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RESTRICTED

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Form 504 Rev. Dec. 1933 DEPARTMENT OF COMMERCE U.S. COAST AND GEODETIC SURVEY R. S. PATTON, Director	
DESCRIPTIVE REPORT	
Topographic } <del>Hydrographic</del>	Sheet No. A
State British West Indies	
LOCALITY	
Trinidad	
Carenage Bay	
Point Sinet to Harts Cut	
1930	
CHIEF OF PARTY	
Fred. L. Peacock	

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

REG. NO.

TOPOGRAPHIC TITLE SHEET

The Topographic Sheet should be accompanied by this form,  
filled in as completely as possible, when the sheet is for-  
warded to the Office.

Field No. A

REGISTER NO. **T6770**

State TRINIDAD BRITISH WEST INDIES

General locality CARENAGE BAY

Locality POINT SINET to HARTS CUT

Scale 1:4800 Date of survey Nov. 29 -- Dec. 31, 1940

Vessel Ship Oceanographer

Chief of party Fred L. Peacock

Surveyed by Joseph P. Lushene

Inked by Joseph P. Lushene

Heights in feet above ~~7.3 ft on Carenage Tide Gauge~~  
MHW to ground #####

Contour ##### Interval 5 feet  
##### feet

Instructions dated November 9, 1940, 19

Remarks: \_\_\_\_\_

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## DESCRIPTIVE REPORT

to accompany

T-6770  
TOPOGRAPHIC SURVEY FIELD NO. A

TRINIDAD, BRITISH WEST INDIES

POINT SINET TO HARTS CUT

SURVEYED NOVEMBER - DECEMBER, 1940

Ship OCEANOGRAPHER

FRED. L. PEACOCK

COMMANDING

## I. INSTRUCTIONS:

The topographic survey of the area from Point Sinet to the vicinity of Harts Cut has been designated as Field Sheet No. "A". The survey includes the shore line and all detail to the 100-foot contour except in the valley known as Tucker Valley and of Caño Ventura. The contours and detail of these two valleys was carried to a limit as designated by the master chart supplied by the Navy Department. The work on Field Sheet No. "A" was executed in accordance with modern topographic practice and the Director's Instructions of November 9, 1940. This survey is a special survey of a part of Trinidad in the Caribbean area and the data is for restricted use.

## II. GENERAL DESCRIPTION OF COAST:

Generally, the shore line is low and covered with a thick growth of cocoanut palms, cocoa, and citrus fruits except in the vicinity of Point Sinet. Here the shore rises abruptly, forming high, rocky cliffs.

A short distance from the shore line the mountains rise quite rapidly except in the vicinity of the two large valleys. These valleys extend well into the interior and are bounded by high mountains.

The valley on the eastern side of the sheet is known as Tucker Valley. This valley, to the limits surveyed, is very low and of a swampy nature, cultivated with dwarf cocoanut palms. The

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area bounded on four sides by roads is a grid of ditches forming an elaborate irrigation system controlling the amount of high water that is permitted to flood the area. Practically every tree in this area is bounded on four sides by ditches which supply the necessary irrigation. The five-foot contour was traced out on both sides of this valley and to the extent surveyed, no contour was found to extend across the valley. The east side of Tucker Valley is bounded by high mountains with slopes that afford cultivation. These sides are cultivated with grape fruit and limes. East of the intersection of Tucker Valley Road and the Western Main Road, the slopes are very steep and covered with a dense growth of brush and trees. The western side of the valley is bounded by steep slopes with heavy brush. This valley is a part of the Tucker Valley Estates which forms a very productive coconut and cocoa estate.

The large valley near the western part of the sheet is referred to as Caño Ventura. The width of this valley is about 350 meters at the northern limit and has an easy slope. This area is covered with cocoanut palms, cocoa, and a few citrus trees. Numerous small bamboo huts with straw roofs dot this area. A small village of these huts exists a short distance from the road. Numerous foot paths, too unimportant to chart, cover the area. During the period of the survey no streams were found but a dry creek bed was located and charted as an intermittent stream. This stream is named "Rio de Caño Ventura" and during the rainy season this stream carries considerable runoff from the mountains. The stream can be definitely defined to the main road. Beyond the road the runoff evidently spreads in all directions and seeks the easiest access to the sea. From personal observation and local information the probable drainage has been charted.

West of Station ANCE and south of the Western Main Road a large tidal mud flat exists. This flat has a few scattered mangrove bushes of a foot or two in height. During low tide the area appears to be moist and full of cracks but during high tide it is covered with several inches of water. The symbol for tidal flat was used for charting purposes though the symbol for mud possibly would have been adequate.

The area west of the mud flat and south of the road is covered with a growth of cocoa, citrus fruits, and cocoanut palms. The area rises on an easy grade from the high water line to a height of twenty-five feet at the road. Tall cocoanut palms fringe the shore line. Citrus, cocoa, cocoanut palms, and tropical grass

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exist in such a mixed proportion that it was impossible to attempt to outline the limits of each. The shore line in this vicinity is gradually eroding. Sea walls will be necessary to retard the subsidence of the shore and the natives point out that yearly subsidence of the shore can be noted. In the vicinity of station RIB a sea wall was built to protect a large, substantially-built house from erosion. Just east of Signal YES a string of piles consisting of large poles spaced close together to prevent erosion, exist. These pilings are badly deteriorated and have passed their usefulness. A sea wall 95 meters long, east of Signal CAT holds the swamp intact. This swamp has a concrete drainage ditch running along the western edge. This ditch takes care of the runoff from the steep slope just north of the road, and during other periods the high water backs up into it and floods the swamp, thus preventing breeding of mosquitos and malaria. The steep slopes north of the swamp are covered with limes, cocoa, and pea trees. ✓

The shore line from ANCE to SON is mangrove with a very narrow strip of sand separating the mangrove growth from the mud flats and marsh. This strip of sand is only a few feet in width. ✓

A few houses are situated near the shore between signals TAP and ASP and these houses are substantially built and are not huts or bamboo houses as is generally the case. These houses are open to the elements and are more or less unprotected, hence they are fairly sturdily built. ✓

The shore line from ANCE to SINET is sea-walled, thus preventing erosion of the road. Signal SHE is a pump house of the irrigation system of the cocoanut plantation. It will be noted that a culvert runs from the pump shed to the shore. Just east of Signal HOE an additional culvert projects on which is located a bench mark. Station DAN is located on a small parkway. The sea wall from ANCE to DAN is about three feet above high water and from Signal CAB to SINET it is seven feet above high water. ✓

A second-class road runs from the vicinity of ANCE northward and then eastward to the Tucker Valley Road. The first 300 meters of this road is on the top of a dyke and has an elevation about three feet. This dyke separates the plantation on the east from the mangrove on the west. At a distance of 200 meters along this road an artificial pond exists west of the road, and is a part of the irrigation system. The area just west of the road is covered with thick mangrove and is covered at high tide. Only at low tide can the indication of the river called "Cuesa River" be noted. ✓

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## III. LANDMARKS:

No conspicuous landmarks exist. Two isolated houses, however, appear to be of material aid for bearings to check position of anchorage of a vessel. These two houses are stations TUCKER, 1940 and HUGGINS, 1940. TUCKER, 1940 is the east gable of a lone house at an elevation of 118 feet, and is cream in color with a red roof. No other house is seen in the locality from seaward. HUGGINS, 1940 is the east gable of a lone house at an elevation of 114 feet and is grayish in color with a galvanized iron (gray) roof. No other house is seen in this locality from seaward. Position of TUCKER: Latitude  $10^{\circ} - 41' - 1101.1$  meters. Longitude  $61^{\circ} - 36' - 566.1$  meters. Position of HUGGINS: Latitude  $10^{\circ} - 41' - 369$  meters. Longitude  $61^{\circ} - 36' - 1630.1$  meters.

## IV. CHARACTER OF CONTROL:

The horizontal control was a local breakdown of existing trigonometric survey which had been established by the Lands and Surveys Department of the Colony of Trinidad and Tobago. The numbers that follow the names of the stations are identification numbers of the Lands and Surveys Department. The stations numbered with "1940" are new stations established during the survey of this locality in 1940. The Datum for this triangulation is the Trinidad Trigonometrical Survey Datum. The breakdown of the existing survey was of second order accuracy with a number of supplemental and intersection stations of third order accuracy. The distance and azimuth checks of this party proved the existing local triangulation to be of standard and satisfactory accuracy. Triangulation stations were numerous and three point fixes were available throughout the entire shore line.

The vertical control system was established by Wye and precise leveling from a tide gauge at Carenage Bay where a provisional mean high water datum had been established. The levels were run in both forward and backward directions. In general, a permanent bench mark or temporary bench mark was available within 200 meters of every setup. It is considered that the bench marks were very well distributed.

## V. TRAVERSES.

A traverse was run from Point Sinet to Station ANCE along the Western Main Road. This traverse closed  $1\frac{1}{2}$  meters in length with no error in azimuth. The closing error was very easily adjusted without the necessary field examination or re-run.

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A traverse was run from the junction of Tucker Valley Road and the Western Main Road, along the Tucker Valley Road. This traverse was joined to a traverse run from Station ANCE along a secondary road running northward and then eastward to the Tucker Valley Road. The traverses joined at a point in the road at Latitude  $10^{\circ} - 41' - 30''$  plus 87 meters; Longitude  $61^{\circ} - 36' - 00''$  plus 520 meters. The error for this closed circuit was two meters with no adjustment for azimuth necessary. Later, the station TUCKER was located and this station was tied in to the adjusted intersection of the two traverses and showed no error in distance or azimuth.

The road from Triangulation Station HARTS CUT to ANCE was partially located from the three point fixes on the shore line and by short lengths of traverse where necessary. No adjustment was necessary.

#### VI. SURVEY METHODS.

Standard planetable survey methods were used in locating the shore line, buildings, rocks, hydrographic signals, and other kindred data, with one exception: The houses along the road and north of the road in the dense growth of cocoa<sup>citrus</sup> and cocoanut palms were located with a steel tape, sextant and azimuth compass. In order to expedite the work while waiting for the arrival of instrumental equipment from the Washington office, this method was resorted to. Houses were located from fixed points on the road measuring the offsets with a tape and the direction with sextant and azimuth compass bearings where necessary. This method appeared feasible as the houses in 95% of the cases were bamboo or straw huts and are not exactly permanent in nature.

The scale of the sheet is 1:4800 and great care was exercised in having the table plumbed over the point. The high water line was very well defined but since the rodmen were inexperienced in selecting controlling and important points, numerous rod readings, far greater than necessary, were taken so that a true delineation of the high water line resulted.

In nearly all cases the coast or shore line was surveyed at approximately high tide. Lack of time prevented the topographic party from returning and surveying sections of the shore line at low tide for the delineation of the low water line. The low water line was left to be traced by the hydrographic party. This party traced the low water line by wading and taking sextant fixes at short intervals and critical points. The line as traced by the hydrographic party meets the desired accuracy and it is believed that the topographic party could not improve upon the delineation as shown on the Hydrographic Sheet.



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## VII. CONTOURS:

The contour interval on this sheet is five feet, with every fifth contour drawn slightly heavier than the rest. Numerous elevations were taken and the contours drawn accurately. To a large extent the contours were drawn in the field. Practically no sketching was resorted to and in the event that some of the contours do not strictly adhere to the pattern they show the exact conditions. The large number of elevations taken reduced interpolation to a minimum. In locating the contours there was no deviation from standard planetable methods. In a large part of the area covered by this survey, especially on steep slopes, the terrain was heavily wooded and lanes for planetable traverse had to be cleared. A Cadet Officer and five men were attached to the party clearing lines ahead of the topographer. Many more men would have been needed were it not for the fact that numerous lines had already been cleared by the engineers of the local highway department. The elevations for the contours were computed on the hypsograph with distance and vertical angles for arguments. No vertical angle over 30 degrees was taken.

## VIII. JUNCTIONS:

This sheet joins Sheet Field Number "E." T-6774 The contours on this sheet were not carried beyond the vicinity of Station DIG. It was deemed advisable to take up the contours on Sheet Field No. "E" from that point because the alidade being close to the edge of the board made it difficult to keep the alidade level. A satisfactory junction was made with Sheet Field No. "E." T-6774. Also joins T-6771 on the west.

## IX. GEOGRAPHIC NAMES:

The geographic names that appear on this sheet were taken from maps furnished this party by the Lands and Surveys Department of Trinidad and Tobago, British West Indies, and are well-established local names.

## X. RIVERS AND STREAMS:

Most of the streams were dry during the period of the survey and they have been charted as intermittent streams. The only river noted was the Cuesa River. The source of the river is a series of drainage ditches of the irrigation area of the cocoanut plantation. During high tide the water backs up into the river and feeds the



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numerous ditches. It is believed that this river is an intermittent stream as far as runoff is concerned but due to the low elevation the tide backs up, extending into the interior and flooding the drainage ditches, and during low tide the water runs back to sea again. The amount of water in the river is governed by the stage of the tide.

#### XI. ROCKS:

Several sunken rocks were noted immediately off the seawall at Point Sinet.

A rocky ledge and outcropping of rock exists in the vicinity of ANCE. The ledge is confined to an area ten meters wide and thirty-eight meters long. Three high points of the ledge extend above the high water. Station ANCE is located on the inshore high point with an elevation of two feet above high water. The remaining two high points have an elevation of three feet and five feet as shown on the Sheet.

#### XII. ROADS:

The Tucker Valley Road and the Western Main Road are paved asphalt roads and kept in excellent condition by the maintenance department.

All other roads are second-class roads and unpaved. Under dry conditions a car can be driven over them, though, in most cases, they are too narrow for two cars to pass.

#### XIII. DESCRIPTION OF AREA COVERED BY CONTOURS:

Where the contours are spaced close together, the vegetation was omitted as it was considered that the contours were more important. Notes have been noted on the sheet describing the area. Where the note "heavily wooded" appears, the trees are of a broad leaf variety. The trees are accompanied by thick underbrush which is usually entangled with a mass of vines, making clearing and walking rather difficult. The note "open field" refers to a grassy area. The other notes are self-explanatory.

#### XIV. ELEVATIONS:

Numerous elevations have been taken and it was deemed not advisable to ink in all elevations and obscure the contours. Elevations were inked in where possible. Since all elevations

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are not shown on the sheet, an overlay on tracing cloth showing every elevation obtained was made as an original record. The overlay accompanies this sheet. Overlay attached to this report. ✓

All elevations are referred to 7.3 feet on the Carenage Bay Tide Gauge Staff which is 0.5 feet higher than the high water datum furnished by the Washington Office. (See tide report for explanation). Disregard  $\frac{1}{2}$  ft. difference and consider reference plane as M.H.W. ✓

#### XV. LIST OF PLANETABLE POSITIONS:

The only marked hydrographic station located by intersection during triangulation, is RIB. The latitude is  $10^{\circ}-41'$  - 1441.5 meters. Longitude,  $61^{\circ}-36'$  - 1757.2 meters. ✓

#### XVI. MAGNETIC MERIDIANS:

The magnetic meridians shown on this sheet were taken with the declinoire of alidade number 210. The observed magnetic meridian at Station POINT SINET, 1940 is  $6^{\circ}-39.7'$  and at Station RIB, 1940 is  $6^{\circ}-51.4'$ . A pipe guard rail at the edge of the road at POINT SINET may have affected the reading of the declinoire. This station is not deemed to be a desirable station for magnetic observations. Charted value  $7^{\circ}20' W.$

The index correction for the declinoire was determined at Magnetic Station Fort Storey at Norfolk, Virginia on February 13, 1941. The corrections to the above observed values will be taken up in a report on magnetics by Lieutenant C. D. Meaney. —

#### XVII. CHARACTER OF MARSHES AND MANGROVE AND EXTENT COVERED AT HIGH WATER.

The mangrove area north of ANCE is covered with about one to two feet of water at high tide. ✓

The mangrove area southwest of ANCE is covered with one to two feet of water at low tide. ✓

The swamp area north of TAP is covered with about two inches of water during high tide and heavy rain. ✓

The marsh north of BID is an ordinary swamp area with low spots and ditches filled with water. During high tide or a heavy rainfall, the area is covered with about three inches of water. ✓

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The light line around the mangrove symbols on this sheet defines the outer limits of vegetation visible at mean high water. The mean high water line (intersection of the plane of mean high water with the ground) is shown only on fast land and is represented by a solid line. ✓

## XVIII. STATISTICS:

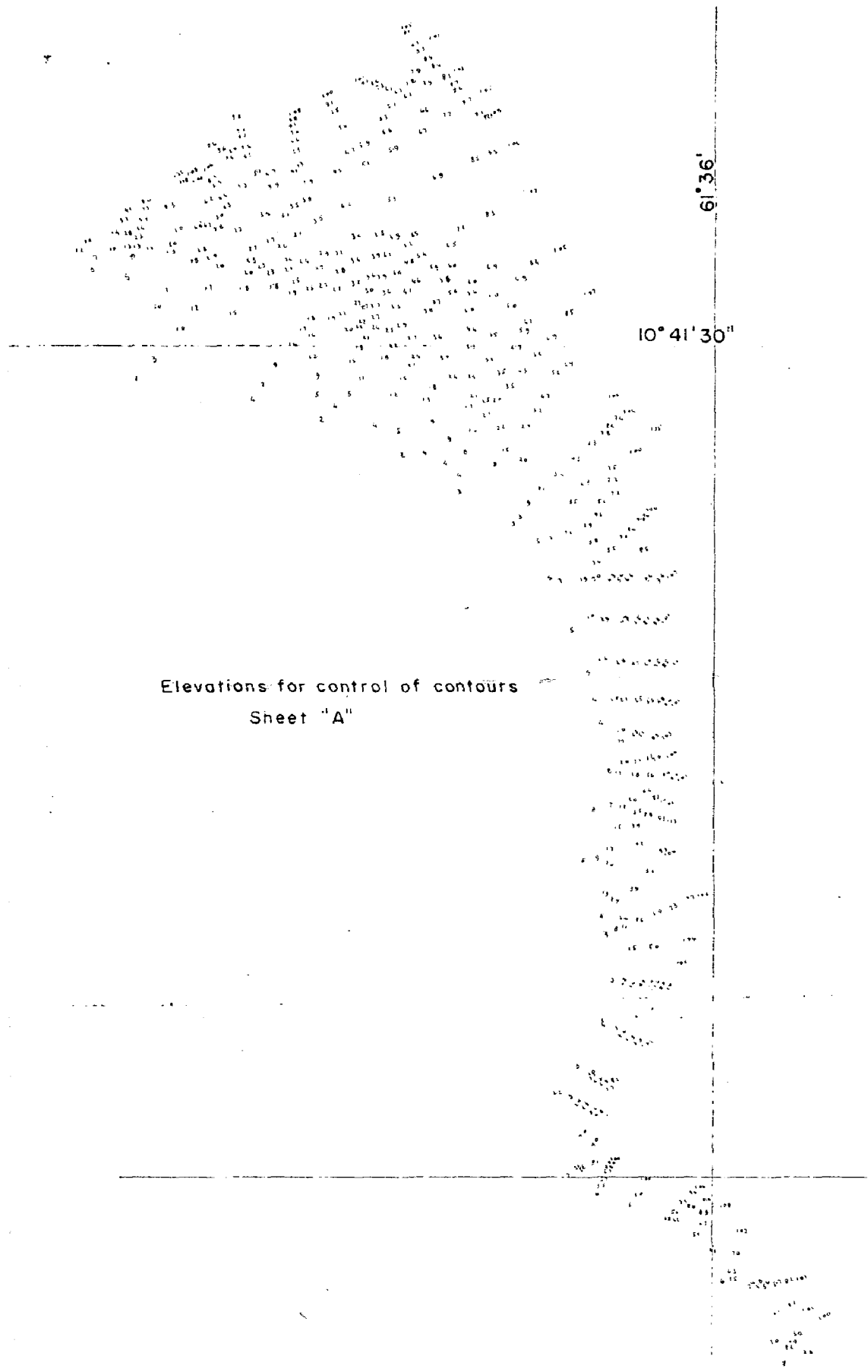
Miles of shore line.....	2.4 miles
Miles of first-class road.....	3.2 miles
Miles of second-class road.....	1.8 miles
Miles of trails.....	0.5 miles
Miles of creeks and streams.....	0.8 miles
Area.....	0.59 sq. mi.
Number of elevations.....	1326

Respectfully submitted,

*Joseph P. Lushene*  
Joseph P. Lushene,  
Jr. H&G Engineer.

Approved and forwarded:

*Fred. L. Peacock*  
Fred. L. Peacock,  
Chief of Party, C&GS.

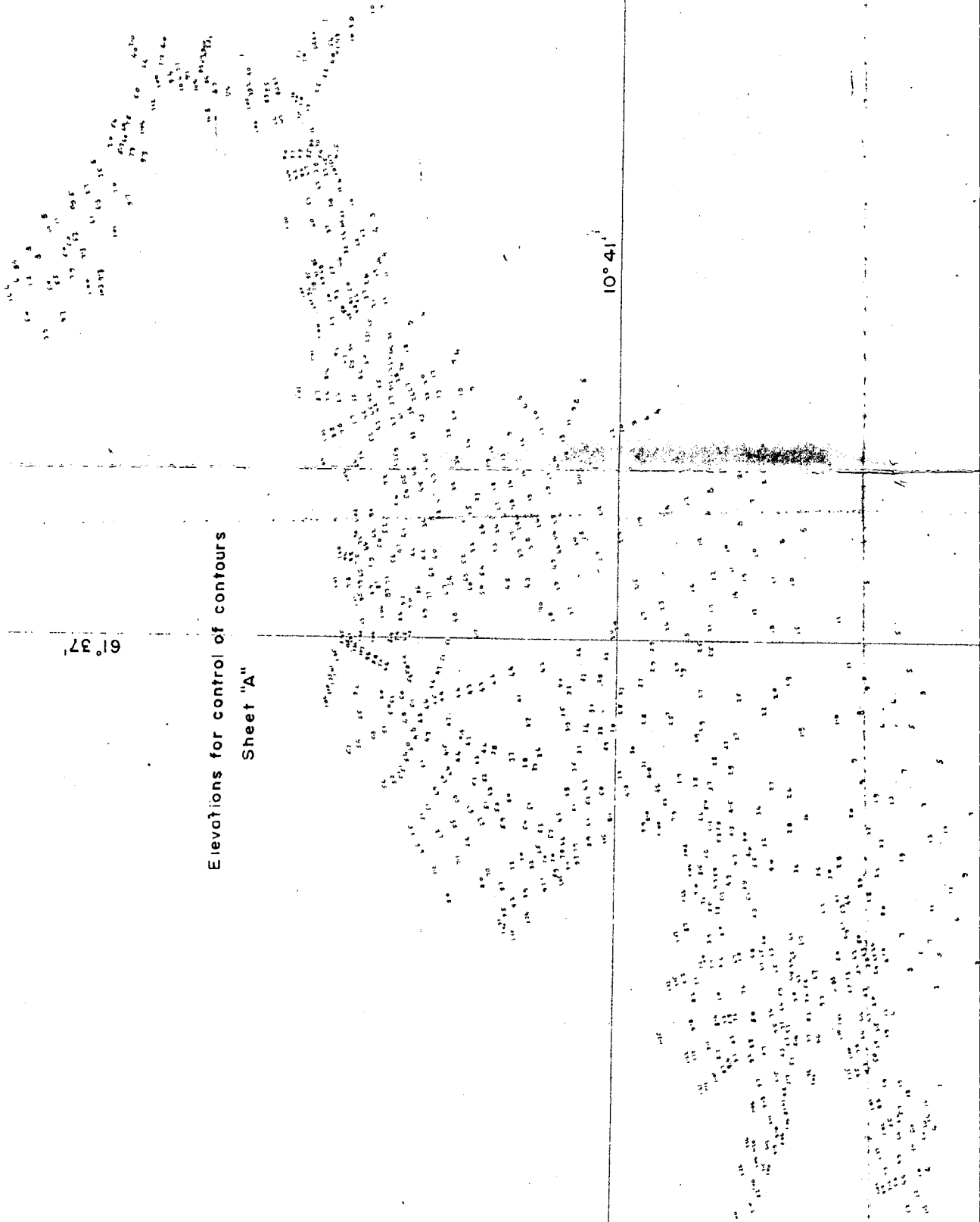


Elevations for control of contours  
Sheet "A"

61° 37'

Elevations for control of contours  
Sheet "A"

10° 41'



## DIVISION OF CHARTS

## SURVEYS SECTION

REVIEW OF TOPOGRAPHIC SURVEY NO. 6770 (1940) FIELD NO. A

Trinidad, B.W.I.; Carenage Bay;

Point Sinet to Harts Cut

Surveyed in November - December 1940, Scale 1:4,800

Instructions dated November 9, 1940 (OCEANOGRAPHER)

Plane Table SurveyAluminum Mounted

Chief of Party - F. L. Peacock

Surveyed and inked by - J. P. Lushene

Reviewed by - J. A. McCormick, June 19, 1941

Inspected by - H. R. Edmonston

1. Junctions with Contemporary Surveys

Excellent junctions were effected with T-6771 (1940-41) and T-6774 (1941) on the west. The project ends at the eastern limits of the present survey.

2. Comparison with Prior Surveys

Prior surveys of this area are of British origin and copies are not available in this office.

3. Comparison with H.O. Chart 2115 (Corrected to Jan. 1941)

Charted shoreline is, for the most part, in fair agreement with that of the survey. High water line in the vicinity of Point Sinet appears to have receded about 35 meters and there are now extensive tidal flats in Lat.  $10^{\circ} 41.1'$ , Long.  $61^{\circ} 36.7'$  where the chart shows fast ground. Topography charted inland bears a close resemblance to the present survey but there are numerous differences of interpretation and position. Traverse closures on the present survey indicate a satisfactory degree of accuracy.

4. Condition of Survey

Not all of the elevations obtained on the survey have been inked on the aluminum mounted sheet (Descriptive Report, pages 7 and 8, Elevations). An overlay tracing showing every elevation determined is attached to the Descriptive Report.

5. Compliance with Instructions for the Project

Excellent.

6. Additional Field Work Recommended

None.

Examined and approved:



Chief, Surveys Section



Chief, Division of Charts



Chief, Section of Hydrography



Chief, Division of Coastal  
Surveys