation Report

The area surveyed is covered by two NOS Charts: Chart 25641 (1:100,000) north of Latitude 17°35'N and the entire survey area on chart 25640 (1:326,856). The comparison of the present survey and the 18th edition of chart 25641 (1:100,000), dated November 28, 1981, was poor on the north side of the island with only 34.2% of the soundings (i.e. 39 of 114 soundings) agreeing within 1% of depth. Sounding differences were as much as 200 fathoms, e.g. a 680 fathom sounding charted at LATITUDE 18°12.3'N, LONGITUDE 64°39.3'W is surrounded by survey depths of 480 fathoms. Positional differences between charted and survey soundings were as much as 1000 meters, i.e. 1200 fathom sounding charted at LATITUDE 17°50.5'N, LONGITUDE 64°46.3'W. There seemed to be no systematic differences between survey and charted depths along the north side of the island. South of the island, however, the comparison was fair with 78.5% of the soundings (15 of 19 soundings) agreeing within 1% of depth for soundings west of Longitude 64°43'W and 58.3% of the soundings, i.e. 28 of 48, agreeing within 1% of depth for those soundings east of Longitude 64°43'W. The differences may be attributed to poor horizontal control of the prior surveys. A reported sounding of 58 fathoms charted at LATITUDE 18°10.6'N, LONGITUDE 64°48.7'W was developed at reduced line spacing; see positions 156 to 167 and 196 and 201.

The present survey is recommended to supersede the reported CHARTED sounding. Two "existence doubtful" soundings of 50 and 75 fathoms charted at LATITUDE 17°37.1'N, LONGITUDE 64°51.0'W and LATITUDE 17°36.5'N, LONGITUDE 64°50.5'W respectively, were not found at 800 meter line spacing. The present survey is recommeded to supersede those CHARTED ~~existence doubtful~~ soundings. CONCUR

Comparison of the present survey with the 29th edition of chart 25640, dated Aug 22/81 was poor on the northside of St. Croix with only 16.1%, i.e. 5 of 31, soundings agreeing within 1% of depth, even allowing for the difference in scale. The worst agreement was an 1160 fathom sounding charted at LATITUDE 17°56.2'N, LONGITUDE 64°41.9'W in 2050 fathoms according to the present survey. The comparison on the southside of the island was good with 70.6%, i.e 12 of 17, soundings agreeing within 1% of depth.

M. ADEQUACY OF SURVEY

This survey is considered adequate to supersede all prior surveys for depths greater than 150 fathoms. SEE THE LARGE SCALE JUNCTIONAL SURVEYS FOR DEPTHS SHOALER THAN 150 FATHOMS.

N. AIDS TO NAVIGATION

Only ~~one aid to navigation,~~ a lighted mooring buoy, was located within the area of sounding lines on this survey. Note that several aids on and near the island of St. Croix and Buck Island were located on inshore surveys. The lighted mooring buoy was located in ~~1172~~ 1585 fathoms at LATITUDE 17°51'~~32.51~~31.14"N, LONGITUDE 64°43'~~07.07~~02.52"W. This position disagrees with the published position of LATITUDE 17°52'07.0"N, LONGITUDE 64°41'01.0"W. The Coast Guard Aid to Navigation Section in San Juan, Puerto Rico was notified of this discrepancy on 12 March 1982 by radio message. The published characterisitics of the light were verifed as an interrupted group flashing white light with a period of 20 seconds.

It is recommended that the position obtained during this survey be used for charting ~~p~~ purposes. RETAIN AS CHARTED.

O. STATISTICS

The following statistics were compiled while acquiring the data for this survey:

Total Number of Positions	1005
Nautical Miles of Sounding Lines	871.3
Nautical Miles of Crosslines	174.2
Square Nautical Miles of Hydrography	873.9
Bottom Samples	0
Nansen Casts	2

P. MISCELLANEOUS

The following soundings were hand plotted ON THE SMOOTH FIELD SHEETS because of errors on the corrector tapes. The corrector tapes were subsequently corrected. The affected soundings were at positions 118+6, 144, 145, 166, 216+5, 283+2, 390+1, 417-418, 453+3, 484+2, 561-562, 600+3-602, and 674.

Several attempts were made to obtain bottom samples without success on J.D. 90 in depths of 800 fathoms. A decision was made to not attempt additional bottom samples due to the limitations of the equipment aboard and the excessive amount of time involved.

Sounding lines north and northeast of Buck Island were run parallel to the contours as a buffer zone for mainscheme hydrographic lines. This was done for the safety of the ship in the vicinity of very shoal water.

Q. RECOMMENDATIONS

This survey is recommended to supersede all prior surveys within the survey area. ~~It is further recommended that the present survey junction with surveys H-10002, H-10006, H-10007, H-10008 and H-10009 at the 150 fathom curve.~~ See section 5 of the Evaluation Report.

R. AUTOMATED DATA PROCESSING

The following programs were used to collect and process the data for this survey.

Program Number	Program Name	Version
RK 111	Range-Range Real Time Plot	01/30/76
RK 112	Range-Range/Hyperbolic Real Time Plot	08/04/81
RK 201	Grid, Lattice, & Signal Plot	04/18/75
RK 211	Range-Range Non-Real Time Plot	01/15/76
RK 300	Utility Computations	10/21/80
RK 330	Data Format and Check	05/04/76
PM 360	Electronic Corrector Abstract	02/02/76
AM 500	Predicted Tide Generator	11/10/72
RK 530	Velocity Correction Computations	05/10/76
RK 561	Geodetic H/R Calibration	02/19/75
AM 602	Extended Line Oriented Editor	05/21/75
RK 612	High Speed Print-out	03/23/78

Range-Azimuth Calibration computations for HP 9815 A/S were written by LT(j.g) John Zabitchuck.

S. REFERENCES TO REPORTS

Information about tidal data information, especially the leveling records and marigrams, were sent to OA/C2. The Horizontal Control Report for OPR I-149-MI/PE-81/82 was submitted by the Operations Division (CAMI) of AMC. The program documentation for the Hewlett-Packard 9815 A/S Range-Azimuth Calibration Program was submitted by LT (j.g.) John Zabitchuck to the Operation Division (CAMI) of AMC.

Respectively submitted,

E. Scott Varney
Lieutenant, NOAA

APPENDIX F

LIST OF STATIONS

SIGNAL TAPE LIST

MI-80-1-82

H-10004

710	4	17	59	24458	065	53	07765	250	0011	164670
720	4	18	19	04495	064	47	21847	254	0086	164670
800	4	17	44	56707	064	35	39299	250	0011	164670
900	4	17	40	54556	064	50	21967	250	0000	164670

Signal Names

Station No.	Station Name	Source	Recovered By/Year
710	House RM3, 1980	AMC Ops, 1980	PE/82
720	Bake ARGO ~~Offset~~, 1982	Peirce, 1982	PE/82
800	Grapetree, 1982	AMC Ops, 1982	PE/82
900	Long Point RM1, 1982	AMC Ops, 1982	PE/82

APPENDIX "F"

APPENDIX I

LANDMARKS FOR CHARTS

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

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

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- ☐ HYDROGRAPHIC PARTY
- ☐ GEODETIC PARTY
- ☐ PHOTO FIELD PARTY
- ☐ COMPILATION ACTIVITY
- ☐ FINAL REVIEWER
- ☐ QUALITY CONTROL & REVIEW GRP.
- ☐ COAST PILOT BRANCH

(See reverse for responsible personnel)

☐ TO BE CHARTED
☐ TO BE REVISED
☐ TO BE DELETED

REPORTING UNIT *(Field Party, Ship or Office)*	STATE	LOCALITY	DATE

The following objects HAVE ☐ HAVE NOT ☐ been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM

CHARTING NAME	DESCRIPTION *(Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)*	POSITION LATITUDE ° ′	POSITION LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	POSITION LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION *(See instructions on reverse side)* OFFICE	METHOD AND DATE OF LOCATION FIELD	CHARTS AFFECTED
	THERE ARE NO LANDMARKS ON THIS SURVEY THAT ARE NOT INCLUDED ON LARGER SCALE CONTEMPORARY SURVEYS.							

APPENDIX "I"

APPENDIX J

APPROVAL SHEET

APPROVAL SHEET

The field work on this Hydrographic Survey was under my daily supervision. The boat sheet and records have been reviewed and approved by me.

J. Austin Yeager
CAPTAIN, NOAA
Commanding Officer

APPENDIX "J"

DATE: 5/3/84

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Marine Center: Atlantic

OPR: I149

Hydrographic Sheet: H-10004

Locality: Offshore St. Croix, Virgin Island

Time Period: March 8 - April 7, 1982

Tide Station Used: 975-1364 Christiansted, Virgin Island
975-1401 Limetree Bay, Virgin Island

Plane of Reference (Mean Lower Low Water): 975-1364 = 3.65 Ft.
975-1401 = 2.27 Ft.

Height of Mean High Water Above Plane of Reference: 975-1364 = 0.8 Ft.
975-1401 = 0.7 Ft.

Remarks: Recommended Zoning:

1. North of latitude $17^{o}45.5'$ Zone Direct on 975-1364 Christiansted, Virgin Island.
2. South of $17^{o}45.5'$ Zone Direct on 975-1401 Limetree Bay, Virgin Island.

James R. Hubbard
Chief, Tidal Datums Section

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-10004

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 25640	B ON PREVIOUS SURVEY NO. 25641	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	
MAR CARIBE										1
SAINT CROIX										2
SAINT JOHN (title)										3
U.S. VIRGIN ISLANDS (title)										4
SAINT CROIX ~~CANYON~~ VALLEY										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
					Approved:					17
										18
					Charles E. Harrington					19
					Chief Geographer - NOAA 2x5					20
					AUG 13 1984					21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NO.: H-10004

Number of positions	968
Number of soundings	5556
Number of control stations	11

	TIME-HOURS	DATE COMPLETED
Preprocessing Examination	24	2 June 1983
Verification of Field Data	30	7 July 1984
Quality Control Checks	40	
Evaluation and Analysis	89	14 Sept 1984
Final Inspection	24	11 Sept 1984
TOTAL TIME	207	

Marine Center Approval 14 Sept 1984

Transmittal letter of survey and survey records will be included in the Descriptive Report to identify the records accompanying the survey.

ATLANTIC MARINE CENTER
EVALUATION REPORT

SURVEY NO.: H-10004 FIELD NO.: MI-80-1-82

Offshore -- Between St. Croix and St. John

SURVEYED: 7 March through 7 April 1982

SCALE: 1:80,000 PROJECT NO.: OPR-I149-MI/PE-82

SOUNDINGS: Raytheon UGR
Ross Digital Echo Sounder

CONTROL: ARGO (Range/Range)

Chief of Party.....J. A. Yeager

Surveyed by.....L. A. Lapine
.....A. N. Flior
.....K. W. Perrin
.....E. S. Varney
.....J. Zabitchuck
.....K. P. Peters
.....F. W. Rossmann
.....R. D. Henegar
.....B. L. Coakley
.....A. E. Orris
.....C. N. McLean

Automated Plot by.....Xynetics 1201 Plotter (AMC)

1. INTRODUCTION

a. No unusual problems were encountered during verification.

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

2. CONTROL AND SHORELINE

a. The control is adequately discussed in sections F and G of the Descriptive Report.

b. There is no shoreline within the area surveyed.

3. HYDROGRAPHY

a. Soundings at crossings agree within the criteria stated in sections 4.6.1 and 6.3.4.3 of the Hydrographic Manual and section 6.6 of the Project Instructions.

b. Except in the junctional areas where only segments of the 20, 50 and 100 fathom curves could be drawn, the standard depth curves were drawn in their entirety. The 30 and 40 fathom curves were not drawn in areas with steep slopes. Brown curves were added to better show the bottom topography.

c. Development of the bottom configuration and determination of least depths is considered adequate with the following exception:

The development of a canyon in the vicinity of Latitude 17°36'00"N, Longitude 64°26'00"W should have been more extensive. Additional lines of hydrography in this area would have better defined the axis of the canyon.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the Hydrographic Manual with the following exceptions:

a. From the records of the survey, it appears that for the first two-thirds of the survey the operators of the UGR were not familiar with the various scale change methods nor were they able to keep track of the scale changes.

b. Electronic positioning systems support data were not assembled and separately bound or arranged in a cahier as required by section 5.3.5.E of the Hydrographic Manual.

c. There were no calibration signals listed in the Descriptive Report as required by section 4.4.3.3 of the Hydrographic Manual. As a result, information about calibration stations 700 and 730 could not be found or verified, and these stations were not entered into the control file during verification.

d. The depths for which a velocity corrector should be used were scaled incorrectly from the velocity graph by the field from 150 fathoms down. This was corrected during office processing.

e. No comparison was made with prior survey H-4652b WD (1924-25).

f. No bottom samples were taken as required by sections 1.6.3 and 4.7.1 of the Hydrographic Manual and section 8.1 of the Project Instructions.

g. A negative Dangers to Navigation report was not included in the Descriptive Report as required by section 6.12 of the Project Instructions. No dangers to navigation were discovered during the course of this survey.

h. The final field sheet reproducibility is poor due to the quality of the pen used and of the line ink work on the depth curves. This problem is more serious than usual because section 10.5 of the Project Instructions required that a copy of the final field sheet be furnished

to the Naval Ocean Research and Development Activity in Bay St. Louis, Mississippi.

5. JUNCTIONS

H-9352 (1973) to the north
H-9935 (1981-82) to the north
H-9936 (1981) to the north
H-9992 (1982) to the west
H-9993 (1982) to the west
H-9998 (1982) to the south
H-10002 (1981-82) to the north and south
H-10003 (1982) to the east
H-10006 (1982) to the south
H-10007 (1982) to the southwest
H-10008 (1982) to the southwest
H-10009 (1982) to the southwest

The smooth sheet for survey H-9352 is archived at Headquarters and a standard junction was not made. The comparison between a stable base copy of survey H-9352 and the present survey shows excellent agreement between soundings in the junctional area and the standard junctional curves can be completed.

Excellent junctions were made between the present survey and surveys H-9936, H-9992, H-9993, H-10003 and H-10009.

With the exception of one present survey sounding, which was given a cartographic code of 251 (miss depth) during office processing due to the differences between the Ross Echo Sounder and the UGR, an excellent junction was made between survey H-10002 and the present survey.

Six present survey UGR soundings, which conflicted with Ross soundings on survey H-10006, were given a cartographic code of 251 during office processing. Otherwise, an excellent junction was made between survey H-10006 and the present survey.

Nine present survey UGR soundings, which conflicted with Ross soundings on survey H-10007, were given a cartographic code of 251 during office processing. Otherwise, an excellent junction was made between survey H-10007 and the present survey.

The junction between the present survey and survey H-9935 will be discussed in its Evaluation Report.

Two present survey UGR soundings, which conflicted with Ross soundings on survey H-10008, were given a cartographic code of 251. Further discussion of the junction between the present survey and survey H-10008 will be in its Evaluation Report.

An excellent junction was made between H-9998 and the present survey. The 600 fathom curve was incorrectly drawn on survey H-9998 on the shoaler side of a 603 fathom sounding transferred from the present survey at Latitude 17°31'42.9"N, Longitude 64°49'49.4"W

Some of the soundings transferred from the present survey to junctional surveys H-9992, H-9993 and H-9998 are one (1) to two (2) fathoms shoaler than now shown on the present survey. This is due to the velocity correctors for the present survey being revised during office processing. See Section 4.d of this report.

There were no contemporary junctional surveys to the northeast or east of the present survey. The charted depths and the present survey depths are in harmony to the northeast and east.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrography

H-4652a (1924-26) 1:20,000
H-4653a (1924-25) 1:20,000

Comparison between this prior survey and the present survey is adequately discussed in section K of the Descriptive Report.

Bottom characteristics were carried forward from these prior surveys to supplement present survey data.

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

b. Wire Drag

H-4653b WD (1924-25) 1:20,000

There are no hangs or groundings within the common area on this prior wire-drag survey. There are no conflicts between the present survey depths and the effective wire-drag depths.

7. COMPARISON WITH CHARTS

No. 25640 (29th Edition, August 22, 1981)
No. 25641 (18th Edition, November 28, 1981)

a. Hydrography

A very small part of the charted hydrography originates with the prior surveys and is adequately discussed under that comparison. The remaining charted hydrography probably originates with British Admiralty and Defense Mapping Agency charts.

From 200 fathoms to the deepest depths the range of comparison is from a small number of charted soundings showing good agreement with present survey depths to extremes from 900 fathoms shoaler to 200 fathoms deeper than present survey depths.

Attention is directed to the following:

1) Three charted soundings, a reported 58, a 50 ED and a 75 ED were investigated at reduced line spacing on the present survey and the hydrographer's recommendations for charting are stated in section L of the Descriptive Report.

2) A charted sounding of 390 fathoms in Latitude 18°09'12"N, Longitude 64°43'30"W falls between present survey depths of 751 fathoms to 804 fathoms. These soundings, along with adjacent sounding lines, show a straight down slope progression of depths with no indication of a shoal feature. It is recommended that this sounding be deleted from the chart.

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

b. Aids to Navigation

There are no fixed or floating aids to navigation within the area covered by the present survey.

8. COMPLIANCE WITH INSTRUCTIONS

Except as listed elsewhere in this report, this survey adequately complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

This is an adequate basic survey and no additional field work is recommended. However, for the purpose of bathymetric mapping, additional development and reduced line spacing would have been desirable for ridges and troughs.

Maurice W. Holloway
Cartographic Technician
Verification of Field Data

Richard H. Whitfield
Cartographic Technician
Evaluation and Analysis

Robert R. Hill
Senior Cartographic Technician
Verification Check

Inspection Report
H-10004

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

Inspected

Charles D. Meador
Chief, Evaluation and Analysis Group
Hydrographic Surveys Branch

R. D. Sanocki
Rudolph D. Sanocki
Acting Chief, Hydrographic Surveys Branch

Approved September 14, 1984

Wesley V. Hull
Wesley V. Hull, RADM, NOAA
Director, Atlantic Marine Center

H-10004
MI-80-1-82

NOAA FORM 61-29 (12-71)

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

LETTER TRANSMITTING DATA

REFERENCE NO.
MT-111-84

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

☐ ORDINARY MAIL ☐ AIR MAIL
☒ REGISTERED MAIL ☐ EXPRESS
☐ GBL (Give number) _____

TO:

CHIEF, DATA CONTROL SECTION
HYDROGRAPHIC SURVEYS BRANCH, N/CG243
NATIONAL OCEAN SERVICE, NOAA
ROCKVILLE, MD 20852

DATE FORWARDED
12/11/84

NUMBER OF PACKAGES
one tube; two boxes

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-10004 OPR-I149 Field No. MI-80-1-82

one tube: ✓one smooth sheet
✓one smooth position overlay
✓two smooth excess overlays
✓one descriptive report
✓four final field sheets
✓eight preliminary field sheets
first box: ✓twelve envelopes with UGR fathograms
✓one stack of sawtooth position charts
second box: ✓one accordian folder with echograms and field data printouts
✓one sounding volume
✓one envelope with data removed from Descriptive Report
✓one envelope with supplemental printout data
✓one cahier with: final control printout
final position printout
final sounding printout
L-File (Z-record) Printout

FROM: (Signature) For Norris A. Wika
D. B. MACFARLAND, JR., LCDR, CHIEF, HYDRO SURVEYS BR

RECEIVED THE ABOVE
(Name, Division, Date)
Dwayne S. Clark
January 4, 1985
N/CG243

Return receipted copy to:

HYDROGRAPHIC SURVEYS BRANCH, N/MOA22X
ATLANTIC MARINE CENTER
NOAA – NATIONAL OCEAN SERVICE
439 WEST YORK STREET
NORFOLK, VA 23510

ATTN: THERESA HIGH

NOAA FORM 61-29 SUPERSEDES FORM C&GS 413 WHICH MAY BE USED. ☆U.S. GOVERNMENT PRINTING OFFICE: 1980—765-012/1121

FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10004

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
25636	7-25-85	Ken Rauscher	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 1
25645	1-18-86	Steven P. LaBossiere	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 10
25641	5-13-86	Steven P. LaBossiere	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			~~Drawing No.~~ 20
25640	8-19-86	Steven P. LaBossiere	~~Full Part Before After Verification Review Inspection Signed Via~~
			~~Drawing No.~~ 31
25632	8/19/86	Steven P. LaBossiere	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 1
25634	8/19/86	Steven P. LaBossiere	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 1
25641	5-7-90	Ed Martin	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 31 ~~Reapplgt~~
25640	6-28-90	Ed Martin	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 35 thru 25641 drg 31, in part thru Survey
25644	1/12/95	Dan Fleck	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 14
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8558-P63