9963

Diagram No. LS-5

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. ... HSB-20-4-81

Office No. ... H-9963

LOCALITY

State ... Michigan

General Locality ... Lake Huron

Locality ... Offshore--Whiskey Harbor to Huron City

1981

CHIEF OF PARTY
LCDR G. W. Jamerson

LIBRARY & ARCHIVES

DATE ... July 27, 1983

☆U.S. GOV. PRINTING OFFICE: 1980—768-230

9963

AREA 7
CHARTS
14862
14863
14860

INDEX

* Removed and filed with misc data in survey box (envelope)

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO.: H- 9963

FIELD NO.: HSB-20-4-81

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State: MICHIGAN

General locality: LAKE HURON

Locality: ~~WHISKEY HARBOR TO OFFSHORE -- HURON CITY~~ PORT HOPE - ~~PTE. AUX BARQUES~~ OFFSHORE -- WHISKEY HARBOR TO HURON CITY

Scale: 1 : 20,000 Date of survey: JULY 15 to JULY 31, 1981

Instructions dated: FEBRUARY 2, 1981** Project No.: OPR - X115 - HSB - 81

Vessel: NOAA LAUNCH 1255 - HFP # 4

Chief of party: George W. Jamerson, LCDR, NOAA

Surveyed by: Samuel P. De Bow, Jr., LT(jg), NOAA

Soundings taken by echo sounder, ~~hand lead, pole~~

Graphic record scaled by: SPD, EM, DP, WS, DB, MS

Graphic record checked by: SPD, EM, WS, DP, DB

Protracted by: N/A Automated plot by: FIELD - PDP 8/e-Hydroplot-Complot ~~AMC-Xynetics 1200~~ Xynetics 1201 Plotter

Verification by: VERIFICATION BRANCH - AMC R.H. WHITFIELD

Soundings in ~~fathoms~~ feet at ~~MEAN LOW WATER~~ IGLD - LWD - 576.8 Feet

REMARKS: ** CHANGE NO., 1 - April 3, 1981

NOTES & changes made in red ink in the Descriptive Report

DIGITAL DATA COMPLETED AT AMC

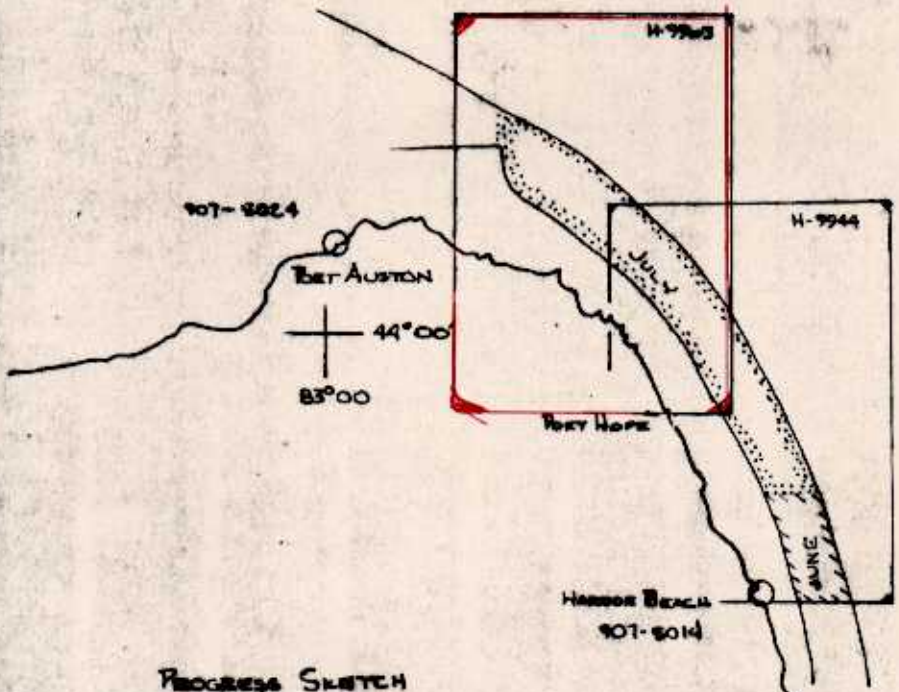
SPD - Samuel P. De Bow
EM - Edwin Martin
DB - Danny Bryant
DP - Dennis Parris
WS - Wayne Sprye
MS - Mark Stewart

STANDARDS CK'D 8-8-83 Cday

AWOIS 8/11/83 mgf (1)

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

☆ U.S. GPO: 1974-0-768-081/1207



PROGRESS SKETCH

OPR X 115

HSB. 80-3&4-81

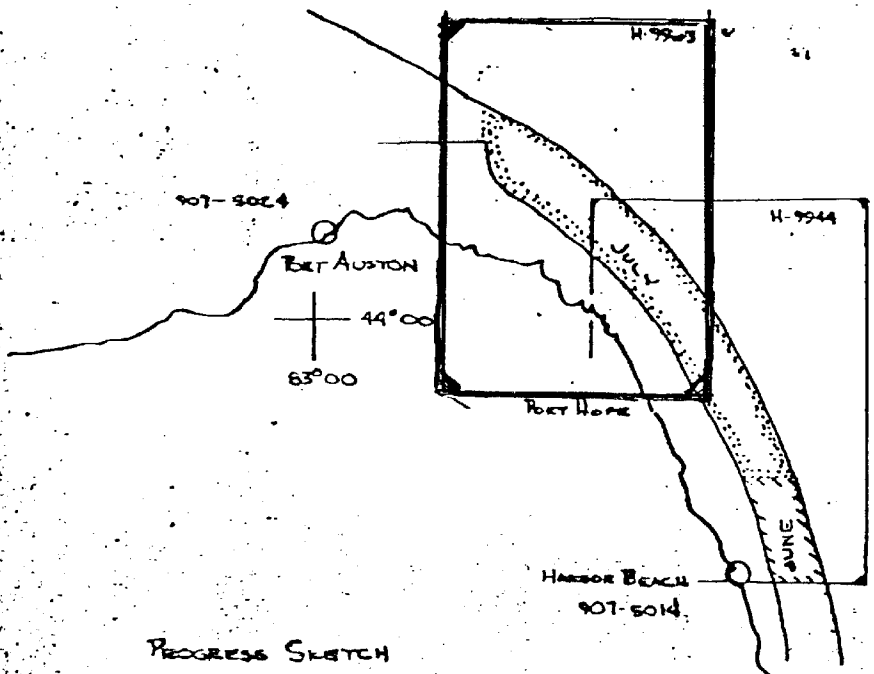
H-9944, H-9963

NOAA LAUNCH 12.55

G. JAMGERSON, LCDR NOAA

From Chart 14860, 27th Ed. Feb 9/80

								LEGEND
	5.1	210	.5					50 N.M SOUNDING
			19.1					LNM SOUNDING
			12.0					LNM DIST. TO - FROM
			34.5					LNM DIST. MISC.
	0	62	35					BOTTOM SAMPLES
	5	8	4					CONTROL STA.
	2	—	2					TIDE GAGE



PROGRESS SKETCH

OPR X 115
HSD. 20-3½-81
H-~~9944~~, H-9963
NOAA LAUNCH 1255
G. JAMERSON, LCDR NOAA

*from Chart 14860, 27th Ed. Feb 9/80

Months	Hours	Days	Miles					Legend
	51	21.0	5					SQ.N.M SOUNDING
	134	55.5	19.1					LNM SOUNDING
	10.5	99.1	12.0					L&M DIST. TO - FROM
	14.0	62.6	30.5					LNM DIST. MISC.
	0	62	35					BOTTOM SAMPLES
	5	8	4					CONTROL STA.
	2	—	2					TIDE GAGE

(12B)

DESCRIPTIVE REPORT
TO ACCOMPANY
HYDROGRAPHIC SURVEY H-9963
HSB-20-4-81

Scale: 1:20,000
Chief of Party: LCDR George W. Jamerson
Officer-In-Charge: LTJG Samuel P. DeBow, Jr.
Hydrographic Surveys Branch, Hydrographic Field Party #4
NOAA Launch 1255

A. PROJECT

The survey was accomplished under Project Instructions OPR-X115-HSB-81, dated February 2, 1981 and amended by:

Change No. 1, April 3, 1981

B. AREA SURVEYED

The locality of the survey was in Lake Huron, north of Harbor Beach, MI, and to the east of Port Hope. The approximate limits of the survey are:

LAT 43°59.4'N, LONG 82°43.2'W
LAT 44°03.8'N, LONG 82°48.0W
LAT 44°04.5'N, LONG 82°51.5'W
LAT 44°00.2'N, LONG 82°42.0'W
LAT 44°05.0'N, LONG 82°48.0'W
LAT 44°07.2'N, LONG 82°51.5'W

The survey ran from July 15, 1981 to July 31, 1981, inclusive.

C. SOUNDING VESSEL

All hydrographic soundings taken on this project were taken aboard NOAA Launch 1255 (EDP # (1255). All survey records are annotated with the vessel number 1255.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

The following Raytheon Survey fathometer was used for the entire survey:

Recorder:	Model	#DE-723
	Serial	#37018
ECU:	Model	#DE-723-D
	Serial	#2132
Digitizer:	Model	#DDM
	Serial	#1907

No other sounding equipment was used during the survey.

A digital phase check was performed at the start, and the end, of the survey. The results are appended with this survey. No other problems were encountered

with the equipment during operations. The initial was monitored continuously while running lines and A-F checks were made at the start of each day, and at the end of each line. On one day it was noticed that the digital printout was recording depths shoaler than the analog record by as much as .3 feet. This discrepancy was determined to be caused by misadjusted stylus and was rectified immediately.

All soundings were scanned within the limits prescribed in the Hydrographic Manual, Table 4-4, for soundings in exposed waters, over an irregular bottom.

Settlement and Squat was run on Launch 1255 on July 31, 1981 (JD 212) off the breakwater at Harbor Beach, Michigan. The level method was used, with the Launch running toward, and away from the breakwater. 1255 was completely fueled and watered immediately before running the test. Results are recorded in the volume and in the appendix of this report. Settlement and Squat correctors were not applied on the smooth field sheets, but will be applied via the TC/TI tape during smooth plotting at the Atlantic Marine Center.

Velocity and instrument corrections were determined by TDC casts, taken once a week, and barchecks, taken twice daily.

Barchecks were taken to the full extent of the chain, which was 45 feet, whenever possible. TDC Casts were taken down to 30 meters, at 2 meter intervals. The length of the barcheck chain was measured by the OIC before, and after, the survey with no variation noticed. The TDC unit was calibrated by the Electronic Engineering Division at AMC prior to the survey. A MARTEC, model #101-10, serial #477, was the TDC used for the project. TDC Casts were taken on the following dates and the following locations:

DATE	LOCATIONS	
JD 189	Latitude	43/55/00
	Longitude	82/36/20
JD 195	Latitude	43/57/48
	Longitude	82/37/18
JD 203	Latitude	44/06/30
	Longitude	82/49/18
JD 213	Latitude	43/55/30
	Longitude	82/36/20

The velocity correctors used for the project were computed from the four (4) TDC casts. Velocity tables and curves are attached. In addition, a composite of all the barchecks taken was graphed and compared to a composite of the four TDC casts. From this comparison, an inherent instrument correction of -0.2 feet was found. This correction will be applied during smooth plotting via the TC/TI tape.

A fair amount of variability was observed in the four TDC casts. The reason for this variability is assumed to be related to the prevailing weather patterns prior to making the cast. Southerly flows tend to cause a deeper thermocline, whereas Northerly flows cause the thermocline to be at a shoaler depth. It was for this reason that a composite curve was compared to the barcheck curve.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Atlantic Marine Center
439 West York Street
Norfolk, Virginia 23510

July 26, 1982 OA/CAM61/125
101-15

TO: OA/CAM11 - George W. Jamerson

FROM: OA/CAM61 - G. Bloom

SUBJECT: DE-723D Fatho Repairs/1255 - HFP4

REF: Your memo - 6 May 1982 - Same Subject

The problem experienced by HFP4/1255's Raytheon Model DE-723D Survey System was found to be generated by the RECORDER (S/N 37018) after both Recorder and ECU were tested in the lab.

The Recorder was found to have a spring pin partially broken but still in place. This pin normally secures the Stylus ARM HUB Assembly to the main gearbox shaft (Shaft D).

The "spiking" recorded on the analog chart was the result of the stylus arm slipping (slowing down) thereby causing the bottom return to appear to rise up. The spring pin would then catch and the stylus arm would resume the normal speed with the bottom return falling back to its correct depth.

A complete overhaul of the gearbox with replacement of bearings/shaftD/ stylus arm hub assy, etc. was performed and a system checkout produced a solid bottom return with no further signs of the previous problem.

This recorder is considered to be RFI (ready for issue) and available for future use as required.

A copy of the analog chart is attached showing BEFORE and AFTER overhaul. A copy of the recorder's failog is also attached.

It should be noted, however, that although the analog presentation did indicate the spikes the digital information recorded by the hydroplot system was unaffected by this mechanical problem. All digital data should not be subject to question where the chart spikes occurred.

CC: CAM611

Days of hydrography were grouped with velocity data in the following manner:

TDC CAST	VELOCITY TABLE	DAYS OF HYDRO
JD 189	1	JD 176, 177, 180, 181, 183, 188, 189
JD 195	2	JD 195, 196
JD 203	3	JD 197, 199, 203, 204, 205
JD 213	4	JD 211, 212, 213, 214

Velocity tapes were made but not applied to the smooth plot, and will be applied at AMC during final processing.

E. HYDROGRAPHIC SHEETS

Field sheets used for the survey were prepared in the field using a PDP 8/e computer and a DP-3 Complot Plotter. Boatsheets, semi-smooth, smooth field sheets, and overlays are included with this survey. Mainscheme and crossline hydrography are plotted on the smooth field sheets. Developments, splits, bottom samples, presurvey review investigations, junction soundings, prior survey soundings, charted soundings, and aids to navigation are shown on various other overlay sheets. Projection parameter tape listings are enclosed in the appendix. All records will be forwarded to the Verification Branch at the Atlantic Marine Center for final smooth plotting by the Harris/7 computer and the Xynetics 1201 plotter.

F. CONTROL STATIONS

Control stations for this survey were either existing geodetic control published by NGS or control established by the Hydrographic Surveys Branch Support Section to a minimum of third-order accuracy. All stations are referred to the North American 1927 datum. A signal list is included with this report.

G. HYDROGRAPHIC POSITION CONTROL

Position control utilized was Del Norte Trisponder in the range-range mode. The following electronic positioning and related equipment was used:

EQUIPMENT	SERIAL #
DMU	179
Master	1070
Parallel Buffer	111

Shore Stations - Remote Units

EQUIPMENT	SERIAL #
Remote 72	245
Remote 76	217
Remote 78	253

The master unit onboard Launch 1255 was mounted on a galvanized pipe mast about 20 feet above the water surface. Remote units were either mounted on signal tripods 10 feet high or on top of Pte Aux Barques Lighthouse. Remote units were powered by 2-12 volt auto batteries which were changed every other day, without fail.

The positioning system was visually calibrated twice daily with sextant fixes to third order control signals, visibility permitting. On a number of days, afternoon calibrations were unobtainable due to the haze which developed on the shoreline. Only those sextant fixes with less than 5 meters inverse and correctors less than 10-meters were used for calibration. Four fixes, with check fixes, were averaged to obtain morning and afternoon correctors. Later a mean for the day was computed. If the calibration met this criteria, no correctors were applied on the corrector tape. The actual printouts of RK561 are included in the survey records.

In addition to daily sextant calibrations, a baseline calibration was performed on each Master/DMU/Remote pair at the start of the survey and again on JD 194. Results are recorded in the volume.

While running lines on the northern limit of the sheet a skip zone was encountered. This was due to the fact that both remote units were situated at positions much higher in elevation than the master on Launch 1255. The problem was rectified by lowering one of the remotes closer to the lake level.

On 29 July, 1981, remote unit 78 at station 368 (see Signal List) was blown down in a severe storm, (winds in excess of 40 knots). From that time on Remote unit 72 was used for the project. No other problems were encountered with the equipment.

H. SHORELINE ✓ See section 2.b. of the Evaluation Report

Shoreline on the smooth field sheet was traced from an enlargement of Chart 14862, 23rd edition, July 29, 1981, and is for orientation purposes only. No shoreline was included within the survey limits.

I. CROSSLINES ✓ See section 3.a. of the Evaluation Report

Crosslines constitute 12% of mainscheme hydrography. 100% of the crossings on sheet HSB-20-4-81 agree to within 1 foot.

J. JUNCTIONS See section 5 of the Evaluation Report

This survey junctions with the following surveys:

LS-2006 to the west
1. LS-2007 to the west
2. LS-2008 to the west
3. Canadian Survey 3845, 1975 to the east.
4. H-9944 to the south

All plotted junctional soundings from this survey which were used for comparison will be adjusted for an estimated lake level of 2-3 feet above low water datum. Overall, the soundings compare reasonably well. 49% of all the junctional soundings agree to within 1 foot, while 88% are in agreement from 2-4 feet. The main reason for this variation is believed to be due to the accuracy of the Canadian Survey, i.e., 1 mm at 1:200,000 or 200 meters.

When compared to LS-2007, the present survey agrees to within 1 foot on 50% of the soundings, and 93% agree between 2-4 feet. On LS-2008, the surveys agree to within 1 foot on 69% of the soundings compared and 99% agree between 2-4 feet. Throughout the project a definite lack of consistency was observed from one lake survey to another. Consequently, strict scrutiny was made on the data collected during this survey to ensure that the variation was not as a result of faulty methods by this unit.

The final junctional survey was the Canadian Survey #3845, 1975, scale 1:200,000. As was stated earlier, this survey is of dubious value since the scale is so small for inshore comparisons. In addition, the NOAA Ship WHITING had numerous problems junctioning with this survey last field season and a letter from the Commanding Officer relating this fact is enclosed with this report. All transferred soundings were checked by the OIC for position and conversion (feet to meters) correctness. Of the 31 soundings transferred, 48% agree to within 2-4 feet, while the remainder were not as close. Since these were offshore soundings, the present sounding lines were continued well offshore to ensure proper junctioning. Due to the spacing of the soundings that could be transferred to the present sheet, most lines were terminated whenever the 60 foot contour could be accurately drawn.

The hydrographer recommends that in the junction areas, the soundings from the present survey be charted. concur

K. COMPARISON WITH PRIOR SURVEYS See section 6 of the Evaluation Report

The present survey area was covered by the two prior surveys which are listed below:

LS-1272 (1913) 1:20,000
LS-1271 (1913) 1:20,000
LS-1270 (1914) 1:20,000 scale
LS-1845 (1946) 1:~~20,000~~ scale 1:20,000

On LS-1270, the present soundings agreed rather closely, 59% compared to within 1 foot or less, while 96% agreed within 2-4 feet. However, agreement was not as close with the deep water survey LS-1845. Of the 12 soundings compared, 33% agreed from 2-4 feet, while the remainder were over 5 feet in comparison. This variation in the soundings compared may be due to a difference in the actual (smooth) water level or the method with which the prior survey was run. As with the comparisons made with the junction soundings, all field plotted data was raw,

without predicted water levels applied. For comparison purposes, an assumed water level of 2-3 feet was applied to all soundings.

The following presurvey review items were within the survey limits. These items originated with Presurvey Review, OPR-520-MI-77, dated May 10, 1977, and updated by Change #1, OPR-X115-HSB-81, dated April 3, 1981.

ITEM 12: The 27 foot sounding, charted at Latitude 44°05'54.6", Longitude 82°50'33". This item was developed by first running 50 meter splits in the same direction as the mainscheme hydrography, and then running 50 meter splits perpendicular to the mainscheme. A least depth of 28 feet, scaled from the analog record and using approximate water levels of 2-3 feet, was found over the shoal. This sounding was inserted after the third out from position #2460 and plotted originally as 30 feet, due to the draft correction of 2.6 feet. No other least depth was found in the area. The surveyed least depth plotted about 75 yards NW of the charted least depth. # 27 on Smooth Sheet in Latitude 44°05'56.96, Longitude 82°50'34.61"

RECOMMENDATIONS: It is the recommendation of this unit that a shoal does exist in the area and the item should remain charted as 27 feet. See section 7.a. 1) of the Evaluation Report

ITEM 13: A 23-foot sounding, charted at Latitude 44°05'06", Longitude 82°49'54", which originated with Lake Survey 1270 (1913). The item was investigated in the same manner as Item 12, with 50 meter splits in perpendicular directions over the charted position. A least depth of 25 feet, reduced for approximate lake level and scaled from the fathogram, was recorded over the shoal. This sounding was the third out from position #2504 and originally plotted as 27 feet. There were no other least depths observed in the area. The surveyed sounding plotted about 75 yards NNE from the charted position of the shoal. * 24-ft. sounding on Smooth Sheet in Lat. 44°05' 05.98" Long. 82° 49' 29.36"

RECOMMENDATIONS: It is recommended that the item should remain as charted on the present edition of Chart 14862. See Section 7. b. 2) of the Evaluation Report.

L. COMPARISON WITH THE CHART See section 7 of the Evaluation Report

This survey was compared to chart 14862, 23rd edition, July 29, 1978, enlarged to 1:20,000. Agreement was very good with 60% of the soundings falling within 1 foot of each other. No sounding varied by more than 2-4 feet when a predicted lake level of 2-3 feet was applied.

A development was run over the charted 21 foot sounding (from prior survey LS-1270 (1913)) at Latitude 44°04'20", and Longitude 82°48'30" with 50 meter splits of the mainscheme hydrography. A least depth of 21 feet was observed, if approximate lake levels are applied. This sounding was the second out of position #2088 and plotted as 23/20 feet. in Lat. 44°04' 19.5" Long. 82° 48' 29.85"

RECOMMENDATION: The 21 foot sounding should remain at the present charted position. no, chart the 20-ft from the present survey

M. AIDS TO NAVIGATION. ✓

The present survey is deemed sufficiently complete to warrant its use to supercede prior surveys for charting.

N. ADEQUACY OF SURVEY

Point Aux Barques Lighted Bouy "1", Light List NO. 1236.50, was located on JD 196. The charted position given was Latitude 44°02.6'N, Longitude 82°45.4'W, and the aid was found as described serving the purpose for which it was intended. Four D.P.'s were taken on four passes by the buoy from different sides. A G. P. of Latitude 44°02.4', Longitude 82°45.35'W, was calculated using RK300.

O. STATISTICS

Nautical miles of Mainscheme Hydrography	251
Nautical Miles of Crosslines	31
Nautical Miles of Developments	60
Total Miles of Hydrography	342
Square Miles of Hydrography	12
Total Number of Positions	1,390
Number of Bottom Samples*	32
Number of Barchecks**	12
Number of TDC Casts	1

P. MISCELLANEOUS

As was noticed on H-9944, a number of stray soundings were observed disjointed from the 30 and 36 foot contour lines. These soundings were not investigated further since it was assumed that they were boulders or large rocks, similar to those along the shoreline. See page 4b. of this report

A local salvage operator from Port Austin, MI reported to the OIC that the wreck of a 37 foot Ericson sailboat was located within our survey limits. He reported that the boat was located between Port Hope Stack and Pte. Aux Barques Lighthouse in 48 feet of water. The only position given was that the Port Hope stack would line up with two silos onshore. The area in question was surveyed by this party, with no indications of a wreck seen on the fathograms. Since the man was of dubious character, it is the recommendation of this unit that the wreck remain uncharted until more information is obtained as to the final disposition of the vessel.

Q. RECOMMENDATIONS

See sections K, L, and P for specific recommendations.

R. AUTOMATED DATA PROCESSING

The following hydroplot system programs were used during this survey:

PROGRAM	VERSION	
RK111	Range-range Real Time Hydroplot	1/30/76
RK201	Grid, Signal and Lattice Plot	4/18/76
RK211	Range-Range Non-Real Time Plot	1/15/76

RK300	Utility Computations	2/05/76
RK330	Data Reformat and Check	5/04/76
PM360	Electronic Corrector Abstract	2/02/76
RK530	Layer Corrections for Velocity	5/10/76
RK561	H/R Geodetic Calibration	2/19/75
AM602	Extended Line Oriented Edition	5/20/75

S. REFERENCE TO REPORTS

Horizontal Control Report, OPR-X115-HFP-80

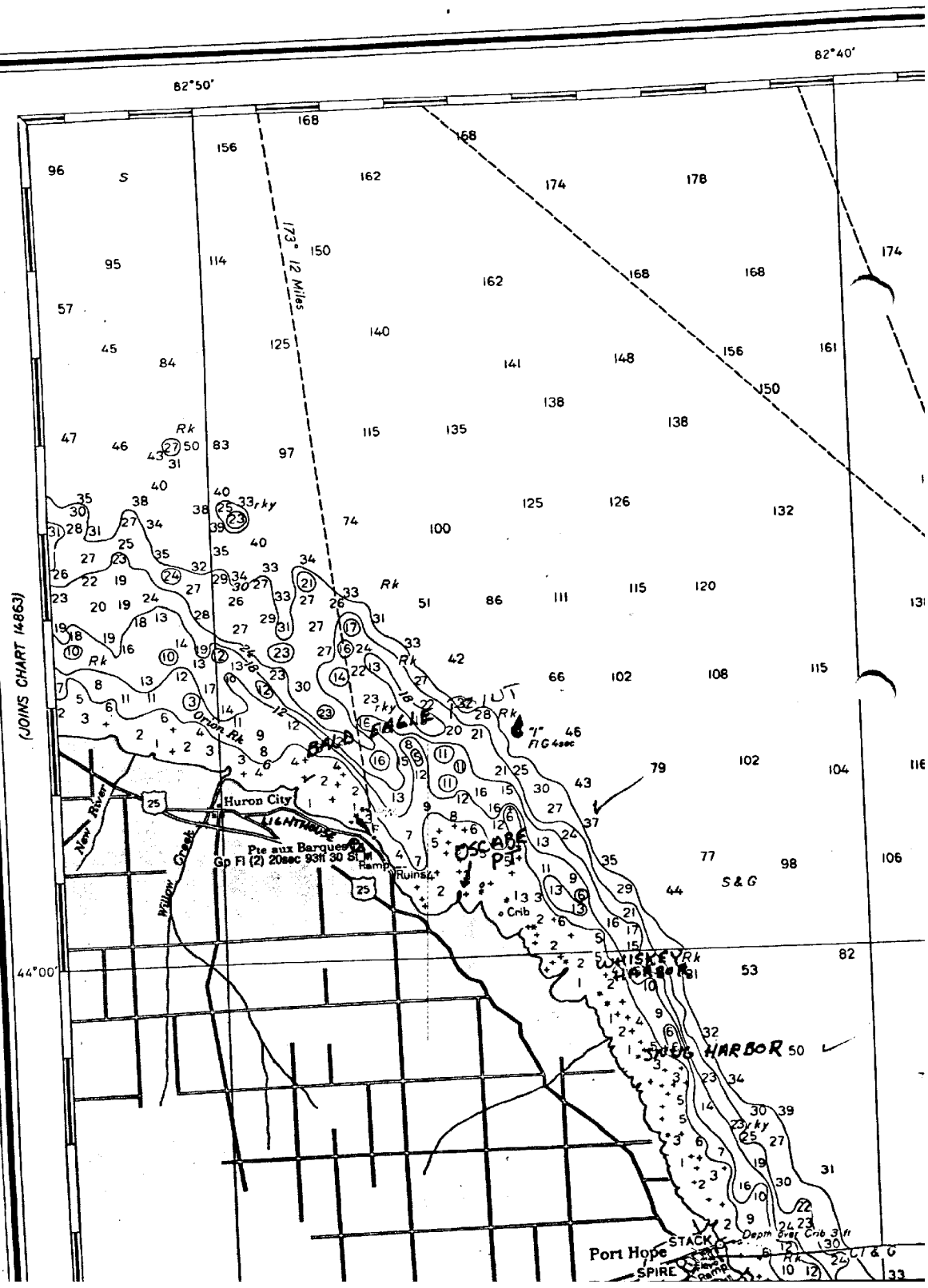
H-9907 Descriptive Report, NOAA Ship WHITING

Respectfully submitted,

Robert Lewis

LT (jg) (Samuel P. De Bow, Jr., NOAA
OIC, Hydrographic Field Party, #4

14862


82°50'
82°40'
44°00'
(JOINS CHART 14863)
173° 12 Miles
Huron City
LIGHTHOUSE
Pte aux Barques
Gp Fl (2) 20sec 93ft 30 St M
New River
Willow Creek
Orion Rk
EAGLE
OSCAR
WHISKEY HARBOR
SIERRA HARBOR
Port Hope
STACK
SPIRE
Ruins
Ramp
Crib
S & G
Rk
Rky
7" FIG 4sec

-.4 -.3 -.2 -.1 0 .1 .2 .3 .4

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

CORRECTIONS IN FEET, FATHOMS

NOAA FORM 25-21 (10-72) — U.S. DEPARTMENT OF COMMERCE — NOAA — NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship LAUNCH 1255

Sam De Baun LT(JG) Comdg.

These corrections are to be used

between 14 July 19 81 and 15 July 19 81

in the locality LAKE HURON

for hydrographic surveys Nos. H-9944 H-9963

JD 195 TOC

Depth	Corr
0.0 - 8.6	0.0
8.7 - 20.1	0.2
20.2 - 31.1	0.4
31.2 - 44.4	0.6
44.5 - 60.0	0.8
60.1 - 75.5	1.0
75.6 - 87.4	0.4
87.5 - 99.4	0.2
99.5 - 9999	0.0

Velocity Table No. 2

for JD's 195, 196

10 5
20 10
30 15
40 20
50 25
60 30
70 35
80 40
90 45
100 50
110 55
120 60
130 65
140 70
150 75
160 80
170 85
180 90
190 95

DEPTHS IN FATHOMS / FEET

(For deep water add a 0 to these figures)

46 1240

K+E 20 X 20 TO THE I KEUFFEL & ESSER C. 7 X 10 INCHES MADE IN U.S.A.

☆ U.S. GOV. PRINTING OFFICE: 1977—767-

(14.)

OPR X115
HSB 20-4-81
H-9963
VELOCITY TABLE 2

```
000086 0 0000 0002 000 125500 020481
000201 0 0002
000311 0 0004
000444 0 0006
000600 0 0008
000755 0 0006
000874 0 0004
000994 0 0002
999999 0 0000
```

-4 -3 -2 -1 0 1 2 3 4

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

CORRECTIONS IN FEET, FATHOMS

NOAA FORM 76-21 (10-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship LAUNCH 1255

Sam De Bow LT 16 Comdg.

These corrections are to be used

between 14 July 1981 and 24 July 1981

in the locality LAKE HURON

for hydrographic surveys Nos. H 9944 H 9963

JD 203 TDC

Depth	Corr.
0.0 - 9.2	0.0
9.3 - 24.1	0.2
24.2 - 58.4	0.4
55.5 - 81.6	0.2
81.7 - 100.1	0.0
100.2 - 9999	-0.2

Velocity Table No. 3

for JD's 197, 199, 203, 204, 205

✓ SPD

FATHOMS	FEET
10	5
20	10
30	15
40	20
50	25
60	30
70	35
80	40
90	45
100	50
110	55
120	60
130	65
140	70
150	75
160	80
170	85
180	90
190	95

DEPTHS IN FATHOMS FEET

(For deep water add a 0 to these figures)

6 1240

K+E 20 X 20 TO THE IN KEUFFEL & ESSER CO. 7 X 10 INCHES DE IN U.S.A.

☆ U.S. GOV. PRINTING OFFICE: 1977—767-212

OPR X115

H3B 20-4-81

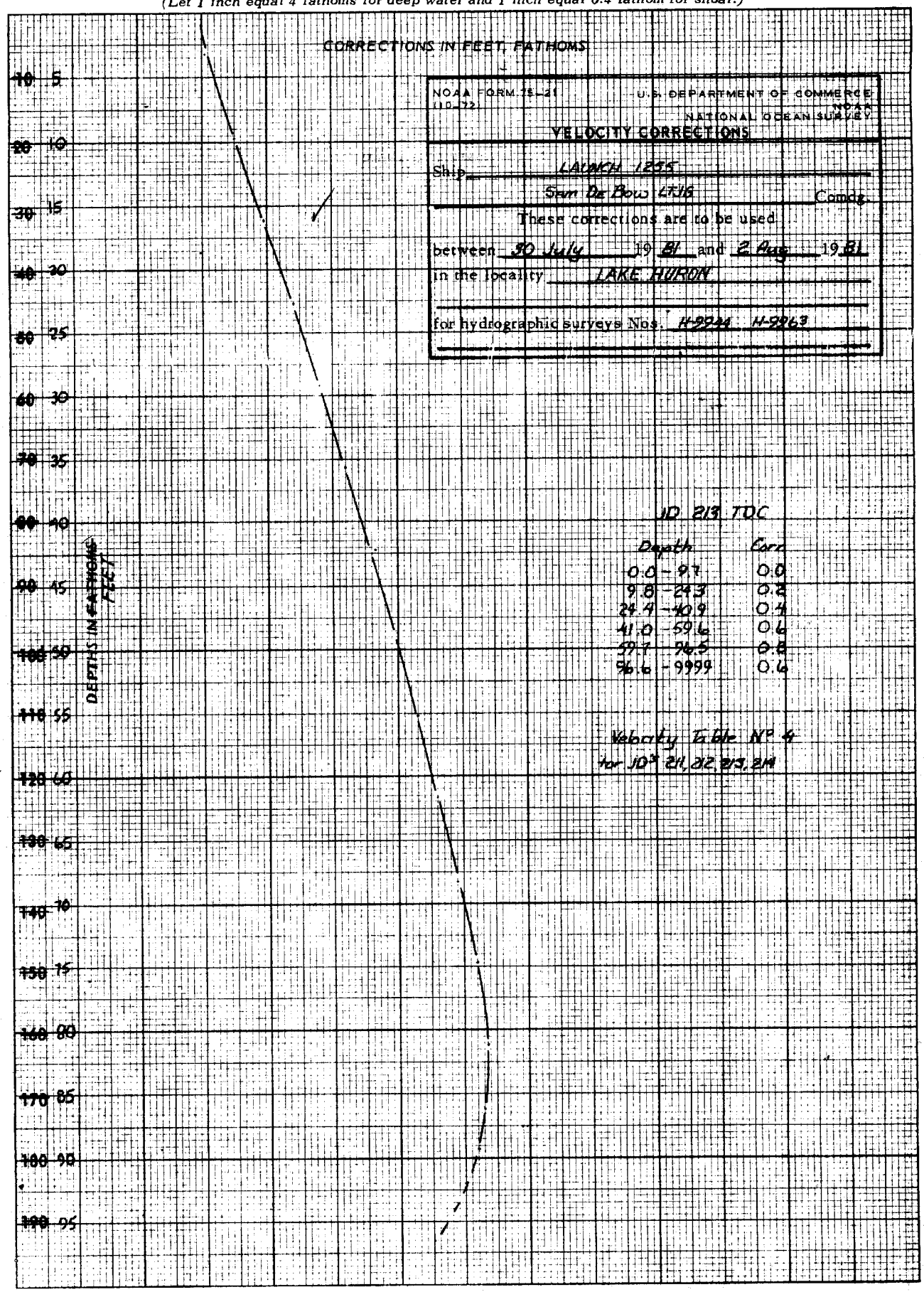
H-9963

VELOCITY TABLE 3

```
000092 0 0000 0003 000 125500 020481
000241 0 0002
000554 0 0004
000816 0 0002
001001 0 0000
999999 1 0002
```

-.4 -.3 -.2 -.1 0 .1 .2 .3 .4

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



NOAA FORM 76-41 (10-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship: LAWSON 1255
Sam De Bow 4716 Comdg.

These corrections are to be used between 30 July 19 81 and 2 Aug 19 81 in the locality LAKE HURON

for hydrographic surveys Nos. H-9944 H-9963

ID 213 TDC

Depth	Corr
0.0 - 9.7	0.0
9.8 - 24.3	0.2
24.4 - 40.9	0.4
41.0 - 59.6	0.6
59.7 - 76.5	0.8
76.6 - 9999	1.0

Velocity Table N° 4
for ID# 211, 212, 213, 214

46 1240

K&E 20 X 20 TO THE I KEUFFEL & ESSER MADE IN USA 7 X 10 INCHES

☆ U.S. GOV. PRINTING OFFICE: 1977—767-21

OPR X115

HSB 20-3-81

H-9944

VELOCITY TABLE 4

```
000097 0 0000 0004 000 125500 020381
000243 0 0002
000409 0 0004
000596 0 0006
000965 0 0008
 99999 0 0006
```

FORM CD-26
(12-11-46)

U.S. DEPARTMENT OF COMMERCE

WORKSHEET

VESNO 1255
OPR X LNS
HSB 20-3-81 HSB 20-4-81
H 9944 H-9965

T23-D S/N 37018

JD	5'	10'	15'	20'	25'	30'	35'	40'	A 45' B
177	0	.1	0	0					
	.2	0	.1	-.1	0				
180	-.3	-.2	-.4	-.4	-.4				
		-.1	-.4	-.4	-.5	-.6			
181	-.1	0	-.2	-.1	0	-.2			
	-.2	0	.2	.1					
183	0	0	-.1	-.2	-.2	-.2	-.4		
	.1	0	0	0	0	-.2			
188		0	0	0	0	-.1	-.2	-.2	-.3 -.3
		.2	.2	.2	.2	.2	.2	.2	0 0
189		0	.2	-.1	.1	0	0	-.2	-.1 -.2
196		.2	.1	.4	.4	.4	.5	.5	.4 .3
		-.1	.1	0	.1	.2	.2	.4	.4 .3
197	0	.1	.1	.2	.4	.4	.4	.6	.6 .6
199	-.2	.1	0	.2	.2	.2	.3	.3	.4 .4
	.2	.1	.2	.2	.3	.4	.4	.4	.4 .3
204	-.1	0	0	0	.1	.2	.4		
	-.2	.1	0	.1	.2	.2	.2	.4	.2 .2
205	0	.1	.2	.2	.2	0			
	0	-.1	-.1	.2	.2	.2	.2	.2	.4 .3
211	0	.2	.2	.2	.2	0	.2	0	.2 .2
	0	.1	.1	0	.1	.2	.2	0	.2 .3
212	.2	.2	.3	.1	.2	.2	.4	.4	.4 .4
213	.1	.2	.1	.2	0	.1	0	.1	0
214	0	0	0	0	.1	.1	0	.1	.1 0
	-.10	0	+.32	.2	.1	.1	.2	.5	.2 .2
Σ	-.3	1.2	1.1	1.2	2.0	1.8	3.2	3.7	3.5 3.0
Mean	0	0	0	0	.1	.1	.2	.2	.2 .2

TRUE DEPTH	(P)	(N)
5	0.0	5.0
10	0.0	10.0
15	0.0	15.0
20	0.0	20.0
25	0.1	24.9
30	0.1	29.9
35	0.2	34.8
40	0.2	39.8
45	0.2	44.8

☆U.S. GOV. PRINTING OFFICE: 1980—668-518

-4 -3 -2 -1 0 1 2 3 4

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

CORRECTIONS IN FEET, FATHOMS

NOAA FORM 76-21 (10-72) — U.S. DEPARTMENT OF COMMERCE — NOAA — NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship: LAUNCH 1255

SAM DE BOOY LTJG — Comdg.

These corrections are to be used

between 25 JUNE 19 81 and 2 AUG 19 81

in the locality LAKE HURON

for hydrographic surveys Nos. H-9944 H-9963

Corr.-from Barcheck

Depth	Corr.
0.0-27.2	0.0
27.3-9999	0.2

√SPD

10 5
20 10
30 15
40 20
50 25
60 30
70 35
80 40
90 45
100 50
110 55
120 60
130 65
140 70
150 75
160 80
170 85
180 90
190 95

DEPTHS IN FATHOMS OR FEET

(For deep water add a 0 to these figures)

46 1240

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

☆ U.S. GOV. PRINTING OFFICE: 1977—767-212

-.4 -.3 -.2 -.1 0 .1 .2 .3 .4

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

CORRECTIONS IN FEET, FATHOMS

NOAA FORM 76-41
(10-72)

U.S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship LAUNCH 1265
SAM DE BOW LT/G Comdg.

These corrections are to be used
between 25 June 19 81 and 2 Aug 19 81
in the locality LAKE HURON

for hydrographic surveys Nos. H-9944 H-9963

Avg of four (4) TDC Casts, (used) as a comparison with Bar check data.

Depth	Corr
00 - 7.5	00
7.6 - 78.0	02
78.1 - 9999	00

(For deep water add a 0 to these figures)

DEPTHS IN FATHOMS

10 5
20 10
30 15
40 20
50 25
60 30
70 35
80 40
90 45
100 50
110 55
120 60
130 65
140 70
150 75
160 80
170 85
180 90
190 95

46 1240

K+E 20 X 20 TO THE 1" 7 X 10 INCHES
KEUFFEL & ESSER MADE IN U.S.A.

☆ U.S. GOV. PRINTING OFFICE: 1977—787-212

-.4 -.3 -.2 -.1 0 .1 .2 .3 .4

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

CORRECTIONS IN FEET, FATHOMS

10	5
20	10
30	15
40	20
50	25
60	30
70	35
80	40
90	45
100	50
110	55
120	60
130	65
140	70
150	75
160	80
170	85
180	90
190	95

DEPTHS IN FATHOMS (FEET)

(For deep water add a 0 to these figures)

NOAA FORM 76-21 (11-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship LAUNCH 1255
SAM DE BOW LTJG Comdg.

These corrections are to be used

between 25 June 19 81 and 2 Aug 19 81

in the locality LAKE HURON

for hydrographic surveys Nos. H 9944 H 9963

E

E

Bar Checks

Avg of four (4) TDC Casts, used as a comparison with Bar check data.

Depth	Corr
00 - 75	00
76 - 780	02
781 - 9999	00

Instr. Error = -0.2

✓SPD

46 1240

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

☆ U.S. GOV. PRINTING OFFICE: 1977—767-21

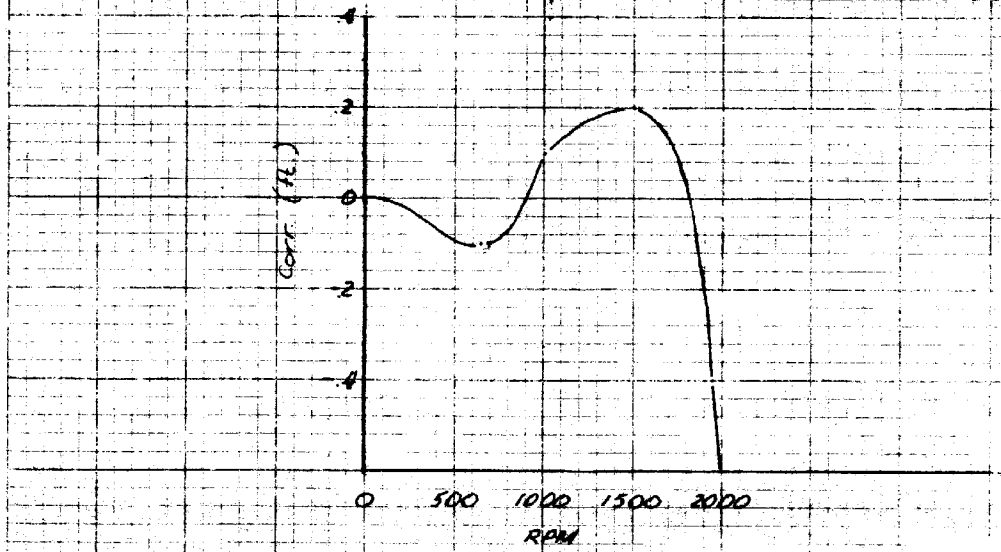
NOAA LAUNCH 1255
SETTLEMENT & SQUAT

Determined off Harbor Beach Bkw, Harbor Beach, MI.
on 31 July 1981 by the Level Method.

original data located in H9944 Survey Records
H 9965

RPM	Mean	Corr. (ft.)
0	9.0	0
650	8.9	-.1
1000	9.1	+.1
1500	9.2	+.2
1950	8.6	-.4

(1950 RPM Normal Survey Speed)



OPR X115
HSB 20-4-81
H-9963
TC/T1

170207 0 1006 0002 196 125500 001981

220940 0 1002

151443 0 1006 0003 197 125500 001981

172957 0 1002 0003 205 125500 001981

180749 0 1006

183905 0 1002

133818 0 1006 0004 211 125500 001981

185301 0 1002

193340 0 1006

193919 0 1002

173528 0 1006 0004 212 125500 001981

185556 0 1002

235959 0 0000 0000 356 125500 001981

OPR X115

SOUNDING CORRECTION ABSTRACT

VESSEL 1255 — 2.6' DRAFT APPLIED VIA CORRECTOR TAPE

FIELD NO. HSB 20-4-81

REGISTRY NO. H- 9963

Julian Date	From Time (GMT)	To Time (GMT)	Velocity Corr Table No.	(Note: TRA Corr. is the algebraic sum of these columns) Draft Corr	Instrument Error Corr	Initial Corr	S&S Corr	TRA Corr ft/fm	Remarks
196	170207		2	0	-2	0	-0.1	-0.6'	1950 RPM
	220940						0	-0.2'	DPS (buoy)
197	151443		3				-0.1	-0.6	1950 RPM
205	172957						0	-0.2	BS
	180749						-0.1	-0.6	1950 RPM
	183905						0	-0.2	BS
211	133818		4				-0.1	-0.6	1950 RPM
	185301						0	-0.2	BS
	193340						-0.1	-0.6	1950 RPM
	193919						0	-0.2	BS
212	173528						-0.1	-0.6	1950 RPM
	185556						0	-0.2	BS
				↓	↓	↓			

FIGURE 5-7.—Sounding Correction Abstract

SIGNAL TAPE LISTING

OPR X-115

ASB 23-4-81

N-9963

374	7	43	53	44344	082	37	53162	253	0330	333333	HARBOR BEACH LIGHT	1980
375	7	43	53	37731	082	37	51973	139	3333	333333	HARBOR BEACH S. PIER	1980
376	7	43	53	45946	082	37	52618	139	0000	333333	HARBOR BEACH N. BRW ANTENNA	1980
377	7	43	53	28334	082	38	53931	139	3333	333333	HARBOR BEACH MUN.PIER RAD TWR	1980
378	7	43	51	28535	082	39	29238	139	3333	333333	HARBOR BEACH CABLE T.V. MAST	1980
379	7	43	51	36495	082	38	37361	139	3333	333333	DETROIT EDISON STACK	1980
380	7	43	53	43247	082	38	57532	139	3333	333333	HERCULES WATER STACK	1980
381	7	43	50	27481	082	39	44360	139	3333	333331	HARBOR BEACH WATER TANK	1980
353	7	43	53	44185	082	37	53988	139	3333	333330	H-62-MI	1980
355	7	43	52	39372	082	39	03313	139	3333	333333	H-63-MI	1980
356	7	43	53	16975	082	40	47636	139	3333	333333	H-64-MI	1980
357	7	43	54	26336	082	44	58559	139	3333	333333	H-65-MI	1980
358	7	43	54	38154	082	41	35636	253	3333	333333	H-66-MI	1980
359	7	43	55	39343	082	42	29176	139	3333	333333	H-67-MI	1980
360	7	43	57	55338	082	43	24617	139	3333	333330	H-68-MI	1980
361	7	43	58	27398	082	43	43736	253	3333	333333	H-69-MI	1980
362	7	43	59	31377	082	44	05485	139	3333	333333	H-70-MI	1980
363	7	43	59	27537	082	44	28295	139	3333	333333	H-71-MI	1980
364	7	43	59	44838	082	44	53156	139	3333	333333	H-72-MI	1980
365	7	44	00	15975	082	45	27958	139	3333	333333	H-73-MI	1980
366	7	44	02	15131	082	49	52085	139	3333	333333	H-74-MI	1980
367	7	44	02	37754	082	51	35753	139	3333	333333	H-75-MI	1980
368	7	44	02	43257	082	52	42652	253	3333	333333	H-76-MI	1980
369	7	44	03	34935	082	53	31521	139	3333	333333	H-77-MI	1980
329	7	44	31	22208	082	47	35723	253	2033	333330	PTE AUX BARQUES LIGHTHOUSE	1979
331	7	44	31	57483	082	48	53913	253	3333	333333	H-6-MI-79	1979
334	7	43	56	26854	082	43	06733	139	3333	333333	PORT HOPE LUTHERN CHURCH SPIRE	(1980)
336	7	43	56	37536	082	42	32557	139	3333	333333	PORT HOPE STACK	1980

FORM CD-26
(12-11-46)

U.S. DEPARTMENT OF COMMERCE

WORKSHEET

POSITION ABSTRACT
OPR X115
HSB 20-4-81
H-9963

JD	From Pos	To Pos	Ctr	S_1	M	S_2	Remarks	
196	1244	1418	R/R	361	000	329	MAIN SCHEME	
	1419	1423					REJECTED	
	1424	1521					MAIN SCHEME	
		1522					REJECTED	
	1523	1539					MAIN SCHEME	
	1540	1543					DP's	Rejected RHD
197	1544	1592		361	000	329	CROSSLINE	
	1593	1638					MAIN SCHEME	
199	1634	1859		329	000	368	MAIN SCHEME	
203	1860	2062		329	000	368	MAIN SCHEME	
204	2063	2073		329	000	368	CROSSLINE	
	2074	2075					REJECTED	
	2076	2084					CROSSLINE	
	2085	2086					REJECTED	
	2087	2096					CROSSLINE	
	2097	2112					MAIN SCHEME	
	2113	2114					REJECTED	
	2115	2192					MAIN SCHEME	
		2193					REJECTED	
	2194	2219					MAIN SCHEME	
		2220					REJECTED	
	2221	2233					MAIN SCHEME	
	2234	2236					REJECTED	
	2237	2248					MAIN SCHEME	
205	2249	2261		329	000	368	MAIN SCHEME	
	2262	2265					CROSSLINE	
	2266	2298					DEVELOPMENT	
	2299	2300					REJECTED	
	2301	2305					BOTTOM SAMPLES	
	2306	2310					REJECTED	
	2311	2314					BOTTOM SAMPLES	
211	2315	2350		331	000	368	DEVELOPMENT	
		2351					REJECTED	
	2352	2524					DEVELOPMENT	
	2525	2533					CROSSLINE	
	2534	2538					BOTTOM SAMPLES	
	2539	2540					MAIN SCHEME	
	2541	2544					BOTTOM SAMPLES	
212	2545	2580		361	000	329	DEVELOPMENT	
	2581	2585					MAIN SCHEME	
	2586	2619					DEVELOPMENT	
	2620	2633					BOTTOM SAMPLES	

☆ U. S. GOVERNMENT PRINTING OFFICE: 1977—786-753

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
- [X] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

- [X] TO BE CHARTED
- [ ] TO BE REVISED
- [ ] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office): HYDRO FIELD PARTY 4

STATE: MICHIGAN

LOCALITY: LAKE HURON
PTE. AUX BARQUES

DATE: 7/31/81

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

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
X115-HSB-81	HSB 20-4-81	H-9963	NORTH AMERICAN 1927

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	FIELD	CHARTS AFFECTED
LIGHT	POINTE AUX BARQUES LIGHTHOUSE	44 01	22.208	82 47	35.728		F-1-6-V 1979	14860 14862
STACK	PORT HOPE HISTORICAL STACK > not within survey limits	43 56	37.635	82 42	32.557		F-1-6-V 1980	14860 14862
SPIRE	PORT HOPE LUTHERN CHURCH SPIRE	43 56	26.850	82 43	06.780		F-1-6-V 1980	14860 14862
	Ref: L-651(83)							

313

RESPONSIBLE PERSONNEL		
TYPE OF ACTION	**NAME**	**ORIGINATOR**
OBJECTS INSPECTED FROM SEAWARD	LT(jg) Samuel P. De BOW, Jr. OIC HFP # 4	☐ PHOTO FIELD PARTY ☒ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER *(Specify)*
POSITIONS DETERMINED AND/OR VERIFIED		FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64,

OFFICE

I. OFFICE IDENTIFIED AND LOCATED OBJECTS

Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.

EXAMPLE: 75E(C)6042
8-12-75

FIELD

I. NEW POSITION DETERMINED OR VERIFIED

Enter the applicable data by symbols as follows:

F - Field	P - Photogrammetric
L - Located	Vis - Visually
V - Verified	
1 - Triangulation	5 - Field identified
2 - Traverse	6 - Theodolite
3 - Intersection	7 - Planetable
4 - Resection	8 - Sextant

A. Field positions* require entry of method of location and date of field work.

EXAMPLE: F-2-6-L
8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont'd)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.

EXAMPLE: P-8-V
8-12-75
74L(C)2982

II. TRIANGULATION STATION RECOVERED

When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.

EXAMPLE: Triang. Rec.
8-12-75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
8-12-75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

APPROVAL SHEET
Survey H-9963 (HSB-20-4-81)

The hydrographic records transmitted with this report are complete and adequate to supersede prior surveys for charting with no additional field work recommended.

Direct daily supervision was not given by me during the field work.

Approved and forwarded,

Geo. W. Jamerson

George W. Jamerson
Lt. Cdr. NOAA
Chief, Hydrographic Surveys Branch

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
NOAA Ship WHITING
439 W. York Street
Norfolk, Virginia 23510

November 14, 1980

TO : AMC Processing, OA/CAM

FROM : Commander Frank P. Rossi, NOAA
Commanding Officer, NOAA Ship WHITING

SUBJECT: 1980 Lake Huron Surveys: Depth Descrepency between WHITING's Surveys and Canadian Surveys.

In late October I talked with Ross Douglas, Canadian Hydrographic Service, Burlington, Ontario, about our junction problem with the Canadian Surveys. He said that they were having problems with these Canadian Surveys, and indicated they were rejecting some of the work. The surveys were primarily for limnological studies and hydrographic use of them was secondary.

The fact that our junctions get worse the further one is from Port Huron - Sarnia would indicate that the CHS may be experiencing a problem with the propagtion velocity they used. They did not calibrate the Mini-Fix on the United States side of their work. A modest error in the propagation velocity will produce a considerable position error when carried to distances greater than 30 miles.

The WHITING generally did not work more than 15 miles from a calibration site; therefore, there should be little error (less than 10 meters) in the WHITING's positions.

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

WATER LEVEL NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center: CAM3

Hourly heights are approved for

Water Level Station Used: Harbor Beach, Michigan (907-5014)

Period: June 15, 1981 - July 1, 1981

HYDROGRAPHIC SHEET: H-9963

OPR- X115-HSB-81

Locality: Lake Huron

Plane of reference: Low Water Datum (IGLD 1955 : 576.8 Feet)

Remarks: Zoning not required. Data from other gages on Lake Huron indicate no unusual water level movement during the survey period.

Philip C. Marris

Chief, Water Level Branch

FIELD WATER LEVEL NOTE

HSB 20-3-81

Predicted or actual water level reductions were not applied to the field sheet. Times of recorded water levels are Eastern Standard Time (+4 hours).

One temporary Fisher-Porter ADR gage was installed at:

	LATITUDE	LONGITUDE	PERIOD
PORT AUSTIN	44°03'N	82°59'W	1 June - 3 August

In addition, the permanent water level gage at Harbor Beach, MI controlled the survey area. This gage was inspected and leveled at the beginning and end of the survey. The gage is located at:

	LATITUDE	LONGITUDE
HARBOR BEACH	43°50.7'	82°38.6'

PORT AUSTIN

Gage and staff were installed on 2 June, 1981 by field party personnel and levelled out on 3 August, 1981. A contract observer was hired to monitor the gage. Over the 4th of July weekend he did not make observations and the gage went down. Mr. Lippencott of the Tides and Water Levels Branch was notified of the discrepancy and he informed the OIC that since the permanent gage was located close to the survey area, that there should be no problem interpolating the data. No other problems were observed from that point on.

All water level records have been sent to the Tides and Water Levels Branch in Rockville, MD.

ATLANTIC MARINE CENTER

December 4, 1981 OA/CAM11

TO: Chief, Water Levels Branch - OA/C234

FROM: Lt. Cdr. George W. Jamerson - OA/CAM11
Chief, Hydrographic Surveys Branch

SUBJECT: Request for water level data

Please furnish smooth water level correctors and zoning information to AMC Processing Division, OA/CAM3, for Survey H-9963 (HSB-20-4-81), OPR-X115-HSB-81, Lake Huron, for the following dates and times:

1981	Hydro Begins	Hydro Ends
198	1500	2400
197	1300	1900
199	1300	2100
203	1200	2100
204	1200	2100
205	1400	2100
211	1100	2200
212	1500	2300

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-9963

GEOGRAPHIC NAMES

Name on Survey	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	K	
BALD EAGLE POINT			Huron City	*						1
HURON CITY	14862									2
LAKE HURON	14862									3
OSCABE POINT				X*						4
WHISKEY HARBOR			Port Hope	*						5
MICHIGAN (TITLE) *	Recommended by field unit for charting									6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
					Approved:					18
										19
					Chas. E. Harrington					20
					Chief Geographer - N/CG2x5					21
					28 March 1983					22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

A13

NOAA FORM 77-27 | U.S. DEPARTMENT OF COMMERCE | REGISTRY NUMBER

HYDROGRAPHIC SURVEY STATISTICS

H-9963

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS.[1] ARC,[2] EXCESS	3
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	3

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDIAN FILES				1-Raw P/O, fathograms		
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES				1-Smooth P/O, Sound Vol, Misc.		

SHORELINE DATA

SHORELINE MAPS (List):

PHOTOBATHYMETRIC MAPS (List):

NOTES TO THE HYDROGRAPHER (List):

SPECIAL REPORTS (List):

NAUTICAL CHARTS (List):

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS VERIFICATION	AMOUNTS EVALUATION	AMOUNTS TOTALS
POSITIONS ON SHEET			1390
POSITIONS REVISED	3	0	
SOUNDINGS REVISED	20	2	
CONTROL STATIONS REVISED	0	0	
	TIME-HOURS VERIFICATION	TIME-HOURS EVALUATION	TIME-HOURS TOTALS
PRE-PROCESSING EXAMINATION	37		
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS	85	0	
VERIFICATION OF SOUNDINGS	96	0	
VERIFICATION OF JUNCTIONS	1	0	
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION	2	0	
COMPILATION OF SMOOTH SHEET	36	7	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		20	
EVALUATION OF SIDESCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		10	
OTHER			
TOTALS	257	37	294

Pre-processing Examination by HYDROGRAPHIC SURVEYS BRANCH (AMC)	*Beginning Date* 12/29/81	*Ending Date* 01/05/82
Verification of Field Data by M.S.S., R.H.W.	*Time (Hours)* 257	*Ending Date* 02/15/83
Verification Check by G.F. Trefethen	*Time (Hours)* 30	*Ending Date* 3/24/83
Evaluation and Analysis by L.G. CRAM	*Time (Hours)* 37	*Ending Date* 3/24/83
Inspection by	*Time (Hours)* 13	*Ending Date* 7/8/83

CDR. R.W. KIENINGER & C.D. MEADOR

ATLANTIC MARINE CENTER

EVALUATION REPORT

REGISTRY NO: H-9963 FIELD NO: HSB-20-4-81

Michigan, Lake Huron, Offshore--Whiskey Harbor to Huron City

SURVEYED: July 15 through July 31, 1981

SCALE: 1:20,000 PROJECT NO: OPR-X115-HSB-81

SOUNDING: DE-723 D Fathometer CONTROL: Del Norte (Range/Range)

Chief of Party ..... G.W. Jamerson
Surveyed by ..... S.P. DeBrow
..... E.L. Martin
..... D.M. Bryant
..... D.K. Parris
..... W.L. Spyre
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. Brown shoreline was transferred to the smooth sheet from enlargements of U.S. Geological Survey Quadrangles Huron City, Redman and Port Hope, dated 1970, for orientation purposes only.

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 generally could be adequately drawn. The charted 24-ft. supplemental curve and other supplemental curves, as well as dashed curves, were used to better delineate some features. The standard 18-ft. curve and the 24-ft. supplemental curve could not be fully delineated at the inshore limits of the hydrography.

c. This survey adequately delineates the basic bottom configuration and least depths.

4. CONDITION OF SURVEY

The smooth sheet, accompanying overlays, hydrographic records and reports comply with the Hydrographic Manual except as follows:

a. The field used one set of sounding volumes (form 77-44) for H-9944 and H-9963. In section 4.8.1 of the Hydrographic Manual it states that all records submitted with a specific survey shall only pertain to that survey.

b. In the Descriptive Report, the information for section M is under section N and vice versa.

c. No bottom characteristics for developed shoals were determined as required in section 8.1 of the Project Instructions and section 4.5.9.2 of the Hydrographic Manual.

d. No comparisions were made with prior surveys LS-1271 (1913) and LS-1272 (1913).

e. No Coast Pilot Report was listed in the Descriptive Report for this survey as required by section 5.3.4.S. of the Hydrographic Manual.

5. JUNCTIONS

LS-2006 (1957) to the West
LS-2007 (1957) to the West
LS-2008 (1957) to the West
H-9944 (1981) to the South

The junction with H-9944 (1981) is complete and requires no further work. The junctions with LS-2006 (1957), LS-2007 (1957), and LS-2008 (1957) were not effected because these surveys are archived at Headquarters. The agreement between these surveys and the present survey is adequate and the standard curves can be completed.

There were no contempory junctional surveys to the east or north of the present survey.

Canadian Survey 3845 (1975) to the east, was not considered as contemporary, as the line spacing was not in accordance with the requirements for this scale survey as per section 4.3.4. of the Hydrographic Manual. The Canadian Survey (3845) is addressed under section J. of the Descriptive Report.

The charted depth curves are in fair agreement with the present survey curves in the areas to the north and east.

6. COMPARISON WITH PRIOR SURVEYS

a. LS-1270 (1913) 1:20,000
LS-1271 (1913) 1:20,000
LS-1272 (1913) 1:20,000
LS-1845 (1946) 1:20,000

The above prior surveys from the U.S. Army Corps of Engineers Lake Survey Center were determined to be the most appropriate for comparison purposes in the area common to the present survey.

In general, the prior surveys agree very well (plus or minus 1 to 3 feet) with the present survey. The basic bottom configuration and least depths are in good agreement, with the present survey providing more information on the topography of the bottom configuration. For additional information on this comparison see sections K and L of the Descriptive Report.

The differences in soundings between the present and prior surveys can be attributed to some natural changes and to improvements in methods of obtaining soundings and to improved positioning methods. The increased sounding density on the present survey (100 meter line spacing versus 250 meter line spacing for the prior surveys) also was a contributing factor.

A number of bottom characteristics were carried forward to the present survey from these prior surveys. The transfer of these bottom characteristics was mainly in irregular bottom areas, and provided additional information and defined the hard bottom found on the present survey.

A charted (chart number 14862) 17-ft. depth in Latitude 44°03'50", Longitude 82°47'48", was carried forward to the present survey. This depth originates with prior survey LS-1271 (1913). The depths on the present survey in this area are from 20 to 21 feet. It is recommended that the chart compiler retain this item as charted.

With the addition of the bottom characteristics and depth described above to supplement the present survey, the present survey is adequate to supersede the above prior surveys in the common area.

b. Wire Drag Surveys

LS-1270 (1913)
LS-1271 (1913)

These surveys are basically hydrographic surveys with wire swept areas portrayed on the most inshore areas of these surveys. There are no conflicts between the effective depths of these wire drag areas and the present survey.

7. COMPARISON WITH CHART #14862 (23rd EDITION, JULY 29, 1978)

a. Hydrography

The charted hydrography (99%) originates with the previously discussed prior surveys and requires no further discussion. The remaining 1% of the charted hydrography originates with unascertainable sources. These soundings (three) appear to be within ± 1 to 5 feet of the present survey depths.

The following items are addressed to the attention of the chart compiler:

(1) Presurvey Review Item Number 12, a 27-ft. sounding charted (chart number 14862) in Latitude 44°05'54", Longitude 82°50'33", originates with prior survey LS-1270 (1913). The field unit located a 27-ft. sounding in Latitude 44°05'56.96", Longitude 82°50'34.61", with a shoal containing depths from 27 to 30 feet in this area. It is recommended that the chart compiler chart the 27-ft. sounding and the shoal from the present survey in this area.

(2) Presurvey Review Item Number 13, a 23-ft. sounding charted (chart number 14862) in Latitude 44°05'06", Longitude 82°49'48", originates with prior survey LS-1270 (1913). The field unit located a 24-ft. sounding in Latitude 44°05'05.98", Longitude 82°49'29.36", with a large shoal containing depths from 24 to 30 feet. It is recommended that the chart compiler chart the 24-ft and shoal from the present survey in this area.

The present survey is adequate to supersede the prior hydrography in the common area except for the one sounding discussed under section 6.a. of this report.

b. Aids to Navigation

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

8. COMPLIANCE WITH INSTRUCTIONS

This survey adequately complies with the Project Instructions with the exception listed below:

a. The Project Instructions (section 6.12) call for a report on dangers to navigation or if there isn't any, than a negative report is to be included in the Descriptive Report. This survey contained no such report.

9. ADDITIONAL FIELD WORK

This is a good basic survey. Additional field work is not recommended.

R. H. Whitfield
Cartographic Technician
Verification of Field Data

L. G. Cram
Cartographer
Evaluation & Analysis

G. R. Trefethen
Senior Cartographic Technician
Verification Check

INSPECTION REPORT
H-9963

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

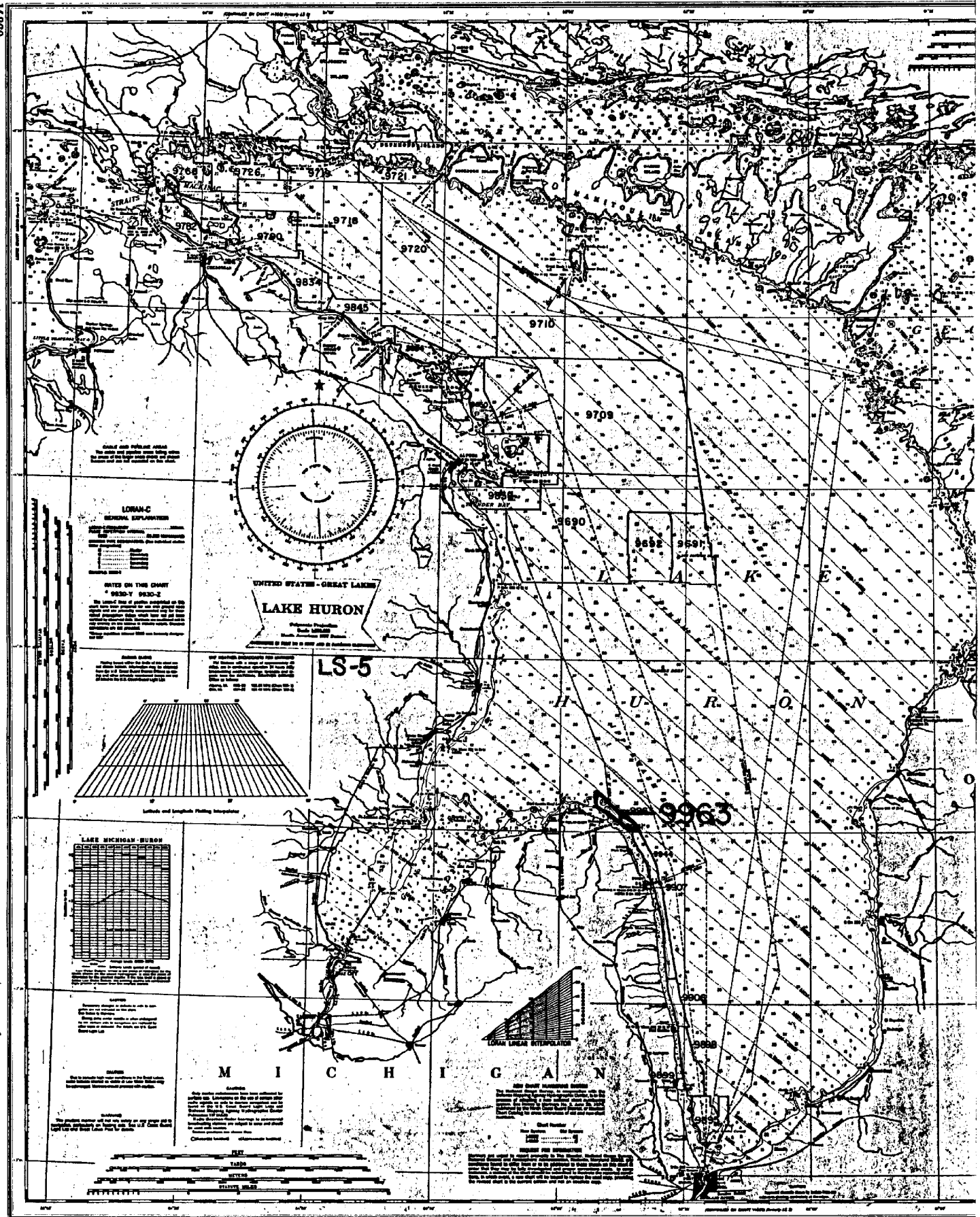
Charles D. Ameador
for R. D. Sanocki
Chief, Verification Section
Hydrographic Surveys Branch

Karl Wm. Kieninger
Karl Wm. Kieninger, CDR, NOAA
Chief, Hydrographic Surveys Branch

Approved July 13, 1983

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

14860 (formerly LS 5) LORAN-C OVERPRINTED



SOUNDINGS IN FEET AND FATHOMS

14860
(formerly LS 5)
LORAN-C OVERPRINTED

LS-5

LS-5

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

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9963

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
14860	1/17/84	Jill A. Spurt	Full ~~Part~~ Before After Verification Review Inspection Signed Via Drawing No. 5
14862	12-7-84	R.B. Rose	Full [redacted] After Verification Review Inspection Signed Via Drawing No. 4
14863	12-11-84	R.B. Rose	Full ~~Part Before~~ After Verification Review Inspection Signed Via Drawing No. 6 thru 14862
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
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FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8558-P63