

7704

Diag. Cht. No. 5530

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. BO-1447 Office No. H-7704

LOCALITY

State CALIFORNIA

General locality SAN FRANCISCO BAY

Locality RICHARDSON BAY & RACCON STRAIT

194 g.

CHIEF OF PARTY

W. M. Gibson

LIBRARY & ARCHIVES

DATE Jan. 12, 1950.

B-1870-1 (1)

7704

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

REG. NO. H-7704

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-7704 (1948)

Field No. Bo-1447

State CALIFORNIA

General locality SAN FRANCISCO BAY

Locality RICHARDSON BAY AND RACCOON STRAIT

Scale 1: 10,000 ✓ Date of survey 28 Mar. to 16 Sept. 1948

Instructions dated 16 Nov. 1940 and Supplemental Instructions 24 Apr. 1947

Vessel BOWIE

Chief of party W.M. GIBSON

Surveyed by R.A. MARSHALL, P.A. WEBER, L.F. WOODCOCK

Soundings taken by fathometer, ~~graphic recorder~~, hand lead, ~~wire & pole~~

Protracted by Robert F. Carr

Soundings penciled by Robert F. Carr & W.W. Feazel

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

REMARKS:

DESCRIPTIVE REPORT

to accompany

HYDROGRAPHIC SHEET

(Field No. BO 1447) H-7704(1948)

Survey of Richardson Bay, Raccoon Strait, Angel Island (inshore) in San Francisco Bay, California during the 1948 field season by personnel of Ship BOWIE, W. M. Gibson, Chief of Party.

A. PROJECT:

The survey was executed in accordance with the Director's instructions dated 16 November 1940, supplemental instructions dated 24 April 1947 for this project No. CS - 256.

B. SURVEY LIMITS AND DATES:

This survey covers the inshore hydrography ^{around} ~~about~~ Angel Island, extending from 1/4 to 1/2 mile off the beach on the east, south and north sides of the Island; Raccoon Strait and Richardson Bay.

The work on this ^{H-7619(1947)} sheet makes a junction with Sheet BO - 1347 to the southward; BO - 1147 to the eastward; BO - 1148 on the north-easterly corner and BO - 1247 to the northward. ^{H-7621(1947)} ^{H-7705(1948)} ^{H-7620(1947)}

Review,
par. 4.

Hydrography was commenced on 29 March 1948 and final work done 16 September 1948.

C. VESSEL AND EQUIPMENT:

The Ship BOWIE and ships launches (Nos. 113, 133 and dinghy) were used on this survey. The launches and dinghy operated from the ship throughout the field season. The BOWIE was used on hydrography in Raccoon Strait and in the deep water about Angel Island. The launches were operated on the inshore work in Raccoon Strait and about Angel Island. In Richardson Bay, the launch was used over about 80% of the area. For shallower area in the northwestern end of the bay, a dinghy and 10 foot sounding pole was utilized to complete the survey. Fathometer 808 J type, Serial Nos. S - 111 and S - 112, were used successfully throughout the season.

D. TIDE AND CURRENT STATIONS:

The data from two tide stations were used to reduce the soundings on this sheet.

The 1948 Tide Tables indicate an average correction between the east and west sides of Angel Island of + 17 minutes to Fort Point values as received from the Washington Office or by actual tide staff readings at Fort Point. MLLW datum for the Fort Point standard gage records was taken as 5.55 feet and MLLW datum for direct staff readings was taken as 2.0 feet.

On 8 June, it was noted that the portable tide gage at Marinship, Sausalito, gave practically the same results as adding 17 minutes to Fort Point. Thereafter, the Sausalito tides were used for reducing soundings without correction for time or height. MLLW at Sausalito was taken as 2.3 feet on the staff. The 105th Meridian time was used for all tide and hydrographic records, except the Fort Point standard tide gage which operates on 120th Meridian time. "v" day is on the 120th Meridian time. When the Fort Point staff was read direct, 105th Meridian time was used. No current stations were occupied.

E. CONTROL STATIONS:

The positions of the following triangulation stations were obtained from the publication "Geographic Positions of Triangulation Stations, California VII, San Francisco and Vicinity."

STRAWBERRY HILL 2
BLUFF POINT 2, 1903
PT STUART LIGHTHOUSE
PT KNOX LIGHTHOUSE

RICHARDSON EAST
SAUSALITO POWER HOUSE
ANGEL ISLAND PK.
STANDPIPE NAVAL NET DEPOT, 1947
WMG

* During the 1948 field season, triangulation was executed in Richardson Bay and the positions for RAIL, TOWNSEND and WHITE determined by W. M. Gibson, Chief of Party. New positions for PT. BLUNT LIGHT and SAUSALITO FOG SIGNAL were also obtained by triangulation in 1948. After a considerable part of the hydrography had been accomplished, the positions of PT. STUART LIGHTHOUSE and PT. KNOX LIGHTHOUSE were checked by triangulation after it was discovered that POINT BLUNT LIGHT was found to have changed position. The new positions were in agreement with published data.

T-7122 (1948)

The topographic stations in Richardson Bay were transferred from topographic sheet BO-D-48. The topographic signals from 'PINK' on the east side of Angel Island southerly thru Pt. Blunt Lt. then easterly to 'LIT' were transferred from topographic sheet BO-E-48. The remainder of the topographic stations were transferred to the boat sheet from

* CONE ROCK located by triangulation in 1948
(Described by the hydrographer as probably
awash at M.H.W.)

to be destroyed after
review

E. CONTROL STATIONS: continued

~~beat sheet from~~

T-7067(1947, rev. 1948)

topographic sheet BO-D-47. After the hydrographic sheet was completed, topographic sheet BO-D-47 was returned to this party for field check and revision. The topographic signals were relocated and new positions of some signals obtained. It is expected that using the new topographic locations will result in some changes in the line spacing but will not impair the accuracy of the survey. 'BEE' and 'BILL' on the south side of Angel Id. are hydrographic signals located in 1947; one additional cut to 'BILL' is recorded in VOL. 19, page 71.

F. SHORELINE AND TOPOGRAPHY:

T-592C & T-5929(1944)

All shoreline was transferred from planimetric maps during the 1947 season. Low water line was determined by soundings when practicable.

G. CONTROL OF HYDROGRAPHY:

Hydrography on this sheet was controlled by fixing the positions from observed sextant angles between shore objects which had previously been located by triangulation or topography.

H. ADEQUACY OF SURVEY:

This survey is believed to be complete and adequate to supersede prior surveys for charting.

Satisfactory junctions were made with sheets on the north, east and south sides of this survey. No holidays or excessive differences were noted. Depth curves can also be adequately drawn at the junctions.

I. CROSSLINES:

About 10 to 15 percent of the survey has been covered by crosslines. In the shoaler waters, crosslines of one foot or less were obtained except for one 2-1/2 foot difference on the flats of Richardson Bay. The lines crossing in deep water vary 2 to 5 percent.

In Richardson Bay, a number of crosslines were sounded with the handlead as a check on the fathometer. As the bay bottom is soft mud, it was difficult for the leadsman to determine when he had actual bottom. It is believed fathometer soundings are more accurate.

Review paragraphs 2-47

J. COMPARISON WITH PRIOR SURVEYS:

No prior surveys were available for comparison except the published charts and preliminary review notes on photostat of Chart No. 5532. Notes on preliminary review of chart No. 5532.

No. 1	Stranded wreck, Lat. 37° 51.96', Long. 122° 28.80'
	Source: Chart letter 753 (1938).
COMMENT:	Wreck removed - previous to this survey (1948). Recommend removal of symbol from chart. (wreck has been deleted from chart)

J. COMPARISON WITH PRIOR SURVEYS: continued

- No. 2 Files, Position Lat. $37^{\circ} 52.18'$, Long. $122^{\circ} 28.20'$
Source: Not readily ascertainable:
Remarks: Charted since 1924. noted in Review,
par. 6A(2)
- Comment: Files removed.
Recommend removal of symbol from chart. ✓
- No. 3 Duck Blind, Pos. Lat. $37^{\circ} 53.28'$, Long. $122^{\circ} 29.60'$
Source: Not readily ascertainable. ✓
Remarks: Charted since 1924.
- Comment: Duck Blind removed previous to this survey.
Recommend deletion from chart. (has been deleted)
- No. 4 Sunken Rock, Pos. Lat. $37^{\circ} 53.57'$, Long. $122^{\circ} 29.60'$
Source: Not readily ascertainable. noted in Review,
par. 6A(3)
Remarks: Charted since 1903.
- Comment: Rock inside low water line as determined by the survey.
Recommend sunken rock symbol be removed. ✓
- No. 5 26 foot depth, Pos. Lat. $37^{\circ} 51.90'$, Long. $122^{\circ} 26.70'$
Source: Project and index map 1946.
Remarks: Project depth of Flood and Harbor Control.
Depth of 28 feet shown on Bp 35502 (1941) by USE.
- Comment: ✓ 26 foot depth verified by this survey. ✓ Review, par. 6A(4)
Recommend retention on chart. ✓

K. COMPARISON WITH CHARTS:

Soundings plotted on 5532, July 1947 were compared with this survey and the following discrepancies noted:

(a) A 1/2 foot sounding shown in first cove south of Bluff Pt., Lat $37^{\circ} 52.8'$, Long. $122^{\circ} 26.4'$ not found. Hand lead sounding line runs over the position with the least depth of 2 feet. Review,
par. 5a.
(1)

(b) The 79 foot sounding, Lat, $37^{\circ} 52.8^{\frac{8}{10}}'$, Long $122^{\circ} 26.05^{\frac{5}{10}}'$. This survey shows a least depth of about 100 feet in this vicinity. No indications of the 79 foot sounding were found. Also, sheet BO 1247 overlaps this sheet in this area and no indications of the 79 foot sounding was noted on the tracing of BO 1247. ^{H-7620 (947)} The 79 foot sounding appears to be out of position; the nearest 79 foot sounding of this survey appear about ^{H-1620} 200 meters inshore (westward) from the charted 79 foot. Review,
par. 5a.(2)

(c) The 14 foot sounding, Lat $37^{\circ} 52.3^{\frac{36}{10}}'$, Long. $122^{\circ} 25.6^{\frac{7}{10}}'$. 18 foot soundings in this area are the shoalest noted. There is evidence of scouring in this vicinity. Close development in the area, positions 1 "v" - 36 "v" failed to find anything shoaler. Recommend removal from chart. Review,
par. 5a.(3)

K. COMPARISON WITH CHARTS: continued

(d) 42 foot sounding, Lat $37^{\circ} 51.5^{\circ}$, Long $122^{\circ} 26.8^{\circ}$.
The sounding as charted appears to be out of position. This survey shows deeper water, about ~~20~~ feet, in this immediate vicinity but does have 40 and 41 foot soundings about 150 meters southwesterly of the charted position. (comparable depths within 50 meters) Disregard

(e) 36 foot sounding, Lat. $37^{\circ} 51.4^{\circ}$, Long $122^{\circ} 26.9^{\circ}$.
This survey shows a least depth of 37 feet within 100⁵⁰ meters of the charted 36 foot sounding. At least depth of 38 feet was obtained at the position of the charted 36 foot sounding.

(f) 35 foot sounding, Lat $37^{\circ} 51.4^{\circ}$, Long $122^{\circ} 26.9^{\circ}$.
No indication of this 35 foot sounding was obtained on the present survey. All the soundings in the immediate vicinity are from 9² to 12 feet deeper. (37-ft. on present survey about 50 m. north)

(g) 38 foot sounding, Lat $37^{\circ} 51.2^{\circ}$, Long $122^{\circ} 26.85^{\circ}$.
Soundings of this survey are from 5 to 20 feet deeper in this area. It appears that this sounding is out of position as charted. About 350 meters eastward is an area where a 38 foot sounding belongs according to this survey.

(h) 44 foot sounding, Lat. $37^{\circ} 51.1^{\circ}$, Long $122^{\circ} 26.9^{\circ}$
46 foot sounding, Lat. $37^{\circ} 51.1^{\circ}$, Long $122^{\circ} 27.1^{\circ}$
44 foot sounding, Lat. $37^{\circ} 51.05^{\circ}$, Long $122^{\circ} 26.95^{\circ}$
All three of the above soundings appear to be charted out of position. They will fit into this survey about 350 meters to the eastward. The least depths of this survey are from 10 to 20 foot deeper in the vicinity of the charted soundings.

(i) 14 foot sounding, Lat. $37^{\circ} 51.25^{\circ}$, Long $122^{\circ} 26.5^{\circ}$.
Soundings of 16 and 18⁷ feet are the least depths found in close proximity to the charted 14 foot sounding. Extensive development in the area indicates the charted 14 foot sounding to be out of position. It is recommended that this 14 foot sounding be charted about 200 meters to southeast in area of 14 feet obtained on present survey. ¹⁰⁰

(j) 111 foot sounding, Lat. $37^{\circ} 51.0^{\circ}$, Long $122^{\circ} 24.75^{\circ}$.
The charted position of the 111 foot sounding places it among soundings of 150 foot depths. About 150 meters northward is where the 111 foot sounding would fit in with this survey. (Sdg. has been deleted from charts)

(k) A sea going dredge has been operating for the past 2 years or more in the area off the southwest tip of Angel Island between Lat. $37^{\circ} 51.0^{\circ}$ and $37^{\circ} 51.5^{\circ}$ and about 1/4 to 1/2 mile offshore. This dredge is constantly taking sand from this vicinity at the rate of 1 to 2 trips daily. Consequently, the chances are that depths here will constantly be changing. The depths indicated on overlay for "u" day are the latest available. (transferred to smooth sheet)

Disregard prior depths. Area has deepened. See par. (k) below

noted in Review

L. DANGERS AND SHOALS:

No new shoals or dangers were discovered during this survey. ✓

M. COAST PILOT INFORMATION:

The Coast Pilot information report was made by the Chief of Party and forwarded to the Washington Office under date of 15 November 1948. ✓


N. AIDS TO NAVIGATION:

Floating aids located are as follows:

NAME	LATITUDE	LONGITUDE	POS. NO.	VOL. NO.	NOE.	DATE
Point Knox Lighted Buoy 2	37° 51.1 ⁴ '	122° 26.55'	1 u	18		12/22/48 ✓
Peninsula Point Bell Buoy 1	37° 51.65'	122° 27.4 ³⁸ '	29 & 30 g	5		7/20/48 ✓
Sausalito Ship Channel Entrance Lighted Buoy 1	37° 51.3 ² '	122° 28.2 ¹⁸ '	17, 18 and 19 g	5		7/20/48 ✓
Sausalito Ship Channel Entrance Lighted Buoy 2	37° 51.34'	122° 28.05'	69 & 70 t	18		9/16/48 ✓
S.F. Bay Yacht Club Buoy "A"	37° 51.36'	122° 25.02'	69e	5		6/7/48 ✓

O. LANDMARKS FOR CHARTS:

The landmarks for charts as shown on the Chart No. 5532 are adequate and should be continued. No new landmarks were located.


Robert A. Marshall,
Lieutenant Commander, C&GS.
Hydrographer.

ECHO SOUNDING CORRECTIONS

BO 1447 H-7704(1948)

29 March 1948 to 16 September 1948

Ship BOWIE

W. M. Gibson, Chief of Party

SPEED:

There follows a list of speed tests made for each fathometer indicator used on the sheet and the days on which hydrography was carried on Fathometer type 808-J. The reed tachometers are being calibrated in the Washington Office.

SHEET BO 1447: H-7704 (1948)

Indicator S-112 used: 3/29/48; 5/11/48; 6/2/48; 8/19/48
9/16/48; 5/12/48; 12/22/48; 1/11/49

3/29/48 Speed 2" per min.
4/15/48 " " " "
4/15/48 Stylus radius 11.186 cm.
5/13/48 Speed 111.5 R. P. M. 2" per min.
6/2/48 " 111.8 R. P. M. 2" per min.
6/4/48 New governor installed.
6/4/48 Speed (New governor) 110.9 R. P. M. 2" per min.
6/22/48 " 0.6% slow (Feet Scale)
0.6% slow (Fathom Scale)
9/15/48 " 0.1% slow (foot scale)
0.25% fast (fathom scale)
12/22/48 " 0.31% slow (foot scale)
0.27% slow (fathom scale)
1/11/49 " 0.15% slow (foot scale)
Fathom scale O. K.

Indicator S-111 used: 5/13/48; 5/18/48; 6/1/48; 6/7/48;
6/8/48 ; 7/20/48; 8/4/48.

4/15/48 Stylus arm radius changed from 11.024 CM
Speed 2" per min. changed to 11.21 cm
5/10/48 Speed 112.5 R. P. M. (fathom scale) 2" per min.
(foot scale)
6/22/48 Speed 0.3% fast (foot scale), 0.4% fast (fathom scale)
7/10/48 Speed 2" per min. (foot scale), 10" per 30 Min.
(fathom scale)
9/15/48 Speed 0.27% fast (foot scale), 0.25% fast (fathom scale)

SETTLEMENT AND SQUAT:

Corrections are not necessary for squat or settlement of the sounding launches or ship as speeds were selected to eliminate them. Details of those tests are included in the Season's Report.

VELOCITY CORRECTIONS:

Mean area serial temperatures and salinities were used to determine velocity corrections. The details of their determination are included in the Season's Report. The corrections so derived are as follows for the two periods of work on the sheet.

29 March 1948 - 8 June 1948

DEPTH (feet)	CORRECTION (feet)
3.0	0.0
20.8	-0.2
39.2	-0.4
58.4	-0.6
77.8	-0.8
97.0	-1.0
120.2	-1.2
145.2	-1.4
165.2	-1.6
185.2	-1.8
206.0	-2.0
229.2	-2.2
252.6	-2.4
276.8	-2.6
301.0	-2.8

20 July 1948 - 16 September 1948

All depths 0.0

Bar checks were taken frequently for the purpose of setting the index and determining phase corrections on the different scales. The ordinary bar suspended in strong currents by two leadlines was not considered adequate for correcting soundings except in special cases. However, most soundings plotted on the boat sheet were corrected by bar check rather than wait for the final values from the Serial Temperatures and Salinities. Final echo sounding reducers as entered in the record books were derived from Serial Temperatures and Salinities.

INDEX OR INITIAL CORRECTION:

This correction was entered in the blank column of the sounding volumes. It represents the variance of the recorded initial from the correct initial as determined by shallow bar checks.

PHASE CORRECTION:

This correction was combined with the initial correction and entered in the blank column of the sounding volumes. It was determined by bar checks during each day of work for each scale used on that day unless conditions of weather prevented. The phase corrections appeared to vary from time to time in spite of uniform method of shifting scales. It is believed the average for the sheet is better value than the daily values. Accordingly, the phase corrections entered in the sounding volumes were obtained by averaging the best determinations for the sheet or sheets.

Indicator S-112

BO-1447 and 024148

B scale	28 Values	-0.4 foot total correction
C "	21 "	(-0.4 + 0.2) -0.2 foot total correction
D "	12 "	(-0.4 + 0.2 + 0.2) -0.0 total correction

FATHOM SCALE Fathom scale recorded initial minus adopted days value for foot scale initial.

Indicator S-111

BO-1447

B scale	11 values	-1.0 foot total correction
C "		-1.6 foot total correction

Used for only about six soundings. No values determined on this sheet so average value determined on Sheet 024148 was used. This was -0.6 ft.

D scale - not used.

SPECIAL CASES:

Early in the season, soundings on "B" and "C" days, Ship, were corrected by taking the mean of several bar checks taken on those days. The values were plotted as a combined velocity and phasing correction curve to obtain values for reducing the soundings. The bar checks covered the entire range of the foot scales and were taken by new equipment which has been made the subject of a special report. The corrections to the soundings so obtained agreed with these obtained from combining the values from the mean area serial temperatures and salinity curves and average phasing head corrections within 0.5%. Accordingly, the record books for those two days work were not corrected at the end of the season to conform to the adopted practice of using bar checks only for phasing head and initial corrections. Fathom scale soundings on "B" and "C" days, as well as all other days, were corrected for velocity by the method of serial temperatures and salinities. On 'u' and 'v' days for launch, bar checks were used to plot a curve for corrections which included both velocity and phasing. In December, after the end of the season, some additional development was required when the mean area serial temperatures and salinities previously used no longer applied. For that work, the soundings were corrected by method of bar check.

Wm Gibson
W. M. Gibson,
Chief of Party, C&GS

BAR CHECK

A DAY SHEET BO-1447

11 May 1948

INITIAL - 2.8 FEET

Indicator 8-112 - 803J

H-7704 (1948)

BAR	FATHOMETER	SCALE	MEAN
10.2	10.0 10.2	A	FEET
	10.4		10.20
20.2	20.4		
	20.6 20.2	A	20.35
30.2	30.6		
	30.7 30.4	A	30.52
40.2	40.6		
	40.9 (40.6)	A	40.65
50.2	50.4 50.7	A	50.55
40.2	41.4		
	41.2 (41.2)	B	41.25
50.2	51.2		
	50.9 51.2	B	51.12
60.2	61.3		
	61.5 (61.0)	B	61.20
70.2	71.6 70.8	B	71.20
80.2	81.8 (80.0)	B	81.30
90.2	(91.8) 90.9	B	91.35
70.2	71.6 70.9	C	71.25
80.2	81.9 (81.0)	C	81.45
90.2	91.2 91.1	C	91.15
100.2	101.9 100.8	C	101.35
110.2	111.6 (110.8)	C	111.20
120.2	121.4 120.8	C	121.10
110.2	111.2 (110.5)	D	110.85
120.2	121.0 120.4	D	120.70
140.2	(141.0) 140.5	D	140.75
150.2	(151.0) 150.5	D	150.75

CORRECTIONS FROM GRAPH

SCALE	DEPTH FEET	CORRECTION FEET
A	2.8	INITIAL
	16.8	-0.2
	29.4	-0.4
	55.0	-0.4
B	35.0	-1.0
	80.8	-1.2
	90.0	-1.2
	70.0	-1.2
C	84.4	-1.0
	97.4	-1.2
	103.4	-1.0
	120.0	-1.0
D	105.0	-0.6
	160.0	-0.6

H-7704(1948)

SHEET NO-1447

B Day 12 May 1948

Fathometer #08-J, Indicator 8-112

Bar	Fathometer		BAR CHECK	
	310	Scale	Scale	Mean
10.2	10.3	10.2	A	10.25
20.2	20.6	20.6	A	20.60
30.2	30.5	30.8	A	30.65
40.2	40.6	40.6	A	40.60
50.2	50.8		A	50.80
40.2	40.8	40.9	B	40.85
50.2	50.8		B	50.80
60.2	61.0		B	61.0
70.2	71.4		B	71.4
80.2	81.4		B	81.4
90.2	91.4		B	91.4
70.2	70.4		C	70.4
80.2	81.0		C	81.0
90.2	90.0		C	91.0
100.2	101.1		C	101.1
110.2	111.3		C	111.3
120.2	121.3		C	121.3
110.2	111.0		D	111.0
120.2	120.8		D	120.8
130.2	131.0		D	131.0
140.2	141.0		D	141.0
150.2	151.2		D	151.2
160.2	161.3		D	161.3

CORRECTIONS FROM GRAPH OF MEAN

Scale	FEET	
	Depth	Correction
A	3.0	Initial
	11.4	-0.2
	17.2	-0.4
	45.0	-0.6
	55.0	-0.6
B	35.0	-0.6
	53.4	-0.8
	60.4	-1.0
	77.0	-1.2
	90.0	-1.2
C	70.0	-1.2
	72.6	-1.0
	77.4	-0.8
	100.2	-1.0
	125.0	-1.0
D	105.0	-0.8
	115.0	-0.6
	125.0	-0.8
	145.0	-1.0
	160.0	-1.0

BAR CHECKS

SHEET B0-1447 H-7704 C DAY 0900 & 1100 POS. 1-39 C

BAR FATHOMETER CORRECTION (1948) FATHOMETER 808-J, INDICATOR 8-112

BAR	FATHOMETER	CORRECTION	INITIAL	
	2.9			
10.25	10.3	10.2	10.2	0.02 A SCALE
20.25	20.5	20.4	20.4	0.18-
30.25	30.8	30.5	30.6	0.38-
40.25	40.8	40.7	40.8	0.52-
50.25	50.3	50.7	50.5	0.22-
40.25	41.0	41.0	40.8	0.22- B Scale
50.25	51.0	50.8	50.5	0.52-
	50.8			
60.25	61.0	60.5	60.9	0.55-
70.25	70.9	70.7	71.8	0.88-
80.25	80.6	81.0		0.55-
70.25	71.2	71.3		1.00- C SCALE
80.25	80.6	81.0		0.55-
90.25	91.0			0.75-
100.25	101.0			0.75-
110.25	111.0			0.75-
120.25	121.0			0.75-
110.25	111.0			0.75- D SCALE
120.25	121.3			1.05-
130.25	131.3			1.05-
140.25	141.2			0.95-

CORRECTIONS FROM GRAPH

SCALE	DEPTH	CORRECTION
A	2.9	INITIAL
	16.2	-0.2
	26.2	-0.4
	38.8	-0.6
	41.2	-0.4
	47.6	-0.2
	55.0	-0.2
B	35.0	-0.6
	64.6	-0.8
	75.8	-0.6
	87.2	-0.8
D	110.0	-0.8
	115.2	-1.0
	160.0	-0.8
B	90.0	-0.8
C	70.0	-1.0
	72.4	-0.8
	77.0	-0.6
	87.2	-0.8
	125.0	-0.8

BAR	FATHOMETER			CORRECTION	SCALE
	3.2			INITIAL	
10.25	10.2	10.2	10.7	-0.12	A
20.25	20.5	20.8	20.7	-0.42	
30.25	30.3	30.8	30.6	-0.32	
40.25	40.6	40.7	41.0	-0.52	
50.25	50.7	50.8	50.6	-0.45	B
40.25	40.7	41.0	41.5	-0.82	
50.25	50.7	51.1	51.2	-0.75	
60.25	60.7	61.4	61.4	-0.92	
70.25	71.0	70.6	71.4	-0.75	C
80.25	81.7	80.6	81.4	-0.93	
90.25	91.6			-1.35	
70.25	70.7	70.8	71.1	-0.65	
80.25	80.7	80.8	81.0	-0.58	D
90.25	90.4	91.3		00.60	
100.25	101.8	101.0		-1.25	
110.25	111.0			-0.75	
120.25	121.5			-1.25	D
120.25	121.2			-0.95	
11.025	111.0			-0.75	
140.25	141.2			-0.95	

CORRECTIONS FROM GRAPH

SCALE	DEPTH	CORRECTION
	FEET	FEET
A	3.2	INITIAL
	10.2	-0.2
	16.4	-0.4
	26.6	-0.2
	33.0	-0.4
	39.6	-0.6
	44.2	-0.4
B	55.0	-0.4
	85.0	-0.8
	59.4	-1.0
	61.4	-0.8
	77.0	-1.0
C	83.6	-1.2
	90.0	-1.4
	70.0	-0.6
	92.2	-0.8
	96.0	-1.0
	99.8	-1.2
	101.8	-1.0
	106.6	-0.8
D	113.2	-1.0
	117.2	-1.2
	120.0	-1.2
	110.0	-0.8
	117.8	-1.0
	160.0	-1.0

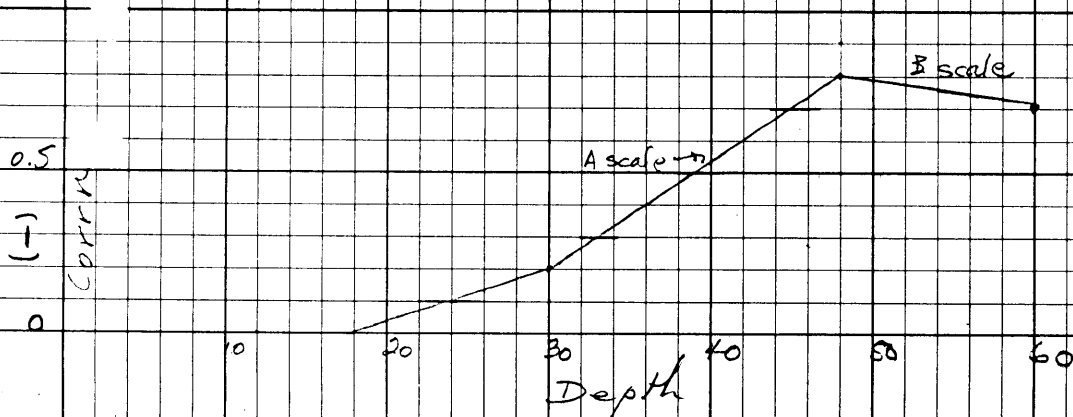
Fathometer Corrn.
 Launch 133
 in day 12/22/48
 Sheet 1447 (H-7704(1948))

Corrn. including
 Velocity - Phase

A scale

23.8	-0.2
33.0	-0.4
39.0	-0.6
44.8	-0.8

B scale -0.8 all depths



Fathometer Corrections S-112

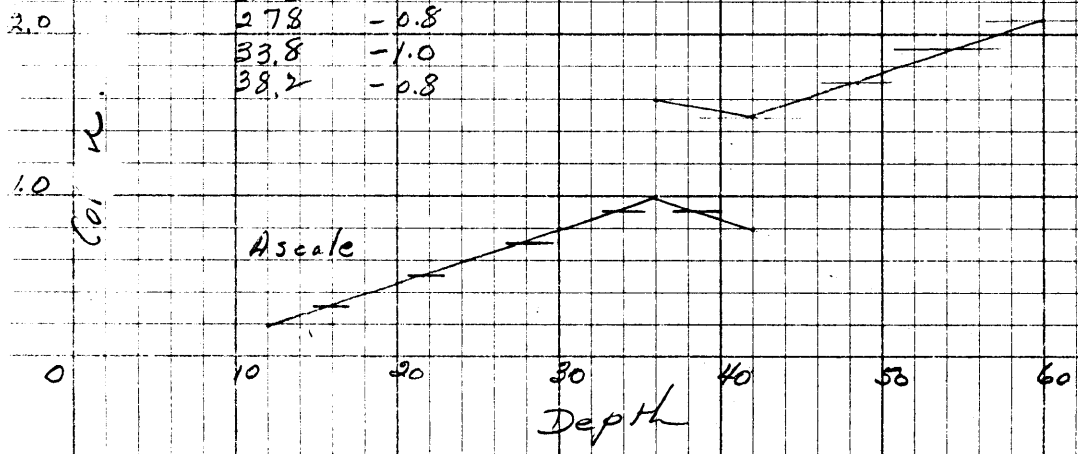
V. Day Sheet 1447 H-7704 (1948)
J. Day " 05148 H-7706 (1948-49)

A scale

10.0	-0.2
15.8	-0.4
21.6	-0.6
27.8	-0.8
33.8	-1.0
38.2	-0.8

B scale

36.0	-1.6
48.2	-1.8
54.4	-2.0
60.0	-2.2



H-7704 (1948)
STATISTICS - SHEET BO-1447

DATE	VOL. NO.	DAY LETTER	NO. H.L. SDGS.	NO. POS.	STAT. MILES	BOAT USED
3/29/48	1	a	---	128	15.3	133
5/13/48	2	b	---	60	6.1	133
5/18/48	2&3	c	---	162	14.8	133
6/ 1/48	3&4	d	---	158	29.6	133
6/ 7/48	4&5	e	---	73	6.5	133
6/ 8/48	5	f	---	63	7.9	133
7/20/48	5&6	g	384	206	21.7	133
7/21/48	6,7&8	h	265	190	23.6	133
7/22/48	8&9	j	---	184	27.3	133
7/27/48	9&10	k	---	179	35.4	133
7/28/48	10,11&12	l	---	180	24.1	133
7/29/48	12&13	m	---	189	25.4	133
8/ 2/48	13&14	n	---	169	24.2	133
8/ 3/48	14&15	p	---	210	27.3	133
8/ 4/48	16	q	---	137	14.4	133
8/ 5/48	17	r	---	(days	work	rejected)
8/19/48	17&18	s	---	73	9.6	133
9/16/48	18	t	278	70	4.1	133
12/22/48	18&19	u	---	181	25.7	133
1/11/49	19	v	---	77	4.9	133
TOTALS	19		927	2689	347.9	
5/11/48	20&21	A	---	206	43.8	BOWIE
5/12/48	21&22	B	---	115	20.9	BOWIE
6/2/48	22&23	C	---	176	35.5	BOWIE
TOTALS	4			497	100.2	
8/ 2/48	24	a	1817	186	21.6	dinghy
8/ 3/48	25	b	1323	138	17.4	dinghy
8/ 4/48	26	c	1156	123	12.9	dinghy
TOTALS	3		4296	447	51.9	
5/17/48	27	a	104	12	0.6	dock sdg.
6/ 7/48	27	b	44	8	0.1	dock sdg.
8/ 5/48	28	c	404	18	1.0	dock sdg.
TOTALS	2		552	38	1.7	
TOTAL (Sheet)	28		5775	3594 3671	496.8	

Area - 12.2 sq. st. miles

APPROVAL SHEET
H-7704 (1948)
BO-1447

19 January 1949

This sheet was layed out in 1947 and surveyed in 1948. Through my personal presence on the bridge while sounding with the ship, assistance in reduction of soundings, other frequent inspections and an examination of the completed sheet, I believe it to be complete and adequate. The fathometer corrections were compiled personally.

Wm Gibson
W. M. Gibson,
Chief of Party.

LIST OF SIGNALS
To Accompany

H-7704 (Bo-1447) (1948)

TRIANGULATION STATIONS

ANGEL ISLAND, POINT BLUNT LIGHT, 1948
CHI, 1948
CONE ROCK, 1948
SAUSALITO FOG SIGNAL, 1948
SOUTHAMPTON SHOALS L.H. 1942
POINT KNOX CHIMNEY, 1948
STANDPIPE, NAVAL NET DEPOT, 1947
PIPE, 1948
STRAWBERRY HILL 2, 1895-1948
POINT STUART L.H. 1920-1948
TOWNSEND, 1948

TOPOGRAPHIC SIGNALS

Bo-D-47 (Revised 1948) T-7067 (1947) revised(1948)

ARM	LITE	ROOF	TOWER
BOX	LIME	ROW	TWIN
BAR	MAST	SAW	
CROSS	NEW	SHED	
FLAG	PIT	STAN	
GAB	PINK	STEP	
GAL	RED	STALL	
GRAY	ROCK	TAC	
HEX		TIB	
		TIP	

Bo-D-48 H-7122 (1948)

A	BLU	DOG	HAP	LIP	NUB	RAT	TAR	WIN
ALE	BUS	EEL	HUG	LUX	OAK	RIP	TEA	YOU
BED	BUM	FIN	IDA	MAT	PAR	RUM	TON	
BELL	CAM	FLY	JOE	MAX	PAL	SET	TOP	
BEN	DAG	GAG	JUG	MID	PIL	SOX	WAS	
BOY	DOC	GOV	LEO	NAG	POD	STAN	W&T	

Bo-E-48 (To be destroyed after review)

BEL	BUM	FLAT	FUN	LIT	NIT	RIP	TON	SAL
BIRD	CHI	FOG	GIN	MIT	PAT	TED	TALL	

HYDROGRAPHIC SIGNALS

BEE - (Vol. 9, H-7621)(1947)	OWL - (Vol. 25, page 2)
BILL " " "	SOW " " "
GUY (" 25, page 2)	SKY " " "
NUX " " " "	WAR " " "
	ZAG " " "

TOPOGRAPHIC FEATURES (Air-photo compilation T-5929) (1941-44)

NUN

ADDENDUM
To Accompany
(1948)
HYDROGRAPHIC SURVEY H-7704 (Field No. Bo-1447)

CONTROL

There are indications that topographic stations on the west side of Raccoon Strait are displaced. There are numerous instances of jumps in time and course on lines going thru this area and while some may be due to strong currents and radical course changes, it is believed further investigation is warranted. A comparison with the air-photo compilation shows apparent displacement of signals between BOX and LITE. For instance, signal TIB, described as a flag pole on yacht club, plots about 12 meters off-shore.

Review,
par. 1.

SOUNDINGS

There is a general disagreement between pole or hand-lead soundings and fathometer soundings in shoal areas of Richardson Bay. The pole soundings are deeper by from 1 to $1\frac{1}{2}$ feet.

Review, par. 7.

DISCREPANCIES

- Lat. 37-51.84 Long. 122-27.28
Position 57a (red) Sounding of 125 ft. falls inshore of 117 ft. *Disregard*
- Lat. 37-51.67 Long. 122-27.40
Position 1 to 9a (red) Soundings not plotted on sheet. Line displacement, apparently due to control. *Rejected*
- Lat. 37-51.88 Long. 122-27.40
Position 66 to 68a (red) and 69 to 72a (red). Positions obviously displaced as deep soundings fall inside shoal areas. *Plots O.K. on corrected signals*
- Lat. 37-52.38 Long. 122-25.77
Position 9B. Position obviously misplaced.
Position 133 to 135m (red). Soundings disagree with surrounding hydrography. By using the un-revised position of TIB, soundings on these lines check very well. *ditto*
- Lat. 37-52.15 Long. 122-29.50
Position 24 to 25b (green). Sounding of 3 ft. crossed by 12 ft. on line 64 to 65n and 81 to 82n (red). *discrepancies eliminated by shifting course*
Position 26 to 27b (green). Sounding of 5 ft. crossed by 13 ft. on lines 64 to 65n and 81 to 82n (red).
Position 26 to 27b (green). Sounding of 4 ft. crossed by $11\frac{1}{2}$ and 12 ft. on line 103 to 104n (red).

The last three discrepancies occur at the edge of the dredged channel and are no doubt due to displacement of positions.

Norfolk, Va.
6 Jan. 1950

Approved and forwarded.

Earl O. Heaton
Earl O. Heaton
Supervisor, SE Dist.

Respectfully submitted,

Hugh L. Proffitt
Hugh L. Proffitt
Cartographer

GEOGRAPHIC NAMES
 Survey No. H-7704
 (1948)

Name on Survey	On Chart No.		On previous survey No.		On U. S. quadrangle Maps		From local information		On local Maps		P. O. Guide or Map		Rand McNally Atlas		U. S. Light List	
	A	B	C	D	E	F	G	H	K							
<u>California</u>				(for title)											USCB	1
<u>San Francisco</u>				" "											"	2
																3
																4
<u>Richardson Bay</u> ✓																5
<u>Sausalito</u> ✓															USCB	6
<u>Strawberry Point</u> ✓				(one tide gage)												7
<u>Peninsula Point</u> ✓																8
<u>Belvedere Cove</u> ✓																9
<u>Bluff Point</u> ✓																10
<u>Raccoon Strait</u> ✓															USCB	11
<u>Angel Island</u> ✓																12
<u>Pt. Campbell</u> ✓																13
<u>Pt. Simpton Dock</u> ✓																14
<u>Hospital Cove</u> ✓																15
<u>U.S. Quarantine Dock</u> ✓																16
<u>Ft. McDowell E.G. Dock</u> ✓																17
<u>Pt. Blunt</u> ✓																18
<u>Cong Rock</u>																19
																20
																21
																22
<u>Presidio, San Francisco</u>				(One tide station)												23
																24
																25
																26
																27

(see chart 5532 for position)

Names underlined entered and approved 2-3-50 L. Hack.

See chart 5532 for best placement of names.

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. H-7704 (1948)

Records accompanying survey:

Boat sheets 1 (a & b); sounding vols. 29; wire drag vols.; bomb vols.; graphic recorder rolls 12 envel.; special reports, etc.

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

Number of positions on sheet 3671
Number of positions checked 941
Number of positions revised 602
Number of soundings revised (refers to depth only) 603
Number of soundings erroneously spaced 33
Number of signals erroneously plotted or transferred 21
Topographic details Time 102
Junctions Time 79
Verification of soundings from graphic record Time 27
Verification by E. M. Brown Total time 845 hrs Date 4-2-51
Reviewed by J. A. Dinamore Time 60 hrs Date 18 April 1951

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Hydrography and Topography~~

25 January 1950

Division of Charts: R. H. Carstens

Plane of reference approved in
29 volumes of sounding records for

HYDROGRAPHIC SHEET 7704 (1948)

Locality Richardson Bay - Raccoon Strait, San Francisco Bay

Chief of Party: W. M. Gibson in 1948-49

Plane of reference is mean lower low water, reading
5.6 ft. on tide staff at San Francisco (Presidio)
13.4 ft. below B. M. 180 (1936)

2.3 ft. on tide staff at Sausalito (Marinship Yard)
12.0 ft. below B. M. 33 (1948)

Height of mean high water above plane of reference is as follows:

San Francisco = 6.2 feet
Sausalito = 5.5 feet

Condition of records satisfactory except as noted below:

E. C. McKay
Section
Chief, ~~Division of Tides and Currents~~

Notes to Accompany
Graphic Control Sheet BO-E-48 (*subsequently destroyed*)

Angel Island

February 1949

Instructions dated 16 Nov. 1940
Supp. Instructions dated 24 April 1947

The purpose of this survey was to furnish control for the in-shore hydrography along the south and east side of Angel Island.

CONTROL:

The following stations were used as control on this sheet:

SIMPTON, 1948
ANGEL ISLAND, POINT BLUNT LIGHT, 1948
ALCATRAZ LIGHTHOUSE, 1910

The remaining triangulation stations shown on the sheet were not visible from any of the set-ups and could not be used for control.

METHODS:

The signals on the east side of Angel Island between SIMPTON, 1948 and ANGEL ISLAND, POINT BLUNT LIGHT, 1948 were located by running a traverse between these two points. Distances were measured with a 300 ft. wire, and angles in the traverse were measured with a 7 inch repeating theodolite using 3 D and R.

This method was found to be unsatisfactory on the fairly rugged terrain encountered. The wire could not be laid flat on the ground while taping, due to rocks, boulders and other obstructions, and was very heavy and unwieldy to support. Particular difficulty was experienced when using the long wire to span across water. It would catch on the rough rocky bottom and could only be used with difficulty.

The traverse was not computed, but was plotted graphically on the sheet using a steel protractor. The closing error was 26 meters (scaled), for which the traverse has been adjusted proportionately throughout its length.

The large error of closure may be due to an accumulated error in plotting the traverse. It is therefore recommended that the traverse be computed, and that positions for signals PINK, NIT, FOG, BIG, TALL, CHI, RIP, SAL, TED, MIT and FUN be computed for use on the smooth hydrographic sheet. The field records on this traverse were forwarded to the Norfolk Processing Office on (the) 25 June 1948. *Positions of signals adjusted on smooth sheet of H-7704 (1948)*

Signals on the south side of Angel Island were located by conventional topographic methods. A topographic traverse was run from ANGEL ISLAND, POINT BLUNT LIGHT, 1948 to signal PAT, locating all signals enroute. The traverse was closed as follows:

A cut was drawn to signal PAT from POINT BLUNT LIGHT, 1948, and orientation lines were drawn. The plane-table was then set up on signal PAT, oriented on POINT BLUNT LIGHT, 1948 using the orientation lines. The position of PAT was then determined by resecting on ALCATRAZ LIGHTHOUSE, 1910. This position checked the traverse position of PAT.

LANDMARKS:

Landmarks as charted are adequate.

Magnetic Meridian

at Sta. Bluff Pt. 2 (BLUFF POINT), the magnetic variation was determined to be 18°14' E.

Lorin F. Woodcock
Lorin F. Woodcock
Lieut. USC & GS

Approved & forwarded:

W. M. Gibson
W. M. Gibson
Chief of Party

This graphic control survey has been compared with H-7704 (1948) and subsequently destroyed.

J. A. Dinmore
5/14/51

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

TO BE CHARTED
~~TO BE DELETED~~ } STRIKE OUT ONE

I recommend that the following objects which have (~~have not~~) been inspected from seaward to determine their value as landmarks, be charted on (~~delete from~~) the charts indicated.
The positions given have been checked after listing by P. A. Weber

Ship BOWIE, Oakland Calif. 27 Jan. 1949

W. M. Gibson, Chief of Party.

STATE	CHARTING NAME	DESCRIPTION	SIGNAL NAME	POSITION				DATUM	METHOD OF LOCATION AND SURVEY NO.	DATE OF LOCATION	HARBOR CHART	INSHORE CHART	OFFSHORE CHART	CHARTS AFFECTED
				LATITUDE	D. M. METERS	LONGITUDE	D. P. METERS							
	PEAK	Highest peak on Angel Island.		37 51	1286.7	122 25	1146.5	N. A. 1927	Tri.	1881-1903	X			5532
	LIGHT	Poimt Blunt Light (L.L. # 296).	Blunt	37 51	345.9	122 25	94.5	N. A. 1927	Tri.	1948	X			5532

This form shall be prepared in accordance with Hydrographic Manual, pages 800 to 804. Positions of charted landmarks and *nonfloating* aids to navigation, if redetermined, shall be reported on this form. The data should be considered for the charts of the area and not by individual field survey sheets. Information under each column heading should be given.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

TOPOGRAPHIC TITLE SHEET

Each Topographic and Graphic Control Sheet, and each Air Photographic Drawing should be accompanied by this form, completed so far as practicable, when forwarded to the Washington office.

REGISTRY No. ~~T-7123~~
Graphic Control Sheet subsequently
Field No. BO - E - 48 *destroyed*
Scale 1 / 10,000

State California General locality San Francisco Bay

Specific locality Angel Island

Dates: Survey began 17 May 1948 Completed 20 May 1948

Photography....., Supplemented by ground surveys to.....

Project No. CS - 256 Instructions dated 16 Nov. 1940 and 24 April 1947

Vessel } ~~***~~ BOWIE Chief of party W. M. Gibson

Field work by L. F. Woodcock Office work by L. F. Woodcock

Final inking by L. F. Woodcock

Ground elevations } in feet above { M. H. W.
Treetop elevations } or {

Contours } by { Planetable } Interval ft.
Approximate contours } { Multiplex }
Form lines } {

REMARKS

.....

.....

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.....

.....

.....

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-7704(1948)

FIELD NO. BO-1447

California, San Francisco Bay, Richardson Bay & Raccoon Strait
Surveyed in March - September, 1948 Scale 1:10,000
Project No. CS-256

Soundings:

Control:

808 Fathometer
Hand lead
Pole

Sextant fixes on shore signals

Chief of Party - W. M. Gibson
Surveyed by - R. A. Marshall, P. A. Weber & L. F. Woodcock
Protracted by - R. F. Carr
Soundings plotted by - R. F. Carr & W. W. Feazel
Verified and inked by - E. M. Bragonje
Reviewed by - T. A. Dinsmore, 18 April 1951
Inspected by - R. H. Carstens

1. Shoreline and Signals

The shoreline originates with planimetric quadrangles T-5926 and T-5929 of 1944.

The signals are from graphic control surveys T-7067, T-7122 (1948) and BO-E-48 (field number). The latter survey has been subsequently destroyed. Twenty-one topographic signals on T-7067 (1947-48) were found to be erroneously located. Most of the erroneous signals are along the western shore of Raccoon Strait from Peninsula Point to Bluff Point. By the use of the planimetric shoreline detail, air photographs and the signal descriptions, these signals were relocated in the Washington Office. Their revised locations range from 5 to 30 meters distant from the locations furnished on T-7067 (1948).

The fixes for hydrographic signals are recorded in the sounding volumes of the present survey and adjoining survey H-7621 (1947).

2. Sounding Line Crossings

Depths at crossings are generally in good agreement. In Richardson Bay a few differences of 1-2 ft. are noted. These differences occur at crossings of handlead (or pole) and fathometer soundings in areas of extremely soft mud bottom.

3. Depth Curves and Bottom Configuration

The usual depth curves are adequately delineated. The 3-ft. curve has been added to aid in defining the configuration of the inshore bottom. The low-water line was determined where practicable.

Except in the mud flats of Richardson Bay, the bottom is generally irregular. Around Angel Island and through Raccoon Strait, the bottom for the most part slopes sharply from the 6-ft. depth curve to depths of 60 feet. A prominent shoal with a least depth of 26 ft. rises from greater surrounding depths in lat. $37^{\circ} 51.90'$, long. $122^{\circ} 26.70'$. Other submerged knolls together with several deeps contribute to the unevenness of the bottom.

4. Junctions with Contemporary Surveys

Adequate junctions were effected with H-7705 (1948) on the northeast, H-7619 (1947) on the east and H-7621 (1947) on the south. In the vicinity of lat. $37^{\circ} 51.1'$, long. $122^{\circ} 27.0'$, overlapping soundings from H-7621 (1947) were not transferred to the present survey because of disagreement with present depths. The subject area has deepened appreciably as a result of sand removal by dredging during the interim between the two surveys (see Descriptive Report, page 5, paragraph K).

The junction with H-7620 (1948) on the northeast will be considered in the review of that survey.

5. Comparison with Prior Surveys

a.	H-462	(1855)	1:10,000	H-2244	(1895)	1:10,000
	H-463	(1855)	1:10,000	H-2254	(1895-96)	1:10,000
	H-464	(1855)	1:20,000	H-2340	(1895-97)	1:10,000
	H-465	(1855)	1:10,000	H-2771	(1905)	1:600
	H-1214a	(1871-73)	1:20,000	H-3928	(1916)	1:20,000
	H-1297	(1874)	1:10,000	H-3929	(1916)	1:20,000
	H-1882	(1888)	1:10,000			

The above surveys comprise previous coverage over the area of the present survey during the periods indicated.

The surveys of the period 1895-97 furnish the most complete prior coverage. A comparison between the prior and present surveys indicates that many bottom changes have taken place in the area. The most conspicuous change has occurred in the vicinity of Sausalito where extensive waterfront improvements have been made and a channel dredged since the time of the prior surveys. Other waterfront construction, together with the deepening of water approaches thereto are noted elsewhere in the area. The foregoing changes, together with sand removal dredging southwest of Point Knox (Angel Island) constitute the major changes resulting from artificial causes.

The natural bottom changes that have taken place since the time of the prior surveys are also extensive and in some instances quite pronounced. Present depths, except in dredged areas, are generally less than prior depths. Examples of appreciable shoaling are indicated in the following comparison:

<u>Prior Depth</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Present Depth</u>
14	37° 51.65'	122° 28.08'	6
83	37° 52.07'	122° 24.70'	68
180	37° 52.20'	122° 26.30'	158
219	37° 52.46'	122° 25.90'	194

The bottom character of the surveyed area consists generally of sand and mud with sporadic outcroppings of rock.

The natural changes that have occurred are attributed largely to the instability of much of the bottom, sedimentation and the strong tidal currents which flow in this region.

Specific mention is made of the following differences between prior and present depths:

- (1) The ½-ft. sounding charted in lat. 37° 52.78', long. 122° 26.40', from H-2254 falls in present depths of 2 feet. This prior sounding is from a line of soundings which differs by 1-1½ ft. with crosslines on that survey and is probably in error. The prior sounding should be disregarded.
- (2) The 79-ft. sounding charted in lat. 37° 52.88', long. 122° 26.05', from H-3929 should be disregarded. Falling in present depths of 100 feet, the prior sounding was found to be erroneously positioned due to improper spacing. In its corrected position 120 meters westward, the 79 falls in comparable depths on the present survey.

- (3) The 14-ft. sounding charted in lat. $37^{\circ} 52.36'$, long. $122^{\circ} 25.67'$, from H-2340 falls in present depths of 18 feet. Close development on the present survey revealed 18 ft. to be the least depth on this shoal. A comparison between prior and present depths in the vicinity indicates evidence of scouring. It is, therefore, recommended that the prior 14-ft. sounding be disregarded.
- (4) The 26-ft. sounding charted in lat. $37^{\circ} 51.67'$, long. $122^{\circ} 27.41'$, from H-3929 should be disregarded. Falling in present depths of 60 feet, the prior sounding is an undeveloped sounding on line and is considered to be erroneously recorded or out of position. Comparable depths on the present survey lie about 90 meters northward. Depths in this vicinity on H-2254 (1895-96) agree closely with depths on the present survey.
- (5) The 59-ft. sounding charted in lat. $37^{\circ} 51.21'$, long. $122^{\circ} 24.83'$, from H-3928 should be disregarded. Falling in present depths of 120 feet, the prior sounding is near the end of a sounding line which terminates close inshore and is considered to be erroneously positioned due to improper spacing. The 59 should actually fall about 120 meters westward (inshore) where comparable depths obtain on the present survey.
- (6) The 14-ft. sounding charted in lat. $37^{\circ} 51.25'$, long. $122^{\circ} 26.48'$, from H-2254 falls in present depths of 16-17 feet. Close development on the present survey clearly indicates that the crest of this shoal has shifted about 100 meters southeastward where present depths of 14 ft. are adequate for charting. The prior 14-ft. sounding should be disregarded.
- (7) The 30-ft. sounding charted in lat. $37^{\circ} 51.07'$, long. $122^{\circ} 26.20'$, from H-2254 falls in present depths of 40 feet. Other prior soundings of 26 to 40 ft. charted in the general vicinity also fall in greater depths on the present survey. Although the bottom is moderately irregular, a careful comparison of prior and present depths indicates that bottom changes have occurred. The prior depths should, therefore, be disregarded.
- (8) About seventeen soundings ranging in depth from 35 to 46 ft. charted in an area covering about one-quarter square mile in the vicinity of lat. $37^{\circ} 51.2'$,

long. 122° 26.9', (southwest of Point Knox) fall in depths of 37 to 68 feet on the present survey. Originating with the prior surveys, these prior soundings should be disregarded. The hydrographer notes in paragraph K., page 5, of the Descriptive Report that a dredge has been removing sand from this area daily for several years and that the greater present depths have resulted therefrom.

A few prior inshore soundings have been carried forward to supplement the present survey. With these additions, the present survey is adequate to supersede the prior surveys within the common area.

b. H-3967 W.D.(1917) 1:20,000 H-3968 W.D.(1917-36) 1:20,000

Except for Richardson Bay, these wire-drag surveys cover most of the remaining area of the present survey. No conflicts are noted between the effective drag depths and depths on the present survey. Attention, however, is directed to the following information originating with H-3968 W.D:

- (1) The 24-ft. sounding charted in lat. 37° 51.07', long. 122° 26.50', from the 1917 work on H-3968 W.D. should be disregarded. Falling in present depths of 28 feet, present development indicates that this area has deepened slightly as previously discussed in paragraph 5a (7).
- (2) The following soundings originating with H-3968 W.D. are not considered to be disproved by the present survey and have been carried forward to supplement present depths:

<u>Prior Depth</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Present Depth</u>
24	37° 51.10'	122° 26.56'	25-26
37	37° 51.98'	122° 26.87'	39-40

- (3) The 20-ft. sounding charted in lat. 37° 51.17', long. 122° 25.90', from H-3968 W.D. should be retained on the chart. The present survey verifies the 20-ft. depth in the same position.

6. Comparison with Chart 5532 (Latest print date 10/9/50)
Chart 5535 (Latest print date 8/28/50)

A. Hydrography

Charted hydrography originates with the previously discussed surveys, Corps of Engineers surveys to 1948, various

chart letters and partial application of the present survey prior to verification and review. Attention is directed to the following charted information:

- (1) The two rocks awash charted in Hospital Cove (Angel Island) originated with the present survey prior to verification and review. The "rocks awash" were actually zero and one-half foot soundings read on kelp. These depths have been subsequently revised and the "rocks awash" should be deleted from the chart.
- (2) The origin of the piles charted in lat. $37^{\circ} 52.18'$, long. $122^{\circ} 28.20'$, since 1924 is not readily ascertainable. The piles were found to be nonexistent at the time of the present survey and therefore should be deleted from the chart.
- (3) The sunken rock symbol charted in lat. $37^{\circ} 53.57'$, long. $122^{\circ} 29.60'$, from a source not readily ascertainable should be deleted from the chart. The sunken rock falls inside the low-water line determined on the present survey.
- (4) The 26-ft. sounding charted in lat. $37^{\circ} 51.90'$, long. $122^{\circ} 26.70'$, from a Project and Index Map of 1946 should be retained on the chart. The present survey verified this depth with a 26-ft. sounding slightly southeastward from the charted sounding.

Except as noted in preceding paragraph (4), the present survey supersedes the charted hydrography.

B. Aids to Navigation

The buoy located in lat. $37^{\circ} 51.33'$, long. $122^{\circ} 28.18'$, on the present survey is presently charted about 140 meters southeastward of the survey position in accordance with H.O. Notice to Mariners No. 51 (1950). The charted position more preferably serves the purpose intended.

Other aids to navigation located on the present survey are in substantial agreement with the charted aids and adequately mark the features intended.

C. Dredged Channel

The charted controlling depths of 12 and 16 feet in the turning basin and channel at Sausalito harbor originate with advance information of the present survey contained in Chart Letter 815 (1948). No revisions are recommended.

7. Condition of Survey


- a. The sounding records are complete; the Descriptive Report covers all matters of importance.
- b. The relocation of twenty-one signals, seventeen of which were along the west shore of Raccoon Strait, necessitated the replotting of all hydrography in the strait. The re-plotted hydrography which appears in an insert on the smooth sheet has eliminated many discrepancies that previously existed. All revisions were accomplished in the Washington Office.
- c. Numerous discrepancies of 1-2 ft. between pole and fathometer soundings in the soft mud bottom of Richardson Bay were eliminated by rejecting the pole soundings and substituting fathometer soundings where the latter were available. However, in the shoal upper reaches of the bay, where the fathometer was not operated, the pole soundings are probably one ft. too deep.


8. Compliance with Project Instructions

The survey adequately complies with the Project Instructions.

9. Additional Field Work


This is a basic survey except for the undeveloped 25-ft. sounding which falls in surrounding depths of 42 to 45 feet in lat. $37^{\circ} 51.03'$, long. $122^{\circ} 25.14'$. It is recommended that any future work in this area include an investigation for least depth at the above location.


H. R. Edmonston
Chief, Nautical Chart Branch


L. S. Hubbard
Chief, Section of Hydrography

Examined and approved:


H. Arnold Karo
Chief, Division of Charts


W. M. Scaife
Chief, Division of Coastal Surveys

NAUTICAL CHARTS BRANCH

SURVEY NO. H-7704 (1948)

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
Jan 23 1950	5535	A. F. Stegman	Before After Verification and Review - Partially applied - made only critical changes from penciled sheet.
Jan 25 1950	5532	A. F. Stegman	Before After Verification and Review Partially applied made critical corrections from chart 5535 drawing #17 in part. Completely applied.
3-20-52	5535	R. K. DeLauder	Before After Verification and Review Added 24 ft edg from 1951 Ad. W.K.
3/24/52	5532	Risegari	Before "After" Verification and Review " {add W.K. Fully applied }
7-21-53	5532	E. M. Bogij	Before After Verification and Review channel/legend sausalito
7/27/54	5532	A. Evans	Before After Verification and Review - reconstruction
9/10/57	Reconst. 5535	J. A. McGinn	Before After Verification and Review Including additional work. Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

**7704 AD. WK
1951**

Diag. Cht. No. 5530-5

Form 504	
U. S. COAST AND GEODETIC SURVEY DEPARTMENT OF COMMERCE	
DESCRIPTIVE REPORT	
Type of Survey <u>HYDROGRAPHIC</u>	
Field No. <u>BC-1117</u>	Office No. <u>H-7704 Ad. Wk.</u> <u>1951</u>
LOCALITY	
State <u>CALIFORNIA</u>	
General locality <u>SAN FRANCISCO BAY</u>	
Locality <u>ANGEL ISLAND</u>	
<u>1951</u>	
CHIEF OF PARTY	
<u>B. C. Bolstad</u>	
LIBRARY & ARCHIVES	
DATE	

B-1870-1 (1)

**7704 AD. WK.
1951**

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-7704 Additional Work 1951

Field No. B0-1447

State CALIFORNIA

General locality SAN FRANCISCO BAY

Locality ANGEL ISLAND, POINT BLUNT

Scale 1 : 10,000 Date of survey 12 October, 1951

Instructions dated 20 Aug. 1951

Vessel Launch 133 from U. S. C. & G. S. S. BOWIE

Chief of party R. C. Bolstad

Surveyed by H. C. Applequist

Soundings taken by fathometer, ~~graphic recorder~~, hand lead, ~~wire~~

Protracted by H. C. Applequist & S. K. Jeffers

Soundings penciled by H. C. Applequist & S. K. Jeffers

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

REMARKS:

FIELD INVESTIGATION

HYDROGRAPHIC SHEET H-7704 - 1948
California - San Francisco Bay
Angel Island

REFERENCE: Director's letter dated 20 August 1951, 22/MEK, S-2-BN

The undeveloped 25-foot sounding in latitude $37^{\circ} 51.03'$, longitude $122^{\circ} 25.14'$ was investigated on 12 October 1951, using Launch No. 133 for the sounding. The shoalest depth found was $24\frac{1}{2}$ feet, approximately 15 meters to the northwest of the original 25.

Topographic stations Lit, Pat, Bel, Ton, and Flat were recovered along with ANGEL ISLAND, PT. BLUNT LIGHT, 1948. Enough of the original whitewash remained to make identification certain. The positions were checked with the sextant. Pat, Ton, and BLUNT were the signals used for the hydrography.

Closely spaced lines, approximately 5 meters, were run on very sensitive ranges in a northeasterly direction. In addition six crosslines were run with slightly greater spacing. About a half hour was spent drifting with the hand lead but no shoaler sounding was obtained.

The fathometer operator was inexperienced and the usual procedure was deviated from as follows:

1. The fathometer was left on the "A" scale throughout so as not to miss possible shoal soundings.
2. The initial was allowed to deviate from the proper setting without attempting to correct it. The Officer in Charge corrected it at one point.

A tide staff was installed at Angel Island, East Garrison and was read at 15 minute intervals. The original record is fastened with scotch tape on page 2 of the sounding record.

The field work was done on a small boat sheet made from a tracing of the photostat of the smooth sheet. Later the work was replotted on a scale of 1:5,000. Both sheets are being forwarded. (subsequently destroyed)
(see enclosed tracing)

H. C. Applequist
H.C. Applequist
Lt. Comdr., USC&GS

Approved:

Roswell C. Bolstad
Roswell C. Bolstad
Commander, USC&GS
Commanding Officer
Ship BOWIE

FIELD INVESTIGATION

HYDROGRAPHIC SHEET H-7704 - 1948
California - San Francisco Bay
Angel Island

REFERENCE: Director's letter dated 20 August 1951, 22/MEK, S-2-BN

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H.C. Applequist
Lt. Comdr., USC&GS

Approved:

Roswell C. Bolstad
Commander, USC&GS
Commanding Officer
Ship BOWIE

20 August 1951

To: Commanding Officer
USC&GS Ship BOWIE
P. O. Box 328
Oakland 4, California

Via: Supervisor, Western District

Subject: Investigation of Undeveloped 25-foot Sounding

1. The Hydrographic Review of Survey H-7704-1948 recommends an investigation for a least depth of an undeveloped 25-foot sounding which falls in surrounding depths of from 42 to 45 feet, in latitude $37^{\circ} 51.03'$, longitude $122^{\circ} 25.14'$.
2. At a convenient time during your present field season when progress of your present project will not be delayed, you will please develop the area of the 25-foot sounding to determine the least depth.
3. A report on your findings shall be submitted immediately to this office.
4. A copy of the smooth sheet covering the area involved is enclosed.
5. You will please acknowledge the receipt of this letter.

(Signed) H. W. Hempfl

Acting Director.

Enclosure.

cc. Supervisor, Western District
Division of Charts
Chief, Nautical Charts Branch
Hydrography Section

26'

25'

PT. BLUNT LIGHT, 1948

Pat

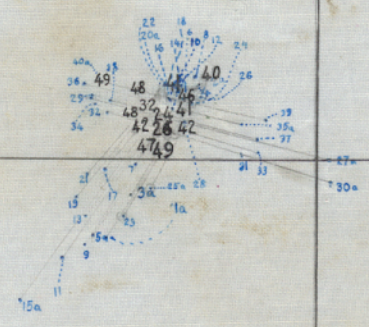
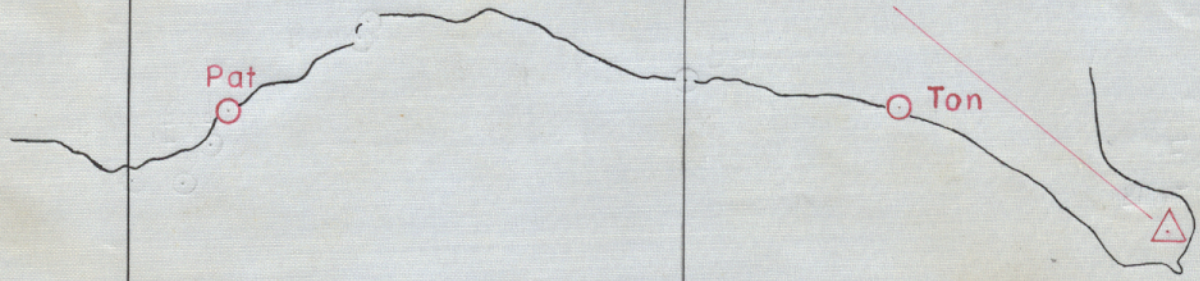
Ton

37°51'

H-7704
Additional Work - 1951
Scale --- 1:10,000

26'

122° 25'



Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. H-7704, Ad, Wk. 1951

Records accompanying survey:

Boat sheets ..1..; sounding vols. ..1..; wire drag vols.;
 bomb vols.; graphic recorder rolls .1.eny.
 special reports, etc. 1 Smooth Sheet; 3 Overlay Tracings.

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

Number of positions on sheet	.....	40
Number of positions checked	.....
Number of positions revised	.....
Number of soundings revised (refers to depth only)	.....	0
Number of soundings erroneously spaced	.....	0
Number of signals erroneously plotted or transferred	.....	0
Topographic details	Time	.....
Junctions Plotting	Time	..... 10 hrs
Verification of soundings from graphic record	Time	..... 8

Verification by *S. K. Jeffers* Total time ..18... Date *11/15/51*..

Reviewed by *J. A. Dinsmore* Time ..1 hr... Date *29 Nov. 1951*

RHC

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Hydrography and Topography:~~

October 31, 1951

Division of Charts: R. H. Carstens

Plane of reference approved in
1 volumes of sounding records for

HYDROGRAPHIC SHEET 7704 (Add. wk.)

Locality: San Francisco Bay, California

Chief of Party: R. C. Bolstad in 1951
Plane of reference is mean lower low water, reading
4.1 ft. on tide staff at Angel Island (East Garrison)
35.7 ft. below B. M. 5(1936)

Height of mean high water above plane of reference is 5.1 feet.

Condition of records satisfactory except as noted below:

E. C. McKay
Section

Chief, ~~Division of Tides and Currents.~~

REVIEW OF H-7704 AD. WK. 1951

A formal review is considered unnecessary for the small amount of additional hydrography done on this survey. The control was that used on the original survey.

The least depth on the unsupported 25-ft. shoal sounding falling in surrounding depths of 40 ft. in lat. $37^{\circ} 51.03'$, long. $122^{\circ} 25.14'$, has been decreased to 24 ft.

This additional work was plotted in the Washington Office. Hydrography for this area is now considered to be complete and basic.

The results of this additional work have been noted on the standards of charts 5532 and 5535 which will be revised accordingly.

Reviewed 29 November 1951

T. A. Dinsmore

Inspected:

R. H. Carstens

Ad work completely applied to Ch 5535 JTW 3/25/52

" " " " " " 5532 Rec. JTW 7/27/54