

9032

Only

Diag. Cht. No. 902.

FORM C&GS-504

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

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. WH-5-2-69 Office No. H-9032

LOCALITY

State ~~Commonwealth of~~ Puerto Rico

General locality South Coast ~~of~~ Puerto Rico

Locality Bahia De Guayanilla

19 69

CHIEF OF PARTY

CDR Wayne L. Mobley, USESSA

LIBRARY & ARCHIVES

DATE 4-23-73

USCOMM-DC 37022-P66

902
930
905

9032

H-9032

HYDROGRAPHIC TITLE SHEET

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.

Wh 5-2-69

State PUERTO RICO

General locality SOUTH COAST

Locality BAHIA DE GUAYANILLA

Scale 1:5,000

Date of survey 5/4/69 to 5/24/69

Instructions dated Jan. 23, 1969

Project No. OPR-423

Vessel SHIP WHITING

Chief of party CDR. WAYNE L MOBLEY

Surveyed by G.C. CHAPPELL, LT. J.L. WALLACE, C.W. TIGNOR, L.T. GILLMAN
G.J. CINPINSKI

Soundings taken by echo sounder, hand lead, pole ECHO SOUNDER & POLE

Graphic record scaled by SHIP PERSONNEL

Graphic record checked by SHIP PERSONNEL & VERIFICATION BR., AMC

Protracted by GERBER DIGITAL PLOTTER Automated plot by PACIFIC MARINE CENTER

Soundings penciled by GERBER DIGITAL PLOTTER

Soundings in ~~XXXX~~ feet at MLW ~~XXXX~~

REMARKS: *useful*
Add supplementary soundings from
Plimetric overlay to 5151 and redraw
some curves. Conflicts should generally
be decided in favor of regular hydro. sdgs
except least depths on shoals. RHC
Applied to plots 5/1/73
CSB

DESCRIPTIVE REPORT

To Accompany

HYDROGRAPHIC SURVEY

H-9032

WH-5-2-69

Scale 1:5000

May 4 to May 24, 1969

South Coast of Puerto Rico

OPR-423

USC&GSS WHITING

CDR Wayne L. Mobley, USESSA, Commanding

- - - - -

A. PROJECT:

Authority for this project is granted by the Revised Instructions, OPR-423, Puerto Rico, dated January 23, 1969.

B. AREA SURVEYED:

The survey was conducted between May 4 and May 24, 1969, in Bahia de Guayanilla on the south coast of Puerto Rico. The limits of the survey are latitudes $17^{\circ}57' 00''\text{N}$ and $17^{\circ}59' 00''\text{N}$, longitudes $66^{\circ}45' 15''\text{W}$ and $66^{\circ}48' 00''\text{W}$.

To facilitate plotting on the Whiting's computer-plotter system, WH-5-2-69 was divided into two sections, 5A and 5B. Sheet 5A extends from longitude $66^{\circ}45' 45''\text{W}$ to $66^{\circ}48' 00''\text{W}$; 5B from $66^{\circ}45' 15''\text{W}$ to $66^{\circ}47' 30''\text{W}$. Both sheets have the same latitude limits: $17^{\circ}57' 00''\text{N}$ and $17^{\circ}59' 00''\text{N}$.

Junctions were made with the following contemporary surveys:

WH-5-1-69 H-9031
WH-20-1-69 H-9032
WH-20-2-69 H-9034
MI-5-1-70 H-9110
MI-10-2-70 H-9185

C. SOUNDING VESSELS:

The sounding vessels and position numbers for which each was used are as follows:

<u>Vessel</u>	<u>Position Numbers</u>
Ship WHITING	6000-6384
Launch WH-2	2000-3611
Launch WH-2	8010-8036 (Bottom Samples)
Zeebird	1-467
Zeebird	8000-8009 (Bottom Samples)

The soundings were all plotted in black ink by the Whiting's computer-plotter system.

D. SOUNDING EQUIPMENT

1. Ship Whiting

Ship soundings were taken in fathoms by the Ross Digital Fathometer at 10 second intervals with, basically, every sounding a fix. Concurrent soundings were taken by a Precision Depth Recorder (PDR), and the PDR soundings were used in depths greater than 200 fathoms. Also on positions 6041, 6042, 6043, 6044, 6343, 6344, & 6345

The ship's position plot was created on-line by the computer-plotter system; soundings were inked in by hand later. The depths were determined from the ROSS and PDR fathograms and a paper tape was generated. The Whiting's Master Edit computer program was used to convert fathoms to feet and create a new tape, consistent with the rest of the survey.

The initial value of the Ross trace, which should have been set at zero, was at 0.1 fathoms, and an initial corrector needs to be applied accordingly. Also, a draft correction of 11.45 Ft. needs to be applied.

2. Launch WH-2

Launch soundings were taken by a Raytheon DE-723D fathometer, number 37018. Soundings between positions 3259-3319 and 3437-3485 were taken in fathoms and later converted to feet; the initial trace was set at zero. The rest of the soundings were taken in feet with the initial trace set at 1.0.

Soundings were taken at 10 second intervals with a fix, basically, every 60 seconds. Bar checks were taken once or twice a day and compared with the soundings to determine velocity corrections.

3. Zeebird (16 foot Rubber Boat)

Zeebird soundings were taken with a 12 foot sounding pole. While running lines, soundings were taken at 30 second intervals with fixes at 60 second intervals. In a few areas where the water was too shallow to operate the zeebird, the shoal areas were walked with soundings and fixes taken at points which would outline the shallow areas.

Part of Day 124 used a DE-723 Fathometer

4. General

All soundings and positions were logged by hand on a paper tape which was used to make off-line position plots and sounding plots on the Whiting's computer-plotter system. Reference should be made to the report "Corrections to Echo Soundings" for further explanation of the depth corrections applied.

E. SMOOTH SHEET

The smooth sheet is to be plotted by PMC's computer-plotter system from the tapes created, corrected, and converted to Friden code by the Whiting's system.

F. CONTROL

1. Ship Whiting

Ship hydrography was controlled electronically by Hi-Fix on range-range mode. Slave station #1 was located on Punta Guayanilla and Slave #2 was located east of Ponce.

1799.6 khz

<u>Slave Station</u>	<u>Latitude</u>	<u>Longitude</u>
#1 CORCO	17°58'42.04"N	66°45' 22.96"W
#2 DON Q	17°58' 04.70"N	66°34' 21.89"W

The Hi-Fix was calibrated daily and whenever any error was suspected by comparing visual and electronic positions. Visual positions were determined by a three-point sextant fix with a check angle; simultaneously the Hi-Fix readings were recorded. The positions of the signals and the sextant angles were input to computer program which calculated actual Hi-Fix lane counts. The actual and observed readings were compared, differences recorded, and a calibration correction applied.

2. Launch WH-2 and Zeebird

Signals falling in water are described as temporary by oral direction of C.O. others not described. HLR

Launch and Zeebird hydrography was controlled visually with three-point sextant fixes. Index error was determined at the beginning of each day and adjusted to zero.

Photo-hydro stations were located by traverses. See attached list of G.P.s

G. SHORELINE

T-13138 & T-13137

The major portion of shoreline on WH-5-2-69 is along the south edge of Punta Verraco. This shoreline was delineated by running a line along it with the zeebird as close as feasible. In general, the shoreline was in close agreement with Chart 928 and with the T-sheets. However, in the area immediately surrounding signal #517 the shoreline extends further out than indicated on previous charts. This area is not as overgrown as surrounding areas and appears to have built up recently.

Final shoreline manuscript has this shoreline change

The remainder of the shoreline on this sheet consists of small islands which were delineated by running lines as close to the land as feasible. Shoal areas were further delineated by walking around them and taking pole soundings.

H. CROSSLINES

Crosslines on the sheet amounted to 11.0 miles or 7% of the total hydrography mileage. Agreement was good, never differing by more than one foot. Agreement was also good between the lines run by the ship and those run by the launch.

The PDR fathometer was used for these soundings. Crossings are in good agreement.

The area where ship position #6043 intersects positions #6344-6345 is of special interest. This is an area where the bottom falls off very rapidly. (The regular series of ship hydrography lines was run perpendicular to the steep slope; the crossline was run parallel to it.) The Ross transducer generates a pulse which spreads more abeam than in a fore and aft direction. For this reason, lines run perpendicular to steep slopes tend to pick up the correct depth beneath the keel, while lines run parallel to the contours tend to pick up strong side echoes.

orientation of ship lines is the reverse

Analysis of the Ross fathogram shows that the crossline was over this steeply sloping bottom between positions #6339-6371. Prominent side echoes were detected in this area, but interpreting the darkest trace as the true bottom, satisfactory junctions were observed.

I. JUNCTIONS

H-9031
H-9033 Junctions with WH-5-2-69 were good in all cases. Junctions with WH-20-1-69 and WH-20-2-69 should be checked after PMC has plotted these sheets. The Whiting does not presently have off-line range-range plotting capabilities; thus, corrected plots of ship hydrography have not been made.

Also joins H-9110 (MI-5-1-70) &

H-9183 (MI-10-3-70)

J. COMPARISON WITH PRIOR SURVEYS:

1. Item #9 on the pre-survey review questioning the location of a reef was checked out with the following results: A shallowest sounding of 2.8⁰ feet was obtained at latitude 17°58' 57"N, longitude 66°46' 27"W.

The charted position appears to be in error.

2. There were areas of Arrecife Guayanilla and Arrecife Unidas which could not be approached from either side at any tide level due to the surf breaking over these reefs. In these areas prior surveys and photogrammetry should be used to delineate the contours.

K. COMPARISON WITH CHART:

A comparison was made with Chart 928 and, with the exceptions already noted, agreement was good. * 25681

L. ADEQUACY OF SURVEY:

The survey is complete and adequate and should be considered as part of an original survey due to the time elapsed since the previous survey and the improved methods used.

M. AIDS TO NAVIGATION:

Guayanilla Channel buoys were checked and located as follows:

<u>Buoy</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
#2 pos. 3333	17°58' 06.0" <i>charted as Lt.</i>	66°45' 44.7"
#3 pos 3436	17°58' 11.9" " " "	66°45' 57.6"
#4 pos 3409	17°58' 48.8" <i>charted as NWW</i>	66°45' 53.0"
#5 pos 3423	17°58' 58.2" <i>charted as - t.</i>	66°46' 18.5"

This compares with the following charted locations:

#2	17°58' 06.0"	66°45' 44.7"
#3	17°58' 46.5"	66°45' 54.0"
#4	17°58' 46.5"	66°45' 51.2"
#5	17°58' 58.2"	66°44' 19.0"

Buoys #2 and #5 are accurately located on Chart 928; Buoys #3 and #4 appear to be slightly mislocated.

Developments were run around each buoy with lines approximately perpendicular to the contours, so that the slopes can be better delineated.

N. STATISTICS:

<u>Vessel</u>	<u>No. of Positions</u>	<u>Nautical Miles</u>	<u>No. of Bottom Samples</u>
Ship WHITING	385	10.75	0
Launch WH-2	1612	135.40	27
<u>Zeebird</u>	<u>467</u>	<u>11.50</u>	<u>10</u>
Total	2464	157.65	37

Total area surveyed: 4.8 sq. mi.

O. REFERENCES TO REPORTS:

1. Corrections to Echo Soundings
2. Hi-Fix Report
3. Computer-Plotter Report

Submitted by:

Lynn T. Gillman

Lynn T. Gillman
ENS, USESSA

NOTE

HI-FIX FREQUENCY

USC&GSS WHITING

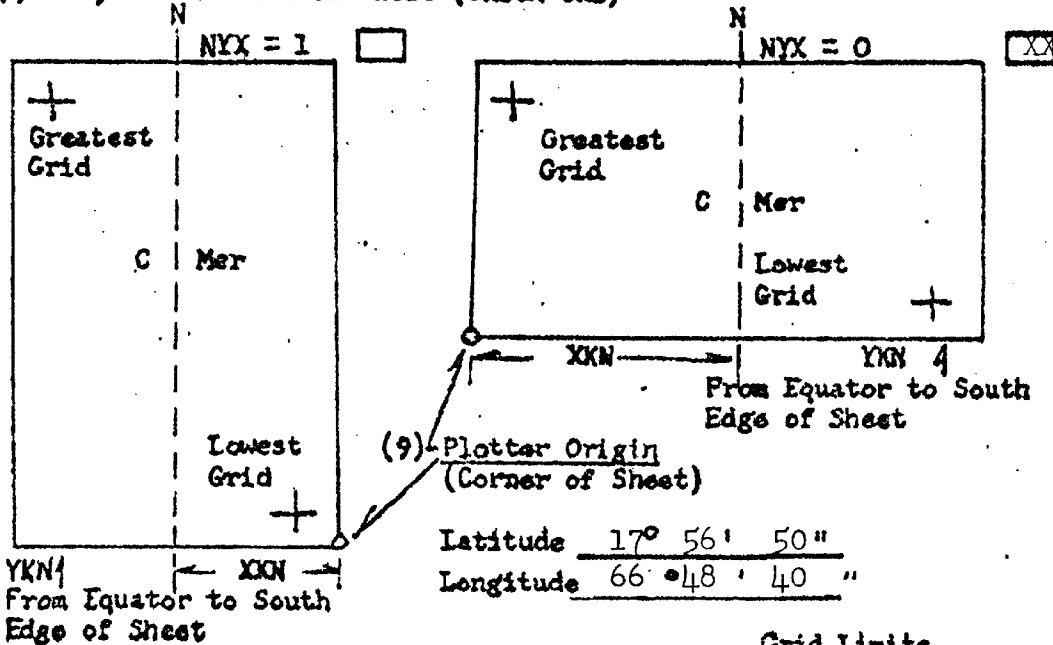
During 1968 and 1969 Hi-Fix frequency was maintained
at 1799.6.

Wayne L Mobley

W. L. Mobley
CDR, USESSA
Commanding

FORM # 2
**PARAMETERS FOR DIGITAL COMPUTING
 POLYCONIC PROJECTION**

- (1) Project No. OPR 423 (4) Requested by _____
 (2) H No. 9032 (5) Ship or Office _____
 (3) Field No. WH 5-2-69 (6) Data Required _____
 (7) Visual Ft.(0) or Fathoms (1) (8) Electronic (fill out form #3)
 (10) XKN (SP 5) Distance from CMER to East Edge (NYX = 1) or West Edge (NYX = 0). (Origin) 2942.7 Meters
 (11) YKN (SP 241) Distance from Equator to South Edge of Sheet. (Origin) 1,985,020.7 Meters
 (12) Central Meridian 66° 47' 00"
 (13) Survey Scale 1:5000
 (14) Size of Sheet (Check one) 36x60 42x60
 (15) NYX, Orientation of sheet (Check one)



Grid Limits	
(16) Greatest Latitude	<u>17° 59' 15"</u> (Projection Line Interval Page 4 Hydro Manual)
(17) Lowest Latitude	<u>17° 57' 00"</u>
(18) Difference	<u>2' 15"</u>
(21) Greatest Longitude	<u>66° 48' 45"</u>
(22) Lowest Longitude	<u>66° 44' 15"</u>
(23) Difference	<u>4' 30"</u>
(19)	<u>9</u> YSN
(24)	<u>15</u> "
(25)	<u>18</u> XSN

Bahia de Guayanilla
Puerto Rico

	Lat	Lon
500	17 59 3089	066 47 5755
501 ✓	17 59 1197	066 47 4711
502 ✓	17 58 5832	066 48 0472
503 ✓	17 59 0984	066 48 1490
504 ✓	17 58 3761	066 48 2187
505 ✓	17 58 4275	066 48 0843
506 ✓	17 58 4370	066 47 4737
507 ✓	17 58 5461	066 47 2686
508 ✓	17 59 1381	066 47 1288
* 509	17 59 3161	066 47 0315
510 ✓	17 58 5169	066 46 3193
511 ✓	17 59 1360	066 45 4847
512 ✓	17 58 4421	066 45 3460
513 ✓	17 58 0706	066 45 1746
514 ✓	17 58 2981	066 46 4092.
515 ✓	17 58 1081	066 47 0079
516 ✓	17 57 4390	066 47 3065
517 ✓	17 58 2911	066 47 1644
518 ✓	17 58 0670	066 48 1873
* 519	18 00 4092	066 47 3892
* 520	17 59 5783	066 47 0254
* 521	18 00 0687	066 44 2190
* 522	18 00 1449	066 44 3317
* 523	17 59 4344	066 44 2930
* 524	18 00 0463	066 45 5264
* 525	17 59 5544	066 45 5709
* 526	17 59 4392	066 45 5863

For H-9031
& H-9032

* stations so marked were used on this survey but fall beyond limits of the smooth sheet.
KLP

Guayanilla Union Carbide Co. Water Tank
1966
Bahia de Tallaboa Range Rear Light,
1966
Bahia de Tallaboa Range Front Light,
1966

527 ✓	17 59 1343	066 47 0583	
530 ✓	17 58 0721	066 44 5531	
* 531 ✓	17 58 1522	066 44 0166	
532 ✓	17 58 2714	066 44 3953	
* 533	17 59 0839	066 44 0766	
534	17 58 5746	066 44 3161	Bahia de Tallaboa Loading Platform,
* 535	17 59 2937	066 44 5545	1966
536 ✓	17 58 3807	066 45 0641	
537	18 00 2491	066 44 4177	Procon International Commonwealth West
538	18 00 2742	066 44 3517	1966 Tank Procon International Commonwealth East
539 ✓	17 58 4204	066 45 2296	1966 Tank
* 540	18 00 1116	066 45 4203	

TC/TI TAPE

WH-5-2-69

Launch #2

000000 0 0005 0001 000 000000 000000 (feet)
000000 0 0005 0001 999 000000 000000

Ship WHITING

000000 0 0020 0002 000 000000 000000 (fathoms)
000000 0 0020 0002 999 000000 000000

Zeebird

000000 0 0000 0003 000 000000 000000 (feet)
000000 0 0000 0003 999 000000 000000

CORRECTIONS TO ECHO SOUNDINGS
LAUNCH # 2
WH-5-2-69
(feet)

000007 0 0011 0001 000 000000 000000
000025 0 0012
000044 0 0013
000062 0 0014
000078 0 0015
000095 0 0016
000113 0 0017
000131 0 0018
000148 0 0019
000167 0 0020
000183 0 0021
000200 0 0022
000217 0 0023
000236 0 0024
000254 0 0025
000270 0 0026
000288 0 0027
000306 0 0028
000324 0 0029
000340 0 0030
000357 0 0031
000375 0 0032
000393 0 0033
000410 0 0034
000427 0 0035
000445 0 0036
000463 0 0037
000480 0 0038
000497 0 0039
000515 0 0040
000533 0 0041
000552 0 0042
000568 0 0043
000587 0 0044
000605 0 0045
000623 0 0046
000642 0 0047
000658 0 0048
000677 0 0049
000729 0 0050

000818 0 0055
000907 0 0060
000992 0 0065
001083 0 0070
001170 0 0075
001257 0 0080
001350 0 0085
001435 0 0090
001522 0 0095
001609 0 0100
001698 0 0105
001785 0 0110
001872 0 0115
001960 0 0120
002050 0 0125
002230 0 0130
002400 0 0140
002570 0 0150
002770 0 0160
002950 0 0170
003120 0 0180
003270 0 0190
003450 0 0200
003640 0 0210
003820 0 0220
003980 0 0230
004170 0 0240
004330 0 0250
004500 0 0260

CORRECTIONS TO ECHO SOUNDINGS

USC&GSS WHITING

10

WH-5-2-69

(fathoms)

000012 0 0000 0002 000 000000 000000
000028 0 0001
000045 0 0002
000063 0 0003
000082 0 0004
000098 0 0005
000116 0 0006
000134 0 0007
000152 0 0008
000168 0 0009
000204 0 0010
000240 0 0012
000274 0 0014
000310 0 0016
000345 0 0018
000380 0 0020
000414 0 0022
000449 0 0024
000484 0 0026
000520 0 0028
000556 0 0030
000592 0 0032
000626 0 0034
000660 0 0036
000695 0 0038
000729 0 0040
000763 0 0042
000798 0 0044
000832 0 0046
000866 0 0048
000900 0 0050
000933 0 0052

000968 0 0054
001000 0 0056
001170 0 0060
001340 0 0070
001530 0 0080
001750 0 0090
002010 0 0100
002300 0 0110
002920 0 0120
003720 0 0140
004720 0 0160
005750 0 0180
006820 0 0200
007760 0 0220
008630 0 0240
009420 0 0260
010140 0 0280
010920 0 0300
011650 0 0320
012320 0 0340
012960 0 0360
013580 0 0380
014180 0 0400
014740 0 0420
015270 0 0440
015780 0 0460
016280 0 0480
016820 0 0500
017280 0 0520
017750 0 0540
018200 0 0560
018630 0 0580
019120 0 0600
019670 0 0620
020220 0 0640
020740 0 0660
021280 0 0680
021840 0 0700
022370 0 0720
022900 0 0740
023440 0 0760
023980 0 0780
024500 0 0800
025040 0 0820
025570 0 0840
026120 0 0860
026640 0 0880
027180 0 0900
027740 0 0920
028260 0 0940
028810 0 0960
029350 0 0980

CORRECTIONS TO ECHO SOUNDINGS

ZEEBIRD (16' RUBBER BOAT)

WH-5-2-69
(feet)

000060	0	0000	0003	000	000000	000000
000093	0	0002				
000125	0	0004				
000157	0	0006				
000190	0	0008				
000223	0	0010				
000256	0	0012				
000290	0	0014				
000320	0	0016				
000355	0	0018				
000388	0	0020				

TIDE NOTE FOR HYDROGRAPHIC SHEET

12/7/72

~~Nautical Chart Division:~~ *PMC*

Plane of reference approved for ~~volumes of sounding records for~~ *tide tape printout*

HYDROGRAPHIC SHEET *H 9031 and 9032*

Locality: *South Coast, Puerto Rico*

~~Chief of Party:~~ *Period*

Plane of reference is *mean low water*

Tide Station Used (Form C&GS-681): *Bahia de Guayanilla, P.R.*

Height of Mean High Water above Plane of Reference is as follows: *0.5 feet*

Remarks

C. L. Hinkley

Chief, Tides and Currents Branch

TIDAL DATUM PLATES SECTION

U.S. COM. FORM 10417-P-67

TIDE TAPE PRINTOUT

USC&GS SHIP WHITING

FIELD NO. WH-5-2-69

REG. NO.

H-9032

TIME MERIDIAN 60TH.

TIDE STATION BAHIA DE
GUAYANILLA

TIDE DATA FOR 1969

CORR. IN FT.

090000 0 1006 0000 118 060000 000000
110000 0 1004
150000 0 1002
180000 0 1004

X

170000 0 1004 0000 119 060000 000000
180000 0 1006

090000 0 1004 0000 120 060000 000000
140000 0 1002
160000 0 1004
180000 0 1006

070000 0 1004 0000 121 060000 000000
160000 0 1002
170000 0 1004
180000 0 1006

070000 0 1004 0000 123 060000 000000
080000 0 1002
090000 0 0000
100000 0 0002
140000 0 0004
150000 0 0002
162000 0 0000
180000 0 1002

P

080000 0 1004 0000 124 060000 000000
090000 0 1002
103000 0 0000
113000 0 0002
150000 0 0004
170000 0 0002
180000 0 0000

FORM 990-1001 FINISHED BY THE STRAIGHT-PLATE REGISTER COMPANY, N. Y.

090000 0 1004 0000 125 060000 000000
100000 0 1002
110000 0 0000
180000 0 0002

090000 0 1004 0000 126 060000 000000
100000 0 1002
120000 0 0000
180000 0 0002

070000 0 1004 0000 127 060000 000000
110000 0 1002
130000 0 0000
180000 0 0002

070000 0 1004 0000 128 060000 000000
080000 0 1002
120000 0 0000
133000 0 1002
180000 0 0000

083000 0 1004 0000 129 060000 000000
120000 0 1002
150000 0 1004
180000 0 1002

080000 0 1004 0000 130 060000 000000
180000 0 1002

082000 0 1004 0000 131 060000 000000
152000 0 1002
180000 0 1004

160000 0 1002 0000 132 060000 000000
180000 0 1004

160000 0 1002 0000 133 060000 000000
180000 0 1004

Q

130000 0 0000 0000 134 060000 000000
150000 0 1002
180000 0 1004

090000 0 0000 0000 135 060000 000000
120000 0 0002
150000 0 0000
170000 0 1002
180000 0 1004

080000 0 1002 0000 139 060000 000000
110000 0 0000
160000 0 0002
180000 0 0000

P

070000 0 1002 0000 140 060000 000000
100000 0 0000
120000 0 0002
150000 0 0004
180000 0 0002

070000 0 1006 0000 142 060000 000000
110000 0 1004
180000 0 1002

070000 0 1004 0000 144 060000 000000
100000 0 1002
053000 0 0000

HI-FIX CORRECTORS

<u>Day</u>	<u>Time</u>	<u>Pattern_1</u>	<u>Pattern_2</u>
139	151925	+0.17	+0.51

SPECIAL REPORT

Bahia de Tallaboa

South Coast of Puerto Rico

May 14, 1969

USC&GS Ship WHITING

CDR Wayne L. Mobley, USESSA Commanding

*Data falls within
1 mi of H-9110
and was received
on spot survey*

A. PROJECT

Authority for this project is granted by the Revised Instructions, OPR-423, Puerto Rico, dated January 23, 1969, and an Amendment to the Revised Instructions dated May 6, 1969.

The study consisted of two parts: (1) to prove or disprove the 39 foot sounding indicated on Chart 928 at latitude $17^{\circ}58'34''N$, longitude $66^{\circ}44'06''W$; (2) to determine the exact location of Tallaboa Channel Buoy #5 which is shown on Chart 928 at latitude $17^{\circ}58'18.8''N$, longitude $66^{\circ}44'19.0''W$.

Both parts of the study were carried out on May 14, 1969, using Launch WH-2. Soundings were taken by a Raytheon DE-723D FATHOMETER, number 37018. Control was visual.

B. METHODOLOGY AND FINDINGS

1. 39 foot Sounding

To investigate the presence of a 39 foot sounding in the location indicated, a development was run consisting of eight North-South lines and eight East-West lines with 40 meter spacing. This development covered the area between latitudes $17^{\circ}58'28''N$ and $17^{\circ}58'39''N$ and between longitudes $66^{\circ}44'03''W$ and $66^{\circ}44'11''W$, and included the location of the suspected shallow sounding.

No 39 foot sounding was found in the area indicated. Soundings in the immediate area were 45-46 feet. The nearest 39 foot sounding was at latitude $17^{\circ}58'37''N$, longitude $66^{\circ}44'07''W$, but this is in the area where the bottom begins to shoal up near Channel Buoy #6, and should not be confused with the 39 foot sounding indicated on the chart.

2. Channel Buoy #5

Two visual sextant angles and a check angle were used to determine the location of Buoy #5. Two such sets of observations were made for a total of four sets of angles.

Comparison between the four sets of angles was good, positioning

the buoy at latitude $17^{\circ}58'24.74''N$, longitude $66^{\circ}44'23.10''W$. This is a considerable discrepancy from the charted position and the Coast Guard was notified accordingly through COMGANTS, Coast Guard Base, San Juan, Puerto Rico, in a letter dated May 28, 1969.

C. RECOMMENDATION

The 39 foot sounding could not be located. The private contractors survey as well as this survey along with the smoothness of the bottom indicate there is no 39 foot shoal in that area.

Since this passage may be used by deep draft tankers and barges a wire drag is recommended to disprove that depth.

Wayne L. Mobley
Wayne L. Mobley
CDR USESSA

APPROVAL SHEET

WH 5-2-69

H 9032

In an attempt to continue the development of automated Hydrography, several unconventional methods were used in this survey. These include:

1. Boat sheets were made from photo manuscripts. Signals were computed and transferred to the manuscript. The manuscript was used in the launch for plotting. Sounding overlays were made on the manuscript for verification purposes.
2. The Computer-plotter was used to plot position overlays for correction of bad fix data. (Note: This is the weak link in automated Visual Hydro as the inexperienced angleman and hydrographer produce sufficient errors which delay the correction of data and thus the sounding plot.)
3. Digital Depth Sounder was used thus requiring a new look at corrections to echo soundings. (See 1969 Fathometer Reports for Puerto Rico, Long Island Sound, and T.D.C. Report.)
4. The Ship Whiting was used to develop the void between launch work and the offshore 1:20,000 sheets. The area includes the deep canyon entrance to the harbor. The ship was controlled by Hifix in Range-Range mode. Each sounding was plotted as a fix.

More time could have been allocated to the development of shoals and reefs. Delays were encountered due to weather, shallowness of bottom, and inexperienced crew. More time could have been used on this project. A project to delineate the shoal water contour is underway by Photogrammetry and will be of value to supplement our work.

This survey should supersede prior surveys. It is complete and adequate for charting.

Wayne L Mobley
CDR USGSSA

OCEANOGRAPHIC LOG SHEET - M
BOTTOM SEDIMENT DATA

SHEET WH 5-2-69

SERIAL NO.	DATE	SAMPLE POSITION		DEPTH Feet (Fathoms)	WEIGHT OF SAMPLE	AP- PROX. TRAN- SECTION	LENGTH OF CORE	COLOR OF SEDI- MENT	FIELD DESCRIPTION	REMARKS (Unusual conditions, cohesionless, detrital cutters, etc.; nature of bottom relief low, slope, plain, disposition, etc.)	OBS. INIT.
		LATITUDE	LONGITUDE								
8017	22 May 69	17-58	66-47	3.2	-	-	-	-	olive drab Mud & sand		
8018	"	17-58	66-47	8.7	-	-	-	-	"		
8019	24 May 69	17-58	66-47	9.8	-	-	-	-	Coral sand & grass		
8020	"	17-58	66-47	2.9	-	-	-	-	Sea Grass		
8021	"	17-57	66-47	8.1	-	-	-	-	Coral Sand		
8022	"	17-57	66-47	5.3	-	-	-	-	Coral sand & grass		
8023	"	17-57	66-47	22.9	-	-	-	-	Coral sand & Mud		
8024	"	17-56	66-47	11.0	-	-	-	-	Coral sand		
8025	"	17-58	66-47	11.0	-	-	-	-	Coral sand & vegetation		
8026	"	17-57	66-47	16.2	-	-	-	-	Coral sand		
8027	"	17-58	66-47	8.1	-	-	-	-	Coral sand, vegetation & shells		
8028	"	17-58	66-46	50.1	-	-	-	-	Coral		
8029	"	17-58	66-46	54.3	-	-	-	-	Coral & Mud		
8030	"	17-58	66-45	MISS	-	-	-	-	NO SAMPLE		
8031	"	17-58	66-45	44.4	-	-	-	-	Coral & Olive Mud		
8032	"	17-56	66-45	15.9	-	-	-	-	Coral		
8033	"	17-58	66-45	22.7	-	-	-	-	"		

Use more than one line per sample if necessary.

GEOGRAPHIC NAMES

Survey No. H-9032

Name on Survey	Source of Name										No.
	A	B	C	D	E	F	G	H	K		
ARRICIFE FANDUCO ✓											1
ARRICIFE GUAYANILLA ✓											2
ARRICIFE UNITAS ✓											3
BAHIA DE GUAYANILLA ✓											4
MAR CARIBE ✓											5
PUNTA GUAYANILLA ✓											6
PUNTA VERRACO ✓											7
											8
											9
											10
											11
											12
											13
											14
											15
											16
											17
											18
APPROVED BY											19
<i>A. J. Wright</i>											20
CHIEF GEOGRAPHER											21
											22
											23
											24
											25
											26
											27

PREPARED BY CARTOGRAPHER

C. E. Harrington
5-11-73

VERIFIER: H. R. Smith

Norfolk, Va.
May 7, 1970

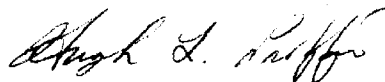
AMC PLOTTER NOTE TO EDAT
SURVEY H-9032

This office has completed the verification of the visually controlled positions on this survey and we are returning the position card printout with applicable changes shown in red pencil.

As you will recall, Ship Whiting Hi-Fix work was not plotted on the existing position overlay because you were not furnished complete data. We are enclosing a Hi-Fix corrector tape and a TC/TI tape which should enable you to plot this work.

Using the above data, We would like for you to furnish the following:

- (1) An overlay showing a plot of the Whiting Hi-Fix positions.
- (2) Sounding overlays with proper edits combining the visually and electronically controlled hydro.



Hugh L. Proffitt
Chief, Hydro Branch, AMC

VERIFIER: Harry R. Smith

Norfolk, Va.
Feb. 10, 1971

AMC PLOTTER NOTE TO EDAT
SURVEY H-9032

As discussed in our recent telcon, we are returning the position card printout with four positions marked for change. They are numbers 2377, 2378, 8035 & 8036. These changes will correct all known errors in positioning on both the visual and Hi-Fix work.

We are also sending a sounding corrector tape to be used after you have generated sounding cards for the visual work, and an arc intersection tape for use in plotting points for Hi-Fix arcs.

When the above changes have been made, please furnish sounding overlays for this survey.


Hugh L. Proffitt
Chief, Verification Br., AMC

VERIFIER: Guy F. Trefethen

Norfolk, Virginia
June 25, 1971

AMC PLOTTER NOTE TO EDAT
SURVEY H-9032

Because of the discrepancies and problems listed below, it will be necessary for this office to have a new reedited sounding overlay for this survey before we can continue the preliminary verification. We are returning the position and sounding card printouts with needed changes marked in red pencil.

TIDES

Tide reducers are incorrect for day 126 as the corrector was stuck on +0.2 ft. for the entire day. We have logged and are forwarding a new tide tape for this day. Also, please send us Form C&GS 712, Tide Note for Hydro Sheet, to attach to the descriptive report.

VELOCITY CORRECTIONS

Fathometer velocity corrections were applied to pole soundings taken by the Zeebird skiff on positions 66 thru 467, Days 124 and 126. Only the soundings deeper than 9 ft. came up with corrections other than 0.0 ft. These and the proper correction are noted on the sounding card printout.

SOUNDINGS

It appears that little or no check scanning was done on the fathograms by the field. The bottom in this area is extremely irregular and it was necessary for this office to completely rescan all fathograms. This work has resulted in about 550 changes or inserted soundings, all of which have been logged on a sounding corrector tape for your convenience.

HI-FIX CORRECTORS

The Hi-Fix correctors for Ship Whiting work, Day 139, positions 6000 thru 6304, were not applied as requested in our Note of May 7, 1970. The corrections and the scale of survey are large and the application of the corrections will shift the sounding lines about 1 centimeter. Please apply Hi-Fix corrections as follows:

R-1 (CORCO) / 0.17 Lanes


R-2 (DON^a) / 0.51 Lanes

POSITION CHANGES

Changes will be needed, as indicated in red pencil, on the positions listed below.

2007, 2064, 2065, 3486, 3603, 2992 thru 2998, 3539 and 3302

When the above and other scattered changes marked in the printouts have been made, please furnish this office a new reedited sounding overlay.


Hugh L. Proffitt
Chief, Verification Br., AMC

VERIFIER: B.T. Davis

Norfolk, Va.
Sept. 13, 1972

AMC PLOTTER NOTE TO EDAT
SURVEY H-9032

This office has completed verification of the preliminary sounding overlay and we are forwarding the position and sounding printouts with needed changes marked in red pencil.


The following is a list of positions to be recomputed:

25	2030	204 ³ 2	2195	2377	2378	2762	2860
2861	2877	3235	3236	3402	3436		

The following is a list of positions to be destroyed. One falls off the limits of the sheet, and the others are positions without associated data, such as, soundings, bottom samples, etc.

467 8013 8030 2382 6264 6265 6266

After the above corrections have been made, please furnish this office a smooth sheet. It should be plotted on 42" paper for later trimming in this office, or on 36" paper with the point of origin moved about one inch Southward. Some hydro lines ~~may~~ now plot too close to the South edge of the paper.


Hugh L. Preffitt
Chief, Verification Br., AMC

FORM CGS-948
 (REV. 11-65)
 (PREP. 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. H-9032 (WH-5-2-69)

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT			
SMOOTH SHEET <i>& PNO</i>	1	BOAT SHEETS	1 T-sheet			
DESCRIPTIVE REPORT	1	OVERLAYS	numerous machine plots (26)			
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS / SOURCE DOCUMENTS
ENVELOPES	X					
CAMERS	1		X			
VOLUMES		13				
BOXES			3			

T-SHEET PRINTS (L.I.N.): ~~T-13137 - P-13138~~

SPECIAL REPORTS (L.I.N.)
 See page 6 of Descriptive Report

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				2464
POSITIONS CHECKED		400		
POSITIONS REVISED		55		
DEPTH SOUNDINGS REVISED		550 +		
DEPTH SOUNDINGS ERRONEOUSLY SPACED				
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED				
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		12		
JUNCTIONS		6		
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS				
SPECIAL ADJUSTMENTS				
scanning & logging ALL OTHER WORK	40	423		
TOTALS	40	441		

PRE-VERIFICATION BY G.F. Trefethen BEGINNING DATE 6/4/71 ENDING DATE 6/11/71

VERIFICATION BY G.F. Trefethen, H.R. Smith, B.T. Davis BEGINNING DATE 3/24/70 ENDING DATE 3/1/73

REVIEW BY _____ BEGINNING DATE _____ ENDING DATE _____

FORM CG-566A
 REV. 12-61
 ISSUED BY HYDROGRAPHIC
 MANUAL, 6-67

VERIFIER'S REPORT

HYDROGRAPHIC SURVEY, H 9032 (WH-5-2-69)

U.S. DEPARTMENT OF COMMERCE
 COAST AND GEODETIC SURVEY

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	Part III - JUNCTIONS (Continued)	CL	R
<p>Note: The verifier should first read the Descriptive Report for general information and problems.</p> <p>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</p>	X		<p>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.</p>	X	
<p>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</p>	X		<p>Part IV - VOLUMES</p> <p>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</p>	X	
<p>3. All reference to survey sheets mentioned in the Descriptive Report should include registry number and year. Remarks Required: -- None</p>	X				
<p>Part II - SHORELINE AND SIGNALS</p> <p>4. Source of shoreline signals T-13137 Remarks Required: -- List all surveys T-13138</p> <p>a. Give earliest and latest dates of photographs 1966 - 1970</p> <p>b. Field inspection date none</p> <p>c. Field Edat date 1969</p> <p>d. Reviewed 1969</p>	X		<p>12. Condition of sounding records was satisfactory except as follows: Remarks Required: -- Mention deficiencies in completeness of notes or actions for the following:</p> <p>(a) rocks</p> <p>(b) line turns</p> <p>(c) position values of beginning and ending of lines</p> <p>(d) bar check or velocity correctors</p> <p>(e) time recording</p> <p>(f) notes or markings on fathograms</p> <p>(g) was reduction of soundings accurately done?</p> <p>see notes to EDAT</p> <p><input checked="" type="checkbox"/> (h) was scanning accurate?</p> <p>(i) were peaks at uneven intervals missed?</p> <p>(j) were stamps completed?</p> <p>(k) references to adjacent features</p>	X	
<p>5. The transfer of contemporary topographic information was carefully examined and reconciled with the hydrography. Remarks Required: -- Discuss remaining differences</p>	X				
<p>6. The plots 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</p>	X				
<p>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 under</p>		X	<p>Part V - PROTRACTING</p> <p>13. All positions verified instrumentally were check marked in color in the sounding records, and verifier initialed the processing stamp. Remarks Required: -- None</p>	X	
<p>Part III - JUNCTIONS</p> <p>Note: Make a cursory comparison preliminary to inking, soundings in area of overlap.</p> <p>8. All junctions of contemporary or overlapping areas were transferred in colored ink and curves and curves were made identical. Remarks Required: -- None</p>	X				
<p>9. The notation in slanted lettering "JOINS II" (1969) was added in colored ink for all verified contemporary adjoining or overlapping sheets. Those not verified are shown in pencil. Remarks Required: -- None</p>	X		<p>14. The protracting and plotting of all unsatisfactory crossings were verified. Remarks Required: -- None</p>	X	
			<p>15. All detached positions locating critical soundings, rocks, buoys, breakers, obstructions, kelp, etc., were verified and the position numbers are legible. Remarks Required: -- None</p>	X	

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

Port V - PROTRACTING (Continued)	CL	R	Port VIII - AIDS TO NAVIGATION	CL	R
16. The protracting was satisfactory except as follows: Remarks Required: -- Refer to protracting in general except for specific faults repeated often, or faults in control information, which required considerable replotting or adjustments.	X		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.	X	
17. The protractor has been checked within the last three months. Remarks Required: -- Date of check, type of protractor and number. Plastic 12/15/72X			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	X	
Port VI - SOUNDINGS			Part IX - BOATSHEET		
18. All soundings are clear and legible, and critical soundings are a little larger than adjacent soundings. Remarks Required: -- None	X		28. The boat sheet was constantly compared with the smooth sheet with reference to note, position of sounding lines and supplemental information. Remarks Required: -- None		X
19. Sounding line crossings were satisfactory except as follows: Remarks Required: -- Discuss adjustments.	X		29. Heights of rocks awash were correctly reduced and compared with topographic information. Remarks Required: -- Note excessive conflicts with topographic information.	X	
20. The spacing of soundings as recorded in the records was closely followed; Remarks Required: -- None	X		Part X - GENERAL		
21. The scanning, reduction, spacing, plotting of questionable soundings have been verified. Remarks Required: -- None	X		30. All information on the sheet is shown in accordance with figures #2 and #3 in the Hydrographic Manual (Pub. 20-2). Remarks Required: -- None	X	
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.	X		31. Unnecessary pencil notes have been removed from the sheet. Remarks Required: -- None	X	
Port VII - CURVES			32. Degree, minute values and symbols have been checked; also electronic distance areas have been properly identified and checked on the smooth sheet. Remarks Required: -- None	X	
23. The depth curves have been inspected before linking. Remarks Required: -- By whom was the pen- ciled curves inspected.	X		33. The bottom characteristics are adequately shown. Remarks Required: -- None	X	
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 X c. Approximate position of sketched curve is dashed orange d. Approximate position of shoal area not sounded in black dashed Remarks Required: -- None		X	Part XI - NOTES TO THE REVIEWER		
25. Depth curves were satisfactory except as follows: Clear statement should not refer to the number in which the curves were drawn). X mark. Required: -- Indicate areas where curves could not be drawn completely because of lack of sounding. For some inshore areas	X		34. Unresolved discrepancies and questionable soundings.		X
			35. Notation of discrepancies with photogram- metric survey inserted in report of unreviewed photogrammetric survey or in copy.	X	
			36. Supplemental information.	X	
<i>Bernie T. Davis</i> Bernie T. Davis			3/1/73		

76-011-71

LETTER TRANSMITTING DATA

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

ORDINARY MAIL AIR MAIL

REGISTERED MAIL EXPRESS

GBL (Give number) _____

TO:

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEAN SURVEY
ROCKVILLE, MARYLAND 20852
ATTN: C-3233

DATE FORWARDED

September 26, 1973

NUMBER OF PACKAGES

1

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

* Photo-Pathymetric Overlay to Accompany H-9032
(Guayanilla Bay, Puerto Rico)

Film ozalid copy

* Descriptive Report, original copy

* Add to contents of H-9032

Attach DR to hydro DR H-9032

File original in hydro. survey tube

Do we have a stamp - TO ACCOMPANY H-

CC: C-323 Carstens
C-342 Theurer

FROM: (Signature)

J. W. Vonasek
for Director AMC

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

DIRECTOR
ATLANTIC MARINE CENTER
439 West York Street
Norfolk, Virginia 23510
Attn: Photo Branch CAM 212

Ack. 9/28/73

36. OFFSHORE DETAILS

All depth curves and depths shown on this overlay are the result of the photogrammetric interpretation of the stereomodels. There will be no field check.

Shoreline survey T-13137 as corrected by field edit depicts areas of reef at Arrecife Guayanilla and Arrecife Unidas. In the low water models being used for the photo bathymetry, it was not possible to delineate as extensive areas of reef as shown. Several rocks awash were interpreted in these areas, but no area of comparable size that could be considered bare at MLW was visible in the low water photography.

37. LANDMARKS AND AIDS

None shown. See item 35.

38. CONTROL FOR FUTURE SURVEYS

Not applicable.

39. JUNCTIONS

There are no contemporary photobathymetric surveys joining this overlay.

For junction with Hydrographic Survey H-9032, see item 45.

40. HORIZONTAL AND VERTICAL ACCURACY

While it is felt that this survey meets the National Standards of map accuracy both horizontally and vertically it should be pointed out here that certain conditions of the photography, bottom details and water clarity limit repeatability. Had the photography been flown at a lower altitude, at a smaller percent of end lap, and at a time when the water condition was not as turbid, the chances of having 100 percent agreement from model to model and from compiler to compiler would be far greater. Considering the "C" factor involved, the condition of the water and the flatness of the bottom, 100 percent repeatability should not be expected.

41. DEPTH CURVES AND DEPTH READINGS

Diligent efforts were made to conform to the requirements of the Hydrographic Manual with regard to the appearance of the data. The major difference is that the depth readings were not taken in straight

41. DEPTH CURVES AND DEPTH READINGS (cont'd)

lines, but rather as the presence of positive photographic images permitted. A spacing of 1/2 inch was considered the optimum but larger spacing had to be accepted due to lack of bottom photographic detail.

The standard break-point of 0.7 ft. was used on depth readings and depth curves. That is, the depth curves were drawn to include 0.7 ft. below the curve depth to conform with hydrographic practice.

It should be pointed out that the stereoscopic instrument operator has the capability of drawing a depth curve around a bottom feature without necessarily being able to read a depth measurement. There are areas where it was not possible to bracket the curves with depth readings as frequently as was intended.

No bottom measurements could be made where the water is clouded with silt and no image of the bottom appears on the photographs. In addition, where the bottom appears with no distinct marks or features to which to relate the measuring dot, no depths can be read. These areas were labeled "No contrast on bottom". In some places it was possible to show a "no bottom" depth symbol to indicate a least depth. (i.e. "0/12" should be interpreted to read "at least 12 feet")

42-44 Not used.

45. COMPARISON WITH CONTEMPORARY HYDROGRAPHIC SURVEYS

A comparison was made with Hydrographic Survey H-9032, scale 1/5000. The two surveys were found to be in good agreement. Plus or minus one foot is considered good agreement. Much of the bottom here is very flat and the difference of one foot can result in the displacement of a curve by several meters. Most of the differences observed in the curves can be attributed directly to this.

Some areas of the hydrographic survey are incomplete which makes it necessary to draw in curves with insufficient sounding data. The hydrographic survey shows no soundings in an area east of Punta Verraco (Lat. 17°58.7', Long. 66°46.9') resulting in the area being practically closed off by a six foot curve when actually a deep extends south of that point.

At another place southeast of Punta Verraco it was possible to delineate the six and twelve foot curves in an area where no hydrographic soundings were obtained. (Lat. 17°58.7' Long. 66°46.5' to Lat. 17°58.4' Long. 66°46.3')

At Lat. 17°58.6' Long. 66°45.5' the 6 foot curve on the overlay disagrees with 17 and 20 ft. soundings. Although this is near an area of cloudy water the curve is considered well positioned.

At Lat. 17°58.8' Long. 66°47.0' the 6 foot curve on the overlay makes a large indentation to exclude a deep area. The curve on the hydrographic survey was not supported by soundings at this point.

46. COMPARLSON WITH EXISTING MAPS

None made.

47. COMPARISON WITH NAUTICAL CHARTS

A comparison was made with Chart 928, 1/10/000 scale, 8th edition, dated March 4, 1972.

Significant differences are listed as follows:

1. At Lat. 17°58.8' Long. 66°46.9' the charted 6 foot curve was not in agreement.
2. At Lat. 17°58.6 Long. 66°47.1' a shoal on the overlay does not appear on the chart.
3. At Lat. 17°58.2' Long. 66°47.4' a shoal does not appear on the chart.
4. Approximately 800 feet ESE of item 3, three submerged rocks are not depicted on the chart.
5. Two small shoals approximately 500 ft. and 900 ft. ENE of item 3 are not depicted on the chart.
6. At Lat. 17°57.8' Long. 66°46.8' the 12 foot curve is in disagreement.
7. At Lat. 17°58.2' Long. 66°46.6' several shoal soundings are on the overlay within a deep area enclosed by a 12 ft curve on the chart.

The curves on the chart are more general than on the overlay. Also in relatively flat areas, a difference of a foot or two in depth can move a curve several hundred feet horizontally.

Soundings agree well generally, but in places there are differences of as much as six feet.

Respectfully submitted:



Arnold L. Shands
Cartographer (Photo)

*Hydro. reviewer to transfer selected data
to H-9032 for final delineation*

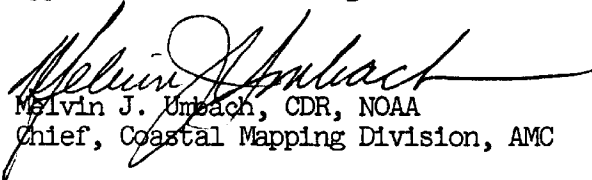
*Rt. Carstens
10/2/73*

Approved for forwarding:



Joseph W. Vonasek
Chief, Special Projects Section

Approved for forwarding:



Melvin J. Umbach, CDR, NOAA
Chief, Coastal Mapping Division, AMC

Approved:



Alfred C. Holmes
RADM, NOAA
Director, Atlantic Marine Center

24. Photography

The definition and quality of photography taken with the RC-8 "L" camera were good, except for occasional sun spots which made measuring underwater points difficult.

25. Accuracy

The RMS for the block is 10.3 micrometers, with an RMS vertical error of 0.16 meters. Horizontal errors were not foreseen as a problem and as they are insignificantly small are not plotable at map scale, require no special mention.

26. Conclusions and Recommendations

The use of infrared photography flown in tandem with color for the purpose of furnishing vertical control at the water line introduced some inaccuracies. No difficulty was encountered transferring shoreline points from the infrared to the color when flown in tandem, but transferring the point to adjoining color strips proved very difficult because of wave action.

In future jobs of this kind, it might prove worthwhile to use targets to determine elevations of vertical control points needed. A target could be placed near the shore and a hand level shot from the water's edge to target, with date and time recorded, would determine the elevation.

In order to get depths in water areas where vertical control is needed, concrete blocks painted white could be placed in the water. In all probability a target could be seen underwater to a depth of ten feet or more.

Respectively submitted,


I. I. Saperstein

Approved and forwarded,


Henry F. Eichert
Chief, Aerotriangulation
Section

COMPILATION REPORT

PHOTO BATHYMETRIC OVERLAY TO ACCOMPANY

H-9032

31. DELINEATION

This survey is intended specifically as a photo bathymetric overlay for Hydrographic Survey H-9032. The objective was to provide, by photogrammetric methods, as much bottom information as could be delineated down to and including the 12 ft. curve. The photographs dated May 3, 1969, were in color at a scale of 1:15,000 with 70 percent forward and side lap and was the same coverage that was used in Job PH-6903, Bahia de Guayanilla, Puerto Rico.

Six stereoscopic models were set in the B-8 at a model scale of 1/7500. The least graduation on the appropriate glass scale was five feet. It was necessary to make a templet to permit the operator to read model elevations to the nearest foot. To convert depth readings to true depths, a multiplication factor of 1.4 was used, to account for the effect of refraction. This correction was used throughout the model. Rounding off to the nearest foot was as specified in the Hydrographic Manual. See item 41.

32. CONTROL

The horizontal and vertical control for all models was supplied by block aerotriangulation as described in the attached Photogrammetric Plot Report for PH-6903.

33. SUPPLEMENTAL DATA

None.

34. CONTOURS AND DRAINAGE

Not applicable.

35. SHORELINE AND ALONGSHORE DETAILS

The area of this survey is covered by regular shoreline manuscripts which were field edited at the time of the hydrographic survey. To avoid duplication and conflict no details above the mean high water line were shown. The shoreline shown on this overlay is incomplete or in the class three stage of development. The T-sheets covering this area should be consulted for the final shoreline.

DESCRIPTIVE REPORT - DATA RECORD

TYPE OF SURVEY

- ORIGINAL
- RESURVEY
- REVISED

SURVEY TF- _____

MAP EDITION NO. ()

MAP CLASS _____

JOB PH- _____

PHOTOGRAMMETRIC OFFICE

Atlantic Marine Center

OFFICER-IN-CHARGE

Melvin J. Umbach

LAST PRECEDING MAP EDITION

TYPE OF SURVEY

- ORIGINAL
- RESURVEY
- REVISED

JOB PH- _____

MAP CLASS _____

SURVEY DATES:

19__ TO 19__

I. INSTRUCTIONS DATED

1. OFFICE	2. FIELD
Verbal as per <i>MU</i>	

II. DATUMS

1. HORIZONTAL: <input type="checkbox"/> 1927 NORTH AMERICAN	OTHER (Specify) New Puerto Rico
2. VERTICAL: <input type="checkbox"/> MEAN HIGH-WATER <input checked="" type="checkbox"/> MEAN LOW-WATER <input type="checkbox"/> MEAN LOWER LOW-WATER <input type="checkbox"/> MEAN SEA LEVEL	OTHER (Specify)
3. MAP PROJECTION Polyconic	4. GRID(S) STATE _____ ZONE _____
5. SCALE 1:5,000	STATE _____ ZONE _____

III. HISTORY OF OFFICE OPERATIONS

OPERATIONS	NAME	DATE
1. AEROTRIANGULATION BY _____ METHOD: _____ LANDMARKS AND AIDS BY _____		
2. CONTROL AND BRIDGE POINTS PLOTTED BY _____ METHOD: _____ CHECKED BY _____		
3. STEREOSCOPIC INSTRUMENT COMPILATION INSTRUMENT: Wild B-8 SCALE: 1:7,500	PLANIMETRY BY A. L. Shands	Oct., 72
	CHECKED BY J. Byrd	Oct., 72
	CONTOURS BY A. L. Shands	Oct., 72
	CHECKED BY J. Byrd	Oct., 72
4. MANUSCRIPT DELINEATION METHOD: Instrument SCALE: 1:5,000	PLANIMETRY BY A. L. Shands	Oct., 72
	CHECKED BY C. H. Bishop	Oct., 72
	CONTOURS BY A. L. Shands	Oct., 72
	CHECKED BY C. H. Bishop	Oct., 72
	HYDRO SUPPORT DATA BY N.A.	
	CHECKED BY _____	
5. OFFICE INSPECTION PRIOR TO FIELD EDIT BY N.A.		
6. APPLICATION OF FIELD EDIT DATA BY _____ CHECKED BY _____		
7. COMPILATION SECTION REVIEW BY C. H. Bishop		Dec., 72
8. FINAL REVIEW BY _____		
9. DATA FORWARDED TO PHOTOGRAMMETRIC BRANCH BY _____		
10. DATA EXAMINED IN PHOTOGRAMMETRIC BRANCH BY _____		
11. MAP REGISTERED - COASTAL SURVEY SECTION BY _____		

COMPILATION SOURCES

1. COMPILATION PHOTOGRAPHY

CAMERA(S) Wild RC 8 "E"		TYPES OF PHOTOGRAPHY LEGEND		TIME REFERENCE	
TIDE STAGE REFERENCE <input type="checkbox"/> PREDICTED TIDES <input type="checkbox"/> REFERENCE STATION RECORDS <input checked="" type="checkbox"/> TIDE CONTROLLED PHOTOGRAPHY		(C) COLOR (P) PANCHROMATIC (I) INFRARED		ZONE 4th	<input checked="" type="checkbox"/> STANDARD
				MERIDIAN 60th	<input type="checkbox"/> DAYLIGHT
NUMBER AND TYPE	DATE	TIME	SCALE	STAGE OF TIDE	
69E(c)-182-185	3 May 69	16:38	1:15,000	0.0	
69E(c)-221-222	3 May 69	16:57	1:15,000	0.0	

REMARKS

2. SOURCE OF MEAN HIGH-WATER LINE:

Office interpretation of the above mentioned photographs.

3. SOURCE OF MEAN LOW-WATER OR MEAN LOWER LOW-WATER LINE:

Office interpretation of the above mentioned photographs.

4. CONTEMPORARY HYDROGRAPHIC SURVEYS (List only those surveys that are sources for photogrammetric survey information.)

SURVEY NUMBER	DATE(S)	SURVEY COPY USED	SURVEY NUMBER	DATE(S)	SURVEY COPY USED

5. FINAL JUNCTIONS

NORTH	EAST	SOUTH	WEST
-------	------	-------	------

REMARKS

HISTORY OF FIELD OPERATIONS

I. <input type="checkbox"/> FIELD INSPECTION OPERATION <input type="checkbox"/> FIELD EDIT OPERATION				
OPERATION		NAME		DATE
1. CHIEF OF FIELD PARTY				
2. HORIZONTAL CONTROL		RECOVERED BY		
		ESTABLISHED BY		
		PRE-MARKED OR IDENTIFIED BY		
3. VERTICAL CONTROL		RECOVERED BY		
		ESTABLISHED BY		
		PRE-MARKED OR IDENTIFIED BY		
4. LANDMARKS AND AID TO NAVIGATION		RECOVERED (<i>Triangulation Stations</i>) BY		
		LOCATED (<i>Field Methods</i>) BY		
		IDENTIFIED BY		
5. GEOGRAPHIC NAMES INVESTIGATION		TYPE OF INVESTIGATION		
		<input type="checkbox"/> COMPLETE BY		
		<input type="checkbox"/> SPECIFIC NAMES ONLY		
		<input type="checkbox"/> NO INVESTIGATION		
6. PHOTO INSPECTION		CLARIFICATION OF DETAILS BY		
7. BOUNDARIES AND LIMITS		SURVEYED OR IDENTIFIED BY		
II. SOURCE DATA				
1. HORIZONTAL CONTROL IDENTIFIED			2. VERTICAL CONTROL IDENTIFIED	
PHOTO NUMBER	STATION NAME		PHOTO NUMBER	STATION DESIGNATION
3. PHOTO NUMBERS (<i>Clarification of details</i>)				
4. LANDMARKS AND AID TO NAVIGATION IDENTIFIED				
PHOTO NUMBER	OBJECT NAME		PHOTO NUMBER	OBJECT NAME
5. GEOGRAPHIC NAMES: <input type="checkbox"/> REPORT <input type="checkbox"/> NONE		6. BOUNDARY AND LIMITS: <input type="checkbox"/> REPORT <input type="checkbox"/> NONE		
7. SUPPLEMENTAL MAPS AND PLANS				
8. OTHER FIELD RECORDS (<i>Sketch books, etc. DO NOT list data submitted to the Geodesy Division</i>)				

RECORD OF SURVEY USE

I. MANUSCRIPT COPIES

COMPILATION STAGES			DATE MANUSCRIPT FORWARDED	
DATA COMPILED	DATE	REMARKS	MARINE CHARTS	HYDRO SUPPORT
Depths and contours mapped	Oct., 1972	No field edit to follow		

II. LANDMARKS AND AIDS TO NAVIGATION

1. REPORTS TO MARINE CHART DIVISION, NAUTICAL DATA BRANCH

NUMBER	CHART LETTER NUMBER ASSIGNED	DATE FORWARDED	REMARKS

2. REPORT TO MARINE CHART DIVISION, COAST PILOT BRANCH. DATE FORWARDED: _____
 3. REPORT TO AERONAUTICAL CHART DIVISION, AERONAUTICAL DATA SECTION. DATE FORWARDED: _____

III. FEDERAL RECORDS CENTER DATA

1. BRIDGING PHOTOGRAPHS; DUPLICATE BRIDGING REPORT; COMPUTER READOUTS.
 2. CONTROL STATION IDENTIFICATION CARDS; FORM NOS 567 SUBMITTED BY FIELD PARTIES.
 3. SOURCE DATA (except for Geographic Names Report) AS LISTED IN SECTION II, NOAA FORM 76-36C. ACCOUNT FOR EXCEPTIONS:
 4. DATA TO FEDERAL RECORDS CENTER. DATE FORWARDED: _____

IV. SURVEY EDITIONS (This section shall be completed each time a new map edition is registered)

SECOND EDITION	SURVEY NUMBER TP - _____ (2)	JOB NUMBER PH - _____	TYPE OF SURVEY <input type="checkbox"/> REVISED <input type="checkbox"/> RESURVEY MAP CLASS <input type="checkbox"/> II. <input type="checkbox"/> III. <input type="checkbox"/> IV. <input type="checkbox"/> V. <input type="checkbox"/> FINAL
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	
THIRD EDITION	SURVEY NUMBER TP - _____ (3)	JOB NUMBER PH - _____	TYPE OF SURVEY <input type="checkbox"/> REVISED <input type="checkbox"/> RESURVEY MAP CLASS <input type="checkbox"/> II. <input type="checkbox"/> III. <input type="checkbox"/> IV. <input type="checkbox"/> V. <input type="checkbox"/> FINAL
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	
FOURTH EDITION	SURVEY NUMBER TP - _____ (4)	JOB NUMBER PH - _____	TYPE OF SURVEY <input type="checkbox"/> REVISED <input type="checkbox"/> RESURVEY MAP CLASS <input type="checkbox"/> II. <input type="checkbox"/> III. <input type="checkbox"/> IV. <input type="checkbox"/> V. <input type="checkbox"/> FINAL
	DATE OF PHOTOGRAPHY	DATE OF FIELD EDIT	

Photogrammetric Plot Report
Job PH-6903
Bahia de Guayanilla, Puerto Rico

October 1969

21. Purpose

The purpose of this pilot project is to test the feasibility of furnishing hydrographic surveys by photogrammetric methods. An area in Puerto Rico, Bahia de Guayanilla, was selected for the test.

22. Method

Seven (7) strips of 1:15,000 color photographs were bridged by analytical aerotriangulation methods, using a forty (40) photograph block adjustment.

23. Control

Eight (8) horizontal and twenty-four (24) vertical control stations were weighted in the final block adjustment. Seven horizontal stations were targeted and one was a natural object.

Two types of vertical control points were used:

1. Underwater points near floating targets and fixed hydro targets, depths of which were field determined, and
2. Shoreline points using infrared photography taken at low water and transferred to the color bridging photography.

The elevations of all underwater points were reduced from tide staff readings to the datum required (low water). The refined coordinates for these underwater points were corrected for refraction.

Shoreline point 42201 has an error of +3 feet. Upon closer examination it was found that the point was drilled on the side of a bush and evidently thus measured. Point 42201 should be discarded.

FIG. 18.

DESCRIPTIVE REPORT DATA RECORD		
PART I SMOOTH SHEET PREPARATION		DATE
		PREPARED BY/OPERATOR
A.	PLOTTER OPERATOR	EDAT-PMC
B.	DISTORTION MARKS PLOTTED	EDAT-PMC
C.	PROJECTION INTERSECTIONS PLOTTED	EDAT-PMC
D.	POINTS OF ELECTRONIC CONTROL ARCS PLOTTED	EDAT-PMC
E.	OVERLAYS PREPARED BY	EDAT-PMC
	1. POSITION NUMBER.	EDAT-PMC
	2. EXCESS SOUNDINGS	EDAT-PMC
	3. PRELIMINARY SMOOTH PLOT	EDAT-PMC
	4. LIST OTHERS	
	A.	
	B.	
F.	SOUNDING SELECTION BY	EDAT-PMC
G.	PLOTTER INPUT PREPARED	EDAT-PMC
H.	CHECKED	EDAT-PMC
I.	DESCRIPTIVE REPORT ADDENDUMS	BTD 2/28/73
PART II SMOOTH SHEET COMPLETION		DATE
		CARTOGRAPHER
A.	DISTORTION SCALE TICKS IDENTIFIED BY NOTE	BTD 2/28/73
B.	PROJECTION INTERSECTIONS VERIFIED BY	BTD 1/11/73
C.	PROJECTION LINES RULED BY	BTD 1/12/73
D.	ELECTRONIC CONTROL ARCS RULED AND LOCATION VERIFIED	BTD 1/22/73
E.	OVERLAYS COMPLETED BY	
	1. POSITION NUMBER LEADERS ADDED	BTD 1/23/73
	2. EXCESS SOUNDING OVERLAY COMPARED	BTD 2/27/73
	3. PRELIMINARY SMOOTH PLOTS COMPARED	BTD 2/27/73
	4. OTHERS UTILIZED	
	A.	
	B.	
F.	DESCRIPTIVE REPORT ADDENDUM	BTD 2/28/73
G.	CONTROL STATIONS VERIFIED	HRS 5/7/70
H.	POSITIONS MANUALLY PLOTTED	
I.	MANUAL PLOT VERIFIED	
J.	SHORELINE APPLIED	BTD 1/16/73
K.	BOTTOM CHARACTERISTICS ADDED	BTD 1/24/73
L.	NOTES AND DEPTH CURVES ADDED	BTD 1/24/73

VERIFICATION NOTES
H-9032

GENERAL

The verification of this survey presented many problems mainly because of the unconventional methods used, combined with the relative inexperience of the launch crews. (See the commanding officer's approval sheet in the body of this report). Most of the problems encountered, and the methods used to resolve them, are listed in the enclosed "AMC Plotter Notes to EDAT".

Agreement of soundings at crossings ~~is~~^{is} satisfactory but the survey appears to be far from complete, due to the sparcity of sounding lines, the lack of developement on shoal indications and charted shoal depths, and the lack of lines using a deep water fathometer and run normal to the steep inclines leading to the shelf. Depth curves are necessarily approximate or incomplete in these areas.

PHOTO-BATHYMETRIC OVERLAY

The Coastal Mapping Division, AMC, is presently compiling a photo-bathymetric overlay for the smooth sheet to supplement shoal water hydrography to a depth of 12 feet. Upon completion, it will be forwarded by that Division.


Hugh L. Proffitt
Chief, Verification Br., AMC

Norfolk, Va.
April 10, 1973

ATLANTIC MARINE CENTER
APPROVAL SHEET
FOR
AUTOMATED SURVEY H- 9032

- Final
A. ~~XXX~~ revisions and additions made on the smooth sheet
printouts during verification have been entered in the ~~magnetic~~
~~tape records~~ for this survey. A new final position
printout ~~has~~/has not been made. A new final sounding
printout ~~has~~/has not been made.

Date: April 10, 1973

Signed: *Hugh L. Poffers*

Title: Chief, Verification Branch

- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic and AMC Manuals. Exceptions are listed in the verifier's report.

Date: April 10, 1973

Signed: *Karl Wm Kuningue*

Title: Chief, Processing Division

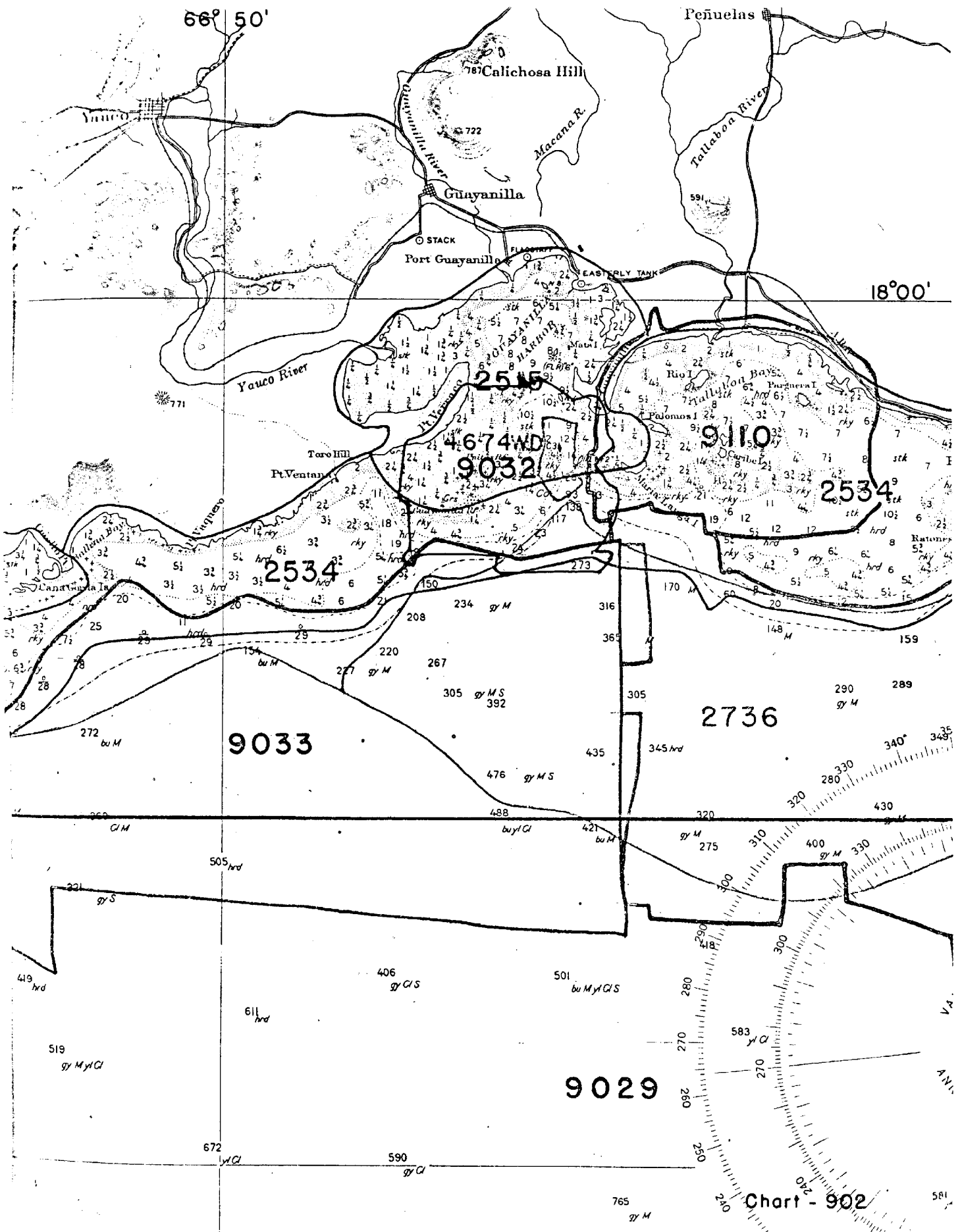


Chart - 902

H-8780

1. Control and Shoreline

The origin of the control is adequately discussed in Part F of the Descriptive Report.

The shoreline originates with Class 1 Advanced Manuscript T.E. 12166 (1859-67)

The mean high water line is shown for guidance only. Its true position is shown on the topographic manuscript previously mentioned.

2. Hydrography

a.

9032

9032

FORM C&GS-504	
U.S. DEPARTMENT OF COMMERCE ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION COAST AND GEODETIC SURVEY	
DESCRIPTIVE REPORT	
Type of Survey	Photo-Bathymetric
Overlay to Accompany H-9032	
Field No.	Office No.
LOCALITY	
State	Puerto Rico
General locality	Southwest Coast
Locality	Punta Verraco
1972	
CHIEF OF PARTY	
LIBRARY & ARCHIVES	
DATE	

9032

Orig

Diag. Cht. No. 902.

FORM C&GS-504

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

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. WH-5-2-69 Office No. H-9032

LOCALITY

State ~~Commonwealth of~~ Puerto Rico

General locality South Coast ~~San Juan Bay~~

Locality Bahia De Guayanilla

19 69

CHIEF OF PARTY

CDR Wayne L. Mobley, USESSA

LIBRARY & ARCHIVES

DATE 4-23-73

USCOMM-DC 37022-P66

*Charts 902
920
925*

9032