

# 9969

Diagram No. 1222-4

NOAA FORM 76-35A

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

## DESCRIPTIVE REPORT

Type of Survey Hydrographic  
Field No. MI-20-4-81  
Registry No. H-9969

### LOCALITY

State Virginia  
General Locality Atlantic Ocean  
Sublocality Cobb Island to Mytle Island

1981

CHIEF OF PARTY  
CAPT R.A. Trauschke

### LIBRARY & ARCHIVES

DATE September 30, 1982

9969

Area 1

12224  
12225  
12226  
12227

Cartog:  
sign off on  
form in back

HYDROGRAPHIC TITLE SHEET

H-9969

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-20-4-81

State Virginia

General locality Atlantic Ocean off ~~Virginia Eastern Shore~~

Locality Myrtle Island to Cobb Island, Virginia  
*Cobb Island to Myrtle Island*

Scale 1:20,000 Date of survey 24 August- 09 October, 1981

Instructions dated 31 March 1981 *changes 1, 2, 3, 4* Project No. OPR-D103-MI-81

Vessel NOAA Ship MT MITCHELL (S-222); Launches (Vesno:2223, 2225)

Chief of party R.A. Trauschke CAPT., NOAA

Surveyed by Ship's Officers (See Remarks)

Soundings taken by echo-sounder, hand-lead, pole Echo Sounder

Graphic record scaled by JH, RW, FS, EM, RC, JZ, UG

Graphic record checked by JH, RW, FS, EM, RC, JZ, UG Verification Branch (AMC)

Protracted by \_\_\_\_\_

Automated plot by Ship's Complot  
Smooth Sheet by Xynetics 1201 Plotter (AMC)

Verification by \_\_\_\_\_

Soundings in ~~fathoms~~ feet at ~~MLLW~~ MLLW (Feet at MLW) feet at MLLW

REMARKS: LT Kenneth W. Perrin (FOO) Notes and changes were made in red ink in

LT E.S. Varney the Descriptive Report.

LT(jg) John W. Humphrey Jr. (OIC)

LT(jg) John Zabitchuck

ENS Frederick Rossmann

ENS Robert Henegar

ENS Bobby Coakley

ENS Amy Orris

ENS Kenneth Peters

*AWOL/SURF TO DM 8/24/87*

A. PROJECT ✓

This survey was carried out in accordance with Project Instructions OPR-D103-MI/PE 81 dated 31 March 1981, and amended by changes 1 through 4 dated 27 April, 06 May, 21 July and 10 August, respectively. *truly*

B. AREA SURVEYED ✓

This survey was conducted off the Virginia, Eastern shore from Myrtle Island to Cobb Island. The shoreline is characterized by low gradually sloping beach front with marsh area adjacent to the west. The charted shoreline shows three inlets, only one of which is navigable (see Section H). Moving offshore the bottom slopes gradually reaching the 30 ft. contour 3.5 n.m. offshore. From the 30 ft. contour east to the survey limit, the bottom continues gradual sloping to an average depth of 55 ft. at the survey limit. The survey area has isolated shoal areas throughout. The limits of the survey are roughly described by lines connecting the following points in a clockwise manner:

<u>Latitude</u>	<u>Longitude</u>
37° <sup>10.8</sup> 08.5' N	75° <sup>49.2</sup> 53.4' W
37° <sup>18.3</sup> 18.3' N	75° 53.4' W
37° <sup>16.3</sup> 16.3' N	75° 35.08' W
37° <sup>11.2</sup> 09.5' N	75° 35.08' W

The survey was conducted between 24 August 1981 (Julian Day 236) and 09 October 1981 (Julian Day 282).

C. SOUNDING VESSELS ✓

Soundings for this survey were obtained by NOAA Ship MT MITCHELL S-222 (VESNO 2220), Launch 1002 (VESNO 2225) and Launch 1004 (VESNO 2223).

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS ✓

The following equipment was used to obtain soundings for this survey:

<u>Equipment</u>	<u>Serial Number</u>
<u>VESNO 2220</u>	
Ross Model 5000 Finline Depth Recorder	1050
Ross Model 4000 Transceiver	1050
Ross Model 6000 Digitizer	1050
<u>VESNO 2223</u>	
Ross Model 5000 Finline Depth Recorder	1089
Ross Model 6000 Digitizer	1053
Ross Model 4000 Transceiver	1039
<u>VESNO 2225</u>	
Ross Model 5000 Finline Depth Recorder	3780
Ross Model 6000 Digitizer	1039
Ross Model 4000 Transceiver	1053

## D. continued

Soundings obtained by the MT. MITCHELL were taken with a skeg mounted transducer (antenna distance = 32.0 m). Antenna distance for all launches is zero. All survey records were scanned by trained Survey Department personnel and checked by the Officer in Charge. Peaks and deeps considered significant that occurred between soundings were inserted and digitizing errors corrected on the electronic corrector tape.

Phase calibration checks were made on each day of hydrography. Any necessary adjustments were made and noted in the sounding volume and on the fathogram. Any departure of the trace from the calibration due to the phase differences was corrected during the scanning process. The Bridge fathometer was run concurrently with the survey fathometer, to aid in detecting shoals and obstructions, during ship hydrographic operations. These records are not part of the survey records.

Velocity correctors were obtained from two Nansen casts on the following dates and locations.

<u>Case Number</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Date</u>
2	37° 03'20"N	75° 25'49"W	08 August 1981
3	37° 14'30"N	75° 20'18"W	26 September 1981

Corrections derived from Cast Number 2 are applied to all hydrography from Julian Date 236 to Julian Date 239. Corrections from Cast Number 3 are applied to Julian Date 257 to Julian Date 282. Bar checks were taken by the launches whenever possible at the beginning and end of each day. Bar check correctors compared favorably with Nansen cast data to a depth of 25 feet after which the bar check began to diverge from the Nansen cast. Since Nansen cast velocity correctors are considered more accurate, those correctors were applied during off-line processing. All velocity tables and tape printouts may be found in Appendix D of this report.

A draft of 14.1 feet is applied to all soundings collected by the MT. MITCHELL during on-line data collection. Settlement and squat correctors for the ship were determined on 26 July 1981, Julian Date 207, 8 miles east of Cape Charles, Virginia. A draft of 1.4 feet is applied to all soundings taken by Launches 2223 and 2225 during on-line data collection. Settlement and squat correctors for the launches were determined on 15 July 1981, Julian Date 196, at Pier 5, Little Creek Naval Amphibious Base, Little Creek, Virginia. A copy of field data and settlement and squat correctors versus RPMs for the launches and the ship is included in the survey support data found in Appendix D. The settlement and squat correctors will be applied during final processing of the data by OA/CAM3, Processing Division, via the TC/TI Tape.

## D. continued

This survey was conducted using predicted tides based on daily predictions at Hampton Roads (Sewells Point), Virginia from the Tide Table 1981, with tidal zoning applied as provided by OPD-103-MI/PE 80 Project Instructions. The tide correctors were applied during on-line sounding with the following exceptions: Julian Dates 257 and 258, VESNO 2220; Julian Date 268, VESNO 2225; Julian Date 269, VESNO 2225, Pos. 5412-5482, when tidal corrections were applied during off-line processing. Smooth tides were requested from the Chief, Tides and Water Levels Branch (OA/C23) dated 19 October 1981, for the period of hydrography.

E. HYDROGRAPHIC SHEETS

This survey was plotted on four mylar field sheets prepared by the MT MITCHELL hydro-plot system.

<u>No. of Sheets</u>	<u>Type</u>	<u>Skew</u>
2	Main Scheme	0, 21, 54
2	Crosslines, Shoreline Bottom Samples, Detached Positions	0, 21, 54

Sounding on the field sheets are corrected for draft, predicted tides, digitizing errors and sound velocity. Sheets are not corrected for smooth tides or settlement and squat; these correctors will be applied on the final smooth sheet prepared by the Atlantic Marine Center (OA/CAM3) Processing Division, Norfolk, Virginia.

All field records and the following tapes have been forwarded to the Atlantic Marine Center, Processing Division:

- Hyperbolic Master Tapes
- Electronic Corrector Tapes
- Velocity Corrector Tapes
- Parameter Tapes
- Signal Tapes
- Predicted Tide Tables
- TC/TI Tapes

F. ELECTRONIC CONTROL STATIONS

The following control stations were used for this survey:

<u>Station No., Name</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
100 Gravity, <del>1965</del> <del>(1980)</del> 1965	36° 40' 31.453"	075° 54' 56.471"
200 Fen, 1960	37° 05' 36.243"	075° 58' 17.556"
300 H-8-VA-78, <del>1980</del> 1978	37° 51' 46.270"	075° 22' 03.968"

F. continued

All stations were established using Third Order Class I survey methods. Stations were recovered in June/July 1981 by MT. MITCHELL officers. A complete list of stations used for this project and their geographic positions are included in Appendix F of this report.

G. HYDROGRAPHIC POSITION CONTROL

Position control for this survey was obtained using HYDROTRAC manufactured by ODOM Offshore Surveys, Inc., in the hyperbolic mode. HYDROTRAC was operated at a frequency of 1718.59 kHz. The equipment used, location and serial numbers are as follows:

<u>Location</u>	<u>Equipment</u>	<u>Model</u>	<u>Ser. No.</u>
Ship (VESNO 2220)	HYDROTRAC Receiver	703	327
	HYDROTRAC Power Amplifier	74-87	539
	Sawtooth Recorder		
Slave 1 (Station 100)	Receiver/Slave Drive Unit (Julian Dates 236-239)		419
	Receiver/Slave Drive Unit (Julian Dates 257-282)		214
	Linear Power Amplifier	74-78	537
	Coupler		131
Master (Station 200)	Master Drive Unit		122
	Linear Power Amplifier	74-87	538
Slave 2 (Station 300)	Receiver/Slave Drive Unit		226
	Linear Power Amplifier	74-87	536
	Coupler		130
VESNO: 2223	HYDROTRAC Receiver	700	328
	Sawtooth Recorder	RB-15	13
VESNO: 2225	HYDROTRAC Receiver	700	326
	Sawtooth Recorder		A-175

Lane counts and partial correctors for the Ship (VESNO 2220) were determined by circle calibration around Chesapeake Light Tower (Third Order Triangulation Station) located at 36° 54'16.158" N, 075° 42'47.123" W. The circle calibration method is described on page 4-28 of the Hydrographic Manual. Calibration buoys deployed by the MT. MITCHELL at the following locations: 37° 05'32.58" N, 75° 41'51.75" W (Calibration Buoy # 1); 37° 14'00.94" N, 75° 40'23.56" W (Calibration Buoy # 2) were used to check whole lanes with an alongside pass during each day of hydrography. Positions for the calibration Buoys # 1 and # 2 were determined using the circle calibration method. Several passes were made to verify the rates of each buoy position.

4-8-27  
6 21'9  
Rudy

G. continued

Static point calibrations for Launches (VESNO 2223 and 2225) were obtained laying alongside Sand Shoal Inlet Mike's Sand Beacon, located at 37° 17'56.547" N, 75° 48'14.311" W. Rates were recorded and averaged out to remove any discrepancies in the correctors. ✓

The HYDROTRAC whole lane count was constantly monitored by comparing the navigation interface readout with a running count on the sawtooth recorder. The sawtooth recorder was annotated by hand during any survey operation. ✓

H. SHORELINE See section 2.6. of the Verification Report

Sounding lines were run parallel to the shoreline at the inshore limits of safe navigation. Where sounding lines are not parallel to the shoreline they delineate areas of shoaling immediately offshore. Positions 5630-5649, Julian Date 274 (VESNO 2225), were run west of ~~the continuous shoreline~~ <sup>a line</sup> extending across New Inlet. These soundings were not smooth plotted <sup>on the field sheet</sup> because they are not within the required survey limits. The data is included with master tapes forwarded to the Atlantic Marine Center (OA/CAM3). ✓

Shoreline was transferred in blue from:

Shoreline Movement Study, Smith Island to Hog Island, Virginia  
1980 Compilation for Digital Data; Map # 229; Scale 1:20,000  
Mercator Projection; Sheet P OPR-D-103-MI/PE-81

Shoreline from Map # 229 was transferred in blue because it was not verified by field edit. Comparison between the charted shoreline and the Shoreline Movement Study Map # 229 shows no major discrepancies. The area around the mouths of New Inlet and Ship Shoal Inlet, although charted as open, are characterized by continuously shifting shoal formations. ✓

It is recommended that the charted shoreline be revised using the aforementioned Shoreline Movement Study until a photo-grammetric shoreline study is undertaken. *concur* ✓

I. CROSSLINES: See section 3.1. of the Verification Report

Crosslines were run at an angle of at least 45 degrees to the main scheme sounding lines. The percentage of crosslines to main scheme per vessel and comparative statistics are: ✓

<u>VESNO</u>	<u>Crossline/Main Scheme</u>
2220	8.5%
2223	11.0%
2225	16.0%

## I. continued

<u>VESNO</u>	<u>Comparison Percentage</u>		
2220	(+) 1 foot or less	80%	
	(+) 2 feet or less	19%	
	(+) 3 feet or more	1%	
2223	(+) 1 foot or less	73%	
	(+) 2 feet or less	22%	
	(+) 3 feet or more	5%	
2225	(+) 1 foot or less	85%	
	(+) 2 feet or less	12%	
	(+) 3 feet or more	3%	

For VESNO 2223 the 5% of plus or minus (+) 3 feet or greater soundings occurred in the area of Sand Shoal Inlet where the inlet meets the ocean. This is a turbulent area caused by ~~use of predicted tides~~, longshore current and the effect of wind driven water being pushed into and out of the inlet. Agreement between main scheme and crosslines for all vessels was good.

J. JUNCTION SURVEYS

This survey junctions with the following contemporary surveys: *See Section 5. of the Verification Report.*

<u>Area of Junction</u>	<u>Field No.</u>	<u>Reg. No.</u>	<u>Scale</u>	<u>Date</u>
South	MI-20-2-81	H-9961	1:20,000	1981
South	MI-20-3-81	H-9962	1:20,000	1981
East	MI-20-5-81	H-9970	1:20,000	1981

Junctions between MI-20-4-81 and MI-20-2-81 to the south overlap between VESNO 2220 and VESNO 2225. Comparison shows the following: 83% agree to plus/minus 1 foot or less; 17% agree to plus/minus 3 feet or less. All remaining junctions to the south are with MI-20-3-81 but have no overlap because consecutive sounding lines were run with the same vessel in the same year. MI-20-4-81 junctions to the east with MI-20-5-81 and comparison shows agreement to (+) 1 foot.

K. COMPARISON WITH PRIOR SURVEYS *See Section 6. of the Verification Report*

The following prior survey was within the survey area:

<u>Registry No.</u>	<u>Scale</u>	<u>Date</u>
H-4194	1:40,000	1921
<del>H-4194</del>	<del>1:40,000</del>	<del>1921</del>

Soundings from the prior survey compared to the current survey show the following:

- 48% agree to plus/minus 3 feet
- 18% agree to plus/minus 6 feet

General trends over the entire survey area show bottom topography deepening.



L. CHART COMPARISON See section 7 of the Verification Report

This area is covered by the following charts:

<u>Chart No.</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>
12221	50th	18 July 1981	1:80,000
12224	16th	23 May 1981	1:40,000

This survey, east of Longitude 75° 40.00' W, extending to the eastern survey limit between Latitude 37° 11.00' N and 37° 18.59' N shows depths ~~3-4~~ <sup>5-4</sup> feet deeper than charted depths over most of this area. Shoal depths have remained fairly constant as shown on the charts; however, the current survey shows shoals located at 37° 14.00' N, 75° 39.10' W migrated in a southeasterly direction to 37° 13.50' N, 75° 38.40' W. These geographic positions encompass a radius of .4 n.m. Charted shoals at 37° 12.30' N, 75° 38.85' W have migrated to a position 37° 11.91' N, 75° 38.50' W, .3 n.m. southeast of the charted position. Shoaling was also seen extending north-south from 37° 12.20' N, 75° 39.60' W; total length of shoal is .45 n.m. Bottom features east of 75° 40.00' W to the eastern survey limit predominantly show <sup>some</sup> shifting to the southeast. *concur*

Small areas of shoaler depths located during survey operations were further developed using reduced line spacing to determine the extent of shoaling. A depth cleared to 41 feet located at 37° 15.32' N, 75° 37.30' W was developed in this manner. The shoalest depth seen in this vicinity was 56 feet. Charted shoals at 37° 12.45' N, 75° 42.35' W and 37° 11.10' N, 75° 42.35' W remain unchanged in depth and location as found by this survey. *by fathometer on the wreck is 61 feet.*

The survey area west of 75° 40.00' W to the shoreline limit of this survey also shows signs of deepening and shoal migration. Shoal movement along Wreck Island, Cobb Island and Sand Shoal Inlet is to the southwest. South east Channel has shifted to the southwest, still oriented 310°-130° true as charted. The eastern limit of the 24 foot contour has been shifted to the west, .90 n.m., possibly a result of filling from sediment transport due to longshore current. *concur*

An exposed shoal charted at 37° 16.75' N, 75° 47.00' W no longer exists at that position; it is recommended it be deleted from the chart. Shoals located at 37° 15.86' N, 75° 45.85' W and 37° 17.03' N, 75° 46.01' W may become exposed at extremely low tide. These shoals have radii of .15 n.m. and .20 n.m. respectively. Areas immediately to the north and south of the channel entering Ship Shoal Inlet are of constantly changing bottom features. Navigation buoys are shifted frequently by the Coast Guard as conditions change. *concur*

Four Presurvey Review Items are within the survey limits.

PSR Item # 60: Visible wreck located at 37° 18'30" N, 75° 45'30" W. The wreck does exist and is exposed through most of the tidal range, totally submerged at very high tide. It was found that the wreck lies at 37° 18'06" N, 75° 46'08" W and is recommended it be charted as such. *concur* <sup>07.55'</sup> *no elevation given by field*  
12.07'

L. continued

PSR Item # 61: Dangerous sunken wreck (37 foot cabin cruiser), PA, at 37° 17'01" N, 75° 42'03" W. A limited investigation, as per project instructions, with reduced line spacing and a star pattern over the position with a 1,000 meter radius was conducted. Since no signs of a wreck were seen on the fathogram the wreck is not considered dangerous and it is recommended that the wreck be charted as ED (existence doubtful). *Do not concur, see section 7.a.3) of the Verification Report*

PSR Item # 62: Dangerous sunken wreck (88 foot fishing vessel), PA, at 37° 16'58" N, 75° 40'00" W. A limited investigation, as per project instructions, with reduced line spacing and a star pattern over the position with a 1,000 meter radius was conducted. No evidence of a wreck was discovered. Therefore, the wreck is considered non-dangerous and it is recommended that it be charted as ED (existence doubtful). During the development of this item the least depth of a sand ridge (41 feet at 37° 17'14" N, 75° 39'07" W) was discovered. The ridge shoals up from the southwest to the northeast. It is recommended that this shoal be charted as indicated. *Concur on shoal do not concur on wreck see section 7.a.2) of the Verification Report*

PSR Item # 63: Non-dangerous sunken wreck (cargo vessel), PA, at 37° 17'00" N, 75° 39'00" W. A limited investigation, as per project instructions, with reduced line spacing and a star pattern over the position with a 1,000 meter radius was conducted. No evidence of the wreck was seen. It is recommended this be charted as ED (existence doubtful). *do not concur see section 7.a.1) of the Verification Report*

M. ADEQUACY OF THE SURVEY *see section 6.b. of the Verification Report*

This survey is considered complete and adequate to supersede prior surveys for charting.

#### N. AIDS TO NAVIGATION

Included within the limits of this survey were five floating aids to navigation. The floating aids within the survey limits are:

<u>Aid</u>	<u>Characteristics</u>	<u>Latitude</u>	<u>Longitude</u>
Bell Buoy	Mo. (A) W. Bl. W. Vert Stripe	37° 17' <sup>41.24</sup> <del>39.7</del> " N	75° 42' <sup>55.60</sup> <del>51.7</del> " W
Buoy # 1	Fl. G. 4s	37° 18' <sup>05.17</sup> <del>03.5</del> " N	75° 45' <sup>49.77</sup> <del>45.4</del> " W
Buoy # 3	Fl. W. 4s	37° 17' <sup>49.69</sup> <del>48.1</del> " N	75° 46' <sup>22.47</sup> <del>18.1</del> " W
Buoy # 5	Bl. Can. G. ref.	37° 17' <sup>47.09</sup> <del>46.3</del> " N	75° 46' <sup>41.15</sup> <del>36.7</del> " W
Buoy # 6	Fl. R. 4s	37° 17' <sup>27.99</sup> <del>26.4</del> " N	75° 46' <sup>57.31</sup> <del>52.9</del> " W

Buoys # 1, # 3, # 5 and # 6 are not charted because they are frequently repositioned due to the changing bottom features of Sand Shoal Inlet. The comparison of the position for Bell Buoy Mo (A) W with U.S. Coast Guard Light List Vol. I (CG-158) is in agreement. *concur*

O. <u>STATISTICS</u>	<u>Ship</u>	<u>Launches</u>	<u>Total</u>
Linear Nautical Miles of Hydrography	364.2	376.7	740.9
Linear Nautical Miles of Crosslines	31.2	50.4	81.6
Linear Nautical Miles of Development	129.3	130.2	259.5
Total Linear Miles of Hydrography	524.7	557.3	1,082.0
Total Miscellaneous Miles	311.7	260.3	572.0
Total Miles Run	836.4	854.6	1,691.0
'Square Miles of Hydrography	-	-	72
Total Number of Positions	1,798	2,172	3,970
Nansen Casts	2	-	2
Bottom Samples	38	35	73

P. MISCELLANEOUS

RK110 was used as the on-line program by the ship in lieu of RK112 because of problems with gyro compass input. Launches 2223 and 2225 used RK112 on line. On Julian Day 282 Launch 2223 ran splits on MI-20-4-81 (south). Between 37° 11.2' N, 75° 49.2' W and 37° 11.7' N, 75° 48.6' W on the Shoreline Movement Study Map # 229 there is evidence of shoreline recession possibly due to erosion and sediment transport. While the ship was running 200 meter line space when developing shoal indications, the ship reduced its speed to make the turn easier. It should be noted that the first and possibly the second soundings at the beginning of the line may indicate that the ship had not reached its normal operation speed and the positions of the soundings are correct.

Q. RECOMMENDATIONS See sections 6 & 7 of the Verification Report

It is recommended that this survey supersede all prior surveys for charting.


R. AUTOMATED DATA PROCESSING

<u>Program Name</u>	<u>Version</u>
RK110 Hyperbolic Real Time Plot	01-30-76
RK112 Range-Range and Hyperbolic Real Time Plot	03-19-81
RK201 Grid, Signals and Lattice	04-18-75
RK210 Hyperbolic Non-Real Time Plot	07-25-80
RK300 Utility Computations	10-21-81
RK330 Data, Reformat and Check	05-04-76
PM360 Electronic Corrector Tape Abstract	02-21-76
AM500 Predicted Tide Generator	11-10-72
RK530 Velocity Corrections Computations	05-10-76
AM602 Extended Line Oriented Editor	05-12-75

S. REFERENCE TO REPORTS

Settlement and Squat Report 1981, NOAA Ship MT MITCHELL: Settlement and Squat Report 1981, Launches 2223 and 2225; Coast Pilot Report-NOAA Ship MT MITCHELL-Eastern Shore Virginia, OPR-D103-MI/PE-81.

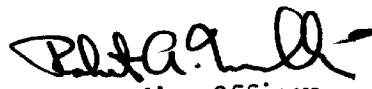
Respectfully Submitted,



John W. Humphrey, Jr.  
Lt.(jg), NOAA

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.

  
Commanding Officer  
CAPT NOAA

APPENDIX "J"

SIGNAL NAMES

OPR-D103-MI-81

MI-20-4-81

SIGNAL TAPE--NAMES

SURVEY H-9969, FIELD NUMBER MI-20 4-81

STA.#	NAME
	SAND SHOAL INLET MIKES SAND BEACON, 1933 (calibration)
100	SANDBRIDGE HYDROTRAC SITE (GRAVITY, 1965 <sup>OK</sup> (1980))
129	CHESAPEAKE LIGHT TOWER (CALIBRATION PT.)
130	<del>PARCEL C TOWER A (LOOKOUT TOWER)</del>
131	<del>DAM NECK MILLS NAVY TANK G-10217</del>
132	<del>VIRGINIA BEACH MUNICIPAL TANK G-10217</del>
133	* <del>CAPE HENRY LIGHTHOUSE, OLD</del>
134	<del>CAVALIER HOTEL CUPOLA</del>
135	<del>CAPE HENRY LIGHTHOUSE ECC. SW (DEL NORTE STA.)</del>
136	<del>CAPE HENRY LIGHTHOUSE 1887</del>
200	FISHERMANS I. HYDROTRAC SITE (FEN, 1960) ✓
201	<del>FISH ISLAND TANK</del>
202	<del>FISH ISLAND TOWER</del>
204	<del>FISH ISLAND SHORAN</del>
210	<del>CAPE CHARLES LIGHT</del>
212	* <del>" " 771ST TWR RED/WHITE</del>
213	<del>" " 771ST AN/FPS N</del>
214	<del>" " " " S</del>
215	<del>SMITH ISLAND TOWER A</del>
216	<del>" " " B</del>
217	<del>" " " C</del>
218	<del>BOWDEN-1962</del> ✓
219	<del>MOCKHORN</del>
220	<del>CAROL 1968</del>
221	<del>GOOD 1999</del>
222	<del>SANDERLIN 1962</del>
223	<del>COBB ISLAND COAST GUARD <sup>LOOKOUT</sup> TOWER, 1937</del> ✓
224	* <del>PIG 1953</del> ✓
225	* <del>LIPHAM 1952</del> ✓
300	<del>ASSATEAGUE I. HYDROTRAC SITE (H-8-VA-78), 1978</del> ✓

\* Deleted from control file

RHW  
3/12/82

SIGNAL TAPE LISTING

MI-20-4-81

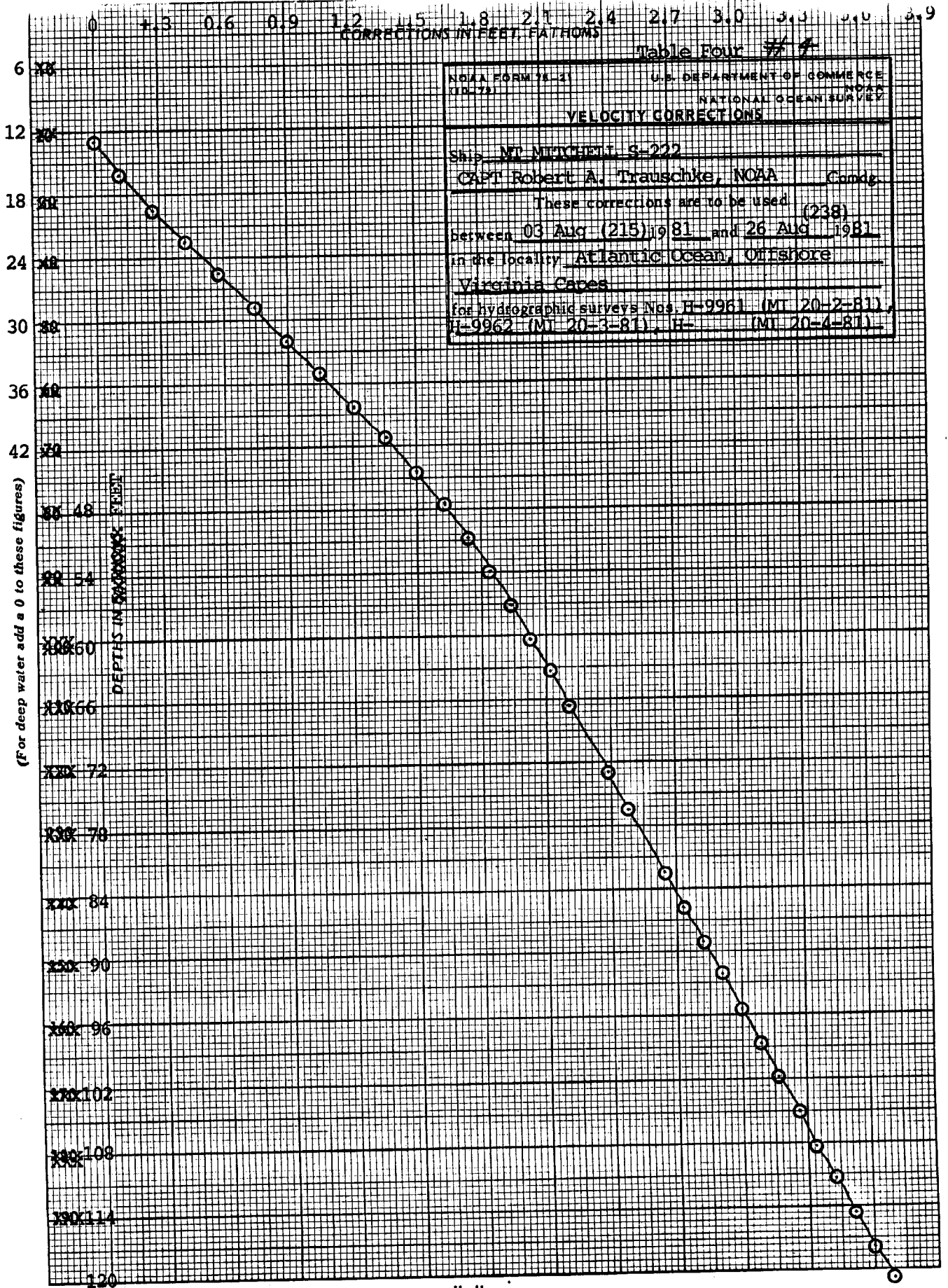
OPP-D103-MI-81

VESNOS 2220  
2223  
2225

100	4	36	40	31453	075	54	56471	✓	250	0004	171359	- GRAVITY, 1965
129	3	36	54	16158	075	42	47123		139	0039	000000	
130	3	36	53	35785	075	59	18153		139	0033	000000	
131	3	36	46	13694	075	57	51981		139	0040	000000	
132	3	36	50	31980	075	59	23523		139	0040	000000	
133	6	36	55	32330	076	00	30516		139	0000	000000	
134	6	36	52	08381	075	59	02012		139	0000	000000	
135	4	36	55	34302	076	00	27323		139	0050	000000	
136	3	36	55	34335	076	00	27216		139	0050	000000	
200	7	37	05	36243	075	58	17556	✓	250	0050	171859	- FEN, 1960
201	3	37	06	04124	075	58	43436		139	0000	000000	
202	3	37	05	57891	075	58	45131		139	0000	000000	
204	3	37	05	51122	075	58	45459		139	0000	000000	
210	3	37	07	22007	075	54	24576		139	0000	000000	
212	4	37	07	57096	075	57	14854		139	0000	000000	
213	3	37	08	03976	075	57	04192		139	0000	000000	
214	3	37	08	02246	075	57	04202		139	0000	000000	
215	4	37	07	19792	075	54	22064		139	0000	000000	
216	4	37	07	19730	075	54	23296		139	0000	000000	
217	4	37	07	19170	075	54	24248		139	0000	000000	
218	4	37	10	52446	075	49	45128	✓	139	0000	000000	BOWDEN, 1962
219	4	37	11	54088	075	54	19060		139	0000	000000	
220	4	37	12	29159	075	48	38976		139	0040	000000	CAROL, 1968
221	4	37	12	48739	075	49	15776		139	0000	000000	GODD, 1933
222	4	37	17	40884	075	47	55438		139	0000	000000	JANDERLIN, 1962
223	4	37	18	14815	075	46	35441		139	0000	000000	COBB ISLAND COAST GUARD LOOKOUT TOWER, 1937
224	4	37	19	23903	075	45	03309		139	0000	000000	PIG, 1933
225	4	37	16	08039	075	47	41820		139	0000	000000	LIPHAM, 1962
300	4	37	51	46270	075	22	03968		250	0004	171359	H-B-VA-78, 1978

K&E 20 X 20 TO THE INCH KEUFFEL & ESSER CO. U.S.A.

1240





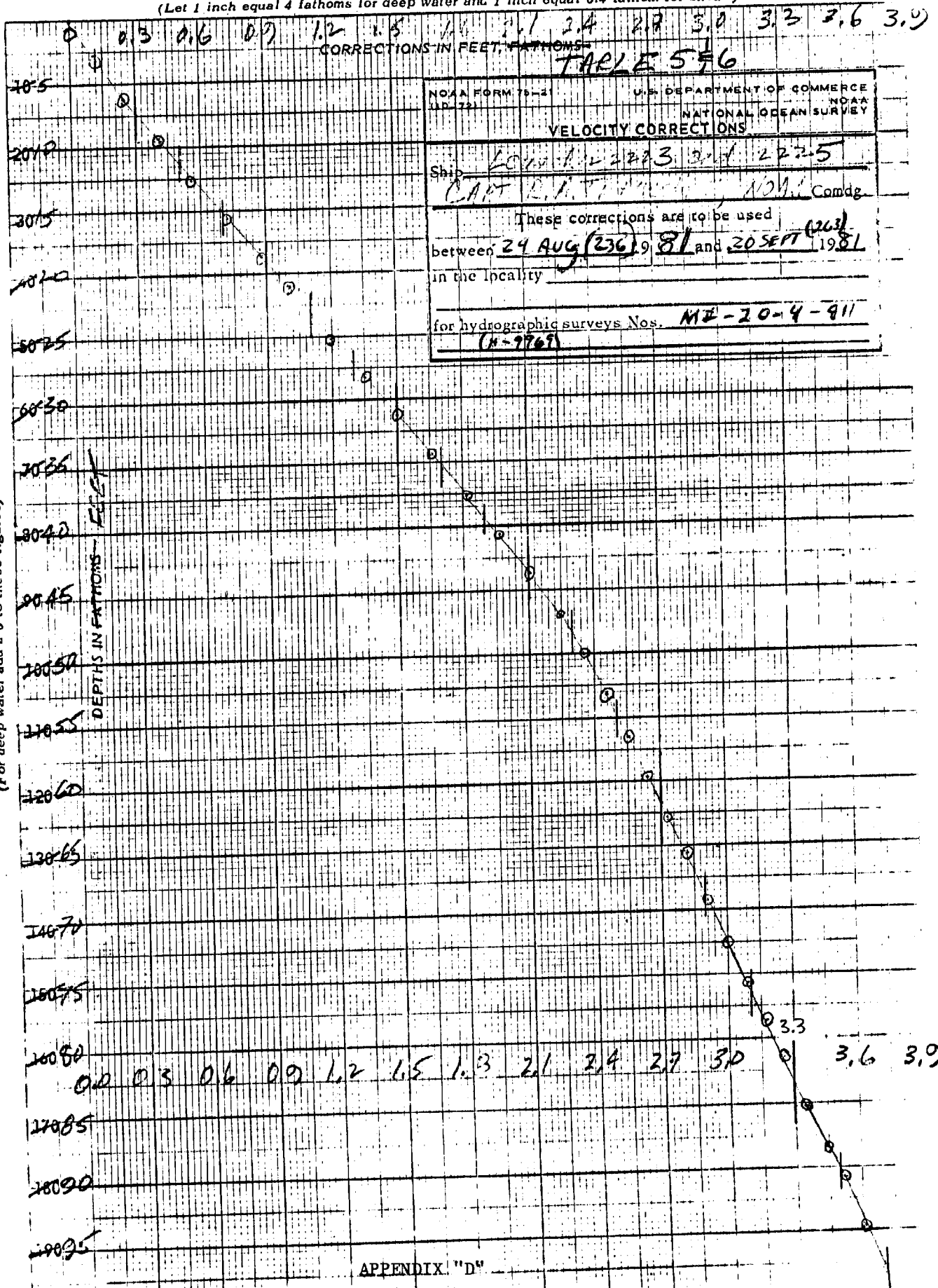
VELOCITY TABLE 4

MI-23-4-81

WESNO 2223

000160 0 0000 0004 000 222000 020431  
000198 0 0002  
000243 0 0004  
000282 0 0006  
000322 0 0008  
000362 0 0010  
000402 0 0012  
000447 0 0014  
000494 0 0016  
000557 0 0018  
000628 0 0020  
000705 0 0022  
000776 0 0024  
000844 0 0026  
000918 0 0030  
000989 0 0030  
001067 0 0032  
001144 0 0034  
001218 0 0036  
999999 0 0000

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)



46.

VELOCITY TABLE 5

MI-20-4-81

OPR-D103-MI-81

WESNO 2223

000032 0 0000 0005 000 222300 020481

000074 0 0002

000114 0 0004

000153 0 0006

000192 0 0008

000233 0 0010

000272 0 0012

000312 0 0014

000351 0 0016

000394 0 0018

000434 0 0020

000484 0 0022

000548 0 0024

000616 0 0026

000687 0 0028

000770 0 0030

000835 0 0032

999999 0 0000

VELOCITY TABLE 6

MI-20-4-81

OPR-D103-MI-81

VESNO 2225

000032 0 0000 0006 000 222500 020431  
000074 0 0002  
000114 0 0004  
000153 0 0006  
000192 0 0008  
000233 0 0010  
000272 0 0012  
000312 0 0014  
000351 0 0016  
000394 0 0018  
000434 0 0020  
000484 0 0022  
000548 0 0024  
000616 0 0026  
000687 0 0028  
000770 0 0030  
000835 0 0032  
999999 0 0000

VELOCITY CORRECTION TABLE OPTIONS:

- 0) NO TABLE
- 1) IN FEET
- 2) IN FATHOMS
- 3) IN METERS

1  
DRAFT = 14.1

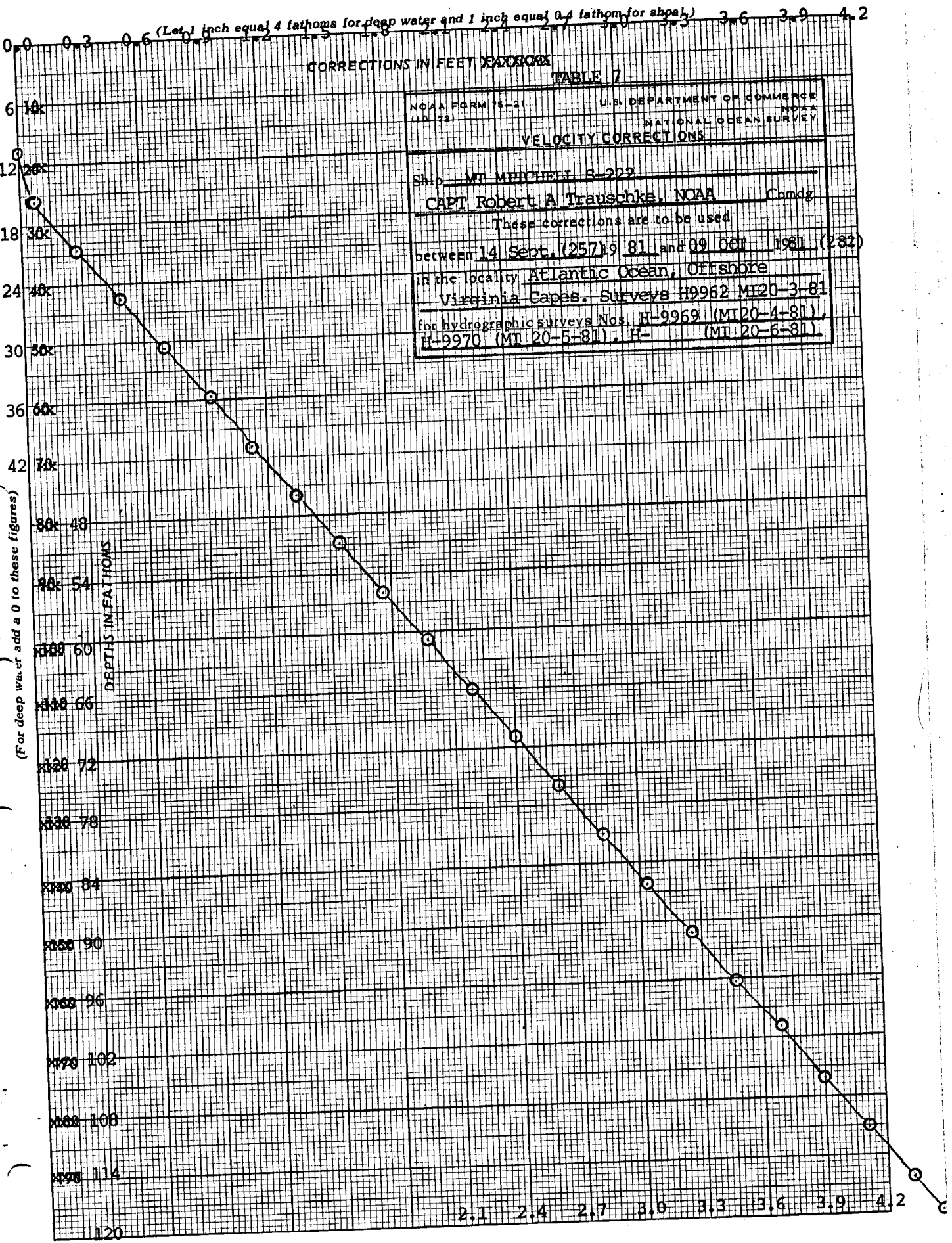
ACTUAL DEPTH (SURFACE)  
MINUS VELOCITY  
CORRECTION  
(FT)

VELOCITY  
CORRECTION  
(FT)

0005.25	0000.00
0010.50	0000.00
0015.68	0000.07
0020.72	0000.28
0025.75	0000.49
0030.79	0000.73
0035.83	0000.92
0040.87	0001.13
0045.90	0001.34
0050.94	0001.55
0055.98	0001.76
0061.02	0001.97
0066.05	0002.12
0071.09	0002.49
0076.13	0002.61
0081.17	0002.32
0086.20	0003.04
0091.24	0003.25
0096.27	0003.46
0101.31	0003.67
0106.34	0003.90
0111.37	0004.11
0116.41	0004.33
0120.18	0004.49

46 1240

K&S  
20 X 20 TO THE INCH • 7 X 10 INCHES  
KEUFFEL & ESSER CO. MADE IN U.S.A.



000159 0 0000 0007 000 222000 009969  
000213 0 0002  
000260 0 0004  
000308 0 0006  
000352 0 0008  
000400 0 0010  
000447 0 0012  
000496 0 0014  
000544 0 0016  
000592 0 0018  
000640 0 0020  
000687 0 0022  
000734 0 0024  
000784 0 0026  
000830 0 0028  
000876 0 0030  
000924 0 0032  
000972 0 0034  
001012 0 0036  
001062 0 0038  
001108 0 0040  
001160 0 0042  
001206 0 0044  
999999 0 0000

VELOCITY CORRECTION TABLE OPTIONS:

- 0) NO TABLE
- 1) IN FEET
- 2) IN FATHOMS
- 3) IN METERS

1

DRAFT = 1.4

ACTUAL DEPTH (SURFACE)  
MINUS VELOCITY  
CORRECTION  
(FT)

VELOCITY  
CORRECTION

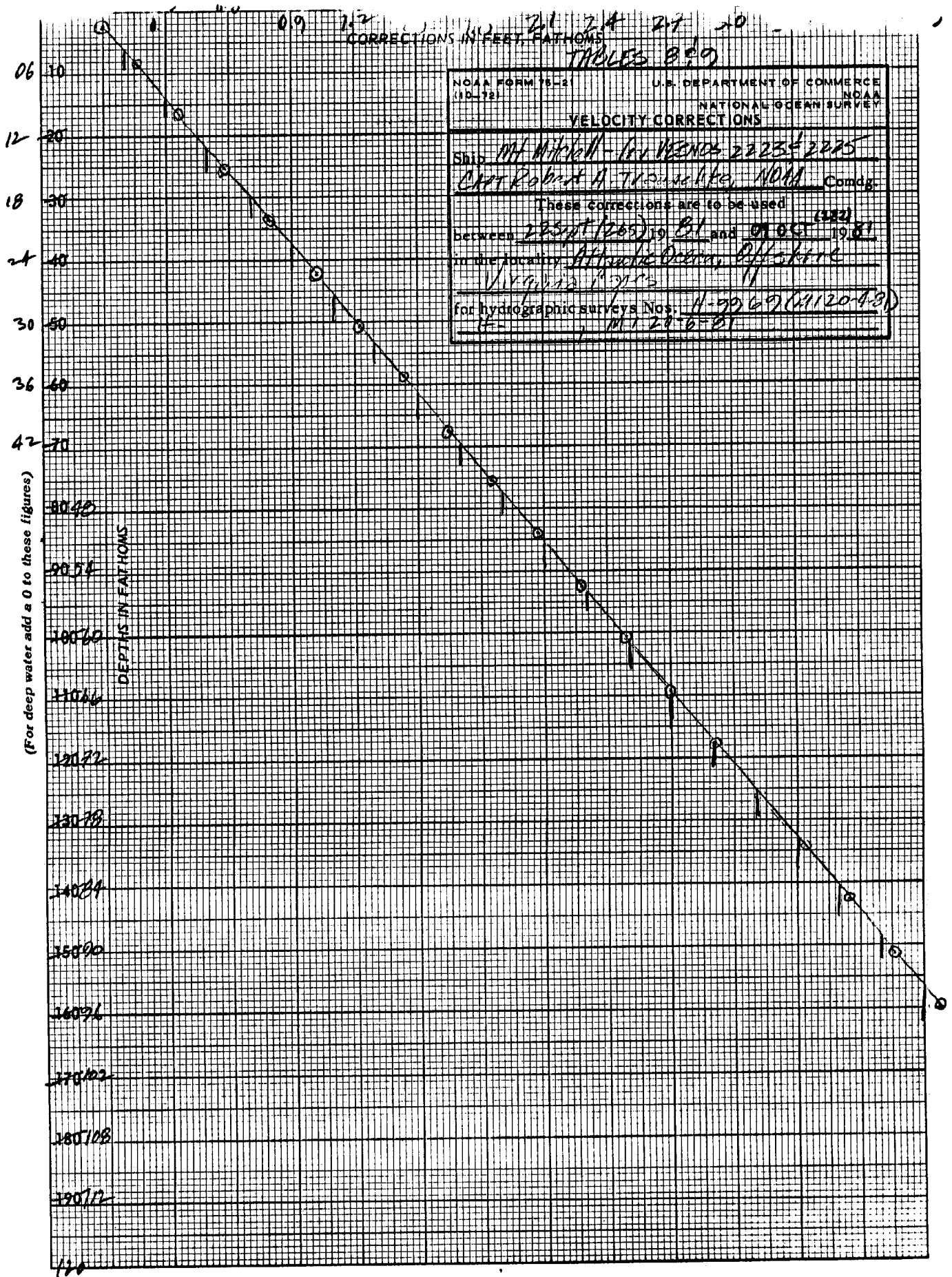
(FT)

0005.09	0000.16
0010.13	0000.37
0015.17	0000.58
0020.20	0000.79
0025.24	0001.01
0030.28	0001.22
0035.31	0001.43
0040.35	0001.64
0045.39	0001.85
0050.43	0002.07
0055.47	0002.28
0060.50	0002.49
0065.54	0002.70
0070.58	0002.91
0075.62	0003.12
0080.65	0003.34
0085.69	0003.55
0090.72	0003.76
0095.76	0003.98
0100.79	0004.19
0105.83	0004.41
0110.86	0004.62
0115.89	0004.84
0119.67	0005.00



KΣ 20 X 22 TO THE INCH REUFFEL & ESSER CO. MADE IN U.S.A.

6 1240



VELOCITY TABLE 8

MI-20-4-81

OPR-D103-MI-81

VENO:2223

000046 0 0000 0008 000 222300 009969  
000084 0 0002  
000130 0 0004  
000178 0 0006  
000225 0 0008  
000274 0 0010  
000321 0 0012  
000369 0 0014  
000418 0 0016  
000464 0 0018  
000512 0 0020  
000562 0 0022  
000609 0 0024  
000655 0 0026  
000704 0 0028  
000750 0 0030  
000796 0 0032  
000844 0 0034  
000891 0 0036  
000940 0 0038  
999999 0 0000

VELOCITY TABLE 9

MI-20-4-81

CFR-D103-MI-81

VENO:2220

000046 0 0000 0009 000 222500 009969  
000084 0 0002  
000130 0 0004  
000178 0 0006  
000225 0 0008  
000274 0 0010  
000321 0 0012  
000369 0 0014  
000418 0 0016  
000464 0 0018  
000512 0 0020  
000562 0 0022  
000609 0 0024  
000655 0 0026  
000704 0 0028  
000750 0 0030  
000796 0 0032  
000844 0 0034  
000891 0 0036  
000940 0 0038  
999999 0 0000

NOAA Ship MT MITCHELL S 222

Settlement and Squat Test ✓

26 July 1981

A settlement and squat test was run for NOAA Ship MT MITCHELL on 26 July 1981, 8 miles off of Cape Charles, Virginia to validate settlement and squat correctors derived on 12 June 1978 at Galveston, Texas. The test consisted of comparisons of depths taken when passing a calibration buoy set in 40 feet of water on a flat-bottom area by MT MITCHELL for OPR D103-MI-81.

The ship made several passes at various speeds on approximate headings of 160° and 340°, and with the ship dead in the water; each time the ship was west of the buoy. Depth measurements were made when the buoy was 10 meters east of the after transducer, i.e. the only transducer to be used during the 1981 field season. Initial depth readings were made with the ship dead in the water immediately before and after any passes were made; initial readings were subsequently adjusted for tidal change. Each difference between the initial reading and the average depth of those taken during the two passes at a given speed were used to construct a graph of correctors. That new graph was compared with the graph of 12 June 1978 for validation. The corrector for standard speed (11 knots) was validated, but the test indicates that a different curve is necessary for lesser speeds. The new curve is recommended for the 1981 field season.

The ship carried a full load of fuel and a Jensen launch in davit #3. This is the typical configuration when the ship is conducting hydrography during this field season. A transducer draft of 14.1 feet was determined before the test by direct comparisons of leadline casts and echo soundings. The test was conducted with both engines at 160 RPM with pitches of 0 foot, 3 feet, 6 feet, and full pitch ahead for the various passes. During the test, the seas were 0 to 1 foot from the south, with the wind also southerly at 5 knots. Lateral stability of the buoy was assured by the short scope of its anchor line and checked by noting the Hydrotrac rates at the buoy.

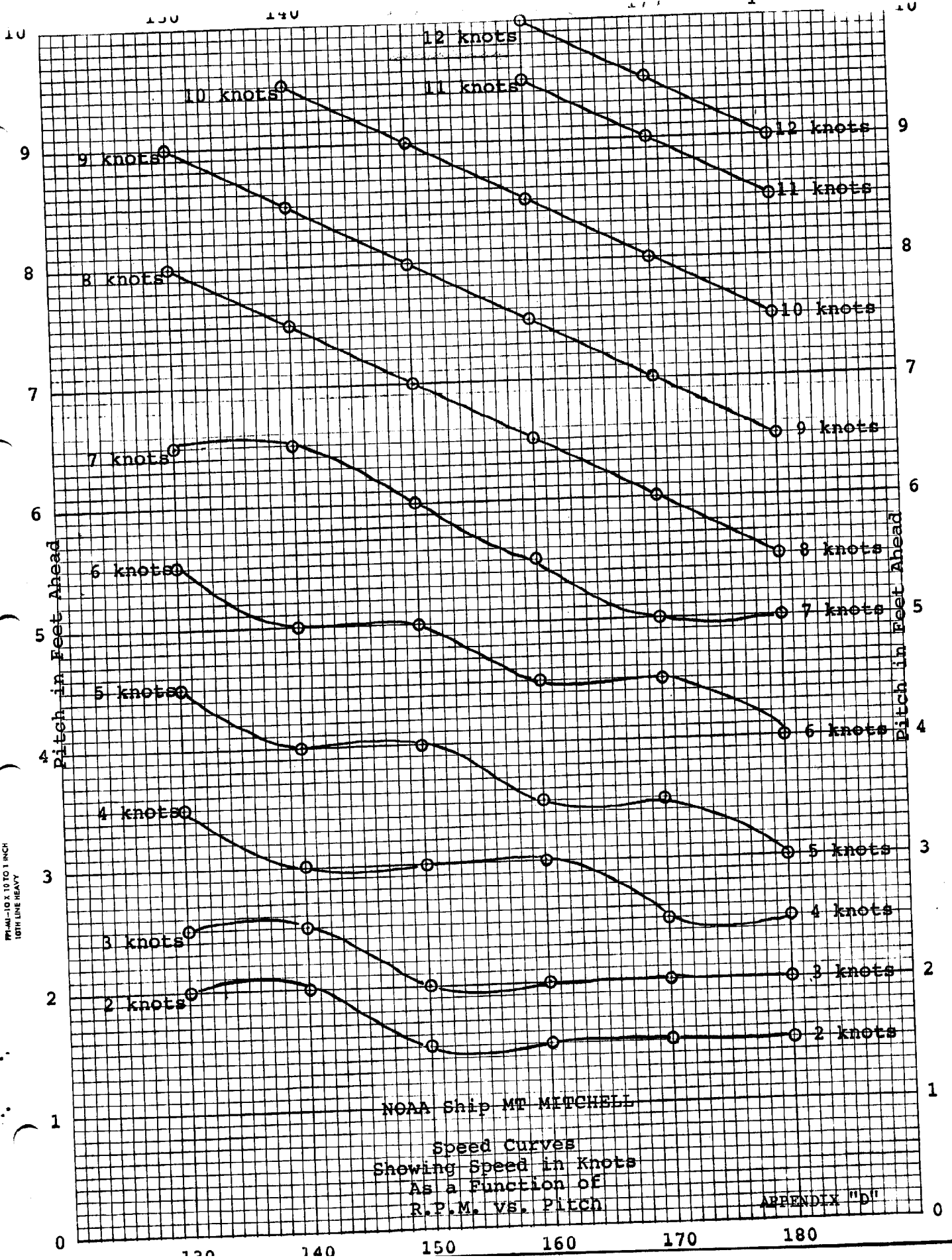
A new settlement and squat corrector curve and a table of correctors is appended. A graph of the ship's speed curves is included.

Respectfully submitted,

*E. Scott Varney*

E. Scott Varney  
Lieutenant, NOAA

APPENDIX "D"



130

140

12 knots

11 knots

10 knots

9 knots

12 knots

11 knots

8 knots

10 knots

7

7 knots

9 knots

6

6 knots

8 knots

5

5 knots

7 knots

4

4 knots

6 knots

3

3 knots

5 knots

2

2 knots

4 knots

3 knots

2 knots

1

NOAA Ship MT MITCHELL

Speed Curves  
Showing Speed in Knots  
As a Function of  
R.P.M. vs. Pitch

APPENDIX "D"

0

120

140

150

160

170

180

0

NOAA Ship MT MITCHELL  
 Settlement and Squat Correctors  
 26 July 1981

Speed (Knots)

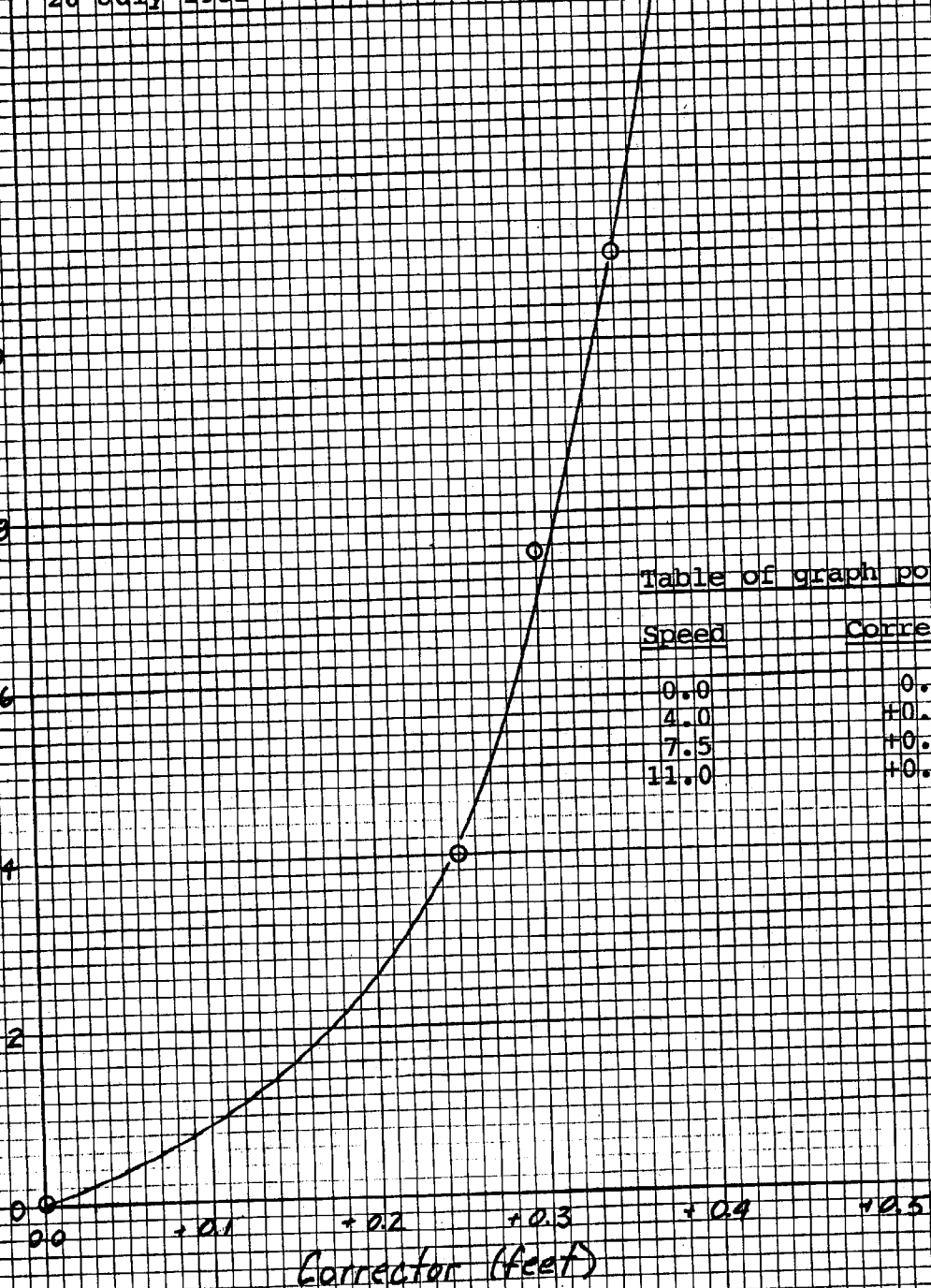


Table of graph points

Speed	Corrector
0.0	0.0
4.0	+0.25
7.5	+0.30
11.0	+0.35

PR-44-10 X 10 TO 1 INCH  
 10TH LINE HEAVY

NOAA Ship MT MITCHELL S 222  
Settlement and Squat Correctors  
Speed vs. Corrector

<u>Speed</u>	<u>Corrector</u>
0.0	0.0
1.0	+0.1
2.0	+0.2
3.0	+0.2
4.0	+0.2
5.0	+0.3
6.0	+0.3
7.0	+0.3
8.0	+0.3
9.0	+0.3
10.0	+0.3
11.0	+0.3
12.0	+0.4
13.0	+0.4

These correctors are derived from the settlement and squat curve dated 26 July 1981. The speed in knots is that taken from the graph of the ship's speed curves and may not necessarily be the speed over the ground. The correctors are in feet, rounded to the nearest tenth; see the graph of correctors if rounding to the nearest even tenth, i.e. to the nearest two tenths, is needed.

SETTLEMENT AND SQUAT

NOAA Ship Mt. Mitchell 1981 Field Season

Settlement and squat tests were run for NOAA Ship Mt. Mitchell launches 1002 and 1004 (vessel #2225 and 2223 respectively) on 15 July 1981 from pier number 5 at Little Creek Harbor, Little Creek, Virginia. Corrections were determined using a Zeiss self-leveling level (serial number 142639) positioned on the north end of the pier and a portable tide staff positioned directly above the transducer on the launches.

A pair of ten staff readings were recorded for each launch at various speeds, and the average reading of each set was then calculated. The final corrector was determined by taking the mean of the averages and comparing that mean at each speed with a baseline corrector value (the mean of each launch at 0 rpms).

Readings from the tide staff were taken as each vessel ran in a southerly direction towards the pier at 800, 1200, 1600, 1800, 2000, 2200, 2400 rpms. Measurements were also made with each vessel laying to (before and after the tests). Both vessels carried a crew of three, full fuel tanks, and all hydrographic survey equipment normally used on each vessel. Corrections were made for changes in the tide level which occurred while the tests were being conducted.

A check was also made at each of the above rpms with each vessel running in an easterly direction (perpendicular as opposed to running towards the observer). The check agreed most favorably with the readings taken with the vessels running in a southerly direction (to  $\pm 0.03$  feet).

Attached is an abstract of the data obtained including a graph of each vessel's draft corrections (feet) versus speed (rpms).

Respectfully submitted,

*John Zabitchuck*  
John Zabitchuck  
Ensign, NOAA



SETTLEMENT AND SQUAT

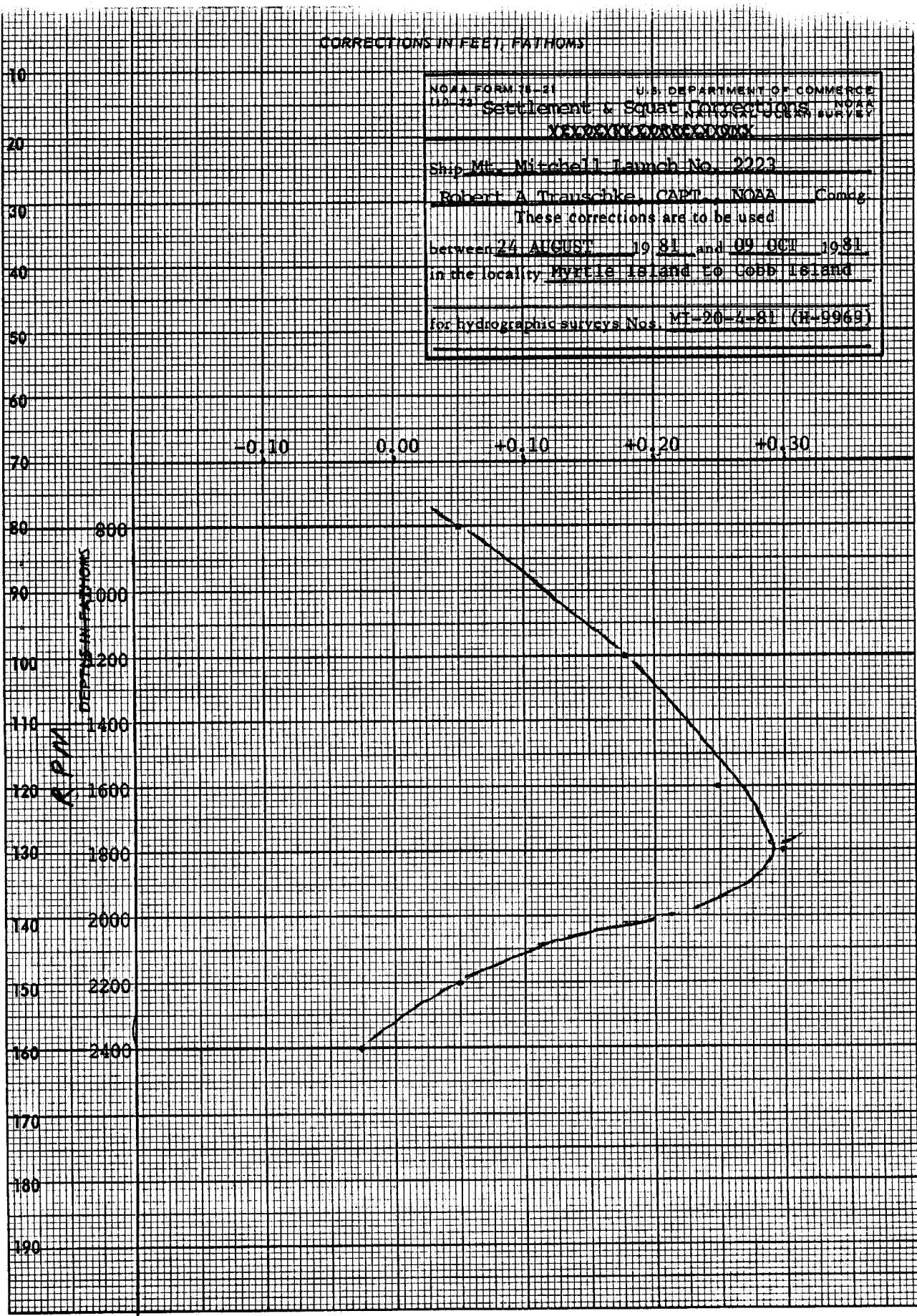
Vessel's Correctors at Various Speeds

Engine rpm	Jensen 1002 VESNO 2225	Jensen 1004 VESNO 2223
0	0.0	0.0
800	+0.01	+0.05
900	+0.07	+0.09
1000	+0.12 ✓	+0.12 ✓
1100	+0.16	+0.15
1200	+0.21	+0.18
1300	+0.24	+0.20
1400	+0.27	+0.22
1500	+0.29 ✓	+0.24 ✓
1600	+0.31	+0.27
1700	+0.33	+0.28
1800	+0.33	+0.29
1900	+0.28	+0.27
2000	+0.24	+0.21 ✓
2100	+0.19	+0.11
2200	+0.14	+0.05
2300	+0.05	+0.01
2400	-0.04 ✓	-0.03

CORRECTIONS IN FEET, FATHOMS

NOAA FORM 18-21 U.S. DEPARTMENT OF COMMERCE  
 Settlement & Squat Corrections  
~~XXXXXXXXXXXXXXX~~  
 Ship Mt. Mitchell Launch No. 2223  
 Robert A. Trauschke, CAPT, NOAA Comdg  
 These corrections are to be used  
 between 24 AUGUST 1981 and 09 OCT 1981  
 in the locality MYRTLE ISLAND TO COBB ISLAND  
 for hydrographic surveys Nos. MT-20-4-81 (H-9969)

(For deep water add a 0 to these figures)



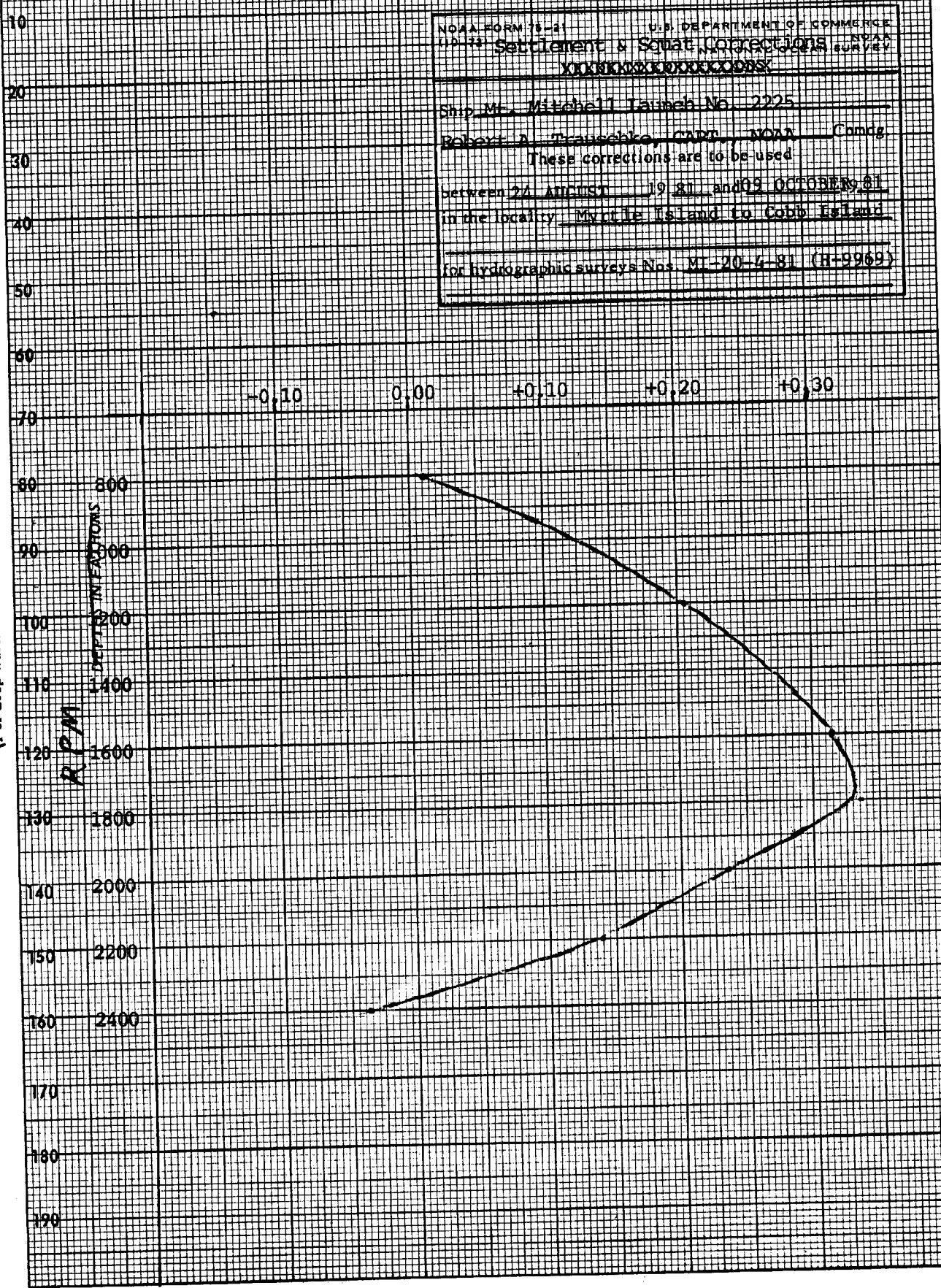
20 X 30 TO THE INCH  
 KEUFFEL & ESSER CO. U.S.A.

CORRECTIONS IN FEET/FATHOMS

NOAA FORM 78-2  
 U.S. DEPARTMENT OF COMMERCE  
 Settlement & Sound Corrections  
 XXXXXXXXXXXXXXXXXXXX

Ship Mt. Mitchell Launch No. 2225  
Robert A. Traubke, CAPT., NOAA Comdg.  
 These corrections are to be used  
 between 24 AUGUST 19 81 and 03 OCTOBER 81  
 in the locality Myrtle Island to Cobb Island  
 for hydrographic surveys Nos. VI-20-4-81 (H-9969)

(For deep water add a 0 to these figures)



K&E 20 X 20 TO THE INCH • 7 X 7 CHES  
 KEUFFEL & ESSER CO. MADE IN U.S.A.

4600



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SURVEY

NOAA SHIP MT. MITCHELL S-222  
439 WEST YORK STREET.  
NORFOLK, VIRGINIA 23510

19 OCT 1981

Date :  
To : Chief, Tides and Water Levels Branch, OA/C23  
From : *Kenneth W. Quinn, LT. NOAA*  
SO1  
Commanding Officer  
NOAA Ship Mt. Mitchell S-222  
Subj. : Tidal Data for OPR-D103-MI-81, "DELMARVANC"  
Hydrographic Survey H-9969, (MI-20-4-81)

It is requested that verified hourly heights of Tides, using Greenwich Mean Time, from the operating tide gages listed below be forwarded to the Processing Division (CAM3), Atlantic Marine Center, Norfolk, VA. 23510

<u>GAGE NAME</u>	<u>NUMBER</u>	<u>LATTITUDE</u>	<u>LONGITUDE</u>
Hampton Rds. (Pier 2, NOB)	863-8610	36°56.8'N	76°19.9'W
Sandbridge, VA.	863-9428	36°41.5'N	75°55.2'W
Sand Shoal Inlet (Cobb Island, VA.)	863-1542	37°18.1'N	75°46.7'W
Ocean City, MD.	857-0280	38°19.8'N	75°05.2'W

It is requested that the Time and Height Correctors for each gage be zoned as per Project Instructions for the area described within the following points:

LATTITUDE 37°09.5'N, 37°19.3'N  
LONGITUDE 75°53.4'W, 75°35.0'W

This information is requested for the following Times and Dates:

0000GMT JD 236 24 AUG. '81 til 2359GMT JD 239 27 AUG. '81  
0000GMT JD 257 14 SEP. '81 til 2359GMT JD 258 15 SEP. '81  
0000GMT JD 265 22 SEP. '81 til 2359GMT JD 270 27 SEP. '81  
0000GMT JD 274 01 OCT. '81 til 2359GMT JD 274 01 OCT. '81  
0000GMT JD 279 06 OCT. '81 til 2359GMT JD 280 07 OCT. '81  
0000GMT JD 282 09 OCT. '81 til 2359GMT JD 282 09 OCT. '81



## FIELD TIDE NOTE

Field tide reduction of soundings were based on Predicted Tides from Hampton Roads (Sewells Pt.) VA, and were corrected for predetermined tidal zone values from to OPR-D103-MI, PE-80, utilizing a PDP8/E Computer and Program RK500. All times of both Predicted and Recorded Tides are Universal Coordinated Time (GMT).

The number and type of Tide Gages installed, their geographic locations, dates of installation/removal, Leveling, Plane of Reference and period of operation are appended to this note, along with a copy of a letter to OA/C23 requesting verified hourly heights of tides from gages listed in this report.

The respective gages reportedly operated properly/improperly during this Project, with any exceptions noted under "REMARKS" on the appended Tide Gage Sheets.

APPENDIX "B"

DATE: February 12, 1982

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center:

Hourly heights are approved for

Tide Station Used (Form 77-12): 863-1542 Sand Shoal Inlet, VA

Period: August 24 - October 9, 1981

HYDROGRAPHIC SHEET: H-9969

OPR: D103

Locality: Chesapeake Bay Entrance, VA

Plane of reference (mean lower low water): 13.38 Ft.

Height of Mean High Water above Plane of Reference is 4.22 Ft.

REMARKS: Recommended Zoning:

1. From Latitude  $37^{\circ}19.3'$  South to  $37^{\circ}15'$

- Zone - 1* a. East of  $75^{\circ}37'$  apply -15 minute time correction and x0.87 range ratio.  
*Zone - 2* b. West of  $75^{\circ}37'$  to  $75^{\circ}45'$  apply to x0.87 range ratio.  
*Zone - 3* c. West of  $75^{\circ}45'$  apply x0.94 range ratio.

2. From  $37^{\circ}15'$  south to  $37^{\circ}12'$

- Zone - 1* a. East of  $75^{\circ}37'$  apply -15 minute time correction and x0.87 range ratio.  
*Zone - 2* b. West of  $75^{\circ}37'$  apply x0.87 range ratio.

3. From  $37^{\circ}12'$  south to  $37^{\circ}09.5'$

- Zone - 1* a. East of  $75^{\circ}37'$  apply -15 minute time correction and x0.87 range ratio.  
*Zone - 2* b. West of  $75^{\circ}37'$  to  $75^{\circ}43.5'$  apply x0.87 range ratio.  
*Zone - 4* c. West of  $75^{\circ}43.5'$  apply x0.84 range ratio.

  
Chief, Tidal Datums and Information Branch

GEOGRAPHIC NAMES

H-9969

Name on Survey	Source of Name											
	A	B	C	D	E	F	G	H	K			
	<small>                     A ON CHART NO.                      B ON PREVIOUS SURVEY NO.                      C ON U.S. QUADRANGLE MAPS                      D FROM LOCAL INFORMATION                      E ON LOCAL MAPS                      F P.O. GUIDE OR MAP                      G RAND McNALLY ATLAS                      H U.S. LIGHT LIST                 </small>											
COBB ISLAND												1
LITTLE COBB ISLAND												2
LITTLE INLET												3
MYRTLE ISLAND												4
NEW INLET												5
NORTHEAST CHANNEL												6
SAND SHOAL INLET												7
SHIP SHOAL INLET												8
SHIP SHOAL ISLAND												9
SMITH ISLAND												10
SOUTHEAST CHANNEL												11
SOUTH CHANNEL												12
VIRGINIA (title block)												13
WRECK ISLAND												14
ATLANTIC OCEAN (title block)												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved:

*Charles E. Harrington*  
Chief Geographer - N/C92x5

6 July 1983

HYDROGRAPHIC SURVEY STATISTICS

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	BOAT SHEETS & PRELIMINARY OVERLAYS		8
DESCRIPTIVE REPORT		1	SMOOTH OVERLAYS: POS. ARC, EXCESS		3

DESCRIP-TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES	7					
CAHIERS			2 rolls P10			
VOLUMES	7					
BOXES			3 strip charts, sounding Vol. P10 misc data			

T-SHEET PRINTS (List)  
SPECIAL REPORTS (List)

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS		
	PRE-VERIFICATION	VERIFICATION	TOTALS
POSITIONS ON SHEET			3970
POSITIONS CHECKED		10	
POSITIONS REVISED		3	
SOUNDINGS REVISED		30	
SOUNDINGS ERRONEOUSLY SPACED			
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED			
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	26		
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS		83	
VERIFICATION OF SOUNDINGS		241	
COMPILATION OF SMOOTH SHEET		75	
APPLICATION OF TOPOGRAPHY		-	
APPLICATION OF PHOTOBATHYMETRY			
JUNCTIONS		4	
COMPARISON WITH PRIOR SURVEYS & CHARTS		44	
VERIFIER'S REPORT		10	
OTHER			
<b>TOTALS</b>	<b>26</b>	<b>457</b>	<b>483</b>
Pre-Verification by MWH	Beginning Date 11/30/81	Ending Date 12/02/81	
Verification by RHW, RRH, LGC	Beginning Date 3/15/82	Ending Date 8/20/82	
Verification Check by GFT	Time (Hours) 50	Date 8/3/82	
Marine Center Inspection by HYDROGRAPHIC INSPECTION TEAM	Time (Hours) 10	Date 8/25/82	
Quality Control Inspection by Lisa Quinlan	Time (Hours) 64	Date 5/15/83	
Requirements Evaluation by	Time (Hours)	Date	

*J. Myers* Thrs. 5/27/83



REGISTRY NO. H-9969

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE \_\_\_\_\_ TIME REQUIRED \_\_\_\_\_ INITIALS \_\_\_\_\_

REMARKS:

ATLANTIC MARINE CENTER  
VERIFICATION REPORT

REGISTRY NO.: H-9969

FIELD NO.: MI-20-4-81

Virginia, Atlantic Ocean, *Cobb Island to Myrtle Island*  
~~Myrtle Island to Cobb Island~~

SURVEYED: August 24 through October 9, 1981

SCALE: 1:20,000

PROJECT NO.: OPR-<sup>D</sup>103 ✓

SOUNDINGS: Ross Digital Echo Sounder

CONTROL: HYDROTRAC (Hyperbolic)

Chief of Party ..... R. A. Trauschke  
..... E. S. Varney  
..... J. Zabitchuck  
..... F. W. Rossmann  
..... R. D. Henegar  
..... B. L. Coakley  
..... A. Orris  
..... K. P. Peters  
Automated Plot by ..... Xynetics 1201 Plotter (AMC)

1. INTRODUCTION

- a. There were no unusual problems encountered on this survey. ✓
- b. Notes and changes were made in red ink in the Descriptive Report. ✓

2. CONTROL AND SHORELINE

- a. The source of control is adequately described in sections F and G of the Descriptive Report. ✓
- b. Shoreline for this survey originates from a digital data file of the NOAA/NOS-CERC COOPERATIVE SHORELINE MOVEMENT STUDY MAP 229. *unobtainable during QC*

3. HYDROGRAPHY

- a. The agreement at crossings on this survey is adequate; depths agree within the limits prescribed by the Hydrographic Manual. ✓
- b. The standard depth curves could be drawn in their entirety with the exception of small parts of the six-foot curve where the field unit didn't develop it because of apparent limitations to safe inshore navigation. Dashed curves, the charted 36-foot supplemental curve and brown curves were used to better delineate some bottom features. *Mean lower low water line is not delineated.* ✓
- c. This survey is considered adequate to delineate the basic bottom configuration and to determine least depths with the exceptions listed in section 6 & 7 of this report and the following: ✓

1) The shoal features found on the survey in the vicinity of Latitude  $37^{\circ}14.0'$ , Longitude  $75^{\circ}39.8'$ , with surveyed depths of 33 to 36 feet on charted shoals of 32 to 35 feet. Additional development would have been desirable to insure that the least *concur* depths were obtained.

2) The shoaling to 30 feet in the vicinity of Latitude  $37^{\circ}13.1'$ , Longitude  $75^{\circ}42.0'$ , in charted depths of 35 to 38 feet should have been further developed to assure *concur* the least depth was found.

3) The approach to Ship Shoal Inlet was not surveyed. It is not clear from the hydrographer's report whether it was unsafe to survey. There was no indication from the survey records that the area was investigated regarding the feasibility of surveying this area.

#### 4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports comply with the requirements of the Hydrographic Manual with the following exceptions:

a. The evaluation of landmarks for charting reported on NOAA Form 76-40, Non-floating Aids or Landmarks for Charts, was submitted by the hydrographer apparently for the entire project area for the 1981 season. Charted & uncharted landmarks should be evaluated from seaward in the survey area and only those landmarks useful for navigation from the surveyed area should be considered and reported. That practice would permit the chart compiler to select the most appropriate landmarks for charting based on what was useful from various survey areas. It would also facilitate the selection of the best landmarks to be shown on smaller scale charts based on what was useful from a navigational standpoint further offshore. In the latter case the landmarks of special importance or extraordinary prominence should be indicated by an asterisk on the 76-40 form.

b. The field located a wreck (Birch Lake) at Latitude  $37^{\circ}15'18.67''$ , Longitude  $75^{\circ}37'15.38''$ , but did not comply with section 4.5.9.3. and 4.5.11. of the Hydrographic Manual in developing it or describing it in the Descriptive Report. *Not necessary already cleared and located by wire drag*

#### 5. JUNCTIONS

H-9961 (1981) to the southwest

H-9962 (1981) to the southeast

H-9970 (1981) to the east

H-9980 (1981) to the north *Estimated completion date - 4/83 at ANTC.*

The junctions with these surveys are complete and require no further work with the exception of H-9980 (1981). Processing on H-9980 (1981) has not been completed enough to make junction with H-9969 (1981). The junction with H-9980 and this survey will be effected when that survey is processed.

#### 6. COMPARISON WITH PRIOR SURVEYS

a. H-4194 (1921) 1:40,000

This is the most recent prior survey in this area that provides complete coverage.

In general these <sup>15</sup> prior surveys agree <sup>3</sup> with the present survey within +/- 1 to 3 feet. There appears to be considerable movement of the shoals around Sand Shoal Inlet and to a lesser degree New Inlet and Ship Shoal Inlet. The shoals around Sand Shoal Inlet appear to have shifted to the south as much as a mile. The greater amount of change between the present survey and the prior surveys (differences up to 11 feet) appears to have taken place between the 18 foot curve and the high water line where shoals have moved and deep areas have been created.

It is reasonable to attribute most of the changes to natural causes and the remainder to improved methods of obtaining soundings and positioning.

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

b. WIRE DRAG SURVEYS

FE-70 WD (1948) 1:40,000

The comparison with survey FE-70 WD was from both a wire drag effective depth standpoint and hydrographic one as this wire drag survey also had reconnaissance hydrography in the present survey area.

The hang depth of 43 and clearance by 41 feet on the wreck (Birch Lake) in Latitude  $37^{\circ}15'20.40''$ , Longitude  $75^{\circ}37'16.80''$ , was carried forward to the present survey from survey FE-70 WD. The present survey found indications on this wreck on splits run in this area. They made no apparent attempt at obtaining a least depth (leadline) on this item, the least depth by echo sounder obtained on the splits covering this area was 61 feet in Latitude  $37^{\circ}15'18.67''$ , Longitude  $75^{\circ}37'15.38''$ .

There were no conflicts between the present survey depths and the wire drag effective depths in the common area.

The agreement between the reconnaissance hydrography run on survey FE-70 WD and the present survey is in fair agreement (+/- 1 to 4 feet) and the present survey is considered adequate to supersede the reconnaissance hydrography.

7. COMPARISON WITH CHARTS #12224 (16th Edition, May 23, 1981)  
#12221 (50th Edition, July 18, 1981)

a. Hydrography

The charted hydrography (90%) originates with the previously discussed prior survey which needs no further discussion. The remaining soundings are from ~~unascertainable~~ <sup>Miscellaneous</sup> sources and agree with the present survey from +/- 1 to 3 feet with the exception of the soundings (~~unascertainable~~ <sup>Miscellaneous</sup> sources) to the east of Longitude  $75^{\circ}46'00''$ . There are differences of up to 13 feet (present survey shoaler) in this area which covers the area of the inlets (Sand Shoal & Ship Shoal) where a good deal of sediment transportation appears to have occurred. Additional information can be found in section L of the Descriptive Report. Attention is directed to the following:

1) Presurvey Review Item Number 63, a non-dangerous sunken wreck, (MERIDIAN) charted (chart number 12221) in Latitude  $37^{\circ}17'03''$ , Longitude  $75^{\circ}39'00''$ , described as originating with the 1957 Wreck List, number 1003, sunk in 1933. An investigation on the present survey found no indication of this wreck. It is recommended that this wreck be considered for revision to a dangerous submerged wreck as the positional accuracy is 1 to 3 miles and no known depth has ever been found over this wreck. It could possibly be a hazard to vessels approaching or leaving the Chesapeake Bay. *Wreck falls in present depths of 50 feet. 41-ft. sdb. lies about 400 meters NW of charted position.* <sup>Unsub # 2786</sup>

2) Presurvey Review Item Number 62, dangerous sunken wreck, PA, (MARY L. LEWIS) charted (chart number 12221) in Latitude  $37^{\circ}16'58''$ , Longitude  $75^{\circ}40'00''$ , is described as originating with Local Notice to Mariners number 19, 1972. The present survey investigations of this item did not find any indication of this wreck. It is recommended that it remain as charted. ✓  
CONCUR ✓

3) Presurvey Review Item Number 61, dangerous sunken wreck, PA, (GEE-BEE-GEE) charted (chart number 12224) in Latitude  $37^{\circ}17'01''$ , Longitude  $74^{\circ}42'03''$ , is described as originating with Notice to Mariners number 47 of 1968. This wreck is further described as a 37-foot cabin cruiser. The present survey investigation of this item did not find any indication of this wreck. It is recommended that it remain as charted. ✓  
CONCUR ✓

4) Ruins, charted in Latitude  $37^{\circ}14'03''$ , Longitude  $75^{\circ}47'33''$ , originate from an unascertainable source at the time of this report. It was not investigated by the hydrographer. It is recommended it be retained as charted. ✓  
*ruins that uncover at M.L.W. Carried forward from T-11702 (1959-1962)*

5) It is recommended that the hydrographer's notation: "continuously shifting shoals", be charted as described in section G of the Descriptive Report. ✓

Except as indicated above and discussed elsewhere in this report the present survey is considered adequate to supersede the charted hydrography in the common area. ✓

b. Aids to Navigation

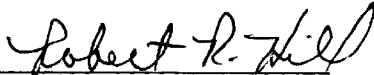
The charted aids to navigation adequately mark the intended features. The aids located by this survey adequately mark the intended features on this survey.

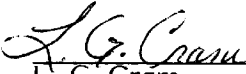
8. COMPLIANCE WITH INSTRUCTIONS

This survey adequately complies with the Project Instructions except as noted elsewhere in this report.

9. ADDITIONAL FIELD WORK

This is a good basic survey. Additional work is recommended when convenient on the items discussed in section 7.a. (1 through 3) of this report. It is felt that these items could best be investigated by a wire drag survey or a side scan sonar survey.

  
R. R. Hill  
Cartographic Technician  
Verification of Field Data

  
L. G. Cram  
Cartographer  
Evaluation & Analysis

August 20, 1982

  
Guy F. Trefethen  
Senior Cartographic Technician  
Verification Check

APPROVAL SHEET  
FOR  
SURVEY H-9969

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has ~~not~~ been made. A new final sounding printout has ~~not~~ been made.
- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the HYDROGRAPHIC MANUAL. Exceptions are listed in the Verification Report.

Date: Aug 80


  
Chief, Verification Branch

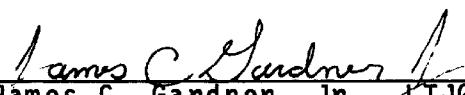
INSPECTION REPORT  
H-9969 (1981)

The completed survey has been inspected by the Hydrographic Inspection Team with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The Verification Report has presented the facts accurately and properly, the procedures used were appropriate, and the recommendations are logical and justifiable. The survey complies with National Ocean Survey requirements except as noted in the Verification Report. The survey records comply with NOS requirements except where noted in the Verification Report. The Hydrographic Inspection Team concurs with the verifier's findings, actions, and recommendations.

Examined and Approved  
Hydrographic Inspection Team

  
Karl Wm. Kieninger, ODR, NOAA  
Chief, Processing Division

  
R. D. Sanocki  
Chief, Verification Branch  
Processing Division

  
James C. Gardner, Jr., LTJG, NOAA  
Chief, EDP Branch  
Processing Division

Approved/Forwarded  
30 August 1982

  
Richard H. Houlder, RADM, NOAA  
Director, Atlantic Marine Center



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL OCEAN SERVICE  
OFFICE OF CHARTING AND GEODETIC SERVICES  
ROCKVILLE, MARYLAND 20852

N/CG242:LQ

October 29, 1984

TO: Roy K. Matsushige  
Chief, Hydrographic Surveys Branch

THRU: Chief, Standards Section *MM*

FROM: Lisa Quinlan *Lisa Quinlan*  
Quality Evaluator

SUBJECT: Quality Control Report for Survey H-9969 (1981), Virginia, Atlantic Ocean, Cobb Island to Myrtle Island

A quality control inspection of survey H-9969 was accomplished to monitor the survey for adequacy with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, shoreline transfer, decisions made and actions taken by the verifier, and the cartographic presentation of data. Revisions and additions to the smooth sheet, plus helpful comments made to the verifier, are identified on a one-half scale copy of the survey to be furnished the verifier. In general, the survey was found to conform to National Ocean Service standards and requirements except as stated in the Verifier's Report.

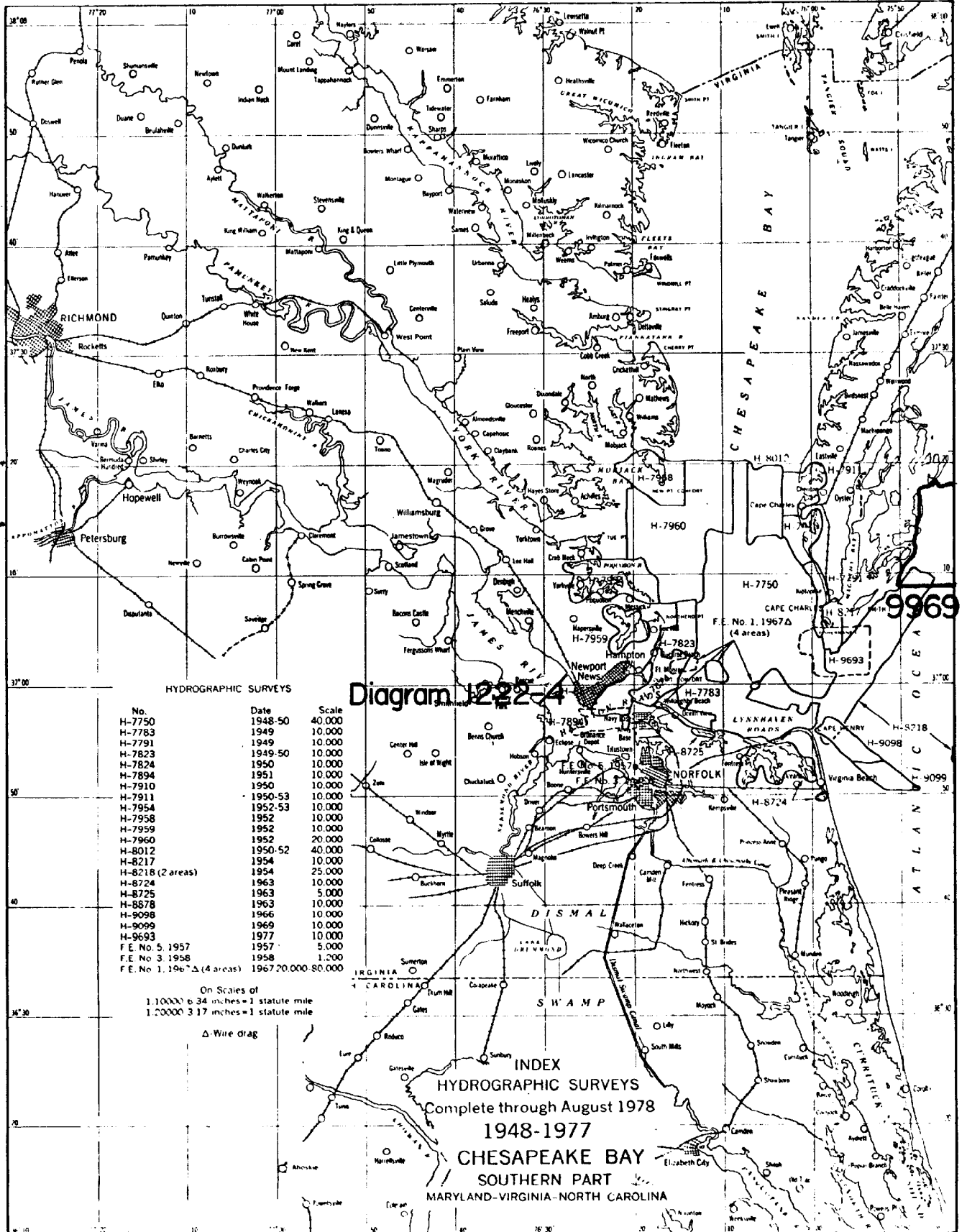
cc:  
N/CG241





DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Ocean Survey  
Rockville, Maryland

Hydrographic Index No. 70 M



RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9969

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
12224	6-11-85	H. Radden	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. <u>19 Revised Hydrography</u>
12221	6-18-85	H. Radden	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. <u>82 Revised Hydrography</u>
12201	10-1-85	J. Graham	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. <u>Prototype</u>
12220	12-1-89	John Pierce	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. <u>53</u>
12200	10-17-90	Tracy Sanford	Full <del>Part Before</del> After Verification Review Inspection Signed Via Drawing No. <u>52 APPLIED THROUGH CHART 12221 5B Ed.</u>
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
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*appld to STDs 10-5-87*