

ALASKAN GRAVITY

BASE STATION

NETWORK

by

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This report is preliminary and
has not been edited or reviewed
for conformity with Geological
Survey standards

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ALASKAN GRAVITY BASE STATION NETWORK

One phase of the U.S. Geological Survey's program to prepare a regional gravity map of Alaska (Barnes 1962, 1964, and 1967) has been the establishment of a network of accessible and reoccupiable base stations. Such a base station network provides the essential framework for any large gravity survey, and its precision determines the value of the geologic and geodetic interpretations that may be obtained from the gravity data. Neither the map nor the base station network have yet been completed, but preliminary release of some of the station descriptions and observed gravities will provide better coordination between detailed surveys which are being initiated by other groups.

Previous compilations of Alaskan gravimeter bases resulted from measurements published by Thiel, Bonini, Ostenso and Woollard (1958) and from pendulum observations by the U.S. Coast and Geodetic Survey (Rice, 1958). Many of the measurements made by Thiel and his co-workers were later reevaluated and published as part of the international gravity network (Woollard and Rose, 1963). A few of the stations in the last investigation formed the starting points for the Geological Survey's newer network, which thus uses the same datum. However, many of the early stations were based on single readings by older gravimeters, and a few discrepancies larger than one milligal have been found between the early data and more recent measurements. The largest single source of error may be the result of rapid economic growth and construction in Alaska, which has altered many sites so much that the earlier stations can no longer be accurately reoccupied by reading the published descriptions. Finally the large elevation changes which accompanied the 1964 Alaskan earthquake caused gravity changes of nearly a milligal at a few stations (Barnes 1966), and their interpretation clearly showed the importance of a good base network.

The pendulum stations at Barrow and Fairbanks, and their gravimeter reference stations at nearby airports are parts of the North American Gravimeter Standardization Range (Woollard and Rose, 1963), and are probably amongst the more accurately established stations on this continent. The primary U.S. Geological Survey Alaskan reference base has been designated "FBKI", and is believed to be identical with the Range Standardization station "WA279", which was described as "Fairbanks International Terminal in lobby at east I-beam pillar" and which was assigned a value of 982.2464 gals (Woollard and Rose, 1963, p. 39). The Geological Survey has assumed a value of 982,246.40 mgal for their station, but now realizes that other groups have sometimes occupied the base of another I-beam, where the observed gravity differs by less than 0.02 mgal from that at "FBKI". However, the gravity values on the World Gravity Net and North American Standardization Range are being continually refined by additional pendulum and gravimeter measurements, and a recent summary suggests that the observed gravity at

Fairbanks International Airport should be closer to 982,246.48 mgals or 0.08 mgals higher than that assumed for the Geological Survey's compilation (personal communication from C. T. Whalen, Warren Air Force Base, Wyoming on June 7, 1967). Whalen also reports gravity values at the University of Alaska pendulum station, the Barrow Arctic Research Laboratory Pendulum station, and the Whitehorse Airport pendulum station which differ from our values by +0.08, -0.12, and +0.04 mgals respectively. Many factors could explain these discrepancies, but final adjustment of the World Gravity Network stations to which the USGS Alaskan gravity network is tied is nearing completion (Szabo, 1967), so further adjustment of the Alaskan network has been delayed until publication of the world network. Available evidence suggests that the final adjustments will include a datum change of nearly 1 mgal for the U.S. national base in Washington, D.C., but that the additional relative changes within Alaska will be significantly smaller.

The most significant factor in determining the accuracy of the relative ties within Alaska is the precision of the calibrations of the gravimeters used in establishing this Alaskan base station network. A small-sized LaCoste and Romberg Geodetic gravimeter (G-17) has been used for most of the Geological Survey's Alaskan measurements since 1961. However, LaCoste Geodetic meter G-8, World-Wide meter 11, and Worden meters 226, M772, and 609 have also been used for parts of the survey network, and World-Wide meter 11 was used for almost all pre-1961 measurements. The original calibrations of meters G-17 and G-8 were based on incremental weight measurements made by the factory to determine relative scale-factors throughout their reading ranges. Factors to convert these relative scales to absolute gravity differences were determined from many differences measured over intervals between North American Gravimeter Standardization stations ranging from Point Barrow, Alaska, to Mexico City, Mexico, and Honolulu, Hawaii (Woollard and Rose, 1963, pages 23 through 43). Some of these standardization stations were only occupied a few times, but measurements of the intervals between airport standardization stations at San Francisco, Seattle, Fairbanks, and Barrow have each been repeated more than eight times, and the total of these intervals covers a range of more than 2,700 mgals. New construction has altered many of the airport sites described by Woollard and Rose (1963), so that the Geological Survey has begun to use new stations at some of the airports enroute to Alaska. All of the new stations were tied as well as the construction changes and activities permitted to the prior Woollard and Rose stations, but errors in these ties are possible. The first page of the tables describes and lists the principal facts for the most frequently occupied stations between Menlo Park, Calif., and Point Barrow, Alaska. Reoccupation of the stations in this list provides one simple method for other investigations to check their gravimeters or base network against that used in this report. The observed gravities at these stations were chosen to fit the Woollard

& Rose data as well as possible, because their compilation provides the framework for the Alaskan gravity base station network. However, we have found inconsistencies both within our own data and between the gravity differences we have measured between these primary base stations and those measured both by Woollard and Rose and by other gravity investigators such as Chapman (1966) and several people who have given the author personal communications. The discrepancies could result from errors in the Woollard & Rose network which we have tried to use as a standard, from uncertainties in the calibrations of our LaCoste & Romberg meters G-17 and G-8; or from other factors influencing their reading such as sensitivity to certain types of vibrations (Hamilton, 1967). The forthcoming publication of the World Gravity Network (Szabo, 1967) and the continuing improvements in gravimeter design and calibrations should permit better recognition of the causes of the discrepancies, and later publication of an improved interpretation of these Alaskan gravity-base-station data. However, present evaluation of the many and varied checks on the calibrations of Geodetic meters G-17 and G-8 and of the discrepancies within the data does show that the calibrations of these two instruments have been determined to better than 3 parts in 10,000, which would cause errors of less than 0.3 mgal throughout the range of the Alaskan network.

The Geological Survey has also used meters G-17 and G-8 to establish gravity differences on mountain calibration loops in California and Alaska, and these loops are used for repeated checks and standardization of the calibration of all USGS gravimeters. The results of all the repeated checks of gravimeter calibrations will be discussed in a separate paper (Barnes, Robbins and Oliver, in preparation), but they suggest that the measurements with USGS LaCoste and Romberg Geodetic meters can be reproduced to better than 0.04 mgal and that those of many nonthermostated (Worden and World-Wide) meters to better than 0.1 mgal. The two small mountain loops in Alaska are near Fairbanks and Anchorage, and have ranges of 142.65 and 194.04 mgals respectively; which can serve as another check on the calibrations of meters used in Alaska. The bottom and summit stations of the loops are given in the tables as stations MPYR, MPYS, ANCW, AND ANK5. However, all three checks on the Anchorage loop have been made in high winds, and the results, although internally consistent, may have been influenced by meter vibration.

The areal extent of the Alaskan gravity base network has gradually expanded and the precision of the adjusted gravity values has gradually improved as successive field parties initiated measurements in new areas and revisited old areas to obtain different types of coverage. The present network extent and the number of ties between stations are shown by the map in Figure 1. The tables in this report also indicate the number of ties to each station, but these numbers are only approximate indications of the precision of each station value. The reproducibility of gravity

intervals measured with the LaCoste geodetic meters has generally been better than 0.05 mgal unless vibrations caused erroneous readings or excessive drift between stations, but measurements with the non-thermostated meters were less reproducible so that more ties were needed to establish bases with these meters. Many of the base stations established with World-Wide meter 11 between 1958 and 1960 have since been reoccupied with LaCoste meters, but such geodetic-meter control is still lacking for some stations on the Aleutian Arc, the Alaska Range, and the Arctic Slope.

Measurements with LaCoste meters were emphasized in deciding what type of line to use to represent the number of ties shown on the map (Figure 1), so three ties with non-thermostated meters were considered the equivalent of one tie with a LaCoste meter. This equivalence ratio may seem arbitrary, but it was estimated by comparing the reproducibility of the base station ties in Alaska. It is probably primarily an indication of the relative sensitivities of the meters which were used there, and of their response to the limited drift control permitted by the field operations. Similarly the lower right-hand box in each base station tabulation contains a number indicating the occupations which were primarily considered in determining the base station gravity and is followed by a letter to show whether these occupations were made with LaCoste (L) or Worden or World-Wide (W) meters. Because LaCoste data are considered preferable the letter "L" usually appears for stations where such data are available and give consistent results. If additional World-Wide or Worden data were considered in determining the value or if single occupations with a meter permitted an additional tie to another base a plus "+" has been added after the letter.

The accuracy of the gravity values for each station varies within the network. The tables show eight digits (hundredths of milligals) for each observed gravity value, but many of the final digits are not significant. However, the final digits are justified (at least to ± 0.03 mgal) where they represent differences between stations established by small and/or often-repeated ties; their publication even in a preliminary tabulation avoids some of the erraticisms that can result from multiple roundoffs. However, in most of the network adjustments before 1964, the observed gravity values were rounded off to the nearest 0.05 or nearest 0.10 mgals, and the date of the last adjustment as well as numbers indicating fewer than 3 LaCoste ties show whether such a roundoff has been made in the observed gravity values. Closure errors and the discrepancies which have not yet been checked or eliminated suggest that errors as large as 0.25 mgal can exist in a few of the measurements on the Aleutian Arc, Alaska Peninsula, the central part of the Alaska Railroad, and for a few stations in the northern foothills of the Brooks Range. Part of these discrepancies might be eliminated by tidal corrections, which have not been applied to many of the measurements. However,

tidal corrections are almost always smaller than 0.1 mgal in Alaska and for the short duration of most of the ties are smaller than 0.03 mgal. One more serious problem is that the datum for most of western Alaska is dependent on a few early ties to Kotzebue where both of the primary stations may have been disturbed by later storm erosion and airport regrading. We hope that all important uncertainties will be eliminated before final publication. The author keeps an up-to-date index of the dates and other important facts concerning all the Alaskan base station ties, and data supporting specific base station gravities can be furnished on request.

A few towns have been used as operating bases so often that their observed gravities have been more precisely determined, and many of these towns contain several stations so that a system of reference stations is available in each town. Towns with better established stations and referencing are marked by double circles on the map and are located at Barrow, Umiat, Noatak, Kotzebue, Nome, Bettles, Fort Yukon, Fairbanks, Delta Junction, Paxson Junction, Gulkana, Anchorage, Cordova, Kenai, Homer, Kodiak, Bethel and Galena.

The base stations are identified by four or less alphanumeric characters which were chosen to permit computer processing of the observational data, and also to provide mnemonic assistance to field parties which were expected to reoccupy the stations, but which did not always have up-to-date tabulations of base-stations. Most of the names can easily be associated with their locations, and most should be easily learned by others who make gravity measurements in Alaska. Two initial characters were designed to identify stations made at U.S. government survey markers. The initial letter "B" designated stations made at U.S. Coast and Geodetic Survey leveling bench marks, and the second letter and following number identify the bench mark. The use of a slash "/" as an initial character identifies most of the stations made at vertical angle bench marks and triangulation stations; the letters after the slash are either an abbreviation of the bench mark name or its first three letters. Gravity surveyors trying to reoccupy Alaskan gravity bases from this tabulation will also be greatly helped by descriptions of government survey-control markers, which may be obtained by writing the U.S. Coast & Geodetic Survey and U.S. Geological Survey headquarters in Rockville, Md., and Washington, D.C., respectively.

Exact reoccupation of stations identified only by brief descriptions is always difficult, and all changes of roads, buildings, vegetation, landforms and other identifying features increase the possibilities for reoccupation errors and difficulties. Many of the Alaskan gravity measurements between 1958 and 1962 were made at either bench marks or mileposts, but a large percentage of these markers had been moved or destroyed when reoccupation attempts were made after the 1964

earthquake. To decrease the possibilities of erroneous reoccupation, the Geological Survey began photographing most of its base stations in 1962, and since late 1965 markers have been placed at many stations. The standard U.S.G.S. gravity marker is a hexagonal tablet about $3\frac{1}{2}$ inches wide. The program of marking and photographing the stations is less than one quarter completed, but such identification aids are available in some areas. Investigators desiring photographs of stations in a specific area should write the author. The date at which each station was last occupied is the second date given in each station tabulation, and may provide a clue to the availability of photos and markers or to the possibilities of changes which could make reoccupation difficult.

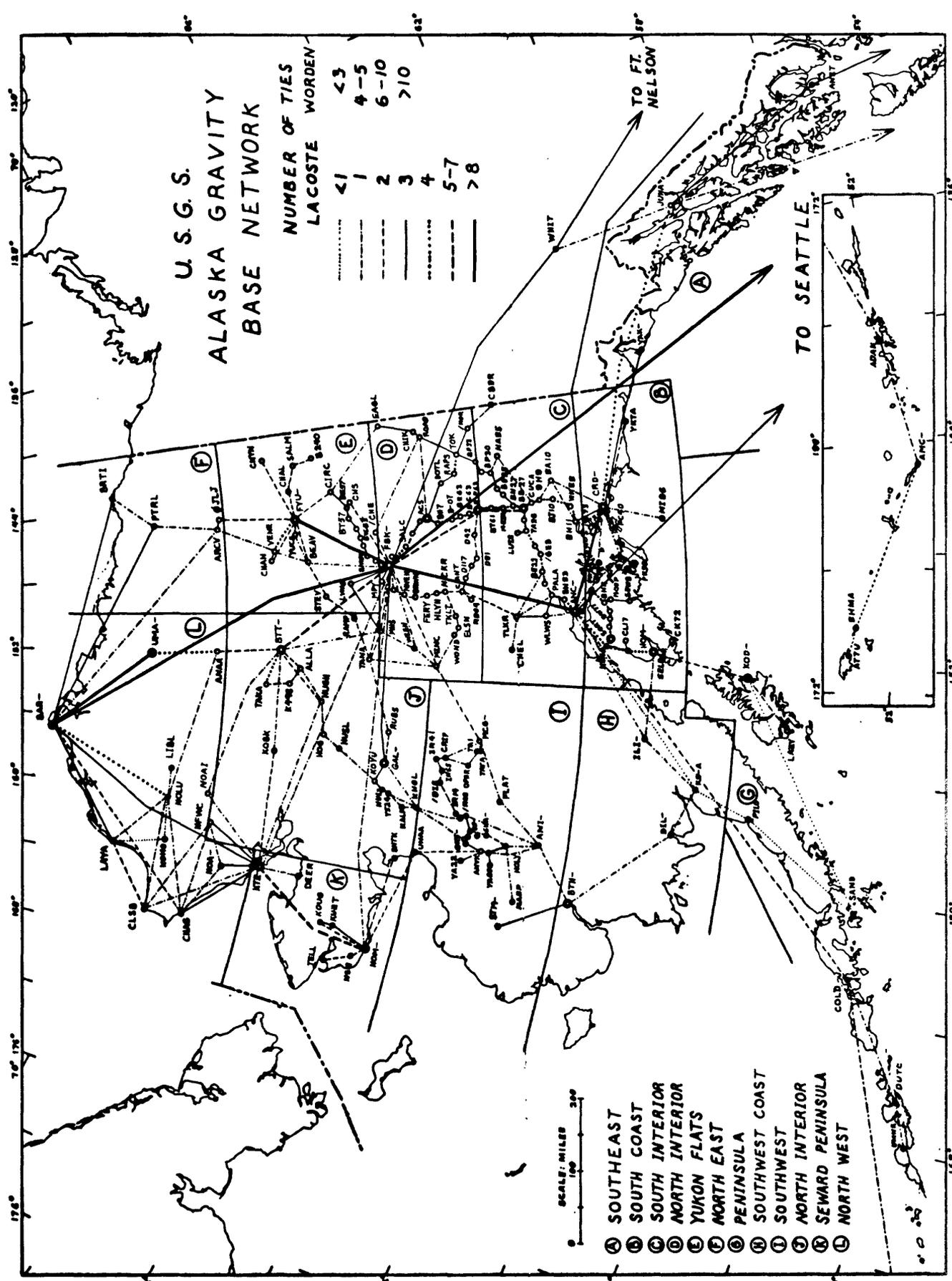
The tabulations of the station data also include elevations, geographical coordinates, Free-air anomalies, and Bouguer anomalies; but these are preliminary data, the accuracies of which may vary more than the accuracies of the observed gravities and position descriptions. We have used the best sources of data available to us but the accuracies of positions and elevations vary widely depending on the quality of local maps and surveys. We have decided not to include data concerning the types of base maps and elevation control, which will later be available when contour maps and the principal facts of stations on which they are based are released. The Free-air anomaly was determined from a computer program using the standard formulas for the 1930 International Ellipsoid and for a Free-air reduction that includes second order effects of the elevation but no terrain effects. The Bouguer anomaly is a simple Bouguer anomaly for a density of 2.67 gm/cm^3 which includes no terrain or curvature terms, and which was derived from the previously computed Free-air anomaly by subtracting 0.34107 times the elevation in feet. These formulas are similar to those given in Sheibe & Howard (1964).

Many of the base stations are in remote areas where geographical names are scarce, so they have been arranged in the tables according to project area. The outline of each area is shown on the map (figure 1), the table of contents shows the page on which the data for each area are tabulated, and an index of principal place names is included.

Nearly two dozen employees of the Geological Survey have assisted the author in the collection and compilation of this gravity base network data, but a few individuals deserve special recognition. R. V. Allen made many of the pre-1964 base ties in interior and arctic Alaska, and assisted the early checks of gravimeter calibrations. R. C. Jachens participated in much of the field work, provided valuable assistance in the initial standardization of gravimeter calibrations, and made many of the 1963 and 1966 adjustments. S. L. Robbins played a major role in the 1964 and 1965 programs in northern and southern Alaska, and C. H. Miller collected the 1967 Aleutian Arc data. The final compilation was made possible by many types of assistance from R. C. Olson and Beatrice Bregman.

Assistance and data from other agencies have been provided by Dr. G. P. Woollard of the University of Hawaii, Dr. Ned Ostenso of the Office of Naval Research, Mr. R. M. Iverson of the U.S. Army Map Service, and Mr. C. T. Whalen of Warren Air Force Base. Much of the logistic support in northern Alaska has been provided by the Office of Naval Research under ONR task 307-265 and was facilitated by the fine cooperation of Dr. Max Brewer of the Arctic Research Laboratory at Point Barrow.

Finally, this is a preliminary tabulation of data which the Geological Survey hopes to extend and improve. The author would appreciate learning about any errors, improvements, or suggestions which readers can make.



U.S.G.S.
ALASKA GRAVITY
BASE NETWORK

NUMBER OF TIES
LACOSTE WORDEN

.....	< 1
---	1
---	2
---	3
---	4
---	5-7
---	> 8

SCALE, MILES
0 100 200

- (A) SOUTHEAST
- (B) SOUTH COAST
- (C) SOUTH INTERIOR
- (D) NORTH INTERIOR
- (E) YUKON FLATS
- (F) NORTH EAST
- (G) PENINSULA
- (H) SOUTHWEST COAST
- (I) SOUTHWEST
- (J) NORTH INTERIOR
- (K) SEWARD PENINSULA
- (L) NORTH WEST

TO FT. NELSON

(A)

(B)

(C)

(D)

(E)

(F)

(G)

(H)

(I)

(J)

(K)

(L)

TO SEATTLE

TO FT. NELSON

TO SEATTLE

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ALASKAN GRAVITY BASE STATIONS
SOUTHERN ALASKA (PRINCE WILLIAM SOUND)

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.	
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES	
CRDA	Cordova Airport on apron at field steps to PNA terminal, on pavement NW of steps on marker.						9/67	1/64
	981,957.60	50	60°29.60	145°28.40	-0.1	-1.8	7-L+	
CRDP	Cordova Post Office, at NW corner of building, in drive, 3 feet below bench mark A-71.						9/65	11/64
	981,954.90	103	60°32.70	145°45.30	-1.8	-5.3	4-L+	
CRDL	Cordova Eyak Lake Airport, on concrete sill at SE corner of E. hanger door on marker.						9/67	11/64
	981,957.10	20	60°32.70	145°43.75	-7.4	-8.1	4-L+	
MID6	Middleton Island, at first radio tower on right and SW of FAA quarters on concrete base on tidal BM 6						9/65	2/68
	981,968.60	90	59°27.60	146°18.20	+95.7	+92.6	1-L	
YKTA	Yakataga airport, Cordova Airlines shack at apron, middle of SE side, on runway below marker.						9/67	2/68
	981,906.05	12	60°04.93	142°28.93	-22.8	-23.6	1-L	
PC40	Hinchinbrook Island at Port Etches, on SE corner of Phipps Point on flat rock near tide level.						6/64	11/64
	981,953.75	5	60°20.90	146°36.60	+3.1	+2.9	3-L	
PC48	Hinchinbrook Lighthouse dock at NW corner, on concrete base of NW crane brace.						6/64	11/64
	981,958.45	15	60°14.40	146°38.90	+17.2	+16.6	2-L+	
PK6	Knight Island, S. shore of Thumb Bay, on rock ledge on tidal BM 3 (1906) a copper bolt with "X" on top.						6/64	11/64
	981,963.95	12.5	60°12.35	147°47.35	+25.1	+24.7	2-L+	
PK42	Evan's Island, Port Ashton cannery mess hall, on bench at base of most northeastern piling.						6/64	11/64
	981,957.30	6	60°03.45	148°03.15	+29.4	+29.2	2-L+	
PK50	Latouche Island, on SW shore of Latouche Anchorage on large grey rocky outcrop on tidal BM disc 4 (1927)						5/64	2/68
	981,948.05	17	60°03.15	147°54.30	+20.6	+19.9	1-L	
PK77	Montague Island on SW shore of Port Chalmers, at tidal BM no. 8 (1964)						6/64	11/64
	981,952.05	14	60°14.55	147°13.20	+10.5	+10.0	3-L	
PS60	Port Nellie Juan cannery on prominent rock east of cannery on tidal BM 1 (1917)						6/64	11/64
	981,968.15	7	60°32.90	148°09.75	+2.1	+1.9	2-L	
PS93	Perry Island, South Bay, on gravel between timbers, SW of porch door of brothers home.						6/64	11/64
	981,980.20	15	60°41.20	147°55.05	+4.2	+3.7	2-L	
W73	Ellamar, Junction of boardwalks along shore and to seaplane dock, 40' SE of house, (Thiel's 1958 Wisconsin station)						9/65	11/65
	982,021.05	13	60°53.90	146°42.00	+28.6	+27.1	1-L	

See Gulkana to Valdez and Anchorage to Seward sheets for other stations.

ALASKAN GRAVITY BASE STATIONS

SOUTH INTERIOR (GULKANA TO SHEEP MTN.)

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.	
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES	
BD27	Gulkana Airport, NE of door to FAA operations building on BM D27.						9/65	
							1/66	
BN26	981,931.46 1573 62°09.60 145°27.30 -10.1 -63.7						7-L+	
	Glennallen Junction, near center of intersection Y, on ground next to BM N26.						9/65	2/68
BG26	981,921.90 1512 62°06.40 145°28.40 -21.4 -72.9						5-L+	
	Glenn Hwy., at residence 1 mi. E. of Glennallen Lodge, on ground near driveway at BM G26.						9/65	2/68
BX25	981,922.40 1583 62°06.40 145°38.40 -14.0 -68.0						1-L+	
	Glenn Hwy. E. of Tolsona Creek at top of hill on BM X25.						9/58	'63
BP25	981,905.65 2025 62°06.40 145°56.50 +10.6 -58.5						4-W	
	Atlasta House, on BM P25 East of entrance to parking area.						9/65	2/68
LUI5	981,877.62 2383 62°05.90 146°09.90 +16.8 -64.4						4-L+	
	Lake Louise Lodge at base of trees, in center of beach.						6/59	'63
TAZB	981,883.80 2364 62°16.75 146°30.70 +7.7 -72.9						4-W	
	Tazlina Glacier Lodge, steps of old bunkhouse E. of lodge.						6/60	'63
SUTR	981,870.45 2434 62°03.80 146°24.00 +17.1 -65.9						8-W	
	Tazlina at Sutter's float plane landing on top of large stump.						9/62	'63
BA25	981,871.30 2417 62°03.80 146°26.70 +16.3 -66.1						4-W+	
	Mendeltna Lodge at BM A25 1½ miles E. of lodge.						9/58	'63
MEND	981,885.45 2164 62°02.90 146°30.50 +7.8 -66.0						4-W	
	Mendeltna Creek, in driveway entrance on S. side of Glenn Hwy. and W. end of bridge.						9/65	2/68
BU24	981,883.50 2189 62°03.00 146°32.60 +7.1 -67.6						4-L+	
	Snowshoe Lake on Glenn Hwy. hill E. of creek at BM U24 (reset).						9/65	2/68
BC24	981,874.53 2329 63°01.75 146°41.20 +13.9 -65.6						2-L+	
	Tahnetta Summit near base of triangulation tower N. of highway on BM C24.						9/65	2/68
BT23	981,833.49 3237 61°58.35 147°05.90 +62.4 -47.9						4-L+	
	Glenn Hwy. near W. end of Tahnetta Lake and Whitey's Guide Service, beside BM T23.						6/59	'63
/GEB	981,859.30 2979 61°53.90 147°19.30 +69.5 -32.1						6-W	
	Glenn Hwy., 1 mi. E. of Sheep Mtn. Lodge at East End Creek on BM "Glenn East Base"						9/65	2/68
	981,850.46 2963 61°49.00 147°28.40 +65.3 -35.7						4-L+	

ALASKAN GRAVITY BASE STATIONS
SOUTH INTERIOR (GULKANA TO TOK)

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.	
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES	
BN27	Gakona Jct., across Hwy. from gas station at BM N 27.						9/65 '63	
	981,929.45	1633	62°17.30	145°21.10	-16.0	-71.7	7-L+	
BY60	Gakona R. bridge on NW abutment on BM Y60						9/62 '63	
	981,941.85	1418	62°18.10	145°18.20	-24.8	-73.2	4-L+	
BD28	Glenn Hwy. near Sanford R., on part of old highway at BM D28.						9/62 '63	
	981,916.30	1803	62°20.30	145°11.70	-16.9	-78.4	5-W+	
BX28	South of Chistochina, 8 miles from lodge at BM X28						8/60 '63	
	981,947.95	1865	62°28.90	144°49.80	+9.9	-53.7	8-W+	
BJ29	Chistochina, across highway from roadhouse at BM J29						8/60 '63	
	981,938.50	1857	62°33.90	144°39.90	-6.5	-69.8	7-W+	
/-48	Glenn Hwy., 2 miles N. of Indian R. bridge at U.S. triangulation mark "48".						9/62 '63	
	981,949.50	2250	62°41.50	144°23.60	+32.1	-44.6	6-W+	
BP30	Slana, on old road and near gate to hunting outfitters at BM P30 in trees.						9/62 '63	
	981,951.00	2154	62°42.40	143°57.60	+23.5	-50.0	3-L+	
NA85	Nabesna Rd., at MP85 on hill above lake.						9/62 '63	
	981,850.30	3203	62°33.30	143°24.20	+32.6	-76.7	2-L+	
G70	Glenn Hwy., near Bear Club Inn site, 1/8 mile S. of site, on road at MP70.						8/60 '63	
	981,951.80	2262	62°47.45	143°45.90	+28.2	-48.9	6-W+	
BT32	Mentasta Lake road junction about ¼ mile W. at BM T32.						6/63 '63	
	981,937.45	2282	62°55.70	143°38.50	+5.7	-72.2	8-W+	
G90	Near Mineral Lake, on Glenn Hwy. above lake at MP 70						8/60 '63	
	981,943.40	2199	62°57.00	143°22.80	+2.2	-72.8	8-W+	
BP33	Mineral Point airstrip at W. end next to BM P33						6/63 '63	
	981,957.10	2020	63°04.30	143°20.80	-9.8	-78.7	2-L+	
TOK	Tok Junction, at U.S. Customs shack, beside SW corner of step						8/63 '63	
	982,005.30	1631	63°20.20	142°59.20	-17.6	-73.2	8-L	
CBDR	Alaska Hwy. at Canadian border on ground under bronze commemorative plaque						7/62 6/63	
	981,962.55	1843	62°36.90	141°00.00	-12.6	-50.3	2-L+	

See north Interior p. 17-D for more stations S. TOK

ALASKAN GRAVITY BASE STATIONS

(NORTH INTERIOR (PAXSON TO MCKINLEY))

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES
BF63	Paxson Jct., N. of a highway distance sign which is S. of Jct., on ground next to stub of BM F63 (destroyed)						9/65 1/66
	981,931.46	2657	63°01.70	145°29.60	+27.6	-63.0	6-L+
D38	Denali Hwy. MP38 on hill E. of Maclaren River on road						6/59 '63
	981,883.17	3485	63°06.30	146°26.50	+51.5	-67.4	3-W
D42	Denali Hwy. MP42 on road opposite Maclaren River Lodge						9/61 '63
	981,913.25	2875	63°07.19	146°31.95	+23.2	-74.9	6-W+
D57	Denali Hwy. MP57 - 1½ miles W. of Clearwater Creek and on road						9/62 '63
	981,906.80	2922	63°02.60	146°54.90	+26.7	-72.9	9-W+
D72	Denali Hwy. MP 72 E. of road to Denali Dam site, on road						9/62 '63
	981,946.80	2778	63°03.00	147°21.80	+52.7	-42.0	5-W+
D81	Denali Hwy. MP 81 at bridge S. of Smitty's gas station						9/61 '63
	981,940.95	2516	63°07.20	147°32.50	+17.1	-68.7	3-W+
D87	Denali Hwy. MP 87 near Gracious House and on road						9/61 '63
	981,923.75	2787	63°11.30	147°35.80	+20.4	-74.6	4-W+
D100	Denali Hwy. MP 100, 5 mi. W. of Canyon Creek on road						7/59 '63
	981,906.10	2725	63°16.70	147°56.50	-9.6	-102.6	3-W+
D102	Denali Hwy. MP 102, 2 miles E. of Bruskana Creek, on road						7/59 '63
	981,905.30	2720	63°16.40	148°00.20	-10.5	-103.3	4-W+
D117	Denali Hwy. MP 117, near old cabin at Nenana River bend, on road						9/61 '63
	981,951.80	2198	63°22.70	148°23.80	-20.7	-95.7	2-L+
D133	Denali Hwy. MP 133 by Cantwell Highway Department						9/61 '63
	981,976.90	2153	63°23.20	148°52.20	-0.4	-73.9	4-W
CANT	Cantwell Station at flagpole in front of Post Office NW of track*						9/61 '63
	981,977.00	2198	63°23.60	148°56.50	+3.4	-71.6	2-L
NCRW	Denali Hwy. at driveway to Nancarrow homestead						7/59 '63
	982,005.60	2638	63°36.60	148°47.10	+57.7	-32.3	7-W
MCKR	McKinley Park RRS; on tracks in front of main office						9/62 '63
	982,049.10	1726	63°43.90	148°54.60	+6.7	-52.1	1-L+

*For additional station at Cantwell see p. 14-D.

ALASKAN GRAVITY BASE STATIONS

YUKON FLATS (RIVER AREA)

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.	
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES	
FYUA	Fort Yukon airfield at Wien office on main concrete step and marker						8/66	1/67
	982,357.90	436	66°34.10	145°15.90	-1.6	-16.4	3-L	
FYUW	Fort Yukon airfield at Wien office on ground in front of W. door						8/66	1/67
	982,358.00	435?	66°34.10	145°15.90	-1.4	-16.3	7-L+	
FYUR	Fort Yukon airfield on Ref. Mark 2 of VABM "Yukon" USAF						8/63	1/67
	982,358.81	444?	66°33.85	145°14.70	+0.4	-14.7	6-L	
CNYN	Canyon Village gate corner outside fence around weather instruments						7/63	9/63
	982,374.72	624	67°09.10	142°04.50	-5.2	-26.5	2-L	
OJLJ	Old John Lake at door to Jamesway at NW end						9/66	1/67
	982,314.05	2242	68°05.30	145°07.70	+26.5	-50.0	2-L+	
CHAN	Chandalar River one mile W. of E. fork junction on gravel bar at bushes and camp						8/64	6/66
	982,339.80	790	67°06.00	147°16.00	-21.2	-48.1	1-L+	
VENE	Venetie teachers quarters at 6-inch vertical capped pipe near SW corner						8/63	10/63
	982,372.32	538	67°00.75	146°24.90	-6.6	-25.0	3-L	
VENF	Venetie school on S. side of flagpole base						8/64	3/68
	982,372.29	538	67°00.75	146°24.90	-6.7	-25.0	3-L	
CHAL	Chalkyitsik BIA school in front of door on ground						8/63	9/63
	982,360.95	538	66°39.30	143°43.15	+5.4	-15.9	2-L	
SALM	Black River and Salmon Fk. junction at foot of high lone spruce on W. point of junction						8/63	10/63
	982,346.22	619	66°33.05	142°34.00	+5.2	-16.0	2-L	
B240	Black River at Grayling Fk. junction on exposed rock in front of cabins						8/63	10/64
	982,312.54	702	66°09.35	142°19.40	+5.6	-18.4	2-L	
BEAV	Beaver Village schoolyard on ground at VABM mark, W. of school						9/66	3/66
	982,330.90	362	66°21.60	147°23.70	-21.7	-34.0	1-L+	
STEV	Stevens Village on ground next to VABM						8/64	3/66
	982,323.57	311	66°00.35	149°07.60	-10.1	-20.7	1-L+	
RAMP	Rampart airstrip at junction of road and parking apron						9/62	3/66
	982,283.60	276	65°30.60	150°08.80	-19.7	-29.1	2-L	

ALASKAN GRAVITY BASE STATIONS

YUKON FLATS (TANANA UPLAND)

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.	
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES	
CIRC	Circle, back of Post Office on corner of concrete block between gas pumps and valves.						9/66	3/66
	982,304.60	597	65°49.55	144°03.60	+10.0	-10.4	3-L	
BX59	Circle, on BM X 59 on concrete tower base in old school yard						9/64	2/68
	982,304.55	596	65°49.50	144°03.70	+9.9	-10.4	2-L	
CHS	Circle Hot Springs Inn, main N.E. entrance on ground 1.5 feet in front of steps						9/64	3/66
	982,229.32	886	65°28.95	144°38.20	-14.8	-45.0	5-L	
/OSP	Circle Hot Springs Airport NE end of NE-SW runway on VABM "OSPA"						9/64	3/66
	982,227.84	843	65°29.20	144°36.30	-20.6	-49.3	4-L	
BZ57	Miller Roadhouse on Steese Hwy. NW of junction of roadhouse entrance on BM Z57						9/64	3/66
	982,174.56	1904	65°31.80	145°13.20	-23.0	-42.1	4-L	
BT57	Eagle Summit on Steese Hwy on BM T57 1 mile N. of summit						9/64	3/66
	982,067.77	3657	65°30.00	145°23.20	+82.9	-41.9	4-L	
BF56	7 miles NE Sourdough Camp on Steese Hwy. and W. of road junction on BM F56						9/64	3/66
	982,151.74	2115	65°20.15	146°16.10	+33.2	-39.0	2-L	
BW55	Sourdough camp, N. of Steese Hwy. on BM W55						8/64	3/66
	982,221.05	1424	65°17.45	146°29.00	-40.7	-7.9	3-L	
BN55	1/3 mile NE U.S. Camp on N. side of Steese Hwy. on BM N55						9/64	3/66
	982,198.84	1262	65°16.15	146°43.30	+4.7	-38.3	2-L	
BZ54	Camp Creek crossing of Steese Hwy. N. of road and W. of Creek on BM Z54						9/64	3/66
	982,220.38	985	65°13.15	147°00.60	-3.7	-29.9	2-L+	
BW54	1/2 mile NE of Belle Cr. on Steese Hwy. at BM W54						9/64	3/66
	982,228.74	932	65°13.00	147°00.60	+7.2	-24.6	2-L+	
BR53	Near Fox at junction of Elliot and old Steese Hwys. on BM R53						9/64	3/66
	982,227.18	781	64°57.75	147°37.20	+9.0	-17.6	2-L+	
LVNG	Livengood airstrip at S. end of airstrip at road crossing in center of strip						9/64	3/66
	982,272.74	645	65°31.65	148°32.80	+2.9	-19.1	2-L+	
/CHE	Chena Hot Springs at S. corner of Adm. Bldg. on VABM "Chena"						6/63	'63
	982,175.55	1190	65°03.20	146°03.30	-10.5	-51.0	2-L	

ALASKAN GRAVITY BASE STATIONS
KODIAK, PENINSULA & ALEUTIANS

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES
KODA	Kodiak airport, PNA terminal at field entrance to waiting room on ground NW of steps.						7/5 11/65
	981,746.00	77	57°30.20	152°45.10	+9.2	+6.6	3-L
KODP	Kodiak Naval Air Station inside building 17 on concrete floor on USC&GS pendulum mark.						5/61 3/88
	981,746.80	38	57°44.50	152°30.30	+7.2	+5.9	2-W
KODU	Kodiak, new post office, on concrete porch beneath plaque.						7/65 3/68
	981,753.85	25	57°47.30	152°24.10	+30.1	+29.3	2-L
LAZY	Lazy Bay cannery on tip of sand spit						6/61 '63
	981,688.60	9	56°54.10	154°15.00	+15.3	+15.0	3-W
PILO	Pilot Point, SW corner of cannery office and store on ground.						6/62 '63
	981,741.70	12	57°34.00	157°35.40	+14.0	+13.5	3-W
SAND	Sand Point in front of Alaska Dept. of Fish and Game office.						6/61 '63
	981,617.60	3	55°19.20	160°31.00	+76.1	+76.0	2-W
COLD	Cold Bay airport on steps of new FAA building beneath sign.						9/67 3/68
	981,553.55	90	55°12.10	162°43.20	+30.3	+27.2	2-L+
DUTC	Dutch Harbor airfield terminal building outside door marked "115" on concrete						7/64 1/66
	981,553.10	10	53 53.70	166°32.20	+133.9	+133.6	1-L
UMNK	Umnak airfield, large hangar NW of runway, outside NE end of large door on concrete at field level.						7/64 1/66
	981,517.25	130	53°22.45	167°54.30	+154.3	+149.9	1-L
ADAK	Adak Naval Air Station terminal porch, in corner between double door and building on concrete marked by yellow paint.						10/67 3/68
	981,422.70	17	51°51.80	176°38.70	+200.9	+200.3	1-L+
AMCH	Amchitka airport, in northernmost of double hangars, 3 ft. inside center of old double doors.						10/67 3/68
	981,362.85	200	51°22.90	179°15.58E	+180.6	+173.8	1-L+
AMCT	Amchitka airport new terminal waiting room in corner.						10/67 3/68
	981,362.70	210	51°22.90	179°15.58E	+181.8	+174.6	1-L+
SHMA	Shemya airstrip - USAF operations building outside entrance at SW corner on pavement on marker.						10/67 3/68
	981,506.60	85	52°42.80	174°07.12E	+196.8	+193.9	2-W
ATTU	Attu Casco Bay airstrip on runway 30' N. of junction with road to buildings on hill, on pavement on marker.						10/67 3/68
	981,534.00	40	52°50	173°11E	+209.6	+208.2	1-W

ALASKAN GRAVITY BASE STATIONS
SOUTHWEST (KUSKOKWIM DRAINAGE)

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.	
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES	
MINC	Minchumina at NE corner of power house on ground						7/67	
	982,154.49	665	63°52.90	152°18.60	+1.7	-21.0	4-L+	
MCGN	McGrath, NCA air terminal garage and shed inside center post between large doors on concrete						7/67 11/67	
	982,128.10	334	62°57.50	155°35.85	+11.0	-0.3	2-L+	
MCGH	McGrath, Harris Inn on end of concrete sidewalk at S. side						7/67 11/67	
	982,127.57	330	62°57.48	155°35.50	+10.1	-1.1	2-L	
TATA	Takotna Air Force landing strip on concrete slab on field side of small building S. of tower on marker						7/67 11/67	
	982,084.85	880	62°53.52	155°58.38	+24.0	-6.1	1-L	
TA 1	Tatalina A.F. station, in main garage, E. end of W. door on concrete inside door post						7/67 11/67	
	982,062.55	1250	62°54.85	156°00.51	+34.8	-7.8	1-L	
OPHR	Ophir airstrip in road leading to town, on SW corner of bridge on marker						7/67 11/67	
	982,120.00	591	63°08.71	156°31.28	+13.4	-6.7	1-L	
FLAT	Flat airstrip at junction with road, beside NE corner of shack on ground below marker						7/67 11/67	
	982,093.42	309	62°27.20	157°59.70	+11.2	+0.7	1-L+	
ANIA	Aniak airstrip, at NCA fuel tank between road and strip, on NW corner of wood base on marker						8/67 11/67	
	982,054.08	84	61°34.80	159°31.60	+16.3	+13.4	2-L+	
ANIH	Aniak, NCA hangar, outside SE corner on concrete base of door support (subject to vibration)						7/67 11/67	
	982,053.76	84	61°34.80	159°31.62	+15.9	+13.1	2-L+	
ANIF	Aniak, FAA operations building on ground in front of steps towards field						7/67 11/67	
	982,053.13	85	61°34.78	159°32.01	+15.4	+12.5	1-L	
BTHN	Bethel, NCA air terminal, main S. entrance from apron, at foot of steps on concrete walk on marker						9/67 11/67	
	981,997.27	130	60°47.05	161°45.29	+24.6	+20.2	3-L+	

NOTE: Other Bethel stations listed on Southwest Coast page

ALASKAN GRAVITY BASE STATIONS

SOUTHWEST (INNOKO RIVER)

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.	
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES	
OPHR	Ophir airstrip in road leading to town, on SW corner of bridge on marker						7/67	11/67
	982,120.00	591	63°08.71	156°31.28	+13.4	-6.7	1-L	
CRIP	Cripple Landing, S. end of large sand bar used as landing strip at stake on bar opposite trail to cache						7/67	11/67
	982,186.40	213	63°41.50	156°21.91	+4.7	-2.6	2-L	
IN41	Innoko R. midway from Cripple to N. Fork Jct. at Leonard's cabin, near door on ground below marker						7/67	11/67
	982,194.82	196	63°45.15	156°25.79	+7.1	+0.5	1-L	
IN65	Rennie's Landing inside W. door to large quonset on dirt floor below marker						7/67	11/67
	982,194.53	119	63°36.74	157°04.54	+9.7	+5.6	1-L	
/DIS	Dishkatak, in field NW of village on top of VABM "Dishkatak" read on tripod with plate 10" above mark						7/67	11/67
	982,181.05	107	63°37.99	157°28.59	-6.4	-10.1	1-L	
IR14	Innoko River bank at north side of large stream that runs W. towards VABM "Noko", on top of bank on marker						8/67	11/67
	982,185.65	91	63°24.50	158°15.48	+12.9	+9.8	2-L	
IR65	Innoko River at sharp bend 6 mi. SW of VABM "Noko" on top of second ledge from north, on marker						8/67	11/67
	982,178.18	77	63°15.81	158°46.47	+14.7	+12.0	2-L	
/ROD	Junction Innoko & Iditarod rivers on N. point mud flats on VABM "Rod"						8/67	11/67
	982,144.85	95	63°01.88	158°46.01	-0.1	-3.28	4-L	
SS13	Junction of Shageluk, Sl. & Innoko R. on NE point on top of bank 2½' NE of clump of 5 trees at marker						8/67	11/67
	982,133.00	67	62°55.13	159°27.91	-6.3	-8.6	3-L	
SS7	Junction of Shageluk and Holikachuk sloughs on top of W. sand bank at stake						8/67	11/67
	982,140.15	74	62°57.19	159°39.11	-1.0	-3.5	3-L	
Y704	Shageluk Sl., ½ m. S. of junction with Yukon R. at S. side of tributary slough on bank beneath marked tree						7/67	11/67
	982,157.07	184	63°02.99	159°45.15	+9.8	+6.9	3-L	
SHAG	Shageluk village, old school building, on ground at base of steps to N. door below marker						8/67	11/67
	982,137.10	62	62°41.09	159°33.71	+14.6	+12.5	2-L	
SHAS	Shageluk new school, base of steps to main door on timber on marker						8/67	11/67
	982,133.10	93	62°39.46	159°31.68	+15.5	+12.3	2-1	
HOLY	Holy Cross, NE corner of new school building N. of church on concrete corner foundation on marker						9/67	11/67
	982,102.55	82	62°12.10	159°46.09	+17.8	+15.0	4-L	

ALASKAN GRAVITY BASE STATIONS
SOUTHWEST (COAST AND LOWER YUKON)

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.	
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES	
SHAK	Shaktolik, at house nearest N. end of airstrip on ground outside SW corner of vestibule on E. side.						8/67	12/67
	982,273.21	23	64°19.67	161°08.65	+28.3	+27.5	2-L	
UNAA	Unalakleet airport, N.E. corner Alaska Airlines terminal outside E. end of garage door on concrete below marker.						8/67	12/67
	982,217.33	13	63°53.04	160°47.82	+3.0	+2.6	4-L+	
KHOL	Yukon and Khotol R. junction on top of bank 10 yds. N. of N. point on ground below marker on tree.						7/67	12/67
	982,221.45	107	64°02.31	158°43.79	+5.0	+1.3	3-L	
Y704	Shageluk Sl., ½ mi. S. of junction with Yukon R. at S. side of tributary slough on bank beneath marked tree.						7/67	11/67
	982,157.07	84	63°02.99	159°45.15	+9.8	+6.9	3-L	
GRYC	Grayling Creek village top of Yukon R. bank at SE corner of school lot at white post & USLM mark S4268 C2 (1963).						7/67	11/67
	982,153.73	83	62°54.53	160°03.51	+16.7	+13.9	3-L	
GRYS	Grayling Creek school house at bottom of SW steps to school house and power house walkway, on marker on timber.						7/67	11/67
	982,153.42	83	62°54.53	160°03.51	+16.4	+13.6	2-L	
ANVK	Anvik, entrance to old Episcopal Church at NE end of town on top center of concrete steps on marker						9/67	11/67
	982,129.49	68	62°39.46	160°11.95	+9.2	+7.0	4-L+	
YA22	Anvik River, 1½ mi. N. of Runkel's Creek at SW elbow of river on top of large rock ledge on marker.						9/67	11/67
	982,149.05	251	63°01.51	160°43.50	+19.3	+10.7	2-L	
YA41	Yukon and Bonasila R. Junction on N. point on ground 2' NW of 6" cottonwood tree with marker.						9/27	11/67
	982,122.85	56	62°32.11	160°13.06	+10.8	+8.9	2-L	
YA60	Bonasila R., 2½ mi. E. of Stuyahok R. junction at cabin on large meander, near S. door on ground 2' S. of marker.						9/67	11/67
	982,116.60	70	62°28.25	160°44.78	+10.7	+8.3	2-L	
HOLY	Holy Cross, NE corner of new school building N. of church on concrete corner foundation on marker.						9/67	11/67
	982,102.55	82	62°12.10	159°46.09	+17.8	+15.0	4-L	
MARP	Marshall at NE corner of entrance to Post Office on ground.						9/67	11/67
	982,075.43	41	61°52.89	162°05.20	+10.8	+9.4	1-L	
STMN	Andreafsky (St. Mary's) new airport at NCA terminal outside NW door on ground below marker.						9/67	11/67
	982,078.69	302	62°03.5	162°17.50	+24.7	+14.4	3-L	
STMM	St. Mary's Mission, main entrance on E. end of first good concrete step above ground level.						9/67	11/67
	982,094.10	25	62°03.20	163°09.91	+14.0	+14.6	2-L	

ALASKAN GRAVITY BASE STATIONS

SEWARD PENINSULA

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.	
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2.67	TIES	
KTZH	Kotzebue village, pre-1962 Wien hotel, (now a dance hall) at sea end and NW corner of vestibule below marker						8/67	11/67
	982,412.32	6	66°54.01	162°35.70	-9.3	-9.5	6-L	
KTZT	Kotzebue airport, SE corner of new Wien Hangar at marker inside right end of door						8/67	11/67
	982,414.24	7	66°53.45	162°36.10	-6.7	-6.9	4-L	
KTZF	Kotzebue airport, Alaska A.L. new terminal at E. end of freight door on ground below marker						8/67	11/67
	982,412.16	7	66°53.46	162°36.24	-8.8	-9.0	2-L	
KTZI	Kotzebue village, Arctic Inn, on ground S. of N. entrance about 1' above path						8/67	11/67
	982,412.64	8	66°53.99	162°35.80	-8.8	-9.0	4-L	
KTZC	Kotzebue village, on ground below bell of Friends Church and 6' SW of marker						8/67	11/67
	982,412.48	9	66°53.98	162°35.59	-8.5	-8.7	3-L	
DEER	Deering, on ground in front of E. steps of school						7/66	12/66
	982,378.35	5	66°04.53	162°42.95	+11.3	+11.1	2-L	
NOMA	Nome airport, FAA Bldg. on W. side of N. door above marker on concrete step						8/67	12/67
	982,274.23	20	64°30.55	165°26.12	+16.2	+15.6	6-L	
NOME	Nome, old post office flagpole next to souvenir shop on USBM "TH4"						8/67	12/67
	982,273.73	17	64°29.00	165°24.20	+17.3	+16.7	6-L	
NOMP	Nome, new post office on east side of flagpole near bank and above marker on concrete						8/67	12/67
	982,273.70	16	64°29.00	165°24.20	+17.1	+16.6	8-L ⁺	
TELL	Teller at N. corner of cemetery near old airstrip on VABM "Teller"						8/67	12/67
	982,311.65	30	65°15.80	166°21.98	+2.1	+1.1	3-L	
KUZT	Kuzitrin R. bridge on road to Taylor on NE abutment 4' below road and on marker						8/67	12/67
	982,301.24	27	65°13.05	164°49.22	-5.4	-6.3	4-L	
KOUG	Kougarok airstrip at SE end of runway on ground at SW post						8/67	12/67
	982,303.74	270	65°24.28	164°38.94	+7.1	-2.1	7-L	
NS 5	Sinuk R. bridge on Teller Rd. at E. end and on road						8/67	12/67
	982,282.08	121	64°43.29	165°55.00	+18.7	+14.6	2-L	
SHAK	Shaktolik, at house nearest N. end of airstrip on ground outside SW corner of vestibule on E. side						8/67	12/67
	982,273.21	23	64°19.67	161°08.65	+28.3	+27.5	2-L	

ALASKAN GRAVITY BASE STATIONS

NORTHWEST ALASKA - SW EDGE

STAT.	LOCATION DESCRIPTION						DATES OF LAST OCCUP. & ADJ.	
	OBS. GRAV.	ELEV.	LATITUDE	LONGITUDE	F.A.A.	B.A-2,67	TIES	
LAYA	Point Lay, military airstrip, NW corner of hangar, on concrete step to door						4/65 '66	
	982,593.79	10	69°43.80	163°00.80	-3.4	-3.7	1-L+	
CLSB	Cape Lisbourne, 25' N. of runway light at E. end of apron						4/65 '66	
	982,531.09	12	68°52.50	166°06.70	-14.7	-15.1	3-L	
CHAG	Cape Thompson, Proj. Chariot Camp, S. end of old grave						5/64 '66	
	982,501.25	34	68°05.95	165°45.40	+5.5	+4.3	3-L	
NOAT	Noatak Village airstrip parking apron at path to village						5/64 '63	
	982,457.50	74	67°34.55	162°58.40	-1.4	-3.9	2-L	
NOAS	Noatak Village school, on concrete base of flagpole at door						8/67 '66	
	982,457.40	80	67°34.20	162°58.10	-0.6	-3.3	4-L	
NOAM	Noatak Village at USLM 2037-1937 8 feet E. of school						4/65 11/67	
	982,457.08	80	67°34.20	162,58.10	-0.9	-3.6	3-L	
NFWC	Noatak River, F&WS cabin on ground in front of door						4/65 '66	
	982,406.85	477	67°54.65	160°49.50	-35.4	-51.7	3-L	
NOAI	Noatak River, 1966 USGS camp on sand bar on marked and staked rock						8/66 1/66	
	982,410.90	665	68°06.09	159°34.80	-25.7	-48.4	2-L	
KTZT	Kotzebue airport, SE corner of new Wien hangar at marker inside at right end of door						8/67 11/67	
	982,414.24	7	66°53.45	162°36.10	-6.7	-6.9	3-L	

Other Kotzebue stations on Seward Peninsula Sheet

Alphabetical Index to Alaskan Localities
with U.S.G.S. gravity bases showing table page and area

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