8848

Diag. Cht. No. 903.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. EX 5-1-65 Office No. H-8848

LOCALITY

State Puerto Rico

General locality North Coast of Puerto Rico

Locality San Juan Harbor

1965

CHIEF OF PARTY

Marvin T. Paulson, Capt, USESSA

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Form 537
(Ed. June 1946)

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

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

REGISTER No. H-8848

Field No. EX 5-1-65

State PUERTO RICO

General locality North Coast of Puerto Rico

Locality San Juan Harbor

Scale 1:5,000 Date of survey March, April, May 1965

Instructions dated 6 November, 1964

Vessel USC&GSS EXPLORER

Chief of party Marvin T. Paulson, Captain, USC&GS

Surveyed by Ship's Officers

Soundings taken by fathometer, graphic recorder, hand lead, wire and pole

Fathograms scaled by Ship's Personnel

Fathograms checked by Ship's Personnel

Protracted by PJD

Soundings penciled by Charles B. Ellis and ENS Gary A. Eskelin

Soundings in fathoms feet at MLW MLLW

REMARKS: No soundings were placed on the boat sheets. The smooth boat sheet was plotted on a day to day basis as far as practical and the reduced soundings were penciled on the smooth boat sheet on the day following the hydrography in most instances. The smooth boat sheet is the product of several officers. On preliminary receipt of smooth sheet numerous changes were made in the soundings and the sheet was returned to the ship for [illegible]

U. S. GOVERNMENT PRINTING OFFICE 16—66520-1

DESCRIPTIVE REPORT

To Accompany Hydrographic Survey
EX 5-1-65
1965 Scale 1:5000
Captain Marvin T. Paulson, Comdg.

A. PROJECT

Hydrography was accomplished in accordance with instructions for Project OPR - 423, dated 6 November 1964.

B. AREA SURVEYED

The area surveyed is San Juan Harbor on the North Coast of Puerto Rico in the vicinity of San Juan. This survey covers the northern half of the harbor. It is bounded by land to the northeast, west, and southwest, by the junction with contemporary survey EX 5-2-65 to the southeast. The survey extended well into the Atlantic to junction with prior surveys.

This survey junctions with the following prior surveys:

Register No.	Scale	Date
H - 2667	1:20,000	1899
H - 6556	1:10,000	1940

Junction was made with the following contemporary survey:

Field No.	Scale	Date
EX 5-2-65	1:5,000	1965

C. SOUNDING VESSELS

All hydrography was accomplished by launches and skiffs from the Ship EXPLORER.

Launch #1	Purple day letters
Launch #2	Brown day letters
Launch #3	Red day letters

Skiff # 1A Green day letters
Skiff # 2 Blue day letters

D. SOUNDING EQUIPMENT

Raytheon DE-723 fathometers, calibrated at 800 fms/sec were used in all sounding vessels. The initial setting for all launches was 2.0 feet, for all skiffs was 0.5 feet. Pole soundings were used by skiff parties for depths less than three feet. Bar checks were taken on a daily basis to determine velocity corrections. Fathometer serial numbers are listed as follows:

Launch # 1	258
Launch # 2	248
Launch # 3	261
Skiff # 1A	531
Skiff # 2	536 and 258

Additional information may be found in the "Fathometer and Velocity correction Report, OPR 423, 1965," dated 14 August, 1965.

E. SMOOTH SHEET

The smooth boat sheet projection was ruled in the Washington Office by PJD. The positions on the sheet were plotted by ship's personnel as the field work progressed, and the soundings were reduced and penciled as soon as practicable. Since the smooth boat sheet was plotted simultaneously with the field work, no soundings were placed on the boat sheets. This sheet is plotted with the accuracy of a smooth sheet but may not be up to smooth sheet standards due to the conditions under which the sheet was plotted and prepared. A copy of a letter concerning this sheet addressed to the Director from Capt. Paulson is included in this report (page 11).

A large portion of the sheet had to be completely erased and redone when dredging was done in the main channel, extending from the entrance to approximately signal CAS. Before dredging occurred, this area was completely finished, with positions inked and soundings penciled on the sheet. The dredged area was resurveyed with sufficient overlay into non-dredged areas by Launch # 3 on "f" day. All positions and soundings rejected in the dredged area are so noted in the volumes.

Several strays were found in the area near signal CAS, but were not penciled on the sheet because they are apparently caused by grass.

Several Soundings that were penciled on the smooth boat sheet were removed by the Washington Office. Again, these soundings were apparently caused by grass and were too shoal by approximately 2 to 5 feet. The removed soundings have been reviewed by EXPLORER personnel.

A list of the changed soundings is as follows:

Sounding in Error	New Sounding	Latitude	Longitude
6.8	9	18° 27' 43"	66° 07' 48"
9.9	12	39	39
10.4	13	42	36
9.9	13	43	35
10.9	13	42	32
10.4	12	40-41	32
10.8	14	41	23
8.6	13	32	20
4.2	10	26	32
9.8	10	16	28
5.6	10	15	28
9.2	12	17	16
8.6	10	15	13
6.7	13	13	16
8.6	12	12	17
8.6	11	10	17
7.6	10	09	14
9.8	13	18° 27' 10"	66° 07' 12"

10 Dec., 65 All fathograms have been check scanned by EXPLORER personnel for additional strays. Two soundings were changed. Refer to the tracing paper overlay accompanying the sheet.

F. CONTROL

All control was established by photogrammetric methods. All final locations of signals are on T-sheets; T-11885, T-11884, T-11887, and T-11888. These sheets are classified as "Incomplete Manuscripts" and are dated January, 1965. Additional information may be found in the "Control and Shoreline Report, OPR 423 1965," dated 24 August, 1965.

G. SHORELINE

Shoreline detail was transferred from the T-sheets listed in section F. Since the advance manuscripts have not been completed, the sheets have been forwarded for verification under the assumption that the shoreline will be inked by the verifier. Discrepencies in the final shoreline will probably occur on the island on which signal FRO (Front Range Light) is located. A spoil area is located to the west of this island and changes in shoreline will occur as dredging operations progress.

H. CROSSLINES

Crosslines compose 12.2% of the hydrography and agree well with other soundings.

I. JUNCTIONS

The depths at the junction between this survey and the EX 5-2-65 survey are in agreement.

This survey makes a small offshore junction with survey H-2667, dated 1904. Depths are in agreement except at the area of latitude 18° 29' 00", longitude 66° 08' 00", where depths on the new survey are 10 feet shoaler.

Junction offshore with survey H-6556, dated 1940, is good with all soundings in agreement.

J. COMPARISON WITH PRIOR SURVEYS

The prior survey of this harbor, H-2418, dated 1899, is considered obsolete. Due to extensive dredging and filling, large changes in depths, shoreline, and channels have occured, making comparison with H-2418 valueless.

The following items of the Presurvey Review, OPR 423 (1965) pertain to EX 5-1-65.
(Items marked with an asterisk *, refer to the statement by CDR Guth, pages 12-15 of this report.)

Item 1 "The sunken wreck ED" No evidence of a wreck was found at the position charted. The least depth obtained was 18 ft. — See L 182/68

Item 2 "The wreck" The position of the wreck is correct as charted. The wreck is now broken in half with the forward half overturned on her port side. The aft half is still relatively upright.

Item 3 "The 23 foot RK sounding" This sounding does exist as shown on the smooth boat sheet at latitude 18° 28' 27", longitude 66° 07' 46".

Item 4 "The sunken wreck" Was not identified. The 18 ft. sounding was verified on the smooth boat sheet located at latitude 18° 28' 05", longitude 66° 07' 52". The least depth obtained was 16 ft. — See L 182/68

Item 6 "The 15 ft. sounding" A least depth of 14 ft. was obtained at the location given, latitude 18° 28' 10", longitude 66° 07' 33".

Item 7 "The 5 ft. sounding" The entire area has changed with a least depth obtained of 8.1 ft. Delete the 5.

* Item 9 "The 4 ft. and 6 ft. soundings" A sounding of 6.9 ft. was obtained at latitude 18° 28' 00", longitude 66° 07' 15". No evidence of a shoaler sounding was found in the area, but chart the 4 and 6.

Item 10 "The 7 ft. sounding" No evidence of a sounding of 7 ft. was found in the area of the charted position, latitude 18° 28' 18", longitude 66° 07' 37". Delete the 7, chart 16 ft.

* Item 11 "The 16 ft. sounding" A sounding of 17 ft. was found in the position given at latitude 18° 28' 37", longitude 66° 08' 04". Chart the 16.

Item 12 "Rock awash" No evidence of a rock awash was noticed at the position given. Due to heavy breakers, anything in this area was extremely dangerous to thoroughly investigate. The rock is possibly inshore of the charted position.

* Item 13 "The 2 ft. sounding" A sounding of 3.0 ft. was found at the position given, latitude 18° 28' 02", longitude 66° 08' 02". It is recommended the 2 remain charted.

Item 14 " The mooring buoy" No mooring buoys were found at the position indicated.

Item 15 "The 34 and 40 ft. soundings" The sounding of 40 feet was substantiated at the position given, latitude 18° 28' 34", longitude 66° 07' 37". The 34 ft. sounding was not substantiated, depths being 46-55 ft. Chart the 40, but not the 34.

Miscellaneous items circled on the Presurvey Review

The 41 ft. depth charted at latitude 18° 28' 40", longitude 66° 07' 44".
The shoalest sounding in this area was found to be 61 ft. but the area was not sufficiently developed in order to positively disprove the charted 41 ft. depth.

The 3 ft. depth charted at latitude 18° 28' 08", longitude 66° 07' 53".
A sounding of 3.0 feet was found at this location.

* The 12 ft. depth charted at latitude 18° 28' 08", longitude 66° 07' 29"
A sounding of 13 ft. was found at this location. Chart the 12.

* The 11 ft. depth charted at latitude 18° 28' 02", longitude 66° 07' 24"
The shoalest sounding obtained at this position was 14 ft.

The 5 ft. depth charted at latitude 18° 27' 57", longitude 66° 07' 19".
The shoalest sounding obtained was 10.1 ft., however, the area was not sufficiently developed to positively disprove the 5 ft. depth.

The 4 ft. depth charted at latitude 18° 27' 54", longitude 66° 07' 17".
The shoalest sounding obtained at this position was 9.1 ft., however again, was not sufficiently developed.

Rocks, charted at latitude 18° 27' 53", longitude 66° 07' 13"
The entire shoreline from Morro Lighthouse to station Caseta is extremely rocky and treacherous inside the sounding lines of this survey. there were no rocks at the charted position. The least depth obtained at this location was 7.4 ft.

* The 1 ft. depth obtained from H-2418, located at latitude 18° 27' 51", longitude 66° 07' 12".
A least depth of 5.0 ft. was obtained at this position with no evidence of a 1 ft. shoal

The 3 to 6 ft. shoal located at approximately latitude 18° 28' 03", longitude 66° 07' 54".
The shoal still exists with the same general configuration as charted. Least depth obtained was 3.6 ft.

* The 6 ft. depth charted at latitude 18° 27' 55", longitude 66° 07' 52".
The least depth obtained at this position was 8.4 ft., but it is likely that the 6 ft. depth still exists. It is recommended that the 6 remain charted.

* The 3 to 5 ft. shoal charted at approximately latitude 18° 27' 48", longitude 66° 07' 50".
The shoal still exists, however the least depth obtained over the area was 5.0 ft. Recommended the 3 remain charted.

The 11 ft. depth charted at latitude 18° 27' 46", longitude 66° 07' 34".
No evidence of a depth of 11 ft. was obtained, the area is consistently 14 to 15 ft. deep. Remove the charted 11.

The 12 ft. depth charted at latitude 18° 27' 38", longitude 66° 07' 39".
The 12 ft. shoal still exists.

The 5 to 6 ft. shoal charted at latitude 18° 27' 46", longitude 66° 08' 00".
The shoal still exists, with a least depth of 5.8 ft.

K. COMPARISON WITH THE CHART

San Juan Harbor is covered on C&GS chart 908, scale 1:10,000, 23 ed., 8 March, 1965. Many of the pertinent items have been discussed in section J, with regards to the Presurvey Review.
In general, in important areas, the chart does not agree favorably with the new survey and a new chart is required. The Main Channel has been extensively dredged with a new controlling depth of 37 feet. The area adjacent to Piers 1, 2, and 3 at San Juan is now controlled by depths of 28 ft., as compared to 31 on the other chart.

L. ADEQUACY OF SURVEY

This survey is complete and adequate to supercede prior surveys for charting purposed, with the exception of the final determination of buoy and new marker positions (see section M below.)

M. AIDS TO NAVIGATION

All positions of aids to navigation obtained during this survey have been reported to the Commander, US Coast Guard Station, San Juan Puerto Rico.
As of May, 1965, the Coast Guard was in the process of changing some of the buoys to permanent beacons and markers.

Buoy "10A" has been replaced by a permanent marker as shown on the smooth boat sheet at latitude 18° 27' 17", longitude 66° 07' 08" (Position #13, Launch 3 buoy locations). Buoy "10A" is not shown on the smooth boat sheet.

Since the extent of change was not known at the time of the end of this survey, final information will be required. It is recommended that the Coast Guard be requested to furnish a complete list of all buoy position changes, removed buoys, and positions of new markers and beacons.

A rather busy ferry route extends from approximately latitude 18° 27' 52", longitude 66° 06' 53" to latitude 18° 26' 45", longitude 66° 06' 57".

The position of buoy "2" at the entrance to the harbor as plotted on the smooth boat sheet is not exact. The fix on this buoy was poor, with no check angle.

All buoy positions were obtained early in the survey (Skiff "1A", "Buoy Locations") and reported to the Coast Guard.
Some of the buoys were out of the desired positions and the Coast Guard subsequently moved them back into the desired position.
A new round of buoy positions was taken using Launch #3 ("Buoy Location" volume) and used as final positions for all moved buoys.

A list of buoy positions as plotted on the smooth boat sheet is included on the following page of this report.

N. STATISTICS

Launch #1

Day letters	"a" thru "g"
No. of positions	871
Nautical miles of sounding line	73.6

Launch #2

Day letters	"a" thru "d"
No. of positions	765
Nautical miles of sounding line	57.1

Launch #3

Day letters	"a" thru "g"
No. of positions	814
Nautical miles of sounding line	100.4

Skiff #1A

Day letters	"a" thru "d"
No. of positions	145
Nautical miles of sounding line	4.6

Skiff #2

Day letters	"a" thru "d"
No. of positions	373
Nautical miles of sounding line	15.4

Totals

No. of positions	2968
Nautical miles of sounding line	251.1

O, MISCELLANEOUS

All of the work done on "g" day, Launch #1, was rejected because of fathometer trouble. A double trace on scales B and C was not discovered until the end of the day. The difference between the traces was not consistent nor decipherable, so the entire day was rejected. The volume and fathogram is included with the other data.

Reject "g" day

Due to breakers at latitude 18° 28' 15", longitude 66° 08' 00", and at latitude 18° 27' 30", longitude 66° 08' 00", it was not possible to survey these areas because of the danger to launches and personnel.

The dredging spoil area to the southwest of the Catano Front Range Light was not surveyed because of extremely shoal depths and constant changes from dredging operations.

Soundings adjacent to the Coast Guard piers (northwest of signal CAS are plotted on a mylar blowup of all the piers in this area that accompanies EX 5-2-65, the second half of San Juan Harbor.

P. RECOMMENDATIONS

It is recommended that this sheet be considered a smooth sheet and be used as such for charting purposes. As mentioned in section M, final information concerning changes in aids to navigation must be obtained.

Q. REFERENCES TO REPORTS

Report	Date Submitted
Seasons Report	3 September, 1965
Control and Shoreline Report	24, August, 1965
Field Edit Report	21, July, 1965
Coast Pilot Report	28 June, 1965
Form 681 Report, Tide Station	4 October, 1965
Fathometer and Velocity Correction Report	14 August, 1965
Currents Report	6 Jult, 1965

Respectfully submitted,

Gary A. Eskelin

Gary A. Eskelin, ENS, ESSA

Approved and Forwarded

Jack E. Guth for

Marvin T. Paulson, CAPT, ESSA

The Director
Thru : Norfolk Regional Officer
Attn : Chief, Nautical Chart Division

July 22, 1965

Commanding Officer
Ship EXPLORER

San Juan Harbor Survey

The smooth boat sheets EX 5-1-65 and EX 5-2-65 have been prepared with the utmost care and accuracy comparable to smooth sheet plotting. The soundings have been reduced in accordance with standard procedures and the reduced sounding entered on the sheet.

To date the sheet is yet incomplete with about 3 days development surveys remaining to be plotted, however, the critical soundings have been selected from the developments and entered in the sheet. The sheet in its present form is considered adequate for charting purposes. Two officers, LTjg. Murphy and Ens. Gammon will be detailed ashore for the period 22-30 July while the ship is out to complete the plotting and write the report.

The sheets were plotted as the field work progressed and pencilled soundings reduced to ~~time~~ tides entered on the sheet the day following each days survey as far as practical, consequently certain smooth sheet refinements of position numbering has in development or over lap areas become somewhat congested. It is assumed that during the inking of the of the soundings, these conditions could be corrected if necessary.

The intent of the smooth boat sheet is to provide a plot of soundings satisfactory for immediate charting which I believe we have accomplished. The sheets are a product of several inexperienced officers in smooth plotting working intermittently under adverse conditions aboard ship. Each officer had numerous other assigned duties and responsibilities to accomplish, including watch standing. It is recommended that inspection and review be guided by the intent and be in the form of constructive comments rather than a critical review of minute detail.

Marvin T. Paulson, CAPT.

SAN JUAN HARBOR SURVEY 1965

8 December, 1965

This report contains data that was generally approved by Captain Paulson. He departed the EXPLORER prior to the final review of the smooth boat sheets and the reports. Therefore, I have added my comments.

San Juan Harbor is an estuary with so little flushing by tide and current that it approaches stagnation. The water is thick with floating and suspended debris which is dumped into the harbor from the surrounding populated areas. Excessive sewerage is channeled into the harbor and the suspended matter is dense. The bottom of the harbor is littered with debris and thick with silt.

Shortly after the survey was begun, it was determined that the harbor was so drastically changed that for all practical purposes the old surveys could be discarded. The project was approached with the idea of making a completely new and comprehensive survey.

Large debris such as old drums and timbers are undoubtedly strewn throughout the harbor. On several occasions our hydro units towed "dead heads" and floating timbers, which were a menace to navigation, to the shore and dragged them up onto the beach. Indications were

that some large debris that was submerged would drift or move along the bottom. The silt is so thick that fathometer depths recorded several feet shoaler than pole soundings. Outboard motors constantly clogged up from the densely suspended matter.

To prove or disprove many of the numerous strays that were recorded, several areas were wire dragged with effective depths that would have hung on solid bottom. The purpose of these was to disprove the strays, not to clear shoals with an effective depth; therefore, they are not to be considered support of hydrography. Although the wire drag was recorded in record volumes no attempt was made to reduce the data and accurately plot the strips. Two launches devoted an entire day to this project, and the strays were disproved, which was their only purpose. The drag strips are as follows:

EX 5-1-65

Two strips centered at approximately latitude 18° 27' 35" longitude 66° 07' 30" cleared 10 feet in 12 to 13 feet of water.

One strip centered at approximately latitude 18° 27' 40", longitude 66° 06' 55" cleared 14 feet in 28 feet of water.

EX 5-2-65

One strip down the channel between Puerta de Tierra and Isla Grande cleared 14 feet in 37 to 44 feet of water.

One strip centered at approximately latitude 18° 26' 50" longitude 66° 06' 25" cleared 11 feet in 13 to 14 feet of water.

To adequately develop every fathometer stray or potential shoal sounding would be extremely time consuming and costly, and would only be accurate for the exact time it was surveyed. Therefore, the concentrated development effort was placed on definite shoals, channels, docking areas, and, in general, every area that might be a hazard to shipping and boating. Some of the Presurvey Review Notes (Items marked with an asterisk, *, Section J, of the report for EX 5-1-65) were not thoroughly developed because their proof or disproof was not considered one of these concerns. These depths may not exist in the exact positions given, but it is more than likely that similar least depths do exist in these generally foul shoal areas. Therefore, it is recommended that the least depth, either from the Presurvey Review, or the new survey, be charted, providing the best indication for mariners to avoid the area. The 41 ft. depth charted at latitude 18° 28' 40", longitude

66° 07' 44"; the 5 ft. depth charted at latitude 18° 27' 57", longitude 66° 07' 19"; and the 4 ft. depth charted at latitude 18° 27' 54", longitude 66° 07' 17" (all on EX 5-1-65) should have been developed and proved or disproved; however, they were overlooked. The other questionable Presurvey Review Items were not developed for the reasons given above.

The number of miles of hydrography in this survey is not staggering, however an enormous amount of time and effort went into accomplishing it. This survey is as accurate as our present means and methods permit. It is adequate for charting purposes and no additional work is recommended, other than the three charted depths noted above, and unless dredging changes have taken place.

Jack E. Guth

CDR Jack E. Guth
Executive Officer and
Operations Officer
USC&GSS EXPLORER

LIST OF BUOYS

To Accompany EX 5-1-65

Buoy	Latitude	Longitude
1	18° 28' 25"N	66° 07' 38"W
2	18 28 27	66 07 46
3	18 28 14	66 07 38
4	18 28 13	66 07 47
6	18 28 03	66 07 47
7	18 28 00	66 07 26
8	18 27 52	66 07 34
10	18 27 39	66 07 20
11	18 27 38	66 07 03
CA	18 27 08	66 07 01
C1	18 27 53	66 07 47
N2	18 27 54	66 07 53
N4	18° 28' 01"N	66° 08' 01"W

TIDE NOTE

To Accompany EX 5-1-65

Tides for the survey were determined by using a direct reading staff, read every 15 minutes by the Quartermaster on watch. The staff was relocated each time the ship changed its berth for convenience of observation. Mean low water was established by comparing the direct reading with the standard tide gage staff at the Navy Tender Piers, San Juan, Puerto Rico. Tide records were referred to local ship time, 60th and 45th meridian.

Location of standard gage

latitude 18° 26' 98"
longitude 66° 05' 47"

(see sheet EX 5-2-65

Location of Tide Staff

latitude 18° 27' 68"
longitude 66° 06' 97"

Location of tide staffs used that are plotted on EX 5-2-65

latitude 18° 27' 02"
longitude 66° 05' 43"

latitude 18° 27' 68"
longitude 66° 05' 98"

GEOGRAPHIC NAMES LIST

No new geographic names were encountered in this survey.

ABSTRACT OF CORRECTIONS TO ECHO SOUNDERS

EX 5-1-65

Launch #1 Raytheon DE 723 #258

"a", "b", "c" & "d" days

Depth, ft.	Corr., ft.
3.8 - 8.3	-0.4
8.4 - 14.5	-0.2
14.6 - 22.2	0.0
22.3 - 30.7	+0.2
30.8 - 39.7	+0.4
39.8 - 48.6	+0.6

"e", "f" & "g" days

3.1 - 4.8	-0.6
4.9 - 6.5	-0.4
6.6 - 8.5	-0.2
8.6 - 16.2	0.0
16.3 - 22.9	+0.2
23.0 - 26.4	+0.4
26.5 - 29.9	+0.6
30.0 - 33.2	+0.8
33.3 - 36.6	+1.0
36.7 - 39.9	+1.2
40.0 - 43.3	+1.4
43.4 - 46.7	+1.6
46.8 - 50.0	+1.8

"e", "f" & "g" days
"B", "C" & "D" scales
(obtained from T&S curve)

40.0 - 43.3	+1.4
43.4 - 46.7	+1.6
46.8 - 50.0	+1.8
50.1 - 54.0	+2.0
54.1 - 58.4	+2.2
58.5 - 62.3	+2.4
62.4 - 66.5	+2.6
66.6 - 70.5	+2.8
70.6 - 74.5	+3.0

74.6 - 78.5	+3.2
78.6 - 82.7	+3.4
82.8 - 86.7	+3.6
86.8 - 90.9	+3.8
91.0 - 95.0	+4.0
95.1 - 99.0	+4.2
99.1 - 103.0	+4.4
103.1 - 107.0	+4.6
107.1 - 111.0	+4.8
111.1 - 115.0	+5.0
115.1 - 119.4	+5.2
119.5 - 132.5	+5.4
123.6 - 127.6	+5.6
127.7 - 131.7	+5.8
131.8 - 135.0	+6.0
135.1 - 139.2	+6.2
139.3 - 143.2	+6.4
143.3 - 147.2	+6.6
147.3 - 151.2	+6.8
151.3 - 155.5	+7.0
155.6 - 159.2	+7.2
159.3 - 163.5	+7.4

Launch #2

Raytheon DE 723, #248

"a" day

Depth, ft.	Corr., ft.
5.0 - 6.6	-0.8
6.7 - 8.6	-0.6
8.7 - 10.5	-0.4
10.6 - 13.4	-0.2
13.5 - 17.7	0.0
17.8 - 21.4	+0.2
21.5 - 24.0	+0.4
24.1 - 26.5	+0.6
26.6 - 29.0	+0.8
29.1 - 31.7	+1.0
31.8 - 35.2	+1.2
35.3 - 39.5	+1.4
39.6 - 44.7	+1.6
44.8 - 50.0	+1.8

"b" day

5.0 - 6.0	-0.6
6.1 - 7.3	-0.4
7.4 - 9.2	-0.2
9.3 - 13.7	0.0
13.8 - 17.0	+0.2

17.1 - 19.4	+0.4
19.5 - 22.7	+0.6
22.8 - 27.2	+0.8
27.3 - 32.1	+1.0
32.2 - 36.6	+1.2
36.7 - 40.7	+1.4
40.8 - 44.6	+1.6
44.7 - 48.1	+1.8

For depths over 50 ft. on "a" and "b" days, the corrections used were those obtained from a T & S curve, tabulated under "Lqunch #1, B, C, and D scales."

"c" and "d" days

3.0 - 5.9	-0.8
6.0 - 9.4	=0.6
9.5 - 13.5	-0.4
13.6 - 17.7	-0.2
17.8 - 22.2	0.0
22.3 - 26.2	+0.2
26.3 - 29.9	+0.4
30.0 - 33.0	+0.6
33.1 - 36.0	+0.8
36.1 - 40.0	+1.0
40.1 - 44.0	+1.2
44.1 - 48.0	+1.4
48.1 - 52.1	+1.6
52.2 - 56.5	+1.8
56.6 - 60.3	+2.0
60.4 - 64.8	+2.2
64.9 - 68.7	+2.4
68.8 - 72.6	+2.6
72.7 - 76.8	+2.8
76.9 - 80.8	+3.0
80.9 - 85.0	+3.2
85.1 - 89.0	+3.4
89.1 - 93.2	+3.6
93.3 - 97.5	+3.8
97.6 - 101.2	+4.0
101.3 - 105.3	+4.2
105.4 - 109.8	+4.4
109.9 - 113.5	+4.6
113.6 - 117.5	+4.8
117.6 - 121.8	+5.0
121.9 - 125.3	+5.2
125.4 - 129.5	+5.4
129.6 - 133.5	+5.6
133.6 - 137.6	+5.8
137.7 - 141.8	+6.0

141.9 - 146.8	+6.2
146.9 - 149.8	+6.4
149.9 - 153.8	+6.8
153.9 - 157.8	+7.0
157.9 - 161.8	+7.2
161.9 - 166.0	+7.4
166.1 - 170.0	+7.6
170.1 - 174.0	+7.8
174.1 - 178.3	+8.0
178.4 - 182.3	+8.2
182.4 - 186.2	+8.4
186.3 - 190.5	+8.6
190.6 - 194.3	+8.8
194.4 - 198.5	+9.0

Launch #3 Raytheon DE 723, #261

"a" day

4.0 - 11.5	0.0
11.6 - 15.6	+0.2
15.7 - 18.7	+0.4
18.8 - 21.0	+0.6
21.1 - 23.1	+0.8
23.2 - 25.3	+1.0
25.4 - 27.3	+1.2
27.4 - 29.4	+1.4
29.5 - 31.6	+1.6
31.7 - 33.7	+1.8
33.8 - 35.8	+2.0
35.9 - 38.0	+2.2

"b" and "c" day

3.8 - 6.0	-0.4
6.1 - 7.7	-0.2
7.8 - 10.0	0.0
10.1 - 12.8	+0.2
12.9 - 16.1	+0.4
16.2 - 20.0	+0.6
20.1 - 23.3	+0.8
23.4 - 26.6	+1.0
26.7 - 30.0	+1.2
30.1 - 33.3	+1.4
33.4 - 36.5	+1.6
36.6 - 39.6	+1.8
39.7 - 42.6	+2.0
42.7 - 45.6	+2.2

"d" and "e" days

4.0 - 6.0	-0.6
6.1 - 8.0	-0.4
8.1 - 10.4	-0.2
10.5 - 15.3	0.0

15.4 - 18.7	+0.2
18.8 - 21.5	+0.4
21.6 - 24.5	+0.6
24.5 - 28.0	+0.8
28.1 - 32.0	+1.0
32.1 - 36.5	+1.2
36.6 - 41.0	+1.4
41.1 - 45.5	+1.6
45.6 - 50.0	+1.8

For depths greater than 50 ft., the corrections used were those tabulated under "Launch #1, B. C. and D scales."

Skiff 1A Raytheon DE 723, #531, all days

Depth, ft.	Corr., ft.
1.4 - 2.2	-1.2
2.3 - 3.4	-1.0
3.5 - 5.0	-0.8
5.1 - 7.2	-0.6
7.3 - 10.5	-0.4
10.6 - 15.6	-0.2
15.7 - 24.0	0.0
24.1 - 36.7	+0.2
36.8 - 50.0	+0.4

Skiff 2 Raytheon DE 723, #536

"a", "b" and "c" days

2.7 - 4.6	-1.0
4.7 - 6.5	-0.8
6.6 - 8.7	-0.6
8.8 - 11.1	=0.4
11.2 - 13.9	-0.2
14.0 - 16.9	0.0
17.0 - 19.9	+0.2
20.0 - 22.9	+0.4
23.0 - 25.9	+0.6
26.0 - 28.9	+0.8
29.0 - 31.8	+1.0
31.9 - 34.8	+1.2
34.9 - 37.8	+1.4

Raytheon DE 723, #258

"d" day

2.7 - 4.3	-0.6
4.4 - 6.6	-0.4

6.7 - 9.7	-0.2
9.7 - 13.3	0.0
13.4 - 16.5	+0.2
16.6 - 19.5	+0.4
19.6 - 22.3	+0.6
22.4 - 24.8	+0.8
24.9 - 27.3	+1.0
27.4 - 30.0	+1.2
30.1 - 34.5	+1.4
34.6 - 40.8	+1.6
40.9 - 45.0	+1.8

LIST OF SIGNALS

Signal	T-Sheet	Photo
BAG-003	T-11885	65W3220
CAP-106		Capitol Cupola 1927
CAS-107		Caseta 1939
DAY-109		64W3220
DEL-124		64W3221
DUE-182		64W3220
EAT-208		64W3220
FIG-233		64W3220
FSM-275		64W3220
GUT-388		64W3220
MOR-567		Morro Lighthouse 1900
NED-521		64W3221
NEX-529		64W3220
NIK-534		64W3226
POL-664		64W3220
SMU-758		64W3220
TOW-869		64W3220
CAN-105	T-11884	Fort Canuelo 1939
DEM-125		Academy 1964
FRO-276		Front Range Light 1939
GAR-307		64W3219
MOP-566		64W3209
NOW-569		64W3209
PET-628		64W3219
DON-165	T-11888	64W3213
IRV-378		64W3240
IVY-389		64W3212
LOG-463		64W3241
EAR-207		
RUM-785		

FORM 197
(3-16-55)

GEOGRAPHIC NAMES

Survey No. H-8848

Name on Survey	A On Chart No.	B On previous survey No.	C On U. S. quadrangle Maps	D From local information	E On local Maps	F P. O. Guide or Map	G Rand McNally Atlas	H U. S. Light List	K	
Bahia de San Juan										1
Catano										2
Isla de Cabras										3
La Puntilla										4
Puerto Rico (title)										5
Punta Catano										6
Punta del Morro										7
Punta Palo Seco										8
Rio de Bayamon										9
San Juan										10
										11
				Names approved						12
						3-11-66				13
					C. J. Wright					14
										15
										16
										17
										18
										19
										20
										21
										22
										23
										24
										25
										26
										27

FORM C&GS-946
(REV. 3-1-64)
(PRESC. BY HYDROGRAPHIC MANUAL 20-2, 6-94, 7-13)

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
NAUTICAL CHART DIVISION

HYDROGRAPHIC SURVEY STATISTICS

HYDROGRAPHIC SURVEY NO. 8848

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS	
DESCRIPTIVE REPORT	1	OVERLAYS (paper tracing)	1

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						
CAHIERS	/					
VOLUMES	28					
BOXES						

T-SHEET PRINTS *(List)*

SPECIAL REPORTS *(List)*

OFFICE PROCESSING ACTIVITIES

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

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

	BEGINNING DATE	ENDING DATE
PRE-VERIFICATION BY		
VERIFICATION BY		
REVIEW BY		

USCOMM-DC 6641-P64

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

U.S. DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

July 26, 1966

Nautical Chart Division: R. H. Carstens

Plane of reference approved in
26 volumes of sounding records for

HYDROGRAPHIC SHEET 8848

Locality: San Juan Harbor
North Coast of Puerto Rico

Chief of Party: M. T. Paulson (1965)

Plane of reference is mean low water

Tide Station Used (Form C&GS-681):
San Juan, Puerto Rico

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

1.10 feet

Remarks

L.C. Wilmston For
J. M. Lyons

Chief, Tides and Currents Branch

USCOMM-DC 6680-P64

FORM C&GS-946A
(REV. 11-65)
(PRES. BY HYDROGRAPHIC MANUAL, 6-94)

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

VERIFIER'S REPORT

HYDROGRAPHIC SURVEY, H-8848

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		
5. The transfer of contemporary topographic information was carefully examined and reconciled with the hydrography. Remarks Required: -- Discuss remaining differences.		
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		
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.		
Part III - JUNCTIONS		
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 overlapping 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		
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		

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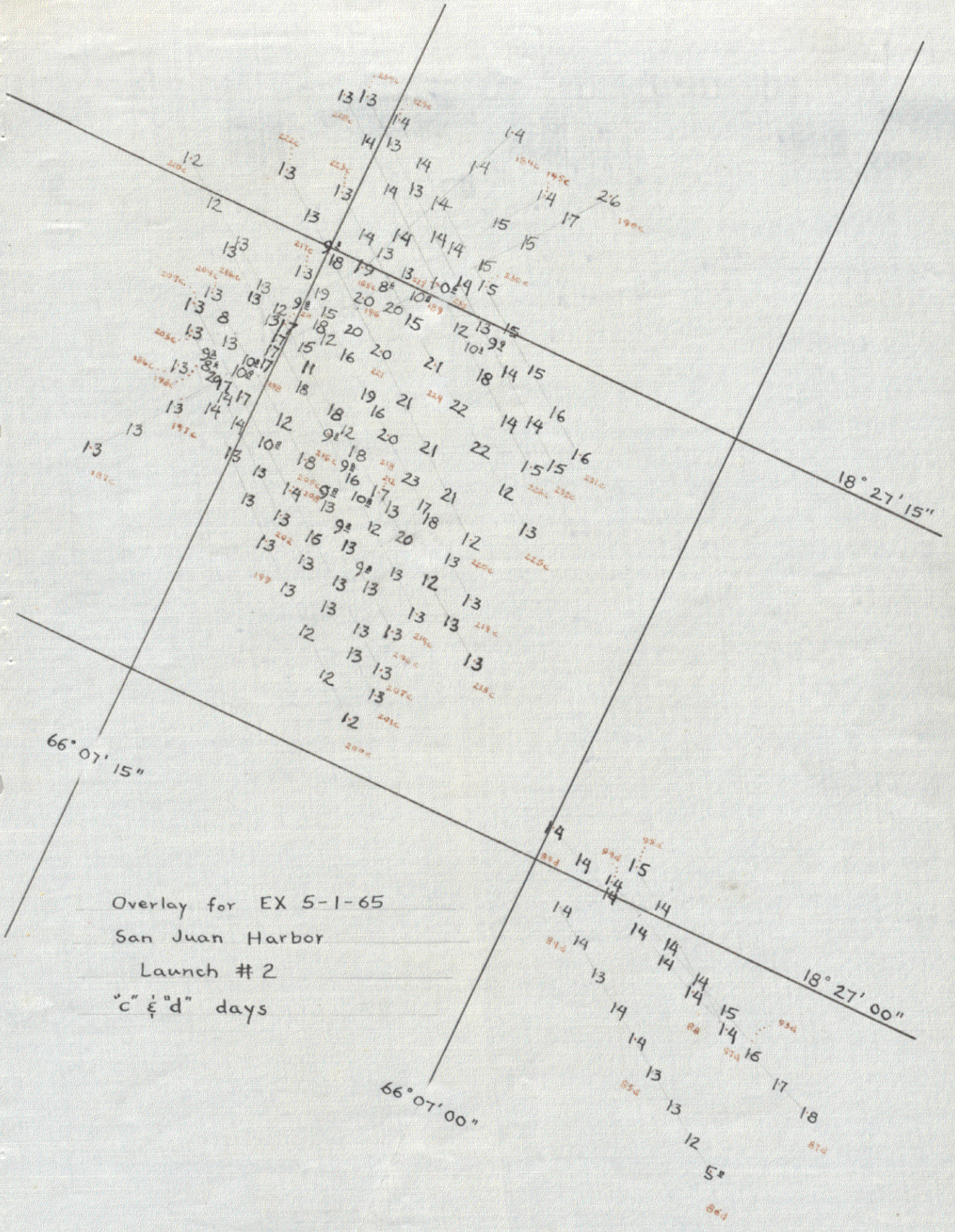
Part V - PROTRACTING (Continued)	CL	R
16. The protracting was satisfactory except as follows: Remarks Required: -- Refers to protracting in general except for specific faults repeated often, or faults in control information, which required considerable replotting or adjustments.		
17. The protractor 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.		
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 excessive conflicts with topographic information.		
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		
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	Date



Overlay for EX 5-1-65
San Juan Harbor
Launch #2
"c" & "d" days

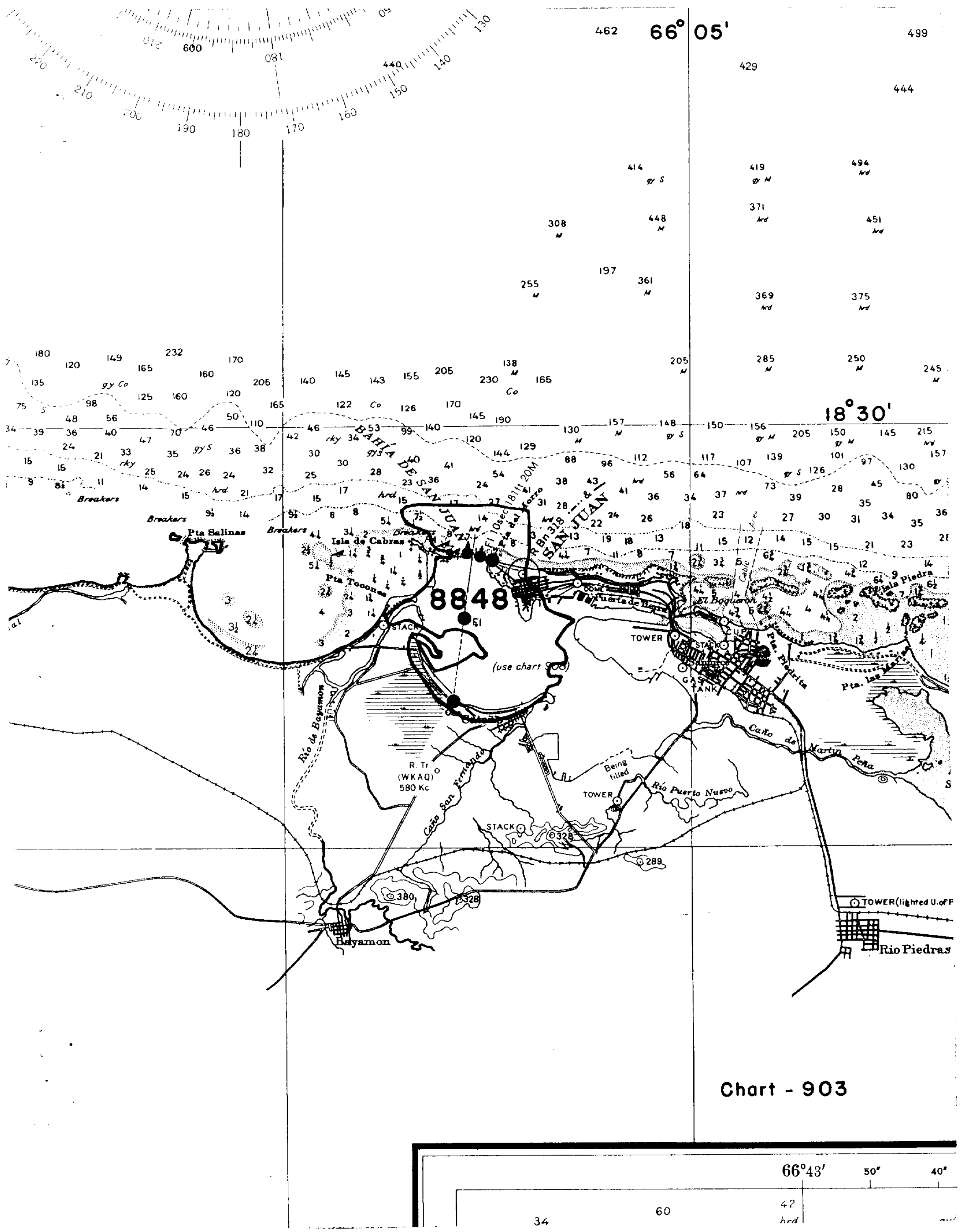

66° 05'
18° 30'
BAHIA DE SAN JUAN
SAN JUAN
8848
(use chart 906)
Isla de Cabras
Pta Salinas
Pta Toconos
Breakers
Puerta de Tierra
El Boqueron
Pta. Piedrita
Pta. las Marias
Isla Piedra
TOWER
STACK
GAS TANK
Caño de Martin Peña
Río Puerto Nuevo
Río de Bayamon
Caño San Fernando
R. Tr. (WKAQ) 580 Kc
Being filled
Bayamon
Rio Piedras
TOWER(lighted U.of P.)
66°43'

Chart - 903

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

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. 8848

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
903	10/20/66	J.A. McMillan	~~Full~~ Part Before ~~After~~ Verification Review Inspection Signed Via
			Drawing No. Critical soundings only thru CHT 908 Aug '65
908	10/12/65	John P. Weis	~~Full~~ Part Before ~~After~~ Verification Review Inspection Signed Via
			Drawing No. Critical soundings only Adequately
908	2/2/78	RJ Sherman	~~Full~~ ~~Part~~ Before After Verification Review Inspection Signed Via
25670			Drawing No. Revised shoaler sdgs only. Consider adequately appld Cat I
25668	9/19/80	B. Fernandez	~~Full~~ ~~Part~~ Before After Verification Review Inspection Signed Via
			Drawing No. Applied thru CHT. 25670
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

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

USCOMM-DC 8558-P63