9099

Diag. Cht. No. 1222-3.

Form 504

U. S. DEPARTMENT OF COMMERCE

COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey Hydrographic (Special)

Field No. HSL 10-R-69 2 *Office No.* H-9099

LOCALITY

State Virginia

General locality Virginia Coast-Cape Henry

Locality Chesapeake Bay Sealanes

19 69

CHIEF OF PARTY

Ralph J. Land, LCDR., USESSA

LIBRARY & ARCHIVES

DATE 10-27-70

USCOMM-DC 5087

9099

FORM C&GS-537
(8-15-59)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REGISTER NO. H-9099

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. HSL 10-2-69

State: VIRGINIA

General locality: ENTRANCE TO CHESAPEAKE BAY

Locality: CHESAPEAKE BAY SEALANES

Scale: 1:10,000 Date of survey: Dec. 9 to 18, 1969

Instructions dated: 14 November 1969 Project No.: AMC-SP-8-69

Vessel: HI-SPEED LAUNCH 1257

Chief of party: RALPH J. LAND, LCDR, USESSA

Surveyed by: RALPH J. LAND & C. DALE NORTH, JR.

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

Graphic record scaled by: C. DALE NORTH, JR.

Graphic record checked by: C. DALE NORTH, JR. & D.C. CALLAND

Protracted by: GERBER DIGITAL PLOTTER - PACIFIC MARINE CENTER

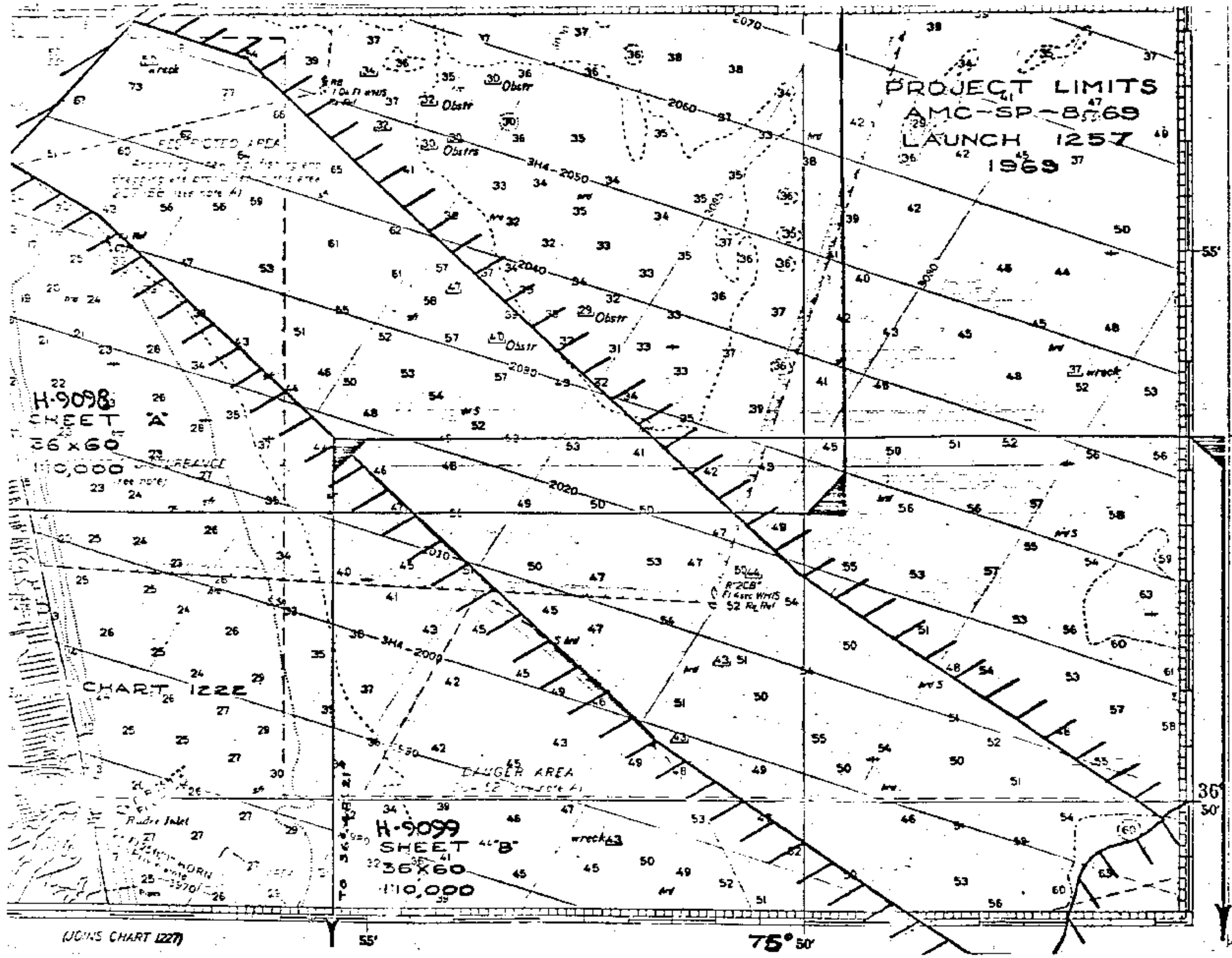
Soundings penciled by: " " " " " "

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

REMARKS: This survey is the first submitted by USC&GS Launch 1257 using the completely automated Hydroplot system.

Processed in Nautical Data Sept '98

USCOMM-DC 8272-P62


PROJECT LIMITS
AMC-SP-8-69
LAUNCH 1257
1969
H-9098
SHEET "A"
36x60
1:10,000
H-9099
SHEET "B"
36x60
1:10,000
CHART 1222
DANGER AREA
RESTRICTED AREA
Rudee Inlet
55'
75° 50'
36° 50'
(JOINS CHART 1227)

DESCRIPTIVE REPORT
TO ACCOMPANY HYDROGRAPHIC SURVEY H-9099
(Field No. HSL-10-2-69)

Scale: 1:10,000
Year : 1969

USC&GS LAUNCH 1257
LCDR Ralph J. Land
Officer-In-Charge

A. PROJECT: AMC-SP-8-69. Instructions--Project AMC-SP-8-69--Chesapeake Bay Sealane Survey, dated 14 November 1969, was the sole written authority. Verbal authority by Operations Officer, AMC, to suspend survey operations one mile south of first buoy marking the sealane.

B. AREA SURVEYED: An area approximately two miles wide and four miles long centered along a line of buoys positioned by the U. S. Coast Guard as fairway buoys for the sealane approaching the Chesapeake Bay entrance from the southeast. This sealane is considered to be the approach for those vessels of deeper draft unable to navigate the more shallow northern Chesapeake Bay sealane. The surveyed sealane diverges at an angle approximately 45° to the Coast of Virginia at Virginia Beach, and the northern end of the sealane leads directly to the main channel of the Chesapeake Bay entrance off Fort Story, Virginia.

Approximate limits of hydrography were: On the north by an east-west line at 36°52'56"N, between 75°54'52"W and 75°51'16"W; and on the south by a line between 75°51'20"W and 75°46'53"W at 36°50'21"N, forming a trapezoidal figure of the survey on this sheet.

The inclusive dates of the survey were (HSL 10-B-69) Julian Days 343-352, December 9, 1969-December 18, 1969.

Junctions with prior surveys were not required; and, no junctions were made except with the contemporary survey HSL 10-A-69 (H-9098).

C. All soundings on HSL 10-B-69 (H-9099) were made by USC&GS Launch 1257.

D. Raytheon Survey Fathometer DE-723, S/N 1904, was used exclusively on this survey.

Echo sounder corrections were obtained by bar check and TDC (Temperature-Depth-Conductance) observations using a Martek 100S instrument.

Sea conditions, wind, and multiple-layered currents prevented good bar checks being taken most of the time on the exposed coast. Two bar checks (Dec. 15 and 17) were taken at the Little Creek fuel pier after the day's work and the results were compatible with those taken in the survey area.

A table of velocity corrections included in this report represents a mean of TDC observations in the survey area. In arriving at the velocity corrections, temperature and specific gravity were

D. (Cont'd.)

determined from a sample of surface sea water. Temperature, depth, and conductance were read directly from the TDC meter--at the surface, at 2 meter intervals to 10 meters, and 5 meter intervals thereafter--as the sensor was lowered to the sampled depths. Afterward, salinity was determined from the surface measurements from temperature, specific gravity, and H.O. Misc. 15530-5 Nomograph, and this determination was used as a corrector to all conductance values. The corrected readings were then used to determine the salinity at all depths using a graph furnished by Martek Co. to convert conductance to salinity. A computer program which uses Wilson's Equations to plot the velocity of sound in seawater from temperature and salinity was employed to determine the corrections to soundings and effective depth applicable.

Because the recorded Hydroplot soundings from the digital output do not have the mechanical corrections inherent in soundings relying on the analogue fathometer record, no raw data soundings have fathometer correctors other than those soundings scanned directly from the fathometer record as inserts or corrections. Adjusted or inserted soundings were determined by comparing the fathometer record before and after the applicable sounding with the digital printout and applying the difference to the scanned sounding. A 2-foot initial setting was maintained throughout the survey.

A mean TRA correction, determined from bar check and physical measurement, of seven-tenths (+0.7) ft. was used in preparing the PMC conversion tapes.

A Squat and Settlement chart was constructed in September 1969 by the conventional method of sounding at a buoy placed in an area of flat bottom and observing the soundings alternately laying to and passing the same area at various RPM's. A -0.3 ft. correction was used exclusively during the survey. The -0.3 ft. was added to the +0.7 ft. correction and a TRA of +0.4 ft. was used for the PMC conversion tapes.

E. No smooth sheet was made. Boat sheet grids were drawn on the Complot plotter on board Launch 1257. The 22½-inch capacity of the XY plotter necessitated drawing two grids for each boat sheet. It is anticipated that the smooth sheet will be plotted by PMC.

F. Hi-Fix in the hyperbolic mode was used for electronic positioning throughout the survey. Each sounding was plotted using its unique GP computed from the Hi-Fix readings auto-

F. (Cont'd.)

matically fed to the computer. However, only position soundings have the control data recorded as Hi-Fix lanes.

Station	Location	
Slave 1 (Pattern 1)	37°05'36.243"N 75°58'17.553"W	Fishermans Island, Va.
Slave 2 (Pattern 2)	36°40'31.453"N 75°54'56.471"W	Sandbridge, Virginia
Master	36°55'07.441"N 75°59'52.541"W	Fort Story, Virginia

Each electronic control (Hi-Fix) station was located by AMC personnel in the following manner:

Slave 1 (Fishermans Island) over second order triangulation station FEN (1960).

Slave 2 (Sandbridge) over third order traverse station GRAVITY (1965).

Master (Fort Story) by third order traverse from established triangulation station FROG (1939-1961).

Objects used for calibration from sextant fixes were from established triangulation points.

Object	Location	
Cape Henry Lighthouse (new) (1882)	36°55'34.335"N 76°00'27.216"W	(1)
Parcel "C", Tower "A" (1939)	36°53'35.785"N 75°59'18.153"W	(2)
Cavalier Hotel Cupola (1929)	36°52'08.381"N 75°59'02.012"W	(3)
Virginia Beach, Mayflower Apt. Building (East Light) (1953)	36°51'44.149"N 75°58'47.147"W	(4)

F. (Cont'd.)

Four sextant fixes on three objects, (1), (2), and (3), were used almost consistently throughout the survey for morning and evening calibrations. An occasional check of two sets each were made between objects (1), (2), and (3); and (1), (2), and (4).

G. SHORELINE: No shoreline was within the survey limits.

H. CROSSLINES: Approximately 2% crosslines were run and no serious discrepancies occur on the crossings. Any differences are readily attributable to the generally rough sea state and large swells encountered during the course of the survey.

I. JUNCTIONS: No junctions were required.

J. COMPARISON WITH PRIOR SURVEY: No presurvey review items were involved in the survey. Comparison of the new survey area with H-6595, 1/40,000, 1940, reveals no significant differences in the results of the two surveys.

K. COMPARISON WITH THE CHART: Chart 1222, 28th edition, 7 July 1969, was used for comparison with the new survey area. Depths are in general agreement.* An indication of the wreck listed at 36°56.7'N and 75°57.6'W was recorded on the fathogram with a reduced sounding of 64'. However, the other charted wire drag clearances over obstructions and other snags were not discernable from the records of this survey. No new dangers to navigation were found.

L. ADEQUACY OF SURVEY: This survey is complete and adequate for the purpose for which it was conducted; and, it is sufficient to supersede any prior survey for charting.

M. AIDS TO NAVIGATION: The U.S. Coast Guard removed buoy R"2CB" F14 sec. (LL.156) and placed two (2) buoys (Light List 156.05 and 156.10) in the survey area while hydrography was in progress. Both buoys were located within one second of the published location. The published physical descriptions were in agreement with those observed.

N. STATISTICS: 1,867 positions were recorded. 8.14 square miles hydrography were accomplished from 321 nautical miles of sounding line. Bottom samples were neither required nor taken during this special survey.

* applies to H8L 10-A-69

O. MISCELLANEOUS: This hydrographic survey was accomplished by USC&GS Launch 1257 which has been equipped with a Hydroplot system to conduct completely automated hydrography (reference is made to CDR Clinton D. Upham's paper entitled "High Speed Data Acquisition for Large Scale Hydrographic Surveys", March 1970, which describes the Hydroplot system in detail).

Briefly, A PDP-8I computer, Complot XY plotter, Hydroplot controller, Digital Control Unit, and a DE-723 Digital Fathometer, Hi-Fix, Left-Right Indicator, and other associated hardware comprise the Hydroplot system. Soundings from the DE-723 fathometer are updated every second and are fed along with the Hi-Fix lane count to the computer upon demand. A printout showing time, sounding depth, and on position fixes, a fix number and Hi-Fix lane count for each pattern is typed; a raw data tape is punched; the GP of every sounding is computed; the Left-Right indicator is updated; and the sounding is plotted with the appropriate predicted tide reducer and Hi-Fix correctors taken into account. Sounding interval and number of in-betweens, TRA, vessel identification and Hi-Fix correctors are set in the Hydroplot Controller by hand at the beginning of the day's work. In processing the data, corrector tapes for insertion of or changing of soundings, final Hi-Fix calibration correctors, and smooth tides were used in preparing the final PMC format tape. All tapes were produced in PMC format using ASCII code in a single indicator format (see Field Processing Discrepancies).

P. RECOMMENDATIONS: All previously charted wire drag indications should, because of the special nature of the sealanes, be redragged at the earliest practical time. No indications of their existence were discernable on this survey.

Q. REFERENCES TO REPORTS:

(1) "TDC Report, Project OPR-474, USC&GSS WHITING", December, 1969.

(2) "High Speed Data Acquisition for Large-Scale Hydrographic Surveys", March 1970, by Clinton D. Upham, CDR, USESSA

SEPARATES FOLLOWING TEXT

TIDE NOTE

Hourly heights were furnished by the Washington Office and a "smooth tide generator" computer program was used to obtain the corrections to be applied to the soundings.

Approval of the tide tape printout is enclosed.

Virginia Beach Tide Station (36°50'N, 75°58'W) was used on time meridian 75°W.

No corrections for differences in time or height were applied to the observed tides.

FORM C&GS-712
(3-9-64)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

February 16, 1970

~~Nautical Chart Division~~ Atlantic Marine Center

Plane of reference approved ~~in volume of sounding records~~ for Tide tape printout

HYDROGRAPHIC SHEET 9099 & 9098

Locality: Virginia Beach, Virginia

~~Chief of Party~~ Year 1969

Plane of reference is mean low water

Tide Station Used (Form C&GS-681):

Virginia Beach

Height of Mean High Water above Plane of Reference is as follows:

3.4 feet

Remarks

J M Symons
Chief, Tides and Currents Branch

USCOMM-DC 6880-P64

Abstract of Corrections to Echo Soundings

The following page contains an abstract, in tabular form, of the velocity corrections which are applied to echo soundings contained in this survey. Attention is directed to the Special Report on Corrections to Echo Soundings submitted for this project.

The table applied to all hydrography conducted during this survey (9 December - 18 December, 1969). USC&GS Launch 1257 conducted all operations, using a Raytheon DE-723 digital fathometer, #1904.

Velocity Corrections
H-9099
HSL-10-B-69

```
.000130 0 0000 0099 000 000000 000000
 000290 0 0002
 000450 0 0004
 000610 0 0006
 000770 0 0008
 000930 0 0010
 001000 0 0012
```

ABSTRACT

CORRECTIONS TO DISTANCE MEASUREMENTS

AMC SP-8-69 (H-9098 & H-9099)

USC&GS Launch 1257 - HIFIX CORRECTORS

Date	Day No.	Location	Range PI	Range PII	Mean PI	Mean PII
11/19	323	VA BEACH	38-41	50-54	+.40	+.52
11/20	324	VA BEACH	42-41	60-60	+.42	+.60
11/24	328	VA BEACH	43-46	54-55	+.44	+.54
11/25	329	VA BEACH	46-45	55-59	+.46	+.57
11/26	330	VA BEACH	45	57	+.45	+.57
12/1	335	VA BEACH	46-43	57-54	+.45	+.56
12/3	337	VA BEACH	46	52	+.45	+.55*
12/6	340	VA BEACH	40-43	52-59	+.42	+.56
12/7	341	VA BEACH	44-43	55-60	+.44	+.58
12/9	343	VA BEACH	42-41	59-58	+.42	+.58
12/12	346	VA BEACH	46	44	+.46	+.44
12/15	349	VA BEACH	44-43	61-60	+.44	+.60
12/16	350	VA BEACH	43	58	+.43	+.58
12/17	351	VA BEACH	43-40	54-62	+.42	+.58
12/18	352	VA BEACH	44-45	50-57	+.44	+.54

* ADOPTED VALUE (WEIGHTED)

ABSTRACT

CORRECTIONS TO DISTANCE MEASUREMENTS

AMC SP-8-69

(H-9098 & H-9099)

HI-FIX CALIBRATIONS

Location	Date	Julian Day	Time 75°W	Corr PI	Corr PII	Mean PI	Mean PII
VA. BEACH	11/19/69	323	0905	+.37	+.49		
				+.36	+.49		
				+.37	+.49		
				+.35	+.50		
				+.37	+.49		
				+.39	+.51		
				+.40	+.51		
				+.38	+.49		
				+.38	+.50	+.38	+.50
			1015	+.42	+.57		
				+.42	+.54		
				+.39	+.50		
				+.39	+.53	+.41	+.54
			1200	+.39	+.50		
				+.40	+.52		
				+.39	+.54		
				+.40	+.54	+.40	+.53
	11/20	323	0900	+.42	+.57		
				+.43	+.64		
				+.42	+.58	+.42	+.60
	11/20/69	324	1420	+.42	+.63		
				+.39	+.57		
				+.42	+.60	+.41	+.60
	11/24/69	328	1105	+44	+52		
				+42	+56		
				+42	+54		
				+44	+55	+43	+54
			1435	+49	+54		
				+46	+55		
				+45	+55		
				+44	+57	+46	+55

	Location	Date	Julian Day	Time 75°W	Conc PT	Conc PT	Mean PT	Mean PT
	VA Beach	11/25/69	329	0907	+46	+56		
					+47	+55		
					+45	+54	+46	+55
				1505	+43	+60		
					+46	+56		
					+48	+60		
					+42	+60	+45	+59
		11/26	330	0850	+46	+56		
					+48	+57		
					+45	+57		
					+50	+56	+45	+57
		12/1	335	1050	+44	+59		
					+45	+58		
					+47	+57		
					+47	+53	+46	+57
				1340	+43	+54		
					+42	+55		
					+45	+54	+43	+54
		12/3	337	0900	+47	+49		
					+44	+55		
					+47	+51		
					+47	+54	+46	+52
		12/6	340	1500	+42	+57		
					+44	+60		
					+42	+59	+43	+59
		12/7	341	0900	+42	+55		
					+43	+57		
					+45	+53		
					+46	+54	+44	+55
		12/6	340	0855	+40	+52		
					+41	+52		
					+41	+52		
					+39	+50	+40	+52

	LOCATION	DATE	JULIAN DAY	TIME 75°W	CORR PE	CORR PT	MEAN PE	MEAN PT
	VA. BEACH	12/7	341	1120	+43	+62		
					+46	+60		
					+41	+58		
					+42	+62		
					+41	+59	+43	+60
		12/9	343	0900	+39	+57		
					+42	+60		
					+42	+59		
					+44	+58	+42	+59
		12/9	343	1505	+39	+57		
					+41	+58		
					+42	+59		
					+43	+57	+41	+58
		12/12	346	0935	+48	+45		
					+46	+44		
					+46	+46		
					+46	+43		
					+45	+41	+46	+44
		12/15	349	0845	+45	+59		
					+45	+61		
					+43	+62	+44	+61
		12/15						
			349	1515	+42	+62		
					+42	+60		
					+44	+58	+43	+60
		12/16	350	0850	+44	+55		
					+42	+59		
					+42	+58		
					+45	+59	+43	+58
		12/17	351	0910	+43	+54		
					+44	+63		
					+43	+55	+43	+54

	Location	Date	Julian Day	Time 75°W	Corr PI	Corr PII	Mean PI	Mean PII
	VA Beach	12/17	351	1515	+42	+60		
					+39	+63		
					+39	+62	+40	+62
		12/18	352	0850	+42	+54		
					+45	+53		
					+45	+54	+44	+54
		12/18	352	0900	+44	+50		
					+46	+50	+45	+50
		12/18	352	1520	+43	+57		
					+41	+57		
					+44	+56		
					+46	+57	+44	+57

FORM # 1 FIG. 15

PARAMETERS FOR DIGITAL COMPUTING
POLYCONIC PROJECTION

(1) PROJECT No. AMC SP-8-69
(2) H No. 9099
(3) FIELD No. HSL 10-B-69
(4) REQUESTED BY
(5) SHIP OR OFFICE
(6) DATE REQUIRED
(7) VISUAL ☐
(8) ELECTRONIC [X] (FILL OUT FORM #3)

(10) XKN (SP 5) DISTANCE FROM CMER TO EAST EDGE (NYX = 1) OR WEST EDGE (NYX = 0). 10,171.0 METERS

(11) YKN (SP 241) DISTANCE FROM EQUATOR TO SOUTH EDGE OF SHEET. 4,074,413.085 METERS

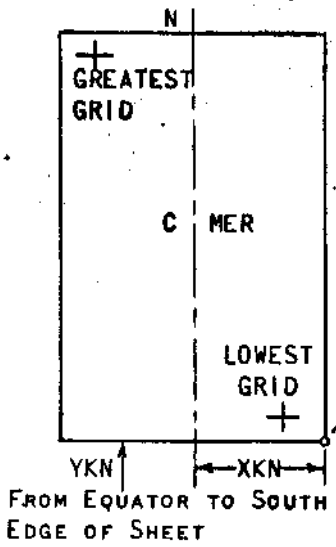
(12) CENTRAL MERIDIAN 75 ° 50 ' 00 "

(13) SURVEY SCALE 1: 10,000

(14) SIZE OF SHEET (CHECK ONE) 36x54 ☐ 42x60 [X] OTHER ____ ☐

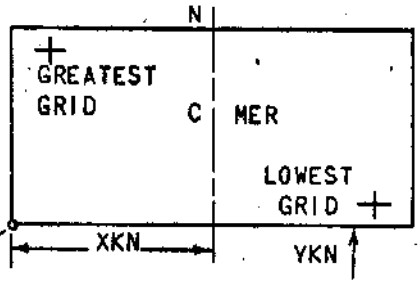
(15) NYX, ORIENTATION OF SHEET (CHECK ONE)

NYX = 1 ☐



FROM EQUATOR TO SOUTH EDGE OF SHEET

NYX = 0 [X]



FROM EQUATOR TO SOUTH EDGE OF SHEET

(9) PLOTTER ORIGIN (CORNER OF SHEET)

LATITUDE 36 ° 48 ' 00"
LONGITUDE 75 ° 55 ' 30"

GRID LIMITS

(16) GREATEST LATITUDE 36 ° 53 ' 00" (PROJECTION LINE INTERVAL, PAGE 4 HYDRO MANUAL)
(17) LOWEST LATITUDE 36 ° 48 ' 00"
(18) DIFFERENCE ° 5 ' 00"
(19) 00 ' 30 "
(20) 10 YSN

(21) GREATEST LONGITUDE 75 ° 55 ' 30"
(22) LOWEST LONGITUDE 75 ° 45 ' 30"
(23) DIFFERENCE ° 10 ' 00"
(24) 00 ' 30 "
(25) 20 XSN

LIST G.P. OF ALL STATIONS TO BE PLOTTED ON THIS PROJECTION ON THE BACK OF THIS FORM. (DEG., MIN., SEC.)

FORM # 3 FIG. 7

COMPUTER PARAMETERS FOR ELECTRONICALLY CONTROLLED SURVEYS

(~~RANGE xx RANGE x~~ (HYPERBOLIC)

(1) PROJECT NO. AMC SP-8-69 (2) H- NO. 9099 (3) FIELD NO. HSL 10-B-69

(4) TYPE OF CONTROL: ____ SHORAN, ____ RAYDIST, x HI-FIX, ____ RADAR
FREQUENCY (FOR CONVERSION OF RAYDIST OR HI-FIX LANES TO METERS) 1799.6

(5) RANGE ONE (R1)
STATION NAME SLAVE 1
LATITUDE 37 ° 05 ' 36.24 "
LONGITUDE 75 ° 58 ' 17.55 "

(6) RANGE TWO (R2)
STATION NAME SLAVE 2
LATITUDE 36 ° 40 ' 31.45 "
LONGITUDE 75 ° 54 ' 56.47 "

(7) AZIMUTH FROM R1 TO R2 ____ ° ____ ' ____ "

(8) BASELINE LENGTH IN METERS ____ M.

(9) LOCATION OF SURVEY WITH RESPECT TO ELECTRONIC BASELINE: CHECK ONE
(TO DETERMINE: IMAGINE AN OBSERVER STANDING AT R1 AND LOOKING DIRECTLY AT R2 --- IF THE SURVEY AREA IS TO THE OBSERVER'S LEFT THEN A IS NEGATIVE; IF THE SURVEY AREA IS TO THE OBSERVER'S RIGHT THEN A IS POSITIVE.)

. X -A (MINUS) ____ +A (PLUS)

(10) IF SHORAN CORRECTIONS ARE APPLIED BY THE EQUATION, K(X) + C = D, WHERE X IS SHORAN DISTANCE AND D IS TRUE DISTANCE, ENTER THE CONSTANT COEFFICIENTS OF THE EQUATIONS HERE:

K(R1) ____, C(R1) ____, K(R2) ____, C(R2) ____

(11) NUMBER OF VELOCITY TABLES TO BE USED:
___NONE, x ONE, ___MORE THAN ONE.

(12) ____THIS FORM IS SUBMITTED ONLY AS AN AID IN PREPARING A BOAT SHEET PROJECTION.

x THIS FORM APPLIES TO ALL DATA ON THIS SURVEY.

____THIS FORM APPLIES TO PART OF THE DATA ON THIS SURVEY -

TIME AND DATE LIMITATIONS: FROM ____ TO ____

POSITION NUMBER LIMITATIONS: FROM ____ TO ____

THIS IS FORM #3 SHEET # 2 OF 2 SHEETS FOR THIS SURVEY.

(13) OTHER REMARKS:

Hi-Fix operated in hyperbolic mode

Station Name MASTER Latitude 36°55'07.44
Longitude 75°59'52.54

Abstract of Daily Position Numbers Used

Sheet H-9099

Julian Day	Position Numbers Used
343	001-522
346	523-661
349	662-1212
351	1213-1696
352	1697-1867

Field Processing Discrepancies

The following short word format appears at the beginning of each day's data and occasionally in the text of the data:

351	0	99
Day	Ind. (ft.)	Vel. Table

The PMC conversion program which Launch 1257 uses will allow the above format only. The correct format which is hand printed on the original raw data printout is as follows:

1257	69	351	0	99*
Launch	Yr.	Day	Ind.(ft.)	Vel. Table

*Only one velocity table was submitted for this survey.

Actual Tides Day 343
USC&GS Launch 1257

HSL-10-B-69
OPR- AMC-SP-8-69
H-9099
Time Meridian 75W
Virginia Beach, Va.
Year 1969
corrections in feet.

time	indicator	correction		Julian Day		
080300	0	1046	0000	343	000000	000000
083100	0	1044				
085100	0	1042				
090700	0	1040				
092000	0	1038				
093300	0	1036				
094500	0	1034				
095600	0	1032				
100600	0	1030				
101600	0	1028				
102700	0	1026				
103700	0	1024				
104700	0	1022				
105700	0	1020				
110700	0	1018				
111700	0	1016				
112800	0	1014				
113900	0	1012				
115100	0	1010				
120400	0	1008				
122000	0	1006				
123900	0	1004				
131000	0	1002				
135100	0	0000				
143200	0	1002				
145500	0	1004				
151300	0	1006				
152800	0	1008				
154100	0	1010				
155300	0	1012				
160000	0	1014				

Actual Tides Day 346

030100 0 1032 0000 346 000000 000000
061800 0 1034
083900 0 1036
091000 0 1038
101500 0 1040
104200 0 1038
110300 0 1036
112500 0 1034
114400 0 1032
120000 0 1030
121400 0 1028
122600 0 1026
123700 0 1024
124700 0 1022
125700 0 1020
130000 0 1018

Actual Tides Day 349

072500 0 1002 0000 349 000000 000000
074800 0 1004
080400 0 1006
081600 0 1008
082700 0 1010
083800 0 1012
084900 0 1014
090000 0 1016
091500 0 1018
093000 0 1020
094600 0 1022
100300 0 1024
101900 0 1026
103700 0 1028
105700 0 1030
113500 0 1032
122200 0 1034
133400 0 1036
140400 0 1034
142700 0 1032
144800 0 1030
150600 0 1028
152200 0 1026
153700 0 1024
155100 0 1022

Actual Tides Day 351

073000 0 1008 0000 351 000000 000000

093400 0 1006

100800 0 1008

103600 0 1010

105800 0 1012

111400 0 1014

113000 0 1016

114500 0 1018

120200 0 1020

122500 0 1022

125400 0 1024

133200 0 1026

152700 0 1028

160000 0 1026

Actual Tide -24- Day 352

091500 0 1006 0000 352 000000 000000

100900 0 1004

105400 0 1006

111800 0 1008

114000 0 1010

115900 0 1012

122000 0 1014

124100 0 1016

13010
0 0 1018

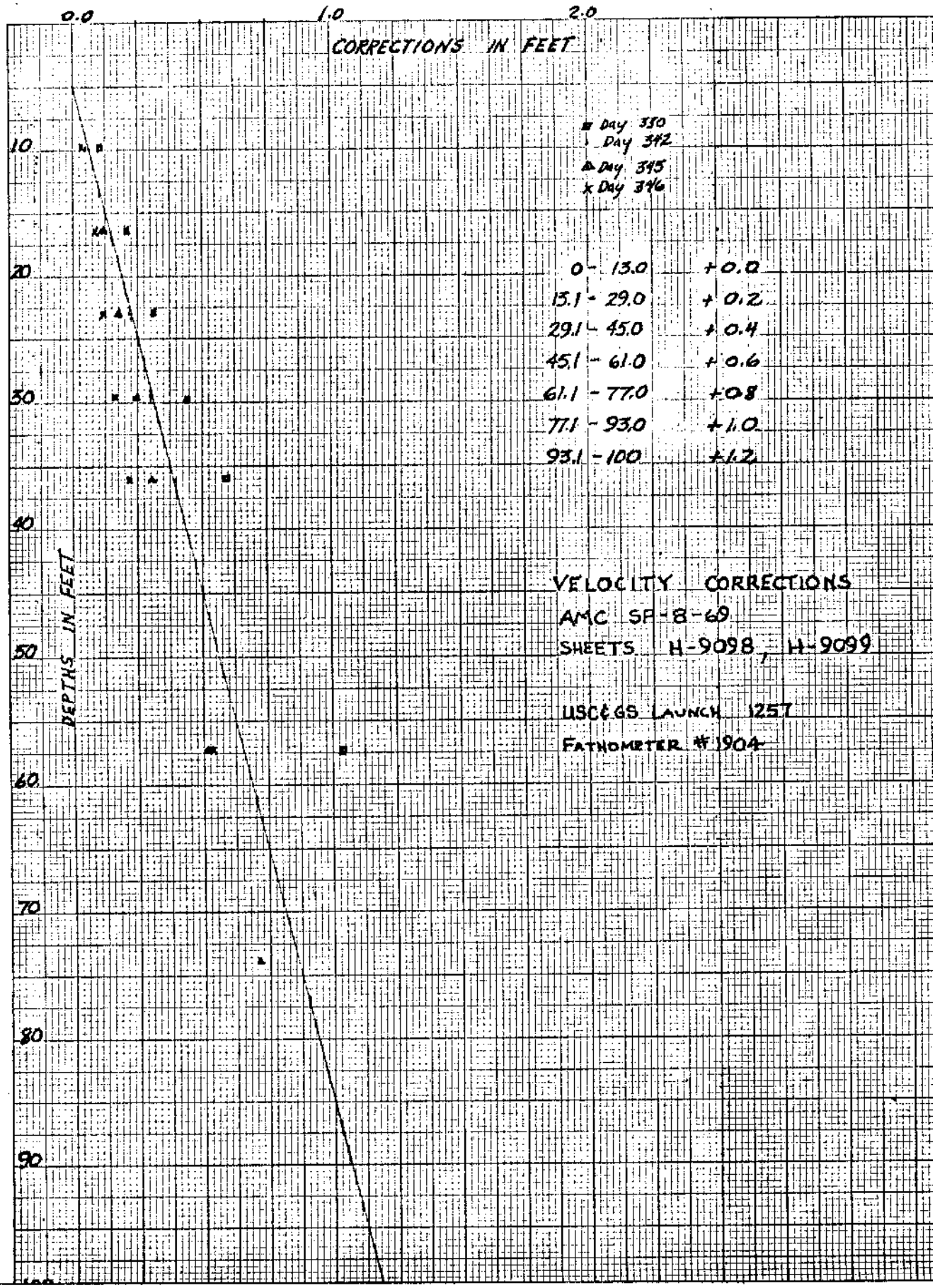
131900 0 1020

133900 0 1022

140100 0 1024

143800 0 1026

160000 0 1028



Abstract of Hydrographic Data Located on Survey
HSL-10-B-69 H-9099

Position No.	Description	Comments
1551	Lighted bell buoy "CBA" Black and White vertical stripes	Placed by U.S. Coast Guard during survey operations
1569	Lighted whistle buoy "CB" Black and White vertical stripes	Placed by U.S. Coast Guard during survey operations

APPROVAL SHEET

The Officer-In-Charge participated in all phases of this survey daily; approval of this survey is thereby attested. No other recommendations other than that stated elsewhere in this Descriptive Report are pertinent.

Ralph J. Land
LCDR, USESSA

FORM 197
(3-16-55)

GEOGRAPHIC NAMES

Survey No. H-9099

Name on Survey	On Chart No. A	On previous survey No. B	On U. S. quadrangle Maps C	From local information D	On local Maps E	P. O. Guide or Map F	Rand McNally Atlas G	U. S. Light List H	K	
Atlantic Ocean										1
										2
										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

PREPARED BY

Frank N. Jackson

CARTOGRAPHIC TECHNICIAN

APPROVED BY

A. Joseph Wright

CHIEF GEOGRAPHER

FORM 197
(3-16-55)

GEOGRAPHIC NAMES

Survey No. H-9099

Name on Survey	On Chart No. A	On previous survey No. B	On U. S. quadrangle Maps C	From local information D	On local Maps E	P. O. Guide or Map F	Rand McNally Atlas G	U. S. Light List H	K	
										1
										2
										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

FIG. 20

(HSL-10-2-69)

FORM C&GS-946A
(REV. 11-65)
(PRES. BY HYDROGRAPHIC MANUAL, 8-94)

U.S. DEPARTMENT OF COMMERCE
ESSA
COAST AND GEODETIC SURVEY

VERIFIER'S REPORT

HYDROGRAPHIC SURVEY, H-9099

INSTRUCTIONS - This form serves to identify items of a check list in verification together with items which are separately reported to the Reviewer. The form is not to be forwarded to the Reviewer. A report, which is prepared for the Reviewer, should identify items by number and letter and will be filed in the Descriptive Report until the survey is reviewed.

CL - Check List Items: should be checked as having been completed during the verification processes.

R - Report Item: This column refers to those items reported to the reviewer and is used to indicate the items discussed.

Part I - DESCRIPTIVE REPORT	CL	R
Note: The verifier should first read the Descriptive Report for general information and problems.		
1. The Descriptive Report was consulted, paragraphs checked if found satisfactory, and notations were made in soft black pencil regarding action taken. Remarks Required: -- None	✓	
2. Soundings originating with the survey and mentioned in the Descriptive Report have been verified and checked in soft black pencil, including latitude and longitude, together with position identification. Remarks Required: -- None	✓	
3. All reference to survey sheets mentioned in the Descriptive Report should include registry number and year. Remarks Required: -- None	✓	
Part II - SHORELINE AND SIGNALS		
4. Source of shoreline signals Remarks Required: -- List all surveys		
a. Give earliest and latest dates of photographs		
b. Field inspection date		
c. Field Edit date	✓	
d. Reviewed-Unreviewed None		
5. The transfer of contemporary topographic information was carefully examined and reconciled with the hydrography. Remarks Required: -- Discuss remaining differences. None	✓	
6. The plotting of all triangulation stations, topographic stations and hydrographic signals has been checked and noted in processing stamp, No. 42 on the smooth sheet. Remarks Required: -- None None	✓	
7. Objects on which signals are located and which fall outside of the high-water line have been described on the sheet. Remarks Required: -- List those signals still unidentified. None	✓	
Part III - JUNCTIONS No Overlap		
Note: Make a cursory comparison preliminary to inking soundings in area of overlap.		
8. All junctions of contemporary or overlapping sheets were transferred in colored ink and verified, and curves were made identical. Remarks Required: -- None	✓	
9. The notation in slanted lettering "JOINS H----- (19)" was added in colored ink for all verified contemporary adjoining or overlapping sheets. Those not verified are shown in pencil. Remarks Required: -- None	✓	

Part III - JUNCTIONS (Continued)	CL	R
10. Junctions with contemporary surveys were satisfactory except as follows: Remarks Required: -- Consider conditions after adjustments have been made; note adjustments made. Make special notes of Butt junctions and areas which are SUPERSEDED.	✓	
Part IV - VOLUMES None		
11. All items affecting the plotting of the survey which are entered in the remarks columns of the sounding records were noted and check marked. In all cases appropriate action was taken and exceptions noted in the volumes. Remarks Required: -- None	✓	
12. Condition of sounding records was satisfactory except as follows: Remarks Required: -- Mention deficiencies in completeness of notes or actions for the following:		
(a) rocks		
(b) line turns		
(c) position values of beginning and ending of lines		
(d) bar check or velocity correctors		
(e) time recording		
(f) notes or markings on fathograms	✓	
(g) was reduction of soundings accurately done?		
(h) was scanning accurate?		
(i) were peaks at uneven intervals missed?		
(j) were stamps completed?		
(k) references to adjacent features		
Part V - PROTRACTING		
13. All positions verified instrumentally were check marked in color in the sounding records, and verifier initialed the processing stamp. Remarks Required: -- None	✓	
14. The protracting and plotting of all unsatisfactory crossings were verified. Remarks Required: -- None	✓	
15. All detached positions locating critical soundings, rocks, buoys, breakers, obstructions, kelp, etc., were verified and the position numbers are legible. Remarks Required: -- None	✓	

(HSL 10-2-69)

H-9099

Fig. 20 (cont'd.)
Form 946 A (back of form)

Part V - PROTRACTING (Continued)	CL	R
16. The protracting was satisfactory except as follows: Remarks Required: -- Refers to protracting in general except for specific faults repeated often, or faults in control information, which required considerable replotting or adjustments.	✓	
17. The protractor has been checked within the last three months. Remarks Required: -- Date of check, type of protractor and number.	✓	
Part VI - SOUNDINGS		
18. All soundings are clear and legible, and critical soundings are a little larger than adjacent soundings. Remarks Required: -- None	✓	
19. Sounding line crossings were satisfactory except as follows: Remarks Required: -- Discuss adjustments.	✓	
20. The spacing of soundings as recorded in the records was closely followed; Remarks Required: -- None	✓	
21. The scanning, reduction, spacing, plotting of questionable soundings have been verified. Remarks Required: -- None	✓	
22. The smooth plotting of soundings was satisfactory except as follows: Remarks Required: -- Refer to legibility, errors in spacing, and errors in numbers - but not to errors in scanning.	✓	
Part VII - CURVES		
23. The depth curves have been inspected before inking. Remarks Required: -- By whom was the penciled curves inspected. W.W.F.	✓	
24. The low-water line and delineation of shoal areas have been properly shown in accordance with the following: a. From T-Sheet in dotted black lines b. From soundings in orange c. Approximate position of sketched curve is dashed orange d. Approximate position of shoal area not sounded in black dashed Remarks Required: -- None	✓	
25. Depth curves were satisfactory except as follows: (This statement should not refer to the manner in which the curves were drawn). Remarks Required: -- Indicate areas where curves could not be drawn completely because of lack of soundings. For some inshore areas a general statement is sufficient.	✓	

Part VIII - AIDS TO NAVIGATION	CL	R
26. All fixed aids located together with those on the contemporary topographic sheets, have been shown on the survey. Remarks Required: -- Conflicts of any nature listed.	✓	
27. All floating aids listed in the Descriptive Report should be verified and checked in soft black pencil, including latitude and longitude and position identification. Remarks Required: -- None	✓	
Part IX - BOAT SHEET		
28. The boat sheet was constantly compared with the smooth sheet with reference to notes, position of sounding lines and supplemental information: Remarks Required: -- None	✓	
29. Heights of rocks awash were correctly reduced and compared with topographic information. Remarks Required: -- Note Extensive conflicts with topographic information. None	✓	
Part X - GENERAL		
30. All information on the sheet is shown in accordance with figures 82 and 83 in the Hydrographic Manual (Pub. 20-2). Remarks Required: -- None	✓	
31. Unnecessary pencil notes have been removed from the sheet. Remarks Required: -- None	✓	
32. Degree, minute values and symbols have been checked; also electronic distance arcs have been properly identified and checked on the smooth sheet. Remarks Required: -- None	✓	
33. The bottom characteristics are adequately shown. Remarks Required: -- None None		
Part XI - NOTES TO THE REVIEWER		
34. Unresolved discrepancies and questionable soundings.		
35. Notation of discrepancies with photogrammetric survey inserted in report of unreviewed photogrammetric survey or on copy.		
36. Supplemental information.		

Verified by Harry L. Smith — Date 9/22/70

FORM C&GS-946A (11-68) — USCOMM-DC 36472-P68

FORM C&GS-946
(REVI 11-65)
(PRESC. BY
HYDROGRAPHIC
MANUAL 20-2,
6-94, 7-13)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY
NAUTICAL CHART DIVISION

HYDROGRAPHIC SURVEY STATISTICS

HYDROGRAPHIC SURVEY NO. 9099 (HSL-10-2-69)

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS	1
DESCRIPTIVE REPORT	1	OVERLAYS	

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES	1					
CAHIERS			4			
VOLUMES						
BOXES						

T-SHEET PRINTS (Lists)
NONE

SPECIAL REPORTS (Lists)
Corrections To Echo Soundings & Hi-Fix Calibration

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				1867
POSITIONS CHECKED		100		
POSITIONS REVISED		0		
DEPTH SOUNDINGS REVISED		32		
DEPTH SOUNDINGS ERRONEOUSLY SPACED		1		
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED				
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS				
JUNCTIONS		2		
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		10		
SPECIAL ADJUSTMENTS				
ALL OTHER WORK		82		
TOTALS		94		

PRE-VERIFICATION BY	BEGINNING DATE	ENDING DATE
VERIFICATION BY Stephen P. Stanley Harry R. Smith	BEGINNING DATE 7/3/70	ENDING DATE 9/22/70
REVIEW BY	BEGINNING DATE	ENDING DATE

(HSL-10-2-69)

H-9099

FIG. 18.

DESCRIPTIVE REPORT DATA RECORD			
PART I SMOOTH SHEET PREPARATION		PREPARED BY/OPERATOR	DATE
A. PLOTTER OPERATOR		EDAT	
B. DISTORTION MARKS PLOTTED		EDAT	
C. PROJECTION INTERSECTIONS PLOTTED		EDAT	
D. POINTS OF ELECTRONIC CONTROL ARCS PLOTTED		See "D" part II	
E. OVERLAYS PREPARED BY		EDAT	
1. POSITION NUMBER		EDAT	
2. EXCESS SOUNDINGS		EDAT	
3. PRELIMINARY SMOOTH PLOT		EDAT	
4. LIST OTHERS			
A.			
B.			
F. SOUNDING SELECTION BY		EDAT	
G. PLOTTER INPUT	PREPARED	EDAT	
H.	CHECKED	EDAT	
I. DESCRIPTIVE REPORT ADDENDUMS			
PART II SMOOTH SHEET COMPLETION			
		CARTOGRAPHER	DATE
A. DISTORTION SCALE TICKS IDENTIFIED BY NOTE		H.R.Smith	9/17/70
B. PROJECTION INTERSECTIONS VERIFIED BY		H.R. Smith	9/4/70
C. PROJECTION LINES RULED BY		H.R.Smith	9/4/70
D. ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED		Arc overlays will be furnished when the plotter at AMC is operational	
E. OVERLAYS COMPLETED BY			
1. POSITION NUMBER LEADERS ADDED		H.R.Smith	9/18/70
2. EXCESS SOUNDING OVERLAY COMPARED		H.R.Smith	7/20/70
3. PRELIMINARY SMOOTH PLOTS COMPARED		H.R.Smith	7/20/70
4. OTHERS UTILIZED			
A.			
B.			
F. DESCRIPTIVE REPORT ADDENDUM			
G. CONTROL STATIONS VERIFIED		See "D" Above	
H. POSITIONS MANUALLY PLOTTED		None	
I. MANUAL PLOT VERIFIED		None	
J. SHORELINE APPLIED		None	
K. BOTTOM CHARACTERISTICS ADDED		None	
L. NOTES AND DEPTH CURVES ADDED		HRS	9/21/70

H-9099 (HSL-10-2-69)

A. Additions and corrections have been furnished the plotter center by the verification unit. Except those marked for correction by Review

Signed [signature]

Date Oct. 21, 1970 Title Chief, Verification Br., AMC

B. Additions and corrections have been added to the survey records and the final smooth sheet forwarded to the Review unit.

Signed [signature]

Date Oct 21, 1970 Title Chief, Verification Br., AMC

C. The smooth sheet has been inspected, is complete, and meets the requirements of the General Instructions for automated surveys and the Hydrographic Manual. (Note: All exceptions are listed in the verifier's report).

Signed [signature]

Date Oct. 21, 1970 Title Chief, Verification Br., AMC

D. Smooth sheet and records forwarded to Rockville, Maryland Office.

Date Oct. 22, 1970

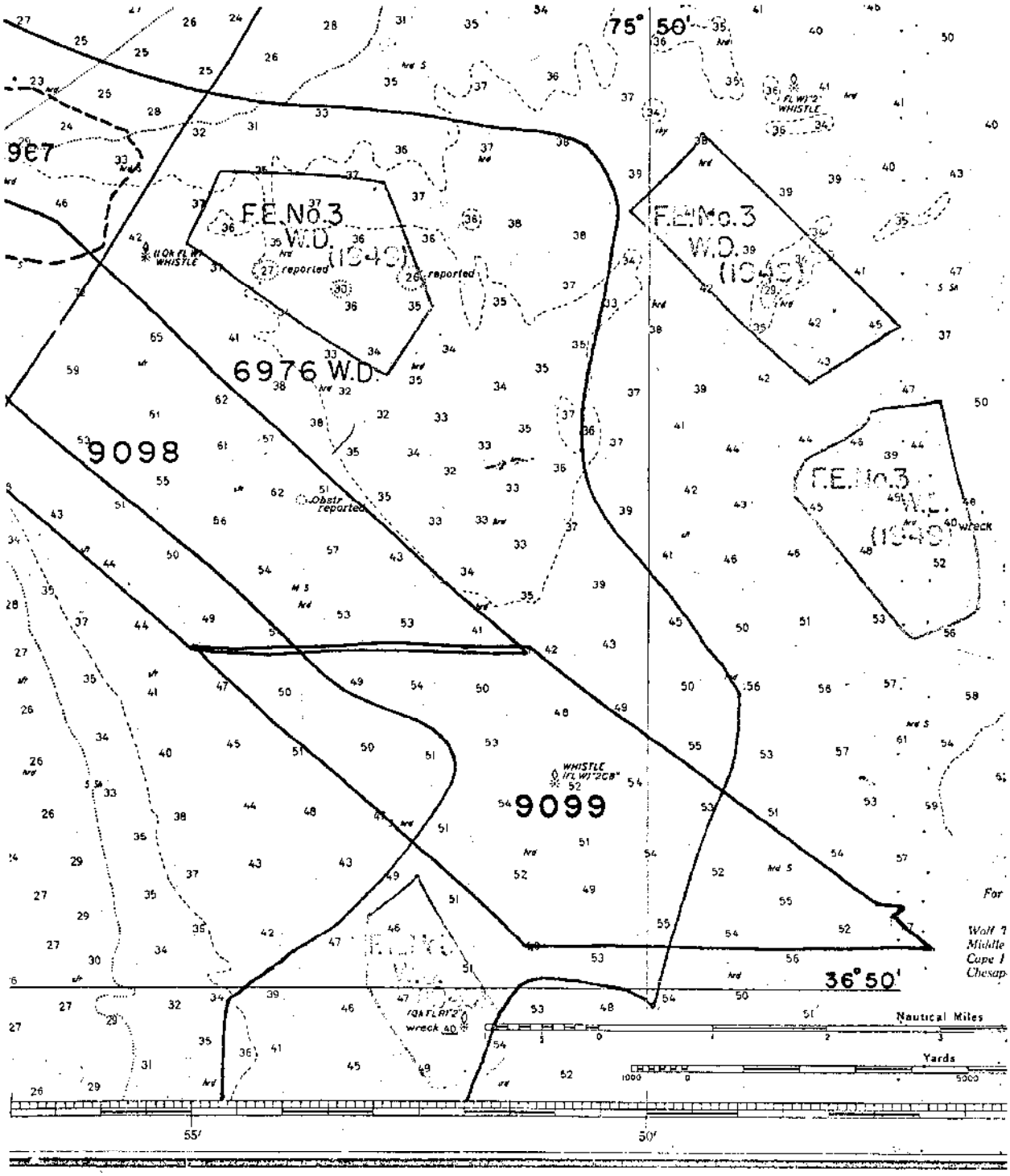
AMC VERIFICATION REPORT
SURVEY H-9099

GENERAL

This appears to be an unusually good basic survey. No problems were experienced during the verification process.

Hugh L. Proffitt
Chief, Verification Br., AMC

Norfolk, Va.
Oct. 21, 1970



6 (12th Edition)

SURVEY

Chart - 1222

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9099

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
1222	2-11-71	B. Fennundews	~~Full~~ Part Before ~~After~~ Verification Review Inspection Signed Via
			Drawing No. Exam No Critical Corr.
~~1109~~	~~2-11-71~~	~~B. Fennundews~~	
1109	2-11-71	B. Fennundews	~~Full~~ Part Before ~~After~~ Verification Review Inspection Signed Via
			Drawing No. Exam No Critical Corr.
562	5-26-71	Lysle Eberhart	~~Full~~ Part Before ~~After~~ Verification Review Inspection Signed Via
			Drawing No. Exam. - no critical corrections
78'''	6-28-71	B. Fennundews	~~Full~~ Part ~~Before~~ After Verification ~~Review Inspection~~ Signed Via
			Drawing No. No Corr. thru cht. 1222
129 sc	11/29/71	B. Fennundews	~~Full~~ Part ~~Before~~ After Verification ~~Review Inspection~~ Signed Via
			Drawing No.
1227	2-2-72	D. Svendsen	~~Full~~ Part ~~Before~~ After Verification ~~Review Inspection~~ Signed Via
			Drawing No. 18 Exam. No critical corrections
1000	7-11-74	J. Bailey	Full ~~Part Before~~ After Verification ~~Review~~ Before Inspection Signed Via
			Drawing No. 51 Consider fully app'd. No hydro detail shown in area on this chart.
12221	12/2/89	F Kull	Full Part Before After Verification ~~Review Inspection~~ Signed Via
			Drawing No. 85
12205 B	2-20-90	E. SPENCER	Full Part Before After Verification Review Inspection Signed Via
			Drawing No 21 - CAT # 1 CONSIDER ADEQUATELY APPLIED - NO FURTHER CORR.
12222	1-24-91	L. ARKenau	Full Part Before After Verification Review Inspection Signed Via
			Drawing No. 33 - CAT #1 CONSIDERED ADEQUATELY APPLIED - NO FURTHER CORRECTION.
12207	10-11-91	KR Forster	Dwg 26 - Cat #1 Considered Adequately Applied
	2-25-92	LARKenau	~~Considered Fully Applied~~ No further Question. JK
			Reexamined no further Correction RPK
12200	2-2-93	L Ahlen	DWG # 54, Re-examined, no further application necessary
12220	3-5-93	J. Barber	Dwg #55 - Cat 1 Consider Adequately App'd - no further corrections - superseded by H-9922 & H-10337 thru cht 12207

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

USCOMM-DC 8558-P63