

# 6580

Form 504  
Rev. April 1935

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

## DESCRIPTIVE REPORT

Topographic }  
Hydrographic } Sheet No. H-6580  
Field No. 4040

U. S. COAST & GEODETIC SURVEY  
LIBRARY AND ARCHIVES

SEP 24 1941

Acc. No. ....

State Alaska

### LOCALITY

Gulf of Alaska

40 miles off Lituya Bay

193/40

### CHIEF OF PARTY

Ray L. Schoppe & Robert W. Knox

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

REG. NO. H6580

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.

Field No. 4040

REGISTER NO. H-6580

State Alaska

General locality Gulf of Alaska

Locality 40 miles off Lituya Bay

Scale 1:40,000 Date of survey July 11 - Aug. 18, 1940

Vessel SURVEYOR

Chief of Party Ray L. Schoppe - R. W. Knox

Surveyed by RLS - GAN - JCP

Protracted by R. H. Woodcock

Soundings penciled by R. H. Woodcock

Soundings in fathoms ~~1000~~

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by

Inked by *[Signature]*

Verified by *[Signature]*

Instructions dated Feb. 2, 1940

Remarks: Smooth sheet and plotting by Seattle

Processing Office

DESCRIPTIVE REPORT

to accompany

Hydrographic Sheets H-6579 and H-6580

U.S.C. & G.S.S. SURVEYOR

1940 Season

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The remarks in this report apply to sheet H-6579, scale 1-200,000, and to sheet H-6580, scale 1-40,000, an offshore sheet with visual fixes plotted on arcs of circles passing through signals beyond the limits of H-6580.

A copy of the report is prepared to accompany each sheet.

AUTHORITY

These surveys were made under the Director's instructions of February 2, 1940.

LOCALITY

Gulf of Alaska, 20 to 70 miles offshore between Lituya Bay and Dry Bay.

JUNCTIONS

H-6579 joins H-6581 on the northeast, and H-4643 and H-4645 on the east.

H-6580 is surrounded by H-6579, and joins H-4643.

METHOD OF SURVEY

Fathometer soundings on lines controlled by visual fixes on mountain peaks and natural features at 30 - 80 miles distance (some distances approximate 130 miles) and bomb locations. The

outer ends of several lines are on dead reckoning for short distances.

### CONTROL

The triangulation stations used for signals, all mountain peaks, are derived from two sources: south of Mt. Fairweather they are from the observations of this survey; north of that peak, from the triangulation of the International Boundary Commission. The latter have been reduced to the N.A. 1927 datum through a point connection on Mt. Fairweather. Two stations, "Seven" and "Nine", had not previously been adjusted to this datum but were so reduced by Mr. Jesse Hill of the International Boundary Commission. <sup>\*</sup> The computation is included with this report. *For a complete discussion of this subject, see descriptive report of H-6681 (1940)*

with H-6581 (1940)

Stations "Island" and "Pap" (topographic) were transferred from the photostat of the 1926 survey of Comdr. A. M. Sobieralski. Stations "Bear", "Newt" and "Black" from the same source were determined by triangulation during the 1940 season.

It was found that poor results were obtained in plotting cuts unless the angles of the fix and objects cut in were reduced to the horizontal by the method shown in the Hydrographic Manual. (Errata and Addenda Sheet IIb). Most of such angles have been corrected and it is recommended that it be done in all cases involving cuts. Should the vertical angles fail to be recorded, they may be closely approximated by use of table 10 of the American Practical Navigator.

SONO-BUOYS

Eleven sono-buoys were planted, all but one, "Good", being located by the mathematical solution of the three-point problem. Of the ten so located, eight were determined by strong fixes, and two, "Item" and "Fox", by weak fixes. Buoy "Good" was bombed in from buoys "Bob", "Dog" and "Item". Neither buoy "Item" nor buoy "Good" was used extensively but principally in an attempt to develop the shoal on the southwest corner of the sheet.

The positions of most of the buoys were determined from four mountain peaks. This method was used both as an attempt to strengthen the positions and to detect, if possible, any discrepancy in azimuth and/or distance between the two groups of mountain peaks mentioned above. With the exception of buoy "Item", the average change to the observed sextant angles necessary to satisfy the added condition in the computation was less than one minute. \* All computations are included with this report.

with H-6581  
(1740)

By reason of the above and because of careful rounds of angles taken at various times during the early part of the season, it is believed the positions of the peaks are sufficiently accurate for all hydrographic purposes.

Buoy "John" was thought to have changed position between "UU" and "VV" days as the bomb distances did not check visual fixes. A new position of the buoy, called "John 2", was determined and used during the remainder of the season. When the buoy was recovered on September 23rd it was found to be on its original station. The second position of the buoy should be disregarded.

incl.?

The preliminary and final positions of buoy "Tex" are substantially different; hence the boat and smooth sheet positions will not agree.

ERROR IN BOAT SHEET, N-6579 (1740)

After considerable hydrography had been plotted on the original boat sheet it was found that the projection had been constructed in error - only half the curvature having been applied. All positions, both visual and R.A.R., were replotted on the second projection.

VELOCITY OF SOUND IN SEA WATER

This has been made the subject of a separate report and was computed to be 1473.3 meters per second for the whole season over the entire area.

1480.2  
1479.7

FURTHER WORK

A further development of the sheet in the southwest portion of the sheet is recommended. This area cannot be successfully bombed owing to the broken bottom, hence it should be developed during the first part of next season when the peaks are generally clear. A 1:40,000 projection with circular arcs thereon (N-6580) (1740) was constructed, but the party was able to see the required peaks but a portion of one day after the sheet had been constructed. Several "cartwheels" were run around buoys planted near or on the shallower depths. It is recommended that the boat sheet be returned to the party for further use.

ADDITIONAL NOTES BY SEATTLE PROCESSING OFFICE

Sheets H-6579<sup>(1940)</sup> and H-6580<sup>(1940)</sup>

SCHO-BUOY "FOX"

The three-point position computed for this buoy depends on angles of  $10^{\circ} 21' 45''$  and  $21^{\circ} 30' 15''$  observed upon mountain peaks fifty to sixty miles distant.

In Bomb Record No. 1, page 50, six bomb positions were also obtained for "Fox". The average distances (plotted from "Bob" and "Dog" intersect 535 meters on azimuth  $155^{\circ}$  from the computed position.

When plotting bomb positions depending on "Fox", it was observed that the arc centered on "Fox" consistently passed to northwestward of the other intersections by a distance approximating that between the computed three-point and the bomb positions of "Fox".

About 70 positions involving buoys "Easy", "Bob", "Dog" and "Fox", were tested on FF, GG, HH and JJ days. The positions lay to eastward, northward and westward of "Fox". In all but two positions so plotted the intersections support the bomb position of "Fox". This position was then accepted and used in plotting.

On sheet H-6580<sup>(1940)</sup>, where the soundings were already completed, the position of the buoy was shifted to agree with H-6579<sup>(1940)</sup> and the work replotted.

SCHO-BUOY "GOOD"

This buoy, which was located by bombs on H-6579<sup>(1940)</sup>, was scaled and transferred to H-6580<sup>(1940)</sup>.

PROCESSING OFFICE NOTES - Sheet H-6580 (1740)

The positions in the "cartwheels" around the sono-buoys depend on course and speed from the buoy. The gyro courses have a correction of -2°. The distance per turn of the wheel was determined from two runs on sheet H-6579<sup>(1740)</sup> where good positions were obtained, together with revolution counter readings.

N.B.  
✓

| Day Sheet | Time | Rev. Counter | Log Miles | Scaled dist. Meters | Meters per turn of wheel | RPM  | Average meters per turn |
|-----------|------|--------------|-----------|---------------------|--------------------------|------|-------------------------|
| 1W        | 4:39 | 389250       | 76.7      |                     |                          |      |                         |
| 8W        | 6:11 | 397429       | 90.4      |                     |                          |      |                         |
|           | 1:32 | 8179         | 13.7      | 24150               | 2.95                     | 88.8 |                         |
| 14JJ      | 1:26 | 799800       | 61.22     |                     |                          |      |                         |
| 25JJ      | 3:26 | 810740       | 80.27     |                     |                          |      |                         |
|           | 2:00 | 10940        | 19.05     | 35200               | 3.22                     | 91.2 | 3.08                    |

The positions from the buoy out to the end of the line and return to the buoy were adjusted where necessary.

RECORDS

H-6580<sup>(1740)</sup> was prepared to develop on larger scale part of H-6579<sup>(1740)</sup>.

The soundings were all included in the series of records for that sheet. They were copied into two volumes by the Seattle Processing Office, after plotting had been done from the original records.

The original sources in sounding volumes for H-6579<sup>(1740)</sup> are cited below:

Around sono-buoy "Item":

|                         |                          |
|-------------------------|--------------------------|
| Pos. 1TT to 47TT incl.  | Vol. 13 of H-6579 (1740) |
| Pos. 48TT to 61TT incl. | Vol. 14 "                |



Around marker buoy "Good":

Pos. 26MM to 67MM incl. Vol. 11 of H-6579 (1940)

Around sono-buoy "Fox":

Pos. 36RR to 46RR incl. Vol. 12 of H-6579 (1940)  
Pos. 47RR to 92RR incl. Vol. 13 "

Around sono-buoy "High":

Pos. 61NN to 76NN incl. Vol. 12 of H-6579 (1940)  
Pos. 47PP to 58PP incl. " "  
Pos. 1RR to 35RR incl. " "  
Pos. 1UU to 20UU incl. Vol. 14 "

Pos. 29X to 63X incl. Vols. 5 & 6, H-6579. (1940)

In plotting the curves of equal angles on H-6580<sup>(1940)</sup> the method described in the Field Engineer's Bulletin for December 1935, page 43, was used. Curves used only on ~~part of~~ X day See 1st par. page 7.

Points on circles passing through NINE - LAST were assumed and designated "A" on the east edge of the sheet and "B" along the west edge of the sheet. Points on circles passing through NINE - AYLESWORTH were assumed and designated "C" along the north side of the sheet and "D" along the south side.

Inverse computations were made between LAST - NINE and NINE - AYLESWORTH.

The triangle sides for the points A, B, C, D were computed, for circles 2° apart for A - B arcs and 3° apart for C - D arcs.

Geographic positions were computed for the points A, B, C, D, 28 in all.

These A, B, C, D points were then plotted and the curves drawn by protractor method.

Then a graph was prepared to give the distances along the arcs (centered on one set of signals) between the intersecting arcs from the other set of signals. The distances read from the graph were scaled along the already drawn arcs to give the intersections with the crossing arcs of the interpolated circles. The interpolated circles were drawn through these points with a spline.

Comment:

The protractor method is enormously laborious and time consuming. Since there are no accurate pencil or pen centers provided to fit protractors it is doubted that any accuracy superior to the beam compass method is actually achieved. It is our own belief that the curves can better be laid out with beam compass even if the drafting room floor is required for drawing board space.

N.B.



Geo. L. Bean  
Officer in Charge  
Seattle Processing Office

STATISTICS - Sheet H-6580(1940)

|   |      |
|---|------|
| Statute miles of sounding lines . . . . . | 368  |
| Number of soundings, Fathometer . . . . . | 3590 |
| "          "      , wire . . . . .        | 6    |
| Number of positions . . . . .             | 272  |
| Area in square statute miles. . . . .     | 54   |

## APPROVAL OF CHIEF OF PARTY

Hydrographic sheet H-6580 (field 4040) and accompanying records have been inspected and approved by me.

The field work was accomplished under the direction of Lieut. Comdr. R. L. Schoppe and myself. No additional work is considered necessary on the development accomplished. It was desired to develop the broken bottom of this vicinity on this enlarged scale, but lack of visibility necessitated the running of cart wheels over only the more shoal indications. The verification and review of sheet H-6579 (1940), within which the sheet under discussion entirely falls, will undoubtedly recommend additional work on the enlarged sheet, and for this purpose the boat sheet of 6580 should be returned to the field party, as the computations and labor required to construct an arc sheet of this type are enormous.

  
H. & G. Engineer

TIDAL NOTE

Sheet H-6580(1940)

Tides recorded by the standard gage at Yakutat were used for reducing all soundings on this sheet.

Yakutat Tide Station:

Latitude . . . . . 59° 32.8'  
Longitude. . . . . 139° 44.1'  
Length of series . . April 24 to Sept. 23, 1940  
M.L.L.W. on staff. . . . . 3.4 feet  
Highest tide recorded, May 22, 1940. .15.3 feet  
Lowest tide recorded, June 21, 1940. . 0.8 feet

R.A.P.  
H.P.C.

TIDE NOTE FOR HYDROGRAPHIC SHEET

October 17, 1941.

~~Division of Hydrography and Topography:~~

✓ Division of Charts:                      Attention: Mr. H. R. Edmonston

Plane of reference approved in  
2 volumes of sounding records for

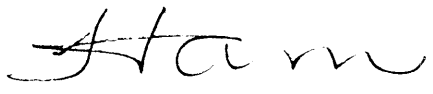
HYDROGRAPHIC SHEET 6580

Locality 40 miles off Lituya Bay, Gulf of Alaska

Chief of Party: R. L. Schoppe in 1940  
Plane of reference is mean lower low water reading  
3.4 ft. on tide staff at Yakutat  
28.2 ft. below B. M. 1

Height of mean high water above plane of reference is 9.2 ft.

Condition of records satisfactory except as noted below:



Acting Chief, Division of Tides and Currents.

GEOGRAPHIC NAMES

Survey No. **H6580**

| Name on Survey                 | Source                |                                 |                                   |                                 |                     |                          |                          |                        |   |  |    |
|--------------------------------|-----------------------|---------------------------------|-----------------------------------|---------------------------------|---------------------|--------------------------|--------------------------|------------------------|---|--|----|
|                                | A,<br>On Chart<br>No. | B,<br>On previous survey<br>No. | C,<br>On U. S. Quadrangle<br>Maps | D,<br>From local<br>information | E,<br>On local Maps | F,<br>P. O. Guide or Map | G,<br>Rand McNally Atlas | H,<br>U. S. Light List | K |  |    |
| <u>Gulf of Alaska</u>          |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 1  |
| <u>Lituya Bay (title only)</u> |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 2  |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 3  |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 4  |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 5  |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 6  |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 7  |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 8  |
| <u>Yakutat</u>                 |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 9  |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 10 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 11 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 12 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 13 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 14 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 15 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 16 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 17 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 18 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 19 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 20 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 21 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 22 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 23 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 24 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 25 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 26 |
|                                |                       |                                 |                                   |                                 |                     |                          |                          |                        |   |  | 27 |

*Names O.K.  
for title  
J.A.M.*

Remarks

Decisions

|    | Remarks                | Decisions |
|----|------------------------|-----------|
| 1  |                        |           |
| 2  |                        |           |
| 3  |                        |           |
| 4  |                        |           |
| 5  |                        |           |
| 6  |                        |           |
| 7  |                        |           |
| 8  |                        |           |
| 9  | Location of tide staff |           |
| 10 |                        |           |
| 11 |                        |           |
| 12 |                        |           |
| 13 |                        |           |
| 14 |                        |           |
| 15 |                        |           |
| 16 |                        |           |
| 17 |                        |           |
| 18 |                        |           |
| 19 |                        |           |
| 20 |                        |           |
| 21 |                        |           |
| 22 |                        |           |
| 23 |                        |           |
| 24 |                        |           |
| 25 |                        |           |
| 26 |                        |           |
| 27 |                        |           |



Surveys Section (Chart Division)

HYDROGRAPHIC SURVEY NO. **H6580**

Records accompanying survey:

Boat sheets ~~one~~; sounding vols. <sup>(2)</sup>....; wire drag vols. ....;  
 bomb vols. ....; graphic recorder rolls .....;  
 special reports, etc. ...Computation of data for curves.(Filed as a...  
 ....cahier with this survey).....

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

|   |            |
|---|------------|
| Number of positions on sheet                            | 277.       |
| Number of positions checked                             | ..46.      |
| Number of positions revised                             | ..3..      |
| Number of soundings recorded                            | 3596       |
| Number of soundings revised<br>(refers to depth only)   | ..11..     |
| Number of soundings erroneously<br>spaced               | 30         |
| Number of signals erroneously<br>plotted or transferred | ..0..      |
| Topographic details                                     | Time ..... |
| Junctions   | Time ..... |
| Verification of soundings from<br>graphic record        | Time ..... |

Verification by *G. B. [Signature]*.....Total time 2.5 hrs Date 1/28/42

Review by *J. A. McCormick*..... Time 6 hrs Date 1/28/42

# MEMORANDUM IMMEDIATE ATTENTION

SURVEY  
DESCRIPTIVE REPORT  
~~PHOTOSTAT OF~~

No. H **H6580**  
~~No. H~~

{ received Sept. 25, 1941  
registered Oct. 15, 1941  
verified  
reviewed  
approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

| ROUTE |  | Initial | Attention called to |
|-------|--|---------|---------------------|
| 20    |  |         |                     |
| 22    |  |         |                     |
| 24    |  |         |                     |
| 25    |  |         |                     |
| 26    |  |         |                     |
| 30    |  |         |                     |
| 40    |  |         |                     |
| 62    |  |         |                     |
| 63    |  |         |                     |
| 82    |  |         |                     |
| 83    |  |         |                     |
| 88    |  |         |                     |
| 90    |  |         |                     |
|       |  |         |                     |
|       |  |         |                     |

RETURN TO

|    |            |
|----|------------|
| 82 | R. W. Knox |
|----|------------|

*Paul*

DIVISION OF CHARTS

SURVEYS SECTION

REVIEW OF HYDROGRAPHIC SURVEY

REGISTER NO. 6580

FIELD NO. 4040

Alaska; Gulf of Alaska; Forty Miles off Lituya Bay  
Surveyed in July - August 1940, Scale 1:40,000  
Instructions dated February 2, 1940 (SURVEYOR)

Soundings: Fathometer

Control: Sextant fixes on shore  
signals; dead reckoning and  
bearings on buoys

Chief of Party - R. L. Schoppe, R. W. Knox  
Surveyed by - R. L. Schoppe, G. A. Nelson  
Protracted by - R. H. Woodcock  
Soundings plotted by - R. H. Woodcock  
Verified and inked by - G. B. Littlepage  
Reviewed by - J. A. McCormick, January 28, 1942  
Inspected by - H. R. Edmonston

1. Control

Some of the work was controlled by sextant fixes on distant shore signals and plotted by loci of angles. For the most part, short dead reckoning lines were run from R.A.R. buoys and supplemented by bearings to the buoys.

2. Sounding Line Crossings

Satisfactory.

3. Depth Curves

Depth curves cannot be completely drawn until the junction is made with H-6579 (1940).

4. Adjoining Surveys

Developments on the present survey fall entirely within the limits of H-6579 (1940). Agreement of the two surveys will be discussed in the review of H-6579. Casual inspection of the unfinished H-6579 reveals no serious differences.

5. Previous Surveys

H-4643 (1926), 1:200,000

This survey is on a much smaller scale than that of the present and does not attain the detail of the latter. General depths on the two surveys are in fair agreement.

6. Comparison with Chart 8002 (New Print of 9-18-1941)

Most of the depths charted in this area are from H-4643. Some are from track-line surveys. The 13 charted in Lat.  $58^{\circ}22.0'$ , Long.  $138^{\circ}43.0'$  results from Chart Letter 505 of 1940 which is an advance report of the 13-fm. depth found 3 miles to the southeast on the present survey. The Chart Letter gave the correct position.

7. Compliance with Project Instructions

Satisfactory.


8. Additional Field Work Recommended

None on developments accomplished. Other developments may be recommended in the review of H-6579 (1940).

9. Superseded Surveys


H-4643 in part.

Examined and approved:

  
Chief, Surveys Section

  
Chief, Division of Charts

  
Chief, Section of Hydrography

  
Chief, Division of Coastal Surveys



applied to drawing of Chart 8002 - Apr. 8, 1942 - J.W.