

# 9984

Diagram No. 5531-1

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

## DESCRIPTIVE REPORT

Type of Survey ..... Hydrographic  
Field No. .... PHP-10-2-81  
Office No. .... H-9984

### LOCALITY

State ..... California  
General Locality ..... San Francisco Bay  
Locality ..... San Mateo

1983

CHIEF OF PARTY  
LCDR P.R. Chelgren

### LIBRARY & ARCHIVES

DATE ..... October 15, 1984

☆U.S. GOV. PRINTING OFFICE: 1980-786-230

9984

Area 5  
CHTS  
18651  
18652 sc A  
A inset 3  
18680-nc B inset 2

To sign off see  
"Record of Application"

**HYDROGRAPHIC TITLE SHEET**

H-9984

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

FIELD NO.

PHP-10-2-81

State California

General locality San Francisco Bay

Locality San Mateo

Scale 1:10,000 Date of survey Sept. 1, 1981 - May 30, 1983

Instructions dated August 11, 1981 Project No. OPR-L123-PHP-81

Vessel NOAA Launch 1101 (EDP 0651), Skiff 594 (EDP 0654), Skiff 779 (EDP 0659)

Chief of party LCDR Pamela R. Chelgren, NOAA

Surveyed by LCDR Pamela R. Chelgren, LT(JG) Eric Secretan, Bruce H. Lund

Soundings taken by echo sounder, hand lead, ~~pole~~ Ross Finline 5000

Graphic record scaled by Pacific Hydrographic Party personnel

Graphic record checked by Pacific Hydrographic Party personnel

Verification  
~~Plotted~~ by L. Deodato Automated plot by PMC Xynetics Plotter

Evaluation  
~~Checked~~ by G. E. Kay

Soundings in ~~XIXIXIX~~ feet at ~~XIXIX~~ MLLW

REMARKS: Times are Coordinated Universal Time.

Revisions and marginal notes in black by evaluator.

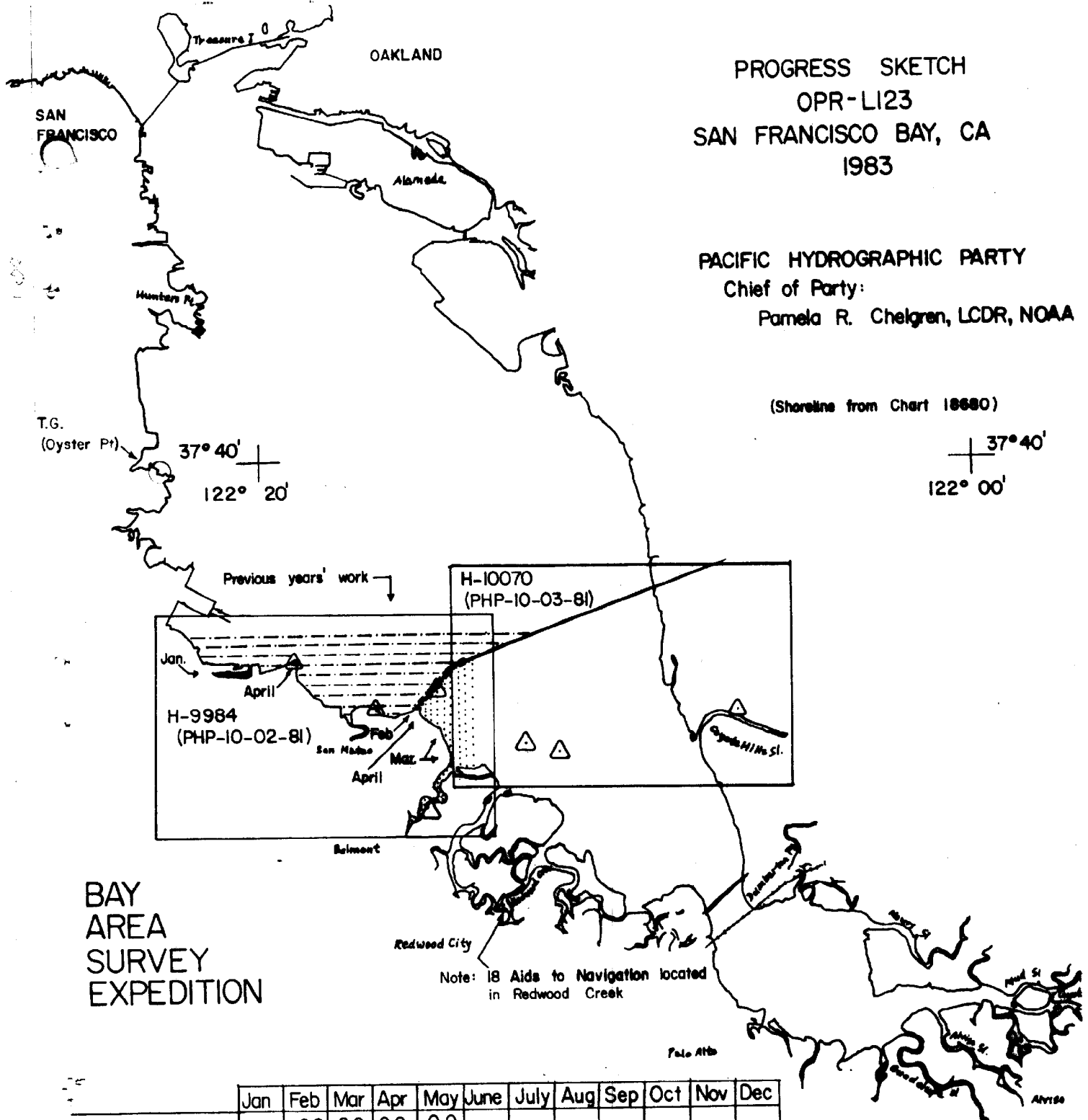
STANDARDS CK'D 10-2284

C. Loy

AWOIS ✓ MUD 10/84

SURE ✓

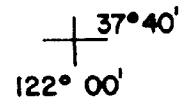
RWW 8/26/92



PROGRESS SKETCH  
 OPR-L123  
 SAN FRANCISCO BAY, CA  
 1983

PACIFIC HYDROGRAPHIC PARTY  
 Chief of Party:  
 Pamela R. Chelgren, LCDR, NOAA

(Shoreline from Chart 18880)



BAY  
 AREA  
 SURVEY  
 EXPEDITION

Note: 18 Aids to Navigation located  
 in Redwood Creek

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
SQ. N.M. Sdgs	--	02	2.0	0.0	0.0							
L.N.M. Misc. Dist.	02	18.0	87.0	19.0	5.0							
L.N.M. Dist To & Fr.	1.0	25.0	104.0	40.0	10.0							
L.N.M. Sdg. Line	0.3	6.4	68.2	6.8	0.1							
Non Samples	--	--	6	--	--							
Control Stations	1	3	20	4	--							
Tide Gauges	--	--	--	--	1							
L.N.M. Field Edit	10	--	--	4.0	10.0							

A. PROJECT

Survey H-9984 (PHP-10-2-81) was accomplished in accordance with Project Instructions OPR-L123-PHP-81, San Francisco Bay, Bay Area Survey Expedition (BASE), dated August 11, 1981; amended by amendment number 3, dated June 10, 1982, number 1, dated Aug 17, 1981, number 2, dated Apr 19, 1982, number 4, dated Dec 29, 1982, and number 5, dated Jul 18, 1982.

B. AREA SURVEYED

Survey H-9984 was conducted in the south portion of San Francisco Bay. The survey encompassed a rectangular portion of southwest San Francisco Bay (25.6 square nautical miles) lying on the west side of the San Mateo-Hayward Bridge. The survey included the areas north and east of San Mateo, the Coyote Point Yacht Harbor and the Belmont Slough and the channel leading into it from the bay. The San Mateo-Hayward Bridge splits the survey area with the main span being on this survey. The inclusive dates of the survey are from September 1, 1981 to May 30, 1983. The boundaries of the survey sheet are as follows:

North	Latitude 37°36'N
East	Longitude 122°14'W
South & west	The shoreline of the cities of Burlingame, San Mateo and Foster City.

C. SOUNDING VESSELS

<u>Vessel</u>	<u>Hull No.</u>	<u>EDP No.</u>	<u>Usage</u>
launch	1101	0651	Soundings 2-58 ft.
skiff	594	0654	Soundings 1-15 ft.
skiff	779	0659	Sextant fixes/support

Skiff 594's transducer was on a portable mount on the gunwhale. It's depth was measured with a tape every day that it was mounted.

Launch 1101 is equipped with two separate narrow beam (7½ degree) transducers used for sounding data acquisition. One of the narrow beam transducers is mounted in the hull and was used for most of the sounding data acquisition on this survey. The second narrow beam transducer was installed during haulout in February 1983 and consists of an aluminum transducer bow mount which supports the transducer away from the hull in front of the boat. The bow mount transducer is used for high speed sounding when there is a low possibility of the launch striking a shoal or submerged hazard. When in use, the bow mount transducer is held firmly in place under the water by a tripod configuration of supporting arms and nylon tension lines. During slower nearshore work, when the hull mounted narrow beam transducer is used, the bow mount is disengaged and folded up out of the water. Launch 1101 is also equipped with a hull mounted wide beam "search" transducer.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS.

Nearly all soundings on H-9984 were recorded from launch 1101 using a standard Ross FineLine fathometer and digitizing system using one of two single  $7\frac{1}{2}$ "<sup>0</sup>, 100 KHz transducers. The Ross system consists of a model 2000 power inverter, a model 4000 transceiver, a model 5000 analog recorder and a model 6000 digitizer. ✓

The Ross system on launch 1101 was made up of the following instruments:

<u>Component</u>	<u>Model No.</u>	<u>S/N</u>
Power inverter	2000	1003
Transceiver	4000	1097
Analog recorder	5000	1082
Digitizer	6000	3787

 ✓

A few soundings (position numbers 7001-7089) were recorded from skiff 594 (EDP 0654) using a Raytheon analog depth recorder with a portable mounted transducer, or leadline. This system was used in depths of 15 feet or less in areas northwest of the San Mateo-Hayward Bridge. The Raytheon system used on skiff 594 consisted of the following: ✓

<u>Component</u>	<u>Model No.</u>	<u>S/N</u>
Analog recorder	DE-719B	6241

 ✓

Sound Velocity Correctors.

Depths on this survey ranged from 0 to 58 feet. Bar checks were made twice daily if wind and sea conditions permitted. Many times the wind was too strong in the afternoon for the lightweight jet launch to get usable bar check data. An 11x1 foot aluminum bar suspended on  $\frac{1}{4}$  inch steel chains with painted markings at 5 foot intervals was used to obtain bar check data on the hull mounted transducers. For the bow mounted transducer a 2 foot diameter aluminum disk suspended on a  $\frac{1}{4}$  inch steel chain marked at 5 foot intervals was used to obtain "bar check" information. Chain markings were checked for accuracy prior to beginning the survey and after its completion and found to be accurate. Bar checks were abstracted daily using a measured static draft value of 2.0 feet for the bow mounted transducer, 1.6 feet for the hull mounted narrow beam transducer and 1.6 feet for the hull mounted wide beam search transducer. ✓

Sound velocity correctors for the point values measured during the bar check (5 foot intervals) were computed using the following formula: ✓

$$\text{Bar depth at A} = \text{Digital depth value at bar depth A} + \text{velocity corrector at depth A} + \text{measured transducer draft.}$$
 ✓

Sound velocity correctors were computed using the mean of the daily values for each bar depth and the appropriate static draft value for the transducer being used. The overall point corrector value for each bar depth was plotted on a depth versus velocity corrector grid and connected by a smooth curve which was the source of the sound velocity corrector tables used to process the sounding data. Soundings on the field sheet are corrected for sound velocity. ✓

The same procedure as above was used with leadline comparison data obtained from skiff 594 (EDP 0654) but with a static transducer draft of 0.5 or 0.9 feet. This data was then added to that obtained from launch 1101 before the velocity corrector plot was made. ✓

There are three sound velocity corrector tables for survey H-9984. Sound velocity table 9 is used for soundings obtained on JD 258 (1981) from skiff 594. Table 1 is for JD 245 (1982) through JD 301 (1982). Table 2 is for JD 302 (1982) through JD 105 (1983). ✓

The Raytheon initial and 50 foot calibration line were kept within 0.2 feet. The tide/TRA line were checked at the beginning and end of the days work and periodically in between. ✓

#### Static Transducer Draft.

The static transducer draft values for the two hull mounted transducers on launch 1101 (EDP 0651) were physically measured in two parts. The first part was done while the launch was out of the water. The distance between the transducer face and the bottom of a black line painted on the hull above the water line was accurately measured using a surveying level (Lietz B-1, S/N 214303) and rod. The second part was done with the launch in the water with a normal crew and fuel load. The distance between the bottom of the painted black line and the actual water line was measured with a steel tape. ✓

The actual static transducer depth is the distance obtained in part 1 minus the distance measured in part 2. ✓

The actual static draft was measured at 1.63 feet for the hull mounted narrow beam transducer, and 1.60 feet for the hull mounted wide beam "search" transducer. ✓

The static transducer draft for the bow mounted transducer on launch 1101 was measured while the launch was in the water. A mark was made at the water line on the main support arm of the transducer mount (vertical arm) while the transducer was in the "down" position. The transducer was then swung up out of the water into the "up" position; and the distance between the transducer face and the mark placed on the mount arm measured with a steel tape. Two separate static transducer drafts were measured for the bow mounted transducer. The first static draft measured was the "survey static draft". This is the static draft measured with a normal fuel load, and crew in the same positions they would be in during sounding operations. The second static draft measured ✓

was the "bar check static draft". This is the static draft measured with equipment and crew in the same positions they would be in during bar/disk checks (i.e. one person, a bucket of  $\frac{1}{4}$  inch chain and the calibration disk all on the bow). The difference between the two different static drafts for the bow mount transducer was measured to be 0.12 feet. ✓

The following is a listing of all static transducer drafts for launch 1101 (EDP 0651). Static transducer drafts used on the TC/TI tape were the same drafts as applied to field sheet soundings. ✓

<u>Transducer</u>	<u>Measured value</u>	<u>TC/TI value</u>
Hull wide beam	1.56 feet	1.6 feet
Hull narrow beam	1.63 feet	1.6 feet
Bow "survey draft"	1.86 feet	1.9 feet
Bow "bar check draft"	1.98 feet	N/A
(used <u>only</u> for bar check comparisons).		

 ✓

The static draft corrector for skiff 594 (EDP 0654) was measured with a steel tape while the skiff was in the water (the transducer is mounted on the side) each time the skiff was used for sounding. The actual static draft corrector of 0.5 and 0.9 feet, as appropriate, is applied on the field sheet and TC/TI tape. ✓

#### Instrument/Draft Corrector.

The instrument/draft corrector is the corrector used to adjust the actual static transducer draft for sounding system characteristics. The instrument/draft corrector is the difference between the measured static draft and the apparent static draft obtained from bar check data. On this survey the bar check apparent static draft agreed well with the actual measured static draft (i.e. 0.0 foot corrector) for all systems used except the wide beam "search" transducer. The wide beam "search" transducer (used on JD 097 and 150 (1983)) has an instrument/draft corrector of -0.3 feet. Instrument/ draft correctors were applied to the TC/TI tape, and were listed in the "scale-phase" column of the TC/TI listing. ✓

#### Settlement and Squat Corrections.

Settlement and squat measurements for launch 1101 were conducted on April 19, 1983 along the face of the Municipal Wharf in Redwood City, California. The depth of the water was always greater than 25 feet while taking the measurements. Changes in transducer draft versus RPM were measured for both narrow beam transducers (bow and hull mounted) by sighting from a stable level gun (Lietz B-1, S/N 214303) on the beach to a stadia rod held perpendicularly on the launch cabin top (or deck) above the transducer. The change in transducer draft at a specific speed (measured in RPMs) was computed as the difference in rod elevation measured with the launch at rest and underway. Measurements were made at each speed with the launch running towards ✓

and away from the level gun. Several rod readings taken during each run were averaged and static rod elevation was determined by averaging rod readings taken before and after each run with the launch dead in the water. This procedure eliminates any error due to changing tide level (during our measurements the tide was at a high and only changing very slowly). Changes in transducer draft due to settlement and squat were measured at regular intervals (which included all standard survey speeds) through the range of 1000 to 2800 RPM with all surveying equipment installed and a normal fuel and crew load on board. These point values were plotted and connected to yield two continuous RPM versus draft correction curves. Settlement and Squat table 1 is to be used for the hull mounted narrow beam transducer with the bow mounted transducer raised up out of the water. When using the hull mounted transducer the bow mounted transducer must be raised up out of the water because of the bubble interference it causes ahead of the hull mounted transducer (i.e. the bow mounted transducer will always be out of the water when the hull mounted transducer is used). Settlement and Squat table 2 is to be used for the bow mounted transducer.

Settlement and Squat measurements were not taken on the wide beam transducer on launch 1101 or on the Raytheon transducer on skiff 594 (EDP 0654) because these systems were only used at idle speed and not subject to settlement and squat considerations.

Settlement and squat corrections are not applied to the field sheet, but are incorporated on the TC/TI tape.

#### Sounding Instrument Accuracy and Adjustments.

The Ross echo sounding system simultaneously produces an analog fathogram and a digitized depth value. Digitized soundings sampled by the logging system at predetermined time intervals are the primary source of data on the field sheet, but these are supplemented by depths scaled from the analog record in areas where digitized soundings were incorrect or lacking. The digitized depths were sometimes triggered by a source other than the bottom (weeds, fish, etc.) or an instrument generated source such as the initial or blanking trace. In these instances the digitized depths were replaced by values scaled from the fathogram.

Initial error occurs when the fathometer's transmit pulse trace is not adjusted to coincide with zero on the fathogram paper. The initial trace alignment was monitored and adjusted during survey operations. Any depths scaled from fathograms with initial error were corrected before being applied to the survey. Initial error has no effect on digitized depth values. A maximum initial error of 0.4 feet was seen on this survey.

Phase errors are caused by faulty stylus belt timing in the analog recorder due to belt stretching or improper internal adjustment. The system was checked for phase error at the beginning and end of



each day (or whenever the analog paper was changed) by introducing simulated depths (e.g. 10', 20', 30', etc.) into the analog recorder via the digitizer phase calibrate mode. The analog trace was then compared to the simulated digital depth. Survey operations were not conducted when phase error exceeded 0.2 feet in the range of depths encountered in the survey area. ✓

#### Application of Sounding System Correctors.

There are no area limitations on any of the sounding system correctors on H-9984 (i.e. all correctors are independent of area). The only corrector dependent on depth is the sound velocity correctors. ✓

The correctors applied to soundings on the field sheet are: ✓

Launch 1101 (EDP 0651)	Tide correctors Velocity correctors Static draft correctors	✓
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Skiff 594 (EDP 0654)	Tide correctors Velocity correctors Static draft correctors	✓
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Because of the very rough bottom in the dredged ship channel, only the shoaler depths were scaled to alleviate sounding congestion. In all cases the difference between the peaks and deeps is less than 4 feet. ✓

On some of the mud flats on survey H-9984 the survey launch continued to sound even though the bottom trace had entered the initial trace on the fathometer. This was done intentionally to insure that the zero foot curve really had been found, and that the water did not get deeper again further inshore. In all cases where the bottom trace was in the initial the depth was rejected (replaced with nines). ✓

#### E. HYDROGRAPHIC SHEETS.

Hydrographic sheet H-9984 was divided into two field sheets at 1:10,000 scale (PHP-10-2-81 north and PHP-10-2-81 south) along latitude 37° 35' 00" N because of plotter size limitations. The sheets were constructed by PHP party members with program RK 201 (on a modified transverse Mercator projection). ✓

Developments, bottom samples, detached positions, dive investigations and some shoreline soundings were plotted on two overlays to avoid congestion on the field sheet. Development contours necessary to represent the shoalest soundings in an area were transferred to the the field sheet. ✓

Field records will be forwarded to the Pacific Marine Center, Seattle, Washington for verification and smooth plotting. ✓

### Expansion Sheet.

Coyote Point Yacht Harbor was plotted on an expansion sheet at 1:5,000 scale to more clearly show dock and shoreline detail. The expansion sheets accuracy is only adequate for a 1:10,000 scale survey.

concur

### Dogear.

The inshore end of the Belmont Slough extends too far south to fit inside the south sheets borders. This part of the Belmont Slough is plotted on a dogear on the western portion of the south sheet.

shown on  
south sheet

### Ink Color Code on Hydrographic Sheets.

Because of the very narrow ocean entrance into San Francisco Bay in relation to the large volume of water contained; differences in actual tide levels from predicted tide levels can sometimes be quite large. Sometimes as large as 2 feet. It was desired that the entire survey be plotted using real tides to alleviate any questions of accuracy arising out of poor cross line and junction comparisons. Because of the long lead time in getting real tides from Rockville, Maryland this was not possible. All soundings obtained before March 1, 1983 are plotted in black ink using real tides. All soundings obtained on March 1, 1983 and later are plotted in purple ink using predicted tides.

✓

### F. CONTROL STATIONS.

Horizontal control for this survey was provided by three newly established control stations and existing triangulation. Stations recovered for survey control and location of new stations were:

✓

Point San Mateo 1925	Point San Bruno 1925
Marsh 1925	Alien 1982
Alien RM 1 1982	Raven 1982
Salt 1925	Turk 1925
Red Hill 1854	Red Hill Top 1958
Crab 1981	Loma 1981
San Mateo Bridge Transm Twr 17 1955	
San Mateo Bridge Transm Twr 18 1955	
Radio Station KNBC Tall Mast 1955	
Coyote Point Yacht Harb Lt 1 1980	
Coyote Point Yacht Harb Lt 2 1980	
Coyote Point Yacht Harb Dbcn 6 1980	
San Francisco Bay S Chan Lt 8 1977	
San Francisco S Chan Dbcn 8A 1980	

✓

New stations Turk RM 4 1925 1983, Block 2 1982 and Bel 1983 were established by Third Order, Class I techniques using intersection and traverse methods. All three stations were monumented and described.

✓

NOTE: Bel ~~1983~~ was not monumented with a standard NOS brass disk because it is only a temporary station. The location of Bel ~~1983~~ is on a recently earth covered dump site. It is a future construction site and should not be recoverable in a year or two. The station is monumented with a vertical 4x4" redwood post extending about 4" above the ground with a brass screw in the top.

San Fran Bay S Ch Lt 12 1983 and San Fran Bay S Ch Twr Lt 1983 (incorrectly labeled as destroyed on the TP-00534, "Chart Maintenance Print") were located by third Order, Class I standards using intersection and traverse methods. ✓

The stations listed below are lost and should be dropped from the geodetic listings: ✓

Transmission Tower 7 1931, 371221/2084 ✓  
Transmission Tower 8 1931, 371221/3061 ✓  
Transmission Tower 9 1931, 371221/2085 ✓

The transmission towers listed above are not stable enough to carry geodetic positions. Mr. Earl Krutchfield, General Foreman, Electric T&D department, Pacific Gas & Electric Company, (415) 592-9410, states that towers on the banks of sloughs, or in sloughs, will move 1 to 2 feet every decade. Our azimuth checks support his statement; none of them closed to the required specifications. ✓

Geodetic computations were based on the 1927 North American Datum. Hydrographic data was processed using unadjusted field geographic positions for the new stations established or located by the party. See Horizontal Control Report for H-9952 and H-9984, OPR-L123-PHP-82, San Francisco Bay, California for a complete discussion of horizontal control procedures, equipment, computations and observations. ✓

#### G. HYDROGRAPHIC POSITION CONTROL.

Launch position for this survey was controlled almost entirely with either a Teledyne-Hastings Raydist radio navigation system operating at a frequency of 3290.400 KHz, or a Motorola Mini-Ranger ultra-high frequency transponder system. North of the San Mateo-Hayward Bridge position control was accomplished primarily by Raydist configured for range-range operation. Some small inshore areas and detached positions north of the Bridge were controlled with Mini-Ranger in a range-azimuth configuration. South of the San Mateo-Hayward Bridge Raydist was not used at all. With the exception of the Belmont Slough, all position control south of the bridge was accomplished with Mini-Ranger in a range-range configuration. The Belmont Slough was controlled mostly by Mini-Ranger in a range-azimuth configuration. "See-boat-sheet" control was used at the inshore end of the Belmont Slough, immediately next to and underneath the San Mateo-Hayward Bridge, inside the Coyote Point Yacht Harbor, and in a small lagoon in the northwest corner of the sheet. Along the San Mateo Bridge positioning was easily controlled by the proximity of the bridge. Therefore, the frequency of fixes is adequate even though it is between 1½ and 7½ cm apart. ✓

### Electronic Control Equipment.

The following electronic positioning equipment was used on this survey: ✓

#### Raydist Mobile Station, launch 1101 (EDP 0651)

Transmitter	Model TA-96	S/N 45	
Navigator	Model ZA-75C-1	S/N 118	
Position Indicator	Model IA-36	S/N 169	✓
Position Indicator	Model IA-36	S/N 180	

#### Raydist "Red" Base Station, Crab 1981 (signal #101)

Transmitter	Model AA-60A	S/N 241	
Power Supply	Model SA-201	S/N 209	✓

#### Raydist "Green" Base Station, Loma 1981 (signal #100)

Transmitter	Model AA-60A	S/N 242	
Power Supply	Model SA-192	S/N 33	✓

#### Motorola Mini-Ranger Mobile Station, Launch 1101

Mini-Ranger Console	S/N 713165	
Mini-Ranger Range Transceiver	S/N 4931	✓

#### Motorola Mini-Ranger Reference Stations

Mini-Ranger Transponder, Code 5	S/N 4499	
Mini-Ranger Transponder, Code 6	S/N 1652	
Mini-Ranger Transponder, Code 7	S/N 4709	✓

### Position Control Equipment Operation - Raydist.

The left ("red") Raydist shore station was located on a large two story flat-topped building approximately 100 meters from the water's edge at an elevation of 30 meters. The station consisted of a 35 foot whip antenna atop a 20 foot tower section with the ground plane radials spread out across the roof. The station was powered with 120 volts A.C. through a Raydist power supply and storage battery buffer. ✓

The right ("green") Raydist shore station was located on packed earth approximately 20 meters from the water's edge at an elevation of 2 meters. The station consisted of a 35 foot whip antenna atop a 20 foot tower section with the ground plane radials spread out across the ground. The station was powered with 120 volts A.C. through a Raydist power supply and a storage battery buffer. ✓

Raydist equipment was calibrated at a fixed point (Third Order, Class I located non-floating aid) at the beginning and end of each day (and sometimes mid-day). Initial lane values computed for the calibration point were entered in the Raydist navigation interface and the phase tracking mechanism was activated with the launch antenna as close to the calibration point as possible. With the receiver tracking, ten sample rates were recorded to determine the partial lane correctors applied during the working day. At the end of the day (and sometimes in the middle of the day) this same procedure was repeated to verify the whole lane count and obtain another set of partial lane correctors. The daily correctors used in data processing were the mean of the morning, afternoon (if any) and evening values; or if the change was high enough at mid-day the correctors were apportioned to meet accuracy requirements. The worst positional difference documented by calibrations was  $\pm 11.3$  meters. This falls within the recommended  $\pm 1.5$ mm at scale for all positional errors (15 meters for 1:10,000 scale) but does not meet the recommended  $\pm 0.5$ mm range error. ✓

All Raydist LOP's used for position control intersected at at least  $45^{\circ}$ . No weak geometric intersections were encountered. No significant aberrations in the Raydist signal due to atmospheric effects occurred during the survey. ✓

The Andist distance for the Raydist system was determined as follows. The physical distance between the Raydist antenna and the hull mounted narrow beam transducer (the only transducer used with Raydist) was accurately measured with a steel tape to be 5.3 meters. A test was performed on JD 104 (1983) to determine the "apparent antenna" location (i.e. the antenna offset caused by parasitic elements on the launch). Two tape marks were placed in the same fore-aft location on both sides of the launch at about mid-cabin. The distance between the Raydist antenna and the tape marks on deck was measured to be 4.81 meters with a steel tape. The launch was positioned against a wood dolphin facing towards the Loma Raydist station and then away from it with the marks on deck at the same location against the dolphin (the center of one of the piles). Raydist rates were recorded with the launch in both positions. Three full sets of readings were recorded. The recorded rates were averaged to obtain mean values for both launch positions (away and toward). Using the Raydist lane value of 45.53 meters, multiplied by the difference between the two sets of recorded rates yields a value of 7.28 meters. If there were no parasitic antenna effects the difference between the two sets of Raydist rates would equal twice the distance measured with the steel tape from the Raydist antenna to the tape marks on deck (i.e. 9.62 meters). Since the distance obtained from the Raydist rates is smaller than the physically measured distance, the Raydist antenna is being electromagnetically offset towards the tape marks and transducer. The Andist for the Raydist controlled work done by launch 1101 is the physically measured andist (5.3 meters) minus the parasitic offset (1.2 meters) which gives a value of 4.1 meters. An Andist ✓

of 4.1 meters is small enough to not be applied on this survey (1:10,000 scale). The logger printout of the Andist test done on JD 104 is in it's own slot at the back of cahier number 2. ✓

Position Control Equipment Operation - Mini-Ranger.

South of the San Mateo-Hayward Bridge most position control was accomplished with Mini-Ranger in a range-range configuration. ✓

The left Mini-Ranger station (Code 5) was located on a small hill at an elevation of 35 meters (Turk RM 4 1925 1983). The transponder was bolted to a steel threaded rod cemented into an outcropping of bedrock. The transponder was powered by batteries which were in turn charged by a solar panel. ✓

The right Mini-Ranger station (Code 7) was located in a U.S. Wildlife Refuge on Redwood Point (Marsh 1925). The transponder was bolted to the top of a 20 foot tower section. The transponder was powered by batteries which were in turn charged by a solar panel. ✓

Mini-Ranger system checks were performed after each survey day (at Third Order, Class I located non-floating aids) to insure the equipment was operating properly. The mean of a group of sample range values collected during the systems check was required to fall within 5 meters of the computed corrected value for the calibration point to be acceptable. Correctors used in data processing were determined from the baseline calibration performed on February 22, 1983. ✓

Andist correctors are not needed for H-9984 Mini-Ranger work because all sounding transducers on launch 1101 are within 5 meters distance of the Mini-Ranger antenna on the launch cabin top. The horizontal distance to the three transducers on launch 1101 from the Mini-Ranger antenna are as follows: ✓

Hull mounted narrow beam	1.6 meters
Hull mounted wide beam	0.0 meters
Bow mounted narrow beam	4.1 meters

 ✓

Location of shore station equipment for hydrographic position control on H-9984 is as follows: ✓

<u>Station #</u>	<u>Station Name</u>	<u>Code or Color</u>
101	Crab 1981	Red
100	Loma 1981	Green
116	Turk RM 4 1925 1983	Code 5
117	Marsh 1925	Code 7,6
122	Point San Mateo 1925	Code 6
114	Block 2 1982	Code 6
118	Bel 1983	Code 6

 ✓

DETACHED POSITIONS LISTING

DAY/YR	POSITION	DESCRIPTION	REMARKS
280/82	1785	Dive Investigation-25 Meter Radius Search.(Nothing Found)	Do Not Smooth Plot-Search Data Only.
	1786	Dive Investigation-25 Meter Radius Search.(Nothing Found)	Do Not Smooth Plot-Search Data Only.
	1787	Dive Investigation-25 Meter Radius Search.(Nothing Found)	Do Not Smooth Plot-Search Data Only.
287/82	2020	Foul With Ruins.	Oyster House Ruins.
301/82	2449	Wood Stakes	
057/83	2566	Wood Pile.	
080/83	3028	Steel Pipe.	
	3029	Steel Buoy.	Private Maintained Buoy.
	3030	Steel Buoy.	Private Maintained Buoy.
	3031	Steel Buoy.	Private Maintained Buoy.
	3032	San Francisco Bay South Channel Buoy "11".	Main Channel Buoy.
	3033	San Francisco Bay South Channel Buoy "10".	Main Channel Buoy.
087/83	3108	Buoy (Private). <i>cc 256</i>	Belmont Slough.
	3109	Steel Pipe. <i>(9)</i>	Belmont Slough.
	3110	Steel Pipe. <i>(9)</i>	Belmont Slough.
	3111	Stake. <i>(9)</i>	Belmont Slough.
	3133	Least Depth. <i>38.8ft</i>	Main Channel.

DETACHED POSITIONS LISTING

DAY/YR	POSITION	DESCRIPTION	REMARKS
088/83	3136	Pipes (Two)	
	3137	Pile.	West End Of Bird Island.
	3138	Pipe.	
	3139	Pipe.	
	3155	Dive Investigation-25Meter Radius Search.	Do Not Smooth Plot. Duplicates TP-00534 Information.
097/83	3176	Rock.	In "Foul Area" At Coyote Point
	<del>3178</del> 3133	Least Depth.	Main Channel.
	3180	Least Depth. <del>3178</del>	Main Channel.
	3182	Bridge Footing, Tower #16 (North Side)	Do Not Smooth Plot. Used For Determination Of Sewer Pipe End
	104/83	3544	Pier Ruins.
105/83	3545	Dive Investigation-25Meter Radius Search.(Nothing Found).	Do Not Smooth Plot. Search Data Only-PSR #33
108/83	3546	Pair Of Steel "I" Beams. <del>obstr</del> (2)	
	3547	Pipe. (2)	
	3548	Row Of Piling, "Inshore End".	
	3549	Row Of Piling, "Offshore End".	
	3550	<del>Pile</del> <sup>Pile</sup> cc hydrophones "Pote" FAA Outer Marker System.	
	3553	Flood Gate.	Belmont Slough.
147/83	7089	Submerged Obstruction.	Concrete Debris.
150/83	3555	Least Depth. <del>41</del> ft	San Mateo/Hayward Bridge(south of)
	3558	Least Depth. <del>39</del> ft	Main Channel.



#### H. SHORELINE.

Shoreline information for H-9984 was taken off AMC Coastal Mapping's "Chart Maintenance Prints" TP-00534 and TP-00535 expanded to 1:10,000 scale by a local reproduction company, and the 1:10,000 scale "Revision Print" of TP-00536 (Aug 1981). Any subsequent changes to either "T-Sheet" were annotated in red ink on the copies of the sheets (original for TP-00534) submitted with the survey. All shoreline details were field edited and changes have been transferred to the field sheet. The photographs supplied were inconvenient in that there were no low water photos given to us, the scale was half that of the survey and we received no ratio prints. ✓

There is only one discrepancy between a photogrammetric position and a hydrographic position for the same item on this survey. The location of a "foul w/piling" item is shown incorrectly on the "Chart Maintenance Print", TP-00534 at latitude  $37^{\circ}35'13.5''N$ , longitude  $122^{\circ}18'20.4''W$ . This location was observed while bare on 30-Dec-82, 0100 Z and no piling exist there. The actual location of the "Foul w/piling" (called "Foul with ruins" on the data print-out) is latitude  $37^{\circ}35'16.2''N$ , longitude  $122^{\circ}18'15.6''W$  and was determined from Pos. #2020, JD 287 (1982); this is also the location of "piles" shown on chart 18651 and "piling" shown on H-8026 which are all the same item. It is assumed that the item "Foul w/piling" was incorrectly plotted on the "Chart Maintenance Print". The item "Foul w/ruins" is plotted in it's correct position in red ink on the TP-00534 "Chart Maintenance Print". ✓

The only control station seaward of the shoreline was San Mateo Bridge Transm Twr 18 1955. ✓

#### I. CROSSLINES.

Crosslines comprise 11.6% of the soundings. Agreement was 0-2 feet which was good for a survey reduced with predicted tides (partly actual, partly predicted) and no settlement and squat correctors applied. ✓

#### J. JUNCTIONS.

H-9872, 1:10,000 Scale, 1980.

Survey H-9872 borders survey H-9984 on the north. It junctions very well with survey H-9984; within  $\pm 1$  foot. There are two areas where by mistake the junction overlap does not meet requirements. One of the areas is at longitude  $122^{\circ}15'30''W$  which consists of a butt junction, the other is at longitude  $122^{\circ}13'55''W$  and has a 100 meter underlap. These two areas were not rerun because the contour and sounding lines junction very well over a flat bottom, and the Raydist control stations had been removed before the mistake was discovered. ✓

H-9952, 1:10,000 Scale, 1982.

Survey H-9952 also borders survey H-9984 on the north. Survey H-9984 junctions very well (within  $\pm 1$  foot) with this survey. ✓

Map features shown on H-9952 south of latitude  $37^{\circ}36'05''N$  are not complete (though not incorrect). H-9984 should be referred to for the complete picture of all features south of the above latitude. Also, the recommended foul area south of the San Francisco Airport is shown incorrectly on survey H-9952; the correct location of this area is described in the Descriptive Report for H-9952 and is shown correctly on H-9984's field sheet. ✓

K. COMPARISON WITH PRIOR SURVEYS.

Presurvey Review Item number 33 (PSR #33).

This item consisted of "submerged piles" charted at latitude  $37^{\circ}35'13''N$ , longitude  $122^{\circ}16'00''W$  which originated when piles charted here from an unknown source since about 1934, were reported destroyed by the U.S. Coast Guard in 1971 (LNM 45/71). ✓

The investigation of this item consisted of the following:

1. A telephone conversation with the U.S. Coast Guard, Aids to Navigation Branch, San Francisco yielded the following history on this aid to navigation. A fixed aid was built on the location in 1919. The fixed aid was rebuilt in 1922, and then discontinued as a Coast Guard aid and replaced with a buoy in 1930. ✓
2. In 1929 the structure was located to Third Order standards and given the name "Pt San Mateo Fl Light, 1929". ✓
3. A search of the Descriptive Report for survey H-8026 (done by a telephone call to Hydrographic Surveys Branch, Rockville, Md.) yielded the following. The only item charted in this area during survey H-8026 (1956) was station "San" which was also labeled "Pt San Mateo Fl Light" because this was its geodetic name. At the time of survey H-8026 the structure was described as a 4-pile structure with "privately maintained sounding boards". ✓
4. In 1971 the U.S. Coast Guard reported the structure destroyed (LNM 45/71), at which point it was then charted as "Submerged piles". ✓

5. A 25 meter radius diver circle search was conducted on the position of the former structure (Pos. #3545, JD 105 (1983)). Nothing was found during the circle search. ✓
6. A very short submerged pile was observed during a minus tide 17 meters southwest of the center of the diver circle search. The pile is located at latitude 37°35'12.33"N, longitude 122°16'00.78"W (Pos # 2566, JD 057 (1983)). The pile is approximately 1.7 feet high and very old and decomposed. It is possible that this pile was used in the construction (or reconstruction) of the original structure (e.g. mooring point, etc.). The pile was observed while the water depth in the area was only 1 to 1½ feet deep. The bottom could be seen and it was obvious that the pile was the only obstruction in the area. *Pile (c)*

The "submerged piles" charted at latitude 37°35'13"N, longitude 122°16'00"W (PSR #33) should be deleted from the chart and a "submerged pile" should be charted at latitude 37°35'12.30"N, longitude 122°16'00.8"W. *Concur, chart according to N 9884*  
*Ref #2566 Pile (c)*

Presurvey Review Item number 35 (PSR #35).

This item, "Submerged obstruction reported, PA" charted at latitude 37°33'56"N, longitude 122°14'01"W, originated with a U.S. Power Squadrons report of 1972 (CL 1843/72). The obstruction is described as part of a platform at latitude 37°34'13"N, longitude 122°16'00"W, that has broken off and floated aground at the present position. ✓

All attempts to contact the original observer (William R. Macke) have failed. ✓

A visual inspection of the area during a minus tide yielded nothing. ✓

The original chart letter describes the item as part of a wood platform which had floated aground. The San Francisco Bay is full of such floating debris originating from it's extensive (and old) shoreline developments. There are at least two U.S. Army Corps of Engineers boats in the San Francisco Bay whose sole duty is to pick up such floating debris. Any hazard to navigation which will float away or shift position during high tides should not be charted. ✓

It is recommended that the "Submerged obstruction reported, PA" charted at latitude 37°33'56"N, longitude 122°14'01"W be deleted from the chart. *Concur*

H-8026, 1:10,000 Scale, 1955-<sup>56</sup>1956.

Soundings.

In the 0 to 6 foot depth range of prior survey H-8026 the agreement with survey H-9984 is  $\pm 2$  feet (allowing a positional shift of  $\pm 1\frac{1}{2}$ mm) with the following exceptions:

1. Along the present shoreline where survey H-9984 shows depths of 0 to 3 feet shoaler due to landfilling. ✓
2. In the area west of longitude  $122^{\circ}20.0'W$  where there is a deepening of 0 to  $3\frac{1}{2}$  feet on survey H-9984. There are at least three storm runoffs west of longitude  $122^{\circ}19.8'W$  that weren't there in the 1950's; it is believed that these runoffs are what caused the deepening. Survey H-9984 should be used to update charted depths in this area. ✓
3. The shoals shown on both sides of the old (no longer used or marked) Coyote Point Yacht Harbor channel have deepened 0 to 2 feet. This is probably due to the fact that there is no longer any active dredging of this channel (or dumping of dredge spoil along the edges). ✓
4. The entire area around and in the Coyote Point Yacht Harbor has changed considerably due to dredging and manmade shoreline changes since survey H-8026 was completed. The new channel into the marina is 3 to 10 feet deeper than this area was during survey H-8026. The west-most basin (of three) agrees only within  $\pm 5$  feet because of dredging and layout changes. The center basin did not exist during survey H-8026 and it now has depths of up to 8 feet deeper than shown on that survey. The east-most basin (which is not finished being built, and has had all construction halted for the indefinite future) also did not exist during survey H-8026. It's west side has deepened up to 13 feet and it's east side has shoaled 1 to 2 feet for a current depth of 0 to 1 foot. Survey H-9984 should be used to update all charted soundings in the Coyote Point Yacht Harbor area. ✓
5. The entrance to Seal Slough has developed a 1 foot channel since survey H-8026. The channel is the result of storm drainage discharge from a major pipeline for the City of San Mateo. The discharge point of the pipe is at the City of San Mateo Sewage Treatment plant located at Seal Slough just outside of the floodgates shown on survey H-9984's field sheet. The sewage treatment plant and pipeline were both built within the last fifteen years and did not exist during survey H-8026. Since there is no navigable access from the bay, and vessels cannot get past the floodgates into Seal Slough it is not recommended that the 1 foot channel be charted. ✓

Concur

Concur

Concur

6. The shoal that extends southeast to west of "San Francisco S Chan Dbcn 8A" has 0 and -1 foot shoal spots throughout. The 0 and minus soundings on survey H-9984 are in different spots than shown on survey H-8026 but overall the general depths agree. Sounding line spacing was reduced in the shoal area to obtain a clearer picture of the depths there. The sounding variations and bottom characteristics (S, M, Sh, Cl) in this area indicate that the bottom shifts with tidal currents (there are already some differences with the 1977 photography). It is recommended that the whole area (as delineated on the field sheet) be shaded light blue with no depths charted and contain the note: "Shifting sand and mud shoals".

See smooth - sheet for area delineation. Check as shown on smooth sheet.

In the 6 to 36 foot depth range of prior survey H-8026 the agreement with survey H-9984 is  $\pm 1\frac{1}{2}$  foot (allowing a positional shift of  $1\frac{1}{2}$ mm) with the following exceptions:

1. The bank on the northeast side of the main ship channel is up to 3 feet deeper than shown on survey H-8026. ✓
2. The southwest edge of the main ship channel (from latitude  $37^{\circ}35.7'N$  to  $37^{\circ}36.1'N$ ) has receded up to 50 meters at the 6, 12 and 18 foot contours from those shown on survey H-8026. Other than the area noted above the remainder of the main ship channel edges have remained within 25 meters of their location shown on survey H-8026. The amount of shifting of the edges of the main ship channel is not surprising considering the 2 to 3 knot currents that run here, dredging of the nearby mud flats (H-9952) and the nature of the bottom (sand, mud, shells and clay). ✓

In the 36 to 58 foot depth range of prior survey H-8026 the agreement with survey H-9984 is  $\pm 3$  feet, allowing a positional shift of  $1\frac{1}{2}$  mm. ✓

Non-sounding Features.

Non-sounding features on prior survey H-8026 which remain the same as shown are as follows: ✓

1. All of the San Mateo Bridge Transmission Towers. • ✓
2. The vehicle bridge crossing the entrance to Seal Slough. ✓
3. The rocks just west of Point San Mateo (along shoreline). ✓

Non-sounding features shown on prior survey H-8026 which have changed are as follows: ✓

1. Major changes (up to 0.3 Nm) have taken place in the shoreline since survey H-8026 was completed. These changes are due to landfilling, dredging and related processes. The "Chart Maintenance Print" of TP-00534 should be used to update the charted shoreline (see section L). concur
  
2. The San Mateo-Hayward Bridge has been rebuilt and the old bridge (shown on H-8026) has been removed, with the exception of the west end of the old bridge which is now a fishing pier. The chart adequately depicts these features. Mr. Jim Spinello, Project Engineer, California Department of Transportation, (415) 557-3114, was contacted by telephone concerning the removal work performed on the old bridge. He states that the removal work was performed by Peter Kiewit Sons Construction Company in August, 1970 (State of California contract #5018). All bridge towers and supports in the channel were completely removed with explosives and a clam shell dredge. All bridge pier supports outside the channel were broken off at least five feet below the mud line. Foul limit transferred from #10070. Chart according to H-8884 ✓
  
3. The "stake" at latitude  $37^{\circ}36'00.4''N$ , longitude  $122^{\circ}20'05.8''W$  was disproved with a 25 meter radius, on bottom, circle search (Pos# 1785, JD 280 (1982)) centered about the position given on survey H-8026.
  
4. The pier ruins located at latitude  $37^{\circ}35'25''N$ , longitude  $122^{\circ}19'40''W$  are 30 meters southwest of their location shown on survey H-8026. Since the current position is photogrammetrically determined, it should take precedence over survey H-8026's location for this item. concur
  
5. The two rocks shown on prior survey H-8026 at latitude  $37^{\circ}35'30''N$ , longitude  $122^{\circ}19'21''W$  are actually only one double-headed rock. The "Chart Maintenance Print" of TP-00534 depicts the higher, more prominent (exposed 6 feet) part of the rock. The smaller head is exposed 3 feet and is located 9 meters away from the larger head on a bearing of  $356^{\circ}$  true. Because of the close proximity and the height difference between the two heads, it is recommended that only the higher inshore part of the rock be charted (i.e. as shown on the Shoreline Manuscript and the 1982 edition of the chart). NOTE: A foul limit for this area is recommended in section L of this report. concur
  
6. The "Duck blind" shown at latitude  $37^{\circ}34'45''N$ , longitude  $122^{\circ}17'54''W$  is now in ruins.
  
7. The three islets at the entrance of Seal Slough (latitude  $37^{\circ}34'20''N$ , longitude  $122^{\circ}17'35''W$  to  $40''W$ ) are not accurately depicted. The "Chart Maintenance Print" of TP-00534 shows this area correctly and should be used to update the chart. concur

8. The seven short piers shown at latitude 37°34'15"N to 20"N, longitude 122°16'00"W to 12"W do not exist as shown on H-8026. This area was observed while bare during Field Edit in 1980. Only three piling remain in the area. The three piling were located during the Field Edit and are shown correctly on the "Chart Maintenance Print" of TP-00534. The "Chart Maintenance Print" should be used to update the chart in this area. ✓

Features shown on prior survey H-8026 which are no longer charted, and no longer exist, are as follows:

Duck blind	latitude	37°35'36"N,	longitude	122°19'57"W ✓
Duck blind	"	37°35'22"N,	"	122°20'07"W ✓
Duck blind	"	37°35'25"N,	"	122°18'26"W ✓
Duck blind	"	37°34'58"N,	"	122°18'23"W ✓
Duck blind	"	37°34'59"N,	"	122°18'02"W ✓
Duck blind	"	37°34'43"N,	"	122°18'30"W ✓
Duck blind	"	37°34'53"N,	"	122°17'47"W ✓
Duck blind	"	37°34'44"N,	"	122°17'30"W ✓
Duck blind	"	37°34'02"N,	"	122°17'30"W ✓
Duck blind	"	37°34'29"N,	"	122°17'14"W ✓
Duck blind	"	37°34'40"N,	"	122°17'03"W ✓
Duck blind	"	37°34'32"N,	"	122°16'57"W ✓
Duck blind	"	37°34'29"N,	"	122°16'10"W ✓
Duck blind	"	37°34'30"N,	"	122°15'59"W ✓
Toll house	"	37°34'23"N,	"	122°15'43"W ✓
Wreck	"	37°35'26"N,	"	122°19'02"W ✓
Wreck	"	37°34'26"N,	"	122°18'58"W ✓
3 Dolphins	"	37°34'24"N,	"	122°19'01"W ✓
Piling	"	37°35'23"N,	"	122°19'42"W ✓
Daybeacon	"	37°35'30"N,	"	122°19'02"W ✓
Daybeacon	"	37°35'41"N,	"	122°18'51"W ✓

H-8027, 1:20,000 Scale, 1955-1956. ✓

#### Soundings.

Prior survey H-8027 has an agreement of  $\pm 2$  feet with survey H-9984 (allowing a positional shift of  $\pm 1\frac{1}{2}$  mm at 1:20,000 scale) except for the following: ✓

The 12 to 14 foot trough shown at latitude 37°35'50"N, longitude 122°14'21"W and the 1 to 3 foot shoals 0 to  $\frac{1}{2}$  Nm north of the San Mateo-Hayward Bridge no longer exist as shown. The trough has filled in to depths of 8 to 9 feet and the shoals have deepened to depths of 3 to 8 feet. According to Mr. Nick Carlson, Manager, Hydraulic Dredging Company, (415) 685-2589, this area was being dredged for oyster shells by a limestone company up until about ten years ago; the area had been a large oyster bed. The depths in this area have long since stabilized to their present values; and the sand and shell bottom has become smooth. Because of the smooth bottom this area was not developed. The current survey depths should be used to update the chart. ✓

Concur

Non-sounding Features.

The San Mateo Bridge Transmission Towers still exist as depicted on prior survey H-8027. ✓

H-8275, 1:10,000 Scale, 1956.

Soundings.

Prior survey H-8275 has an agreement of  $\pm 2$  feet with survey H-9984 (allowing a positional shift of  $\pm 1\frac{1}{2}$  mm) except for the following: ✓

1. The area around the sewer pipeling south of the San Mateo-Hayward Bridge (latitude  $37^{\circ}34'30''N$ , longitude  $122^{\circ}15'28''W$ ) is deeper by up to 5 feet than shown on survey H-8275 (see development G). It is probable that the change in this area was caused by the dredging done to lay the pipeline. It is recommended that survey H-9984 be used to update the chart. concur
2. The area just northwest and southeast (within 0.1 Nm) of the San Mateo-Hayward Bridge in, and around, the main ship channel has deepened up to 10 feet in some areas and shoaled up to 14 feet in others in a location with depths of 34 to 51 feet. There is evidence on the fathograms of some scouring. Telephone conversations with Dave Rubin and Dave McCulloch, Geologists, U.S. Geological Survey, Menlo Park, California, (415) 856-7103 confirmed this. They stated that there are sediment plumes extending away from the San Mateo-Hayward Bridge, there is localized scouring and ridges in their side scan sonar records, the grain size of the sediment is in the silt and clay categories (finer than sand), and that this condition has existed for the last five years probably because of the abnormally large tides California has been experiencing during this time. It is recommended that survey H-9984 be used to update the chart. concur
3. The bank on the notheast side of the main ship channel, just southeast of the Sag Mateo-Hayward Bridge (latitude  $37^{\circ}35.4'N$ , longitude  $122^{\circ}14.3'W$ ) and extending northeast to the east edge of the survey sheet has deepened 2 to 4 feet out to the 12 foot contour. On prior survey H-8275 it is shown as uncovering 1 foot; now the least depth is 2 feet and no bare spots were observed on a minus 1 foot tide. This deepening was probably caused by the dredging of the sand and shell banks immediately north of the San Mateo-Hayward Bridge which allowed the two knot currents experienced here to erode the shoal spots. It is recommended that survey H-9984 be used to update the chart. concur



4. The entrance to the Belmont Slough and Belmont Slough itself have been dredged a couple of times since survey H-8275 was completed. The dredging work was done by Hydraulic Dredging Company for Marine World/Africa USA. It was last dredged in 1966 and is no longer maintained. The slough is really only used now by the Sea Scouts who moor one of their boats in the mud flats at the head of the slough (Marine World Parkway and Highway 101). In the entrance to the slough the current depths differ by  $\pm 8$  feet from those shown on prior survey H-8275 and the channel was moved counter-clockwise from a point near the southern end of the entrance. In Belmont Slough itself the current depths differ by  $\pm 9$  feet from those shown on prior survey H-8275. Survey H-9984 shows there is 3 feet in the entrance to Belmont Slough which then shoals to baring about 1 Nm above the transmission line crossing. It is recommended that survey H-9984 and Coastal Mappings Shoreline Manuscript TP-00536 be used to update the chart in these areas. A private hydrographic survey performed by the Towill Company in 1974 is submitted with survey H-9984 for reference but considerable shoaling has occurred since this development planning (the development plans never materialized) survey was done. ✓ CONCERN
5. The apparent 2 to 3 foot deepening of the bank to the east of the entrance of Belmont Slough (as seen on our survey sheet) is caused by the settlement and squat of the launch's bow mounted transducer. PMC's Processing plot should show a 1 to 2 foot agreement with the prior here. ✓
6. Bay Slough (which is just south of Bird Island on Belmont Slough) has shoaled up to 10 feet in places to a least depth of -2 feet. The shoaling was probably the result of the overworked storm outfalls in Belmont Slough plus the dredging in Belmont Slough. It is presently charted as tide flats, and should continue to be charted as such. ✓ CONCERN
7. There are 10 to 100 meter differences in the shoreline between the prior survey and Coastal Mapping's "Revision Print" of TP-00536. Some changes are landfill and some are beach erosion. There also is a charted land spit off Foster City that extends 300 meters east by southeast of the prior survey's shoreline from latitude  $37^{\circ}33'51''N$ , longitude  $122^{\circ}14'55''W$ . The largest beachfront erosion occurred along the north, east and west sides of Bird Island. In all cases, the chart should use the "Revision Print" of TP-00536 for shoreline determination. ✓ CONCERN

### Non-sounding Features.

1. The "Taller towers" shown crossing Belmont Slough on prior survey H-8275 are no longer prominent because the addition of other power lines make the individual towers insignificant. Neither the U.S. Geological Survey or the U.S. Coast Guard vessels use them because of this reason. The chart should instead show the power lines here as they are charted crossing the Bay at the San Mateo-Hayward Bridge (with dashes for the lines and dots for the towers). Also, the new power line put in immediately to the northeast of the existing lines should be charted this way (as shown on TP-00536 "Revision Print"). *also reference paragraph L #10.*
2. Prior survey H-8275 depicts the old San Mateo-Hayward Bridge with it's old channel span. The chart correctly shows the new bridge and the fishing pier that was made out of the west end of the old bridge. This should continue to be charted as it is now shown.  
NOTE: See comparison with prior survey H-8026 for more information on the old San Mateo-Hayward Bridge.

### L. COMPARISON WITH THE CHART.

#### Soundings.

This survey was compared with the 33rd edition of Chart 18651 (9/18/82), the 21st edition of Chart 18652 (April 1982) and a June 25, 1982 listing of Charts 18651 and 18652's FFAIDs. A more current edition of the chart than specified in the Project Instructions was used to eliminate the necessity of investigating features already removed from the chart. The general agreement of survey H-9984 with the chart is from 1 foot shoaler to 3 feet deeper. Because of extensive dredging in the area this agreement is believed to be adequate.

General differences with the chart, other than those already discussed in section K, are as follows:

1. The charted shoreline varied as much as 50 meters from that shown on the T-sheets (TP-00534 and TP-00536). In all cases the T-sheets should be used to update the charted shoreline.
2. Coyote Point Yacht Harbor channel is charted as having a least depth of 3 feet (reported). No evidence of this shoal depth was found during this survey. Sounding line spacing was reduced to 45 meters across the channel, and a sounding line was run up the center of the channel. A least depth of 6 feet can be carried on the left side of the channel to the westerly turn, then 5 feet carried to the marina basins. The west basin has a least depth

of 6 feet, the center basin has 5 feet and the east basin (partially constructed; now halted) has a dredged channel on its west side with 5 to 15 foot depths and the rest of the basin is shoal to bare. The charted 9 and 10 foot depths in the marina have shoaled 2 to 3 feet to a depth of 7 feet. The 1:5,000 scale expansion sheet of Coyote Point Yacht Harbor should be used to update the charted depths.

Use inset  
on smooth sheet

NOTE: The Coyote Point Range is not intended to keep a vessel in the deep part of a narrow channel as are most ranges. Its purpose (when visible through sailboat masts and rigging) is only to direct vessels in from the Bay to the entrance of the channel, which can be very difficult to find at night because of the many other lights on shore. Because of this reason no sounding line was run on the range.

3. Belmont Slough was last dredged in 1966 and last surveyed in 1974 by Towill Company (BP 114686-692). As stated in section K (prior survey H-8275) this slough has shoaled considerably in the nine years since the Towill survey; and survey H-9984 should be used to update the chart in Belmont Slough. A feature of interest shown on the Towill survey is the 12 to 24 foot deep trench at the end of the landspit off Foster City. This trench was dredged out so that a large barge could be moored there (the barge is shown on one of the Towill blueprints). The trench is now only a 4 to 9 foot hole. The hole is probably still silting-in and it is recommended that it not be charted because it probably will not be present in a decade or two. Other than the above exception (and the 1 foot deep channel into Seal Slough mentioned in section K, H-8026) survey H-9984 should be used to update charted depths.
4. In the main ship channel, immediately south of the San Mateo-Hayward Bridge there is a charted depth of 47 feet (latitude 37°34'58"N, longitude 122°14'55"W). A sounding line through this area produced a depth of 39.2 feet (Pos # 2564, 1st out). The area was later developed (development E) and a more shoal depth of 34 feet (Pos. #3133) was found. Position information was obtained from Mini-Ranger (range/range). It was very easy to control the launch position visually because the shoal areas were in the main channel, between the bridge and the power lines just to the south (a very small area). The search consisted of drift sounding with a wide beam search transducer, and running lines at 10 meter spacing. The cause of these shoals (actually ridges) has already been discussed in section K, H-8275. As stated in section K, it is recommended that survey H-9984 be used to update the chart.

No wire drag, wire sweep or pipe sweep operations were conducted on survey H-9984. Six 25 meter radius, on bottom, circle searches were performed on non-sounding features and are discussed in the appropriate areas of sections K and L of this report. ✓

There were nine development investigations performed on survey H-9984. They are as follows:

- A. Split lines to help define the 0 foot curve over the shoals north of the San Mateo-Hayward Bridge, and west of San Francisco Bay South Channel Daybeacon 8A. Position numbers 2116-2385. ✓
- B. Development/centerline of small unmarked dredged channel in Coyote Point Yacht Harbor eastern basin. Position numbers 2386-2396. ✓
- C. Two short cross-lines across a small shoal near the inshore end of the sewer pipeline just south of the San Mateo-Hayward Bridge. Position numbers 2960-2963, 2967-2968. *Least depth -1.8 ft MLLW Pos# 2961* ✓
- D. Split lines over the entrance channel to Belmont Slough and the discontinued spoil area next to the land spit off Foster City. Position numbers 3034-3067, 3071-3101. ✓
- E. Search for least depth in main ship channel, immediately south of the San Mateo-Hayward Bridge. 10 meter line spacing pattern and wide beam transducer drift search. Position numbers 3133, 3178, 3180. *Least depth 26.7 ft Pos# 3100* ✓
- F. Development of historical (no longer used or maintained) channel into Coyote Point Yacht Harbor. And the corresponding shoulder shoals. 50 meter line spacing across the channel. Position numbers 3156-3175. ✓
- G. Split lines to help define depth curves, and ensure the erosion of former shoals over areas immediately south of the San Mateo-Hayward Bridge, on both sides of the main ship channel. Position numbers 3502-3539. ✓
- H. Investigation sounding line across a deep hole shown in Bay Slough on prior survey H-8275. Position numbers 3540-3543. *Deepest depth 0.0 Pos# 3542* ✓
- I. One very short split line to verify regular sounding line depths, and help develop two ridges immediately south of San Mateo Bridge Transm Twr 17. Position numbers 3560, 3561. ✓

Hydrographic findings of special note are the deepening of the areas on the east side of the channel on both sides of the San Mateo-Hayward Bridge as noted in section K of this report. ✓

There Has been one Danger to Navigation Report submitted to the U.S. Coast Guard concerning hazards to navigation on this survey. The hazards reported were the 13 feet shoaler than charted depths in the main ship channel immediately south of the San Mateo-Hayward Bridge and the submerged obstruction at latitude  $37^{\circ}34'50.9''N$ , longitude  $122^{\circ}15'30.6''W$  (Pos. #7089). The letter is dated 31-May-83, and is attached to the end of this report.

Non-sounding Features.

Non-sounding charted features which have changed, been destroyed or were incorrectly charted are as follows:

1. "Stake" charted at latitude  $37^{\circ}35'55.3''N$ , longitude  $122^{\circ}20'45.9''W$  (originated from Chart Evaluation Survey OPR-511-DA-76, Pos. #6070). This item was searched for using a 25 meter radius, on bottom, circle search (Pos. #1787). Nothing was found and it is recommended that this item be deleted from the chart. concur
2. "Pile" charted at latitude  $37^{\circ}35'50.8''N$ , longitude  $122^{\circ}21'11.7''W$  originated from Chart Evaluation Survey OPR-511-DA-76. This item is shown on the "Chart Maintenance Print" as a stake; and it was visually verified as a stake by us (not large enough for a pile). It is recommended that this item be revised to "stake". concur
3. The five "Duck blind"s originating from Chart Evaluation Survey OPR-511-DA-76, located at:
  - latitude  $37^{\circ}35'45.8''N$ , longitude  $122^{\circ}20'38.2''W$  ✓
  - latitude  $37^{\circ}35'43.7''N$ , longitude  $122^{\circ}20'53.4''W$  ✓
  - latitude  $37^{\circ}35'45.5''N$ , longitude  $122^{\circ}21'06.1''W$  ✓
  - latitude  $37^{\circ}35'40.9''N$ , longitude  $122^{\circ}21'18.3''W$  ✓
  - latitude  $37^{\circ}36'00.5''N$ , longitude  $122^{\circ}20'54.8''W$  ✓are all now in ruins. It is recommended that they all be revised to "Duck blind ruins". concur
4. The names "Ruins" (really new bridge construction) and "OVHD PWR CAB" should not be applied to items in Seal and O'Neill Sloughs because these are non-tidal, gate controlled, residence lakes; and are not accessible from the bay. It is recommended that these names be deleted from the chart. concur
5. "Groin" charted at latitude  $37^{\circ}35'00''N$  to  $04''N$ , longitude  $122^{\circ}18'43''W$  to  $49''W$ . Webster's Dictionary defines a groin as a rigid structure built out from shore. This feature is a low mud ridge, is not at all prominent, and the whole area is above the 0-foot curve. It is recommended that this item be deleted from the chart. do not concur  
chart at  
competent  
direction

6. The area charted as "Being filled" at latitude  $37^{\circ}35'02''\text{N}$  to  $29''\text{N}$ , longitude  $122^{\circ}18'33''\text{W}$  to  $54''\text{W}$ . The following information was obtained from Les Rahn, Harbormaster, Coyote Point Yacht Harbor, (415) 573-2594. Construction work has been totally stopped for over 6 years. Construction was halted for financial and new environmental regulation reasons. Plans are to resume construction again in about five years. Because of the new regulations, changes will be made in what is eventually built, from what was planned. Because of this, a new permit will have to be filed with the U.S. Army Corps of Engineers when construction starts again. It is recommended that the item "Being filled" be deleted from the chart until construction resumes. This recommendation is supported by Les Rahn, Harbormaster. NOTE: See recommendations for additions to the chart (later in this section) for the charting recommendation for the riprap already placed (in 1971) in the "Being filled" area. CONCUR
7. "NW Gable" charted at latitude  $37^{\circ}34'22.6''\text{N}$ , longitude  $122^{\circ}15'42.9''\text{W}$ . This item was determined visually to no longer exist; nor does any building exist in this location. It is recommended that this item be deleted from the chart. CONCUR
8. "Snag PA" charted at latitude  $37^{\circ}35'12.0''\text{N}$ , longitude  $122^{\circ}15'53.8''\text{W}$ . The chart letter (1965) which was the source of this item describes it as a "large log reported to the Coast Guard for removal". Since the log was never fixed to the bottom (and may have been floating when reported) it would never have stayed in the same location beyond the next higher tide. It is recommended that this item be deleted from the chart. CONCUR
9. The building charted at latitude  $37^{\circ}32'18''\text{N}$ , longitude  $122^{\circ}15'27''\text{W}$  was visually verified to no longer exist. The entire area is under construction. It is recommended that this item be deleted from the chart. CONCUR
10. "Taller towers" charted at latitude  $37^{\circ}32'57.6''\text{N}$ , longitude  $122^{\circ}14'50.8''\text{W}$  and latitude  $37^{\circ}33'02.8''\text{N}$ , longitude  $122^{\circ}15'00.2''\text{W}$ . See section K, prior survey H-8275, non-sounding features, in this report for the recommendation on these items. ✓
11. "Pile" charted at latitude  $37^{\circ}31'48.0''\text{N}$ , longitude  $122^{\circ}15'31.8''\text{W}$ . This feature was inappropriately applied from BP 115562 (TP-00536, Revision Print"). That source document had the feature plotted as "PRS" (i.e. piers). A visual inspection determined that they were float docks, in bad disrepair, partially hauled up on shore and secured to shore by steel cables. This item should be revised to "Floats" and charted as shown on TP-00536, "Revision Print". CONCUR

12. "Piles" charted at latitude  $37^{\circ}35'17''$ <sup>6</sup>N, longitude  $122^{\circ}18'16''$ W. This item was observed to consist of steel pipes and bars extending from the bottom at different angles and heights. A hydrographic fix was taken on the area on 14-Oct-82 (Pos. #2020). It is recommended that this item be revised to "Foul with ruins" (for a radius of 20 meters) to better represent the potential hazard to navigation that it is. *concur*
13. The "Spoil area" charted off Foster City at latitude  $37^{\circ}34'00''$ N to  $27''$ N, longitude  $122^{\circ}14'45''$ W. This spoil area has not been used since the last dredging of the nearby channel in 1966. This spoil area has been discontinued. Split sounding lines were run over the entire area (development D) at 45 meter spacing. It is recommended that this spoil area be deleted from the chart. *concur*
14. The flood gate charted under the vehicle bridge at latitude  $37^{\circ}34'14''$ N, longitude  $122^{\circ}17'30''$ W (implied by the sudden change in color from mud flat green to deeper water light blue) is not charted in the correct location. The correct location of the floodgate is latitude  $37^{\circ}34'09.0''$ N, longitude  $122^{\circ}17'26.0''$ W, and is shown correctly on TP-00534 "Chart Maintenance Print". This flood gate should be revised to the correct location. *concur*
15. The row of "piling" (both ends - dashed line between) located at latitude  $37^{\circ}33'53''$ N, longitude  $122^{\circ}14'53''$ W to latitude  $37^{\circ}33'51''$ N, longitude  $122^{\circ}14'45''$ W. This line of piling is charted as being somewhat longer than it really is. A sextant fix was taken at both ends (Pos. #'s 3548, 3549) while the entire area was bare. The correct location of the east end, and the west end of the row of piling is:  
 east end latitude  $37^{\circ}33'51.1''$ N, longitude  $122^{\circ}14'51.2''$ W  
 west end latitude  $37^{\circ}33'50.9''$ N, longitude  $122^{\circ}14'49.9''$ W  
 It is recommended that the chart be revised to show the correct location of these piling. *concur*
16. The two "Sewer PA"s charted north and south of the San Mateo-Hayward Bridge at Little Coyote Point (west end of the bridge) were verified to exist during this survey. Engineer's blueprints and a hydrographic position (Pos. # 3182, bridge tower 16 - end of north pipeline) have been used to adequately locate these pipelines. The engineer's blueprints and the fix information have been submitted with this survey. The pipelines are shown in their correct location on the field sheet. It is recommended that their locations as shown on the field sheet be used to update the chart, and the charted "Sewer PA"s be revised to "Sewer"s. *concur*

17. The Coyote Point Yacht Harbor Range Lights should be revised to their correct location (see the 76-40's included with this survey). Also, it is recommended that the light characteristics for these lights (both are blue *concur* strobes) be charted, along with the note "Privately maintained".
18. The Coyote Point Yacht Harbor shoreline and breakwaters are shown correctly on the "Chart Maintenance Print" of TP-00534. The new float-dock layout is shown correctly on a handout *shoal not* obtained from the Harbormaster. The two piles shown on TP-00534 next to daybeacon 7, and the other two at the *developed* end of the center spit are all shoal markers. The entire *by hydro* marina area is shown correctly on the field sheet and it should be used to update the chart. *Chart according to H 9884 and TP 00534.*
19. The charted islet at latitude  $37^{\circ}31'57.9''N$ , longitude  $122^{\circ}15'39.6''W$  (Belmont Slough) was observed to no longer exist during hydrography. It is recommended that this item *concur* be deleted from the chart.

The following additions should be made to the chart:

1. "Area foul with stakes, piling and ruins". The area is enclosed by the shoreline and a line drawn from latitude  $37^{\circ}36'33.2''N$ , longitude  $122^{\circ}21'27.5''W$ , to latitude  $37^{\circ}36'02.7''N$ , longitude  $122^{\circ}20'14.3''W$ , and then to latitude  $37^{\circ}35'31.6''N$ , longitude  $122^{\circ}20'14.3''W$  (the area south and west of this line). This area has duck blinds built and destroyed seasonally. It is covered with stakes, snags, pipes, piling and ruins. Some are visible above the water, most are submerged. These hazards seem to be in constant change in this area. All known hazards have been located, verified or disproved with more than one search being made for new hazards; but this in no way insures that we have found them all. NOTE: This exact same recommendation was made on survey H-9952. ✓
2. "Stake" at latitude  $37^{\circ}35'50.9''N$ , longitude  $122^{\circ}21'15.3''W$ . This item was scaled off TP-00534 "Chart Maintenance Print" and verified to exist during a minus tide. ✓
3. "Stake" at latitude  $37^{\circ}36'00.6''N$ , longitude  $122^{\circ}21'22.2''W$ . This item was scaled off TP-00534 "Chart Maintenance Print" and verified to exist during a minus tide. ✓
4. "Duck blind ruins" at latitude  $37^{\circ}35'58.1''N$ , longitude  $122^{\circ}21'36.9''W$ . This item was scaled off TP-00534, "Chart Maintenance Print" and was verified to exist during a minus tide. ✓



5. "Poles (swimming markers)". Shown on TP-00534, "Chart Maintenance Print" just west of Coyote Point. And, the two sets of "ruins" just west of the swimming markers. ✓
6. "Foul with rocks and boulders". The recommended area is located along Coyote Point and is shown on the field sheet in red ink. Enclosed within this recommended area is a detached position (Pos. #3176) taken on one of the individual rocks. \* (?) lat 37° 35' 30.8" N  
long 122° 19' 10.1" W
7. The riprap just outside the Coyote Point Yacht Harbor is a hazard to navigation during high water because it is then submerged. The location of the riprap is shown correctly (though inappropriately labeled as a breakwater) on the "Chart Maintenance Print" of TP-00534. This riprap was the beginning of what was to be the outer breakwater of a new third yacht basin; construction has since been halted. It is recommended that this item be charted as shown on the field sheet (i.e. a dashed line for the riprap itself, surrounded by a dotted line denoting a hazard to navigation) and labeled "Riprap (submerged at MHW)". Also, it is recommended that any notes concerning the marina channel (e.g. "3 FT APR 1976 Priv maintd") which are presently charted south of the channel be moved elsewhere so that they do not occupy the location of this riprap; or reduce the charted visual impact of this riprap. ✓
8. "Ruins" at latitude 37° 35' 02.7" N, longitude 122° 18' 52.8" W. This item was scaled off TP-00534, "Chart Maintenance Print" and was verified to exist during a minus tide. ✓
9. The area "Foul w/snags" as shown on TP-00534, "Chart Maintenance Print" at latitude 37° 34' 33" N, longitude 122° 18' 14" W. This item was verified during a minus tide. ✓
10. "Duck blind ruins" at latitude 37° 34' 45.6" N, longitude 122° 17' 52.3" W. This item, shown as a "Duck blind" on TP-00534, "Chart Maintenance Print", was observed to be "Duck blind ruins" during a minus tide. ✓
11. "Submerged pipes" at latitude 37° 34' 55.8" N, longitude 122° 17' 27.0" W. This item is shown on the TP-00534 "Chart Maintenance Print" as "Duck blind ruins". It was not observed during minus tides, so a diver circle search (Pos. # 3155) was performed on JD 088/83. Three submerged steel pipes were found within 3 meters of the T-sheet position, the highest being 3 feet above the bottom. It was determined that the term "Submerged pipes" better represents this item. ✓

chart as  
shown on  
19884

12. San Mateo Bridge Transm Twr 17 and 18 1955 have geodetic positions (see the 76-40's with this report) and are much taller than any of the other San Mateo Bridge Transm Towers. They are very prominent up and down the south bay. It is recommended that they be named "Taller towers" and be charted with landmark symbols. Currently they have only map feature symbols with no name.

NOTE: San Mateo Bridge Transm Twr 18 also has a private navigation light on it's northeast leg. The field geographic position for this light is also included in the 76-40's with this report. The two symbols will plot in the same position; but this is preferable to not showing the tower symbol and name. It will be the transmission tower that is visible from many miles away; not the light.

concur

13. "Stakes" located at latitude  $37^{\circ}34'19.7''$ <sup>249</sup>N, longitude  $122^{\circ}16'19.8''$ W, and 7 meters due east of this position. Observed during hydrography (Pos. # 2449). (5) ✓
14. "Pipe" at latitude  $37^{\circ}33'47.7''$ N, longitude  $122^{\circ}14'39.2''$ W. Hydrographic position #3028. (4) ✓
15. "Pipe" at latitude  $37^{\circ}31'58.0''$ N, longitude  $122^{\circ}15'42.1''$ W. Hydrographic position #3109. (8) ✓
16. "Pipe" at latitude  $37^{\circ}32'00.9''$ N, longitude  $122^{\circ}15'50.3''$ W. Hydrographic position #3110. (9) ✓
17. "Stake" at latitude  $37^{\circ}32'42.9''$ N, longitude  $122^{\circ}15'03.2''$ W. Hydrographic position #3111. (8) ✓
18. "Pipes" at latitude  $37^{\circ}33'47.4''$ N, longitude  $122^{\circ}14'37.2''$ W. Hydrographic position #3136. (4) ✓
19. "Pile" at latitude  $37^{\circ}33'13.1''$ N, longitude  $122^{\circ}14'34.2''$ W. Hydrographic position #3137. (6) ✓
20. "Pipe" at latitude  $37^{\circ}33'51.1''$ N, longitude  $122^{\circ}14'35.6''$ W. Hydrographic position #3138. (8) ✓
21. "Pipe" at latitude  $37^{\circ}33'49.3''$ N, longitude  $122^{\circ}14'36.1''$ W. Hydrographic position #3139. (6) ✓
22. "Platform" at latitude  $37^{\circ}34'20.1''$ N, longitude  $122^{\circ}15'31.3''$ W. This item was scaled off TP-00534, "Chart Maintenance Print". This platform is shown on TP-00534 but it is not labeled. The platform is owned by the F.A.A. and it supports approach electronics for the San Francisco Airport. It is very visible from out on the bay. not showing on smooth sheet - poles showing just off shore

- 23. "Pole" at latitude  $37^{\circ}34'20.5''N$ , longitude  $122^{\circ}15'31.0''W$ . Hydrographic position #3550. This pole is part of the F.A.A. system described above. It has guy wires leading northeast and southeast for approximately 20 meters. (14) ✓
- 24. "Piles" shown on TP-00536, "Revision Print" at latitude  $37^{\circ}33'41.9''N$ , longitude  $122^{\circ}14'49.2''W$  and latitude  $37^{\circ}33'42.3''N$ , longitude  $122^{\circ}14'49.2''W$ . These piles were scaled off TP-00536 and were verified to exist during hydrography. ✓
- 25. "Pier ruins". Two rows of six piles each, running southwest by south from latitude  $37^{\circ}32'58.4''N$ , longitude  $122^{\circ}14'27.8''W$  (Pos. #3544) to shore. (19) ✓
- 26. "Obstruction" at latitude  $37^{\circ}33'38.5''N$ , longitude  $122^{\circ}14'36.8''W$ . Hydrographic position #3546. (2) ✓
- 27. "Pipe" at latitude  $37^{\circ}33'38.0''N$ , longitude  $122^{\circ}14'37.3''W$ . Hydrographic position #3547. (2) ✓
- 28. "Flood gate" located at latitude  $37^{\circ}32'29.8''N$ , longitude  $122^{\circ}14'53.4''W$ . This item was scaled off TP-00536, "Revision Print". The flood gate lets water into Belmont Channel during high tides. This item was incorrectly labeled "pier" on cover TP-00536. ✓
- 29. "Flood gate" located at latitude  $37^{\circ}32'21.2''N$ , longitude  $122^{\circ}14'59.5''W$ . Hydrographic position #3553. This flood gate is identical to the one above. ✓
- 30. "Submerged obstruction" at latitude  $37^{\circ}34'50.9''N$ , longitude  $122^{\circ}15'30.6''W$ . Hydrographic position #7089. ✓

The three T-sheets included with this survey (TP-00534, TP-00535 and TP-00536) have been corrected where wrong (in red ink) in the area of survey H-9984. No additions or new features have been added to the T-sheets. All features shown on the T-sheets (which have not been corrected) can be assumed to be correct, and have been verified. All chartable features (including additions) have been applied to the field sheet. ✓

M. ADEQUACY OF SURVEY.

Survey H-9984 is complete and adequate to supersede all prior surveys for charting purposes.

See Eval Rpt  
Sheet 6

#### N. AIDS TO NAVIGATION.

During the course of this survey one of the two U.S. Coast Guard buoys marking the center span of the San Mateo-Hayward Bridge (Can buoy 11) was found to not be in its charted location. A hydrographic fix taken on it's position (Pos. #3032) was 38 meters away from it's charted location in a direction away from the channel, and closer to the bridge. The local Coast Guard Aids to Navigation Branch was contacted by telephone. It was determined that the buoy had originally been positioned wrong because of the use of incorrect objects while positioning. The Coast Guard has immediate plans to reset the buoy in its charted position. It is recommended that this buoy continue to be charted as it is presently (the buoy is shown *correct* in it's actual present position on the field sheet).

All floating aids to navigation in the limits of this survey sheet were located using hydrographic methods. There are a total of six buoys on the survey sheet; two U.S. Coast Guard buoys marking the center span of the San Mateo-Hayward Bridge, three small privately maintained buoys near the Foster City land spit and another privately maintained buoy in the Belmont Slough near Marine World. As stated above can buoy "11" was 38 meters away from it's charted location, but will soon be repositioned as charted. Coast Guard nun buoy "10" is 39 meters due north of it's charted position, but it adequately serves it's purpose, and it is recommended that the chart be revised to show it's current position (as determined by Pos. #3033). The three small white privately maintained buoys near Foster City (Pos. #'s 3029, 3030 and 3031) appear to mark the east side of the channel into Belmont Slough. They are not presently charted, or shown on the T-sheet, and appear to be fairly new. It is believed that they were placed there by the Sea Scouts who keep a boat up at the end of the Belmont Slough. A fourth buoy, exactly like the other three, was noticed to be aground on the south shore of Bay Slough during the last three months of the survey. No one was ever found aboard the Sea Scout boat to inquire about the future (or past) of this fourth private buoy. In fact the Sea Scout boat was never seen to move. The other privately maintained buoy near Marine World (Pos. #3108) appears to be a mooring buoy, and is quite old. This buoy is also not charted or shown on the T-sheet. A description of all the buoys on this sheet is as follows:

1. San Francisco Bay South Channel Buoy "10". Between Light List numbers 677 and 678 (1983 ed.). Latitude  $37^{\circ}35'03.0''N$ , longitude  $122^{\circ}15'08.6''W$ . Standard steel Coast Guard unlighted nun buoy. 7 feet high, red, with white number "10" on the sides and a radar reflector built into the top. *Pos# 3033*

2. San Francisco Bay South Channel Buoy "11". Between Light List numbers 677 and 678 (1983 ed.). Latitude  $37^{\circ}35'02.6''\text{N}$ , longitude  $122^{\circ}14'56.3''\text{W}$  Standard steel Coast Guard unlighted can buoy. 7 feet high, black, with white number "11" on the sides and a radar reflector built into the top. *Ref-3032* ✓
3. The three privately maintained buoys near Foster City (and the one aground in Bay Slough) are all identical. They are 2 foot in diameter, steel, with a padeye welded in the top and are unlighted. They are painted white with five 5 inch diameter round amber reflectors spaced evenly around the top half. Their positions are: *Ref-3029* ✓
  - latitude  $37^{\circ}33'46.0''\text{N}$ , longitude  $122^{\circ}14'41.2''\text{W}$ . *3029*
  - latitude  $37^{\circ}33'49.1''\text{N}$ , longitude  $122^{\circ}14'39.1''\text{W}$ . *3030*
  - latitude  $37^{\circ}33'59.4''\text{N}$ , longitude  $122^{\circ}14'40.5''\text{W}$ . *3031*
4. The privately maintained mooring buoy in Belmont Slough near Marine World is a 4 foot diameter, steel, unlighted buoy. It is painted black (though the paint is wearing off) and it is surrounded by a rope mesh. Its position is latitude  $37^{\circ}31'46.9''\text{N}$ , longitude  $122^{\circ}15'30.9''\text{W}$ . *Ref-3015* ✓

All non-floating aids to navigation in the limits of survey H-9984 were located by Third Order, Class I methods; and this information will update the position information for all of these aids. Positions for all non-floating aids to navigation on this sheet were compared to their listed positions in a June 25, 1982 listing of FFAID's for charts 18651 and 18652. The following results were obtained. San Francisco South Channel Daybeacon 8A had a difference of 3 meters. The privately maintained San Francisco Bay South Channel Tower Light had a difference of 11 meters. Both Coyote Point Yacht Harbor Light 1 and 2 had differences of approximately 11 meters. The Coyote Point Yacht Harbor Range Lights had differences of 111 and 158 meters. The Coyote Point Yacht Harbor Daybeacons 3,4,5,6,7 and 8 had differences ranging from 46 to 115 meters. The charted positions for the Coyote Point Range Lights is obviously wrong, as the range they form on the chart is not even close to the channel (when in fact it passes midway between lights 1 and 2). The charted positions for the Coyote Point Yacht Harbor Daybeacons, though quite a ways off, did not present a safety hazard because of their usage. All non-floating aids to navigation on this survey sheet serve the apparent purpose *concur* for which they were established. ✓

Aids to navigation not shown in the Light List (in addition to the Foster City/Belmont Slough buoys) are all of the Coyote Point Yacht Harbor Daybeacons and the Coyote Point Range Lights. The Daybeacons mark the edge of the channel into the marina, and the range lights direct vessels to the outer end of the channel. A description of these aids and their positions are as follows: ✓

1. Coyote Point Yacht Harbor Daybeacon 3. Latitude  $37^{\circ}35'34.232''$ N, longitude  $122^{\circ}18'43.477''$ W. Private aid, maintained by Coyote Point Yacht Harbor. Located in July 1980 by the Pacific Hydrographic Party. 3 meter high wood pile with numbered green square dayboards. ✓
2. Coyote Point Yacht Harbor Daybeacon 4. Latitude  $37^{\circ}35'35.175''$ N, longitude  $122^{\circ}18'45.124''$ W. Private aid, maintained by Coyote Point Yacht Harbor. Located in July 1980 by the Pacific Hydrographic Party. 3 meter high wood pile with numbered red triangle dayboards. ✓
3. Coyote Point Yacht Harbor Daybeacon 5. Latitude  $37^{\circ}35'31.819''$ N, longitude  $122^{\circ}18'45.581''$ W. Private aid, maintained by Coyote Point Yacht Harbor. Located in July 1980 by the Pacific Hydrographic Party. 3 meter high wood pile with numbered green square dayboards. ✓
4. Coyote Point Yacht Harbor Daybeacon 6. Latitude  $37^{\circ}35'32.813''$ N, longitude  $122^{\circ}18'47.239''$ W. Private aid, maintained by Coyote Point Yacht Harbor. Located in July 1980 by the Pacific Hydrographic Party. 3 meter high wood pile with numbered red triangle dayboards. ✓
5. Coyote Point Yacht Harbor Daybeacon 7. Latitude  $37^{\circ}35'29.222''$ N, longitude  $122^{\circ}18'47.876''$ W. Private aid, maintained by Coyote Point Yacht Harbor. Located in July 1980 by the Pacific Hydrographic Party. 3 meter high wood pile with numbered green square dayboards. ✓
6. Coyote Point Yacht Harbor Daybeacon 8. Latitude  $37^{\circ}35'30.360''$ N, longitude  $122^{\circ}18'49.390''$ W. Private aid, maintained by Coyote Point Yacht Harbor. Located in July 1980 by the Pacific Hydrographic Party. 3 meter high wood pile with numbered red triangle dayboards. ✓
7. Coyote Point Yacht Harbor Rear Range Light. latitude  $37^{\circ}35'13.015''$ N, longitude  $122^{\circ}19'01.560''$ W. Private aid, maintained by Coyote Point Yacht Harbor. Located in 1983 by the Pacific Hydrographic Party. Steel pile, 9 meters above MSL, 80 flash per minute blue strobe light. ✓
8. Coyote Point Yacht Harbor Front Range Light, latitude  $37^{\circ}35'18.428''$ N, longitude  $122^{\circ}18'57.321''$ W. Private aid, maintained by Coyote Point Yacht Harbor. Located in 1983 by the Pacific Hydrographic Party. Steel pile, 6 meters above MSL, 90 flash per minute blue strobe light. ✓

All bridges on survey H-9984 are shown correctly on the chart. All overhead cables are shown on the chart with the exception of a third set of towers and lines across the Belmont Slough immediately northeast of the two sets presently charted. All three sets of lines are correctly shown on the TP-00536 "Revision Print". The clearance is still 125 feet above mean high water. See section K, prior survey H-8275 for charting recommendation. ✓

Vertical clearances were obtained on the two bridges crossing the entrance into the small lagoon in the northwest portion of the survey sheet. The vehicle bridge at latitude  $37^{\circ}35'27.6''N$ , longitude  $122^{\circ}20'13.8''W$  (northern of the two) has a clearance of 5.2 feet at MHW (based on real tides). The southern vehicle bridge at latitude  $37^{\circ}35'18.2''N$ , longitude  $122^{\circ}20'13.8''W$  has a clearance of 4.5 feet at MHW. ✓

There are no submarine cables or ferry routes known to exist on survey H-9984. ✓

There are two sewer pipelines on survey H-9984. Both pipelines leave the shore at Little Coyote Point (latitude  $37^{\circ}34.5'N$ , longitude  $122^{\circ}05.7'W$ ) and run out into the bay on either side of the San Mateo-Hayward Bridge. See section L for more information on these two charted "PA" items. ✓

#### O. STATISTICS.

<u>Vessel</u>	<u>Number of Positions</u>	<u>N. miles of Sounding Lns.</u>	<u>Square Nm of Hydrography</u>	<u>Detached Positions</u>
1101 (EDP 0651)	<del>2411</del> 2194	288.8	11.5	32
594 (EDP 0654)	89 ✓	2.6	0.1	1
779 (EDP 0659)	5 ✓	0.0	0.0	6
Total	<del>2605</del> 2288	291.4	11.6	39

Number of bottom samples: 20  
 Number of tide stations: 1 (Plus 2 of PTP's, San Mateo, Ft. Point)  
 Number of current stations: 0  
 Number of velocity casts: 0 (bar checks only)  
 Number of magnetic stations: 0

P. MISCELLANEOUS.

None.

Q. RECOMMENDATIONS.

No additional field work is required for the area covered on survey H-9984.

No construction or dredging is presently being done in the area covered by survey H-9984. As discussed in section L, there are future construction plans for a new eastern yacht basin in the Coyote Point Yacht Harbor. See section L for charting recommendations.

R. AUTOMATED DATA PROCESSING.

<u>Number</u>	<u>Name</u>	<u>Version Date</u>
RK201	Grid, Signal, and Lattice Plot	4/18/75
RK211	Range-Range Non-Real Time Plot	2/2/81
RK212	Visual Station Table Load	4/1/74
RK216	Range-Azimuth Non-Real Time Plot	2/9/81
RK300	Utility Computations	10/21/80
RK330	Reformat and Data Check	5/4/76
PM360	Electronic Corrector Abstract	2/2/76
RK407	Geodetic Inverse/Direct Computation	9/25/78
RK410	Geodetic Three-Point Fix	9/22/78
AM500	Predicted Tide Generator	11/10/72
RK561	H/R Geodetic Calibration	2/19/75
AM602	Elinore-Line oriented Editor	5/20/75
AM607	Self-Starting Binary Loader	8/10/80

S. REFERRAL TO REPORTS.

Other project reports covering this survey area are:

1. Horizontal Control Reports for years 1980-1983 (submitted at least yearly).
2. Field Edit Report, and Supplement to Field Edit Report for TP-00534 (submitted in 1980 and January 1982).
3. Field Edit Report, and Supplement to Field Edit Report for TP-00535 (submitted in August 1980 and June 1981).



4. Tide Station Reports and leveling records submitted to OA/C231 on all project area tide stations semi-annually.
5. Coast Pilot Reports submitted annually to OA/CPM3 every January

Respectfully Submitted,

*Eric Secretan*

Eric Secretan  
LTJG, NOAA

## FIELD TIDE NOTE

Soundings on the field sheet were reduced on the basis of either predicted tides for San Francisco (Golden Gate), California, or real tides from San Mateo, California. Real tides were applied to soundings taken before March 1, 1983 (JD 060) and plotted in black on the field sheet. Predicted tides were used to reduce soundings obtained on, and after, March 1, 1983 and were plotted in purple.

Tides were adjusted with correctors supplied by the Tides and Water Levels branch, Rockville, Maryland as follows:

Real tides from San Mateo, California (941-4458):

Time of high water	0 minutes
Time of low water	0 minutes
Height ratio	1.0

Predicted tides for San Francisco, California (941-4290)

Time of high water	+43 minutes
Time of low water	+1 hour 10 minutes
Height ratio	1.41

Tidal reducers were computed at 0.2 foot intervals using a PDP 8/e computer system and program AM 500, "Predicted Tide Generator".

Only one tide gage (ADR type gage) was in operation in the survey area besides the two permanent gages maintained by the NOAA, Pacific Tide Party at San Francisco and San Mateo, California. Location and period of operation of this single gage are as follows:

<u>SITE</u>	<u>POSITION</u>	<u>PERIOD</u>
Oyster Point 941-4392	37 <sup>0</sup> 39.8'N 122 <sup>0</sup> 22.6'W	June 7, 1982 - May 9, 1983

### Oyster Point

Fischer Porter ADR gage, S/N 7304A1380M5, was in place for the entire survey. Excellent records were obtained with no significant interruptions. The analog record reads 42.5 feet greater than the staff.

### Levels

The tide staff at Oyster Point had a negligible shift of less than 0.005 millimeters.

A new bench mark (BM 14) placed on a new pier foundation near the gage and staff on June 7, 1982 has settled 0.026 millimeters in one year (0.017 millimeters the first six months). This bench mark was disregarded in leveling comparisons; and the staff was compared to other more stable bench marks in the area which date from 1974 and 1975.

#### Time Meridian

The time meridian used for Oyster Point tide station was  $120^{\circ}$  west (Pacific Standard Time).

NOTE: The Pacific Tide Party maintains tide gages at Fort Point, Alameda and San Mateo which all lie in our project area. We kept in close contact with PTP during this survey, and no problems were encountered with their gages which would result in a break in tide data during times of hydrography.

NOTE: One day of "See Boat Sheet" soundings were obtained with a different "gage to staff" value for Oyster Point tide station than noted above. The day was September 15, 1981 (JD 258); and at that time (the only time in survey H-9984) the analog record read 21.0 feet greater than the staff (See The Field Tide Note for survey H-9952 for the full reasons for this).

NOTE: Six soundings and two detached positions on JD 150/83, and 1 detached position on JD 147/83 were obtained on survey H-9984 after the Oyster Point tide gage had been removed. The San Mateo and Fort Point gages were operating during this time; as was a new gage on the Dumbarton Railroad Bridge (941-4510).

DATE: 9/21/83

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 945-4458 San Mateo Bridge, CA

Period: September 1, 1981 - May 27, 1983

HYDROGRAPHIC SHEET: H-9984

OPR: LI23

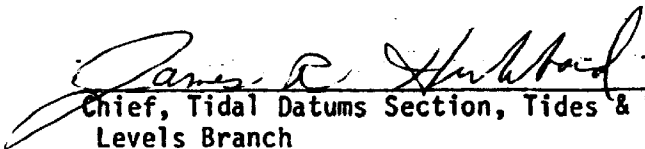
Locality: South San Francisco Bay, California

Plane of reference (mean lower low water): 14.67 feet

Height of Mean High Water above Plane of Reference is 7.0 feet

REMARKS: Recommended Zoning:

1. North of latitude  $37^{\circ}35.5'$ 
  - a. west of  $122^{\circ}15.0'$  apply x 0.96 range ratio.
  - b. east of  $122^{\circ}15.0'$  zone direct.
2. South of  $37^{\circ}35.5'$  to  $37^{\circ}34.0'$  zone direct.
3. South of  $37^{\circ}34.0'$ 
  - a. in Belmont Slough apply +15 minute time correction.
  - b. in San Francisco Bay apply x 1.03 range ratio.

  
Chief, Tidal Datums Section, Tides & Water  
Levels Branch

## Signal Tape Listing (4/7/83)

H-9984

PHP 10-2-81

Station	Latitude	Longitude	CRT	Elev. F.Khz	Name / Source
100	37 39 58318	122 29 36871	250	0003 329040	Loma 1981 - PHP 1981
101	37 46 06295	122 16 39385	250	0011 329040	Crab 1981 - PHP 1981
102	37 36 17794	122 17 21194	139	0003 000000	San Francisco Bay S Chan Lt 8 1977 - 371221/3098
103	37 39 14579	122 23 02571	139	0050 000000	South San Francisco Forbes Twr 1977 - 371221/3100
104	37 37 01655	122 22 55764	139	0015 000000	San Francisco Apt Rot Bcn 1982 - PHP 1982
105	37 42 58177	122 23 38291	139	0110 000000	KYA Radio Tower 1937 - 371221/3052
106	37 45 54676	122 12 50885	139	0116 000000	Oakland P G and E Gas Holder 1947 - 371221/1072
107	37 35 11021	122 14 45779	139	0050 000000	San Mateo Bridge Transm Twr 17 1955 - 371221/2082
108	37 34 56315	122 15 01900	139	0050 000000	San Mateo Bridge Transm Twr 18 1955 - 371221/3070
109	37 45 18578	122 27 05923	139	0575 000000	Mt Sutro TV Tower S Antenna 1976 - 371221/4329
110	37 35 37571	122 18 43020	139	0003 000000	Coyote Point Yacht Harb Lt 2 1980 - PHP 1980
111	37 35 32813	122 18 47239	139	0003 000000	Coyote Point Yacht Harb Dbcn 6 1980 - PHP 1980
112	37 32 49793	122 13 58002	139	0170 000000	Radio Station KNBC Tall Mast 1955 - 371221/2044
113	37 34 18398	122 15 43593	139	0035 000000	San Mateo Bridge Transm Twr 21 1955 - 371221/3072
114	37 34 24557	122 16 41658	139	0002 000000	Block 2 1982 - PHP 1982
115	37 34 41419	122 15 18246	139	0035 000000	San Mateo Bridge Transm Twr 19 1955 - 371221/3071
116	37 34 18043	122 06 14236	250	0035 000000	Turk RM 4 1925 1983 - PHP 1983
117	37 32 04661	122 11 42707	250	0008 000000	Marsh 1925 - 371221/2020
118	37 32 12565	122 15 17982	254	0010 000000	Bel (Temp.) 1983 - PHP 1983

Station #	Latitude	Longitude	CRT	Elev. F.Khz	Name / Source
119 0	37 35 25965	122 14 29321	139	0035 000000	San Mateo Bridge Transm Twr 16 1955 - 371221/2081
120 3	37 35 19970	122 16 07024	139	0003 000000	San Francisco S Chan Dbcn 8A 1980 - php 1980
121 0	37 36 05470	122 12 16667	139	0050 000000	San Mateo Bridge Transm Twr 10 1955 - 371221/2075
122 5	37 35 28848	122 19 06017	250	0013 000000	Point San Mateo 1925 - 371221/3036
123 0	37 39 12095	122 23 01817	139	0055 000000	Point San Bruno 1925 - 371221/3035
208 0	37 33 02830	122 15 00157	243	0036 000000	Transmission Tower 8 1931 - 371221/3061
207 7	37 32 57568	122 14 50830	243	0036 000000	Transmission Tower 7 1931 - 371221/2084
209 7	37 32 15394	122 13 35933	243	0036 000000	Transmission Tower 9 1931 - 371221/2085
212 0	37 33 35554	122 12 33842	139	0003 000000	San Fran Bay S Ch Lt 12 1983 - PHP 1983
213 3	37 34 56675	122 15 01905	139	0005 000000	San Fran Bay S Ch Twr Lt 1983 - PHP 1983
215 0	37 35 32390	122 14 07838	139	0035 000000	San Mateo Bridge Transm Twr 15 1955 - 371221/2080



TYPE OF ACTION	RESPONSIBLE PERSONNEL		ORIGINATOR
OBJECTS INSPECTED FROM SEAWARD	Eric Secretan, LTJG, NOAA		<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODEIC PARTY <input type="checkbox"/> OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED	Felipe L. Rosario, NOAA		FIELD ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	Pamela R. Chelgren, LCDR, NOAA		OFFICE ACTIVITY REPRESENTATIVE  <input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE
<b>INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'</b> (Consult Photogrammetric Instructions No. 64.)			
<p><b>OFFICE</b></p> <p><b>I. OFFICE IDENTIFIED AND LOCATED OBJECTS</b>            Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.  <b>EXAMPLE:</b> 75E(C)6042            8-12-75</p> <p><b>FIELD</b></p> <p><b>I. NEW POSITION DETERMINED OR VERIFIED</b>            Enter the applicable data by symbols as follows:            F - Field                      P - Photogrammetric            L - Located                    Vis - Visually            V - Verified            1 - Triangulation            5 - Field Identified            2 - Traverse                 6 - Theodolite            3 - Intersection            7 - Planetable            4 - Resection                8 - Sextant</p> <p>A. Field positions* require entry of method of location and date of field work.  <b>EXAMPLE:</b> F-2-6-L            8-12-75</p> <p>*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.</p>	<p><b>FIELD (Cont'd)</b></p> <p><b>B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.</b>  <b>EXAMPLE:</b> P-8-V            8-12-75            74L(C)2982</p> <p><b>II. TRIANGULATION STATION RECOVERED</b>            When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.  <b>EXAMPLE:</b> Triang. Rec.            8-12-75</p> <p><b>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH</b>            Enter 'V-Vis.' and date.  <b>EXAMPLE:</b> V-Vis.            8-12-75</p> <p>**PHOTOGAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.</p>		



Replaces C&GS Form 567.

- TO BE CHARTED
- TO BE REVISED
- TO BE DELETED

REPORTING UNIT  
(If field Party, Ship or Office)  
NOAA NOS  
Pacific Hydro. Party

STATE  
California

LOCALITY  
San Francisco Bay

DATE  
3-May-83

**NONFLOATING AIDS**

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

ORIGINATING ACTIVITY

- HYDROGRAPHIC PARTY
- GEODETIC PARTY
- PHOTO FIELD PARTY
- COMPILATION ACTIVITY
- FINAL REVIEWER
- QUALITY CONTROL & REVIEW GRP.
- COAST PILOT BRANCH

(See reverse for responsible personnel)

The following objects HAVE  HAVE NOT  been inspected from seaward to determine their value as landmarks.

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION				METHOD AND DATE OF LOCATION (See instructions on reverse side)		CHARTS AFFECTED
		LATITUDE		LONGITUDE		OFFICE	FIELD	
		° / ' "	° / ' "	D.M. Meters	D.P. Meters			
OPR-L123-PHP-82	PHP-10-2-81	H-9984				N.A. 1927		
SF BAY 50	(SAN FRANCISCO S CHAN DBCN 8A 1980).	37° 35'	122° 16'	07.024			F-3-6-L	18651
CHN DBN 8A	(SAN FRANCISCO S CHAN DBCN 8A 1980). Priv maintd	37° 34'	122° 15'	01.905			7-23-80	18652
TOWER LIGHT	(SAN FRANCISCO S CHAN DBCN 8A 1980).						F-2-6-L	18651
COYOTE PT	(COYOTE POINT YACHT HARB LT 1 1980). Priv maintd	37° 35'	122° 18'	41.294			3-4-83	18652
YACHT LT 1	(COYOTE POINT YACHT HARB LT 1 1980).						F-3-6-L	18651
COYOTE PT	(COYOTE POINT YACHT HARB LT 2 1980). Priv maintd	37° 35'	122° 18'	43.020			7-23-80	18652
YACHT LT 2	(COYOTE POINT YACHT HARB LT 2 1980).						F-3-6-L	18651
MRKR LT S	(COYOTE PT YCHT HBR REAR RNG LT 1983). BLUE STROBE, 27 FEET ABOVE MHW, Priv maintd	37° 35'	122° 19'	01.560			7-23-80	18652
MRKR LT N	(COYOTE PT YCHT HBR FR RNG LT 1983). BLUE STROBE, 18 FEET ABOVE MHW, Priv maintd	37° 35'	122° 18'	57.321			F-2-6-L	18651
							4-19-83	18652
MARKER	(COYOTE POINT YACHT HARB DBCN 3 1980). Priv maintd	37° 35'	122° 18'	43.477			F-3-6-L	18651
MARKER	(COYOTE POINT YACHT HARB DBCN 4 1980). Priv maintd	37° 35'	122° 18'	45.124			7-23-80	18652
MARKER	(COYOTE POINT YACHT HARB DBCN 5 1980). Priv maintd	37° 35'	122° 18'	45.581			F-3-6-L	18651
MARKER	(COYOTE POINT YACHT HARB DBCN 6 1980). Priv maintd	37° 35'	122° 18'	47.239			7-23-80	18652

See 1-1337(14)

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	Eric Secretan, LTJG, NOAA
POSITIONS DETERMINED AND/OR VERIFIED	Felipe L. Rosario, NOAA Pamela R. Chelgren, LCDR, NOAA
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEOETIC PARTY <input type="checkbox"/> OTHER (Specify) FIELD ACTIVITY REPRESENTATIVE OFFICE ACTIVITY REPRESENTATIVE <input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE
INSTRUCTIONS FOR ENTRIES UNDER METHOD AND DATE OF LOCATION* (Consult Photogrammetric Instructions No. 64.)	
<b>OFFICE</b> <b>I. OFFICE IDENTIFIED AND LOCATED OBJECTS</b> Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75	<b>FIELD (Cont'd)</b> <b>B. Photogrammetric field positions** require</b> entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P-8-V 8-12-75 74L(C)2982
<b>FIELD</b> <b>I. NEW POSITION DETERMINED OR VERIFIED</b> Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection P - Photogrammetric Vis - Visually 5 - Field Identified 6 - Theodolite 7 - Planetable 8 - Sextant A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75	<b>II. TRIANGULATION STATION RECOVERED</b> When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75 <b>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH</b> Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75
*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods. **PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.	

NOAA FORM 10-46  
(10-78)

Replaces CGCS Form 367.

**NONFLOATING AIDS**

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

**FOR CHARTS**

ORIGINATING ACTIVITY  
 HYDROGRAPHIC PARTY  
 GEODETIC PARTY  
 PHOTO FIELD PARTY  
 COMPILATION ACTIVITY  
 FINAL REVIEWER  
 QUALITY CONTROL & REVIEW GRP.  
 COAST PILOT BRANCH  
*(See reverse for responsible personnel)*

REPORTING UNIT  
 (If not Party, State or Office)  
 NOAA, NOS  
 Pacific Hydro. Party  
 California  
 San Francisco Bay  
 DATE  
 3 May 83

LOCALITY  
 STATE  
 CALIFORNIA  
 SURVEY NUMBER  
 H-9984

CHARTING NAME  
 OPR-L-123-PHP-82

DESCRIPTION  
 (General reasons for deletion of landmark or aid to navigation.  
 Show identification station number, unless applicable, in parentheses.)  
 (COYOTE POINT YACHT HARB DBCN 7 1980).  
 Priv maintd

CHARTS AFFECTED  
 18651  
 18652

METHOD AND DATE OF LOCATION  
 (See instructions on reverse side)  
 OFFICE  
 FIELD  
 F-3-6-L  
 7-23-80

LATITUDE  
 37° 35'

LONGITUDE  
 122° 18'

DATE  
 3 May 83

CHARTING NAME  
 OPR-L-123-PHP-82

DESCRIPTION  
 (COYOTE POINT YACHT HARB DBCN 8 1980).  
 Priv maintd

CHARTS AFFECTED  
 18651  
 18652

METHOD AND DATE OF LOCATION  
 (See instructions on reverse side)  
 OFFICE  
 FIELD  
 F-3-6-L  
 7-23-80

LATITUDE  
 37° 35'

LONGITUDE  
 122° 18'

See L-1337(84)

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	Eric Secretan, LTJG, NOAA
POSITIONS DETERMINED AND/OR VERIFIED	Felipe L. Rosario, NOAA
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	Pamela R. Chelgren, LCDR, NOAA
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'	
(Consult Photogrammetric Instructions No. 64.)	
<b>OFFICE</b> <b>1. OFFICE IDENTIFIED AND LOCATED OBJECTS</b> Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75	<b>ORIGINATOR</b> <input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)
<b>FIELD</b> <b>I. NEW POSITION DETERMINED OR VERIFIED</b> Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75	<b>FIELD (Cont'd)</b> <b>8. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.</b> EXAMPLE: P-8-V 8-12-75 74L(C)2982
<b>FIELD</b> <b>II. TRIANGULATION STATION RECOVERED</b> When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75	<b>FIELD</b> <b>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH</b> Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75
<b>*FIELD POSITIONS</b> are determined by field observations based entirely upon ground survey methods.	<b>**PHOTOGRAMMETRIC FIELD POSITIONS</b> are dependent entirely, or in part, upon control established by photogrammetric methods.



RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	Eric Secretan, LTJG, NOAA
POSITIONS DETERMINED AND/OR VERIFIED	Felipe L. Rosario, NOAA
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	Pamela R. Chelgren, LCDR, NOAA
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'	
(Consult Photogrammetric Instructions No. 64.)	
<p><b>OFFICE</b></p> <p><b>I. OFFICE IDENTIFIED AND LOCATED OBJECTS</b> Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75</p> <p><b>FIELD</b></p> <p><b>I. NEW POSITION DETERMINED OR VERIFIED</b> Enter the applicable data by symbols as follows: F - Field L - Located V - Verified 1 - Triangulation 2 - Traverse 3 - Intersection 4 - Resection P - Photogrammetric Vis - Visually 5 - Field Identified 6 - Theodolite 7 - Planetable 8 - Sextant</p> <p>A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75</p> <p>*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.</p>	<p><b>FIELD (Cont'd)</b></p> <p><b>B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.</b> EXAMPLE: P-8-V 8-12-75 74L(C)2982</p> <p><b>II. TRIANGULATION STATION RECOVERED</b> When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75</p> <p><b>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH</b> Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75</p> <p>**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.</p>
	<p><b>ORIGINATOR</b></p> <p><input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEOETIC PARTY <input type="checkbox"/> OTHER (Specify)</p> <p>FIELD ACTIVITY REPRESENTATIVE</p> <p>OFFICE ACTIVITY REPRESENTATIVE</p> <p><input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE</p>

NOAA FORM 76-40  
(8-74)

Replaces C&GS Form 567.

TO BE CHARTED  
 TO BE REVISED  
 TO BE DELETED

REPORTING UNIT  
*(If field party, ship or office)*  
NOAA, NOS

Pacific Hydro. Party

STATE

California

LOCALITY

San Francisco Bay

DATE

3 May 83

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NONFLOATING ~~AND/OR~~ LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY

- HYDROGRAPHIC PARTY
- GEODETIC PARTY
- PHOTO FIELD PARTY
- COMPILATION ACTIVITY
- FINAL REVIEWER
- QUALITY CONTROL & REVIEW GRP.
- COAST PILOT BRANCH

*(See reverse for responsible personnel)*

OPR PROJECT NO. OPR-L-123-PHP-82

JOB NUMBER PHP-10-2-81

SURVEY NUMBER H-9984

DATUM

N.A. 1927

METHOD AND DATE OF LOCATION

*(See instructions on reverse side)*

CHARTING NAME

TOWER

(TRANSMISSION TOWER 7 1931).  
NO LONGER OF LANDMARK VALUE.

TOWER

(TRANSMISSION TOWER 8 1931).  
NO LONGER OF LANDMARK VALUE.

NW GABLE

GABLE AT WEST END OF SAN MATEO BRIDGE.  
NO LONGER EXISTS.

*See L-1337(84)*

POSITION

LATITUDE

D.M. Meters

° /

57.53

37°32'

02.83

37°33'

22.64

37°34'

LONGITUDE

D.P. Meters

° /

50.83

122°14'

00.15

122°15'

42.93

122°15'

CHARTS

AFFECTED

18651

18652

18651

18652

18651

18652

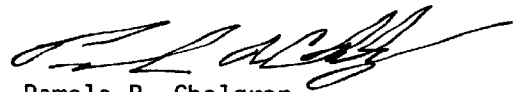
*See L-1337(84)*

RESPONSIBLE PERSONNEL	
TYPE OF ACTION	NAME
OBJECTS INSPECTED FROM SEAWARD	Eric Secretan, LTJG, NOAA
POSITIONS DETERMINED AND/OR VERIFIED	Felipe L. Rosario, NOAA
	Pamela R. Chelgren, LCDR, NOAA
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES	<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'	
(Consult Photogrammetric Instructions No. 64.)	
<b>OFFICE IDENTIFIED AND LOCATED OBJECTS</b> Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75	<b>FIELD (Cont'd)</b> B. Photogrammetric field positions* require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object. EXAMPLE: P-8-V 8-12-75 74L(C)2982
<b>FIELD</b> I. NEW POSITION DETERMINED OR VERIFIED Enter the applicable data by symbols as follows: F - Field                      P - Photogrammetric L - Located                    Vis - Visually V - Verified 1 - Triangulation            5 - Field Identified 2 - Traverse                    6 - Theodolite 3 - Intersection              7 - Planetable 4 - Resection                 8 - Sextant  A. Field positions* require entry of method of location and date of field work. EXAMPLE: F-2-6-L 8-12-75	III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75  **PHOTOGAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.
*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.	



Approval Sheet  
Hydrographic Survey H-9984  
PHP-10-2-81  
OPR-L123-PHP-81/82/83

The field sheet and accompanying records have all been inspected and are approved by me. All field work was personally supervised on a semi-weekly basis. This survey is complete and adequate to supercede all prior information.



Pamela R. Chelgren  
LCDR, NOAA  
Chief of Party  
Pacific Hydrographic Party

# HYDROGRAPHIC SURVEY STATISTICS

H-9984

**RECORDS ACCOMPANYING SURVEY:** To be completed when survey is processed.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		3
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		5
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDIAN FILES					
ENVELOPES					
VOLUMES	1				
CANISERS	2				
BOXES					

**SHORELINE DATA**

SHORELINE MAPS(List): TP-00534 and TP-00536

PHOTOBATHYMETRIC MAPS(List):

NOTES TO THE HYDROGRAPHER(List):

SPECIAL REPORTS(List):

NAUTICAL CHARTS(List): Chart Enlargement #Chart 18651 1:10,000

**OFFICE PROCESSING ACTIVITIES**

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

PROCESSING ACTIVITY	AMOUNTS		
	VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET			2288
POSITIONS REVISED	429	-----	429
SOUNDINGS REVISED	346	-----	346
CONTROL STATIONS REVISED	-----	-----	0
	TIME - HOURS		
	VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION	4	0	4
VERIFICATION OF CONTROL	25	3	28
VERIFICATION OF POSITIONS	67	5	72
VERIFICATION OF SOUNDINGS	159	10	169
VERIFICATION OF JUNCTIONS	3	2	5
APPLICATION OF PHOTOBATHYMETRY	-----	0	0
SHORELINE APPLICATION/VERIFICATION	7	16	23
COMPILATION OF SMOOTH SHEET	43	8	51
COMPARISON WITH PRIOR SURVEYS AND CHARTS	-----	24	24
EVALUATION OF SIDESCAN SONAR RECORDS	-----	-----	-----
EVALUATION OF WIRE DRAGS AND SWEEPS	-----	-----	-----
EVALUATION REPORT	4	16	20
<del>XXXXXXXX</del> Rework	52	-----	52
Digitization	-----	-----	25
<b>TOTALS</b>	<b>364</b>	<b>84</b>	<b>473</b>

Pre-processing Examination by <b>D. Dreves</b>	Beginning Date	Ending Date <b>July 20, 1983</b>
Verification of Field Data by <b>L. T. Deodato</b>	<del>XXXXXXXX</del> Beginning <b>8/22/83</b>	Ending Date <b>6/4/84</b>
Verification Check by <b>James S. Green</b> <b>Stanley H. Otsubo</b>	Time(Hours) <b>48 hours</b>	Ending Date <b>6/8/84</b>
Evaluation and Analysis by <b>Gordon E. Kay</b>	Time(Hours) <b>July 18, 1984</b>	Ending Date <b>August 8, 1984</b>
Inspection by <b>D. Hill</b>	Time(Hours) <b>4</b>	Ending Date <b>9-17-84</b>

PACIFIC MARINE CENTER

EVALUATION REPORT

REGISTRY NO: H-9984

FIELD NO: PHP-10-2-81

California, San Francisco Bay, San Mateo

SURVEYED: September 1, 1981 - May 30, 1983

SCALE: 1:10,000

PROJECT NO: OPR-L123-PHP-81

SOUNDINGS: Ross Fineline 5000 Fathometer

CONTROL: Range/Range  
Hastings Raydist  
Range/Azimuth  
Motorola Mini-Ranger  
III/Wild T-2

Chief of Party.....LCDR P. R. Chelgren

Surveyed by.....LT(JG) E. B. Secretan  
B. H. Lund

Automated Plot by.....PMC Xynetics Plotter

Verified by.....L. T. Deodato

Evaluated by.....Gordon E. Kay

1. INTRODUCTION

H-9984 is a basic hydrographic survey conducted by the Pacific Hydrographic Party in accordance with the following:

Project Instructions OPR-L123-PHP-81, dated August 11, 1981  
Change Number 1 dated August 17, 1981  
Change Number 2 dated April 19, 1982  
Change Number 3 dated June 10, 1982  
Change Number 4 dated December 29, 1982  
Change Number 5 dated July 18, 1983

H-9984 is a three-year survey situated along the southwestern shore of San Francisco Bay near San Mateo.

Although H-9984 is a basic hydrographic survey with photogrammetric support, the high water line and geographic names are not shown on the smooth sheet, in accordance with N/CG letter dated February 16, 1984 entitled, "Reduction of Marine Center Hydrographic Survey Processing Backlog" (copy attached).

The following data was changed during verification:

a. Projection parameters were changed to center the hydrography on the smooth sheet and to change the projection to polyconic.

b. Tide levels - values are from observed tides. See Form 712.

## 2. CONTROL AND SHORELINE

Horizontal control and hydrographic positioning are adequately addressed in the Ship's Descriptive Report paragraphs F and G, and Horizontal Control Report for (H-9952, H-9984) OPR-L123-PHP-81.

The smooth sheet was plotted using published and preliminary adjusted field geographic positions on the North American Datum of 1927.

The following features were transferred from the field sheet without supporting positional information:

<u>Feature</u>		<u>Latitude North</u>	<u>Longitude West</u>
stake		37°35'50.0"	122°21'15.0"
stake		37°35'50.7"	122°21'16.5"
stake		37°35'51.0"	122°21'16.7"
submerged pipeline	from	37°34'19.0"	122°15'42.0"
(sewer)	to	37°34'40.0"	122°15'16.0"
submerged pipeline	from	37°34'25.0"	122°15'45.0"
(sewer)	to	37°34'51.0"	122°15'16.0"

Applicable shoreline manuscripts and dates are as follows:

<u>TP Number</u>	<u>Date of Photography</u>	<u>Date of Field Edit</u>	<u>Date of Final Review</u>
TP-00534 (Class I)	March 1977	October 1980	April 1982
*TP-00535 (Class III)	March 1977	cancelled	April 1981

\*revised by 1981 photography

Shoreline is not shown on H-9984, except for the piers in Coyote Point Yacht Harbor. These piers are shown in dashed red, originating from the field sheet.

## 3. HYDROGRAPHY

Soundings at crosslines are in good agreement. The hydrography contained within this survey is adequate to determine the bottom configuration and least depths. Depth curves were adequately drawn.

## 4. CONDITION OF SURVEY

The hydrographic records and final reports adequately conform to the requirements of the Hydrographic Manual, 4th Edition, revised through change number 3.

This evaluator feels that the writer of this Descriptive Report should be recognized for an excellent job in producing a well written and informative narrative on H-9984.

## 5. JUNCTIONS

H-9984 junctions the following:

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Note</u>	<u>Color</u>	<u>Junctions on</u>
H-9872	1980	1:10,000	Adjoins	Brown	Northeast
H-9952	1981-82	1:10,000	Adjoins	Orange	Northwest
H-10070	1983	1:10,000	Joins	Red	East

The junctions have been adequately effected. The junctions with H-9872 and H-9952 are not complete since these surveys have been forwarded to Rockville, Maryland.

## 6. COMPARISON WITH PRIOR SURVEYS

H-8026 (1955-56) 1:10,000 compares favorably with H-9984. For a complete comparison see Descriptive Report paragraph K, H-8026, supplemented as follows:

A piling and duck blind at latitude 37°35'16"N, longitude 122°18'15"W was searched for by the launch (Position #2020); a pipeline was found surrounded by ruins. The smooth sheet portrays the area as pipe (8) surrounded by a limit line with the note "foul with ruins". Chart according to present survey H-9984.

The present survey is adequate to supersede H-8026 over the area of common coverage.

H-8027 (1955-56) 1:20,000 compares favorably with H-9984. The depth curves on H-9984 are in general agreement with the curves on H-8027. For a complete prior survey comparison see Descriptive Report paragraph K, H-8027. The present survey is adequate to supersede H-8027 over the area of common coverage.

H-8275 (1956) 1:10,000 does not compare well with H-9984. The large portion of prior survey data compares within +2 feet with present survey data, but considering that this data is in depths of less than 6 feet, the magnitude of discrepancies is quite large. For the cause and effect discussion see Descriptive Report paragraph K, H-8275. H-9984 is adequate to supersede H-8275 over the area of common coverage.

## 7. COMPARISON WITH CHART

Chart 18651, 33rd Ed., September 18, 1982, 1:40,000  
 Chart 18652, 21st Ed., May 1, 1982 (inset 3), 1:20,000

a. Hydrography -- Charted depths come from the beforementioned prior surveys and unknown sources and are in good agreement with H-9984. All

charted rocks can be accounted for on the present survey. H-9984 should become the new charting source. For a detailed item-for-item chart comparison see Descriptive Report paragraph L.

There are two presurvey review items located within the limits of H-9984. They are adequately disposed of in the Descriptive Report paragraph K.

b. Controlling depths -- There are no controlling depths located within the limits of H-9984.

c. Aids to Navigation -- These are adequately discussed and disposed of in Descriptive Report paragraph N.

There have been two dangers to navigation reports submitted as follows:

<u>Date</u>	<u>Originator</u>
May 31, 1983	Pacific Hydrographic Party
July 19, 1983	Pacific Marine Center

Copies of these reports are appended.

The geographic name shown on the smooth sheet originates from the chart.

H-9984 is adequate to supersede hydrography on the above charts over the area of common coverage.

#### 8. COMPLIANCE WITH INSTRUCTIONS

H-9984 adequately complies with the instructions and changes listed in section one of this report.

#### 9. ADDITIONAL FIELD WORK

H-9984 is an excellent basic hydrographic survey. Additional field work is neither required nor recommended at this time.

Respectfully submitted,

*Bruce Alan Olmstead*  
for Gordon E. Kay  
August 6, 1984

This survey has been verified and evaluated. I have examined the survey and it meets Charting and Geodetic Services survey standards and requirements for use in nautical charting except as noted in the Evaluation Report. The survey is recommended for approval.

*James S. Green*  
For James S. Green  
Supervisory Cartographer



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL OCEAN SURVEY  
31 May 83

NOAA - Pacific Hydrographic Party  
1A Uccelli Blvd.  
Redwood City, Ca 94063

Commander (OAN)  
12th Coast Guard District  
Building 51  
Government Island  
Alameda, California 94501

Dear Sir:

It is requested that the following two items be included in the next publication of the Coast Guard Local Notice to Mariners. These items were located and investigated by the NOAA, Pacific Hydrographic Party during hydrographic survey H-9984. These items along with the rest of survey H-9984 will be used to update future editions of nautical charts 18651 and 18652, but are considered important enough to warrant immediate publication.

The two items to be published are as follows:

1. Shoaling has occurred in the main ship channel under, and immediately southeast of, the San Mateo-Hayward Bridge (latitude  $37^{\circ}35.0'N$ , longitude  $122^{\circ}15.0'W$ ). Controlling depths through this area are presently 34 feet at MLLW.

2. An obstruction was located at latitude  $37^{\circ}34'50.9''N$ , longitude  $122^{\circ}15'30.6''W$ . The obstruction consists of a heap of concrete piling lying on the bottom. The obstruction is covered by 2 feet of water in an area with depths of 5 feet at MLLW.

Respectfully,

Pamela R. Chelgren, LCDR, NOAA  
Chief of Party  
Pacific Hydrographic Party, NOAA, NOS





**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL OCEAN SURVEY

23-Nov-83

2

Commander (oan)  
12th Coast Guard District  
Building 51  
Government Island  
Alameda, California 94501

Dear Sir:

This letter is to assist your office in the updating of geographic positions (G.P.'s) of non-floating aids to navigation.

The following fixed aids to navigation were located using Third Order, Class 1 standards. These aids were located while conducting Hydrographic Survey H-9984.

1. Coyote Point Yacht Harbor Light 1. 1983 Light List # 675.  
Latitude  $37^{\circ}35'36.724''$  N, longitude  $122^{\circ}18'41.294''$  W.
2. Coyote Point Yacht Harbor Light 2. 1983 Light List # 676.  
Latitude  $37^{\circ}35'37.571''$  N, longitude  $122^{\circ}18'43.020''$  W.
3. San Francisco Bay South Channel Tower Light. 1983 Light List # 678.  
Latitude  $37^{\circ}34'56.675''$  N, longitude  $122^{\circ}15'01.905''$  W.
4. San Francisco South Channel Daybeacon 8A. 1983 Light List # 677.  
Latitude  $37^{\circ}35'19.970''$  N, longitude  $122^{\circ}16'07.024''$  W.

In addition to the above non-floating aids to navigation which are in the 1983 edition of the Light List, the following non-floating aids (which are not included in the current edition of the Light List) were also located.





1. Coyote Point Yacht Harbor Rear Range Light. Private aid.  
Latitude  $37^{\circ}35'13.015''$  N, longitude  $122^{\circ}19'01.560''$  W.  
80 flash per second blue strobe light. 9 meters above Mean  
Sea Level. 1,000,000 Candlepower.
2. Coyote Point Yacht Harbor Front Range Light. Private aid.  
Latitude  $37^{\circ}35'18.428''$  N, longitude  $122^{\circ}18'57.321''$  W.  
90 flash per second blue strobe light. 6 meters above Mean  
Sea Level. 950,000 Candlepower.
3. Coyote Point Yacht Harbor Daybeacon 3. Private aid.  
Latitude  $37^{\circ}35'34.232''$  N, longitude  $122^{\circ}18'43.477''$  W.
4. Coyote Point Yacht Harbor Daybeacon 4. Private aid.  
Latitude  $37^{\circ}35'35.175''$  N, longitude  $122^{\circ}18'45.124''$  W.
5. Coyote Point Yacht Harbor Daybeacon 5. Private aid.  
Latitude  $37^{\circ}35'31.819''$  N, longitude  $122^{\circ}18'45.581''$  W.
6. Coyote Point Yacht Harbor Daybeacon 6. Private aid.  
Latitude  $37^{\circ}35'32.813''$  N, longitude  $122^{\circ}18'47.239''$  W.
7. Coyote Point Yacht Harbor Daybeacon 7. Private aid.  
Latitude  $37^{\circ}35'29.222''$  N, longitude  $122^{\circ}18'47.876''$  W.
8. Coyote Point Yacht Harbor Daybeacon 8. Private aid.  
Latitude  $37^{\circ}35'30.360''$  N, longitude  $122^{\circ}18'49.390''$  W.

Sincerely,



Pamela R. Chelgren, LCDR, NOAA  
Chief of Party  
Pacific Hydrographic Party, NOS



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Ocean Service  
Pacific Marine Center  
1801 Fairview Avenue East  
Seattle, Washington 98102-3767

JUL 19 1983

Commander (OAN)  
Twelfth Coast Guard District  
630 Sansome Street  
San Francisco, CA 94126

Dear Sir:

During preliminary office review of hydrographic survey H-9984, San Mateo, San Francisco Bay, the depths in Belmont Slough were noted to be two feet shallower than currently shown on Chart 18651. The shoaling is considered a danger to navigation. Questions concerning the survey may be directed to Capt. Ned C. Austin, Chief, Nautical Chart Branch, telephone (206) 442-4764.

The following statement is recommended for the Local Notice to Mariners:

"Shoaling has occurred in Belmont Slough south of latitude 37°33'00"N. Depths are generally two feet shallower than charted (Chart 18651), and range from 1 to 4 feet MLLW (based on predicted tides)."

Sincerely,

*for* *K.W. Jefferson*  
Charles K. Townsend  
Rear Admiral, NOAA  
Director, Pacific Marine Center

bc: N/CG222

ATTACHMENT A



ATTACHMENT TO DESCRIPTIVE REPORT FOR H-9984

I have reviewed the smooth sheet, accompanying data, and reports of this hydrographic survey. Except as noted in the Evaluation Report, the hydrographic survey meets or exceeds Charting and Geodetic Services (C&GS) standards, complies with instructions, and is accurately and completely represented by the smooth sheet and digital data file for use in nautical charting.

*Dennis Hill* 9-17-84  
FOR Chief, Nautical Chart Branch (Date)

CLEARANCE:

N/MOP2:LWMordock

SIGNATURE AND DATE

*Lynn Mordock* 9/21/84

After review of the smooth sheet and accompanying reports, I hereby certify this survey is accurate, complete, and meets appropriate standards with only the exceptions as noted above. The above recommendations are forwarded with my concurrence.

*Robert L. Siefert* 9/27/84  
Director, Pacific Marine Center (Date)



**U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration**

Addendum to H-9844

Subsequent to office processing, additional field data became available which affected the TRA sounding corrector values. These additional data consist of localized launch settlement and squat correctors which affect raw soundings of 13 feet or less. A complete description of this corrector is contained in the report, "Ground Effect Report", dated May 1984.

The additional office processing consisted of revising the TC/TI tables to include the appropriate correctors; applying the correctors to raw depths of 13 feet or less; and plotting these corrected depths on an overlay to the smooth sheet. In addition, the revised sounding file was processed through a computerized sounding excessing routine and revised excess overlays accompany the survey records.

Junctioning has been accomplished and is adequate as described in the Evaluation Report.

The revised data have been evaluated and it has been determined that the survey continues to be adequate to supersede prior surveys and charts as recommended in the Evaluation Report.

Approval:

*Dennis J. Hill* 10-31-85  
Dennis J. Hill (Date)  
Chief, Hydrographic Section

*David W. Yeager* 10/31/85  
David W. Yeager (Date)  
Chief, Nautical Chart Branch

*Robert L. Sandquist* 11/85  
Robert L. Sandquist (Date)  
Director, Pacific Marine Center



DEPARTMENT OF COMMERCE  
 National Oceanic and Atmospheric Administration  
 National Ocean Survey  
 Rockville, Maryland

Hydrographic Index No. 95M

