4660

4660

Form 504
Ed. June, 1928

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
R. S. Patton, Director

State: Alaska

DESCRIPTIVE REPORT

Topographic / ~~Hydrographic~~ } *Sheet No.* A 4660

LOCALITY

Kodiak Island

Trinity Islands

(Sitkinak and Tugidak Ids.)

*19*31

CHIEF OF PARTY

F.B.T.Siems, H. & G. E.

U. S. GOVERNMENT PRINTING OFFICE: 1931

DESCRIPTIVE REPORT
TO ACCOMPANY
TOPOGRAPHIC FIELD SHEET "A"

STR. SURVEYOR F.B.T.SIEMS, COM'D'G.

Instructions dated April 17, 1931

4660

AREA SURVEYED:

This sheet includes surveys of portions of Sitkinak and Tugidak Islands, off the south coast of Kodiak Island, Alaska.

The north side of Sitkinak Island was surveyed from triangulation station Bad Point 2, northeastward to a point in latitude, 56° 35.85' N. and longitude 155° 16.85' W., where the sheet forms a junction with Topographic Sheet Reg. No. 4583.

The east end of Sitkinak Island was surveyed from the vicinity of triangulation station Osk, to the vicinity of triangulation station Equinox (see Insert A).

On Tugidak Island, the survey was carried from the vicinity of triangulation station Tug, around the north end of the island, to triangulation station Red Bluff 2.

GENERAL DESCRIPTION:

(a) Sitkinak Island (Valley Point to Bad Point).

This part of the island is mountainous, and in summer is covered with a thick growth of grass, except along the steep slopes adjacent the shore, where landslides are common. The soil is composed of sand and clay, and is grayish brown in color. Numerous rocks outcrop from the eroded slopes. The beach is composed of sand and gravel, with scattered rocks. The area offshore is generally foul for a distance of one-half mile (nautical). There is a very gradual recession of the shore between Valley Point and signal NUT, due to the wave-action of the sea against the earth cliffs.

(b) Sitkinak Island (East End).

The east end of Sitkinak Island is mountainous and grass-covered. The slopes adjacent the shore are precipitous, and generally subject to landslides. The beach is composed of large boulders, from triangulation station OSK to signal TIRE. From signal TIRE to the limit of the sheet, the beach is sandy. An unbroken band of thick kelp skirts the shore, at a distance of one mile (nautical).

(c) Tugidak Island.

The northern part of this island is low, and is interspersed with a number of grassy sand-hills about 20 feet high. The land slopes gradually to the west and southwest, where it terminates at the sea in earth cliffs. There is a large lagoon in the northern part, which almost divides the island.

CONTROL:

The triangulation stations VALLEY POINT 2, BAD POINT 2, TUG, EAST BASE, RED BLUFF 2, IN, OUT, OSK, EQUINOX, and OCEAN-VIEW, all of which were established in 1930, were used for the control of this survey.

SURVEY METHODS:

This survey was made by planetable, supplemented by the use of sextants.

A traverse was run from triangulation station TUG to triangulation station RED BLUFF 2, and closed without error.

A traverse from triangulation station BAD POINT 2 toward triangulation station VALLEY POINT 2, was first closed on signal GUD and signal OLD (hydro. signals established in 1930), with a closing error of 10 meters in distance, and no error in azimuth. Prior to this traverse, planetable cuts were taken from triangulation station E.BASE and triangulation station TUG to all the signals on Sitkinak Island as far toward Valley Point as signal DOG. The traverse location of the signals checked the planetable cuts in all instances. This traverse was run when the sheet was new and but slightly distorted. About one month later, the traverse was continued toward VALLEY POINT 2, using DOG as a starting point. This traverse closed on Valley Point 2, with an error of 40 meters in distance, and no error in azimuth. The distortion due to expansion amounted to thirteen meters for this distance, thus reducing the instrumental error to 27 meters, which is slightly over the allowable for a traverse of $3\frac{1}{4}$ miles. The total error was adjusted proportionately between DOG and VALLEY POINT 2, it being assumed that no error had occured between BAD POINT 2 and DOG. The adjustment of this traverse was verified by sextant cuts from a launch, anchored at successive points about one mile offshore. Triangulation station E.BASE, signal DOG and triangulation station VALLEY POINT 2 were used for the primary control. At least three cuts were taken to each signal between DOG and VALLEY POINT 2. Position fixes were taken before and after the cuts, to check against any movement of the anchored boat. No appreciable movement of the boat resulted. The cuts are recorded in a number of pages from Form #274, which are attached to this report.

The position of DOG was considered accurate, since cuts were obtained to it from triangulation station E.BASE and triangulation station TUG, and the traverse checked the intersection of these cuts. Later in the season, an hydrographic station-marker was established at signal DOG, and the angle TUG - EAST BASE observed by theodolite (See Sketchbook notes accompanying this report). It was intended that triangulation station TUG and triangulation station E.BASE be occupied by theodolite also, in order that signal DOG could be computed trigonometrically, but lack of time and bad weather conditions prevented this operation. However, a check on the distance of DOG from E.BASE and TUG was determined in the following manner:

Two arbitrary azimuth lines were laid off on the sheet, from triangulation station TUG, so as to pass a short distance (about 20 meters) on each side of signal DOG. The angular distances at TUG, between these azimuths as scaled off by protractor and the azimuth TUG - E.BASE were then determined by subtraction. Now considering two points, A and B, to be on the arc of a circle passing thru DOG, TUG, and E.BASE, and also on the respective azimuths as laid off, two triangles, viz., A, TUG, E.BASE and B, TUG, E.BASE, are formed. In these triangles, the angles a A and B are equal, and are the same as the observed angle (32° 19' 20") at DOG, since both points are on the arc of the circle through DOG, TUG, and E.BASE. The third angle of each of these triangles was concluded. Thus with the three angles of each triangle, and the known side, TUG - E.BASE, each triangle was computed trigonometrically, and the geographic positions of A and B determined. These positions were plotted on the sheet, and joined by a right line, which is so short that it approximates the arc, A-B. The line thus drawn passed through the topographic position of DOG. This method was used in order to eliminate any distortional errors of the sheet. The computations involved in this operation are shown in Appendix "A" of this report.

Planetable cuts were taken to the rocks offshore, when visible. These cuts were supplemented by sextant fixes, taken at the rocks where less than three planetable cuts were obtained.

A traverse was run from triangulation station OSK to the vicinity of triangulation station EQUINOX, and was terminated at the hydrographic signal FOOT. This signal was located by carefully-observed sextant cuts from the SURVEYOR, using triangulation stations OUT, OSK, EQUINOX and OCEAN-VIEW for control. The data relating to the location of this signal are recorded in Vol.11, Sheet 42, pages 9 to 13. The traverse closed without error in distance, but was found to be about 35 meters out in azimuth (final azimuth taken to OCEAN VIEW). This error was considered accountable to the great number of set-ups necessary to traverse around the point between triangulation station OSK and signal TIRE. The azimuth error was adjusted proportionately between triangulation station OSK and signal FOOT.

In 1930, the position of OSK was computed from the single triangle OSK, IN, and OUT, the angle at OSK being concluded. This angle was measured by sextant by the topographer, and found to be 17° 50' 36" (See Sketchbook notes accompanying this report). The concluded angle determined in 1930 was 17° 48' 14".

FORM-LINES:

The elevations on this sheet were practically all determined by means of sextant angles from a launch. Where possible, planetable elevations were obtained, but these were few, on account of the steepness of the slopes adjacent to the shoreline. In determining the elevations by sextant, due allowance was made for the height of eye of the observer, distance of the boat from the shore, and curvature of the earth. The form-lines were extended to a satisfactory junction with Topographic Sheet, Reg. No. 4583.

DISCREPANCIES:

New locations were made of some of the rocks offshore in the vicinity of signal MIL. These were verified by sextant fixes, taken at the rocks by the hydrographic party. The notes relating to the heights of these rocks above M.L.L.W. are based on observations by the hydrographic party, and are recommended in preference to the heights shown on Topographic Sheet, Reg. No. 4583.

NEW NAMES:

BAD POINT -- so named by the field parties of 1906, 1930 and 1931. This point was probably so named because of the strong tidal currents, which flow past it.

PHOTOGRAPHS:

Two photographs, as shown and described on page 5, form a part of this report.

LIST OF PLANETABLE POSITIONS

Object and Description	Lat.	D.M.	Long.	D.P.	Height	Remarks
NUT--large rock outcropping from earth cliff, 330 meters, 46° true from lone rock (3 ft.) 160 meters offshore.	56-34	95	154-20	370	20 ft.	Center
DOG--moderate sized boulder near H.W. line, 1220 meters, N.E., true, from stream emerging from deep valley.	56-35	833	154-18	99	4 ft.	Marked with standard hydrographic disk.
ROCK--Lone black conical rock, 2 ft. above H.W., close to shore, This rock is off the third point of land S.W. of False Head.	56-31	511	153-54	653	2 ft.	Top

STATISTICS:

Miles of shoreline surveyed in statute miles ----------- 16.5

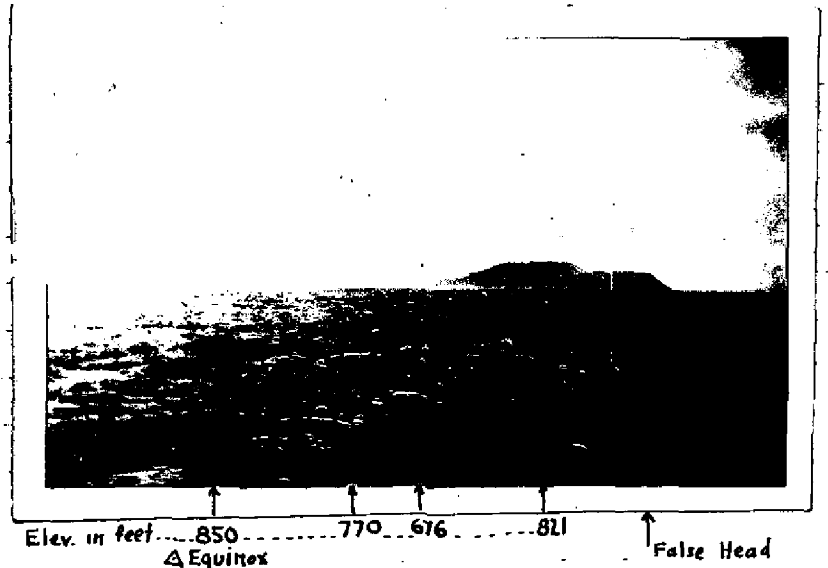
Area surveyed in square statute miles ----------------- 12.0

Respectfully submitted,

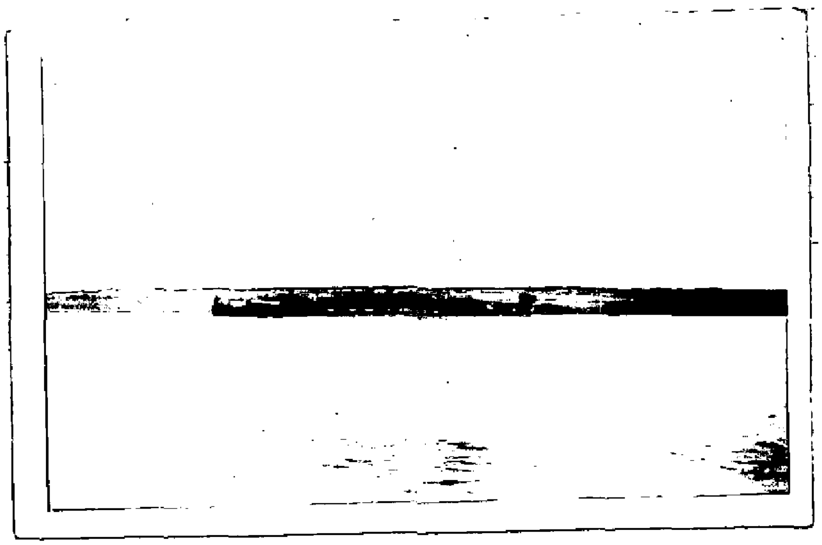
G.M.Marchand, Jr. H.&G.E.
U.S.Coast & Geodetic Survey.

Approved and Forwarded:

F.B.T.SIEMS, H.&G.E.,
Chief of Party, C.&G.S.



Sitkinak Island as viewed from a point about 5 miles S.E. (true) of the most easterly point of the island.



Wreck of the S.S.Pavlof -- North end of Tugidak Island.

APPENDIX "A"

OF

DESCRIPTIVE REPORT

FOR

TOPOGRAPHIC SHEET # A

SHIP SURVEYOR

KODIAK ISLAND, ALASKA

1931

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 25
Ed. Jan., 1929

COMPUTATION OF TRIANGLES

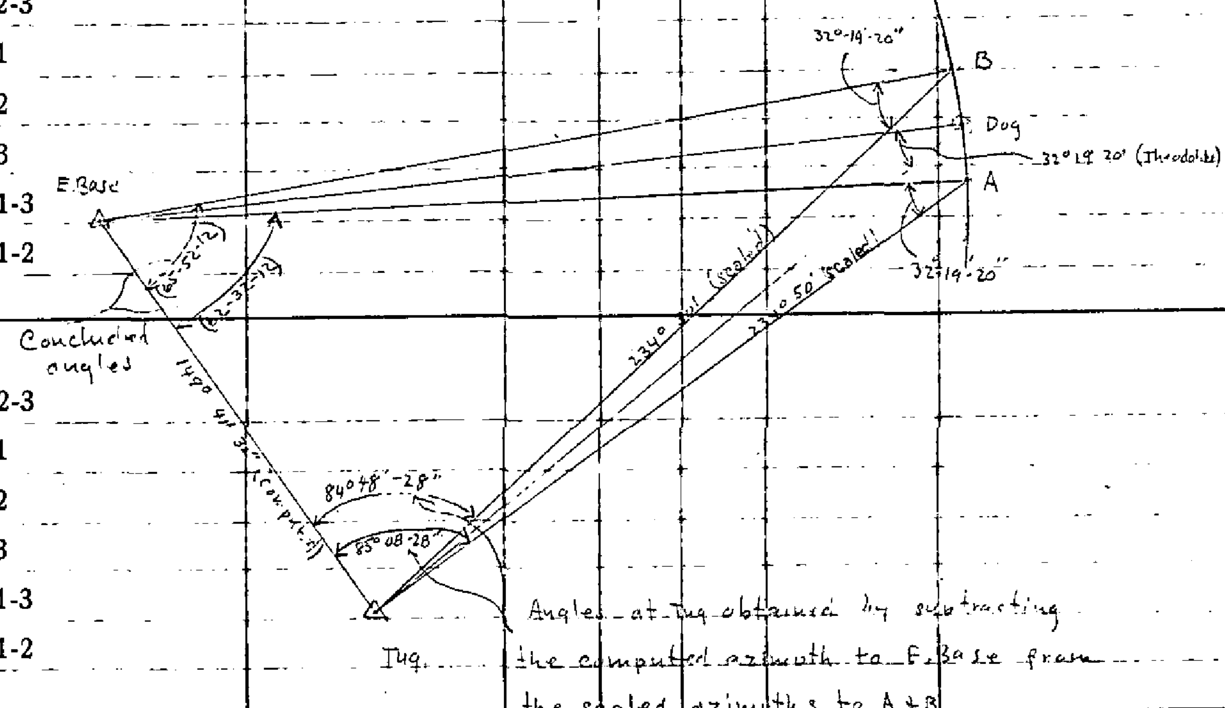
State: Alaska

11—9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
2-3	E. Base To Tug			Inverse Computation			3.663 606
1	B	32 19 20					0.271 906
2	Tug	84 48 28					9.998 214
3	E. Base	(62 52 12)					9.949 377
1-3						E. Base- B	3.933 726
1-2						B - Tug	3.884 889
2-3	E. Base - Tug						3.663 606
1	A	32 19 20					0.271 906
2	Tug	85 08 28					9.998 436
3	E. Base	(62 32 12)					9.948 074
1-3				A - E. Base			3.933 948
1-2				A - Tug			3.883 586

Computed by GMM
Checked by WJC

NO.							
2-3							
1							
2							
3							
1-3							
1-2							
2-3							
1							
2							
3							
1-3							
1-2							



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DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 662
Ed. Mar., 1929

INVERSE POSITION COMPUTATION

$$s_1 \sin\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{\Delta\lambda_1 \cos\phi_m}{A_m}$$

$$s_1 \cos\left(\alpha+\frac{\Delta\alpha}{2}\right)=\frac{-\Delta\phi_1 \cos\frac{\Delta\lambda}{2}}{B_m}$$

$$-\Delta\alpha=\Delta\lambda \sin\phi_m \sec\frac{\Delta\phi}{2}+F(\Delta\lambda)^3$$

in which $\log \Delta\lambda_1=\log(\lambda'-\lambda)$ − correction for arc to sin*; $\log \Delta\phi_1=\log(\phi'-\phi)$ − correction for arc to sin*; and $\log s=\log s_1+$ correction for arc to sin*.

	°	′	″	NAME OF STATION		°	′	″
1. ϕ	56	35	13.16	E. Base, 1930	λ	154	26	28.50
2. ϕ'	56	33	04.54	Tug, 1930	λ'	154	24	12.23
$\Delta\phi\ (=\phi'-\phi)$	− 00	02	08.62		$\Delta\lambda\ (=\lambda'-\lambda)$	− 00	02	16.27
$\frac{\Delta\phi}{2}$	−	01	04.31		$\frac{\Delta\lambda}{2}$	−	01	08.14
$\phi_m\left(=\phi+\frac{\Delta\phi}{2}\right)$	56	34	08.85			154	25	20.36
$\Delta\phi$ (secs.)	−128.62				$\Delta\lambda$ (secs.)	−136.27		

log $\Delta\phi$	2.109308 n	**log $\Delta\lambda$**	2.134400 n
cor. arc−sin	−	cor. arc−sin	−
log $\Delta\phi_1$	2.109308 n	log $\Delta\lambda_1$	2.134400 n
log cos $\frac{\Delta\lambda}{2}$		**log cos ϕ_m**	9.741097
colog B_m	1.490402	**colog A_m**	1.491300
log{s_1 cos $\left(\alpha+\frac{\Delta\alpha}{2}\right)$}	3.599710 (opposite in sign to $\Delta\phi$)	**log{s_1 sin $\left(\alpha+\frac{\Delta\alpha}{2}\right)$}**	3.366797n
		log{s_1 cos $\left(\alpha+\frac{\Delta\alpha}{2}\right)$}	3.599710
log $\Delta\lambda$	2.134 400 n (3 log $\Delta\lambda$)	**log tan $\left(\alpha+\frac{\Delta\alpha}{2}\right)$**	9.767087n
log sin ϕ_m	9.921 453 (log F)	$\alpha+\frac{\Delta\alpha}{2}$	329 40 35
log sec $\frac{\Delta\phi}{2}$	(log b)	**log sin $\left(\alpha+\frac{\Delta\alpha}{2}\right)$**	9.703 191n
		log cos $\left(\alpha+\frac{\Delta\alpha}{2}\right)$	9.936 105
log a	2.055 853 n		
a		**log s_1**	3.663 606 — 4609 meters
b		cor. arc−sin	+
−$\Delta\alpha$ (secs.)	−113.7	log s	
$\frac{\Delta\alpha}{2}$	−56.8		

	°	′	″
$\frac{\Delta\alpha}{2}$	− 00	00	56.8
$\alpha+\frac{\Delta\alpha}{2}$	329	40	35.0
α (1 to 2)	329	39	38.2
$\Delta\alpha$		01	53.7
180			
α' (2 to 1)	149	41	31.9

* Use the table on the back of this form for correction of arc to sin.

Computed by GMM
Checked by WJC

NOTE.—For log s up to 4.52 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 10′, omit all terms below the heavy line except those printed in heavy type or those underscored, if using logarithms to 6 decimal places.

11—9810

Table of arc-sin corrections for inverse position computations

log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$
4.177	1	2.686	5.223	124	3.732	5.525	497	4.034
4.327	2	2.836	5.234	130	3.743	5.530	508	4.039
4.415	3	2.924	5.243	136	3.752	5.534	519	4.043
4.478	4	2.987	5.253	142	3.762	5.539	530	4.048
4.526	5	3.035	5.260	147	3.769	5.543	541	4.052
4.566	6	3.075	5.269	153	3.778	5.548	553	4.057
4.599	7	3.108	5.279	160	3.788	5.553	565	4.062
4.628	8	3.137	5.287	166	3.796	5.557	577	4.066
4.654	9	3.163	5.294	172	3.803	5.561	588	4.070
4.677	10	3.186	5.303	179	3.812	5.566	600	4.075
4.697	11	3.206	5.311	186	3.820	5.570	613	4.079
4.716	12	3.225	5.318	192	3.827	5.575	625	4.084
4.734	13	3.243	5.326	199	3.835	5.579	637	4.088
4.750	14	3.259	5.334	206	3.843	5.583	650	4.092
4.765	15	3.274	5.341	213	3.850	5.587	663	4.096
4.779	16	3.288	5.349	221	3.858	5.591	674	4.100
4.792	17	3.301	5.356	228	3.865	5.595	687	4.104
4.804	18	3.313	5.363	236	3.872	5.600	702	4.109
4.827	20	3.336	5.369	243	3.878	5.604	716	4.113
4.857	23	3.366	5.376	251	3.885	5.608	729	4.117
4.876	25	3.385	5.383	259	3.892	5.612	743	4.121
4.892	27	3.401	5.390	267	3.899	5.616	757	4.125
4.915	30	3.424	5.396	275	3.905	5.620	771	4.129
4.936	33	3.445	5.403	284	3.912	5.624	785	4.133
4.955	36	3.464	5.409	292	3.918	5.628	800	4.137
4.972	39	3.481	5.415	300	3.924	5.632	814	4.141
4.988	42	3.497	5.422	309	3.931	5.636	829	4.145
5.003	45	3.512	5.428	318	3.937	5.640	845	4.149
5.017	48	3.526	5.434	327	3.943	5.644	861	4.153
5.035	52	3.544	5.440	336	3.949	5.648	877	4.157
5.051	56	3.560	5.446	345	3.955	5.652	893	4.161
5.062	59	3.571	5.451	354	3.960	5.656	909	4.165
5.076	63	3.585	5.457	364	3.966	5.660	925	4.169
5.090	67	3.599	5.462	373	3.971	5.663	941	4.172
5.102	71	3.611	5.468	383	3.977	5.667	957	4.176
5.114	75	3.623	5.473	392	3.982	5.671	973	4.180
5.128	80	3.637	5.479	402	3.988	5.674	989	4.183
5.139	84	3.648	5.484	412	3.993	5.678	1005	4.187
5.151	89	3.660	5.489	422	3.998			
5.163	94	3.672	5.495	433	4.004			
5.172	98	3.681	5.500	443	4.009			
5.183	103	3.692	5.505	453	4.014			
5.193	108	3.702	5.510	464	4.019			
5.205	114	3.714	5.515	474	4.024			
5.214	119	3.723	5.520	486	4.029			

U. S. GOVERNMENT PRINTING OFFICE: 1929 11—9810

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April, 1929

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

			°	′	″
α	2 Tug	to 3 E. Base	149	41	32
2d ∠		&	+ 85	08	28
α	2	to 1	234	50	00
Δα					
			180	00	00.0
α′	1	to 2			

First Angle of Triangle

	°	′	″			°	′	″
φ	56	33	04.54	2 Tug	λ	154	24	12.23
Δφ		02	22.27		Δλ	−	06	06.37
φ′	56	35	26.81	1 A	λ′	154	18	05.86

	Logarithms		Values in seconds
s	3.883 586		829.3
Cos α	9.760 390		(1026.6)
B	8.509 599		
h	2.153 575	1st term	-142.12
s²	7.767 1		
Sin²α	9.824 9		
C	1.582 9		
	9.174 9	2d term	+ 0.15
h²			
D			
		3d term	+
		−Δφ	-142.27

	°	′	″
½(φ+φ′)			

	Logarithms	Values in seconds
s	3.883 586	100.0
Sin α	9.912 477	(924.2)
A′	8.508 701	
Sec φ′	0.259 152	
Δλ	2.563 916	-366.37
Sin ½(φ+φ′)		
−Δα		

			°	′	″
α	3 E. Base	to 2 Tug	329	39	38
3d ∠		&	− 52	32	12
α	3	to 1	257	07	26
Δα					
			180	00	00.0
α′	1	to 3			

	°	′	″			°	′	″
φ	56	35	13.16	3 E. Base	λ	154	26	28.50
Δφ			13.65		Δλ	−	08.	22.64
φ′	56	35	26.81	1 A	λ′	154	18	05.86

	Logarithms		Values in seconds
s	3.933 948		
Cos α	8.700501		
B	8.509 597		
h	1.144 046	1st term	-13.93
s²	7.867 9		
Sin²α	9.998 9		
C	1.583 4		
	9.450 2	2d term	+ 0.28
h²			
D			
		3d term	+
		−Δφ	-13.65

	°	′	″
½(φ+φ′)			

	Logarithms	Values in seconds
s	3.933 948	
Sin α	9.999 453	
A′	8.508 700	
Sec φ′	0.259 152	
Δλ	2.701 253	-502.64
Sin ½(φ+φ′)		
−Δα		

U. S. GOVERNMENT PRINTING OFFICE: 1929

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April, 1920

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

			°	′	″
α	2 Tug	to 3 E. Base	149	41	32
2d ∠		&	+84	48	28
α	2 Tug	to 1 B	234	30	00
Δα					
			180	00	00.0
α′	1	to 2			

First Angle of Triangle

	°	′	″			°	′	″
φ	56	33	04.54	2 Tug	λ	154	24	12.23
Δφ		02	23.88		Δλ	–	06	05.97
φ′	56	35	28.42	1 B	λ′	154	18	06.26

	Logarithms	Values in seconds	
s	3.884 889	879.1	
Cos α	9.763 954	(975.8)	
B	8.509 599		
h	2.158 442	1st term	-144.03
s^2	7.769 7		
$Sin^2 α$	9.821 3		
C	1.582 9		
	9.173 9	2d term	+ 0.15
h^2			
D			
		3d term	+
		–Δφ	-143.88

½(φ+φ′)	° ′ ″	
	Logarithms	Values in seconds
s	3.884 889	105.9
Sin α	9.910 686n	(917.3)
A′	8.508 701	
Sec φ′	0.259 157	
Δλ	2.563 433	-365.97
Sin ½(φ+φ′)		
–Δα		

			°	′	″
α	3 E. Base	to 2 Tug	329	39	38
3d ∠		&	– 62	52	12
α	3 E. Base	to 1 B	266	47	26
Δα					
			180	00	00.0
α′	1	to 3			

	°	′	″			°	′	″
φ	56	35	13.16	3 E. Base	λ	154	26	28.50
Δφ			15.26		Δλ	–	08.	22.23
φ′	56	35	28.42	1 B	λ′	154	18	06.27

	Logarithms	Values in seconds	
s	3.933 726		
Cos α	8.748 080		
B	8.509 597		
h	1.191 403	1st term	-15.54
s^2	7.867 4		
$Sin^2 α$	9.998 6		
C	1.583 4		
	9.449 4	2d term	+ 0.28
h^2			
D			
		3d term	+
		–Δφ	-15.26

½(φ+φ′)	° ′ ″	
	Logarithms	Values in seconds
s	3.993 726	
Sin α	9.999 318n	
A′	8.508 700	
Sec φ′	0.259 157	
Δλ	2.700 901	-502.23
Sin ½(φ+φ′)		
–Δα		

11—9362 U. S. GOVERNMENT PRINTING OFFICE: 1920

1-466U

Form 274
Ed. Jan., 1929

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

R. S. Patton, Director

State: Alaska

SKETCHBOOK

Sheet A

ABSTRACT OF CONTENTS:

Theodolite Angles at ⊙ Deg

Sextant cuts to Topographic Sta.

Sextant Angles at △ Osk.

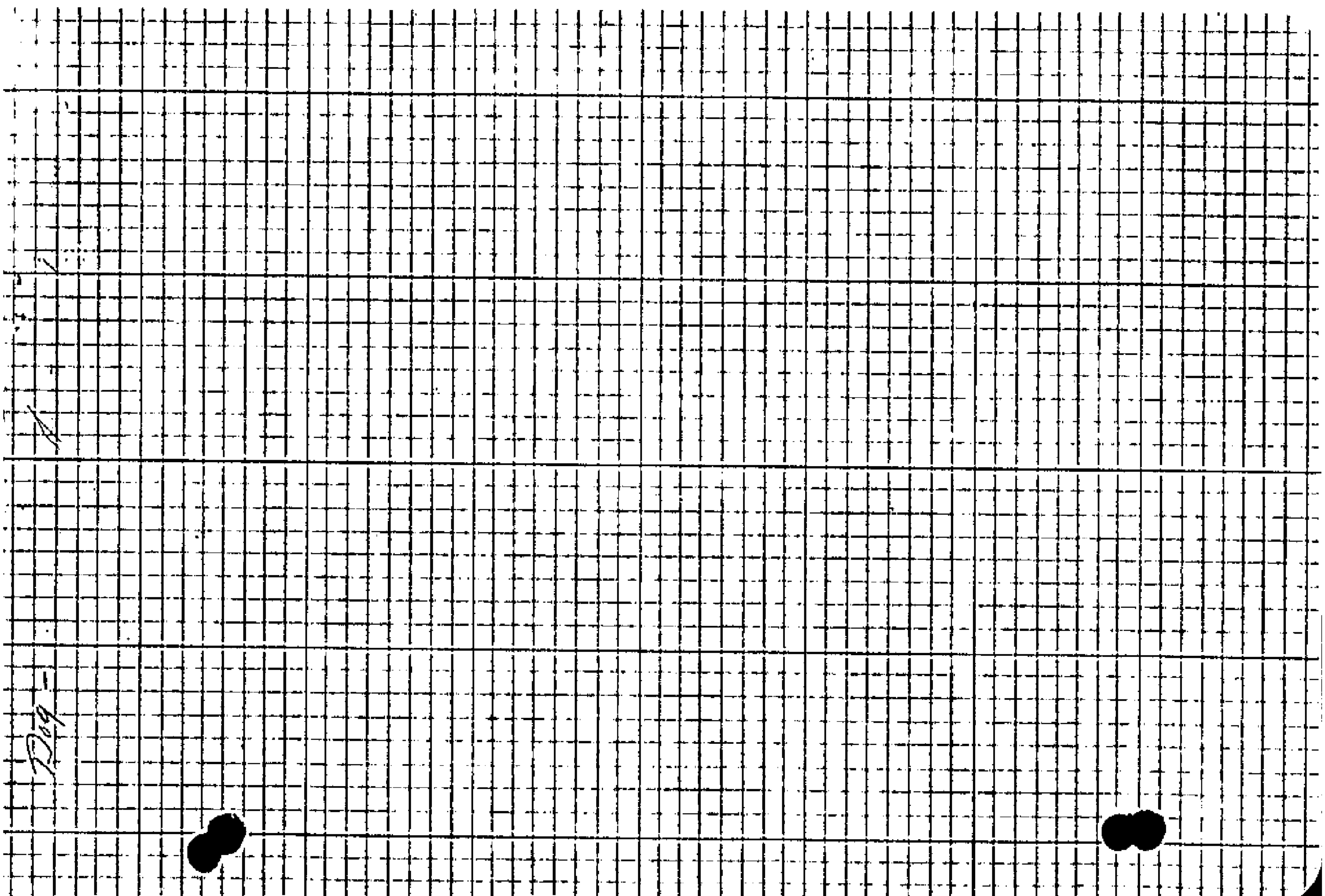
1931

CHIEF OF PARTY:

F. B. T. Siems, H. & G. E.

1 Vols. Vol. 1

U. S. GOVERNMENT PRINTING OFFICE: 1929


Dog -

Station: Dog

Observer: R.A.E.

Date: 8/25/31

Instrument: Berger 5" #225

		A ° ′ ″	B ° ′ ″	
Tug – East Base	D	0 00	0 40	
	1	32-19-30		[illegible] 32° 19′ 20″
	3	96-58	96 58	
	R 3	00 – 00		

Observer – GMM

		A ° ′ ″	B ° ′ ″	
Tug – E Base	D 0	0 00	0 00	
	1	32-19-30	30	
	3	96-58-00	58-00	32° 19′ 20″
	R 3	0-00 00	0 00	

Sextant Cuts from Launch.

Date: 8/25/31

G.M.M. in charge
G.M.M. Rt. Angle
R.A.E. Left "

1 E Base	112	56		G.M.M. / R.H.E. / R.A.M. } Cuts.
Dog				
Valley Pt	53	19		
Dog - Gud	28	23		Cut taken to signals between ⊙ Dog & △ Valley Point
" Old	38	50		
" Bom	47	00		
" Nel	49	24		
" ~~Son 52 - 03~~				
" Ban	52	19		
" ~~Hot~~ Son	51	56		
" Mil	73	28		

Position at end of launch

2 E Base	92	10 / 04	10	92-10
Dog				
Valley Pt	73	12	12	73-12
Mil	19	04	04	19-04
Gud	37	42	43-44	37-43
Old	53	30	34	53-3.45
~~Bom 64 - Ban~~				
Bom	64	40	40	64-40
Ban	69	43	45	69-44
Nel ~~Hot~~	67	54	54	67-54
Son	71	18	18	71-18
Nol	72	51	51	72-51

Sextants checked at

3	E Base	62 - 53	GMM 52		Mx 4.3
	Dog				62 - 53.5
	Valley Pt	99 - 56	RAE 59		99 - 57.5
	Mil	15 - 36	38 RAM		99 - 57.5 15 - 37
	Gud	39 - 04	02 GMM		39 - 03
	Bem	85 - 44	46 RAM		85 - 45
	Nel	91 - 03	63 RAM		91 - 04.5
	Old	67 - ~~11~~	10 RAE		67 - 10
	Ban	93 - 55	58 RAM	91	93 - 57.5
	Son	96 - 45	46 GMM		96 - 45.5
	Nel ~~Old~~	99 - 18	RAE		99 - 18
4	E Base	43 - 48	47 GMM		Mx Fix
	Dog				43 - 47.5
	Valley Pt	116 - 00	- 00 RAE		116 - 00
	Mil	08 - 17	18 RAM		08 - 17.5
	Gud	24 - 31	- 30 GMM		24 - 30.5
	Bem	90 - 15	- 18 - 17 RAM		90 - 17
	Old	59 - 09	09 GMM		59 - 09
	Nel	100 - 01	04 RAM		100 - 02.5
	Ban	105 - 00	02 RAM		105 - 01
	Son	110 - 24	26 - 26 RAM		110 - 26
	Nel	114 - 35	37 - 36 RAM		114 - 36

E 32 - 07

120 - 35
Mil 03 - 110 - 40 RHM
Bud 11 12 Gen
Bom 61 - 41 RA
Nel 83 - 38 Gen
Old 37 - 46 38 RAE

Bar 93 - 12
Sun
Nel 116 - 09

5 E Base 32 - 14
Dog
Valley Pt 119 - 37
Mil 03 - 41 41 RHM
Gud 11 11 11 Harm
Bom 64 - 32 30 RAE
Old 38 - 38 35 Gen
Nol 44 - 37 115 - 39 - 39 RAE
106 - 37
Jon 107 - 33 - 31 "
Nel 82 - 62 - 30 - 27 RHM
Bar 84 RAE
92 - 28 26

Launch dragged during
observation

	1st	2nd	Mean	Remarks
(a) E Base	32-14	12	32-13'	
Dog Valley Pt	119-20	18	119°-19'	
Mil	03-42	42	03°-42'	
Gud	11-12	12	11°-12'	
Bom	64-26	28	64°-27'	
Old	32-35	33	32°-34'	
Nel	82-24	30	82-26'	
(b) Fix	32-12		32-12	Fix at end of this series of cuts.
	119-18		119-18	
Ban	92-26	25-20	92-25'	
Mol	115-38	37	115-37.5'	
Bom	106-27	32-30	106-30'	
(c) Fix	32-13			Fix at end of series of cuts
	119-16			

@	Base	40 - 02		{40-02 / 83-28
	Old Valley Av	83 - 27		
	Mil	13 - 00	400 +	13-00
	Gust	09 - 34	23 +	09-34½
	Bom	11 - 10	10 - 11 -	11-10
(b)	Fix	{40 - 02 / 82 - 29	[illegible]	{40-02 / 80-29½
	Ban	21 - 33	33	21-33
	Mel	20 - 47	47	20-47
	Mal	70 - 40	38 / 40	70-39
	Bom	50 - 27	25	50-26
(c)	Fix	{40 - 02 / 83 - 30	[illegible]	

Deflect/angle at second out ∆ oak

object sighted

At Oak

00-00-00 ∆ In
17-49-30 ∆ Out
17-50-00
17-51-00
17-51-30
17-51-00 "

mn = 17°-50'-36"

Form 537a

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. 4660

TOPOGRAPHIC TITLE SHEET

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

Field Letter "A"

REGISTER NO. 4660

State ALASKA

General locality Kodiak Island

Locality Trinity Islands

Scale 1:20,000 Date of survey May - September, 1931

Vessel SURVEYOR

Chief of Party F.B.T.Siems

Surveyed by G.M.Marchand

Inked by G.M.Marchand

Heights in feet above MHW to ground ~~xxxxxxxxxxxxxx~~

~~xxxxxx xxxxxxxxxxxxxxxxxxxx~~ Form line interval 100 feet

Instructions dated April 17, 1931, 19

Remarks:

U. S. GOVERNMENT PRINTING OFFICE: 1928