5584

Diag. Cht. No. 6380.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Topographic

Field No. Ph-26(47) Office No. T-5584 N&S.

LOCALITY

State Washington

General locality Bellingham

Locality Nooksack River

19/49-52

CHIEF OF PARTY
C.W.Clark, Chief of Field Party
H.A.Paton, Baltimore Photo. Office

LIBRARY & ARCHIVES

DATE December 31, 1959

8-1870-1 (I)

DATA RECORD

T - 5584

Project No. (II):

Quadrangle Name (IV):

Ph-26 (47)

Field Office (II): Bellingham, Wash.

Chief of Party: C.W.Clark

Photogrammetric Office (III): Baltimore, Maryland.

Officer-in-Charge:

H. A. Paton Copy filed in Division of

Photogrammetry (IV)

Office Files

Instructions dated (II) (III):

31 August 1949

fetter dated 24 October 1949

No. 731-aal

Supp No 1 , 21 July 1980
Supp No 2 16 Jan 1981
Method of Compilation (III): Air-photographic-Multiplex

Manuscript Scale (III): 1:10,000

Stereoscopic Plotting Instrument Scale (III): 1.0.000

Scale Factor (III): 1.00

Date received in Washington Office (IV):UN 25 1951 Date reported to Nautical Chart Branch (IV): JUN 29 1951

Applied to Chart No.

Date:

Date registered (IV): 3/19/59

Publication Scale (IV):

Publication date (IV):

Geographic Datum (III): N.A. 1927

Vertical Datum (III): MSL

Mean sea level except as follows: Elevations shown as (25) refer to mean high water Elevations shown as (5) refer to sounding datum i.e., mean low water or mean lower low water

Reference Station (III): PEARSON 3, 1949

Long.: 122° 36' 55.79

Unadjusted

Plane Coordinates (IV):

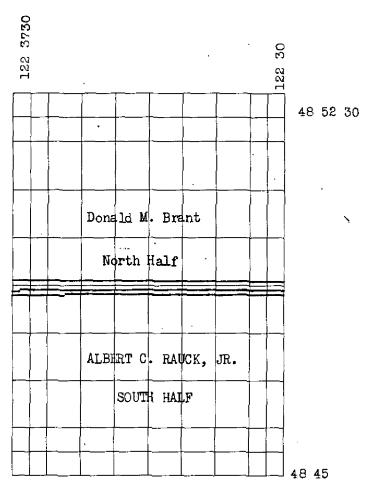
State: Washington

North

X=

Roman numerals indicate whether the item is to be entered by (II) Field Party, (III) Photogrammetric Office, or (IV) Washington Office.

When entering names of personnel on this record give the surname and initials, not initials only.



Areas contoured by various personnel (Show name within area) (II) (III)

DATA RECORD

Field Inspection by (II): John C. Lajoye Roy A. Davidson Date: 12-7-49

Planetable contouring by (II):

Date:

Completion Surveys by (II): Ray H. Skelton II

(latest date in field notes)

Mean High.Water Location (III) (State date and method of location): Same as date of photography

T.L.J. Projection and Grids ruled by (IV):

6+19-50 Date:

H.D.W. Projection and Grids checked by (IV):

6-20-50 Date:

Control plotted by (III): B.A.Dew

July 1950 Date:

Control checked by (III): A.K. Heywood

Date:

July1950

RESIDENTE Stereoscopic

Control extension by (III): D.M. Brant and A.C. Rauck, Jr.

Date:

August 1950

Planimetry

D.M.Brant A.C.Rauck

Aug.-Sept.1950 Date:

Stereoscopic Instrument compilation (III):

D.M. Brant

Date: Aug.-Sept.1950

A.C.Rauck, Jr.

Date:

Manuscript delineated by (III): D.M.Brant, A.C.Rauck, Jr.

Oct.Nov.1950

Photogrammetric Office Review by (III):

A.C.Rauck, Jr., D.M. Brant

Feb. 1951

Elevations on Manuscript checked by (II) (III):

D.M.Brant, A.C.Rauck, Jr.

Contours

Date:

Date:

Feb. 1951

U.S. Coast and Geodetic Survey Camera, Type "O" Camera (kind or source) (III): Focal length 152.37 mm

		PHOTOGRAPHS (III)		
Number	Date	Time	Scale	Stage of Tide
1194-1200 incl.	6/4/49	1228	1:24,000	3/9' above MLLW
1214-1220 incl.	11	1238	II	3.7' above MLLW
1222-1229 incl.	n .	1248	11	3.51 above MLLW

Tide (III)

From table of predicted tides

Reference Station: Subordinate Station: Port Townsend Bellingham, Wash.

Subordinate Station:

Washington Office Review by (IV): Everet H. Ramey

Final Drafting by (IV): J.H.FRAZIER 7-5584-5

Drafting verified for reproduction by (IV):

Proof Edit by (IV):

Land Area (Sq. Statute Miles) (III): 40

Shoreline (More than 200 meters to opposite shore) (III): 8.5 Shoreline (Less than 200 meters to opposite shore) (III):

Control Leveling - Miles (II): 40

Number of Triangulation Stations searched for (II): 57

Number of BMs searched for (II): 23

Number of Recoverable Photo Stations established (III): 13 Number of Temporary Photo Hydro Stations established (III): Q

Recovered:

Recovered: 16

Identified: 13

Date:

Date:

Ratio of Mean | Spring

Range

Date: 27 August 1954

Date: 19 March, 1959

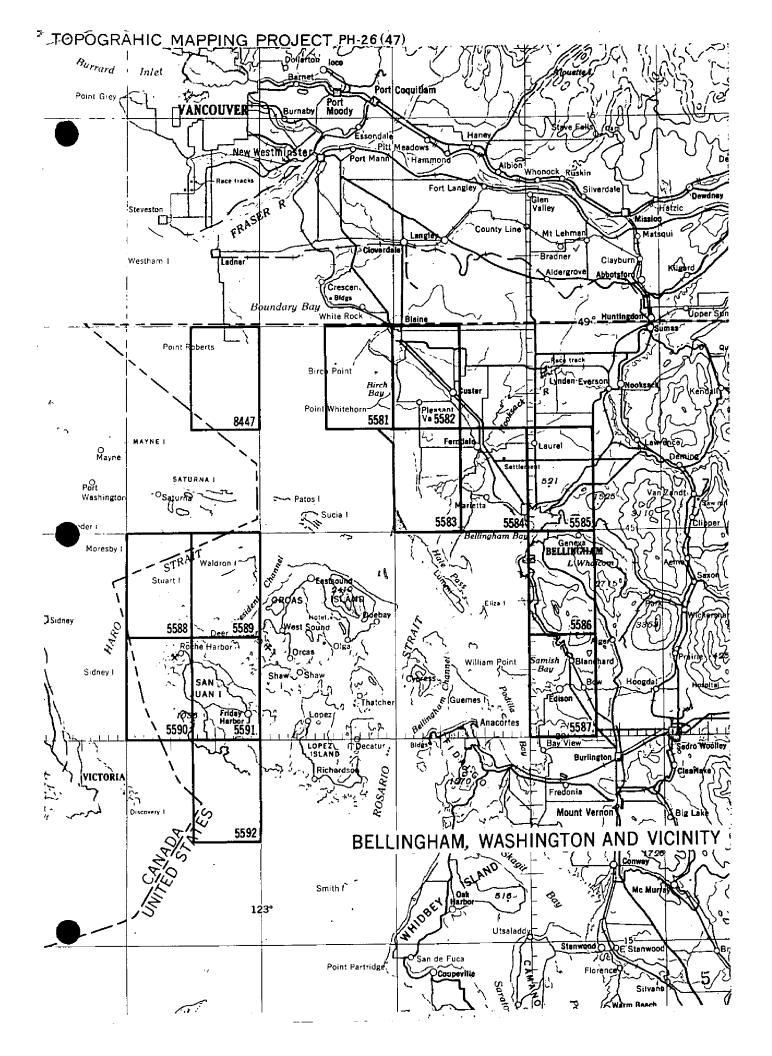
Ranges

Remarks:

Two of the triAngulation stations recovered during the 1949 field inspection season have since been reported destroyed.

SQUALICUM CREEK ENTRANCE LIGHT, 1950 BELLINGHAM BREAKWATER ENTRANCE LIGHT, 1950

See 5.57



Summary to Accompany Topographic Map T-5584

Map T-5584 is one of thirteen topographic maps of Project Ph-26(47). It includes a portion of Bellingham Bay and land area to the northward, all within Whatcom County, Washington.

Project Ph-26(47) is a stereoscopic mapping project. Field work in advance of compilation included the establishment of additional horizontal and vertical control, field inspection of shoreline and interior features, and the investigation of boundaries, land lines and geographic names. Map T-5584 was compiled in two parts at a scale of 1:10,000 by multiplex methods using 1949 single-lens photography. Field completion was done in 1952. With the addition of hydrographic data the map will be forwarded to the Geological Survey for publication as a standard 7.5 minute topographic quadrangle.

Items registered under T-5584 will include a descriptive report and cleth-cached copies of the map manuscript (in two parts) at a scale of 1:10,000 and the published map at a scale of 1:24,000.

FIELD INSPECTION REPORT

This report is included as part of the Descriptive Report for T=5584 and covers surveys T=5583 and T=5584.

PHOTOGRAMMETRIC PLOT REPORT

This report covers the plot for T-5581 thru T-5584 and is filed as part of the Descriptive Report for T-5581.

STATION SC	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR "-COORDINATE LONGITUDE OR *-COORDINATE	COORDINATE	DISTANCE FRO OR PROJECTION FORWARD	DISTANCE FROM GRID IN FEET, OR PROJECTION LINE IN METERS FORWARD (BACK)	DATUM	N.A. 1927 - DATUM DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD (BACK)	FACTOR DISTANCE FROM GRID OR PROJECTION LINI IN METERS FORWARD (BACK)
		N.A.	690,324.36	9	98.9	(1425.2)			N. of guad
T-22 USE	USE	1927	1,586,372.04	~*	418.2	(1105.8)			limits
		=	647,059.09	6	627.6	(896.4)			
WATERWAY)			1,596,604.509	6 0	789.0	(1035.0)			
1940 (USE									
MI 2 (COLIVE INTERNAL	=	=	87 717 779	00	736 R	(787).2			
CREEK WATERWAY			1,595,834.15	5	254.2	(1269.8)			
No. \$ (SQUALICUM			01.176.979		591.6	(932.4)			
CREEK WATERWAY 1940, USE	= -	:	1,596,858.13	3	566.4	(957.6)			
2/01 08 0/1 W 8			78 47	46.598	1439.4	(414.0)			
(USE)	#	H	122 32	.10.480	213.9	(7,0101)			
B.M. 150.79,1942			27 87	39.526	1221.0	(632.4)			
(USE)	=	E	122 32	01.926	39.3	(1185.3)	,		
BM 152.58,1942			78 47	32,608	1007.3	(846.1)			
(JSE)	n	II .	122 32	10.425	212.8	(1011.8)			
T-2 (USE)	=	=	669,372.58	80	1332.8	191.2		Used for control	Par
			1,575,758.13	3	231.1	1292.9	destroyed.	Not shown on	e dam
	Field		48 45	00.00	Q.00	(1853.3)			7
(Fourth order)	Comp.	=	122 37	10.74	219.4	(1006.3)			
9									
1 FT = 3048006 METER					-	 		1	M-2388-17
	A. Senasack		DATE JULY 19	1950	_	CHECKEN BY.	H. F. Eichert	DATE JULY	0661

MAP 785584		PROJEC	PROJECT NO. Ph26(47)	SCALE OF	MAP 1:10,000	000	SCALE FACTOR	JR 1,000
							N.A. 1927 - DATUM	
STATION	SOURCE OF	DATUM	LATITUDE OR W.COORDINATE LONGITUDE OR X.COORDINATE	DISTANCE FROM GRID IN FEET. OR PROJECTION LINE IN METERS	DISTANCE FROM GRID IN FEET, R PROJECTION LINE IN METERS	DATUM	DISTANCE FROM GRID OR PROJECTION LINE IN METERS	FACTOR DISTANCE FROM GRID OR PROJECTION LINI IN METERS
	(INDEX)			FORWARD	(BACK)		FORWARD (BACK)	FORWARD (BACK)
M7, 1942 USE,	p 7	N.A.	653,624.05	1104.6	(7.617)			
	ส.ช.	1761	1,589,023.88	1226.5	(297.5)			
M 8, 1942 (USE)			653,949.22	1203.7	(320.3)			
	=	E	1,588,654.38	1113.9	(410.1)			
M 10, 1942 (USE,		=	655,830,82	253.2	(1270.8)			
	=		1,588,709.96	1130,8	(393.2)			
M 11, 1942 (USE)		=	655,871.87	265.7	(1258.3)			
_ 			1,586,703.81	519.3	(1004.7)			
M 12, 1942 USE		±	660.152.01	46.3	(1477.7)			
TITLE CLOSE	=		1,586,844.47	562.2	(8.196)			
- / 	F	=	662.725.99	6*088	(693.1)			
			1,586,884.70	5.775	(676.5)			
T38N, RZE Sec. Cor.	=	E	662,770.66	844.5	(6.679.5)			
4,5,7,10,1344			1,586,225.82	373.6	(1150.4)			
T38N, RZE 1/4 Cor	=	#	657,454.31	1/87/	(775.9)			
10,15, 1942 (01,01	.**		1,588,727.91	1136.3	(387.7)			
T-1 (USE)	=	=	668,613.55	1101.4	(422.6)			
ļ			1,575,354.47	108.0	(1416.0)			
T-9 (USE)	=	2	687.750.03	838.2	(685.8)			Pa
			1,579,648.96	1417.0	(107.0)			ge
T-10 (USE)	=	£	680,356.68	108.7	(1415.3)			8
			1,579,546.80	1385.9	(138.1)			
T-21 (USE)	=	u.	689,556.64	1388.9	(135.1)			N. of quad limits
0			1,586,613-98	491.9	(1032.1)			0
I FT.=,3048008 METER COMPUTED BY.	L.A. Senasack		DATE JULY 1950	CHE	CHECKED BY. H. P. Eichert	.Eichert	DATE	July 1950
		-		_			-	

: .

MAP T5584		PROJE	PROJECT NO. Ph-26(47)		SCALE OF	F MAP 1:10,000	000,	SCALE FACTOR	1.000
STATION	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR V-COORDINATE LONGITUDE OR x-COORDINATE		DISTANCE FRO OR PROJECTION FORWARD	DISTANCE FROM GRID IN FEET, OR PROJECTION LINE IN METERS FORWARD (BACK)	DATUM	N.A. 1927 - DATUM DISTANCE FROM GRID ON PROJECTION LINE IN METERS FORWARD (BACK)	FACTOR DISTANCE FROM GRID OR PROJECTION LINI IN METERS FORWARD (BACK)
BELLINGHAM, OESER CEDAR CO., STACK, 1950	Field Comp	NA 1927/	48 46 08.786 122 30 54.573	786	271.4	(1582.0)			
BELLINGHAM, OLYMPIC PORTLAND CEMENT CO STACK, SW of 3.1950	း ပင့်င	=	48 46 06.669 122 31 22.295	.295	206.0	(1647.4)	Used destroyed.	for control k	out map.
PORTLAND CEMENT CO.	10 65696 60. p.658 3.1914		48 46 06.6 122 31 22.6	2 8 8 8	212,2	(1641.2)		troyed	
BELLINGHAM, OLYMPIC PORTLAND CEMENT CD. STACK, NE of 3,1927	- - - - - - - - - - - - - - - - - - -	E	48 46 07.08 122 31 21.88	88 88	218.7	(1634.7)			
K4.)	Field Comp.	=	51 09	.238	285.4	(1568.0)			
AIRWAY BEACON NO. 9,1941 (Destroyed)	G-5410 P 602	=	37.	761	1166.4	(687.0) (230.10		Used for control. Not shown on map.	
JOHN 3, 1941 (USE)	G5410 P 598	=	48 46 13.9 122 36 00.3	.236	432.4	(1421.0)			
BUSWELL, 1942 USE	USE	=	655,200.80		61.2	(1462.8)			
MA, 1942 (USE)	=	=	658,659,21		631.3	(408.7)			
M3, 1942 USE	=	=	653,986.22		1215.0 596.0	(928.0)			Pa
Bellingham Airway Beacon, 1950	G.P. 5 1960	=	48 47 658- 122 31	2	4.6211				ge 9
11									
1 FT = 3048006 METER 3COMPUTED BY: I.A.Semesack	Senesack	ļ.——	DATE_Tuly_1950		H5	CHECKED BY.H.P.E.Elchert	1chert	DATEJULY 1950	м. 2388-1

COMPILATION REPORT T-5584

PHOTOGRAMMETRIC PLOT REPORT

Report submitted with Descriptive Report for Survey T-5581.

FIELD INSPECTION REPORT

Report submitted with Descriptive Report for Survey T-5583.

31. <u>DELINEATION</u>

Refer to Photogrammetric Plot Report.

32. CONTROL

Refer to Photogrammetric Plot Report and Field Inspection Report.

33. SUPPLEMENTAL DATA

Land plats -

- 1-Township No. 38 North, Range No. 2 East, Willamette Meridian, Wash. Dated Feb. 21, 1860.
- 1-Township No. 39 North, Range No. 2 East, Willemette Meridian, Wash. Dated Feb. 21, 1872.
- 1-Township No. 38 North, Range No. 2 East, Willamette Meridian, Wash. Dated June 29, 1931. (Boundary of the Lummi Indian Reservation in sections 7, 17, & 18.)

Township layouts

- 1-Lummi Indian Reservation, Twp. 37 and 38 North Range 1 and 2 East, W.M. Whatcom County, Wash.
- 1-Marietta Township, Twp. 38 North, Range 2 East W.M., Whatcom County, Wash.
- 1-Ferndale Township, Twp. 39tNorth, Range 2 East, W.M., Whatcom County, Wash.
- 1-Mountainview Township, Twp. 39 North, Range 1 East and Range 1 West, W.M., Whatcom County, Wash.
- 1-Port of Bellingham, Proposed Small Boat Harbor.

Refer to 41, Boundaries, for a description of how these data were used.

Also plans and descriptions of city boundaries were used. ****

34. CONTOURS AND DRAINAGE

In general, the quality of diapositives was fair to good.

The density of dispositives of model 1197-1198 was very poor and

34. CONTOURS AND DRAINAGE (Continued)

considerable difficulty was encountered in contouring. It is requested Sec \$52 that contours within the limits of this model be checked in field edit.

35. SHORELINE AND ALONGSHORE DETAILS

Shoreline inspection was adequate except for structures and buildings adjacent to the shoreline in the vicinity of Squalicum Creek entrance. These buildings will need additional classification in order to complete their delineation.

No shoal areas or low water lines*are shown. The shallow line in Bellingham Bay is office interpretation of photographs. 14th A some shown on w. side of Bellingham Bay. See \$65.

36. OFFSHORE DETAILS

These are believed to be complete.

37. LANDMARKS AND AIDS

Refer to item 9 of the Field Inspection Report. The position of one non-floating aid to navigation, located by multiplex is reported herewith on form 567. This aid was easily seen in the multiplex model and pricked direct. See \$57 & \$68

See \$49, Notes For The Hydrographer FAR 38. CONTROL FOR FUTURE SURVEYS

Forms 524 are herewith submitted for 14 recoverable topographic stations.

LUMI, 1949, a fourth order control station, is the only one not determined by stereoscopic methods.

Four of the 14 stations were not reported under item 11 of the Field Inspection Report. They are:-

- 1. JOHN 3 (USE) 1941 AZ MK, 1950 2. CITY, 1951

1.7

- 3. CAGE, 1949
- 4. T 38N, R2E, 1/4 CORNER, SECTIONS 13-14, 1951

39. JUNCTIONS

Junctions are complete with T-5583 to the west and T-5585 to the east. There are no contemporary surveys to the north and south. Sec 66.7

40. HORIZONTAL AND VERTICAL ACCURACY

Refer to item 34 "CONTOURS AND DRAINAGE". Also see Photogrammetric Plot Report. See §53

41. <u>BOUNDARIES</u>

Land Lines

See special report - Land Lines - Ph-26(47) and item 10 of field inspection report.

True or accepted corners of land lines are plotted by photogrammetric means, supplemented with field data. Land lines and theoretical corners have been delineated from the natural and cultural features of the manuscript and photographs supplemented by the trans-position of a graphically enlarged copy of the land plats of Townships No. 38 N and 39 N. Range No. 2 East, Willamette Meridian. This enlargement is herewith submitted

Natural and cultural features, such as roads, ditches, and field or woods lines were accepted for the placement of reliable land lines where they were nearly coincident with the lines transposed from the enlarged land plat, or where they connected true or accepted corners.

Where there was no evidence of natural and cultural features from inspection of the photographs and manuscript, the land lines of the enlarged land plat were used and shown asrunreliable land lines. Intersections of these lines resulted in unreliable theoretical corners.

Land lines and corners, accepted or theoretical, were compared with the township layout. Theoretical corners not in agreement, were noted on the discrepancy overlay.

Lummi Indian Reservation

Refer to Special Report-Boundaries-Ph-26(47) and item 10 of field inspection report.

This reservation boundary line is delineated from an enlarged copy plotted from bearings and distances from the original land plat in sections 7, 17, 18.

This line begins at a point called Treaty Rock and ends at a General Land Office standard disc. stamped "T 38N, R2E, S7 S8, L/R, PL, AP7, WC" which is a recoverable topographic station. The bearings of several of the roads in this vicinity were also plotted on the enlarged copy. By holding station AP 7 at one end of the line and orienting the manuscript until the centerline of Hoff Rd, coincided with the bearing of the same road on the enlarged copy at the beginning of the line, the reservation bound ry line was then traced to the manuscript.

41. BOUNDARIES (continued)

In addition to those boundary lines and theoretical corners discussed on the overlay and the unreliable land lines of the manuscript, it is believed that the Lummi Indian Reservation boundary line as discussed in the preceding paragraph, should be further investigated in the field.

46. COMPARISON WITH EXISTING MADS

Comparison was made with Geological Survey Blaine quadrangle, scale 1:62,500, edition of 1907 reprinted 1947.

The interior areas, compare favorably. However, many large changes have since occurred in the vicinity of Bellingham and Bellingham Bay.

47. COMPARISON WITH NAUTICAL CHARTS

The manuscript was compared with Chart No. 6376, scale 1:40,000, published June 1935, corrected September 5, 1949.

Generally, the same differences are noted in this comparison as are reported in item 46.

Items to be apllied to nautical charts immediately:

Sec \$65

In the vicinity of Bellingham are many changes. The street system of Bellingham is to be extended. Shoreline structures to be added are: large wood bulkhead, piling, large breakwater, and large buildings.

Offshore piling between Marietta and Bellingham, and at Fish Point should be applied.

At the mouth of the Nooksack River are many shoreline changes. The channels and inlets in this area are entirely different and should be so charted.

Control tower at Bellingham Airport to be applied.

Items to be carried forward

None

Respectfully submitted

Albert C. Rauck

Cartographic Photo Aid

Approved and forwarded 28 June 1951

Hubert A. Paton

Comdr., C&GS

Officer in Charge

FIELD EDIT REPORT Lap Manuscript T-5584 Project Fh-26(47)

5b. Methods

No new or unusual methods have been used in the completion survey and field edit of this sheet. Inspection was from a truck, dismounting and walking where necessary. All profiling and resketching was done with the plane table. A legend of the colored inks and symbols used is shown on Field Edit Sheet No. 4.

Field edit data is shown on Field Edit Sheets Nos. 1 through 5, and on photos 1374, 1194-1200, 1214-1219, 1222-1229, and 1243 and 1244. Photographs 1243 and 1244 will be furnished with Quad T-5585. All others are with this quad. Notes are cross referenced from field edit sheets to photographs.

52. Adequacy of compilation

The adequacy of the compilation is more or less in line with other sheets in the project. The delineation of buildings is often incomplete, because the compiler just doesn't see all the buildings. They are obvious to the man in the field who is standing on the road looking at the house. From his point of view the building is quite obvious on the photo and there is no need to intensify the image with a bright colored ink, but to the compiler the image is not often so plain. This is the cause of so many omissions. There is often a lack of thought shown on the part of the compiler, too. Probably well over half the time a class two building with a good access road will have a class one building in the immediate vicinity. The compiler must learn to look for these buildings. If the field is to continue to delineate the buildings it wants to delete, instead of the buildings it wants to save, the compiler will have to be more watchful.

Field treatment of the political boundaries was seriously deficient, and this is reflected in the compilation. The compilation unit shares the responsibility for the error in the Bellingham City Limit, since the material furnished by the field inspection unit was sufficient to disclose the error, even though the field inspection unit delineated the City Limit wrongly on the photographs. Apparently the compilation unit did not inspect the legal descriptions or the plats furnished with the special report on boundaries.

The contouring follows the pattern established in past quads on this project. It does not test too badly in accuracy (83% within a half interval), but much detail is missing in the area of glacial till northwest of Ferndale. Several tops were missed in the area east of Ferndale. These things change the expression of the area considerably, though they will often affect the accuracy tests badly.

53. Pap Accuracy.

A portion of the horizontal map accuracy test made for this project extends into the northwest corner of this sheet. This traverse has already been the subject of special report on Horizontal Lap Accuracy for this project. All horizontal errors were within prescribed limits.

Approximately 49 miles of plane table traverse was run as vertical accuracy tests and to resketch topography. About 1.2 miles of combined horizontal and vertical accuracy tests and about 2.5 miles of barometrically controlled leveling may be added to this figure. This total is, of course, quite high, but in view of the fact that the summary of all this traverse shows only 83% of all points tested within to contour interval, there was apparently a need for well-controlled resketching, and only a small portion of this total can be questioned as unnecessary. About 8 miles of this total were run to sketch the 10 foot contour in the Lummi River bottom. About 8 to 9 square miles of topography were resketched, and the equivalent of three to four square miles of sketching was done in adding the 10 foot contour in the Lummi River bottom.

The field editor believes that the map can be certified as meeting National Nap Accuracy Standards after application of the corrections to topography submitted. See §45

54. Recommendations.

It is difficult for the observer to make recommendations for the improvement of similar maps. The bulk of the troubles seem to arise from inexperience as an organization, rather than as individuals. Using the present grade of personnel, closer and more detailed supervision of field personnel seems indicated, along with closer and more critical inspection of field work and of the compilation. The observer has given the matter considerable thought and contemplates submitting a more detailed report on the matter later in the winter.

55. Examination of Proof Copy.

Mr. Paul E. Matz, Ferndale Pharmacy, Ferndale, Mashington, and Ir. Alfred Tedford, 3302 Northwest Avenue, Bellingham, Mashington have each agreed to examine a proof copy of the map for possible errors. Ir. hatz is well acquainted with the area around Ferndale in the northwest corner of the sheet, and Ir. Tedford is better acquainted with the area around Bellingham, in the southeast corner of the sheet. The sheet seems divided geographically by the wooded area around the airport. No further geographic name data was obtained. However, the application of the name "Squalicum Creek "aterway" should be changed. The Squalicum Creek Waterway is a dredged ship basin, and the approach channel, and is a facility of the Port of Bellingham. Squalicum Creek comes off the hill just inshore from the Squalicum Creek Jaterway. The name "Squalicum Creek Fill" is also in common local usage as indicated on Field Edit Sheet Lo. 4, but would appear as a redundance if the names Squalicum Creek and Squalicum Creek daterway are shown.

56. Political Boundaries.

(See paragraph 10, Field Inspection Report and Special Report on Boundaries, Project Ph-26). Besides the public land lines, the political boundaries within the limits of this quadrangle are the boundary of the Lummi Indian Reservation, the Corporate Limit of the City of Ferndale, and the Corporate Limit of the City of Bellingham.

56 1. Lummi Indian Reservation.

The field inspection party recovered one witness to a corner of the Lummi Indian Reservation, "T 38N, R2E, S7 S8, L/R, PL, AP7, WC". This corner seems to have been accepted by the field inspection and by the compiler as a corner on the boundary. The letters "JC" included in any property corner designation mean "witness corner", and such a corner is set because the true corner cannot be monumented. In this case it cannot be monumented because it is in the middle of the river. The field editor recovered seven additional witness corners and two corners on this boundary. These corners and the witnesses were located by plane table. These recovered corners, witnesses, and plotted corners are shown on Field Edit Sheet No. 3, and are keyed to the numbers listed below, with brief descriptions shown in the case of recovered points.

- 1. Recovered, a standard GLO disk, riveted to the top of a 3/4 inch pipe extending 16" above ground, stamped "S17/S16, 10, 1930". A witness for Treaty Rock.
- 2. reaty Rock, not recovered. This was plotted from witness (1). The Indians say Treaty Rock "sank". The fact of the

matter is that Treaty Rock was below mean high water, and although it was as big as a small house, it was covered by silt when the river channel shifted. Probing at the plotted position was considered, but was not attempted because of the heavy cover of large driftwood logs almost completely covering the area.

3. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 9 inches above the ground, stamped "T3EN, R2.7, PL, S17, NC, AP3, L/R, 1930".

4. AP3, not recovered, plotted from witness (3).

5. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 6 inches above the ground, stamped "T38N, R2J, S18, PL, APJ,L/R, 1930". (Plotted as AP I). GLO plat shows to AP 1, a standard GLO disk riveted to the top of a 1½ inch pipe extending 1 foot above ground stamped "S7, S8, S17, S18".

7. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 2 inches above the ground and stamped "T38N, R2J, PL, S18, AP2, L/R, 1930".

8. Recovered, a standard GLÖ disk, riveted to the top of a 3/4 inch pipe, extending 2 inches above the ground, stamped "T38N, R2N, PL, S18, NC, AP3, L/R, 1930".

9. AP3, not recovered, plotted from witness.

10. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe, extending 9 inches above the ground, and stamped "T38N, R24, S7, AP1,L/R, PL, 1930". Should have been "%".

11. AP1. Not recovered; plotted from witness.

12. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe, extending 9 inches above the ground, stamped "T38N, R2N, S7, AP2, L/R, PL, 1930". Should have been "NC".

13. AP 2, not recovered, plotted from witness.

14. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 4 inches above the ground, stamped "T38N, R2N, S7, NC, AP3, PL, L/R, 1930".

AP 3, not recovered, plotted from witness.

The plat of the Malter D. Long resurvey of 1930 is quite good, but the stamping of the marks is often in error. Each mark is stamped R2M, where it should be R2E. Mith this in view, it is not unreasonable to assume that the omission of the witness corner designation in a couple of cases was an error also. I think only two reference bearings are omitted from the plat, and one of these may be deduced from another plat. The only portion of the boundary difficult to deal with was the portion from S7, AP3 to S7, AP7. The bearing from S7, AP7 to MC, S7, AP7 is omitted from the plat, although the distance, 1.50 chains is shown. A circle of radius 1.50 chains with center at MC, S7, AP7 was struck, and the portion of the boundary from S7, AP3 to the eastward was plotted

on a piece of vellum and positioned so that S7, AP3 fell in the proper position, and the eastern end of the plotted portion of boundary fell on the 1.50 chain circle. Then the corners in between were pricked. Other portions of the line plotted between recovered corners fitted very well with almost zero closures. The survey is really quite good.

56 2. City of Ferndale.

The field inspection party furnished descriptions for the last two additions to the Ferndale numicipal corporation, stating that legal descriptions for the balance of the corporate limit were not available. They did, however, show on the photograph the position of the city limit. The original act incorporating the City of Ferndale was located without any trouble, and a subsequent addition to the city was located after local inquiry. These descriptions are furnished as a part of this report. The boundary shown on the field photographs was taken from a map in the assessor's office, or at least it agrees with it, but there is a discrepancy in the Pioneer Park area. As a matter of interest, the City Limit shown in the Assessor's plat book (not on his wall map) is correct. I think that where the city limit follows the edge of a road, that the line on the manuscript should reflect this by turning and following its true position along the edge of the road for about0.5 inch. If you just run it up to the road and stop, there may be confusion about whether it goes with the center line of the road, or with the edge, and this should be clarified. See also 564, Riparian boundaries of municipal corporations.

* Limits were also delinested on Field Edit Sheet No.1. Above descriptions not located
56 3. City of Bellingham. at review. EVE

The field inspection party furnished copies of the original charter of the City of Bellingham, and of all but one of the annexations to the city. They also furnished maps of the city with the city limits shown thereon. They also drew the city limit on the appropriate photographs. Apparently, neither the field inspector, the compiler, or the office inspector made a careful review of the maps or descriptions, because there are gross disagreements between the data furnished, and the city limit delineated on the photographs. One annexation was also omitted. Complete descriptions of the Bellingham City limit are furnished with this report. The corrected city limit within the limits of the quadrangle are shown with a red city limit symbol on Field Edit Sheet No. 4. See also 56 4, Riparian boundaries of municipal corporations.

56 4. Riparian Boundaries of Lunicipal Corporations.

A copy of an act of the Mashington State Legislature extending the corporate limits of cities fronting on waters is attached, with a copy of a decision of the Mashington State Supreme Court relating to the act also attached. This act will affect the city limits of both Ferndale and Bellingham.

57. Aids to Navigation.

Observations were made to relocate the Squalicum Creek Entrance Light and the Bellingham Breakwater Entrance Light No check positions were obtained, but they check very nicely with plane table intersections which used mapped detail as control. Using mapped detail as control the plane table intersections gave about a thirty foot triangle of error; while not quite good enough for a location, it is quite good enough to indicate See \$48 that there is no gross error in the work. The computed G.P. for the Squalicum Creek Entrance Light in only about a meter different from that obtained by the field inspection party, and there was probably no change in the light. The Bellingham Breakwater Entrance Light, however, has been moved about 500 feet from the first position obtained by the field inspection party, and moved about 360 feet while the field editor was in the area. Further shifts in this light may be expected as construction of the breadwater continues. The breakwater will be extended about 1500 feet to the west, and work has proceeded at the rate of about 200 feet per year. A plan of the work contemplated was furnished by the field inspection party. * Shown as less than third order stations on the manuscript. CARE

58. Triangulation.

The Olympic Portland Cement Company in Bellingham has been converted from a coal-fired to an oil-fired operation. Two of the large stacks which were shown as landmarks (Triple Stack) and which doubled as intersection stations have been torn down. Appropriate recovery notes are submitted. A check observation was made on the remaining stack. See also Paragraph 57.

* New form 567 submitted at final review.

59. Hew Leveling.

A level party of this bureau under the supervision of Lt. Plaggmier has completed a rerun of the trunk level line along the Great Northern Railway across this sheet with a spur line to the Bellingham Airport. The bench marks established, and the field elevations are listed:

			*							
\mathbf{F}	327	Elv.		\mathtt{At}	m	of	RR	and	Kass	Rd.
G	327		11.8769/							
	6=26B		10.5610/							
	327		5.2861							
	327		6.1411 -							
	327		12.5989 1							
	327		32.0809 /							
	6=107B		32.9910/							
1.1	327		34.3786 -							
	327		15.5423/							
T	330		4.5773 ~							

Spur line to Bellingham Airport:

Q 327	48.2168 / *
N 327	45.8692 <
P 327	45 . 5661 /
152.58	46,6028 /
149.80	45.6034 /
145.53	44.2857
157.93	48.0607 /

The locations of these marks have been spotted on the field edit sheet. No further recovery notes are submitted inasmuch the level party was in the area after completion of the bulk of the field work on the quad.

* The adjusted elevations have since been published and are shown on the manuscript. 5th

60. Junctions.

The work of the Geological Survey on topographic quadrangle Blaine NE has been matched along the north edge of the sheet. See \$67 * Bertrand Creek, Wash. (1952).

Approved and Forwarded:

Charles W. Clark Lt. Comdr., USC&GS

Chief of Party

Respectfully submitted:

Ray H. Skelton II

Cartographer (Photo)

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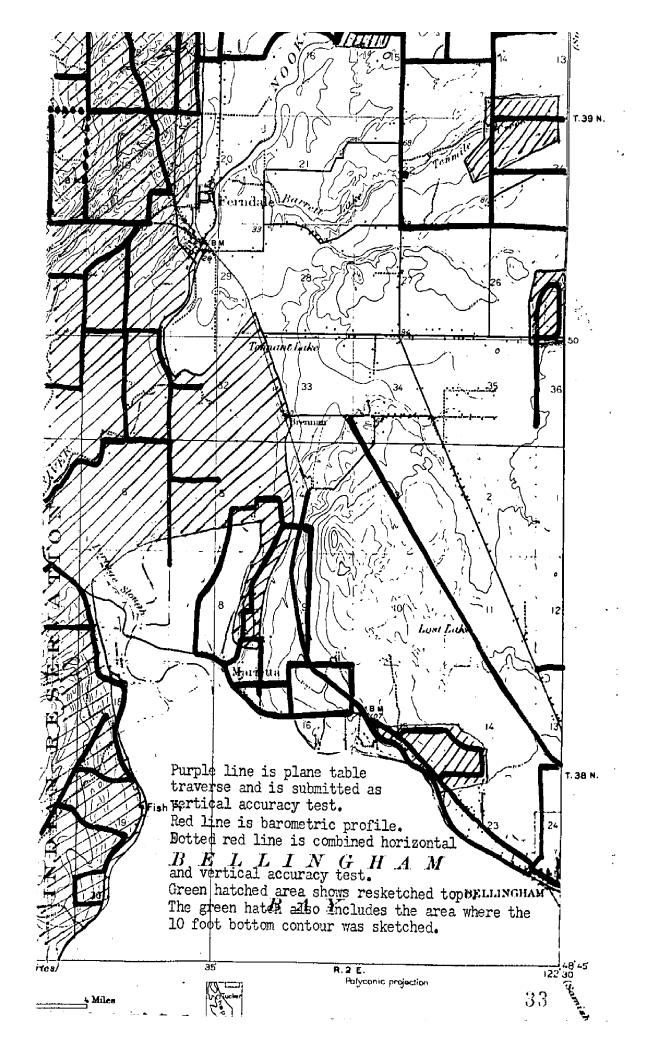
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TOPOGRAPHIC MAPPING

Summary & Abstract of Vertical Accuracy Test

Project No. Ph-26 Quad. No. T-558/L Quad. Name
Method of Testing Plane table profiling
Tested by R. H. Skelton Date May 1952 Evaluated by R.H.S. II
Contour interval 20 ft. 1.22 M.M. allowable shift at 1/10,000
map or manuscript scale.
539 Total number of points tested 83 % of points within ½ contour interval or better 155 Test points correct within ½ contour interval 80 Test points in error between ½ and full contour interval
lt Test points in error over full contour interval

Test Elev.		Error	Error after shift	Remarks	Test Elev.	Map Elev.	Error	Error after shift	Remarks	
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thend	e east	to ti	е.	•	32	32	. 0	0		
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. 73	57	-16	-12		29	35	- 6.	- 6		
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113	12և	<i>‡</i> 11	79	· .	1:1	hl	. 0	0		
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					17	i -		i —		



DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 24A Rev. Oct., 1932

*These columns are for office use and should be left blank in the field.

LIST OF DIRECTIONS

Station BEECH 1914, 1927	State	Washington			
Chief of party C. Y.C.	Date	6 October 1	952	Computed by R.	H.S.II
Observer R.H.S. II	Instrument_	USC&GS 231		Checked by	
OBSERVED STATION	Observed direction	Eccentric reduc-	Sea level reduction*	Corrected direction with / zero initial	Adjusted direction*
Bellingham, Olympic Port- land Cement Co., Stack, NE of 3	0 00 00.00		7	0 00 00.00	, "
Bellingham, Bellingham Breakwater Entrance light	01 .16 40.2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
JOHN 3 (USE)	(328 45 26.4)	Compute	d.		-
Bellingham, Squalicum Creek Entrance Light	358 29 57.6				· · · · · · · · · · · · · · · · · · ·
		7			
Observed from ins No eccentricities Recorded p. 2, Vo	strument tripod.	······································			4
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Station: Ken

Chief of party: C. V. H.

Observer: C. V. H.

State: Maryland

Date: 1917

Instrument: No. 168

Computed by: O. P. S.

Checked by: W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
Chevy Tank west of \(\triangle \) Dulce Ken (center), 3.469 meters Forest Glen standpipe Home Bureau of Standards, wireless pole Reno Reference mark, 16.32 m Ken To Home 70 65	0 00 00.00 29 03 37.0 176 42 313 24 53.0 326 31 30.21 352 17 20.8 367 28 48.63 358 31 20 eccentric	7.31 -1 09.8 +3 01.2 + 31.93 + 5.7 - 1.16	7	0 00 00.00 29 02 34.5 313 28 01.5 326 32 09.45 352 17 33.8 357 28 54.78	' "

This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. To be acceptable it must contain every direction observed at the station.

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned clockwise around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. Measure no sum angles. Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 24A Rev. Oct., 1932

LIST OF DIRECTIONS

Station JOHN 3 (USE)					
Chief of party C. W. C.					
Observer R.H.S. II	Instrument_	USC&GS 231		Checked by	
OBSERVED STATION	Observed direction	Eccentric reduc- tion	Sea level reduction *	Corrected direction with zero initial	Adjusted direction*
Bellingham, Oeser Cedar Co., Stack, 1941	o" / " O 00 00:00		ų	o 00 00.00	, ,,
Bellingham, Olympic Portla Dement Co., Stack, NE of	ind 3 00 40 32.0				
Bellingham, Olympic Portla Dement Co., Stack NE of 3	ind (00 40 46.3)	Computed	as chec	k on point obse	ved.
Bellingham, Squalicum Creek Entrance Light	11 44 59.8				-
Bellingham, Bellingham Breakwater Entrance Light	13 55 18.9		-		
BEECH 1914, 1927	(_22 _30_ 42.6)	_Computed	this-da	te··	, , , , , , , , , , , , , , , , , , ,
BEECH 1914, 1927		Computed	by_CWC,	reduced-from hi s initial.	s-list -
		- 4, 5, 5			
			· • · · · · · · · · · · · · · · · · · ·		
Observed from instrum No eccentricities. Recorded pp. 3,4,-Vo	1				
				-	-
					
स्कर्णके शास्त्रका अक्टा कराकी गणस्कर्णकारीके स्वयं	<u>. </u>	<u></u>	<u>.</u>	<u> </u>	35

Chief of party: C. V. H.

Observer: C. V. H.

State: Maryland

Date: 1917

Instrument: No. 168

Computed by: O. P. S.

Checked by: W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
Chevy	0 00 00.00 29 03 37.0 176 42 313 24 53.0 326 31 30.21 352 17 20.8 357 28 48.63 358 31 20	- 7.31 -1 09.8 +3 01.2 + 31.93 + 5.7 - 1.16	,,	0 00 00.00 29 02 34.5 313 28 01.5 326 32 09.45 352 17 33.8 357 28 54.78	, 0

This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. To be acceptable it must contain every direction observed at the station.

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Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned clockwise around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. Measure no sum angles. Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

PHOTOGRAMMETRIC OFFICE REVIEW

T. 5584 N

1. Projection and grids <u>ACR</u> 2. Title <u>ACR</u> 3. Manuscript numbers <u>ACR</u> 4. Manuscript size <u>ACR</u>
CONTROL STATIONS
5. Horizontal control stations of third-order or higher accuracy <u>QCR</u> 6. Recoverable horizontal stations of less
than third-order accuracy (topographic stations) \overline{ACR} 7. Photo hydro stations \overline{ACR} 8. Bench marks \overline{ACR}
9. Plotting of sextant fixes QCR 10. Photogrammetric plot report QCR 11. Detail points
ALONGSHORE AREAS
(Nautical Chart Data)
12. Shoreline QCR 13. Low-water line QCR 14. Rocks, shoals, etcQCR 15. Bridges QCR 16. Aids
to navigation QCR 17. Landmarks QCR 18. Other alongshore physical features QCR 19. Other along-
shore cultural features QCA
PHYSICAL FEATURES
20. Water features Q.CA 21. Natural ground cover Q.CA 22. Planetable contours 23. Stereoscopic
instrument contours QCR 24. Contours in general QCR 25. Spot elevations QCR 26. Other physical
features <u>QCR</u>
CULTURAL FEATURES
27. Roads \overline{GCR} 28. Buildings \overline{GCR} 29. Railroads \overline{GCR} 30. Other cultural features \overline{GCR}
BOUNDARIES
31. Boundary lines QCA 32. Public land lines QCA
MISCELLANEOUS 33. Geographic names 4. Junctions QCP. 35. Legibility of the manuscript QCR 36. Discrepancy
overlay \underline{GCR} 37. Descriptive Report \underline{GCR} 38. Field inspection photographs \underline{GCR} 39. Forms \underline{GCR}
40. Albert C. Trauch J. Supervisor, Review Section or Unit
,
41. Remarks (see attached sheet)
FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT
42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The

manuscript is now complete except as noted under item 43.

compiler

43, Remarks:

M-2623-12

PHOTOGRAMMETRIC OFFICE REVIEW T- 5584-5

1. Projection and grids <u>DMB</u> 2. Title <u>DMB</u> 3. Manuscript numbers <u>DMB</u> 4. Manuscript size <u>DMB</u>

CONTROL STATIONS

5. Horizontal control stations of third-order or higher accuracy <u>DMB</u> 6. Recoverable horizontal stations of less than third-order accuracy (topographic stations) <u>DMB</u> 7. Photo hydro stations <u>DMB</u> 8. Bench marks <u>DMB</u> 9. Plotting of sextant fixes <u>DMB</u> 10. Photogrammetric plot report <u>DMB</u> 11. Detail points <u>DMB</u>

ALONGSHORE AREAS

(Nautical Chart Data)

12. Shoreline <u>DMB</u> 13. Low-water line <u>DMB</u> 14. Rocks, shoals, etc. <u>DMB</u> 15. Bridges <u>DMB</u> 16. Aids to navigation <u>DMB</u> 17. Landmarks <u>DMB</u> 18. Other alongshore physical features <u>DMB</u> 19. Other alongshore cultural features <u>DMB</u>

PHYSICAL FEATURES

20. Water features <u>DMB</u> 21. Natural ground cover <u>DMB</u> 22. Planetable contours <u>2366</u> 23. Stereoscopic instrument contours <u>DMB</u> 24. Contours in general <u>DMB</u> 25. Spot elevations <u>DMB</u> 26. Other physical features <u>DMB</u>

CULTURAL FEATURES

27. Roads DMB 28. Buildings DMB 29. Railroads DMB 30. Other cultural features DMB

BOUNDARIES

31. Boundary lines DMB 32. Public land lines DMB

MISCELLANEOUS

33. Geographic names 34. Junctions <u>DMB</u> 35. Legibility of the manuscript <u>DMB</u> 36. Discrepancy overlay <u>DMB</u> 37. Descriptive Report 38. Field inspection photographs <u>DMB</u> 39. Forms <u>DMB</u>

40. Horseld Manuscript <u>DMB</u> 36. Discrepancy overlay <u>DMB</u> 37. Descriptive Report 38. Field inspection photographs <u>DMB</u> 39. Forms <u>DMB</u>

Reviewer Supervisor, Review Section or Unit

41. Remarks (see attached sheet)

FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT

42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The manuscript is now complete except as noted under item 43.

Bornice Wilson Compiler

Supervisor

43. Remarks:

This chart shows the vertical clearance for the bridge at latitude 48° 47.5', longitude 122° 35.3' as 15 feet which was probably taken from an advance print of T-5584. This value was referenced to MLLW datum based on predicted times for this area at the time of the measurement in the field. The clearance from the MHW datum is 10 feet.

This survey shows some primary roads which are not charted.

- 66. Adequacy of Results and Future Surveys. This map meets the National Standards of Map Accuracy and complies with project instructions. except possibly for contours.
- 67. Junctions.-All junction discrepancies with the published quadrangle, Bertrand Creek, Washington (USGS 1952) scale 1:24,000 were reconciled during this review, except as follows:

At longitude 122° 33.3' and 122° 37.3' - woodland limit. At longitude 122° 30.4' - woodland limit and section line differ between the two maps by approximately 17 meters. Planimetric detail is in agreement with the USGS map both eastward and westward. Also the position of the line as shown on T-5584 checks the plotted position by GLO data. Therefore, it is believed that the position as shown on T-5584 is accurate.

- 68. Bridges .- Vertical clearances for the three bridges at Ferndale were referenced to water level for a time and date. Because the tidal effect at this point was not determined or is negligible, the clearances could not be determined from the field data. Also, the disparity between the field measurements and the values in the Bridge Book indicate the fluctuation in river level to be the controlling factor rather than tides.
- 69. Landmarks.-Forms 567 were submitted during this review for "STACK" and "RADIO RANGE STATION". Forms 567 not included as part of this report are filed as part of Chart Letter L 242 (1951) and L 326(1950).

Chief.

Reviewed by: Everett H.

APPROVED

Chief, Review

Div. of Photogrammetry

togrammetry

Division of Charts

Wautical

Chief, Div. of Coastal Surveys

Review Report Topographic Map T-5584 27 August 1954

62. Comparison with Registered Topographic Surveys .-

T-1798 1799	1:10,000	1887
2069	1:5,000	1891
2920	1:10,000	1909
3480	1:5,000	1914
4277	1:10,000	1927

Many changes in shoreline and cultural features have occurred since these surveys. Survey T-5584 should supersede the above surveys for nautical charting purposes for the area encompassed by this survey.

63. Comparison with Maps of Other Agencies .-

Blaine, Washington quadrangle (USGS) 1:62,500 1907

A visual comparison reveals general agreement in contouring. There have been many cultural changes and the Nooksack River delta has built seaward approximately one mile.

- 64. Comparison with Contemporary Hydrographic Surveys .- None
- 65. Comparison with Nautical Charts .-

- 6378 1:40,000 1935 corr. to 54-8/9

A form 567 was submitted at the time of this review correcting landmark "STACK (CENTER OF THREE)".

This chart shows piling at lat. 48°45.4, longitude 122°30.2' which was not field inspected. However, there is some indication of piling on the photographs and it should be retained on the chart.

This survey shows an addition to the pier at latitude 48° 45.5', longitude 122° 30.3' which is not charted. This survey shows an extension to the breakwater at latitude 48° 45.4', longitude 122° 30.1' which is not charted. This survey shows piling at latitude 48° 45.6', longitude 122° 36.4' which is not shown at the chart.

The field inspection party delineated on the photographs some low-water line on the west side of Bellingham Bay which differs with the position shown on the chart. This line apparently was delineated to follow a tone line on photographs not taken at the time of low water. The accuracy is therefore questionable and it has been labeled "approximate" on the map.

48. GEOGRAPHIC NAME LIST

Alderwood Ave Aldrich Road

Axton Rd

Bakerview Rd

Bancroft Rd

Barrett Lake

Beaver Dam

Bellingham

. Bellingham Airport

· Bellingham Bay

. Bennett Ave

Birchwood

. Birchwood Ave

Brennan

Byers Rd

(more than cone) SHR CAA Reservation

. Bible Can

Cagey Road

· Cedarwood Ave

Cherrywood Ave

Church Rd

· Cottonwood Ave

. Curtis Rd

Deer Creek · Douglas Rd

· Edens Ave

Ferndale . Ferndale Rd

Fish Point

Fort Bellingham Rd

· Ferndale City Reservoir

CM StP & P Ry

FERNDALE TOWNSHIP

· Gilason Rd

· Great Northern Railway

Graveline Rd

· (Green Acres Memorial

(Park Cemetery

Greenwood Ave

Hemmi Rd

. Hendrickson Rd

Hoff Rd

Hovander Rd

Imhaf Rd

Johnson Rd - Per Whatcom Co. Hy. M. P. Tohnston Road

Jones Rd

_Kass_Rd Kivina Rd (wina,

40

48. GEOGRAPHIC NAMES (continued) Labounty Rd Lange Rd Larrabee Rd Larson Rd Laurel Rd Laurelwood Ave Lumi Shore Road ummi School Lummi Lummi Indian Reservation . Lummi River Mallory Rd Marietta Marietta Rd L Mountain View Township Mc Loud RA · McAlpine Rd · Mt View Rd Neevel Rd Neilson Rd New Kirk Rd Nooksack River Northwest_Rd Olympic Way Oswald Rd · Pacific Highway (U.S.99) Paradise Rd Pinewood Ave Pioner Park Piper Rd Rayhorst Rd Reighton Rd Red River Rd · River Rd Rural Ave Slater Rd ... · Slater Slough · Smith Rd Smmugler Slough Sunset Ave (Squalicum Creek · Squalicum Creek (Waterway St. Joachims Church Tenmile Creek Tennant Lake

Thornton Rd

48. GEOGRAPHIC NAMES (CONTINUED)

Ulrick Rd U.S. 99

Ph 5 1

Waske Rd
Wiser Lake Rd
Woodlawn Cemetery

Whatcom County Hospital

Woodlyn Rd

Wynn Rd

Names underlined in red are approved. 7-19-51. L. HECY

Based on names report for project. Road names trom 1934 whatcom Co. Hy. Map.

Names checked and approved 8-16-54 Q-J. W.

49. NOTES FOR THE HYDROGRAPHER

Following is a list of recoverable topographic stations which may be used during the Hydrographic Survey.

CONTROL TOWER, 1950
EDGE, 1950
LUMI, 1949
SQUALICUM CREEK WATERWAY LIGHT, 1950
CAGE, 1949
GHTY, 1951
JOHN 3 (USE) 1941 AZ MK, 1950

Form 567 April 1945

DEPARTMENT OF COMMERCE

FEODETIC SURVEY U. S. COAST AND

NONFLOATING AIDS OR LANDWARKS, FOR CHARTS

	STRIKE
CHARTED	BELETEP
BE	最
9	ß

BNO TOO

Baltimore, Maryland

I recommend that the following objects which have (hasternet) been inspected from seaward to determine their value as landmarks be

charted on (2002000000) the charts indicated.

The positions given have been checked after listing by Clourt Trauch 9 Albert C. Reuck, Jr.

D. P. METERS DATUM DATE LOCATION DATE AND LAND OF MAINTAIDLEX DATE OF MAINTAIDLEX OF								1	1		╟	11
Squaltoum Creek	STATE	WASHINGTON				POSITION			METHOD			
Name				LAT	TUDE	LONG	TUDE		LOCATION	DATE OF		 CHARTS
Squaltum Greek 48 45 1054 122 30 737 Rth Multiplex 1950 4 4 4 4 5 1054 122 30 737 1927 1-5584 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	CHARTING NAME	DESCRIPTION	SIGNAL		D. M. METERS		D. P. METERS	DATUM	SURVEY No.	LOCATION		
		Squalicum Creek Waterway Light			7501	122 30	737		Multiple T-558/			 6300,63
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This form shall be prepared in accordance with Hydrographic Manual, pages 800 to 804. Positions of charted landmarks and nonfloating aids to navigation, if redetermined, shall be reported on this form. The data should be considered for the charts of the area and not by individual field survey sheets. Information under such actions the charts of the area and not by

567	1945
Form	April

COMMERCE 止 **DEPARTMENT**

U. S. COAST AND GEODETIC SURVEY

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ANO THO RAIGHS	5
O BE CHARTED	COCHECODEL MEDICAL

Baltimore, Maryland

May 1,

19_53 I recommend that the following objects which have (Maternal) been inspected from seaward to determine their value as landmarks be charted on (AND CASA CHARM) the charts indicated.

Jack C. Sammons

Donald M. Brant The positions given have been checked after listing by

Ph 26(47)

6300,6378, 6380 6300,6378 6380 CHARTS AFFECTED Chief of Party. OFFSHORE CHART MEHORE CHART H × H HARBOR CKART LOCATION DATE 1952 # METHOD OF LOCATION SURVEY NO. X lation E DATUM NA 1927 = 41.042 838.3 D. P. METERS 21.855 1,10.11 LONGITUDE # 8 8 POSITION 122 122 ۰ D.M. METERS 12.370 24∙395 753.6 382.1 LATITUDE* 元 芫 o 8 SIGNAL BELLINGHAM SQUALICUM CHEEK ENTRANCE LIGHT BELLINGHAM, BELLINGHAM BREAKWATER ENTRANCE LT DESCRIPTION Washington CHARTING NAME STATE

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	Thown on map its less Than third-order in accuracy " #	וח פכנמ	racy 2M/						
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	NOTE: These aids located during the field	field edit.				 			
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This form shall be prepared in accordance with Hydrographic Manual, pages 800 to 804. Positions of charted landmarks and nonfloating s to navigation if redetermined shall he amounted on this form. The date them the constitution of charted landmarks and nonfloating aids to navigation, if redetermined shall he nonorted on this from

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 24A Rev. Oct., 1992

LIST OF DIRECTIONS

Station LUMI (Topo.)		State	Wa	shington			
Chief of party C.W.Clark,		Date.	12	/6/49		Computed by	J.C.L. C.W.B.
Observer J.C.Lajoye		Instr	ument	7" Berge	r No. 231		C.W.C.
OBSERVED STATION	Obs	erved dir	ection	Eccentric reduc-	Sea level reduction	Corrected direction with zero initial	Adjusted direction*
BUSWELL (U.S.E.)	0	00 0	0.00	, ,	•	0 00 00.00	
Bellingham, Oeser Cedar Co., Stack, 1941	29	08	25.8				
Bellingham Museum (City			-				<u> </u>
Hall, 1927)	42	:50	25.8	,			
Bellingham, Bloedel-		- I -					
Conovan, Stack, 1927	50	58	18.3				
Seattle-Vancouver Air- way Beacon No.8,1941	93	23	09.1	1			
	<u>-</u> -						-
Squalicum Creek Water-					·		
way Light	_37	09_	09				· · ·
Light 							
_wnatcom_waterway_bigito_	4.1	J.7	-4/				
KPUC Radio Tower	298	46	28				
KPUG Radio Tower	298	59_	_33				
KVOS Radio Tower	234	49	_50				
KVOS Radio Tower	234	50	23	······································			
						<u>,</u>	
		-					
	· · ·	·					
1		· —— —					
*These columns are for office use and should be				क्षा कार्याः ३, का∞	# := '= === 	alian i seren at est. Al ikare e	-

State: Maryland

Chief of party: C. V. H.

Date: 1917

Computed by: O. P. S.

Observer: C. V. H.

Instrument: No. 168

Checked by: W. F. R.

OBSERVED STATION	Observe	d dire	ction		entri c uction	Sea level reduction	Corre	ted di zero i	rection with nitial	Adjusted direction	
Chevy Tank west of Δ Dulce Ken (center), 3.469 meters Forest Glen standpipe Home Bureau of Standards, wireless pole Reno Reference mark, 16.32 m Ke To Home Voc. 56	313 326 352 357	4-1	00.00 37.0 53.0 30.21 20.8 48.63 20	-1 +3 +	7.31 09.8 01.2 31.93 5.7 1.16	# : ';	313 326 352 357	, 00 02 28 32 17 28	00.00 34.5 01.5 09.45 33.8 54.78	"	

This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. To be acceptable it must contain every direction observed at the station.

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjust ment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of

Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00." 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned clockwise around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. Measure no sum angles. Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

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

1-2

COMPUTATION OF TRIANGLES

No.	(Hert, Prühtin	STATION	OBSE	RVED	ANGLE	CORR'N	SPHER'L	Spher'l	PLANE ANGLE AND DISTANCE	LOGARI	THM
*****		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	52 5-				TWATE	EACESS	AND DISTANCE		
	2-3									3.742	8 9
		llingham, Bellingha akwater Ent. Cf.	~ (13 8	53	22.5)					0.182	09
		BEECH	3z		13.8					9.730	4 (
_		JOHN 3	08	35	23.7			-	,	9 174	2
	1-3							-		3.855	4 6
•	1-2						•			3.299	1 8
			/	/	-						
	2-3							<u>.</u>		3.942	б
	Be 10€	Hinghow Squelier ele Gut Lt.	′′′′(13 9	z 9	46.0)		•			0.187	4
	2	BEECH	29	44	31.7_				•	9.695	ک
	3	JOHN 3	10	45	42.8					9.271	z
	1-3									3 . 8 2 5	
	1-2	9		•					v	3.401	4
			/	/	-						
					o						
	2-3	•									
	1							-		•	
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	1-3	•				,					
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				•						•	
	2-3										
	1										
	2										
	3					-					
	1-3										

Obstruction No	From Base Point	From Base Point	References
Vertical Angle	Formu	Forne	
Vertical Angle Log. Tangent			
Log. Distance to Obst.			
Log. Height Above Trat.			
Height Above Inst. in Feet	-		
Inst. Elev.		,	
C. & R. corr.			
Elev. of Obst.			
Obstruction No	From Base Point	From Base Point	References
Vertical Angle			
Log. Tangent			
Log. Distance to Obst.		;	
Log. Height Above Inst.			
Height Above Inst. in Feet			
Inst. Elev.			
C. & R. corr.			
Elev. of Obst.			<u> </u>
Obstruction No	From Base Point	From Base Point	References
Vertical Angle			
Log: Tangent			
Log. Distance to Obst.			
Log. Height Above Inst.			
Height Above Inst. in Feet			
Inst. Elev.			
C. & R. corr.			
Elev. of Obst.			
Obstruction No	From Base Point	From Base Point	References
Vertical Angle			
Log. Tangent			
Log. Distance to Obst.			
Log. Height Above Inst.			
Height Above Inst. in Feet			
	1		
Inst. Elev.			
Inst. Elev. C. & R. corr.			

INVERSE POSITION COMPUTATION

$$\begin{aligned} s_1 & \sin \left(\alpha + \frac{\Delta \alpha}{2}\right) = \frac{\Delta \lambda_1 \cos \phi_m}{A_m} \\ s_1 & \cos \left(\alpha + \frac{\Delta \alpha}{2}\right) = \frac{-\Delta \phi_1 \cos \frac{\Delta \lambda}{2}}{B_m} \\ & -\Delta \alpha = \Delta \lambda \sin \phi_m \sec \frac{\Delta \phi}{2} + F(\Delta \lambda)^3 \end{aligned}$$

in which log $\Delta \lambda_i = \log (\lambda' - \lambda) - \text{correction for arc to sin*}$; log $\Delta \phi_i = \log (\phi' - \phi) - \text{correction for arc to sin*}$; and log $s = \log s_i + \frac{1}{2}$ correction for arc to sin*.

	NAME O	F STATION	
1. φ 2. φ'	48 46 13 997 JOHN.	3 (USE) 1941 X Cadar Campany 941 X	122 36 co.236. 122 30 54.568.
$\Delta\phi \ (=\phi'-\phi)$ $\Delta\phi$ 2	- 05.207- - 02.604	$\frac{\Delta\lambda}{2} (=\lambda'-\lambda)$	- 05 05.668
$\phi_{m} \left(= \phi + \frac{\Delta \phi}{2} \right)$ $\Delta \phi \text{ (secs.)}$	48 - 46 - 11.393 -5.207 -	Δλ (secs.)	- 305.668 -
log ∆ø	0.716 588 v	log Δλ	2. 485 250 V
cor. arc-sin		cor. arc—sin	
$\log \Delta \phi_1 \ \log \cos rac{\Delta \lambda}{2}$		log Δλ _ι log cos φ _m	9818 9422
$\begin{array}{c} \mathbf{colog} \; \mathbf{B}_{\mathrm{m}} \\ \mathbf{log} \Big\{ \mathbf{s}_{\mathrm{I}} \; \mathbf{cos} \Big(\alpha + \frac{\Delta \alpha}{2} \Big) \Big\} \end{array}$	1. 489823 (opposite in sign to $\Delta \phi$)	$egin{aligned} \operatorname{colog} \mathbf{A}_{\mathrm{m}} \ & \log \left\{ \mathbf{s}_{1} \sin \left(lpha + rac{\Delta lpha}{2} ight) ight\} \ & \log \left\{ \mathbf{s}_{1} \cos \left(lpha + rac{\Delta lpha}{2} ight) ight\} \end{aligned}$	1 491 106 × 3. 795 298 - 2 206 411 +
log·Δλ	2.485 250 3 log Δλ	$\log \tan \left(\alpha + \frac{\Delta \alpha}{2}\right)$	2306 411" + 11,58 E E 97
$egin{aligned} \mathbf{log} & \mathbf{sin} \; oldsymbol{\phi_m} \ & \log & \sec rac{\Delta oldsymbol{\phi}}{2} \end{aligned}$	9 8 7 6 2 5 7 V log F. log b	$\log \sin \left(lpha + rac{\Delta lpha}{2} ight)$	271 28 3421 9999 8561
log a	2 361 507~	$\log \cos \left(\alpha + \frac{\Delta \alpha}{2} \right)$	
а	229.882	log sı	3.795 444 v .
b	"	cor. arc—sin	
$-\Delta \alpha \text{ (secs.)}$ $-\frac{\Delta \alpha}{2}$	- 129.9 L - 15.0 L - 1 55.0 L	log s	
$\alpha + \frac{\Delta \alpha}{2}$ $\alpha \text{ (1 to 2)}$	271 28 342 ×	* Use the table on the are to sin.	e back of this form for correction of
Δα	+ 3 499 V	·	comp J.C.L.
<u> </u>	180		V 1.Z. Jr.
α' (2 to 1)	9/ 30,29/1	• 	

Note.—For log s up to 4.0 and for $\Delta \phi$ or $\Delta \lambda$ (or both) up to 3', omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 7 decimal places.

 $Table\ of\ arc\text{-}sin\ corrections\ for\ inverse\ position\ computations$

						·	1	,	
log s ₁	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	log s _i	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	log s ₁	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	
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 5. 128 5. 139 5. 151 5. 163	75 80 84 89 94	3. 623 3. 637 3. 648 3. 660 3. 672	5. 473 5. 479 5. 484 5. 489 5. 495	392 402 412 422 433	3. 982 3. 988 3. 993 3. 998 4. 004	5. 671 5. 674 5. 678	973 989 1 0 05	4. 180 4. 183 4. 187	
5. 172 5. 183 5. 193 5. 205 5. 214	98 103 108 114 119	3. 681 3. 692 3. 702 3. 714 3. 723	5. 500 5. 505 5. 510 5. 515 5. 520	443 453 464 474 486	4, 009 4, 014 4, 019 4, 024 4, 029				``.

U. S. GOVERNMENT PRINTING OFFICE 16-31070-1

INVERSE POSITION COMPUTATION

$$\begin{aligned} & s_1 \sin \left(\alpha + \frac{\Delta \alpha}{2}\right) = \frac{\Delta \lambda_1 \cos \phi_m}{\Lambda_m} \\ & s_1 \cos \left(\alpha + \frac{\Delta \alpha}{2}\right) = \frac{-\Delta \phi_1 \cos \frac{\Delta \lambda}{2}}{B_m} \\ & -\Delta \alpha = \Delta \lambda \sin \phi_m \sec \frac{\Delta \phi}{2} + F(\Delta \lambda)^3 \end{aligned}$$

in which $\log \Delta \lambda_i = \log (\lambda' - \lambda)$ —correction for arc to \sin^* ; $\log \Delta \phi_i = \log (\phi' - \phi)$ —correction for arc to \sin^* ; and $\log s = \log s_i + \cos \phi$ correction for arc to \sin^* .

		NAME O	F STATION	
	1. φ	48 44 18.575 BEEC	ch 15/4 \ \ \	122 29 28:126
	2. φ'	I I	1 3 (USE) 1941 X	122 36 00.236 -
	$\frac{\Delta\phi}{2} (= \phi' - \phi)$	+ 01 55.422 115 60 57.711	$\frac{\Delta\lambda}{2} (=\lambda' - \lambda)$	06 32.110
	$\phi_{\mathbf{m}} \Big(= \phi + \frac{\Delta \phi}{2} \Big)$	48 45 16.286 /	Ĭ	
	Δφ (secs.)	115.47.2.	Δλ (secs.)	392.110
	· · · · · · · · · · · · · · · · · · ·			·
	log Δφ	2. 062 2886 4	log Δλ	Z. 593 '4079 +
	eor. arc-sin		cor. arc—sin	
	$\log \Delta \phi_1$		$\log \Delta \lambda_1$.	
	$\log \cos \frac{\Delta \lambda}{2}$		log cos φ _m	9. 819 0741 1
	$colog B_m$	1 489 8215	colog A _m	1. 491 1060 1
	$\log \left\{ s_1 \cos \left(\alpha + \frac{\Delta \alpha}{2} \right) \right\}$	3.552 / 10 (opposite in sign to $\Delta \phi$)	$\log \left\{ \mathbf{s}_1 \sin \left(\alpha + \frac{\Delta \alpha}{2} \right) \right\}$	3. 903 5880 ±
		7	$\log \left\{ \mathbf{s}_{t} \cos \left(\alpha + \frac{\Delta \alpha}{2} \right) \right\}$	3. 552 1101
	log Δλ	z. 593 4079 + 3logΔλ	$\log an \left(lpha + rac{\Delta lpha}{2} ight)$	0:351 H779 " m
	$\log \sin \phi_{ m m}$	9.876 1555 · log F	$\alpha + \frac{\Delta \alpha}{2}$	113 59 49.235
	$\log\secrac{\Delta\phi}{2}$	log b	$\log \sin \left(\alpha + \frac{\Delta \alpha}{2} \right)$	9-960 7403 +
	log a	z.4695634	$\log \cos \left(\alpha + \frac{\Delta \alpha}{2} \right)$	9.609 2624
	а	294.82 +	log s _i	3 942 8477 +
	ь		cor. arc—sin	+
	-Δα (secs.)	+ 294.82	log s	· · · · · · · · · · · · · · · · · · ·
	$-\frac{\Delta \alpha}{2}$	+ 147.41		• • • • • • • • • • • • • • • • • • • •
	$\alpha + \frac{\Delta \alpha}{2}$	+ 02 27.41 113 59 49.24		ne back of this form for correction of
	α (1 to 2)	114 02 16:65	are to sin.	
	$\Delta \alpha$	- 04 54.82		
	:	180		
	α' (2 to 1)	293 57 21.83		•

Note.—For log s up to 4.0 and for $\Delta \phi$ or $\Delta \lambda$ (or both) up to 3', omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 7 decimal places.

Table of arc-sin corrections for inverse position computations

								<u> </u>	
log sı	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	$\log s_i$	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	log s _i	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	
4. 177	1	2 . 686	5. 223	124	3, 732	5, 525	497	4. 034	
4. 327 4. 415	2 3	2. 836 2. 924	5. 234 5. 243	130 136	3. 743 3. 752	5, 525 5, 530 5, 534	508 519	4. 039 4. 043	
4. 478 4. 526	2 3 4 5	2. 987 3. 035	5. 253 5. 260	142 147	3. 762 3. 769	5. 539 5. 543	530 541	4. 048 4. 052	
4. 566 4. 599	6 7	3. 075 3. 108	5. 269	153	3. 778	5. 548	553	4. 057	
4. 628	8 9	3. 105 3. 137 3. 163	5. 279 5. 287 5. 294	160 166 172	3. 788 3. 796 3. 803	5. 553 5. 557 5. 561	565 577 588	4. 062 4. 066 4. 070	
4. 654 4. 677	10	3. 186	5. 303	179	3. 812	5. 566	600	4. 075	
4. 697 4. 716 4. 734	11 12 13	3. 206 3. 225 3. 243	5. 311 5. 318 5. 326	186 192	3. 820 3. 827 3. 835	5. 570 5. 575	613 625	4, 079 4, 084	
4. 750 4. 765	14 14 15	3. 259 3. 274	5. 334 5. 341	199 206 213	3. 843 3. 850	5, 579 5, 583 5, 587	637 650 663	4, 088 4, 092 4, 096	
	16	3, 288	5. 349	221	3, 858	5, 591	674	4. 100	
4, 779 4, 792 4, 804	17 18	3. 301 3. 313	5, 356 5, 363	228 236	3. 865 3. 872 3. 878	5, 595 5, 600	687 702	4, 104 4, 109	
4. 827 4. 857	20 23	3. 336 3. 366	5. 369 5. 376	243 251	3. 878 3. 885	5. 604 5. 608	716 729	4. 113 4. 117	
4. 876 4. 892 4. 915	25 27 30	3. 385 3. 401	5. 383 5. 390	259 267	3. 892 3. 899	5. 612 5. 616	743 757	4, 121 4, 125	
4. 936	30 33 36	3. 424 3. 445	5. 396 5. 403	275 284 292	3. 905 3. 912	5. 620 5. 624	771 785	4. 129 4. 133	
4. 955 4. 972	36	3. 464 3. 481	5. 409 5. 415	300	3. 918 3. 924	5. 628 5. 632	800 814	4. 137 4. 141	
4. 988 5. 003 5. 017	42 45	3. 497 3. 512	5. 422 5. 428	309 318	3. 931 3. 937	5. 636 5. 640	829 845	4. 145 4. 149	
5. 017 5. 035	48 52	3. 526 3. 544	5. 434 5. 440	327 336	3, 943 3, 949	5. 644 5. 648	861 877	4. 153 4. 157	
5. 051 5. 062	56 59	3, 560 3, 571	5. 446 5. 451	345 354	3. 955 3. 960	5. 652 5. 656	893 909	4. 161 4. 165	
5. 062 5. 076 5. 090	63 67	3, 585 3, 599	5. 457 5. 462	364 373	3. 966 3. 971	5. 660 5. 663	925 941	4. 169 4. 172	
5. 102	71	3. 611	5. 468	383	3. 977	5. 667	957	4. 176	
5. 114 5. 128 5. 139	75 80 84	3. 623 3. 637 3. 648	5. 473 5. 479 5. 484	392 402 412	3. 982 3. 988 3. 993	5. 671 5. 674 5. 678	973 989 1005	4. 180 4. 183 4. 187	
5. 151 5. 163	89 94	3. 660 3. 672	5. 489 5. 495	422 433	3. 998 4. 004		1000	101	
5. 172	98	3. 681	5. 500	443	4, 009				
5. 183 5. 193 5. 205	103 108 114	3. 692 3. 702 3. 714	5, 505 5, 510 5, 515	453 464 474	4. 014 4. 019 4. 024				
5. 214	119	3, 723	5. 520	486	4. 029				

U. S. GOVERNMENT PRINTING OFFICE 16-31070-1

INVERSE POSITION COMPUTATION

$$\begin{aligned} & s_{1} \sin \left(\alpha + \frac{\Delta \alpha}{2}\right) = \frac{\Delta \lambda_{1} \cos \phi_{m}}{\Lambda_{m}} \\ & s_{1} \cos \left(\alpha + \frac{\Delta \alpha}{2}\right) = \frac{-\Delta \phi_{1} \cos \frac{\Delta \lambda}{2}}{B_{m}} \\ & -\Delta \alpha = \Delta \lambda \sin \phi_{m} \sec \frac{\Delta \phi}{2} + F(\Delta \lambda)^{3} \end{aligned}$$

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 $\log s = \log s_1 + \cos t$ correction for arc to \sin^* .

	NAME OF	FSTATION	
1. φ 2. φ'	48 46 13.997 JOHN - Bellingho.	3 (USE) 1941 X m. ohympic Fortland	122 36 00.236 122 31 21.880
$ \Delta \phi \ (=\phi'-\phi) \\ \frac{\Delta \phi}{2} $	- 06.917 - 03.458	$\frac{\Delta\lambda}{2} (=\lambda' - \lambda)$	- 04 38.356 - 02 /9./78
$\phi_{\rm m} \Big(= \phi + \frac{\Delta \phi}{2} \Big)$ $\Delta \phi \text{ (secs.)}$	48 - 46 - 10·538 06·917	Δλ (secs.)	278·356
log ∆φ	0. 839 9178	log Δλ	2.444 6006 -
cor. arc—sin		cor. arc—sin	
$\frac{\log \Delta \phi_1}{\log \cos \frac{\Delta \lambda}{2}}$		$\log \Delta \lambda_1$ $\log \cos \phi_m$	9.818 9438 +
$\begin{array}{c} \mathbf{colog} \ \mathbf{B}_{\mathrm{m}} \\ \mathbf{log} \Big\{ \mathbf{s}_{1} \ \mathbf{cos} \Big(\alpha + \frac{\Delta \alpha}{2} \Big) \Big\} \end{array}$	7. 489 8226 (opposite in 2.3 29 74 Δ 4 4 sign to Δφ)	$egin{align*} \mathbf{colog} \ \mathbf{A_m} \ \mathbf{log} \Big\{ & \mathbf{s_i} \ \mathbf{sin} \left(lpha + rac{\Delta lpha}{2} ight) \Big\} \ \mathbf{log} \Big\{ & \mathbf{s_i} \ \mathbf{cos} \left(lpha + rac{\Delta lpha}{2} ight) \Big\} \end{aligned}$	1.491 1664 7 3.754 650 8 - 2.329 7404 4
$egin{aligned} oldsymbol{\log \Delta \lambda} \ oldsymbol{\log sec} rac{\Delta \phi}{2} \end{aligned}$	2.444 6006 3log Δλ 9.876 2555, log F	$\log \tan \left(\alpha + \frac{\Delta \alpha}{2}\right)$ $\alpha + \frac{\Delta \alpha}{2}$ $\log \sin \left(\alpha + \frac{\Delta \alpha}{2}\right)$	1.04249,104 , in 272 09 10.154
log a	2.3 2 0 85 6 1 _m	$\log \cos \left(\alpha + \frac{\Delta \alpha}{2}\right)$	9.999 6934 M 8.574 7830
a b	209.34	log s _i	3. 754 9574
$-\Delta \alpha$ (secs.) $\Delta \alpha$	- 200 , 34 - 104 - 67	log s	
$-rac{\Delta lpha}{2}$ $\alpha+rac{\Delta lpha}{2}$	- 01 44.67 272 05 10.15	* Use the table on th	e back of this form for correction of
α (1 to 2) <u>Δα</u>	272 07 25.48		
α' (2 to 1)	92 10 54.82		

Note.—For log s up to 4.0 and for $\Delta\phi$ or $\Delta\lambda$ (or both) up to 3', omit all terms below the heavy line except those printed (in whole or in part) in heavy type or those underscored, if using logarithms to 7 decimal places.

Table of arc-sin corrections for inverse position computations

log sı	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	log s ₁	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	$\log s_1$	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	
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 4. 599 4. 628 4. 654 4. 677	6 7 8 9	3, 075 3, 108 3, 137 3, 163 3, 186	5. 269 5. 279 5. 287 5. 294 5. 303	153 160 166 172 179	3. 778 3. 788 3. 796 3. 803 3. 812	5. 548 5. 553 5. 557 5. 561 5. 566	553 565 577 588 600	4. 057 4. 062 4. 066 4. 070 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 5. 128 5. 139 5. 151 5. 163	75 80 84 89 94	3. 623 3. 637 3. 648 3. 660 3. 672	5. 473 5. 479 5. 484 5. 489 5. 495	392 402 412 422 433	3, 982 3, 988 3, 993 3, 998 4, 004	5. 671 5. 674 5. 678	973 989 1005	4. 180 4. 183 4. 187	
5. 172 5. 183 5. 193 5. 205 5. 214	98 103 108 114 119	3. 681 3. 692 3. 702 3. 714 3. 723	5. 500 5. 505 5. 510 5. 515 5. 520	443 453 464 474 486	4. 009 4. 014 4. 019 4. 024 4. 029				

U. S. GOVERNMENT PRIKTING OFFICE 16-81070-1

INVERSE POSITION COMPUTATION

$$\begin{aligned} s_1 & \sin \left(\alpha + \frac{\Delta \alpha}{2}\right) = \frac{\Delta \lambda_1 \cos \phi_m}{A_m} \\ s_1 & \cos \left(\alpha + \frac{\Delta \alpha}{2}\right) = \frac{-\Delta \phi_1 \cos \frac{\Delta \lambda}{2}}{B_m} \\ & -\Delta \alpha = \Delta \lambda \sin \phi_m \sec \frac{\Delta \phi}{2} + F(\Delta \lambda)^3 \end{aligned}$$

in which $\log \Delta \lambda_1 = \log (\lambda' - \lambda) - \text{correction for arc to sin*}$; $\log \Delta \phi_1 = \log (\phi' - \phi) - \text{correction for arc to sin*}$; and $\log s = \log s_1 + \frac{1}{2}$ correction for arc to sin*.

correction for are to s		STATION	
1. φ 2. φ'	48 44 18.575 BEEC 48 46 07.080 Bellingh	μ /9/4 λ	122 29 28.126 122 31 21.880
$\Delta \phi \ (=\phi'-\phi)$ $\Delta \phi \over 2$ $\phi_{\rm m} \left(=\phi+\frac{\Delta \phi}{2}\right)$	+ 01 48.505 103 54.252 48 45 12.827	$\frac{\Delta\lambda}{2} (=\lambda' - \lambda)$	+ 01 53·754 113 + 56·877
Δφ (secs.)	+ 108 - 505	Δλ (secs.)	+ 113.754
$\log \Delta \phi$ $\operatorname{cor. arc-sin}$ $\log \Delta \phi_1$ $\log \cos \frac{\Delta \lambda}{2}$ $\operatorname{colog} \mathbf{B}_{\mathrm{m}}$	2. 035 4498 + - 1. 481 8214	$egin{aligned} & \log \Delta \lambda & & & & & \\ & & & & & & & \\ & & & & &$	2. 055 9C67 + - 9 813 0824 1 491 1060
$egin{aligned} & \log \left\{ \mathbf{s_1} \cos \left(lpha + rac{\Delta lpha}{2} ight) ight\} \ & \log \Delta \lambda \ & \log \sin \phi_{\mathrm{m}} \end{aligned}$	3. 5 2 5 27 / 7 sign to Δφ) Z. 055 96671 3 log Δλ 9. 876 14 9 1 1 log F	$egin{aligned} \log \left\{ \mathbf{s}_1 \cos \left(lpha + rac{\Delta lpha}{2} ight) ight\} \ \log an \left(lpha + rac{\Delta lpha}{2} ight) \ lpha + rac{\Delta lpha}{2} \end{aligned}$	3. 525 2712 m 9.840 8 \$ 39 " m 145 16 07.44
$\log\secrac{\Delta\phi}{2}$ $\log \mathbf{a}$ \mathbf{a}	log b	$egin{aligned} \log \sin\left(lpha + rac{\Deltalpha}{2} ight) \ \log \cos\left(lpha + rac{\Deltalpha}{2} ight) \ \log s_{t} \end{aligned}$	9.755 66 77 + 9.914 78.38 m 3.610 48.74
b	+ 85.53	cor. arc—sin	+
$-\Delta lpha$ (secs.) $-rac{\Delta lpha}{2}$	+ 42.76 42.76	-	
$\alpha + \frac{\Delta \alpha}{2}$	145 16 07.44	* Use the table on tarc to sin.	he back of this form for correction of
α (1 to 2) <u>Δα</u>	145 16 50.20°°	•	•
α' (2 to 1)	325 15 24.67		

Table of arc-sin corrections for inverse position computations

		====			e position com	paramons			
log s	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	log sı	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	$\log s_1$	Arc-sin correction in units of seventh decimal of logarithms	log Δφ or log Δλ	
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, 548	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 5. 128 5. 139 5. 151 5. 163	75 80 84 89 94	3. 623 3. 637 3. 648 3. 660 3. 672	5. 473 5. 479 5. 484 5. 489 6. 495	392 402 412 422 433	3. 982 3. 988 3. 993 3. 998 4. 004	5. 671 5. 674 5. 678	973 989 1005	4. 180 4. 183 4. 187	
5. 172 5. 183 5. 193 5. 205 5. 214	98 103 108 114 119	3. 681 3. 692 3. 702 3. 714 3. 723	5.+500 5. 505 5. 510 5. 515 5. 520	443 453 464 474 486	4. 009 4. 014 4. 019 4. 024 4. 029				,

U. S. GOVERNMENT PRINTING CHECK 16-21070-1

DEPARTMENT OF COMMERCE	U. S. COAST AND GEODETIC SURVEY	Form 27	Ed April 1945
DEPARTN	U. S. COAST		1

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

-	Ed. April 1945			-		`		*						-	0	-		"
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. *	3.299 182	-4		-φ) *	\$(\phi + \phi')	34	† †	45.473	83	3.855 4	404			* (4+4')-		7 8 H	45 4	43.183
٠,	9.921400	<u> 0</u> 	Či,		——	Logarithms		Values in seconds	Cosa	9.423	727				Log	Logarithms	-	Values in
٠,	181015.8	0	interpretation of the second	8	m	3.2991	787		В	1015.3	177				w)	3.855 404		
-11	1.730762	2 Ist term	- (e-)	Sina	6	741 2	7 612		ų	1.7888	o 5 1st	1st term	+ 61.490	Sinα	9.6.6	161 486 6	}	
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1	4. 48244		D. January	Sec φ'	ó	180 9	916		$\sin^2 \alpha$	9.968	800 M			Sec φ'	0.180	80 916	\ <u>0</u>	
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l l	7.54120	2d term	+ 0.003	Sin \(\frac{1}{2} (\phi + \phi') \)	ł	9.876 0	860			1071.6	7	2d term	4 6.136	Sin } (φ+φ')	9.876	20	ار ا	7. /
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DEPARTMENT OF COMMERCE U. 8. COAST AND GEODETIC SURVEY FORM 271 1945

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

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D			Δλ.	8 298 1	23 72.916	ت	1.460	76		۷γ	2.50	2.504055	319,194
į	7.80643	2d term + 0.006	Sin (φ+φ')	1.876110	0		9.089	3.7	2d term + 0.122	Sin \$ (4+4')		9.876216	
ם	3.6363		Δα	1.73893	13 54.82		38.8	8 3		Δα	2.38	1220	240.03
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LIST OF DIRECTIONS

T-5534

Station PEARSON 3, 1949 State Washington

Chief of party C.V. Clark Date 12/7/19, 3/22/50, 2/5/51 Computed by J.C.I.

7 Berger, #231 C.V.C.

Observer J.C. Injoye Instrument Korn P-36563 Checked by G.R.

OBSERVED STATION	Observed direction	Eccentric reduc-	Sea level reduction *	Corrected direction with zero initial	Adjusted direction*
	6 / #	, 0		- 0 / // -	1 - 9
JOHN 3 (USE), 1941	0 00 00.00	ļ		0 00 00.00	
			,		
coor, Mt. Constitution	26 11 11.1				
1949		∯	-		
		<u> </u>	· · · · · · · · · · · · · · · · · · ·	ents to the control	†
1.11. 110. 2 20.416 neters 66.98 feet	95 36 43		 	, -	
 		!			
TICHTLL, 1941 (Comp.)	304 02 15.6	}	ļ		
			ļ .		ļ -
ellingham, Larson Tank,	314_03_37.0			· · · · · · · · · · · · · · · · · · ·	
1951	:		<u> </u>		
VHATCON, 1926 (Comp.)	321 04 20.6		-		
minious Lyco (compay)	- Joseph - Little - Artifet	1		† - 	†· - ··
2224		+ ·· ·- ·	 	 	† · · ·
ollingham, Oeser Cedar		 	-	 	 -
lo, Stack, 1950-1941	328_36_02.2			 	
					† · ·
ellingham, Sunset Heights,	, 332 10 38.1				ļ
water tank					† - ·
					1.
Seattle-Vancouver Airway	345 31 55.		,	1	,
Beacon No. 8, 1941		* `	† · ·		1
Decident Mos. Og. 2722			1		-
n 11 m 7 26 000 ii Ausia	APA 36 AA			†	
R.M. No. 1 16.239 meters 53.28 feet	359 13 28	ļ	-	 -	-
		ļ		·	i
		1			†
No eccentricity of signal	or instrument.		! +- ^ ^	 	
All objects observed are	vlsible from gr	ound.			
				1	
· · · · · · · · · · · · · · · · · · ·		-	† · - · -	• • • • • • • • • • • • • • • • •	
<u> </u>		† – -	 ·	+	
	·	+ · · · · · · · · · · · · · · · · · · ·	 		
				L	<u> </u>

Chief of party: C. V. H.

Observer: C. V. H.

State: Maryland

Date: 1917

Instrument: No. 168

Computed by: O. P. S.

Checked by: W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
Chevy Tank west of \(\triangle \) Dulce Ken (center), 3.469 meters Forest Glen standpipe Home Bureau of Standards, wireless pole Reno Reference mark, 16.32 m	0 00 00.00 29 03 37.0 176 42 313 24 53.0 326 31 30.21 352 17 20.8 357 28 48.63 358 31 20	- 7.31 -1 09.8 +3 01.2 + 31.93 + 5.7 - 1.16	•	0 00 00.00 29 02 34.5 313 28 01.5 326 32 09.45 352 17 33.8 357 28 54.78	
To Home Ken	eccentric		·		,

This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. To be acceptable it must contain every direction observed at the station.

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned clockwise around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

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DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 24A , Rev. Oct., 1932

44

LIST OF DIRECTIONS

Station JOHN 3 (USE), 19 Chief of party C.V. Clark		ington /51	·	C (11 - *				
Observer J.C. Lossoye	•	erger 7º #/	231	Computed by J.C.L. Checked by C.N.C.				
OBSERVED STATION	Observed direction	Eccentric reduc-	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*			
Seattle-Vencouver Airway Seacon No. 8, 1941	0 00 00.00	, H		0 00 00.00				
Seattle-Vancouver Airway Seacon No. 9, 1951	277 59 15.9							
писнил, 1941 (Сопр.)	282 28 07.5	-						
lellingham Breakwater Entrance Light, 1951	315 52 27,1							
OTAN 3 (U.S.E.),1941 (Comp.	324 00 00,6							
ellinghem, Sumset Heights,	327 51 28,7				-			
allingham Plywood Corp.,	338 37 48.7							
	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -							
NOTE: Bellingham Bree same as Belling tions dated 4/	hwater Entrance than Breakmater 750.	Entrance L	on the light, 1	his list is not 950 on list of	the Direc-			
ecorded pp. 21-22 o eccentricities.					•			
					-			
					-			
			···		•			

 $[\]ensuremath{^{\bullet}}$ These columns are for office use and should be left blank in the field.

State: Maryland

Chief of party: C. V. H.

Date: 1917

Computed by: O. P. S.

Observer: C. V. H.

Instrument: No. 168

Checked by: W. F. R.

OBSERVED STATION	Observed	dire	etion		entric action	Sea level reduction	Correc	ted di zero i	rection with nitial	Ad dir	justed ection
Chevy Tank west of \(\Delta \) Dulce Ken (center), 3.469 meters Forest Glen standpipe Home Bureau of Standards, wireless pole Reference mark, 16.32 m Kel To Home See 58	0 29 176 313 326 352 357 358	700 03 42 24 31 17 28 31	20	+3++-	7.31 09.8 01.2 31.93 5.7 1.16		0 29 313 326 352 357	, 00 02 28 32 17 28	00.00 34.5 01.5 09.45 33.8 54.78		<i>d</i> .

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DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 24A Rev. Oct., 1932

Photogrammetric Record - 4th Order LIST OF DIRECTIONS

Station BUSWELL (U.S.E.)	State Washington	
Chief of party C.W. Clark	Date 12/7/49	Computed by J.C. L.
Observer J.C. Lajoye	Instrument 7" Berger #231	Checked by C.W.C.

OBSERVED STATION	. Observed direction	Eccentric reduc-	Sea level reduction	Corrected direction with zero initial	Adjusted direction •
Bellingham, Bloedel- Donovan Stack, 1927	0 00 00:00	****	10	0 / //	, ,,
Seattle-Vancouver Airway	0 00 00:00			0 00 00.00	
	20 70 71		, .		
Beacon No. 8, 1941	30 10 14.4	- 1 = -	. . -y= -		-
UMI (Topo.)	05 10 17 0		• • • • • • • • • • • • • • • • • • • •		
nowit (Tobo.)	95 40 47.2				
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Chief of party: C. V. H.

Observer: C. V. H.

State: Maryland

Date: 1917.

Instrument: No. 168

Computed by: O. P. S.

Checked by: W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
Chevy	0 00 00.00 29 03 37.0 176 42 313 24 53.0 326 31 30.21 352 17 20.8 357 28 48.63 358 31 20	7.31 -1 09.8 +3 01.2 + 31.93 + 5.7 - 1.16	"	0 00 00:00 29 02 34.5 313 28 01.5 326 32 09.45 352 17 33.8 357 28 54.78	r n
To Home Ken	eccentric ^{Sen} ∆ Ken				

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LIST OF DIRECTIONS

Station JOHN 3 (U.S.E.) 1941 State Washington

Chief of party C.W. Clark Date 4-5-50 Computed by J.C. Lajoye

Observer C.W. Clark Instrument Kern P-36563 Checked by G. Richter

OBSERVED STATION	Ob	served o	lirection		tric reduc- tion	Sea level reduction*	Corre	ted dire zero ini	ction with tial	Adjusted direction*
Seattle-Vancouver Alrway Beacon No. 8, 1941		_00_	.″	+ 00	04.0			_00_(, , , , , , , , , , , , , , , , , , ,
PEARSON 3, 1949	203	43	05.6	- 00	07.3		1 .		54.3	
JOHN 3 (U.S.E.), 1941				<u> </u>						
(Center) d = 0.330 m.	302	29		1		1				
Bellingham, Oeser Cedar				1.			Ï			1.4
Co. Stack, 1941	302	14	23.4		, -		302	14	23.4	7
Bellingham, Olympic Port			,			-				
land Coment Co., Stack,			•]		-	•	
S.W. of 3, 1941	303	02	58,6		:		303	02	58.6	
Larsen Tank	308	17	40.6				308	17	40,6	
Squalicum Creek Entrance	1		•					ě.		•
Light	313	59	50.8	Ì			313	59	50,8	•
Bellingham Breakwater				1	- · · · ·					
Entrance Light	315	39	43.8	1			31.5	39	43.8	
Whatcom Waterway Light	320	39	38,6	1			320	39	38.6	•
BEECH, 1914-1927 (Computed	1)324	45	02.1	1		•		• .	* * * * * * * * * * * * * * * * * * * *	
FRANCES 2 (U.S.E.) 1940 -			• -		:		-			-
1941 (Computed)	33	23	02,7	-		-· - <i>-</i>				
			_ ' _51 .		· - ·-			-	Ì	- •
Instrument eccentric fo	r obs	91.A8	tions	on PE	ARSON	3.			-	-
No eccentricity of inst	1			1	_ 1	i ⁻				
No eccentricity of Sign			- · -	 -			2°- 29	, .		
e - de la companya d						3*	24	ι		
All objects observed ar	e vis	ible	from a	roun	s	(5)	9	<u>, </u>	0. 3 10m N	JOHN 3 (USE
except PEARSON 3 (pol				Ī	•	JOHN 3(U	المحراة		-	
•				1	-	Ecc.	-,	<u>'</u>	}	
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									1	
				i			一丁。	. Se.	≤ttle- Vi	No. 8, 1941

___ .

Chief of party: C. V. H. Observer: C. V. H.

State: Maryland

Date: 1917

Instrument: No. 168

Computed by: O. P. S.

Checked by: W. F. R.

OBSERVED STATION .	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
Chevy	0 00 00.00 29 03 37.0 176 42 313 24 53.0 326 31 30.21 352 17 20.8 357 28 48.63 358 31 20	7.31 -1 09.8 +3 01.2 + 31.93 + 5.7 - 1.16	,	0 00 00.00 29 02 34.5 313 28 01.5 326 32 09.45 352 17 33.8 357 28 54.78	, ,,
To:Home Co. 50	eccentric Ken		-		

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DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FOrm 24A Rev. Oct., 1932

LIST OF DIRECTIONS

Chief of party C.V. Clark
Observer J.C. Lajoye

Station PEARSON 3, 1949 State Washington

Instrument 7" Berger, #231 Checked by C.W. Clark

Date 12-7-49, 3-22-50 Computed by J.C. Lajoye

OBSERVED STATION	Observed direction	Eccentric reduc-	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
	0 / //	,	,	0 / "	, "
JOHN 3 (USE), 1941	0 00 00.00		<u>.</u> .	0_00_00.00	ı
	ļ.,				
lower, lit. Constitution					
1949	46 11 11.1				•
Bellingham Oeser Gedar					
Co. Stack, 1950 1941	328 36 02.2				
Seattle-Vancouver Airway	, , , , , , , , , , , , , , , , , , , ,				
Beacon No. 8, 1941	345 31 55.5	1			
	4 2	† - • †	-		
16.239 meters 3.11. No. 1 53.28 feet	359 13 28	* • • • • • • • • • • • • • • • • • • •	,		. •
'	· ·				
20.416 meters R.H. No. 2 66.98 feet	00 00 10	+			
1.H. No. 2 66.98 Feet	95 36 43	 	 		
		_		*	
		<u> </u>			
No eccentricity of	signal or inst	rument.			
All objects observ	ed are visible	from ground			}
mana and a same and a same and a same and a same and a same and a same and a same and a same and a same and a s					
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State: Maryland

Chief of party: C. V. H.

Date: 1917

Computed by: O. P. S.

Observer: C. V. H.

Instrument: No. 168

Checked by: W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
Chevy Tank west of △ Dulce Ken (center), 3.469 meters Forest Glen standpipe Home Bureau of Standards, wireless pole Reno Reference mark, 16.32 m	0 00 00.00 29 03 37.0 176 42 313 24 53.0 326 31 30.21 352 17 20.8 357 28 48.63 358 31 20	- 7.31 -1 09.8 +3 01.2 + 31.93 + 5.7 - 1.16	,	0 00 00.00 29 02 34.5 313 28 01.5 326 32 09.45 352 17 33.8 357 28 54.78	<i>1 11</i>
To Home Ken	eccentric _e Ren				

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DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY Form 24A Rev. Oct., 1932

LIST OF DIRECTIONS

Squalicum Creek State Washington Station Entrance Light Computed by J.C. Lajoye Date 4-7-50 Chief of party C.W. Clark Instrument Kern P-36563 Checked by ... G. Richter Observer I. Zirpel. Jr. Adjusted direction* Eccentric reduc-Sea level reduction* Corrected direction with zero initial OBSERVED STATION Observed direction -02 57.9 BEECH 1914, 1927 ... 0 00 00.00 0 00 00.00 Squalicum Creek Entrance Light, (Center) d=2.32 m 30 Bellingham Coser Coder Co. 104 00.8 204 51 204 44 22.3 Stack. 1941 Squalicum Creek Waterway 235 10 04.4 Light | (City Hall) Bellingham 56,3 07.0 -03 Museum, 1914-1927 Bellingham Breakwater Entrance Light 350 58 19.9 -04 12.8 Whatcom Waterway Light Squalicum Creek Entrance Light Ecc. Instrument eccentric for all observations. No eccentricity of signal. TO REECH, 1914-1927

^{*} These columns are for office use and should be left blank in the field.

Station: Ken

Chief of party: C. V. H.

Observer: C. V. H.

State: Maryland

Date: 1917

Instrument: No. 168

Computed by: O. P. S.

Checked by: W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
Chevy	0 00 00.00 29 03 37.0 176 42 313 24 53.0 326 31 30.21 352 17 20.8 357 28 48.63 358 31 20	- 7.31 -1 09.8 +3 01.2 + 31.93 + 5.7 - 1.16	IF	0 00 00.00 29 02 34.5 313 28 01.5 326 32 09.45 352 17 33.8 357 28 54.78	7 "
To Home Ken	eccentric				

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Checked by .

C.71.C.

LIST OF DIRECTIONS

Station BEECH 1914-1927 State Washington

Chief of party C.W. Clerk Date 4/4/50, 1/26/51, 2/27/51 Computed by J.C.L.

Chief of party C.W. Clark

C.W. Clark

Observer J.C. Lajoya

Date 4/4/50, 1/26/51, 2/27

Kern P-36563

Instrument Berger 70, //231

Corrected direction with zero initial Sea level reduction Eccentric reduc-Observed direction OBSERVED STATION (City Hall) Bellingham Huseum, 1927 0 00 00.000 00 00.00 R.M. 1 (highest point of 55 21 boulder) R.M. No. 4. 1951 6.682 meters 68 21.93 feet R.H. 2 (cross on hospital) 143 22 30 15 151 48 R.H. 3 Bellingham, Hospital stack, 174 25 1914 JOHN 3 (USE), 1941 (Comp.) 266 57 29.4 Squalicum Creek Entrance 58.6 Light Bellingham, Olympic Port-00 00.1 298 land Cement Co. Stack, SW of 3, 1941 Bellingham Breakwater 302 31 01.3 Entrance Light, 1951 18.6 Bellingham Breekwater 303 Entrance Light, 1950 Bellingham, Ceser Cedar Co. Stack, 1941 48.2 319 Whatcom Waterway Light Bellingham, Bloedel-333 44 Donovan Stack. 1927 NOTE: Bellingham Breakwater Entrance Light, 1950 was moved between 4-4-50 and 1-26-51. Squalicum Creek Entrance Light was destroyed after being observed upon on 1/26/51. Recorded p. 20, p. 39. No eccentricity of signal or instrument. All objects observed are visible from ground.

^{*} These columns are for office use and should be left blank in the field.

Station: Ken

Chief of party: C. V. H.

Observer: C. V. H.

State: Maryland

Date: 1917

Instrument: No. 168

Computed by: O. P. S.

Checked by: W. F. R.

OBSERVED STATION	Observe	d dire	ction		centrio luction	Sea level reduction	Correc		irection with initial	A dji dire	usted etion
Chevy. Tank west of \(\Delta \) Dulce Ken (center), 3.469 meters Forest Glen standpipe Home Bureau of Standards, wireless pole Reno Reference mark, 16.32 m Ken To Home	0 29 176 313 326 352 357 358 eccen	00 03 42 24 31 17 28 31	00.00 37.0 53.0 30.21 20.8 48.63 20	, -1 +3 + +	7.31 09.8 01.2 31.93 5.7 1.16	T T	0 29 313 326 352 ,357	, 00 02 28 32 17 28	00.00 34.5 01.5 09.45 33.8 54.78		,

This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. To be acceptable it must contain every direction observed at the station.

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned clockwise around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. Measure no sum angles. Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.

NAUTICAL CHARTS BRANCH

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
1-28-81	18424	C James	Before After Verification and Review 7-55645
		216/81 RCS	Pully applied Drg 24
1-28-81	18424	6 James	Before After Verification and Review I. 5.5 9.45
INSET		2-6-81 Ras	fully applied Dig 24
1-28:-81	184238	6 Janus	Before After Verification and Review 7-55845
Anset	1_	2-6-BI ROS	1 . 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1-28-81	1812/	6 James	Before After Verification and Review 7-55845
		12-6-81-RCS	fully applied Drg 11
1-28-81	18 400	2-6-81-RCS Gfamed 2-6-8120	Before After Verification and Review 7_55845-N
		/	Fully applied Dry 45
			Before After Verification and Review
			Before After Verification and Review
<u> </u>			
	<u> </u>		Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
	-		
	 		
 	-		
			,
			`
L		<u> </u>	M-2168-1

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

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT
Type of Survey Topographic
Field No. Office No. T-5584 Project Ph-26 (47)
LOCALITY
State Washington
General locality Bellingham.
Locality Nooksack Kiver
19
CHIEF OF PARTY C. W. Clark, Chief of Field Party Hubert A. Paton, Baltimore Photo. Office
LIBRARY & ARCHIVES
DATE

 $\int_{\mathbb{R}^{N}}$

DATA RECORD

T- 5584

Project No. (II):

Quadrangle Name (IV):

PH-26 (47)

Field Office (II):

Bellingham, Wash.

Chief of Party:

C.W. Clark

Photogrammetric Office (III): Baltimore, Maryland

Officer-in-Charge:

H.A. Paton

Instructions dated (II) (III):

31 August 1949

Lette dated 24 October 1949

No. 731-aal

Copy filed in Division of Photogrammetry (fV)

Method of Compilation (III): Air-photographic-Multiplex

Manuscript Scale (III): 1:10,000

Stereoscopic Plotting Instrument Scale (III): 1:10,000

Scale Factor (III): 1.00

Date received in Washington Office (IV):

Date reported to Nautical Chart Branch (IV):

Applied to Chart No.

Date:

Date registered (IV):

Publication Scale (IV):

Publication date (IV):

Geographic Datum (III):

N.A. 1927

Vertical Datum (III):

Mean sea level except as follows: Elevations shown as (25) refer to mean high water Elevations shown as $(\underline{5})$ refer to sounding datum i.e., mean low water or mean lower low water

Reference Station (III):

PEARSON 3. 1949

48° 51' 09.238"

Long.:

122° 36' 55.797"

Adlusted

Unadjusted

Plane Coordinates (IV):

State:

Washington Zone:

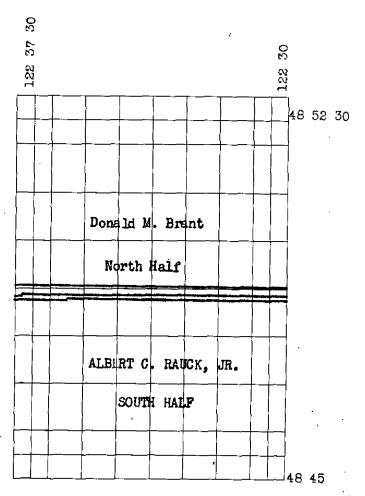
North

Y=

X=

Roman numerals indicate whether the item is to be entered by (II) Field Party, (III) Photogrammetric Office, or (IV) Washington Office.

When entering names of personnel on this record give the surname and initials, not initials only.



Areas contoured by various personnel (Show name within area)
(II) (III)

DATA RECORD

Field Inspection by (ii): John C. Lajoy
Roy A. Davidson

Date: 12-7-49

Planetable contouring by (II): Date;

Completion Surveys by (II): Date:

Mean High Water Location (III) (State date and method of location):
Same as date of photography

Projection and Grids ruled by (IV): T.L.J. Date: 6-19-50

Projection and Grids checked by (IV): H.D.W. Date: 6-20-50

Control plotted by (III): B.A.Den Date: July 1950

Control checked by (III): A.K.Haywood Date: July1950

RadiakRowkor Stereoscopic
Date: August 1950

Control extension by (III): D.M. Brant and A.C. Rannk, Jr.

Planimetry D.M. Brant Date: Aug.—Sept.1950
Stereoscopic Instrument compilation (III): AlC.Rauck

Contours D.H. Brant Date: Aug.-Sept.1950

A.C.Rauck, Jr.

Manuscript delineated by (III): D.M.Brant, A.C.Rauck, Jr. Date: Oct.Nov.1950

Photogrammetric Office Review by (III): A.C.Rauck, Jr., D.M. Brant Date: Feb. 1951

Elevations on Manuscript checked by (II) (III):

D.M.Brant, A.C.Rauck, Jr.

Date: Feb. 1951

U.S. Coast and Geodetic Survey Camera. Type "O" Camera (kind or source) (III): Focal length 152.37 mm

		PHOTOGRAPHS (IF	1)	
- Number	Date "	Time	Scale	Stage of Tide
1194-1200 incl.	6/4/49	1228	1:24,000	3/91 above MLLW
1214-1220 incl.	ti	1238	o ·	3.7° above MLLW
1222-1229 incl.	tī .	1248	ti .	3.51 above MLLW

Tide (III)

Ratio of Mean From table of predicted tides Range Range Port Townsend Bellingham, Wash, 1.0 8.6

Washington Office Review by (IV):

Date:

Final Drafting by (IV):

Reference Station:

Subordinate Station:

Subordinate Station:

Date:

Drafting verified for reproduction by (IV):

Date:

Proof Edit by (IV):

Date:

Land Area (Sq. Statute Miles) (III): 40

Shoreline (More than 200 meters to opposite shore) (III): 8.5

Shoreline (Less than 200 meters to opposite shore) (III): 14.2

Control Leveling - Miles (II): 40

Number of Triangulation Stations searched for (II): 57

Recovered: 32

Identified: 13

Number of BMs searched for (II): 23

Recovered: 16

Identified: 16

Number of Recoverable Photo Stations established (III): 13

Number of Temporary Photo Hydro Stations established (III)

Remarks:

Two of the triAngulation stations recovered during the 1949 field inspection season have since been reported destroyed. These are: SQUALICUM CREEK ENTRANCE LIGHT, 1950 BELLINGHAM BREAKWATER ENTRANCE LIGHT, 1950

MAP T. 5584		PROJEC		2717	COLL OF MAL LITTONOO		ga・t:よりこうな」 ゴコくつの	
STATION	SOURCE OF INFORMATION (INDEX)	DATUM	LATITUDE OR y-COORDINATE LONGITUDE OR x-COORDINATE	DISTANCE FROM OR PROJECTION FORWARD	DISTANCE FROM GRID IN FEET. OR PROJECTION LINE IN METERS FORWARD (BACK)	DATUM	N.A. 1927 - DATUM DISTANCE FROM GRID OR PROJECTION LINE IN METERS FORWARD (BACK)	FACTOR DISTANCE FROM GRID OR PROJECTION LIN IN METERS FORWARD (BACK)
T-22(USE)	TISE	N.A. 1927	690,324.36	98.9	(1425.2)			
No.1(SQUALICUM	=	=	647,059.09	627.6	(896.4)			
CREEK WATERWAY) 1940 (USE)			1,596,604,509	0.687	(1035.0)			
No.2(Squalicum Creek Waterway	=	=	1,595,834.15	736.8	(787).2	2.1		
1940 (USB)								
No.8(Squalicum Crerk Waternay 1940, (USE)	=	=	646,941.10	591.6	(932.4)			
B.M.149.80,1942 (USE)	=	8	122 32 10,480	1439.4	(414.0)			
B.M. 150.79,1942 (USE)		=	2.2	1221.0	(632.4)			
EM 152.58,1942 (USE)	z	z	5 %	212.8	(8,46.1)			
T-2 (USE)	2	£	1,575,758.13	1332.8	191.2	Us destroyed.	ed for control	but
LUMI, 1949 F (Fourth order)	Field Comp.	=	48 45 00.00 122 37 10.74		(1853.3)			
								7
FT = 3048006 METER L. A.	A. Senasack		1050					M - 2368 - 12

MAP 7 5584		PROJEC	PROJECT NO. Ph-26(47)	SCALE OF	SCALE OF MAP 1.10,000	000	SCALE FACTOR 1:000
STATION	SOURCE OF INFORMATION (INDEX)		LATITUDE OR y-COORDINATE LONGITUDE OR x-COORDINATE	DISTANCE FROM GRID IN FEET. OR PROJECTION LINE IN METERS FORWARD (BACK)	GRID IN FEET. INE IN METERS (BACK)	DATUM	N.A. 1927 - DATUM DISTANCE FROM GRED ON PROJECTION LINE IN METERS FORWARD (BACK) FORWARD (BACK)
M7, 1942(USE)	U.S.E.	N.A. 1927	653,624.05	1104.6	(7.617)	. ,-	
M 8, 1942 (USE)		t	653,949.22	1203.7	(320.3)		
M 10, 1942 (USE)		=		253.2	(1270.8)		
M 11, 1942 (USE)	=	=	655,871.87	265.7	(1258.3)		Sec.
M 12, 1942 (USE)		£	660,152,01	562.2	(1477.7)		
(SCO) 7567 6CT W	B,	5	662,725,99 1,586,887.70	830.9	(693.1)		
T38N, RZE Sec. Cor. (4,3,9,10,1942	=	=	662,770.66	844.5	(679.5)		
T38N, RZE 1/4 Cor. 10,15, 1942 (USE)	=	=	657,454.31	748.1	(775.9)		
T-1 (USE)	=	£	668, 613.55	1101.4	(422.6)		
T-9 (USE)	=	ÇŲ.	667,750.03	838.2 17.0	(685.8)		Page
T-10 (USE)	E		680,356.68	108.7	(1215.3)		8
T-21 (USE)	# ,	=	689,556.64	1388.9	(135.1)		
1 FT.=.3048006 METER COMPUTED BY:		DA	рате Лију 1950	11	CHECKED BY: H. P. Elchert	Elchert	M. 2388-12

STATION INFORMATION (INDEX)		90 90	# N O O O	0 R			N.A. 1927 - DATUM	ACKATOTO OCTOAR
Fie	DATUM	LONGITUDE OR x-COOR	ONGITUDE OR Z-COORDINATE	OR PROJECTION FORWARD	DISTANCE FROM GRID IN PEET. OR PROJECTION LINE IN METERS FORWARD (BACK)	DATUM	FROM GRID OF PROJECTION LINE IN METERS FORWARD (BACK)	FROM GRID OR PROJECTION LIN IN WETERS FORWARD (BACK)
_	NA	97 87	08.786	271 1	(1582 0)			
GEDAR CO., STACK, 1950			54.573	1114.4	(110.8)			
BELLINGHAM, OLYMPIC	1	97 87	699.90	206.0	(1617.1)		Used for control b	but
FURTLAND CEMENT OF	t 	122 31	22,295	455.3	(46.69.4)	destroyed.	Not shown on	map.
9]	71 61	20 70	0 0 0 0	(3,55)			•
FURTILAND CEMENT GO. p. 658 STACK MIDDLE OF 2 1917.	# 00	122	80 00	450	(400 and 100			
			1					
PORTLAND CEMENT CO. "	E	97 87	07.08	218.7	(1624.7)			
STACK, NE of 3, 1927		122 31	21.88	4,46.8	(7.8.7)			
FEARSON 3, 1949 Figh		15 87	09.238	285.4	(1568.0)			
Comb	:	122 36	55.797	1137.5	(85.7)			
AIRWAY BEACON NO. G-5410		27 87	37.763	1166.4	(687.0)		Used for control.	
	a l		48.728	994.5	(230.10		Not shown on map.	
JOHN 3, 1941 (IISR) G-5410		97 87	13.997	735.7	(1,21.0)			
	=	122 36	00.236	4,8	(1220.4)			
BUSWELL, 1942 (USE)	ŧ	655,200,80	S	61.2	(8,69,1)		:	
		1,581,597.20	50		(1037.2)			
M, 1942 (USE) "	=	658,659.21	21	1115.3	(2,807)			
		1,592,071,32	8	631.3	(892.7)			
M3, 1942 (USE) "	=	653,986.22	22	1215.0	(309.0)			
		1,591,955.46	97	596.0	(928.0)			Per
								J-
								9
	L					-		

COMPILATION REPORT T-5584

PHOTOGRAMMETRIC PLOT REPORT

Report submitted with Descriptive Report for Survey T-5581.

FIELD INSPECTION REPORT

Report submitted with Descriptive Report for Survey T-5583.

31. DELINEATION

Refer to Photogrammetric Plot Report.

32. CONTROL

Refer to Photogrammetric Plot Report and Field Inspection Report.

33. SUPPLEMENTAL DATA

Land plats -

- 1-Township No. 38 North, Range No. 2 Rast, Willamette Meridian, Wash. Dated Feb. 21, 1860.
- 1-Township No. 39 North, Range No. 2 East, Willsmette Meridian, Wash. Dated Feb. 21, 1872.
- 1-Township No. 38 North, Range No. 2 East, Willamette Meridian, Wash. Dated June 29, 1931.
 (Boundary of the Lummi Indian Reservation in sections 7, 17, & 18.)

Township layouts

- 1-Lummi Indian Reservation, Twp. 37 and 38 North Range 1 and 2 Kast, W. M. Whatcom County, Wash.
- 1-Marietta Township, Twp. 38 North, Range 2 East W.M., Whatcom County, Wash.
- 1-Ferndale Township, Twp. 39 North, Range 2 East, W.M., Whatcom County, Wash.
- 1-Wountainview Township, Twp. 39 North, Range 1 East and Range 1 West, W.H., Whatcom County, Wash.
- 1-Port of Bellingham, Proposed Small Boat Harbor.

Refer to 41, Boundaries, for a description of how these data were used.

34. CONTOURS AND DRAINAGE

In general, the quality of dispositives was fair to good.

The density of dispositives of model 1197-1198 was very poor and

34. CONTOURS AND DRAINAGE (Continued)

considerable difficulty was encountered in contcuring. It is requested that contours within the limits of this model be checked in field edit.

35. SHORELINE AND ALONGSHORE DETAILS

Shoreline inspection was adequate except for structures and buildings adjacent to the shoreline in the vicinity of Squalicum Creek entrance. These buildings will need additional classification in order to complete their delineation.

No shoal areas or low water lines are shown. The shallow line in Bellingham Bay is office interpretation of photographs.

36. OFFSHORE DETAILS

These are believed to be complete.

37. LANDMARKS AND AIDS

Refer to item 9 of the Field Inspection Report. The position of one non-floating aid to navigation, located by multiplex is reported herewith on form 567. This aid was easily seen in the multiplex model and pricked direct.

38. CONTROL FOR FUTURE SURVEYS

Forms 524 are herewith submitted for 14 recoverable topographic stations.

LUMI, 1949, a fourth order control station, is the only one not determined by stereoscopic methods.

Four of the 14 stations were not reported under item 11 of the Field Inspection Report. They are:

- 1. JOHN 3 (USE) 1941 AZ MK, 1950
- 2. CITY, 1951
- 3. CAGE, 1949
- 4. T 38N, R2E, 1/4 CORNER, SECTIONS 13-14, 1951

39. JUNCTIONS

Junctions are complete with T-5583 to the west and T-5585 to the east. There are no centemporary surveys to the north and south.

40. HORIZONTAL AND VERTICAL ACCURACY

Refer to item 34 "CONTOURS AND DRAINAGE". Also see Photogrammetric Plot Report.

41. BOUNDARIES

Land Lines

See special report - Land Lines - Ph-26(47) and item 10 of field inspection report.

True or accepted corners of land lines are plotted by photogrammetric means, supplemented with field data. Land lines and theoretical corners have been delineated from the natural and cultural features of the namuscript and photographs supplemented by the trans-position of a graphically enlarged copy of the land plats of Townships No. 38 N and 39 N. Range No. 2 East, Willemette Meridian. This enlargement is herewith submitted

Natural and cultural features, such as roads, ditches, and field or woods lines were accepted for the placement of reliable land lines where they were nearly coincident with the lines transposed from the enlarged land plat, or where they connected true or accepted corners.

Where there was no evidence of natural and cultural features from inspection of the photographs and nanuscript, the land lines of the enlarged land plat were used and shown as unreliable land lines. Intersections of these lines resulted in unreliable theoretical corners.

Land lines and corners, accepted or theoretical, were compared with the township layout. Theoretical corners not in agreement, were noted on the discrepancy overlay.

Limmi Indian Reservation
Refer to Special Report-Boundaries-Ph-26(47) and item 10 of field inspection report.

This reservation boundary line is delineated from an enlarged copy plotted from bearings and distances from the original land plat in sections 7, 17, 18.

This line begins at a point called Treaty Rock and ends at a General Land Office standard disc. stamped "T 38N, R2E, S7 S8, L/R, PL, AP7, WC" which is a recoverable topographic station. The bearings of several of the reads in this vicinity were also plotted on the enlarged copy. By holding station AP-7 at one end of the line and orienting the manuscript until the centerline of Hoff Rd, coincided with the bearing of the same road on the enlarged copy at the beginning of the line, the reservation bound ry line was then traced to the manuscript.

41. BOUNDARIES (continued)

In addition to those boundary lines and theoretical corners discussed on the overlay and the unreliable land lines of the manuscript, it is believed that the Lumai Indian Reservation boundary line as discussed in the preceding paragraph, should be further investigated in the field.

46. COMPARISON WITH EXISTING MADE

Comparison was made with Geological Survey Blaine quadrangle, scale 1:62,500, edition of 1907 reprinted 1947.

The interior areas compare favorably. However, many large changes have since occurred in the vicinity of Bellingham and Bellingham Bay.

47. COMPARISON WITH NAUTICAL CHARTS

The manuscript was compared with Chart No. 6370, scale 1:40,000, published June 1935, corrected September 5, 1949.

Generally, the same differences are noted in this comparison as are reported in item 46.

Items to be apillied to nautical charts immediately:

In the vicinity of Bellingham are many changes. The street system of Bellingham is to be extended. Shoreline structures to be added are: large wood bulkhead, piling, large breakwater, and large buildings.

Offshore piling between Marietts and Bellingham, and at Fish Point should be applied.

At the mouth of the Nooksack River are many shoreline changes. The channels and inlets in this area are entirely different and should be so charted.

Control tower at Bellingham Airport to be applied.

Items to be carried forward

None

Respectfully submitted

Albert C. Rauck

Cartographic Photo Aid

Approved and forwarded

Hubert A. Paten Comdr., C&GS Officer in Charge

PHOTOGRAMMETRIC OFFICE REVIEW

T- 5584-N

1. Projection and grids $Q \subseteq R$ 2. Title $Q \subseteq R$ 3. Manuscript numbers $Q \subseteq R$ 4. Manuscript size $Q \subseteq R$
CONTROL STATIONS 5. Horizontal control stations of third-order or higher accuracy $G \subset R$ 6. Recoverable horizontal stations of less than third-order accuracy (topographic stations) $G \subset R$ 7. Photo hydro stations $G \subset R$ 8. Bench marks $G \subset R$ 9. Plotting of sextant fixes $G \subset R$ 10. Photogrammetric plot report $G \subset R$ 11. Detail points $G \subset R$
ALONGSHORE AREAS (Nautical Chart Data) 12. Shoreline \underline{GCR} 13. Low-water line \underline{GCR} 14. Rocks, shoals, etc. \underline{GCR} 15. Bridges \underline{GCR} 16. Aids to navigation \underline{GCR} 17. Landmarks \underline{GCR} 18. Other alongshore physical features \underline{GCR} 19. Other alongshore cultural features \underline{GCR}
PHYSICAL FEATURES 20. Water features GCR 21. Natural ground cover GCR 22. Planetable contours 23. Stereoscopic instrument contours GCR 24. Contours in general GCR 25. Spot elevations GCR 26. Other physical
CULTURAL FEATURES 27. Roads QCR 28. Buildings QCR 29. Railroads QCR 30. Other cultural features QCR
BOUNDARIES 31. Boundary lines GCR 32. Public land lines GCR
MISCELLANEOUS 33. Geographic names 34. Junctions <u>A.C.R.</u> 35. Legibility of the manuscript <u>A.C.R.</u> 36. Discrepancy overlay <u>A.C.R.</u> 37. Descriptive Report <u>A.C.R.</u> 38. Field inspection photographs <u>A.C.R.</u> 39. Forms <u>A.C.R.</u> 40. <u>A.C.R. C.T. T. A.C.R.</u> Supervisor, Review Section or Unit 41. Remarks (see attached sheet)
FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT 42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The manuscript is now complete except as noted under item 43.

43. Remarks:

M-2623-12

PHOTOGRAMMETRIC OFFICE REVIEW

T. 5584 - S

1	1. Projection and grids <u>DMB</u> 2. Title <u>DMB</u> 3. Manuscript numbers <u>DMB</u> 4. Manuscript size <u>DMB</u>
	CONTROL STATIONS
Ę	5. Horizontal control stations of third-order or higher accuracy <u>OMB</u> 6. Recoverable horizontal stations of less
1	than third-order accuracy (topographic stations) <u>DMB</u> 7. Photo hydro stations <u>DMB</u> 8. Bench marks <u>DMB</u>
	9. Plotting of sextant fixes <u>DMB</u> 10. Photogrammetric plot report <u>DMB</u> 11. Detail points <u>DMB</u>
	ALONGSHORE AREAS
	(Nautical Chart Data)
	2. Shoreline <u>DMB</u> 13. Low-water line <u>DMB</u> 14. Rocks, shoals, etc. <u>DMB</u> 15. Bridges <u>DMB</u> 16. Aids
t	o navigation DMB 17. Landmarks DMB 18. Other alongshore physical features DMB 19. Other along-
5	shore cultural features <i>DMB</i>
	PHYSICAL FEATURES
	20. Water features <u> </u>
i	nstrument contours <u>DMB</u> 24. Contours in general <u>DMB</u> 25. Spot elevations <u>DMB</u> 26. Other physical
!	eatures DMB_
	CULTURAL FEATURES
1	27. Roads DMB 28. Buildings DMB 29. Railroads DMB 30. Other cultural features DMB
	BOUNDARIES
3	31. Boundary lines <u>PMB</u> 32. Public land lines <u>PMB</u>
	MISCELLANEOUS
3	33. Geographic names 34. Junctions DMB 35. Legibility of the manuscript DMB 36. Discrepancy
c (overlay DMB 37. Descriptive Report 38. Field inspection photographs DMB 39. Forms DMB
•	Reviewer Supervisor, Review Section or Unit
4	41. Remarks (see attached sheet)
	FIELD COMPLETION ADDITIONS AND CORRECTIONS TO THE MANUSCRIPT
	42. Additions and corrections furnished by the field completion survey have been applied to the manuscript. The
4	
	manuscript is now complete except as noted under item 43.
	, , , ,

43. Remarks:

48. GEOGRAPHIC NAME LIST

Alderwood Ave Aldrich Road Axton Rd

Bakerview Rd
Bancroft Rd
Barrett Lake
Beaver Dam
Bellingham
Bellingham Airport
Bellingham Bay
Bennett Ave
Birchwood Bible Camp
Birchwood Ave
Brennan
Byers Rd

CAA Heservation Cagey Road Cedarwood Ave Cherrywood Ave Church Rd Cottonwood Ave Curtis Rd

Deer Creek Douglas Rd

Edens Ave

Ferndale Rd Ferndale City Reservoir
Fish Point
Fort Bellingham Rd

Gilason Rd
Great Northern Railway
Braveline Rd
(Green Acres Memorial
(Park Cemetery
Greenwood Ave

Hemmi Rd Hendrickson Rd Hoff Rd Hovander Rd

Imhaf Rd

Johnson Rd Jones Rd

Kass Rd Kivina Rd Kwina

48. GEOGRAPHIC NAMES (continued)

Labourty Rd Lange Rd Larrabee Rd Larson Rd Laurel Rd Laurelyood Ave

Lummi Limit Cemetery -ummi School Lummi Lumi Shore Road

Lamai

Lummi Indian Reservation

Lumi River

Mallory Rd Merietta Mariette Rd McAlpine Rd Mt View Rd

Church Marietta Community

Neevel Rd Keilson Rd New Kirk Rd Mooksack River Northwest Rd

Bellingham Grange North School

Olympic Way Oswald Rd

Pacific Highway Paradise Rd Pinewood Ave Pioner Park Piper Rd

Rayhorst Rd Reighton Rd Red River Rd River Rd Rural Ave

Slater Rd Slater Slough Smith Rd Smugler Slough Sunset Sve (Squalicum Creek (Waterway

St. Joschims Church

Termile Creek Tennant Lake Thornton Rd

48. GEOGRAPHIC NAMES (CONTINUED)

Ulrick Rd U.S. 99

> Waske Rd Wiser Lake Rd Woodlawn Cemetery Woodlyn Rd Wynn Rd

Whatcom County Hospital

43. REMARKS

No published elevations could be found in this office for the following USGS Bench Marks:

BM 21 5R USGS Photo 49-0-1215 PM 31.01 " " " BM 49.93 " " " " BM 63.4R " " "

Drainage into pond at Brennan was originally incomplete. The field editor added a road 7, but did not complete the drainage so it is shown as interpreted in this office.

The geographic name "McCloud Road" was added from field inspection for T-5585. Several descriptions for Redoverable Topographic Stations refer to "McLeod Rd." rather than "McCloud Rd."

Johnson Rd. was changed to Johnston Rd in the Descriptive Report for T-5584. This name should be checked on the manuscript and in the report for T-5583.

The Lummi Indian Reservation boundary was left hanging just south of Marietta. There is no available information to close this boundary; it ends at "Treaty Rock". Refer to item 56 of the field edit report:

Discrepancies between field data and the data contained in the U.S. Engineers "List of Bridges over Navigable Waters" concerning the bridges in the vicinity of Ferndale and Marietta could not be reconciled in the compilation office.

Approximate location of reconstructed zero beacon at Bellingham Airport was identified by the field editor. No form 567 was submitted for this beacon and it is shown on the manuscript with the elevated object symbol.

Geographic names added during field edit:
Bonneville Power Line
C M St.P & P Ry
Ferndale Township
Marietta Township
McCloud Road
Mountain View Township
Squalicum Creek
Wash PSH 1 (Pacific Highway, US 99)

49. NOTES FOR THE HYDROGRAPHER

Following is a list of recoverable topographic stations which may be used during the Hydrographic Survey.

CONTROL TOWER, 1950
EDGE, 1950
LUMI, 1949
SQUALICUM CREEK WATERWAY LIGHT, 1950
CACE, 1949
CITY, 1951
JOHN 3 (USE) 1941 AZ MK, 1950

567	1945
Form	April

F COMMERCE U. S. COAST AND GEODETIC SURVEY DEPARTMENT

NONFLOATING AIDS OBLIANDMARKS FOR CHARTS

Baltimore, Maryland

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	TO BE C	Tox BEx B

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The positions given have been checked after listing by allert C. Fauch A.

Albert C. Rruck, Jr.

Chief of Party.

Hubert A. PATON

	CHARTS APFECTED		6300,637 6380°							
	SEE CI	HARBI	×			-	 -			
 	DATE	7	1950							
	LOCATION	SURVEY No.	Multiplex T-5584							-
		DATUM	NA 1927							
	LONGITUDE	D.P. METERS	737							
POSITION	LONG	-	122 30							
	LATITUDE	D. M. WETERS	1054							
!	LAT	0	57 87					 		
		SIGNAL						 		
		•					700			
		DESCRIPTION	, k							
WASH TNOTON	a rour and a	1	Squalicum Creek				-	- Andrews		
		CHARTING	 							

This form shall be prepared in accordance with Hydrographic Manual, pages 800 to 804. Positions of charted landmarks and nonfloating aids to navigation, if redetermined, shall be reported on this form. The data should be considered for the charts of the area and not by indicated in a consumer parameter of the area and not by

567	1945
Form	April

DEPARTMENT F COMMERCE

U. S. COAST AND GEODETIC SURVEY

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

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TO BE CHARTED	TOUBHURBURED

STRIKE OUT ONE

Baltimore, Maryland

Hay 1,

I recommend that the following objects which have (Azaciata) been inspected from seaward to determine their value as landmarks be charted on (dariancepana) the charts indicated.

The positions given have been checked after listing by

Ph 26(47)

Donald M. Brant

							300	data to seminans	RECEIP	Ċ	Chief of Party.
STATE	Eashington			_	POSITION			METHOD		THA	
			LAT	LATITUDE*	FONO	LONGITUDE *		LOCATION	DATE	HO 31	
CHARTING	DESCRIPTION	BIGNAL	0	D.M.METERS	•	// D. P. METERS	DATUM	SURVEY No.	LOCATION	OBBAH IOHEKI	AFFECTED
	BELLINGIAM SQUALICUM CHEEK ENTRANCE LIGHT		54 84 18	24.395 753.6	122 30	11.0h2 838.3	NA 1927	Triang-	1952) H	6300,6378
	BELLINGHAN, BELLINGHAN BREAKWATER ENTRANCE LT		57 84	12.370 382.1	122 30	21.855	i .	#		l M	6300,6378,
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This form shall be prepared in accordance with Hydrographic Manual, pages 800 to 804. Positions of charted landmarks and nonfloating aids to navigation, if redetermined shall be renorted on this form. The data should be considered for the charts of the area and not by

NOTES FOR THE REVIEWER

Submitted herewith are two enlarged copies of supplemental data. These were made graphically to facilitate transfer of pertinent data to the manuscript

- 1 Layout showing land lines of townships 38 and 39 North. Range 2 East, Willamette Meridian.
- 2 Layout of Lummi Indian Reservation boundary in sections 7, 17, and 18, T 38N, R2E.

All road objectives are not complete. Due to the incompleted road network of the old U.S. Geological Survey quadrangles adjoining this manuscript, it was not possible to accurately measure the objectives. These will be completed when all adjoining manuscripts are com iled.

Geographic names in the vicinity of Lummi, namely, Slater Slough Samugler Slough, and Nooksack River may not be correctly placed as considerable physical change has occurred in the area making the map and the old quadrangle entirely different.

A discrepancy exists concerning the position of the north city limits of Bellingham. The 1949 field inspection unit established sub. pts. "A" and "C" to locate the north boundary line This line does not agree with the line as shown on photo 49-0-1224. The 1951 field inspection unit established in the immediate vicinity of sub. pt. "C", a third sub. pt. to fix the position of recoverable topographic station CITY, 1951. which is on the boundary line. This line is shown on the map, and is approximately 21 meters north of the line established by the 1949. field unit.

Refer to "Port of Bellingham, Plan of Proposed Small Boat Harbor" dated 19 January 1949 and photo 49-0-1245. Changes to be made here are noted on this plan and photo. In sauch as these have not yet been constructed, they have not been shown. not submitted. Data in Battimare, Erra

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 24A Rev. Oct., 1932

LIST OF DIRECTIONS

Station LUMI (Topo.)	State	Washington	
Chief of party C.W.Clark,	Date	12/6/49	J.C.L. Computed by C.W.B.
or T.C. Telovo	T due com	7" Berger No. 231	Checked his C.W.C.

òbserved stàtion	Öbser	ved dire	ection	Eccentric redu tion	Sea level reduction*	Corrected direction with zero initial	Adjusted direction*
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BUSWELL (U.S.E.)	0_0	0 <u>0</u> <u>0</u> 0	0.00	·		0 00 00.00	<u> </u>
Bellingham, Oeser Cedar Co., Stack, 1941	29	08	25.8	· ————————————————————————————————————			<u> </u>
Bellingham Museum (City		· · · ·		·			
Hall, 1927)	42	50	25.8				
Bellingham, Bloedel- Conovan, Stack, 1927	50	 i	18.3	_			
Seattle-Vancouver Air-							
way Beacon No.8,1941	93	23	09.3				
Squalicum Creek Water-							+ ·- ·- · ·
way Light	37	09	09		+		ļ
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Squalicum Creek Entranc							+
Light	39	11	_54				†
Whatcom Waterway Light	47	59_	49				
KPUG Radio Tower	298	46	28	<u> </u>			
KPUC Radio Tower	298		33				<u>. </u>
KVOS Radio Tower		49	50				<u></u>
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^{*} These columns are for office use and should be left blank in the field.

Station: Ken

State: Maryland

Chief of party: C. V. H.

Date: 1917

Computed by: O. P. S.

Observer: C. V. H.

Instrument: No. 168

Checked by: W. F. R.

OBSERVED STATION	Observed direction	Eccentric reduction	Sea level reduction	Corrected direction with zero initial	Adjusted direction
Chevy Tank west of \triangle Dulce Ken (center), 3.469 meters Forest Glen standpipe Home Bureau of Standards, wireless pole Reno Reference mark, 16.32 m Ker To Home	0 00 00.00 29 03 37.0 176 42 313 24 53.0 326 31 30.21 352 17 20.8 357 28 48.63 358 31 20	- 7.31 -1 09.8 +3 01.2 + 31.93 + 5.7 - 1.16		0 00 00.00 29 02 34.5 313 28 01.5 326 32 09.45 352 17 33.8 357 28 54.78	, "

This form, with the first three and fifth columns properly filled out and checked, must be furnished by field parties. To be acceptable it must contain every direction observed at the station.

It should be used for observations with both repeating and direction theodolites.

The directions at only one station should be placed on a page.

If a repeating theodolite is used, do not abstract the angles in tertiary triangulation. The local adjustment corrections (to close horizon only) are to be written in the Horizontal Angle Record, and the List of Directions is to be made from that record directly.

Choose as an initial for Form 24A some station involved in the local adjustment, and preferably one which has been used as an initial for a round of directions on objects not in the main scheme. Use but one initial at a station. Call the direction of the initial 0° 00′ 00.″ 00, and by applying the corrected angles to this, fill in opposite each station its direction reckoned clockwise around the whole circumference regardless of the direction of graduation of the instrument. The clockwise reckoning is necessary for uniformity and to make the directions comparable with azimuths.

If a station has been occupied eccentrically, reduce to the center and enter in this form, in ink, the resulting corrections to the observed directions in the column provided for them. If an eccentric reduction is necessary, but not made in the field, leave the column blank. If the station was occupied centrally, and no eccentric reduction is required, put dashes in the column to show that no corrections are necessary.

Directions in the main scheme should be entered to hundredths of seconds in first-order triangulation; otherwise to tenths only. Points observed upon but once, direct and reverse, should be carried to tenths in first-order and second-order triangulation, and to even seconds only in third-order triangulation. In general, but two uncertain figures should be given.

It is recommended that the following simple plan of observing be used with a repeating instrument: Measure each single angle in the scheme at each station and the outside angle necessary to close the horizon. Measure no sum angles. Follow each measurement of every angle immediately by a measurement of its explement. Six repetitions are to constitute a measurement. The local adjustment will consist simply of the distribution of the error of closure of the horizon.



FIELD EDIT REPORT Map Manuscript T-5584 Project Ph-26(47)

50. Methods

No new or unusual methods have been used in the completion survey and field edit of this sheet. Inspection was from a truck dismounting and walking where necessary. All profiling and resketching was done with the plane table. A legend of the colored inks and symbols used is shown on Field Edit Sheet No. 4.

Field edit data is shown on Field Edit Sheets Nos. 1 through 5, and on photos 1374, 1194-1200, 1214-1219, 1222-1229, and 1243 and 1244. Photographs 1243 and 1244 will be furnished with Quad T-5585. All others are with this quad. Notes are gross referenced from field edit sheets to photographs:

52. Adequacy of compilation

The adequacy of the compilation is more or less in line with other sheets in the project. The delineation of wildings is eften incomplete, because the compiler just doesn't see all the buildings. They are obvious to the man in the field whe is standing on the road looking at the house. From his point of view the building is quite obvious on the photo and there is no meed to intensify the image with a bright colored ink, but be the sompiler the image is not often so plain. This is the cause of so many omissions. There is often a lack of thought shewn on the part of the compiler, too. Probably well over half the time a class two building with a good access read will have a class one building in the immediate vicinity. The compiler must learn to look for these buildings. If the field is to continue to delineate the buildings it wants to delete, instead of the baildings it wants to sage, the compiler will have to be more matchful.

Field treatment of the pelitical boundaries was seriously deficient, and this is reflected in the compilation. The compilation whit shares the responsibility for the error in the Beiling-ham City Limit, since the material furnished by the field imposed in spection unit was sufficient to disclose the error, even though the field inspection unit delineated the City Limit wrongly on the photographs. Apparently the compilation unit did not impact the legal descriptions or the plats furnished with the special report on boundaries.

The contouring follows the pattern established in past quade on this project. It does not test too badly in accuracy (83% within a half interval), but much detail is missing in the area of glacial till northwest of Ferndale. Several tops were missed in the area east of Ferndale. These things change the expression of the area considerably, though they will often affect the accuracy tests badly.

53. Man Accuracy.

A portion of the horizontal map accuracy test made for this project extends into the northwest corner of this sheet. This traverse has already been the subject of special report on Horizontal Map Accuracy for this project. All horizontal errors were within prescribed limits.

Approximately 49 miles of plane table traverse was run as vertical accuracy tests and to resketch topography. About 1.2 miles of combined horizontal and vertical accuracy tests and about 2.5 miles of barometrically controlled leveling may be added to this figure. This total is, of course, quite high, but in view of the fact that the summary of all this traverse shows only 83% of all points tested within a contour interval, there was apparently a need for well-controlled resketching, and only a small pertion of this total can be questioned as unnecessary. About 8 miles of this total were run to sketch the 10 foot contour in the Lummi River bottom. About 8 to 9 square miles of topography were resketched, and the equivalent of three to four square miles of sketching was done in adding the 10 foot contour in the Lummi River bottom.

The field editor believes that the map can be sertified as meeting National Map Accuracy Standards after application of the corrections to topography submitted.

54. Recommendations.

It is difficult for the observer to make recommendations for the imprevenent of similar maps. The bulk of the troubles seen to arise from inexperience as an organization, rather than as individuals. Using the present grade of personnal, closer and mend detailed supervision of field personnal seems indicated, along with closer and more critical inspection of field mark and of the compilation. The observer has given the matter considerable thought and contemplates submitting a more detailed report on the matter later in the winter.

55. Exemination of Proof Copy.

Wr. Faul E. Matz, Ferndale Pharmacy, Ferndale, Meshington, and Mr. Alfred Tedford, 3302 Northwest Avenue, Bellingham, Washingten have each agreed to examine a proof copy of the hap for possible errors. Br. Mats is well acquainted with the area around Perudele in the northwest corner of the sheet, and has Tedford is better acquainted with the area around Bellinghan, in the southeast corner of the sheet. The sheet seems divided geographically by the mooded area around the airport. He further geographic name data was obtained. However, the application of the name "Squalicum Greek Waterway" should be changed. The Squalicum Creek Materway is a dredged ship basin, and the mpproach channel, and is a facility of the Port of Bellingham. Squalicum Creek comes off the hill just inshers from the Squalicum Creek Materway. The name "Squalicum Creek Mai" is else in common local usage as indicated on Field Edit Sweet No. 4, but would appear as a redundance if the names Squalicem Creak and . Squalicum Creek Waterway are shown.

56. Political Remderica.

(See paragraph 10, Field Inspection Report and Special Report on Boundaries, Project Ph-26). Besides the public land lines, the pelitical boundaries within the limits of this quadrangle are the boundary of the Lummi Indian Reservation, the Capporate Limit of the City of Perndale, and the Corporate Limit of the City of Bellingham.

56 1. Lumni Indian Reservation.

The field inspection party recovered one witness to a corner of the Lummi Indian Reservation, "T 368, R2E, S7 86, L/R, PL, AP7, WC". This corner seems to have been accepted by the field inspection and by the compiler as a corner on the boundary. The letters "WC" included in any property conner designation mean "witness corner", and such a corner is set because the two corner cannot be nonumented. In this case it cannot be nonumented because it is in the middle of the river. The field editor recommend seven additional witness corners on this boundary. These capeners and the witnesses were located by plane table. These recovered corners, witnesses, and plotted corners are shown on Field Edit Edits No. 3, and are keyed to the numbers listed below, with brief descriptions shown in the case of recovered points.

1. Recovered, a standard GLO disk, riveted to the top of a 3/4 inch pipe extending 16" above ground, stamped \$17/\$16, MC, 1930". A witness for Treaty Reck.

2. Treaty Rock, not recovered. This was pletted from witness (1). The Indians may Treaty Rock "sack". The fact of the

metter is that Treaty Rock was below mean high water, and although it was as big as a small house, it was covered by silt when the river channel shifted. Probing at the plotted position was considered, but was not attempted because of the heavy cover of large driftwood logs almost completely sovering the area.

12. Recevered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 9 inches above the ground, stamped

"T38#, R2W, PL, S17, WC, AP3, L/R, 1930".

4. AP3, not recovered, plotted from whiness (3).
5. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 6 inches above the ground, stamped "T38M, \$2M, \$18, PL, AP4, L/R, 1930". (Plotted as AP 1).

76. Recovered, section corner 3, 7, 18, 17, also a witness to AP 1, a standard GLO disk riveted to the top of a 1½ inch pipe extending 1 foot above ground stamped *57, S8, \$17, \$18*.

7. Recovered, a standard GLO disk riveted to the top of a 3/4 inch pipe extending 2 inches above the ground and stamped

"T39", B2W, PL, B18, AP2, L/K, 1930".

58. Recovered, a standard GLG disk, riveted to the top of a 3/4 inch pipe, extending 2 inches above the ground, stamped *7388, B28, PL, \$18, BC, AP3, L/R, 1930".

9. AP3, not recovered, plotted from witness.

10. Recovered, a standard GLV dick riveted to the top of a 3/4 inch pipe, extending 9 inches above the ground, and stamped "7388, 228, 67, APL, L/R, PL, 1936". Should have been "88".

11. Apl. Not recovered; plotted from witness.

12. Recovered, a stendard GLO disk riveted to the top of a 3/4 inch pipe, extending 9 inches above the ground, etamped "138N, R2W, 57, AFS, L/R, FL, 1930". Should have been "NC".

13. AP 2, not receivered, platted from witness.

W 14. Recovered, a standard the disk riveted to the top of a 3/4 inch pipe extending 4 inches above the ground, stanged \$1388, R2W, S7, NG, AP3, PL, L/R, 1936s.

15. #7 3, not recovered, placed from witness.

The plat of the waiter D. Long recurrey of 1930 is quite good, but the stamping of the marks is often in enter. Each mark is stamped R2W, where it should be R2E. With this in view, is is not unreasonable to assume that the categories of the mitness country designation in a couple of cases was an error also. I think they two reference bearings are omitted from the plat, and one of these may be deduced from another plat. The only purties of the sense ary difficult to deal with was the portion from \$7, AP3 to \$2. AP7. The bearing from \$7, AP7 to \$0, \$7, AP7 is cuitted from the plat, although the distance, 1.50 chains is shown. A circle of radius 1.50 chains with center at WC, \$7, AP7 was struck, and the portion of the beautiful from \$7, AP3 to the eastward was plotted

on a piece of vellum and positioned so that S7, AP3 fell in the proper position, and the eastern end of the plotted portion of boundary fell on the 1.50 chain circle. Then the conners in between were pricked. Other portions of the line plotted between recovered corners fitted very well with almost zero closures. The survey is really quite good.

56 2. City of Ferndale.

The field inspection party furnished descriptions for the last two additions to the Ferndale nursicipal corporation. stating that legal descriptions for the believe of the corperate limit were not available. They did, however, show on the photograph the position of the city limit. The original act incorporating the City of Ferndale was located without any trouble, and a subsequent addition to the city was located after local inquiry. These descriptions are furnished as a part of this report. The boundary shown on the field photographs was taken from a map in the assessor's office, or at least it agrees with it, but there is a discrepancy in the Pioneer Park area. As a matter of interest, the City Limit shown in the Assessor's plat book (not on his well map) is correct. I think that where the city limit fallows the edge of a road, that the line on the manuscript should reflect this by turning and following its true position slong the edge of the road for about0.5 inch. If you just run it up to the road and stop, there may be confusion shout whether it goes with the center line of the road, or with the edge, and this should be clarified. See also 564, Riperian boundaries of municipal corporations.

56 3. City of Bellingham.

The field inspection party furnished copies of the original charter of the City of Bellingham, and of all but one of the annexations to the city. They also furnished maps of the city with the city limits shown thereon. They also drew the city limit on the appropriate photographs. Apparently, neither the field inspector, the compiler, or the office inspector made a careful review of the maps or descriptions, because here are gross disagreements between the data furnished, and the city limit delineated on the photographs. One apprention was also omitted. Complete descriptions of the Bellingham City limit are furnished with this report. The Bellingham City limit within the limits of the quadrangue shown with a red city limit symbol on Field Mit Short No. 4. See also 56 4, Riparian boundaries of manuficipal corporations.

56 4. Riparian Boundaries of Municipal Corporations.

A copy of an act of the Washington State Legislature extending the corporate limits of cities fronting on waters is attached, with a copy of a decision of the Washington State Supreme Court relating to the act is also attached. This act will affect the city limits of both Ferndale and Bellingham.

57. Aids to Nevigetion.

Observations were made to relocate the Squalicum Creek Rntrance Light and the Bellingham Breakwater Entrance Light. No check positions were obtained, but they check very misely with plane table intersections which used mapped detail as control. Using mapped detail as control the plane table friencections gave about a thirty foet triangle of error; while not quite good enough for a location, it is quite good enough to indicate that there is no gross error in the work. The computed G.F. for the Squalicum Creek Entrance Light in only about a meter different from that obtained by the field inspection party, and there was probably no change in the light. The Mallingham Breakwater Entrance Light, however, has been moved about 500 fost from the first position obtained by the field impostion party, and moved about 360 feet while the field editor was in the area. Further shifts in this light may be expected as construction of the breadwater centiques. The breakwater will be extended about 1500 feet to the west, and work has proceeded at the rate of about 200 feet per year. A plan of the work contemplated was furnished by the field inspection party.

58. Triengulation.

The Olympic Fortland Cement Company in Bellingham has been converted from a coel-fired to an oil-fired operation. Two of the large stacks which were shown as landmarks (Triple Stack) and which doubled as intersection stations have been torn dewn. Appropriate recovery notes are submitted. A check observation was made on the remaining stack. See also Paragraph 57.

59. New Leveling.

A level party of this bureau under the supervision of Lt. Plaggmier has completed a rerun of the trunk level line along the Great Northern Railway across this sheet with a spur line to the Bellingham Airport. The bench marks established, and the field elevations are listed:

F 327	Klv.	. 18.2166 m.	At xm of RB and	Kass Rd.
G 327		11,8769	· · · · · · · · · · · · · · · · · · ·	
L 6 26B		10,5610		
H 327		5.2861		•
J 327	erina erina erina erina erina erina erina erina erina erina erina erina erina erina erina erina erina erina er Erina erina er	6.1411		4" -
k 327		12.5989		
L 327		32.0809		
¥ 6 1078		32,9910		
M 327	•	34.3786		
R 327	•	15.5423		-
T 330		4.5773		

Spur line to Ballingham Airport:

48.2168
45.8692
45.5661
16.6028
45.6034
44.2857
48.0507

The locations of these marks have been spotted on the field edit sheet. No further recovery notes are submitted inesamen the level party was in the area after completion of the bulk of the field work on the quad.

60. Imetions.

The work of the Geological Survey on topographic quadrangle blaine NK has been matched along the merth edge of the sheet.

Approved and Forwarded:

Charles N. Clerk Lt. Comdr., RECEGS Chief of Party Respectfully submitted:

Ray H. Skelten II Cartographer (Phote)

Remarks	rom Thornton Rd.	1		Tred II						21.72			rom Church Rd.					bot elv. x-rd			x-rd													
Error after shift	Rd. F	a rd.	0	T.	7 6	≠ 15	£ 16	4.15	0	0	0	1 4	. Ad.	me RR	2 7	- 4	0 =	-4	4 3	0	- 7	- 3	17	25	-1	17	- 5	5	L -	8 -	6 =			
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TOPOGRAPHIC MAPPING

Summary & Abstract of Vertical Accuracy Test

Project No. Ph-26 Quad. No. T-5581; Quad. Name
Method of Testing Plane table profiling
Tested by R. H. Skelton Date Kay 1952 Evaluated by R.H.S. II
Contour interval 20 ft. 1.22 M.M. allowable shift at 1/10,000
map or manuscript scale.
539 Total number of points tested
83 % of points within ½ contour interval or better
Let Test points correct within \(\frac{1}{2}\) contour interval
80 Test points in error between \$ and full contour interval
h Test points in error over full contour interval

Test Elev.	Map Elev.	Error	Error after shift	Remarks	Test Elev.	Map Elev.	Error	Error after shift	Remarks
150	161	<i>‡</i> 11	<i>‡</i> 1.0		32,	35	41	41	Y-rd
147	156	79	<i>¥</i> 8		32	3/1	12	42	
From	BL1 66E	S sout	west 1	o Carey Rd.	32	37	-1	-1	x-rd
thenc	e east	to ti	3.		32	32	0	. 0	
40	50	<i>≠</i> 3.0	<i>+</i> 6		30	33	+3	<i>¥</i> 3	
73	57	-16	-12		29	35	-6	- 6	
87	711	-1.3	- 9		32	36	1 h	44	
97	101	F 4	<i>f</i> 2		1:0	38	72	42	
113	124	AU	79		1.1	la	0_	٠ ٥	
111,	127	<i>4</i> 13	711		21.	24	. 0	0	
11/	130	<i>‡</i> 16	/1/4		20	23	#3	<i>4</i> 3	
119	134	** /1 5	+16/13						
123	1,38	<i>f</i> 15	<i>F</i> 13						
122	135	/13	/11						
117	130	<i>7</i> 13	/11						
111	121,	<i>7</i> 13_	/11						
108	117	79	77				<u> </u>		
105	108	73	/1			<u> </u>			
99 95	99 95	0	0						
	95	0	0			ļ		ļ	
94	94	0	0.						
<u>98</u> 88	90	- 8	- 8		<u> </u>		ļ		
	88	0	0		<u> </u>		ļ	<u> </u>	
69	69	0	0					ļ	
Along	Smith	Rd ea	ot from	Great	Щ				
North	ern En	y, the	pce Nu	along rie	 		<u> </u>	<u> </u>	
			ence :	E along RR	 	<u> </u>	· .	<u> </u>	
	ith Ro					ļ <u>.</u>	-	ļ	
15	28	<i>4</i> 13	413		Щ	<u> </u>	 	<u> </u>	
22	3/4	/12	<i>f</i> 32		Ш	<u> </u>	ļ	<u> </u>	
28	39	/11.	/11		 			ļ	
61.	68	+7	76	x-rd	 	<u> </u>			
28	<u>38</u>	<i>+</i> 10	/10		₩	ļ		 	
26	38	<i>F</i> 12	f12		Ш	<u> </u>	 	 	
			<u></u>		Ш	1		<u></u>	M-2875