

5259

5259

Form 504

U. S. COAST AND GEODETIC SURVEY
DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey *Hydrographic*
Field No. _____ Office No. *5259*

LOCALITY

State *S. Alaska*
General locality *East of*
Locality *Afognak Island*

1932

CHIEF OF PARTY

H. B. Campbell

LIBRARY & ARCHIVES

DATE _____

5259

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES

MAY 2 1933

Acc. No. _____

Form 504
Ed. June, 1928
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

_____, Director

State: Alaska

DESCRIPTIVE REPORT

~~Hydrographic~~ } Sheet No. 5259 { 141
Hydrographic } 161 { 201

LOCALITY

S. W. Alaska

East of Afognak Island

19 32

CHIEF OF PARTY

H. B. Campbell

5259

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
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Acc. No. _____

REG. NO. 5259

HYDROGRAPHIC TITLE SHEET

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

Field No. 141 } Smooth Sheet 161
201 }

REGISTER NO. 5259

State Alaska

General locality East of Afognak I.

Locality Western Part of Portlock Bank

Scale 1/160,000 Date of survey Aug.-Sept., 19 32

Vessel DISCOVERER

Chief of Party H. B. Campbell

Surveyed by H. B. Campbell

Protracted by Henry J. Healy

Soundings penciled by Henry J. Healy

Soundings in fathoms ~~cast~~

Plane of reference MLW

Subdivision of wire dragged areas by _____

Inked by Harold W. Murray

Verified by H. W. M.

Instructions dated April 21., 19 32

Remarks: Smooth sheet is complete work of Boat Sheets

#141 & #201

DESCRIPTIVE REPORT

to accompany

HYDROGRAPHIC FIELD SHEET #161

(Hydrographic Boat Sheets #141 & 201)

U.S.C. & G.S.S. DISCOVERER H. B. Campbell, Comdg.

Season 1932.

Project No. H-2104

AUTHORITY

Director's Instructions dated April 21, 1932.

LIMITS

This offshore sheet joins the work done by the DISCOVERER during the seasons of 1930 and 1931 at the north and carries the work southward to Lat. $57^{\circ}-58'$. East of Long. $151^{\circ}-00'$ the work is carried south to Lat. $57^{\circ}-51'$ and east of Long. $151^{\circ}-26'$ the work is carried south to Lat. $57^{\circ}-34'$.

The eastern limits are Long. $150^{\circ}-10'$ from Lat. $57^{\circ}-34'$ to Lat. $58^{\circ}-10'$, Long. $150^{\circ}-23'$ from Lat. $58^{\circ}-10'$ to Lat. $58^{\circ}-24'$, and Long. $150^{\circ}-28'$ from Lat. $58^{\circ}-24'$ to Lat. $58^{\circ}-37'$, and Long. $150^{\circ}-32'$ from Lat. $58^{\circ}-37'$ to Lat. $58^{\circ}-42'$.

The western limits joins Sheets No. 41 and No. 42, executed by the Ship DISCOVERER during the season of 1932. ✓

Due to the shortage of bombs and also the late date of the season it was considered advisable to carry on only such work as could not be done by visual fix. The last four days RAR was done keeping this in mind.

SURVEY METHODS

The work accomplished on this sheet comprises visual fix control and RAR control. The northern section of the work, (plotted on boat sheet #201), is controlled by visual fixes. Prominent mountain peaks were used, which had been located by triangulation in previous years.

The southern section of the work (plotted on boat sheet #141) is entirely controlled by RAR. Two radio stations were established to control the sounding lines. KVB was established on the southernmost part of Marmot Island. This station was established on August 12, 1932. The magnetophone unit was placed in $19\frac{1}{2}$ fathoms of water floating 10 fathoms from the surface. One reel of armored cable and about $\frac{3}{4}$ of a reel of rubber covered cable were used to connect the unit to the radio station ashore. When the magnetophone unit was established, sextant angles were taken to topographic signals located by Mr. Garber. On August 23 it was found necessary to underrun the cable, a break was found which was spliced. Sextant angles were again taken to locate the unit. This position was plotted on the topographic sheet executed by Mr. Garber, the position was scaled off and transferred to this sheet.

KVD was established at Cape Chiniak on August 24, 1932. The magnetophone unit was placed in 15 fathoms of water, floating 9 fms. below the surface. One reel of armored cable and

two reels of rubber covered cable were used to connect the magnetophone unit with the shore station. When the magnetophone unit was placed sextant angles were taken to triangulation stations and topographic stations located by the Ship SURVEYOR season 1932. This position was plotted on the topographic sheet executed by Mr. Bowie. This position was scaled off and plotted on this sheet. ✓

VELOCITY

On August 31 and Sept. 19 velocity tests were made. These velocity tests were all computed and the mean result of 1475.5 m/s obtained. The theoretical bottom velocity was also computed, according to table #5 and #6 in the Hydrographic Manual, and found to be 1474.56 m/s. The velocity determined from actual tests (1475.5 m/s.) was used. Attached to this report will be found computations and a tabulated list of all results. Distance circles were then drawn on the sheet using units of time. The circles are five seconds apart (7377.5 m.). ✓

Bomb positions were usually taken at intervals of fifteen to twenty minutes, which was considered sufficient to well control the sounding lines. ✓

Tin can bombs were used wherever possible. When these failed to give the desired results cast iron bombs were used. ✓ Attached to this report is a complete list of the bombs used.

Soundings were obtained by the fathometer using Red Light Method. A few of the deeper soundings were taken using the red light times six method. Vertical casts were taken in accordance with the instructions obtaining a comparison for the fathometer also temperatures, water specimens, and bottom characteristics.

No regular system of cross lines were run but where crossings were made the soundings check very closely with the exception of between 19B & 20B where the crossing is 10 fms. This can be further investigated when the inshore work is being accomplished. ** Junction with H-5442 (1933) on the west has been made. A portion of the soundings on line 19 to 20B have accordingly been rejected. See Review of H-5442 (1933). KLM.*

The shoalest sounding obtained on this sheet is $26\frac{1}{2}$ fathoms in Lat. $58^{\circ}-20'$, Long. $150^{\circ}-22.1'$ which is position 68 "L" day.

TIDES

Tidal data for the visual work on this sheet was obtained from a portable automatic tide gauge at Marmot Id. Tidal data for the RAR work on this sheet was obtained from the automatic tide gage at Kodiak.

FATHOMETER CORRECTIONS

The data pertaining to fathometer corrections are attached.

STATISTICS

(Boat Sheet #201)

Date	Day	Stat.Mi. Sdg.Lines	Fath. Sdgs.	Ver. Casts	No. Pos.
6/6/32	A	70.1	318	---	65
6/7/32	B	84.0	393	8	97
6/8/32	C	97.0	428	9	93
6/9/32	D	233.0	1013	13	210
6/10/32	E	118.3	588	7	114
6/14/32	F	33.8	164	---	29
6/17/32	G	49.0	260	2	51
9/1/32	H	20.7	97	---	17
9/9/32	J	147.2	724	---	95
9/10/32	K	72.6	347	11	67
9/13/32	L	40.6	174	---	29
9/15/32	M	50.3	225	---	41
9/19/32	N	75.3	356	8	72
Totals		1091.9	5087	58	980

(Boat Sheet #141)

Aug. 25	A	51.4	204	--	24
" 26	B	222.3	978	7	84
" 27	C	167.3	732	--	69
" 29	D	189.8	791	--	74
" 30	E	88.3	487	1	51
" 31	F	108.1	486	5	52
Sept. 9	G	64.5	310	--	27
" 10	H	186.4	867	--	85
" 11	J	114.3	478	--	41
" 13	K	99.6	465	--	47
" 14	L	145.9	692	13	92
" 15	M	123.0	546	8	73
" 16	N	166.4	745	11	62
" 19	P	15.2	71	2	10
" 20	Q	181.0	865	--	91
Totals		1923.5	8717	47	882
Total of Smooth					
Sheet No. 161		3015.4	13804	105	1862

VELOCITY TESTS

August 31, 1932.

No.	Station	Distance	Sum Dist.	Time	Sum Time	Velocity
1	KVB	13869.2	59832.2	9.32	40.44	1479.5
	KVD	45963.0		31.12		
2	KVB	14920.9	59802.2	10.03	40.39	1480.6
	KVD	44881.3		30.36		
3	KVB	15895.0	59800.5	10.71	40.41	1479.8
	KVD	43905.5		29.70		
4	KVB	15701.0	59834.2	10.58	40.43	1479.9
	KVD	44133.2		29.85		
5	KVB	14694.5	59828.5	9.91	40.45	1479.1
	KVD	45134.0		30.54		
6	KVB	13492.2	59823.4	9.11	40.47	<u>1478.2</u>
	KVD	46331.2		31.36		
					Total	<u>8877.1</u>
(Mean of Aug. 31, 1932 tests)					Mean	<u>1479.5</u>
(Mean of Sept. 19, 1932 tests)-----						<u>1471.6</u>
					Total	11.1
					Mean	<u><u>1475.5</u></u>

Theoretical Velocity.

Average depth ----- 67 fms.
 Average bottom temperature 7.1 °C. (46 observations
 on sheet.)
 Average salinity for Area 31.9 parts per 1000

From table 5 Hydrographic Manual 805.2 fms./s
 " " 6 " " " 1.14 " " (Adiabatic
 806.34 " " Correction)

$$806.34 \times 6 \div 3.281 = 1474.56 \text{ m/s.}$$

VELOCITY TESTS

Sept. 19, 1932

No.	Station	Distance	Time in Seconds	Velocity
1	KVD	76381	51.95	1470.3
2	"	76752.8	52.51	1467.3
4	"	77119.8	52.51	1468.7
5	"	76729.6	52.05	1474.2
6	"	76407.2	51.71	1477.6
			Total	7358.1
			Mean	1471.6 m/s.
Mean value August 31, 1932 -----				1479.5
" " Sept. 19, 1932 -----				<u>1471.6</u>
				2 <u>2951.1</u>
Mean value for the season -----				1475.5 m/s.

9
 10 x 6
 30 x 6
 50 x 5
 60
 180
 230
 171 4/9 0(2)
 34
 150

LIST OF SIGNALSTriangulation Stations

<u>Name</u>	<u>Location</u>	<u>Name</u>	<u>Location</u>
Banks	1907-31	Otter	1907-31
Bruin	1931	Peak "C"	1927
Chugach	1906-30	Pearl	1906-31
Chugach High Pk.		Puffen	1906-31
Dome	1932	Sea Lion	1932
Edge	1907-32	South	1932
Gore Pk.	1930	Sugar	1931
High	1930	Tolstoi	1931
Kon	1930	Tonki	1907-31
Marmot	1932	Ushagat	1906-31
Met		White	1930
		Why	1932


Hydrographic & Topographic Stations

<u>Name</u>	<u>Location</u>	<u>Name</u>	<u>Location</u>
Brown Mountain	1930 Topo.	New	1932 Topo.
Log	1932 "	Peak "O"	1930 Hydro.
		Pine	1932 Topo.

RAR Stations.

<u>Name</u>	<u>Location</u>
KVB	-----
KVD	-----

Respectfully submitted:


Henry J. Healy,
J. H. & G. Engr.

Approved and forwarded:



H. B. Campbell,
H. & G. Engr.,
Chief of Party.

POST-OFFICE ADDRESS: 202 Burke Bldg., Seattle, Wash.

TELEGRAPH ADDRESS:

EXPRESS OFFICE:
PC:PF

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

Ship DISCOVERER

Seward, Alaska.
October 8, 1932.

To: Commanding Officer,
U.S.C. & G.S.S. DISCOVERER,
Seward, Alaska.

From: Philip Cohen, Electrician,
U.S.C. & G.S.S. DISCOVERER,
Seward, Alaska.

Subject: Season's Report.

There is respectfully transmitted herewith a report on the number of bombs fired, the total cost of bombs, and an analysis of the cost of the several sizes of bombs, for the season of 1932.

Philip Cohen
Philip Cohen,
Electrician,
Ship DISCOVERER.

BOMB RECORD

U.S.C. & G.S.S. DISCOVERER

SEASON OF 1932

H. B. Campbell,
H. & G. Engineer,
Commanding.

Vicinity of
Southwest
Alaska

Month	Day	Bombs					Total
		Large Cast Iron	Small Cast Iron	Quarts	Pints	Misses	
Aug.	25		5	9	5		19
"	26	6	10	9	28	1	53
"	27	9	12	12	10		43
"	29	11	19	7	6		43
"	30		3	23	3		29
"	31		2	28	8	1	38
Sept.	9			15			15
"	10		15	27			42
"	11	18	9	1			28
"	13	3	6	21			30
"	14	1	29	32		1	62
"	15	16	5	22			43
"	16	16	27	3			46
"	19			5	7		12
"	20	11	27	19		2	57
Totals		91	169	233	67	4	560

BOMB RECORD

TOTAL COST OF BOMBS FOR SEASON OF 1932

Capacity	Number	Cost	Total Cost
Pint	67	\$0.0500	\$ 3.35
Quart	233	0.0575	13.3975
Small C.I.	169	1.1000	175.9000
Large C.I.	91	1.5000	136.5000
			\$329.1475
Fuse	706 ft.	\$0.1100 per ft.	77.6600
Caps	820 ea.	0.0282 each	22.9980
Powder	1414 lbs.	0.4500 lb.	636.1848
Disc, large	233 ea.	0.1500 each	34.9500
Disc, small	67 ea.	0.1000 each	6.7000
Total Cost of Bombs - - - - -			\$1107.6403

ANALYSIS OF COST OF BOMBS

Size	Powder		Container Cost	Fuse		Caps		Disc		Unit Cost of Bombs.
	Amt.	Cost		Length	Cost	No.	Cost	No.	Cost	
Pint	14 oz.	0.3938	0.0500	6"	0.0550	1	0.0282	1	0.1000	0.6270
Quart	27 oz.	0.7594	0.0575	7"	0.0642	1	0.0282	1	0.1500	1.0593
Small C.I.	3 lbs.	1.3500	1.1000	23"	0.2108	2	0.0563	- - - - -	- - - - -	2.7171
Large C.I.	5 lbs.	2.2500	1.5000	28"	0.2567	2	0.0563	- - - - -	- - - - -	4.0630

Fathometer Corrections

Sheet No. 141

Date (1952)	Pos. No.	Temperature		Fath. Sdg.	Corr.	Ver. Cast	T.S.S. Corr.	Index Corr.
		Surf.	Bot.					
8/26	23B	9.5	6.5	86.0	- 1.7	84.3	+ 0.8	- 2.5
"	27B	9.0	7.0	62.5	- 1.2	61.3	+ 0.6	- 1.8
"	33B	9.5	7.0	49.5	- 0.4	49.1	+ 0.6	- 1.0
"	36B	10.0	7.0	50.5	- 0.1	50.4	+ 0.6	- 0.7
"	39B	10.0	6.0	82.5	- 1.1	81.4	+ 0.8	- 1.9
"	42B	11.0	6.0	75.0	- 0.5	74.5	+ 0.8	- 1.3
"	44B	11.5	6.0	101.5	- 0.5	99.4	---	
8/30	50B	9.0	6.5	49.5	+ 0.5	49.5	+ 0.5	- 0.2
8/31	9F	9.0	6.5	66.0	+ 0.2	66.2	+ 0.7	- 0.5
"	12F	-	-	69.0	+ 0.3	69.3	+ 0.7	- 0.4
"	14F	8.5	6.5	81.0	+ 1.0	82.0	+ 0.8	+ 0.2
"	16F	9.5	6.5	72.0	+ 0.8	72.8	+ 0.7	- 0.1
"	18F	10.0	6.0	87.0	+ 0.8	87.8	+ 0.8	0.0
9/14	15L	9.0	7.0	38.0	- 1.0	37.0	+ 0.5	+ 0.5
"	17L	9.0	7.5	39.5	- 1.5	38.0	+ 0.5	- 2.0
"	19L	9.0	8.8	37.0	- 0.6	36.4	+ 0.5	- 1.1
"	21L	9.5	8.8	40.0	- 0.6	39.4	+ 0.5	- 1.1
"	23L	9.5	9.0	39.0	- 0.1	38.9	+ 0.5	- 0.6
"	51L	9.8	8.8	38.5	+ 0.1	38.6	+ 0.5	- 0.4
"	55L	9.0	8.5	41.0	0.0	41.0	+ 0.5	- 0.5
"	57L	9.0	8.7	44.0	- 0.6	43.4	+ 0.5	- 1.1
"	60L	9.5	9.0	43.0	+ 0.1	43.1	+ 0.5	- 0.4
"	62L	9.5	8.8	44.0	- 0.6	43.4	+ 0.5	+ 0.1
"	66L	9.5	9.0	65.0	- 1.4	63.6	+ 0.6	- 2.0
"	90L	9.5	6.7	87.0	- 1.3	85.7	+ 0.8	- 1.1
"	92L	9.5	6.8	73.0	- 0.6	72.4	+ 0.7	- 1.3

Bathometer Corrections

Sheet No. 141

Date (1932)	Pos. No.	Temperature		Fath. Sdg.	Corr.	Ver. Cast	T.&S. Corr.	Index Corr.
		Surf.	Bot.					
9/15	8M	9.5	9.0	43.0	- 0.5	42.5	+ 0.5	- 1.0
"	14M	9.0	9.0	40.0	- 0.4	39.6	+ 0.5	- 0.9
"	17M	9.0	8.5	38.5	- 1.5	37.0	+ 0.5	- 2.0
"	20M	9.5	8.5	37.5	- 0.2	37.3	+ 0.5	- 0.7
"	22M	9.5	7.5	52.0	- 1.0	51.0	+ 0.6	- 1.6
"	41M	9.5	5.6	89.0	+ 0.1	89.1	+ 0.8	- 0.7
"	46M	9.5	5.6	96.0	- 1.0	95.0	+ 0.8	- 1.8
"	49M	9.5	6.5	74.5	- 0.7	73.8	+ 0.7	- 1.4
9/16	4N	9.5	6.7	61.5	- 0.5	61.0	+ 0.6	- 1.1
"	7N	9.5	6.5	60.0	- 0.6	59.4	+ 0.6	- 1.2
"	9N	9.5	6.5	60.5	+ 0.4	60.9	+ 0.6	- 0.2
"	11N	9.5	5.8	87.5	R	88.0	+ 0.8	---
"	14N	9.5	5.8	94.5	+ 0.8	95.3	+ 0.8	0.0
"	31N	9.5	5.8	125.0	0.0	125.0	---	---
"	34N	9.5	6.5	82.0	+ 0.4	82.4	+ 0.8	- 0.4
"	36N	10.0	7.5	70.5	- 1.1	69.4	+ 0.7	- 1.8
"	38N	10.0	4.0	101.0	R	103.0	+ 0.8	+ 1.2
"	40N	9.5	5.8	104.0	R	105.5	---	---
"	42N	9.5	5.0	146.0	R	148.9	---	---
9/19	2P	7.8	8.0	45.0	0.0	45.0	+ 0.5	+ 0.5
"	6P	8.8	7.3	90.0	+ 0.5	90.5	+ 0.8	- 0.3

Pathometer Corrections

Sheet No. 201

Date (1932)	Pos. No.	Temperature		Path. Sdg.	Corr.	Var. Cast	P.M.S. Corr.	Index Corr.
		Surf.	Bot.					
6/7	21B	6.1	5.0	98.0	- 1.0	97.0	+ 0.5	- 1.5
"	27B	6.2	5.0	100.5	- 0.2	100.3	+ 0.5	- 0.7
"	33B	6.4	5.0	99.5	- 0.5	99.0	+ 0.5	- 0.0
"	39B	6.5	5.0	95.5	- 0.5	95.0	+ 0.5	- 1.0
"	55B	6.3	5.0	85.4	- 0.4	85.0	+ 0.4	- 0.0
"	61B	6.2	5.0	107.8	- 0.3	107.5	+ 0.5	- 0.8
"	66B	6.1	5.0	95.8	- 1.8	94.2	+ 0.5	- 2.1
"	72B	6.5	5.0	95.2	- 1.0	94.2	+ 0.5	- 1.5
6/8	1C	7.2	5.0	96.0	- 0.6	95.4	+ 0.5	- 1.1
"	6C	7.1	5.0	94.8	0.0	94.8	+ 0.5	- 0.5
"	12C	7.0	5.0	89.8	- 0.6	89.3	+ 0.5	- 1.0
"	17C	7.0	5.5	65.8	- 0.7	65.1	+ 0.3	- 1.0
"	22C	7.2	5.7	56.5	- 0.8	57.7	+ 0.3	- 1.1
"	27C	7.1	5.8	44.5	- 0.2	44.3	+ 0.2	0.0
"	32C	7.4	5.8	42.0	+ 0.3	42.3	+ 0.2	+ 0.1
"	37C	6.9	5.3	60.5	- 0.6	49.9	+ 0.2	- 0.8
"	44C	7.0	5.8	47.0	- 1.0	46.0	+ 0.2	- 1.2
6/9	54D	6.9	5.7	45.2	- 1.0	42.2	+ 0.2	- 1.2
"	59D	7.1	5.4	67.8	- 1.1	66.7	+ 0.3	- 1.4
"	64D	7.1	5.1	103.4	- 1.5	101.9	+ 0.5	- 2.0
"	69D	7.4	5.1	117.7	- 1.2	116.5	+ 0.6	- 1.8
"	73D	7.0	5.2	117.0	+ 0.9	117.9	+ 0.6	+ 0.3
"	77D	7.1	5.1	113.2	- 0.2	113.0	+ 0.6	- 0.8
"	127D	7.4	5.1	69.0	- 1.7	67.3	+ 0.3	- 2.1
"	132D	7.4	5.1	96.3	- 0.1	96.2	+ 0.5	- 0.6
"	136D	7.5	5.1	109.5	- 0.2	109.3	+ 0.6	- 0.8
"	140D	7.2	5.1	107.3	- 0.5	106.8	+ 0.6	- 1.1
"	180D	7.5	5.2	83.4	- 0.9	82.5	+ 0.4	- 1.3

Fathometer Corrections

Sheet No. 201

Date (1932)	Fog. No.	Temperature		Fath. Sdg.	Corr.	Ver. Cast	T.M.S. Corr.	Index Corr.
		Surf.	Bot.					
6/9	135D	7.1	5.1	102.6	- 1.1	101.7	+ 0.6	- 1.7
"	190D	7.0	5.0	98.6	+ 0.1	98.7	+ 0.6	- 0.4
6/10	45E	7.1	-	80.5	- 0.2	80.3	+ 0.4	- 0.6
"	51E	7.1	5.1	84.7	- 2.2	82.5	+ 0.4	- 2.6
"	56E	7.1	5.0	87.8	- 1.2	86.6	+ 0.5	- 1.7
"	87E	5.6	5.2	87.5	+ 0.1	87.6	+ 0.5	- 0.4
"	92E	7.2	5.2	82.0	- 0.4	81.6	+ 0.4	- 0.8
"	97E	7.5	6.5	92.0	- 0.4	91.6	+ 0.5	- 0.9
"	102E	6.5	5.0	98.5	- 0.5	98.0	+ 0.5	- 1.0
8/17	51G	9.5	6.5	80.6	- 1.8	78.8	+ 0.4	- 2.2
"	36G	9.5	6.5	54.9	- 0.9	54.0	+ 0.2	- 1.1
9/10	1K	9.5	8.5	51.0	- 0.3	50.7	+ 0.6	- 0.9
"	12K	8.5	6.8	37.0	+ 0.1	37.1	+ 0.5	- 0.6
"	18K	9.5	6.8	61.0	+ 1.0	62.0	+ 0.6	- 1.6
"	22K	9.8	7.0	83.5	+ 1.2	84.7	+ 0.8	+ 0.4
"	27K	10.0	7.2	59.5	- 0.7	58.8	+ 0.6	- 1.3
"	32K	10.2	7.0	74.3	+ 0.5	74.8	+ 0.7	- 0.2
"	36K	10.5	7.0	64.5	+ 0.2	64.7	+ 0.6	- 0.4
"	49K	9.8	6.3	37.1	+ 0.4	37.5	+ 0.5	- 0.1
"	54K	9.7	7.5	37.2	+ 1.0	38.2	+ 0.5	+ 0.4
"	59K	9.3	7.5	40.2	+ 0.2	40.4	+ 0.5	- 0.3
"	63K	9.5	7.0	50.5	- 0.3	49.6	+ 0.6	- 1.1
9/19	1N	9.0	5.8	91.0	- 0.8	90.2	+ 0.8	- 1.6
"	6N	9.0	4.8	92.5	- 1.7	90.8	+ 0.8	- 2.5
"	11N	9.0	6.4	79.0	- 0.6	78.4	+ 0.8	- 1.4
"	17N	9.0	7.4	57.0	+ 0.1	57.1	+ 0.6	- 0.5
"	21N	9.0	6.0	61.5	- 1.3	60.2	+ 0.6	- 1.9
"	26N	9.0	6.2	64.0	- 0.6	63.4	+ 0.6	- 1.2

Fathometer Corrections

Sheet No. 201

Date (1932)	Pos. No.	Temperature		Fath. Sdg.	Corr.	Ver. Cast	W.M. Corr.	Index Corrs.
		Surf.	Bot.					
9/19	32H	9.3	5.5	74.0	- 0.6	73.4	+ 0.7	- 1.3
"	37H	9.0	5.5	64.0	- 0.5	63.5	+ 0.8	- 1.3

APPROVAL OF CHIEF OF PARTY

Sheet #161 and accompanying records (141 & 201) have been inspected by me. Both the field and office work were done under my supervision. No further hydrography is considered necessary in the area covered by this sheet.

Respectfully:



H. B. Campbell,
Chief of Party,
C. & G. Survey.

COMPUTATIONS
VELOCITY TESTS
AUGUST 31, 1932.

Aug. 28, 1933

Section of Field Records
Report on H-5259
Portland Bank, East of Afognak I., Alaska.
Surveyed in 1932
Instructions dated Apr. 21, 1932, Vancouver

Surveyed by H. B. Campbell
Chief of Party H. B. C.
Contracted by H. J. Healy
Sounding plotted by H. J. H.
Verified & inked by Harold W. Murray

1. The records conform to the Hydrographic Manual except that the deviation's tabulation was not entered. ✓
2. The plan, character, & extent of development satisfy the general & specific instructions ✓
3. The sounding lines crossing are satisfactory. ✓
4. The 50 & 100 fms. curves may be satisfactorily drawn ✓ within the limits of the survey. ✓
5. Three volumes of this survey are 3-pl. fix and the balance is R.A.R. ✓
6. Difficulty was experienced in verifying 3-pl. fix work in the northern portion of this sheet. The line 82-93C is long. 150° 50' plots considerably to the west and falls on the adjacent line. The only reason seems to be

lack of care in bisecting the signals for in spite of the size of the sheet and the remote signals, many positions can be checked perfectly which fact is suggestive of a sheet relatively free from unequal distortion & shrinkage.

In as much as the bottom is very uniform and since adjacent soundings were in excellent agreement, it was not deemed advisable to spend additional time straightening out the line.

7. The Boat Sheet is on a scale of 1:200,000 whereas the Smooth Sheet is 1:160,000 (3-pt fix work). This accounts in part for the relatively smooth lines on the Boat Sheet. It is quite probable that if some of the angles had not been so weak and the fact that time was limited in protecting the Boat Sheet, the resultant gaps between lines would have been eliminated in the field.
8. In lat. $58^{\circ}36'$, long. $151^{\circ}40' - 152^{\circ}00'$, the line 45-46A could not be checked satisfactorily. Beginning at Pos. 45A, this line was plotted by the reefin as dead reckoning and the end adjusted to pos. 56A. On the $151^{\circ}50'$ meridian, the new penciled line fell about $\frac{3}{4}$ of a mile to the north (approx. lat. $58^{\circ}35'.8$). The objection to this ^{new} line was the tendency to magnify the 30 fms drop with the line of

sounding obtained on 6 day to the north which incidentally agrees excellently with H-5194 (Surveyed in 1931). Upon recommendation, the original Field plotting was accepted as a compromise.

9. The junction of this survey with contemporary work was of considerable extent.

The junction on the north with H-5194 (Jan. 1931) is excellent. Likewise the junction with H-5087.

The junction on the west, inshore, with H-5261 & H-5258 was made from a traverse enlarged 4 times.

Agreement of the former is satisfactory. Two positions, 22 & 23 D were plotted on H-5259, this sheet where the overlap would show to better advantage and consequently eliminates the necessity of a "dog-eat".

Agreement of the latter (with H-5258) over the overlapping ^{area} is within 1-2 fms with 3 or 4 exceptions where the difference is 3-4 fms.

11. The vertical casts of fms. 39 & 14 N, lat. $57^{\circ}52.7$, long. $150^{\circ}14'$ and lat. $57^{\circ}56.8$, long. $150^{\circ}20'$ respectively were not plotted because of excessive depth due to the slope of the lead line.

12. Respectfully submitted:

Harold W. Murray

SECTION OF FIELD RECORDS

Review of Hydrographic Sheet No. 5259
Western part of Portlock Bank, East of Afognak Island, Alaska.
Surveyed August-September 1932.
Instructions dated April 21, 1932 (Discoverer).

Chief of Party - H. B. Campbell.
Surveyed by - H. B. Campbell.
Protracted and soundings plotted by - H. J. Healy.
Verified and inked by Harold W. Murray.

1. The records conform to the Hydrographic Manual except that the ship's Deviation Table was not entered in any of the sounding volumes. This is of small importance as the positions are all three point fixes or R A R fixes. Duplicate day letters were used but caused no confusion as they appear on different localities on the sheet.
2. The plan and extent of the survey conform to the regulations and satisfy the specific instructions.
3. Soundings are consistent. The agreement in depths at crossings of lines are good. An adequate number of vertical casts and character of bottom are shown on this sheet.
4. Depth curves can be drawn satisfactorily.
5. Junction with adjacent sheets (H. 5194 and H. 5087 to the north, H. 5258 and 5261 to the west) are satisfactory.
6. Comparisons. Portions of the reconnaissance lines plotted on H. 4518 cross the area represented on this sheet (H. 5259) but they are of little value for comparison purposes.

Chart 8502 is in general agreement with this sheet. Bottom on Portlock bank is more irregular than indicated by the soundings on the chart.

7. Field drafting was fair. Plotting of 3 point fixes shows that the protractor was out of adjustment or not sufficient care was taken to bisect signals. However no changes were made on the smooth sheet.

8. Recommendation. This sheet (H. 5259) represents the basic survey of this area and should supersede all previous information for charting purposes.

No further surveying is deemed necessary.

9. Reviewed by - R. J. Christman - Sept. 21, 1933.

10. Inspected by R. L. Johnson.


Chief, Field Work Section.


Chief, Field Records Section.

Examined and approved:


Chief, Division of Charts.


Chief, Division of H. & T.

INVERSE POSITION COMPUTATION

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

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

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

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	58° - 10' 57.72"	Pine	λ	151° - 48' 43.90"	
2. ϕ'	57° - 54' 43.96"	Spruce	λ'	152° - 23' 32.68"	
$\Delta\phi (= \phi' - \phi)$	- 16 - 08.76		$\frac{\Delta\lambda (= \lambda' - \lambda)}{2}$	+ 34 - 48.78	
$\frac{\Delta\phi}{2}$	8 - 06.88			17 - 24.39	
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	58 - 02 - 50.84		$\Delta\lambda$ (secs.)	2088.78	1044.39
$\Delta\phi$ (secs.)	973.76				
log $\Delta\phi$	2.9884519		log $\Delta\lambda$	3.31989 48 ²⁷	
cor. arc-sin	- 4		cor. arc-sin	- 11	
log $\Delta\phi_1$	2.9884515		log $\Delta\lambda_1$	3.31989 57 ¹⁶	
log $\cos \frac{\Delta\lambda}{2}$	9.9999944		log $\cos \phi_m$	9.7236360	
colog B_m	8.4995040		colog A_m	8.4993347	
log $s_1 \cos (\alpha + \frac{\Delta\alpha}{2})$	4.4789579	(opposite in sign to $\Delta\phi$)	log $s_1 \sin (\alpha + \frac{\Delta\alpha}{2})$	4.5348638	
			log $s_1 \cos (\alpha + \frac{\Delta\alpha}{2})$	4.4789519	
log $\Delta\lambda$	3.3198948	$3 \log \Delta\lambda$	log $\tan (\alpha + \frac{\Delta\alpha}{2})$	0.0559 179 ⁰⁹⁸	
log $\sin \phi_m$	9.9826451	$\log F$	$\alpha + \frac{\Delta\alpha}{2}$	48 - 40 - 40.43	
log $\sec \frac{\Delta\phi}{2}$	0.0000012	$\log b$	log $\sin (\alpha + \frac{\Delta\alpha}{2})$	9.87564 84 ⁵	
log a	3.2485411		log $\cos (\alpha + \frac{\Delta\alpha}{2})$	9.81973 85 ⁵	
a	2006.97 1772.34		log s_1	4.65921 74 ⁶²	
b	- "		cor. arc-sin	+ 9	
$-\Delta\alpha$ (secs.)	2006.97 1772.34		log s	4.65921 83 ⁷¹	
$-\frac{\Delta\alpha}{2}$	1003.48	886.17			
$\alpha + \frac{\Delta\alpha}{2}$	48 40 40.43	14 48.17			
α (1 to 2)	48 57 28.41	33 26.97			
$\Delta\alpha$	180 29 - 32.34	25 - 54.27			
α' (2 to 1)	228 - 25 - 54.27	25 - 54.27			

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

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.

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			

INVERSE POSITION COMPUTATION

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

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

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

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	58° 10' 57.72"	Pine	λ	151° 48' 43.90"			
2. ϕ'	58° 11' 22.20"	Edge	λ'	152° 07' 00.69"			
$\Delta\phi (= \phi' - \phi)$	+ 24.48		$\Delta\lambda (= \lambda' - \lambda)$	+ 18 - 16.79			
$\frac{\Delta\phi}{2}$	12.24		$\frac{\Delta\lambda}{2}$	9 - 08.40			
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	58 - 11 - 09.96		$\Delta\lambda$ (secs.)	1096.79			
$\Delta\phi$ (secs.)	24.48						
log $\Delta\phi$	1.3888114		log $\Delta\lambda$	3.0401234			
cor. arc - sin	-		cor. arc - sin	5			
log $\Delta\phi_1$	1.3888114		log $\Delta\lambda_1$	3.0401229			
log $\cos \frac{\Delta\lambda}{2}$	2		log $\cos \phi_m$	9.7219440			
colog B_m	1.4905143		colog A_m	1.4913369			
log $\left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	2.8793259	(opposite in sign to $\Delta\phi$)	log $\left\{ s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.2534038			
			log $\left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	2.8793259			
log $\Delta\lambda$	3.0401234	3 log $\Delta\lambda$	log $\tan \left(\alpha + \frac{\Delta\alpha}{2} \right)$	1.3740779			
log $\sin \phi_m$	9.9292987	log F	$\alpha + \frac{\Delta\alpha}{2}$	92 25 11.42			
log $\sec \frac{\Delta\phi}{2}$	-	log b	log $\sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.9996126			
			log $\cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	8.6255447			
log a	2.9694221		log s_1	4.2537812			
a	932013		cor. arc - sin	+	1		
b	-		log s	4.2537813			
$-\Delta\alpha$ (secs.)	15.53332013						
$\frac{\Delta\alpha}{2}$	7 47.00 46.01						
$\alpha + \frac{\Delta\alpha}{2}$	92 25 11.42						
α (1 to 2)	92 - 32 - 57.43						
$\Delta\alpha$	15 32.01						
	180						
α' (2 to 1)	272 - 17 - 25.42						

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

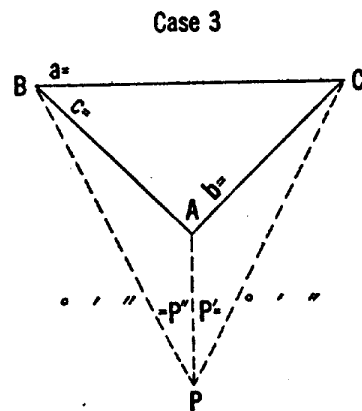
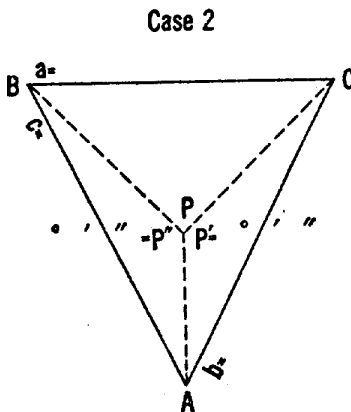
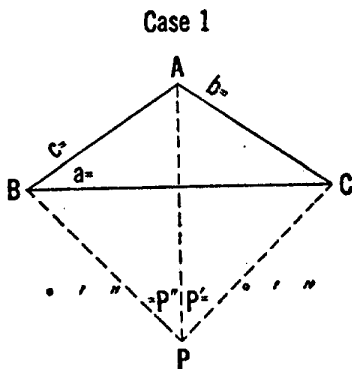
NOTE.—For log s up to 4.52 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 10', omit all terms below the heavy line except those printed in heavy type or those underscored, if using logarithms to 6 decimal places.

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			

P(1)

COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P' 56-54
P'' 88-46
A 115 36 33

Sum 261-16-33
1/2 Sum 130-38-16

S = 180° - 1/2 sum = 49-21-44

Log c = 4.542 935
Log sin P' = 9.923 098
Colog b = 5.746 219
Colog sin P'' = 0.202 101

Sum = log tan Z = 9.212 353

Z = 58-28-51
Z + 45° = 103-28-51

Log cot (Z + 45°) = 9.379 713
Log tan S = 0.066 387

Sum = log tan ε = 9.446 100 (sign -)

ε 15-36-22
S 49 21-44

(Tan ε+)
S + ε = angle ABP
S - ε = angle ACP

(Tan ε-)
S - ε = angle ABP
S + ε = angle ACP

BPA 88-46-00
ABP 33-45-22
PAB 57-28-38

APC 56-54-00
PCA 64-58-06
CAP 58-07-54

PCB 21-20-35
CBP 12-59-26
BPC 145-40-00

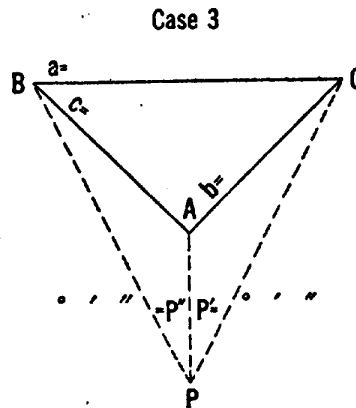
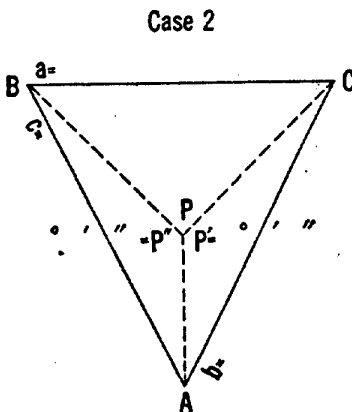
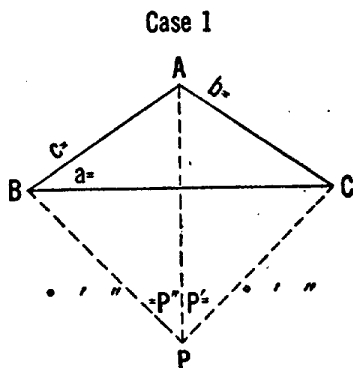
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180-00-01

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

P^2

COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P' 54-04-
P'' 89-28
A 115-36-33

Sum 259-08-33
 $\frac{1}{2}$ Sum 129-34-16

$S = 180^\circ - \frac{1}{2} \text{sum} = 50-25-44$

Case 3

P'
P''

Sum
A

A-sum

$S = \frac{1}{2} (A - \text{sum}) =$

Log c = 4.542 935
Log sin P' = 9.908 324
Colog b = 5.746 219
Colog sin P'' = 0.000 019

Sum = log tan Z = 0.197 497

Z = 57-36-02
Z + 45° = 102-36-02

Log cot (Z + 45°) = 10.659.349 349
Log tan S = 10.082798

Sum = log tan ε = 9.432147 (sign -)

ε 15-08-08
S 50-25-44

(Tan ε+)
S + ε = angle ABP
S - ε = angle ACP

(Tan ε-)
S - ε = angle ABP
S + ε = angle ACP

BPA 89-28-
ABP 35-17-36
PAB 55-14-24

APC 54-04-00
PCA 65-33-52
CAP 60-22-08

PCB 21-56-27
CBP 14-31-40
BPC 143-32-00

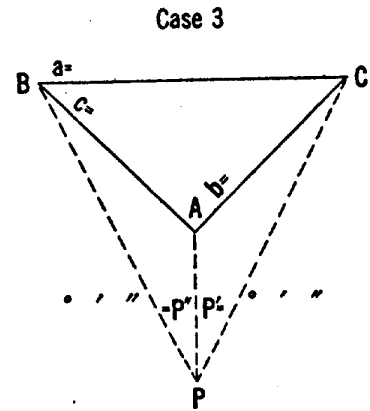
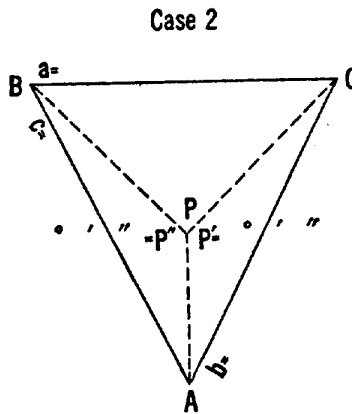
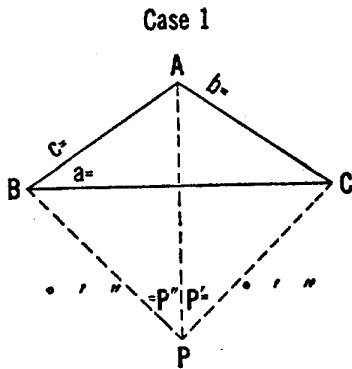
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180 00 00

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(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

^{P₃}
COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P' 51-43-
 P'' 89-51
 A 115 36 33

Sum 257-10-33
 1/2 Sum 128-35-16

S = 180° - 1/2 sum = 51-24-44

Case 3

P'
 P''

Sum
 A

A - sum

S = 1/2 (A - sum) =

Log c = 4.542 935
 Log sin P' = 9.894 846
 Colog b = 5.746 219
 Colog sin P'' = 0. 2

Sum = log tan Z = 0.184002

Z = 56-47-25
 Z + 45° = 101-47-25

Log cot (Z + 45°) = 9.319 593
 Log tan S = 10.098 030

Sum = log tan ε = 9.417 623 (sign -)

ε 14-39-35
 S 51-24-44

(Tan ε +)
 S + ε = angle ABP
 S - ε = angle ACP

(Tan ε -)
 S - ε = angle ABP
 S + ε = angle ACP

BPA 89-51-
 ABP 36-45-09
 PAB 53-23-51

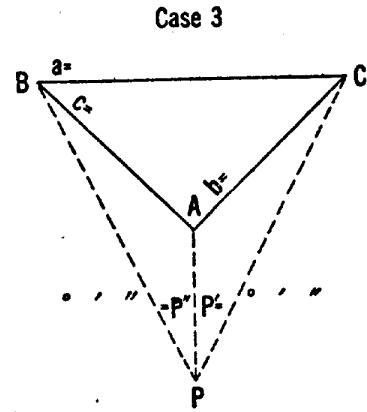
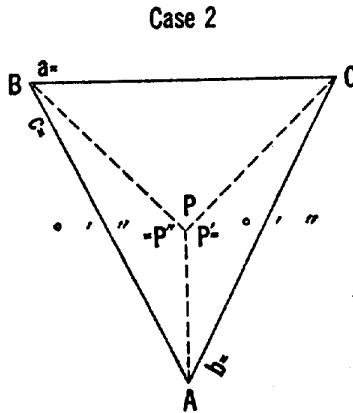
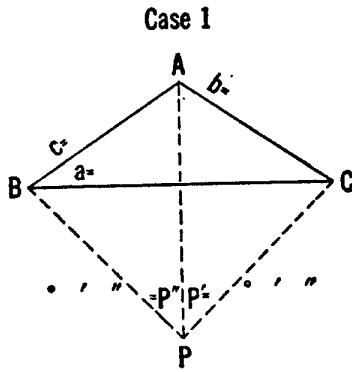
APC 51-43-00
 PCA 66-04-19
 CAP 62-12-41

PCB 22-26-48
 CBP 15-59-13
 BPC 141-34-00

180-00-00 180-00-00 180-00-00

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

P₄
COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P' 52-31-
P'' 91-06-
A 115-36-33

Sum 259-13-33
½ Sum 129-36-46

S = 180° - ½ sum = 50-23-14

Case 3

P' _____
P'' _____
Sum _____
A _____

A-sum

S = ½ (A-sum) =

Log c = 4.582 935
Log sin P' = 9.899 564
Colog b = 5.746 219
Colog sin P'' = 0.0 — 80

Sum = log tan Z = 0.188 798

Z = 56-28-28
Z + 45° = 101-28-28

Log cot (Z + 45°) = 9.307 479
Log tan S = 10.082 154

Sum = log tan ε = 9.389 624

ε 13°-46'-49"
S 50-23-14

57-04-45
102-04-45

9.330 416
10.082 154

(sign -) 9.412 570

14-29-50
50-23-14

(Tan ε+)

S + ε = angle ABP
S - ε = angle ACP

(Tan ε-)

S - ε = angle ABP
S + ε = angle ACP

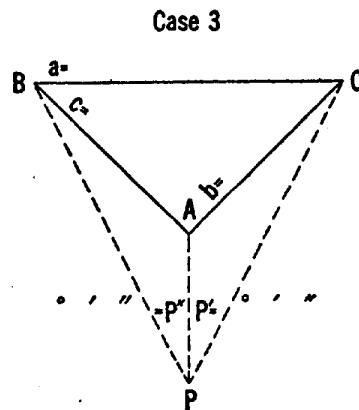
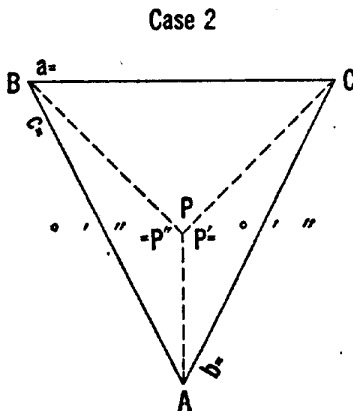
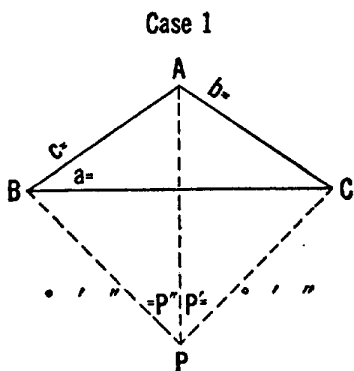
BPA	91-06-	91-06-00	APC	52-31-00	52-31-00	PCB	20-32-31	21-15-32
ABP	56-36-25	35-53-24	PCA	64-10-03	64-53-04	CBP	15-50-29	15-07-28
PAB	52-17	35-53-00-36	CAP	63-18-57	62-35-56	BPC	143-39	143-31-60

180-00-00

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

P 5

COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P' 54-57
P'' 90-21
A 115-36-33

Sum 260-54-33

1/2 Sum 130-27-16

S = 180° - 1/2 sum = 49-32-44

Case 3

P'
P''

Sum
A

A - sum

S = 1/2 (A - sum) =

Log c = 4.542 935
Log sin P' = 9.913 099
Colog b = 5.746 219
Colog sin P'' = 0. ——— 8

Sum = log tan Z = 0.202 261

Z = 57-53-03
Z + 45° = 102-53-03

Log cot (Z + 45°) = 9.359 342
Log tan S = 10.069 200

Sum = log tan ε = 9.428 542 (sign -)

ε 15-00-58
S 49-32-44

(Tan ε +)
S + ε = angle ABP
S - ε = angle ACP

(Tan ε -)
S - ε = angle ABP
S + ε = angle ACP

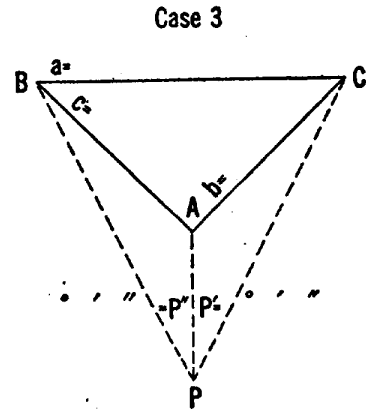
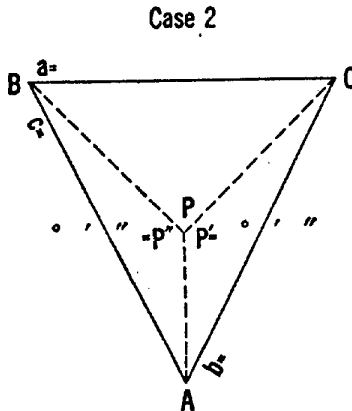
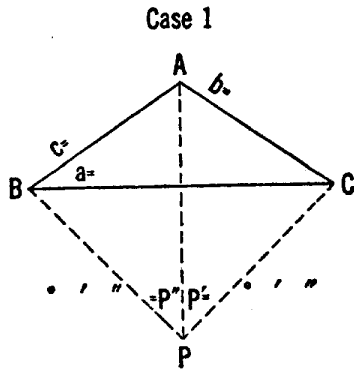
BPA 90-21-00
ABP 34-31-46
PAB 55-07-14

APC 54-57-
PCA 64-33-42
CAP 60-29-18

PCB 20-56-10
CBP 13-45-50
BPC 145-18-00

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

P₆
COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P' 58-07
 P'' 89-13
 A 115-36-33

Sum 262-56-33
 1/2 Sum 131-28-16

$S = 180^\circ - \frac{1}{2} \text{sum} = 48-31-44$

Case 3

P'
 P''

Sum
 A

A - sum

$S = \frac{1}{2} (A - \text{sum}) =$

Log c = 4.542 935
 Log sin P' = 9.928 972
 Colog b = 5.746 219
 Colog sin P'' = 0.41

Sum = log tan Z = 0.218 167

Z = 58-49-18
 Z + 45° = 103-49-18

Log cot (Z + 45°) = 9.390 978
 Log tan S = 10.053 633

Sum = log tan ε = 9.444 611 (sign -)

ε 15-33-19
 S 48-31-43

(Tan ε +)
 S + ε = angle ABP
 S - ε = angle ACP

(Tan ε -)
 S - ε = angle ABP
 S + ε = angle ACP

BPA 89-13-00
 ABP 32-58-24
 PAB 57-48-36

APC 58-07-00
 PCA 64-05-02
 CAP 57-47-58

PCB 20-27-30
 CBP 12-12-29
 BPC 147-20-00

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

COMPUTATION OF TRIANGLES.

State: Alaska.

11-0121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3						4.542 935
	1 <i>Pi</i>	88-46-00					0.000 101
	2 <i>Spruce</i>	33-45-22					9.744 808
	3 <i>Edge</i>	57-28-38					9.925 919
	1-3						4.287 844 ✓
	1-2						4.468 955 °
	2-3						4.253 781
	1 <i>Pi</i>	56-54-00					0.076 902
	2 <i>Edge</i>	58-07-54					9.928 042
	3 <i>Pine</i>	64-58-06					9.957 164
	1-3						4.259 725 °
	1-2						4.287 847 ✓
	2-3						4.659 217
	1 <i>Pi</i>	145-40-00					0.248 716
	2 <i>Spruce</i>	12-59-26					9.351 778
	3 <i>Pine</i>	21-20-34					9.561 038
	1-3						4.259 711 °
	1-2						4.468 971 °
	2-3						
	1						
	2						
	3						
	1-3						
	1-2						

Do not write in this margin

COMPUTATION OF TRIANGLES.

State: _____

11-9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3 1 <i>P₂</i> 2 <i>Spruce</i> 3 <i>Edge</i> 1-3 1-2	89-28-00 35-17-36 55-14-24					4.542 935 0.000 019 9.761 750 9.914 633 4.304 704 ° 4.457 587 °
	{ 2-3 1 <i>P₂</i> 2 <i>Edge</i> 3 <i>Pine</i> 1-3 1-2	54-04-00 60-22-08 65-33-52					4.253 781 0.091 676 9.939 133 9.959 245 4.284 590 ✓ 4.304 702 °
	2-3 1 <i>P₂</i> 2 <i>Spruce</i> 3 <i>Pine</i> 1-3 1-2	143-32-00 14-31-40 21-56-20					4.659 217 0.225 954 9.399 413 9.572 427 4.284 584 ✓ 4.457 598 °
	2-3 1 2 3 1-3 1-2						

Do not write in this margin

COMPUTATION OF TRIANGLES.

State: _____

11-9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3 1 <i>P₃</i> 2 <i>Spruce</i> 3 <i>Edge</i> 1-3 1-2	89-51-00 36-45-09 53-23-51					4.542 935 0. ——— 01 9.776 962 9.904 603 4.319 898 ✓ 4.423 900
	2-3 1 <i>P₃</i> 2 <i>Edge</i> 3 <i>Pine.</i> 1-3 1-2	51-43-00 62-12-41 66-04-19					4.253 781 0.105 154 9.946 783 9.960 972 4.305 718. 4.319 907 ✓
Do not write in this margin	2-3 1 <i>P₃</i> 2 <i>Spruce</i> 3 <i>Pine</i> 1-3 1-2	141-34-00 15-59-13 22-26-47					4.659 217 0.206 486 9.439 993 9.581 857 4.305 696° 4.447 560
	2-3 1 2 3 1-3 1-2						

COMPUTATION OF TRIANGLES

State:

11-9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3 1 <i>P4</i> 2 <i>Spruce</i> 3 <i>Edge</i> 1-3 1-2	91-06— 35-53-24 53-00-36					4.542 935 0.0 — 80 9.768 069 9.902 406 4.311 084 ✓ 4.445 421
	2-3 1 <i>P4</i> 2 <i>Edge</i> 3 <i>Pine</i> 1-3 1-2	52-31— 64-53-04 62-35-56					4.253 781 0.100 436 9.948 318 9.956 866 4.302 535 ✓ 4.311 083 ✓
Do not write in this margin	2-3 1 <i>P4</i> 2 <i>Spruce</i> 3 <i>Pine</i> 1-3 1-2	143-37— 15-07-28 21-15-32					4.659 217 0.226 810 9.416 501 9.559 407 4.302 528 ° 4.445 434
	2-3 1 2 3 1-3 1-2						

COMPUTATION OF TRIANGLES.

State: _____

11-9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3 1 <i>Pf</i> 2 <i>Spruce</i> 3 <i>Edge</i> 1-3 1-2	90-21— 34-31-46 55-07-14					4.542 935 0 ——— 8 9.753 453 9.914 003 4.296 396 4.456 946
	2-3 1 <i>P5</i> 2 <i>Edge</i> 3 <i>Pine</i> 1-3 1-2	54-57-00 60-29-18 64-33-42					4.253 787 0.086 901 9.937 647 9.955 711 4.280 329 4.296 393
	2-3 1 <i>P5</i> 2 <i>Spruce</i> 3 <i>Pine</i> 1-3 1-2	145-18— 13-45-50 20-56-10					4.659 217 0.244 664 9.376 433 9.553 066 4.280 314 4.456 947
	2-3 1 2 3 1-3 1-2						

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COMPUTATION OF TRIANGLES

State:

11-9121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3 1 P ₆ 2 Spruce 3 Edge 1-3 1-2	89-13-00 32-58-24 57-48-36					4.542 935 ————— 41 9.735 797 9.927 517 4.278 773 4.470 493
	2-3 1 P ₆ 2 Edge 3 Pine 1-3 1-2	58-07-00 57-47-58 64-05-02					4.253 781 0.071 028 9.927 467 9.953 971 4.252 276 4.278 780
	2-3 1 P ₆ 2 Spruce 3 Pine 1-3 1-2	147-20-00 12-12-29 20-27-31					4.659 217 0.267 807 9.325 233 9.543 485 4.252 257 4.470 509
	2-3 1 2 3 1-3 1-2						

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POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

α		β		γ		δ		ε	
2	to 8	272	17	25.4	8	to 2	92	82	57.4
297	to 1	58	07	54	3	to 1	64	58	06
α	2	330	25	09.4	Δα		27	34	51.4
Δα		180	00	00.0			180	00	00.0
α'	1	to 2			α'	1	to 3		

φ		λ		ν		ξ		ζ	
58	11	22.20	2	Eddge	58	10	57.72	8	Pine
Δφ	9	08.34	Δλ	-	8	41.28	Δξ		0
φ'	58	02	19.36	1	58	02	16.44	1	P1
Logarithms			16.44 in seconds		Logarithms		Values in seconds		Logarithms
4.287847					4.259725				4.259725
Cos α	9.938235				9.847609				9.847609
B	8.509484				8.509484				8.509484
h	2.736693				2.716818				2.716818
h'	8.57569				8.51945				8.51945
Sin α	9.39677				9.399116				9.399116
C	1.61008				1.60992				1.60992
h ²	5.4734				5.46053				5.46053
D	2.3455				2.3456				2.3456
3d term	0.01				0.01				0.01
-Δφ	544.80				521.28				521.28

1/2(φ+φ')		Logarithms		Values in seconds		1/2(φ+φ')		Logarithms		Values in seconds	
φ	58	11	22.20	2	Eddge	φ	58	10	57.72	8	Pine
Δφ	9	08.34	Δλ	-	9.4366	Δφ	9	08.34	Δλ	-	9.4366
φ'	58	02	19.36	1	P1	φ'	58	02	16.44	1	P1
Logarithms			16.44 in seconds			Logarithms			Values in seconds		
4.287847						4.259725					
Cos α	9.938235					9.847609					
B	8.509484					8.509484					
h	2.736693					2.716818					
h'	8.57569					8.51945					
Sin α	9.39677					9.399116					
C	1.61008					1.60992					
h ²	5.4734					5.46053					
D	2.3455					2.3456					
3d term	0.01					0.01					
-Δφ	544.80					521.28					

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

° ' "		° ' "		° ' "	
α	2	to 3	272	17	25.4
β	2	&	+ 62	12	41
α	2	to 1	334	30	06.4
$\Delta\alpha$			180	00	00.0
α'	1	to 2			
α	3	to 2	92	32	57.4
β	3	&	- 66	54	19
α	3	to 1	26	28	38.4
$\Delta\alpha$			180	00	00.0

° ' "		° ' "		° ' "	
ϕ	58	11	22.20	2	Edge
$\Delta\phi$			10	09.72	
ϕ'	58	01	12.48	1	P ₃
λ	152	07	00.69		
$\Delta\lambda$			9	07.73	
λ'	151	57	52.96		
ϕ	58	10	57.72	8	Pine
$\Delta\phi$			9	48.83	
ϕ'	58	01	12.29	1	P ₃
λ	151	48	43.90		
$\Delta\lambda$			9	08.04	
λ'	151	57	52.94		

Logarithms		Values in seconds		Logarithms		Values in seconds	
s	4.319 907	$\frac{1}{2}(\phi+\phi')$		s	4.305 718	$\frac{1}{2}(\phi+\phi')$	
Cor α	9.955 494	Logarithms		Cor α	9.951 877	Logarithms	
B	8.509 484	Values in seconds		B	8.509 484	Values in seconds	
h	2.78 488.5	1st term	6093.8	h	2.78 979	1st term	584.89
s	8.639 81	$\sin^2 \alpha$		s	8.611 44	$\sin^2 \alpha$	
$\sin^2 \alpha$	9.267 91	A'		$\sin^2 \alpha$	9.298 36	A'	
C	1.610 08	Sec ϕ'		C	1.609 92	Sec ϕ'	
	9.517 80	$\Delta\lambda$			9.519 72	$\Delta\lambda$	
\ln	5.569 8	$\sin \frac{1}{2}(\phi+\phi')$		\ln	5.537 9	$\sin \frac{1}{2}(\phi+\phi')$	
D	2.345 5	- $\Delta\alpha$		D	2.345 6	- $\Delta\alpha$	
	7.915 3	2d term	+ 0.33		7.879 8	2d term	+ 0.33
		3d term	+ 0.01			3d term	+ 0.01
		- $\Delta\phi$	609.72			- $\Delta\phi$	588.93

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

		° ' "			° ' "						
α	2	to 3	272	17	25.4	α	3	to 2	92	32	57.4
$2^d L$		δ	+ 62	35	5.6	$3^d L$		δ	- 64	53	0.4
α	2	to 1	334	53	21.4	α	3	to 1	27	39	53.4
$\Delta\alpha$			180	00	00.0	$\Delta\alpha$			180	00	00.0
α'	1	to 2				α'	1	to 3			

		° ' "			° ' "						
ϕ	58	11	22.20	2	Edge	ϕ	58	10	57.72	8	Pine
$\Delta\phi$	9	59.35				$\Delta\phi$	9	34.87			
ϕ'	58	01	22.85	1	P4	ϕ'	58	01	22.85	1	P4

		Values in seconds			Values in seconds				
s	4.311083	$\frac{1}{2}(\phi+\phi')$	Logarithms	Values in seconds	s	4.302535	$\frac{1}{2}(\phi+\phi')$	Logarithms	Values in seconds
$\text{Cos } \alpha$	9.956883	s	4.311083		$\text{Cos } \alpha$	9.947276	s	4.302535	
B	8.509684	$\text{Sin } \alpha$	9.627743		B	8.509684	$\text{Sin } \alpha$	9.666799	
h	2.777450	A'	8.508666		h	2.759295	A'	8.508666	
a	8.62217	$\text{Sec } \phi'$	0.276070		a	8.60507	$\text{Sec } \phi'$	0.276070	
$\text{Sin } \alpha$	9.25549	$\Delta\alpha$	2.728562	-529.55	$\text{Sin } \alpha$	9.33359	$\Delta\alpha$	2.754068	527.63
C	1.61008	$\text{Sin } \frac{1}{2}(\phi+\phi')$		529.13	C	1.60992	$\text{Sin } \frac{1}{2}(\phi+\phi')$		
h'	9.48774	$-\Delta\alpha$			h'	9.54858	$-\Delta\alpha$		
h''	5.8549				h''	5.5186			
D	2.3455				D	2.3456			
	7.9004	3d term	+ 0.01			7.8632	3d term	+ 0.01	
		$-\Delta\phi$	599.35				$-\Delta\phi$	574.87	

INVERSE POSITION COMPUTATION

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

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

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

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	58° 09' 15.93"	KVB	λ	151	52	24.76
2. ϕ'	58- 02 16.44	P1	λ'	151	57	17.04
$\Delta\phi (= \phi' - \phi)$	- 06-59.49					04-52.28
$\frac{\Delta\phi}{2}$	03-29.74					2-26.14
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	58-05-46.18					
$\Delta\phi$ (secs.)	- 419.74					46.14 292.28
$\log \Delta\phi$	2.622980		$\log \Delta\lambda$	2.164769	2.46	
cor. arc - sin	-		cor. arc - sin	-		
$\log \Delta\phi_1$	2.622980		$\log \Delta\lambda_1$	2.164769	2.465799	
$\log \cos \frac{\Delta\lambda}{2}$			$\log \cos \phi_m$	9.723041	9.723041	
$\text{colog } B_m$	1.491510		$\text{colog } A_m$	1.491335	1.491335	
$\log s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	4.114490	(opposite in sign to $\Delta\phi$)	$\log s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	3.379145	3.680175	
			$\log s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	4.114490	4.114490	
			$\log \tan \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.264655	9.565685	
$\log \Delta\lambda$			$\alpha + \frac{\Delta\alpha}{2}$	10-25-19.2	20-11-48	
$\log \sin \phi_m$	9.928875	$3 \log \Delta\lambda$	$\log \sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.257431	9.537125	
$\log \sec \frac{\Delta\phi}{2}$		$\log F$	$\log \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.992775	9.972440	
		$\log b$	$\log s_1$	4.121715		
$\log a$			cor. arc - sin	+		
a			$\log s$	4.121715	4.142050	
b						
$-\Delta\alpha$ (secs.)						
$-\frac{\Delta\alpha}{2}$						
$\alpha + \frac{\Delta\alpha}{2}$						
α (1 to 2)						
$\frac{\Delta\alpha}{2}$						
	180					
α' (2 to 1)						

$13234.7 \div 9.32$
 $13869.2 \div 9.32 = 1488.11 \frac{m}{s}$

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

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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.

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			

INVERSE POSITION COMPUTATION

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

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

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

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		57° 38' 25.98"	KVD	λ	152° 09' 50.81"	
2. ϕ'		58° 02' 16.44"	P'	λ'	151° 57' 17.04"	
$\Delta\phi (= \phi' - \phi)$		23-50.46			12-33.77	
$\frac{\Delta\phi}{2}$		11-55.23				
$\phi_m (= \phi + \frac{\Delta\phi}{2})$		57-50-21.21				
$\Delta\phi$ (secs.)		1430.46		$\Delta\lambda$ (secs.)	753.77	
$\log \Delta\phi$		3.155476		$\log \Delta\lambda$	2.877239	
cor. arc - \sin		<u> </u>		cor. arc - \sin		
$\log \Delta\phi_1$		3.155476		$\log \Delta\lambda_1$	2.877239	
$\log \cos \frac{\Delta\lambda}{2}$		<u> </u>		$\log \cos \phi_m$	9.726154	
$\text{colog } B_m$		1.490421		$\text{colog } A_m$	1.491306	
$\log \left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$		4.645897	(opposite in sign to $\Delta\phi$)	$\log \left\{ s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.094699	
				$\log \left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.645897	
				$\log \tan \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.448802	
$\log \Delta\lambda$			$3 \log \Delta\lambda$	$\alpha + \frac{\Delta\alpha}{2}$	195°-41-55.1	
$\log \sin \phi_m$			$\log F$	$\log \sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.983490	
$\log \sec \frac{\Delta\phi}{2}$			$\log b$	$\log \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.432292	
$\log a$				$\log s_1$	4.662407	
a				cor. arc - \sin	<u> </u>	
b				$\log s$	4.662408	
$-\Delta\alpha$ (secs.)						
$\frac{\Delta\alpha}{2}$						
$\alpha + \frac{\Delta\alpha}{2}$						
α (1 to 2)						
$\Delta\alpha$						
α' (2 to 1)		180				

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

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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.

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			

INVERSE POSITION COMPUTATION

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

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

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

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	58° 09' 15.93	KVB	λ	151° 52' 24.76	
2. ϕ'	58 02 42.76	PZ	λ'	151 57 36.04 36.28	
$\Delta\phi (= \phi' - \phi)$	7 - 33.17	$\frac{\Delta\lambda (= \lambda' - \lambda)}{2}$		5 - 11.52	
$\frac{\Delta\phi}{2}$	3 - 46.58	$\Delta\lambda$ (secs.)		311.52	
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	58 - 05 - 29.34				
$\Delta\phi$ (secs.)	453.17				
log $\Delta\phi$		log $\Delta\lambda$			
cor. arc - sin		cor. arc - sin			
log $\Delta\phi_1$	2.656261	log $\Delta\lambda_1$		2.493486	
log $\cos \frac{\Delta\lambda}{2}$		log $\cos \phi_m$		9.723098	
colog B_m	1.490510	colog A_m		1.491335	
log $\{s_1 \cos (\alpha + \frac{\Delta\alpha}{2})\}$	4.146771	log $\{s_1 \sin (\alpha + \frac{\Delta\alpha}{2})\}$		3.707919	
		log $\{s_1 \cos (\alpha + \frac{\Delta\alpha}{2})\}$		4.146771	
log $\Delta\lambda$		log $\tan (\alpha + \frac{\Delta\alpha}{2})$		9.561148	
log $\sin \phi_m$		$\alpha + \frac{\Delta\alpha}{2}$		20 - 00 - 12.5	
log $\sec \frac{\Delta\phi}{2}$		log $\sin (\alpha + \frac{\Delta\alpha}{2})$		9.534124	
log a		log $\cos (\alpha + \frac{\Delta\alpha}{2})$		9.972976	
a		log s_1		1	
b		cor. arc - sin		+	
$-\Delta\alpha$ (secs.)		log s		4.173795	
$\frac{\Delta\alpha}{2}$				14920.9 ÷ 10.03	
$\alpha + \frac{\Delta\alpha}{2}$					
α (1 to 2)					
$\Delta\alpha$					
α' (2 to 1)	180				

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

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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.

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			

INVERSE POSITION COMPUTATION

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

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

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

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	57° 38' 25.98"	KVD	λ	152° 09' 50.81"	
2. ϕ'	58° 01' 42.76"	P ²	λ'	151° 57' 36.28"	
$\Delta\phi (= \phi' - \phi)$	23 - 16.78		$\Delta\lambda (= \lambda' - \lambda)$	12 - 14.53	
$\frac{\Delta\phi}{2}$	11 - 38.39		$\frac{\Delta\lambda}{2}$		
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	57 - 50 - 04.37		$\Delta\lambda$ (secs.)	734.53	
$\Delta\phi$ (secs.)	1396.78				
log $\Delta\phi$			log $\Delta\lambda$		
cor. arc - sin	-		cor. arc - sin	-	
log $\Delta\phi_1$	3.145128		log $\Delta\lambda_1$	2.866010	
log cos $\frac{\Delta\lambda}{2}$			log cos ϕ_m	9.726210	
colog B_m	1.490491		colog A_m	1.491329	
log $\left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.635617	(opposite in sign to $\Delta\phi$)	log $\left\{ s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.983549	
			log $\left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.635617	
log $\Delta\lambda$		3 log $\Delta\lambda$	log tan $\left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.447932	
log sin ϕ_m		log F	$\alpha + \frac{\Delta\alpha}{2}$	195-40-07.6	
log sec $\frac{\Delta\phi}{2}$		log b	log sin $\left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.431484	
log a			log cos $\left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.983554	
a			log s_1	4.652064	
b			cor. arc - sin	+	
$-\Delta\alpha$ (secs.)			log s	4.652065	
$-\frac{\Delta\alpha}{2}$					
$\alpha + \frac{\Delta\alpha}{2}$			44881.3		
α (1 to 2)					
$\Delta\alpha$					
α' (2 to 1)	180				

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

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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.

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			

INVERSE POSITION COMPUTATION

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

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

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

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	58° 09' 15.93"	KVB	λ	151° 52' 24.76"			
2. ϕ'	58° 01' 12.48"	P ₃	λ'	151° 57' 52.95"			
$\Delta\phi (= \phi' - \phi)$	8 - 03.45		$\Delta\lambda (= \lambda' - \lambda)$	5 - 28.19			
$\frac{\Delta\phi}{2}$	4 - 01.72		$\frac{\Delta\lambda}{2}$				
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	58 - 05 - 14.20		$\Delta\lambda$ (secs.)	328.19			
$\Delta\phi$ (secs.)	483.45						
log $\Delta\phi$			log $\Delta\lambda$				
cor. arc-sin			cor. arc-sin				
log $\Delta\phi_1$	2.684352		log $\Delta\lambda_1$	2.516125			
log $\cos \frac{\Delta\lambda}{2}$			log $\cos \phi_m$	9.723146			
colog B_m	1.490510		colog A_m	1.491335			
log $s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	4.174862	(opposite in sign to $\Delta\phi$)	log $s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	3.730606			
			log $s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	4.174862			
			log $\tan \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.555744			
log $\Delta\lambda$		3 log $\Delta\lambda$	$\alpha + \frac{\Delta\alpha}{2}$	19-46-31.5			
log $\sin \phi_m$		log F	log $\sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.529346			
log $\sec \frac{\Delta\phi}{2}$		log b	log $\cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.973602			
log a			log s_1				
a			cor. arc-sin				
b			log s	4.201260			
$-\Delta\alpha$ (secs.)							
$\frac{\Delta\alpha}{2}$							
$\alpha + \frac{\Delta\alpha}{2}$							
α (1 to 2)							
$\Delta\alpha$							
	180						
α' (2 to 1)							

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

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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.

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			

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	57° 38' 25.98"	KVD	λ	152° 09' 50.81"			
2. ϕ'	58° 01' 12.48"	P3	λ'	151° 57' 52.95"			
$\Delta\phi (= \phi' - \phi)$	22 - 46.50		$\Delta\lambda (= \lambda' - \lambda)$	11 - 57.86			
$\frac{\Delta\phi}{2}$	11 - 23.25		$\frac{\Delta\lambda}{2}$				
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	57 49. 49.23		$\Delta\lambda$ (secs.)	717.86			
$\Delta\phi$ (secs.)	1366.50						
log $\Delta\phi$			log $\Delta\lambda$				
cor. arc-sin	-		cor. arc-sin	-			
log $\Delta\phi_1$	3.135610		log $\Delta\lambda_1$	2.856040			
log $\cos \frac{\Delta\lambda}{2}$			log $\cos \phi_m$	9.726261			
colog B_m	1.490491		colog A_m	1.491382			
log $\left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.626101	(opposite in sign to $\Delta\phi$)	log $\left\{ s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.073630			
			log $\left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.626101			
log $\Delta\lambda$		3 log $\Delta\lambda$	log $\tan \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.447529			
log $\sin \phi_m$		log F	$\alpha + \frac{\Delta\alpha}{2}$	195-39-18			
log $\sec \frac{\Delta\phi}{2}$		log b	log $\sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.431113			
log a			log $\cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.983583			
a			log s_1	4.642518			
b			cor. arc-sin	+	1		
$-\Delta\alpha$ (secs.)			log s	4.642519			
$-\frac{\Delta\alpha}{2}$				43905.5			
$\alpha + \frac{\Delta\alpha}{2}$							
α (1 to 2)							
$\Delta\alpha$							
	180						
α' (2 to 1)							

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

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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.

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			

INVERSE POSITION COMPUTATION

⑦

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

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

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

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	58° 09' 15.93"	KVB	λ	151	52 24.76
2. ϕ'	58 01 22.85	P4	λ'	151	58 11.54
$\Delta\phi (= \phi' - \phi)$	07 - 53.08	$\frac{\Delta\lambda (= \lambda' - \lambda)}{2}$	05 - 46.78		
$\frac{\Delta\phi}{2}$	03 56.54	$\Delta\lambda$ (secs.)	346.78		
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	58 - 05 - 19.39				
$\Delta\phi$ (secs.)	473.08				
$\log \Delta\phi$	-	$\log \Delta\lambda$	-		
cor. arc-sin	-	cor. arc-sin	-		
$\log \Delta\phi_1$	2.674935	$\log \Delta\lambda_1$	2.540054		
$\log \cos \frac{\Delta\lambda}{2}$	-	$\log \cos \phi_m$	9.723131		
$\text{colog } B_m$	1.490509	$\text{colog } A_m$	1.491335		
$\log \left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.165444	$\log \left\{ s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	3.754520		
		$\log \left\{ s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right) \right\}$	4.165444		
		$\log \tan \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.589076		
		$\alpha + \frac{\Delta\alpha}{2}$	21-13-01.5		
		$\log \sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.558591		
		$\log \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.969516		
		$\log s_1$	+		
		cor. arc-sin	+		
		$\log s$	4.195928		
			15701.0		
$\log \Delta\lambda$		$3 \log \Delta\lambda$			
$\log \sin \phi_m$		$\log F$			
$\log \sec \frac{\Delta\phi}{2}$		$\log b$			
$\log a$					
a					
b					
$-\Delta\alpha$ (secs.)					
$-\frac{\Delta\alpha}{2}$					
$\alpha + \frac{\Delta\alpha}{2}$					
α (1 to 2)					
$\Delta\alpha$	180				
α' (2 to 1)					

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

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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.

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			

INVERSE POSITION COMPUTATION

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

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

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

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	57° 38' 25.98"	KVD	λ	152° 09' 50.81"			
2. ϕ'	58° 01' 22.85"	Pf	λ'	151° 58' 11.54"			
$\Delta\phi (= \phi' - \phi)$	22 - 56.87	$\frac{\Delta\lambda (= \lambda' - \lambda)}{2}$		11 - 39.27			
$\frac{\Delta\phi}{2}$	11 - 28.43						
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	57 - 49 - 54.41	$\Delta\lambda$ (secs.)		699.27			
$\Delta\phi$ (secs.)	1376.87						
log $\Delta\phi$		log $\Delta\lambda$					
cor. arc-sin		cor. arc-sin					
log $\Delta\phi_1$	3.138 893	log $\Delta\lambda_1$		2.844 645			
log $\cos \frac{\Delta\lambda}{2}$		log $\cos \phi_m$		9.726 243			
colog B_m	1.490 490	colog A_m		1.491 329			
log $\{s_1 \cos (\alpha + \frac{\Delta\alpha}{2})\}$	4.629 384	log $\{s_1 \sin (\alpha + \frac{\Delta\alpha}{2})\}$		4.062 217			
		(opposite in sign to $\Delta\phi$)		4.629 384			
log $\Delta\lambda$		log $\tan (\alpha + \frac{\Delta\alpha}{2})$		9.432 833			
log $\sin \phi_m$		$\alpha + \frac{\Delta\alpha}{2}$		195-09-30.3			
log $\sec \frac{\Delta\phi}{2}$		log $\sin (\alpha + \frac{\Delta\alpha}{2})$		9.417 453			
		log $\cos (\alpha + \frac{\Delta\alpha}{2})$		9.984 620			
log a		log s_1		4.644 764			
a		cor. arc-sin		+			
b		log s		4.644 765			
$-\Delta\alpha$ (secs.)							
$-\frac{\Delta\alpha}{2}$							
$\alpha + \frac{\Delta\alpha}{2}$							
α (1 to 2)							
$\Delta\alpha$							
α' (2 to 1)	180						
				44133.2			

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

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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.

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			

INVERSE POSITION COMPUTATION

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

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

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

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	58° 09' 15.93"	KVB	λ	151° 52' 24.76"			
2. ϕ'	58° 01' 53.14"	PS	λ'	151° 57' 49.16"			
$\Delta\phi (= \phi' - \phi)$	07 - 22.79		$\Delta\lambda (= \lambda' - \lambda)$	05 - 24.40			
$\frac{\Delta\phi}{2}$	3 - 41.40		$\frac{\Delta\lambda}{2}$				
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	58 - 05 34.54		$\Delta\lambda$ (secs.)	324.40			
$\Delta\phi$ (secs.)	442.79						
log $\Delta\phi$	-		log $\Delta\lambda$	-			
cor. arc-sin	-		cor. arc-sin	-			
log $\Delta\phi_1$	2.646 198		log $\Delta\lambda_1$	2.511 081			
log cos $\frac{\Delta\lambda}{2}$			log cos ϕ_m	9.723 081			
colog B_m	1.490 510		colog A_m	1.491 335			
log $s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	4.136 708	(opposite in sign to $\Delta\phi$)	log $s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	3.725 497			
			log $s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	4.136 708			
log $\Delta\lambda$		3 log $\Delta\lambda$	log tan $\left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.588 789			
log sin ϕ_m		log F	$\alpha + \frac{\Delta\alpha}{2}$	21-12-15.7			
log sec $\frac{\Delta\phi}{2}$		log b	log sin $\left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.558 343			
log a			log cos $\left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.969 554			
a			log s_1				
b			cor. arc-sin	+			
$-\Delta\alpha$ (secs.)			log s	4.167 154			
$-\frac{\Delta\alpha}{2}$				14694.5			
$\alpha + \frac{\Delta\alpha}{2}$							
α (1 to 2)							
$\Delta\alpha$							
α' (2 to 1)	180						

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

August 31, 1932

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.

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			

INVERSE POSITION COMPUTATION

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

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

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

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	57° 38' 25.98"	KVD	λ	152° 09' 50.81"	
2. ϕ'	58° 01' 53.14"	P5	λ'	151° 57' 49.16"	
$\Delta\phi (= \phi' - \phi)$	23 - 27.16		$\Delta\lambda (= \lambda' - \lambda)$	12 - 01.65	
$\frac{\Delta\phi}{2}$	11 - 43.58		$\frac{\Delta\lambda}{2}$		
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	57° 50' - 09.56"		$\Delta\lambda$ (secs.)	721.65	
$\Delta\phi$ (secs.)	1407.16				
<hr/>					
log $\Delta\phi$			log $\Delta\lambda$		
cor. arc - sin	-		cor. arc - sin	-	
log $\Delta\phi_1$	3.148 343		log $\Delta\lambda_1$	2.858 327	
log $\cos \frac{\Delta\lambda}{2}$			log $\cos \phi_m$	9.726 193	
colog B_m	1.490 491		colog A_m	1.491 329	
log $s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	4.638 834	(opposite in sign to $\Delta\phi$)	log $s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	4.075 849	
			log $s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	4.638 834	
log $\Delta\lambda$		$3 \log \Delta\lambda$	log $\tan \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.437 015	
log $\sin \phi_m$		log F	$\alpha + \frac{\Delta\alpha}{2}$	195-17-53.7	
log $\sec \frac{\Delta\phi}{2}$		log b	log $\sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.421 347	
log a			log $\cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	9.984 332	
a			log s_1	4.654 502	
b			cor. arc - sin	+	
$-\Delta\alpha$ (secs.)			log s	4.654 503	
$\frac{\Delta\alpha}{2}$				451340	
$\alpha + \frac{\Delta\alpha}{2}$					
α (1 to 2)					
$\Delta\alpha$					
α' (2 to 1)	180				

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

August 31, 1932

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.

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 $\log \Delta\lambda$
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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			

INVERSE POSITION COMPUTATION

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

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

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

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	58° 09' 15.93"	KVB	λ	151° 52' 24.76"	
2. ϕ'	58 02 29.48	PL	λ'	151 57 23.21	
$\Delta\phi (= \phi' - \phi)$	06 - 46.45	$\Delta\lambda (= \lambda' - \lambda)$		04 - 58.45	
$\frac{\Delta\phi}{2}$	3 - 23.22	$\frac{\Delta\lambda}{2}$			
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	58 - 05 - 52.70	$\Delta\lambda$ (secs.)		298.45	
$\Delta\phi$ (secs.)	406.45				
log $\Delta\phi$		log $\Delta\lambda$			
cor. arc-sin	-	cor. arc-sin			
log $\Delta\phi_1$	2.609007	log $\Delta\lambda_1$		2.474872	
log $\cos \frac{\Delta\lambda}{2}$		log $\cos \phi_m$		9.723019	
colog B_m	1.490500	colog A_m		1.491335	
log $s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$	4.099517	log $s_1 \sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$		3.689226	
		log $s_1 \cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$		4.099517	
		log $\tan \left(\alpha + \frac{\Delta\alpha}{2} \right)$		9.589709	
log $\Delta\lambda$		$\alpha + \frac{\Delta\alpha}{2}$		21-14-43.2	
log $\sin \phi_m$		log $\sin \left(\alpha + \frac{\Delta\alpha}{2} \right)$		9.559143	
log $\sec \frac{\Delta\phi}{2}$		log $\cos \left(\alpha + \frac{\Delta\alpha}{2} \right)$		9.969433	
log a		log s_1			
a		cor. arc-sin		+	
b		log s		4.130084	
$-\Delta\alpha$ (secs.)					
$-\frac{\Delta\alpha}{2}$					
$\alpha + \frac{\Delta\alpha}{2}$					
α (1 to 2)					
$\Delta\alpha$					
	180				
α' (2 to 1)					

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

August 31, 1932

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.

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			

INVERSE POSITION COMPUTATION

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

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

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

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	57° 38' 25.98"	KVD	λ	152° 09' 50.81"	
2. ϕ'	58° 02' 29.48"	P6	λ'	151° 57' 23.21"	
$\Delta\phi (= \phi' - \phi)$	24-03.50	$\Delta\lambda (= \lambda' - \lambda)$		12-27.60	
$\frac{\Delta\phi}{2}$	12-01.75	$\frac{\Delta\lambda}{2}$			
$\phi_m (= \phi + \frac{\Delta\phi}{2})$	57° 50' 27.73"	$\Delta\lambda$ (secs.)		747.60	
$\Delta\phi$ (secs.)	1443.50				
log $\Delta\phi$		log $\Delta\lambda$			
cor. arc - sin	-	cor. arc - sin			
log $\Delta\phi_1$	3.159417	log $\Delta\lambda_1$		2.873669	
log $\cos \frac{\Delta\lambda}{2}$		log $\cos \phi_m$		9.726131	
colog B_m	1.490491	colog A_m		1.491329	
log $\{s_1 \cos (\alpha + \frac{\Delta\alpha}{2})\}$	4.649908	log $\{s_1 \sin (\alpha + \frac{\Delta\alpha}{2})\}$	(opposite in sign to $\Delta\phi$)	4.091129	
		log $\{s_1 \cos (\alpha + \frac{\Delta\alpha}{2})\}$		4.649908	
		log $\tan (\alpha + \frac{\Delta\alpha}{2})$		9.241221	
log $\Delta\lambda$		$\alpha + \frac{\Delta\alpha}{2}$		195-26-24.2	
log $\sin \phi_m$		log $\sin (\alpha + \frac{\Delta\alpha}{2})$		9.425257	
log $\sec \frac{\Delta\phi}{2}$		log $\cos (\alpha + \frac{\Delta\alpha}{2})$		9.984036	
log a		log s_1		4.665872	
a		cor. arc - sin		+	1
b		log s		4.665873	
$-\Delta\alpha$ (secs.)					
$-\frac{\Delta\alpha}{2}$					
$\alpha + \frac{\Delta\alpha}{2}$					
α (1 to 2)					
$\frac{\Delta\alpha}{2}$					
α' (2 to 1)	180				
					46331.2

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

August 31, 1932

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.

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			

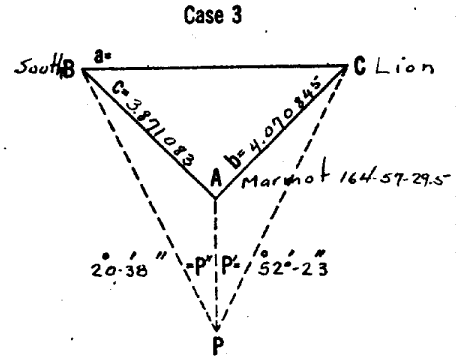
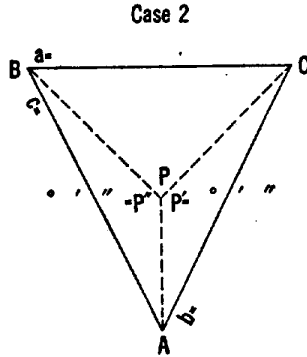
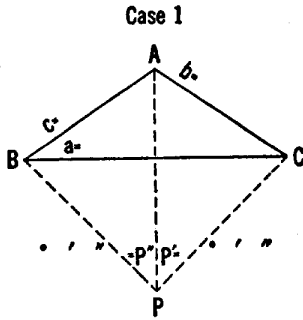
COMPUTATIONS

VELOCITY TESTS

SEPTEMBER 19, 1932.

p⁽¹⁾ Sept 19 KVD

COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P'
P''
A

Sum
1/2 Sum

$S = 180^\circ - \frac{1}{2} \text{sum} =$

Case 3

P' 52° 23
P'' 20° 38

Sum 73° 01
A 164° 57' 29.5

A-sum 91° 56' 29.5
 $S = \frac{1}{2} (A - \text{sum}) = 45° 58' 14.7$

Log c = 3.871083
Log sin P' = 9.898787-10⁺
Colog b = 5.929155-10⁺
Colog sin P'' = 0.452981⁺

Sum = log tan Z = 20.152006⁺

Z = 54-49-42
Z+45° = 99-49-42

Log cot (Z+45°) = 9.238646^m
Log tan S = 10.014719

Sum = log tan ε = 9.253365 (sign -)

ε 10-09-36.7
S 45-58-14.7

(Tan ε+)
S+ε = angle ABP 35-48-38.0
S-ε = angle ACP 56-07-51.0

(Tan ε-)
S-ε = angle ABP
S+ε = angle ACP

1 BPA 20-38-00.0
2 ABP 35-48-38.0
3 PAB 123-33-22.0

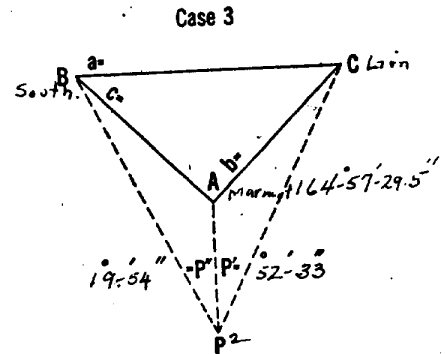
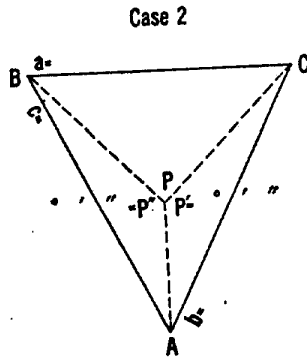
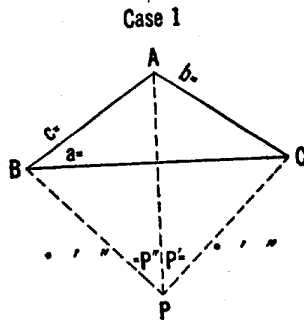
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PCA 56-07-51.0
CAP 71-29-09.0

PCB
CBP
BPC 73-01-00

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

P⁽²⁾ Sept 19 KVD

COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P' _____
P'' _____
A _____
Sum _____
½ Sum _____

Case 3

P' 52 33-00
P'' 19 54-00
Sum 72-27-00
A 164-57-29.5

A-sum 92-30-29.5
S = ½ (A-sum) = 46-15-14.8

S = 180° - ½ sum =

Log c = 3.871 083
Log sin P' = 9.899 757
Colog b = 5.929 155
Colog sin P'' = 0.468 036

Sum = log tan Z = 20.168 031

Z = 55-49-02.8
Z + 45° = 100 49-02.8

Log cot (Z + 45°) = 9.281 206
Log tan S = 10.019 018

Sum = log tan ε = 9.300 224 (sign -)

ε 11-17-22.2
S 46 15 14.8

(Tan ε +)
S + ε = angle ABP
S - ε = angle ACP

(Tan ε -)
S - ε = angle ABP 34-57-52.6
S + ε = angle ACP 57-32-37.0

BPA 19-54-00.0
ABP 34-57-52.6
PAB 125-08-07.4

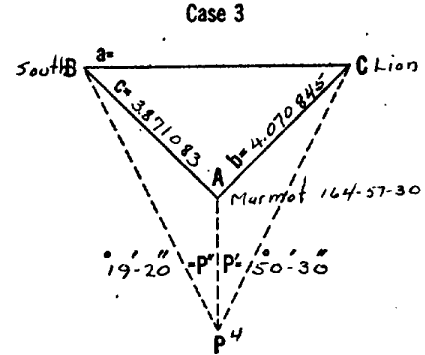
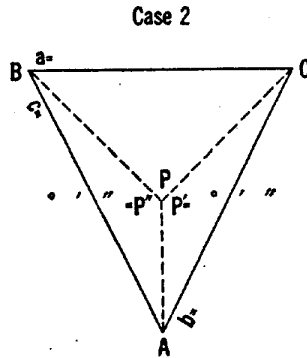
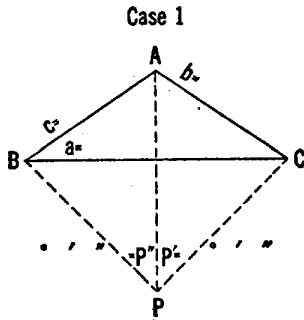
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PCA 57-32-37.0
CAP (69-54-23.0)

PCB
CBP
BPC

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

p⁴ Sept. 19 KVD

COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P'
P''
A

Sum
 $\frac{1}{2}$ Sum

$S = 180^\circ - \frac{1}{2} \text{sum} =$

Log c = 3.871 038
Log sin P' = 9.887 406
Colog b = 5.929 155
Colog sin P'' = 0.480 089

Sum = log tan Z = 0.167 ~~628~~ ⁷³³

Z = 55-47-~~47~~ ⁵⁷
Z + 45° = 100-47-~~47~~ ⁵⁷

Log cot (Z + 45°) = 9.280 ~~334~~ ⁴⁵⁷
Log tan S = 0.038899

Sum = log tan ε = 9.319 ~~238~~ ³⁵³ (sign -)

ε = 11-4~~6~~ ⁰²-~~57~~
S = 47-33-45

(Tan ε +)
S + ε = angle ABP
S - ε = angle ACP

(Tan ε -)
S - ε = angle ABP
S + ε = angle ACP

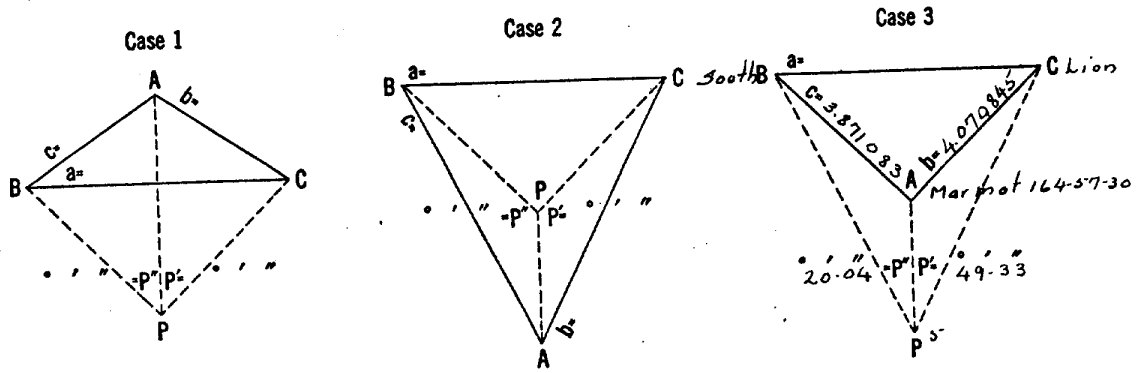
BPA 19-20-00
ABP 35-46-~~47~~ ⁵⁷
PAB 124-53-~~62~~ ⁶⁷

APC 50-30-00
PCA 59-20-~~37~~ ⁴⁷
CAP (170-09-~~22~~ ²⁷)

PCB
CBP
BPC

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

P^s Sept 19 1932 KYD
COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P'

P''

A

Sum

$\frac{1}{2}$ Sum

$S = 180^\circ - \frac{1}{2} \text{sum} =$

Case 3

P' 49-33

P'' 20-04

Sum 69 37

A 164-57-30

A-sum 95-20-30

$S = \frac{1}{2} (A - \text{sum}) = 47-40-15$

Log c = 3.871083
Log sin P' = 9.881369
Colog b = 5.929155
Colog sin P'' = 0.464562

Sum = log tan Z = 0.146169

Z = 54-27-53.4

Z + 45° = 99-27-53.4

Log cot (Z + 45°) = 9.221966

Log tan S = 10.040548

Sum = log tan ε = 9.262514 (sign -)

ε 10-22-19
S 47-40-15

(Tan ε+)
S + ε = angle ABP
S - ε = angle ACP

(Tan ε-)
S - ε = angle ABP
S + ε = angle ACP

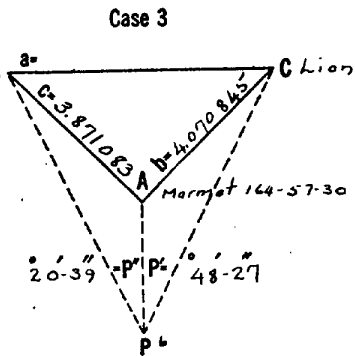
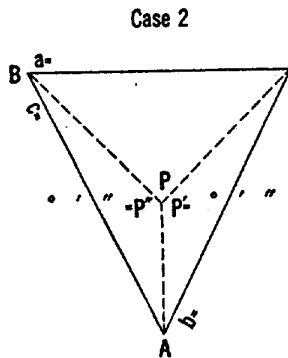
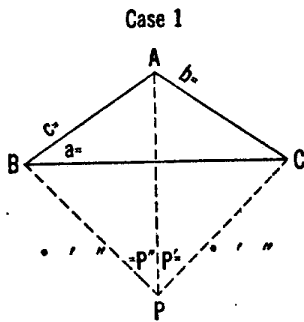
BPA 20-04-00
ABP 37-17-56
PAB (122-38-04)

APC 49-33-00
PCA 58-02-34
CAP (72-24-26)

PCB
CBP
BPC

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

P^c Sept 19 1932 KVD
COMPUTATION OF THREE-POINT PROBLEM



Cases 1 and 2

P'

P''

A

Sum

$\frac{1}{2}$ Sum

$S = 180^\circ - \frac{1}{2} \text{sum} =$

Case 3

P' 48 27

P'' 20 39

Sum 69 06

A 164 57-30

A-sum 95 51-30

$S = \frac{1}{2} (A - \text{sum}) = 47-55-45$

Log c = 3.871 083
Log sin P' = 9.874 120
Colog b = 5.929 155
Colog sin P'' = 0.452 646

Sum = log tan Z = 0.127 004

Z = 53-15-39

Z + 45° = 98-15-39

Log cot (Z + 45°) = 9.161 925^m

Log tan S = 10.044 483

Sum = log tan ε = 9.206 408 (sign -)

ε 9-08-15⁻
S 47-55-45⁻

(Tan ε +)
S + ε = angle ABP
S - ε = angle ACP

(Tan ε -)
S - ε = angle ABP
S + ε = angle ACP

BPA 20-39-00
ABP 38-47-30
PAB (120-33-30)

APC 48-27-00
PCA 57-04-00
CAP (74-29-00)

PCB
CBP
BPC

(For explanation of this form see Special Publication No. 138, pages 191 and 192, or Special Publication No. 145, pages 98-100)

Velocity
COMPUTATION OF TRIANGLES

State: Alaska

11-0121

NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
	2-3						3.871 083
	1 P'	20-38-00					0.452 981
	2 South	35-48-38					9.767 235
	3 Marmot	(123-33-22)					9.708 997
	1-3						9.920 825
	1-2						4.091 299
							4.233 861
							4.244 889
	2-3						4.070 845
	1. P'	52-23-00					0.101 213
	2 Marmot	(71-29-09)					9.976 921
	3 Lion.	56-07-51					9.919 242
	1-3						4.148 979
	1-2						4.091 300
	2-3						3.871 083
	1 P ²	19-54-00					0.468 036
	2 South	34-57-53					9.758 209
	3 Marmot	125-08-07					9.912 645
	1-3						4.097 328
	1-2						4.251 764
	Use this A						
	2-3						4.070 845
	1 P ²	52-33-00 ✓					0.100 243
	2 Marmot ok	57-32-37 ✓					9.926 240
	3 Marmot ok	69-54-23 ✓					9.972 727
	1-3						4.097 328
	1-2						4.143 808

Do not write in this margin

COMPUTATION OF TRIANGLES

State:

11-9121

	NO.	STATION	OBSERVED ANGLE	CORR'N	SPHER'L ANGLE	SPHER'L EXCESS	PLANE ANGLE AND DISTANCE	LOGARITHM
		2-3						3.871 083
	1	P ⁶	29-39-00					0.4 25 646
	2	South	38-47-30					9.796 914
	3	Marmot	120-33-30					9.935 134
		1-3						4.290 645
		1-2						4.258 863
		2-3						4.070 845
	1	P ⁶	48-27-00					0.125 880
	2	Marmot	74-29-00					9.983 876
	3	Lion	57-04-00					9.923 9 25
		1-3						4.180 601
		1-2						4.120 650
Do not write in this margin		2-3						
	1							
	2							
	3							
		1-3						
		1-2						
		2-3						
	1							
	2							
	3							
		1-3						
		1-2						

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

α	2	to 8	182	58	20	02	58	52
$2d\angle$		&	+ 71	29	09	- 56	07	51
α	2	to 1	254	27	29	306	51	01
$\Delta\alpha$			180	00	00.0	180	00	00.0
α'	1	to 2						

FIRST ANGLE OF TRIANGLE

ϕ	58	14	03.76	2	Marmot	λ	151	49	43.68
$\Delta\phi$			46.28			$\Delta\lambda$	- 12	09.11	
ϕ'	58	15	50.04	1	50.1 P'	λ'	151	37	34.57

	Logarithms	Values in seconds		$\frac{1}{2}(\phi+\phi')$	Logarithms	Values in seconds	
		1st term	2d term			1st term	2d term
s	4.091300			$\frac{1}{2}(\phi+\phi')$	4.148979		
$\text{Cos } \alpha$	9.428044			Logarithms	9.777953		
B	8.509481			s	9.777974		
h	2.028825	1st term	106.863	$\text{Cos } \alpha$	9.777953		
s'	8.18260	s'	$\text{Sin } \alpha$	B	8.509474		
$\text{Sin } \alpha$	9.96764	A'	8.508661	h	2.436406	1st term	273.15
C	1.61086	$\text{Sec } \phi'$	0.279008	s'	8.29796	s'	8.29796
	9.76110	$\Delta\lambda$	2.862791	$\text{Sin } \alpha$	9.80640	$\text{Sin } \alpha$	9.80640
h^2	4.0576	$\text{Sin } \frac{1}{2}(\phi+\phi')$	729.11	C	1.61266	2d term	+ 0.52
D	2.3452	$-\Delta\alpha$			9.71700		
	6.4028	3d term	+ 106.28	h^2	4.8728		
		$-\Delta\phi$		D	2.3443		
					7.2171	3d term	+ 273.67

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

°		'		"		°		'		"	
α	2	to 8	182	58	20	α	8	to 2	02	58	52
β		&	+ 69	54	23	β		&	- 57	32	37
α	2	to 1	252	52	43	α	8	to 1	305	26	15
$\Delta\alpha$						$\Delta\alpha$					
α'	1	to 2	180	00	00.0	α'	1	to 8	180	00	00.0

°		'		"		°		'		"	
ϕ	58	14	03.76	2	Marmot	ϕ	58	20	23.72	8	Lion
$\Delta\phi$						$\Delta\phi$					
ϕ'	58	16	02.23	1	P ⁻	ϕ'	58	16	02.23	1	P ⁻
λ	151	49	43.68	λ	151	49	06.16				
$\Delta\lambda$				$\Delta\lambda$							
ν	151	37	30.26	ν	151	37	30.26				

Logarithms		Values in seconds		Logarithms		Values in seconds		Logarithms		Values in seconds	
s	4.097328	s	4.097328	s	4.143815	s	4.143815	s	4.143815	s	4.143815
$\text{Cos } \alpha$	9.468934	$\text{Sin } \alpha$	9.980314	$\text{Cos } \alpha$	9.763289	$\text{Sin } \alpha$	9.911024	$\text{Cos } \alpha$	9.763289	$\text{Sin } \alpha$	9.911024
B	8.509481	A'	8.508661	B	8.509474	A'	8.508661	B	8.509474	A'	8.508661
h	2.075743	$\text{Sec } \phi'$	0.279050	h	2.0716578	$\text{Sec } \phi'$	0.279050	h	2.0716578	$\text{Sec } \phi'$	0.279050
ϕ	8.19466	$\Delta\lambda$	2.865353	ϕ	8.28763	$\Delta\lambda$	2.842550	ϕ	8.28763	$\Delta\lambda$	2.842550
$\text{Sin } \alpha$	9.98063		733.42	$\text{Sin } \alpha$	9.82205		695.90	$\text{Sin } \alpha$	9.82205		695.90
C	1.61086			C	1.61264			C	1.61264		
	9.76615	2d term	+ 0.58		9.72232	2d term	+ 0.53		9.72232	2d term	+ 0.53
h^2	4.1515			h^2	4.8332			h^2	4.8332		
D	2.3452			D	2.3443			D	2.3443		
	6.4967	3d term	+ —		7.1775	3d term	+ —		7.1775	3d term	+ —
		$-\Delta\phi$	-118.47			$-\Delta\phi$	241.49			$-\Delta\phi$	241.49

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

191932

		to 3		to 2		to 1		to 8	
α	β	+		-					
α	2								
β	2								
$\Delta\alpha$		180	00	00.0					
α'	1								

First Angle of Triangle

		KVD		P ¹	
ϕ	$\Delta\phi$	λ	$\Delta\lambda$	μ	$\Delta\mu$
ϕ	57 38	152 09	32	50.81	20.55
$\Delta\phi$	37				
ϕ'	58 16	151 37		30.26	

s	Logarithms	Values in seconds	$\frac{1}{2}(\phi+\phi')$		Logarithms	Values in seconds	s	Logarithms	Values in seconds
			1st term	2d term					
Cos α	4.844654		4.500213		4.842303		4.499290		
B	8.509822		8.508661		8.509522		8.508661		
h	3.354176	2260.35	0.279050		3.351825	2248.15	0.279008		
s'									
Sin α	9.00043		3.287924		8.99858		3.286959	1936.24	
C	1.60091		1940.55		1.60091		1936.24		
Δ	0.60134								
h^2	6.7068	3.99			6.7022	3.98			
D	2.3496				2.3496				
h^3	9.0564	0.11			9.0518	0.11			
		-4 ϕ	222.56.25			-4 ϕ	2244.06		

$S \sin \alpha = 4.500213$
 $S \cos \alpha = 4.844654$
 $S = 4.885093$

$S \sin \alpha = 4.499290$
 $S \cos \alpha = 4.842303$
 $S = 4.882985$

$S \sin \alpha = 4.500213$
 $S \cos \alpha = 4.844654$
 $S = 4.885094$

$S \sin \alpha = 4.499290$
 $S \cos \alpha = 4.842303$
 $S = 4.882986$

$S = 76752.8 \div 52.31 = 1467.3$
 $S = 76381 \div 51.95 = 1470.3$

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

Sept. 19, 1932

FIRST ANGLE OF TRIANGLE		" "		" "		" "	
α'	to 2	α	to 3	α	to 2	α	to 3
2	to 3	+		3d L	ϕ		
2d L	to 1			α	to 1		
α	2			$\Delta\alpha$			
$\Delta\alpha$		180	00	00.0		180	00
α'	1			α'	1		
0	"	0	"	0	"	0	"
ϕ	57	38	25.98	2	KVD	ϕ	
$\Delta\phi$	+37	09.78		λ	152	09	50.81
ϕ'	58	15	35.76	1	PC	$\Delta\lambda$	-33
				λ'	151	36	33.42
Logarithms				Values in seconds			
s				$\frac{1}{2}(\phi+\phi')$			
Co s α	4.8839584			Logarithms			
B	8.509522			Values in seconds			
h	3.349106	1st term	2234.12	$\sin \alpha$	4.512843		
s^2		A'	8.508661	$\sec \phi'$	0.278959		
$\sin^2 \alpha$	9.02569	$\Delta\lambda$	3.300463	$\sin \frac{1}{2}(\phi+\phi')$	1.997.39		
C	1.60091	2d term	+ 4.23	$-\Delta\alpha$			
h^2	6.6965	3d term	+ 0.11	$5 \sin a$	4.512843		
D	2.3496	$-\Delta\phi$	-2229.78	$5 \cos a$	4.8839584		
	9.0461			$\tan a$	9.628259		
				$a = 205-13-57.8$			

$5 \sin a = 4.512843$
 $\sin a = 9.629709$
 $S = 4.883134$

$5 \cos a = 4.8839584$
 $\cos a = 9.956449$
 $S = 4.883135$

$S = 76407.2$
 $\lambda = S \sin \lambda = 76,407.2 \div 51.71 = 1477.6$

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

Sept. 19 1932

to 8		to 1		to 2	
α	β	α	β	α	β
2		8		8	
$2^d L$					
α	to 1	α	to 1	α	to 1
$\Delta \alpha$		$\Delta \alpha$		$\Delta \alpha$	
	180 00 00.0		180 00 00.0		180 00 00.0
ϕ'	1	ϕ'	1	ϕ'	1
	to 2		to 8		to 8

FIRST ANGLE OF TRIANGLE

to 2		to 1		to 8	
ϕ	λ	ϕ	λ	ϕ	λ
37	152 09 50.81	57	38 25.98 8	57	38 25.98 8
$\Delta \phi$		$\Delta \phi$		$\Delta \phi$	
ϕ	to 1	ϕ	to 1	ϕ	to 1
$\Delta \phi$		$\Delta \phi$		$\Delta \phi$	
	180 00 00.0		180 00 00.0		180 00 00.0
ϕ'	1	ϕ'	1	ϕ'	1
	to 2		to 8		to 8

Logarithms		Values in seconds		Logarithms		Values in seconds	
s	$\phi + \phi'$	s	$\phi + \phi'$	s	$\phi + \phi'$	s	$\phi + \phi'$
Cosec	4.845456	1st term	2264.53	Cosec	4.842369	1st term	2248.49
B	8.509522	"	"	B	8.509522	"	"
h	3.354978	"	"	h	3.351891	"	"
s^2		"	"	s^2		"	"
Sine	9.01677	"	"	Sine	9.02062	"	"
C	1.60091	"	"	C	1.60091	"	"
s^2		"	"	s^2		"	"
0.61768		"	"	0.62153		"	"
h^2	6.7083	"	"	h^2	6.7021	"	"
D	2.3496	"	"	D	2.3496	"	"
	9.0579	"	"		9.0517	"	"

$S \sin a = 4.508386$
 $S \cos a = 9.958290$
 $Tan a = 9.662930$
 $a = 204.42-39.8$

$S \sin a = 4.845456$
 $S \cos a = 9.958290$
 $Tan a = 9.662930$
 $a = 204.42-39.8$

$S \sin a = 4.510310$
 $S \cos a = 9.957406$
 $Tan a = 9.667941$
 $a = 204-57-47$

$S = 77.19.8$
 $V = S \div t = 77.19.8 \div 52.51 = 1468.7$

$S = 76.729.6$
 $V = S \div t = 76.729.6 \div 52.05 = 1474.2$

CHINIAK KVD

Boat used: *Squad*

day

BOTTOM	HEADING BY COMPASS	ANGLES AND RANGES BEARINGS LOG READINGS ENGINE REVOLUTIONS	REMARKS
		Δ Flex 87-04	
		Chiniak Light	
		Δ Hale 43-10	
		Rock to light 50-45	
		Pinnacle " 57-30	
		Light to high rock 24-04	
Location of magnetophone used 1 1/2 mile cable. 15 fms water 9 fms below surface. <i>2/9/24</i>			
Position plotted on Topo sheet.			
Executed by Mr. Boonie "Surveyor".			
Lat. 57-38 + 797 (1907 Datum)			
Long. 152-09 + 851			
plotted and scaled by <i>2/9/24</i>			
Lat 57-38 + 791.0 } Discovers			
152-09 + 837.0 } Datum.			
Correction + 3.7 meters in lat. -14.0 meters in long.			
<i>2/9/24</i>			
57-30 + 117.1 (2086)			
152-00 + 199.8 (113)			
meters for 1:10000 scale			

MARMOT ISLAND

Boat used

day

BOTTOM	HEADING BY COMPASS	ANGLES AND RANGES BEARINGS LOG READINGS ENGINE REVOLUTIONS	REMARKS
			- Marmot Id. - K.V.B.
		Arp 48-33 End Jew 17-26	
		2nd W. Lt. of "End" 04-34	
		Max. 5th W. Lt. of "End" 32-05	
	Lat	58-09 + ⁽¹³²⁸⁾ 528	Scaled from sheet No 42
	Long	151-52 + ⁽⁵⁵⁷⁾ 424	
		August 23, 1922. Unit was pulled up and a break in the cable was found, a splice was made and unit replaced.	
		Arp 48-37 End Jew 17-33	
		This position plotted on sheet "D"	
		Executed by Mr. Garber.	
	Lat	58-09 + ⁽¹³⁶³⁾ 493	
	Long	151-52 + ⁽⁵⁷⁷⁾ 405	
		plotted & scaled by J.A.H.	
		58-00 + ⁽¹⁰⁰⁾ 1228.6 (-97.6)	
		151-50 + ⁽¹⁰⁰⁾ 169.1 (-332.0)	
		meters for 1:10000 scale	✓ J.A.H.

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. *H-5259*

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

Number of positions on sheet	<i>1862</i>
Number of positions checked	<i>102</i>
Number of positions revised	<i>23</i>
Number of soundings recorded	<i>13,804</i>
Number of soundings revised	<i>358</i>
Number of signals erroneously plotted or transferred	<i>5</i>

Date: *Aug. 12, 1933*
Cartographer: *Harold W. Murray*

May 22, 1933.

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in
8 volumes of sounding records for

HYDROGRAPHIC SHEET 5259

Locality Western part of Portlock Bank, East of Afognak Island, S.W. Alaska

Chief of Party: H. B. Campbell in 1932

Plane of reference is mean lower low water, reading

8.7 ft. on tide staff at Marmot I.

5.9 ft. below B. M. 1

4.0 ft. on tide staff at Kodiak

19.9 ft. below B.M. 8

Height of mean higher high water above plane of reference is 9.8 ft.
at Marmot Island; 8.8 ft. at Kodiak.

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.

Paul Schuerman

Acting Chief, Division of Tides and Currents.

