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VJ-ONE-B "POLAR BEARS"

REPORT

OF

ALASKAN AERIAL SURVEY DETACHMENT

1929

Lieutenant Commander Arthur W. Radford, U. S. Navy,
Officer in Charge.

A9 UNITED STATES FLEET 10-Le
AIRCRAFT SQUADRONS, BATTLE FLEET
ALASKAN AERIAL SURVEY DETACHMENT

San Diego, California,
31 October 1929.

From: Officer-in-Charge.
To: Commander-in-Chief, BATTLE FLEET.

Subject: ALASKAN AERIAL SURVEY DETACHMENT 1929 - Report of Activities.

Reference: (a) OpNav let. Op-38-E-EMW EG3/N1-1(290295) of 18 February 1929.
(b) CinCBF let. 00/RADFORD,A.W.,Lt-Cdr.,USN, 05/DG(0) of 15 April 1929.
(c) ComAirRonsBF dispatch to CinCBF 0023-1540 of 23 September 1929.

Enclosures: Three - copies of above references.

1. In accordance with references (a) and (b), the Alaskan Aerial Survey Detachment was commissioned at San Diego, California on 23 April 1929, conducted an aerial survey in southeastern Alaska from 24 May to 7 September and returned to San Diego on 22 September. In accordance with reference (c), approved by the Commander-in-Chief, Battle Fleet the Detachment is decommissioned this date.

2. All personnel have been transferred and all material has been properly accounted for.

3. Approximately 13,000 square miles of territory were photographed and 467 oblique photographs made for governmental activities other than the Navy Department. There remain some 4,000 square miles in the Tongass National Forest which have not been covered.

4. Expenditures authorized by the Officer-in-Charge which are in the main properly chargeable to the allotment of $15,000 made by the Departments of Interior and Agriculture total $15,091.35. A detailed analysis of these expenditures is included in Part II, Section C of this report. In addition approximately $1200 was expended directly by Mr. Sargent and representatives of the Forest Service and it is understood that repairs to and fitting out of Barge YF-88 cost about $6,000. The grand total of expenses incident to the survey approximates $22,291.35 about $1.71 per square mile of territory mapped.

5. A detailed report of activities and work accomplished, is attached herewith. It consists of two parts;

Part I, Chronological, Historical Resume', with photographs,
Part II, Section A - Operating Conditions,
B - Photographic,
C - Financial,
D - Personnel,
E - Material,
F - Medical,
G - Aerological,
H - Aircraft Radio,
I - Covered Barge YF-88,
J - Report of Mr. R. H. Sargent,
K - Report of U.S.S.GANNET.

One hundred copies of this report have been mimeographed. Those copies not needed to cover the distribution shown below have been forwarded to the Bureau of Aeronautics, Navy Department, Washington, D. C.

6. Final disposition of all mapping film and obliquo negatives is given in the photographic section of this report.

7. Recommendations for future work of this nature are included in the section of the report to which they are pertinent. In general, personnel were adequate, material satisfactory and operating conditions good to excellent.

/s/ ARTHUR W. RADFORD,
Lieutenant Commander, U. S. Navy.

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Op nav - 5

Op-38-E-RMW
EG5/N1-1(290295)

NAVY DEPARTMENT
OFFICE OF NAVAL OPERATIONS
WASHINGTON D C

18 February 1929.

From: Chief of Naval Operations.
To: Bureaus and Offices of the Navy Department.
Commander-in-Chief, U. S. Fleet.
Commander-in-Chief, Battle Fleet.
Commander Aircraft Squadrons, Battle Fleet.

Subject: Alaskan Aerial Survey, Completion of.

1. The Department, at the request of the Department of Agriculture and of the Interior, has approved the completion of the aerial survey of southeastern Alaska, which was first undertaken in the summer of 1926.

2. The project will be carried out by a detachment of the Aircraft Squadrons, Battle Fleet, under the orders of the Commander-in-Chief, Battle Fleet, who will detail the necessary tender, and render such assistance in furtherance of the project as may be required and is within the capacity of the forces under his command.

3. The departments mentioned will transfer to the credit of the Navy Department the sum of $15,000 to cover the extraordinary expenses of the expedition. It is desired that all expenses be kept to a minimum, and that the Bureau of Supplies and Accounts issue the necessary instructions regarding accounting for sums expended on account of the project.

4. The Bureau of Aeronautics will be the coordinating agency for all matters relating to the project, and will make recommendations to the Bureau of Navigation regarding the detail of the officer-in-charge, in accordance with recommendations of the Commander-in-Chief, Battle Fleet. The detail of personnel other than the officer-in-charge will be made by the Commander-in-Chief, Battle Fleet, from the personnel under his command.

5. The Bureau of Constructionaand Repair is requested to proceed with the rehabilitation and fitting out of YF-88, now at the Navy Yard, Puget Sound, for use by the detachment, the cost of such repairs to be defrayed from the allotment of funds mentioned

Enclosure - A

Tech file

ENCLOSURE A AND B
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REPORT

OF

ALASKAN AERIAL SURVEY DETACHMENT

1929

Lieutenant Commander Arthur W. Radford, U. S. Navy,
Officer in Charge.

A9 UNITED STATES FLEET 10-Le
AIRCRAFT SQUADRONS, BATTLE FLEET
ALASKAN AERIAL SURVEY DETACHMENT

San Diego, California,
31 October 1929.

From: Officer-in-Charge.
To: Commander-in-Chief, BATTLE FLEET.

Subject: ALASKAN AERIAL SURVEY DETACHMENT 1929 - Report of Activities.

Reference: (a) OpNav let. Op-38-E-EMW EG3/N1-1(290295) of 18 February 1929.
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(c) ComAirRonsBF dispatch to CinCBF 0023-1540 of 23 September 1929.

Enclosures: Three - copies of above references.

1. In accordance with references (a) and (b), the Alaskan Aerial Survey Detachment was commissioned at San Diego, California on 23 April 1929, conducted an aerial survey in southeastern Alaska from 24 May to 7 September and returned to San Diego on 22 September. In accordance with reference (c), approved by the Commander-in-Chief, Battle Fleet the Detachment is decommissioned this date.

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3. Approximately 13,000 square miles of territory were photographed and 467 oblique photographs made for governmental activities other than the Navy Department. There remain some 4,000 square miles in the Tongass National Forest which have not been covered.

4. Expenditures authorized by the Officer-in-Charge which are in the main properly chargeable to the allotment of $15,000 made by the Departments of Interior and Agriculture total $15,091.35. A detailed analysis of these expenditures is included in Part II, Section C of this report. In addition approximately $1200 was expended directly by Mr. Sargent and representatives of the Forest Service and it is understood that repairs to and fitting out of Barge YF-88 cost about $6,000. The grand total of expenses incident to the survey approximates $22,291.35 about $1.71 per square mile of territory mapped.

5. A detailed report of activities and work accomplished, is attached herewith. It consists of two parts;

Part I, Chronological, Historical Resume', with photographs,
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7. Recommendations for future work of this nature are included in the section of the report to which they are pertinent. In general, personnel were adequate, material satisfactory and operating conditions good to excellent.

/s/ ARTHUR W. RADFORD,
Lieutenant Commander, U. S. Navy.

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Off-in-Chge, A.A.S.D. - 10
Bu Aero - 5
Op nav - 5

Op-38-E-EMW
EG5/N1-1(290295)

NAVY DEPARTMENT
OFFICE OF NAVAL OPERATIONS
WASHINGTON D C

18 February 1929.

From: Chief of Naval Operations.
To: Bureaus and Offices of the Navy Department.
Commander-in-Chief, U. S. Fleet.
Commander-in-Chief, Battle Fleet.
Commander Aircraft Squadrons, Battle Fleet.

Subject: Alaskan Aerial Survey, Completion of.

1. The Department, at the request of the Department of Agriculture and of the Interior, has approved the completion of the aerial survey of southeastern Alaska, which was first undertaken in the summer of 1926.

2. The project will be carried out by a detachment of the Aircraft Squadrons, Battle Fleet, under the orders of the Commander-in-Chief, Battle Fleet, who will detail the necessary tender, and render such assistance in furtherance of the project as may be required and is within the capacity of the forces under his command.

3. The departments mentioned will transfer to the credit of the Navy Department the sum of $15,000 to cover the extraordinary expenses of the expedition. It is desired that all expenses be kept to a minimum, and that the Bureau of Supplies and Accounts issue the necessary instructions regarding accounting for sums expended on account of the project.

4. The Bureau of Aeronautics will be the coordinating agency for all matters relating to the project, and will make recommendations to the Bureau of Navigation regarding the detail of the officer-in-charge, in accordance with recommendations of the Commander-in-Chief, Battle Fleet. The detail of personnel other than the officer-in-charge will be made by the Commander-in-Chief, Battle Fleet, from the personnel under his command.

5. The Bureau of Constructionaand Repair is requested to proceed with the rehabilitation and fitting out of YF-88, now at the Navy Yard, Puget Sound, for use by the detachment, the cost of such repairs to be defrayed from the allotment of funds mentioned

Enclosure - A

above, and their extent to be in accordance with the recommendations of the Commander-in-Chief, Battle Fleet.

6. It is essential to the successful completion of the project that the detachment arrive at its first Alaskan base by May 25, 1929, and every effort will be made by those concerned to make this possible.

/s/ C. F. HUGHES.

- -

Enclosure - B.

00/RADFORD,A.W. UNITED STATES FLEET 05/DG(0)
Lt.Cdr.,USN BATTLE FLEET
U.S.S.CALIFORNIA, Flagship

San Pedro, California,
15 April 1929.

From: Commander-in-Chief, BATTLE FLEET.
To: Lieutenant Commander Arthur W. Radford, U.S.Navy.
Via: Commander Aircraft Squadrons, BATTLE FLEET.

Subject: Alaskan Aerial Survey Detachment;
Orders to Duty as Officer in Charge of.

Reference: (a) CNO let. Op-38-E-EMW EG3/N1-1(290295)
of 18 February 1929.
(b) BuNav let. Nav-315-R9643-80 T-7855
of 1 March 1929.

1. As outlined in reference (a) the Navy Department has approved the request of the Department of Agriculture and the Department of the Interior for the completion of the aerial survey of southeastern Alsaka which was begun during 1926. The project will be carried out by a detachment of the Aircraft Squadrons, Battle Fleet, under orders of the Commander-in-Chief, Battle Fleet.

2. In accordance with reference (b), you are hereby assigned to duty as Officer in Charge Alaskan Aerial Survey Detachment. You will commission this Detachment on or about 15 April 1929, at San Diego, California. You are authorized to issue such orders to the units assigned to your command as may be necessary for the execution of your mission.

Enclosure - A and B.

3. Expenses of officers and enlisted men will be paid from funds provided in accordance with the following provisions of an Act of Congress approved 3 March, 1925:

"Sec. 5. To cover actual additional expenses to which officers are subjected when making aerial surveys, hereafter a per diem of 7.00 in lieu of other travel allowances shall be paid to officers, warrant officers, and enlisted men of the Army, Navy and Marine Corps for the actual time consumed while traveling by air, under competent orders, in connection with aerial surveys of rivers and harbors, or other government projects, and a perdiem of 6.00 for the actual time consumed in making aerial surveys, to be paid from appropriations available for the particular improvements or project for which the survey is being made; PROVIDED, That not more than one of the per diem allowances authorized in this section shall be paid for one day."

The Department of Agriculture and the Department of the Interior have agreed to transfer the sum of Fifteen Thousand Dollars ($15,000) to the credit of the Navy Department to cover additional expenses incurred in connection with this aerial survey.

4. You will, by weekly reports, keep the Commander-in-Chief, Battle Fleet, fully informed of the progress made in carrying on this work; copies of these reports will be forwarded by you direct to the Chief of Naval Operations, Chief of the Bureau of Aeronautics, and to Commander Aircraft Squadrons, Battle Fleet.

5. These orders do not modify your present status as a part of the Aeronautic Organization of the Navy and your existing detail to duty involving flying remains in effect.

/s/ W. V. PRATT.

FIRST ENDORSEMENT. UNITED STATES FLEET, AIRCRAFT SQUADRONS
00:RADFORD,A.W. BATTLE FLEET, USS AROOSTOOK, Flagship. 05-Rs
Lieut-Cdr.,USN San Diego, California, 23 April 1929

From: Commander Aircraft Squadrons, Battle Fleet.
To: Lieutenant Commander Arthur W. Radford, U.S.Navy.

1. Delivered.

/s/ E. E. WILSON,
Senior Aide.

Received: 23 April 1929.
/s/ A. W. RADFORD,
Lt-Cdr, U.S.Navy. Enclosure - B.

Enclosure - C.

FROM: COMAIRRONS BF 23 SEPTEMBER 1929

TO: CINC BF

0023 ALASKAN AERIAL SURVEY DETACHMENT AT SANDIEGO AND OFFICER IN CHARGE HAS REPORTED PERIOD SUGGEST UNIT OPERATE WITH AIRRONS WHILE DECOMMISSIONING COMMA PERSONNEL TO BE DETACHED TO OTHER UNITS AS THEY CAN BE SPARED AND MATERIAL INCLUDING PLANES TURNED OVER TO AIRRONS AND NAVAL AIR STION PERIOD DESIRE GANNET REPORT AIRRONS ABOUT THIRTY SEPTEMBER ON COMPLETION OVERHAUL PERIOD OFFICER IN CHARGE ALASKAN SURVEY DETACHMENT STATES READY TO GO OUT OF COMMISSION ON THIRTYONE OCTOBER AND FINAL REPORT RENDERED AS OF THAT DATE 1540

Enclosure - C.

PART I.

CHRONOLOGICAL HISTORICAL RESUME OF OPERATIONS.

1. On 18 February 1929, the Secretary of the Interior and the Secretary of Agriculture made a formal request to the Secretary of the Navy to complete the aerial survey of the Tongass National Forest of southeastern Alaska a project which had been originally undertaken by the Navy's Alaskan Aerial Survey Expedition in the summer of 1926. It was agreed that the sum of $15,000 would be transferred to the credit of the Navy Department by the Departments of Interior and Agriculture to help defray the expenses of the survey. The Department of the Interior also promised the services of Mr. R. H. Sargent, Topographic Engineer of the Geological Survey who would accompany the Detachment as technical advisor. On 23 February 1929, the Secretary of the Navy replied that the Navy Department would undertake the project, and plans were immediately formulated to carry out the work during the summer of 1929. The Chief of Naval Operations issued orders for the organization of the Alaskan Aerial Survey Detachment as a detached unit of the Aircraft Squadrons, Battle Fleet to operate under orders of the Commander in Chief, Battle Fleet stating that the Detachment should arrive at its first Alaskan base not later than 25 May.

2. In compliance with orders issued by the Commander in Chief via Commander Aircraft Squadrons, Battle Fleet, Lieutenant Commander Arthur W. Radford, U. S. Navy, placed the Alaskan Aerial Survey Detachment in commission at the U. S. Naval Air Station, San Diego, California, on 23 April and assumed command. Preparations for the assembly of personnel and material which had been started previously were continued and rushed to completion. The covered barge that had been used for living quarters, photographic laboratory and offices by the 1926 Expedition was reconditioned at the Navy Yard, Puget Sound and assigned to the Detachment. The USS GANNET was assigned as aircraft tender, the Commanding Officer of which reported for duty at San Diego on 1 May 1929. After loading material and embarking personnel of the Detachment, the GANNET departed from San Diego on 6 May arriving at the Navy Yard, Puget Sound, Washington, on 11 May. The personnel of the Detachment was composed of four officers and sixty-one men regularly attached to the USS GANNET, and five Naval Aviators, one medical officer, one supply officer and forty enlisted men comprising the aviation detail.

3. Four Loening Amphibian (OL-8A) planes were made available for the Survey;- one was assigned from VJ SQUADRON ONE-B and three were shipped from the Loening factory at New York via the USS LANGLEY to San Diego. The four planes were named after Alaskan Cities which were to be used as operating bases. Plane number one being the Juneau; number two, Ketchikan; number three, Petersburg; and number four, Sitka. An insignia was adopted showing a winged seal against a background of an active volcano and the midnight sun.

4. The four planes with a total crew of twelve officers and men left San Diego, 15 May and arrived at the U. S. Naval Air Station Sand Point, Seattle, Washington, 17 May after stops at Fresno and Oakland in California, and Medford, Oregon. Mr. Sargent joined the Detachment at Seattle and made the flight to Ketchikan as a passenger in one of the planes. The GANNET with the Barge in tow left the Navy Yard, Puget Sound, 20 May arriving at Ketchikan, Alaska, 24 May.

5. Prior to departure of the Detachment from San Diego, the State Department had obtained permission from the Canadian Government for the four planes to fly over Canadian territory and use Canacian Government radio stations for transmitting movement reports and obtaining necessary weather data. The four planes left Sand Point, 21 May, and after an overnight stop at Alert Bay, B.C., arrived at Ketchikan 22 May. Plane number one was equipped with an SE-1385 radio set while at Sand Point and, with efficient and willing cooperation on the part of British Columbia radio operators, excellent two way radio communication was maintained throughout the flight from Seattle to Ketchikan,- providing the flight leader with reliable weather reports from points along the line of flight.

6. Upon arrival of the GANNET at Ketchikan on 24 May the Detachment was ready to commence photographic operation,- one day prior to the date previously set by the Chief of Naval Operations. Contracts for delivery of gas and oil at Ketchikan, Wrangell, Sitka, and Juneau had previously been placed by the Supply Officer, Navy Yard Puget Sound, with the Standard Oil Company of California.

7. At Ketchikan, the GANNET and Barge were moored to the Lighthouse Service Dock and the planes were secured on the beach at the Model Dairy farm, two miles down the Channel. A Chevrolet truck, obtained from the Aircraft Squadrons, Battle Fleet and transported to Alaska on the stern of the GANNET, proved to be an absolute necessity in transferring men and supplies to and from the dock and the operating beach. Although photographic operations could have been carried on from Ketchikan it was decided to move nearer to the area to be mapped. An aerographer, with complete equipment for taking upper air soundings and for making a daily weather map and forecast, proved his worth at this stage of the operations. Unfavorable weather for

photographic flights was predicted for the next few days and on 27 May the entire Detachment departed from Ketchikan arriving at Petersburg on 28 May after an overnight stay at Wrangell.

8. At Petersburg the planes were parked on a narrow beach directly across Wrangell Narrows from the town while the GANNET and Barge secured to the Citizens Wharf. The base was well established and all preparations for mapping were completed before the arrival of good weather on 30 May. From Petersburg, the Islands of Kuiu, Coronation, Warren, and the southern half of Baranof were photographed.

9. In making the aerial survey, flight lines four and one half miles apart were drawn on a chart showing only the coastline of the area to be mapped,- the data required from the photographs being the details of rivers, lakes and mountains in the interior. The mapping plane, with one naval aviator as pilot, another as navigator, and a photographer, would then follow these flight lines at an altitude of 10,900 feet,- the photographs being taken through an open hatch in the bottom of the plane with the "T-2" four lens camera. The scale of the photographs taken of areas at sea level was then 1-20,000. Due to the intense cold at the mapping altitude, considerable trouble was at first experienced with the shutters of the "T-2" cameras. This difficulty was temporarily overcome by operating the cameras in the Petersburg Cold Storage plant and observing and correcting the cause of the shutter failures, although additional failures occurred from time to time later in the summer. Close-up oblique photographs of areas designated by the Forest Service and Mr. Sargent were taken over the side of the plane with the "K-3A" camera.

10. After investigation and comparison of the facilities at Sitka and Juneau it was decided to shift the Detachment from Petersburg to Juneau for the remainder of the work left in the northern part of the Tongass National Forest. On 17 June the entire Detachment left Petersburg arriving at Juneau the same day. In Juneau, the GANNET and Barge were tied up alongside the Government Wharf and the planes secured on the Wharf,- the GANNET hoisting them to and from the Wharf as operations required. While operatinf from Juneau, the Islands of Chichagof, Kruzof, Yakobi and the norther half of Baranof and portions of the mainland in the vicinity of Juneau were completed.

11. When the summers work first started the actual photography from 10,900 feet was limited to the time between the hours of 8 a.m. and 4 p.m. As the season progressed, due to shortening days and consequent lengthening shadows, the time limit was cut first to between the hours of 9 a.m. and 3 p.m. and finally from 11 a.m. to 1 p.m.

12. After operating from Juneau for two months, the Detachment departed on Saturday, 17 August and, after stopping over at Petersburg on Sunday, arrived at its next base, Ketchikan, on Monday, 19 August. The GANNET and Barge were moored to the Lighthouse Service Dock and arrangements were made to clear enough space on the Dock for securing the planes instead of operating from a beach as had been done during the short stay in Ketchikan while on route north. From the experience gained at Juneau this was found to be, by far, the best method of carrying on flight operations,- the personnel of the GANNET having become quite efficient in hoisting the planes to and from the dock.

13. The Detachment arrived in Ketchikan during a heavy downpour which continued almost without cessation for seven days. Roads and bridges were washed out, houses undermined and even the routine overhaul work on the planes had to be discontinued. When the weather finally cleared, the Detachment mapped sections of the mainland between Behm Canal and Portland Canal and a few scattered areas to the north along Stephens Passage. After the first of September, the daily weather maps were examined with care and misgiving in view of the expected approach of the annual equinoctial storms. On Friday, 6 September, after a week of good weather, an immense "low" showed itself on the weather map, and rather than become storm bound for an indefinite period, plans were immediately made for an early departure. The next morning, rain was reported at Wrangell,- less than seventy-five miles north,- with the prospect that it would reach Ketchikan late in the afternoon on the following morning. A digression is made at this point to call attention to the excellent service rendered by the Signal Corps, U. S. Army in placing the facilities of the Alaska Cable and radio stations at the disposal of the Detachment. At any time during the summer, a telephone request to the nearest Army cable or radio office was all that was required to obtain the weather conditions at any point in Alaska.

14. On Saturday afternoon, 7 September, the entire Detachment left Ketchikan ahead of the approaching storm,- the four planes arriving at Sand Point, Seattle, the following day after an overnight stop at Alert Bay, B.C. On these flights, the planes followed the regular inside steamer route between Ketchikan and Seattle. The new aviation charts, recently published by the Hydrographic Office, Navy Department, were followed with the greatest ease and found to be most excellent.

15.- The GANNET and Barge arrived Seattle the following Thursday, 19 September, and the entire Detachment was concentrated at Sand Point, Lake Washington, during the overhaul of planes and the

completion of photographic work for the Departments of Interior and Agriculture. On Monday, 16 September, the GANNET, with the Barge in tow, proceeded to the Navy Yard, Puget Sound where the Barge was turned in,- the GANNET departing for San Diego the Next day.

16. The four planes were delayed at Sand Point due to extremely adverse weather conditions caused by dense smoke from numerous forest fires in Washington, Oregon and California, until Friday, 20 September, when the flight was continued to Corning, California via Eugene, Oregon. The next morning at 1050 the planes left Corning and after stopping at the Long Beach Airport completed the flight to San Diego at 1725, Saturday, 21 September. The GANNET arrived the next day.

17. The period from 23 September until 31 October was spent in completion of photographic work, compilation of data for this report, inventory and turning in of planes and equipment, issuing orders for the next assignment of all personnel, and in routine office work incident to placing the Detachment out of commission on 31 October. The following disposition was made of the major items of equipment:

Item	Disposition
Barge YF-88 and permanent installations	- Navy Yard, Puget Sound,
4 Loening Amphibians (OL-8A"	VJ SQUADRON ONE-B,
Aerological Equipment	Naval Air Station, San Diego, for shipment to Naval Air Station, Sand Point, Seattle.
Medical Supplies	Naval Air Station, San Diego, for shipment to Medical Supply Depot, Mare Island.
2 Four lens cameras (T-2)	Naval Air Station, San Diego.
2 Fairchild (K-3A) cameras	ditto
4 Stineman Developing Reels	ditto
Remainder of photo equipment	ditto
Engine and structural spares	ditto
Radio Sets and Equipment	Aircraft Squadrons, Battle Fleet.
Galley equipment and mess gear.	ditto
Office equipment, typewriters, safe etc.	ditto
Chevrolet Truck	ditto

18. During the time that the Detachment was in commission - from 23 April until 31 October - the records shown the following totals:-

SECTION A.

OPERATIONS.

AVIATION FACILITIES BETWEEN SEATTLE, WASHINGTON and KETCHIKAN, ALASKA. OPERATING CONDITIONS IN SOUTHEASTERN ALASKA.

1. AVIATION FACILITIES BETWEEN SEATTLE, WASHINGTON AND KETCHIKAN, ALASKA.

(1) As soon as instructions had been issued by the Chief of Naval Operations for the organization of the 1929 Alaskan Aerial Survey Detachment, the Navy Department instituted a formal request via the State Department to the Canadian Government for permission for the planes of the Detachment to fly over Canadian territory and to use Canadian Government radio stations in transmitting movement reports and obtaining weather data along the line of flight. This permission was granted and the Officer in Charge was directed to make all arrangements for radio communication direct with the Director of Wireless Telegraph of British Columbia at Victoria, B.C. These arrangements were completed through the District Communication Officer, Thirteenth Naval District prior to the departure of the planes from Seattle, and the Canadian radio stations at Victoria, Vancouver, Cape Lazo, Alert Bay, Dead Tree Point, Bull Harbor and Prince Rupert rendered excellent and efficient service in maintaining constant two way communication between Plane Number One and the nearest radio station. The value of this service cannot be overemphasized, as weather reports along the line of flight were thereby immediately available to the flight leader.

(2) With few exceptions the regular steamer route via the inside passage was followed on the flight from Seattle to Ketchikan, due to the fact that it is usually over well protected water and, in case of a forced landing, assistance would be more readily available. However, when the weather is sufficiently clear to permit the flight to be made at an altitude of 5000 feet, it is recommended that the line of flight be laid to cut across Cape Caution which is indented with numerous inlets affording excellent shelter in case of a forced landing.

(3) As the distance between Seattle and Ketchikan could not be covered in one flight, Alert Bay, B.C., 264 nautical miles northwest of Seattle in Johnstone Straits, was selected as the logical refueling point. This Bay, although small, is well protected except from south winds, and has a fair gravel beach in front of the prominent brick buildings of the Indian Residential Schools located to the west of the town. Caution should be used in approaching this beach due to the presence of stationary half submerged logs in the western part of the Bay. All four planes of the Detachment were taxiied up on this beach and securied barely clear of the high tide. Aviation gasoline in fifty gallon drums was delivered to the beach by the Union Oil Company, Limited, although a lone plane desiring gasoline could probably obtain it quicker and with less trouble by going direct to the Union Oil Dock near the center of the waterfront. The radio station transmitted movement reports and obtained weather reports prior to departure the next day. Alert Bay is a regular port of call for several Canadian steamers making the run between British Columbia ports and southeastern Alaska. It has two small hotels.

(4) Although under present conditions Alert Bay is considered the most feasible stop-over point for planes flying between Seattle and Ketchikan, there are several other well protected harbors along this route where aviation refueling facilities are available. Information concerning local refueling facilities in these ports at any future time may be obtained from any of the prominent oil companies maintaining branch offices in British Columbia and southeastern Alaska.

2. GENERAL CONDITIONS IN SOUTHEASTERN ALASKA.

(1) The operations of the Detachment in southeastern Alaska during the past summer gave clear-cut and positive proof of the adaptability of a rugged amphibian such as the Deening for this work. No suitable land plane fields were available. Unusually deep water and an extreme tide range of twenty-four feet with resulting strong currents in the channels along which the most important cities are located, usually made anchoring the planes impracticable. At bases where sufficient dock space was available, the planes were secured on the dock,- the GANNET hoisting them to and from the water as operations required. Where dock space was not available, the nearest suitable beach was selected and cleared,- the planes landing on the water and taxiing out on the beach under their own power. It is in connection with such operations that the value of the characteristics of the amphibian type of plane is fully realized and appreciated. The best beaches were barely large enough,- the water coming up to the axles of the planes during the extreme high

tides which occured for a few days each month.

3. LOCAL CONDITIONS.

(1) PETERSBURG, ALASKA. Through the courtesy of Mr. Earl N. Ohmer, Mayor and leading citizen of Petersburg, a space was cleared at the Citizens Wharf for the GANNET and Barge and a beach directly across Wrangell Narrows was made available for the planes. Personnel, gas and photographic equipment were transported back and forth across the Narrows in the GANNET'S motor sailor. A nearby vacant house was used as quarters for the men standing plane guard duty at night.

(2) At Juneau, the GANNET and Barge were moored to the Government Wharf and the planes secured on the wharf. This wharf was in excellent condition and equipped with telephone, water and power connections which were made available for the use of the Detachment. The operating conditions were were very satisfactory and permitted concentration of all units of the Detachment. The officers and crew of the GANNET became extremely efficient in handling the planes to and from the dock, and always gave excellent cooperation in the work to be done. Before the summer was over, all four planes could be hosted from the water and secured on the dock within twelve minutes. This became a vital factor in cutting down the interval at noon between mapping flights as the summer passed and the time limit for actual photography was reduced. Aviation gasoline and oil in fifty gallon drums was delivered to the dock by the Juneau branch of the Standard Oil Company of California.

(3) At Ketchikan, arrangements were made through the Superintendent of the Lighthouse Service for dock space for the GANNET and Barge and the four planes. The Lighthouse Service Dock is about a mile south of town and reached by a good highway. The machine shop facilities of the Depot at the Dock, and water, telephone and power connections were made available for the use of the Detachment. Operating conditions at Ketchikan compared favorably with those at Juneau, and photographic work was carried on with a minimum of lost motion. Aviation gasoline and oil in fifty gallon drums was delivered to the dock by the Ketchikan branch of the Standard Oil Company of California.

(4) During the summer in southeastern Alaska each plane was given the regular twenty hour checks as required by existing instructions and it was largely due to the care and thoroughness with which these were carried out that engine failures were entirely eliminated During rainy weather, which frequently occurred when the planes were due for this check, a canvas tent fly was rigged over the engine and

the check carried out,- assuring the readiness of the plane for the next mapping weather. Excellent performance was obtained from the four Pratt-Whitney aircooled Wasp engines, and all four planes completed the summer's work without a change of engines. In view of the unfavorable operating conditions due to limited beach space, lack of shelter, rapid temperature changes, and heavy rainfall, it is considered that both the planes and the engines withstood the rigorous test remarkably well.

SECTION B.

PHOTOGRAPHIC.

General Information - Equipment - Methods Used - Work Accomplished.

1. EQUIPMENT.

(1) Upon receipt of information in April 1929 that the Alaskan Aerial Survey Detachment was to be reorganized to continue the aerial survey started in May 1926, steps were immediately taken to secure the necessary cameras, photographic equipment and photographic personnel, as it was the Department's wishes that photographic work be started in Alaska by May 25, 1929. Requisitions for photographic equipment were forwarded to the Bureau on 15 March and with the exception of a few items, were approved and returned to the Naval Air Station, San Diego, - the majority of the items not available in the Supply Department to be purchased by the Supply Officer at that station. The delivery of a great deal of the photographic material was delayed due to late opening of bids, odd sizes, and nature of equipment. All requisitions for photographic supplies were based on the experience gained by the 1926 expedition. A complete list of photographic supplies is included in the material section of this report.

(2) The following mapping cameras were drawn from store at the Naval Air Station, San Diego on 15 April: two (2) "T-2" four lens; one (1) "K-3A" single lens; - (as no suitable oblique camera was available, the "K-3A" was drawn for this purpose). A "T-1" camera drawn from Aircraft Squadrons, Battle Fleet was carried along to be used as a spare. The "T-2" four lens cameras were to be used for all mapping photographs and therefore were carefully inspected as soon as drawn from store and found to be in the following condition:-

CAMERA #1 - Lock screws of rollers on mounts were frozen. Focal plane frame was burred and screws not properly seated. The plungers of all shutters were not properly lined up with the operating part of release mechanism. This camera cleaned up, adjusted and was tested at 10,000 feet altitude on 25 April and found to be satisfactory.

CAMERA #2 - Focal plane frame was burred and screws not properly seated. The "C" lens showed signs of having been tampered with,

the lens having been unscrewed from the mount one half turn. On first air test on 22 April the "C" shutter failed. Examination showed that the plunger of this shutter was badly burred. This camera was tested at 10,000 feet altitude on 24 April and found to be satisfactory.

"K-3A" MAPPING CAMERA - Lack of time prevented this camera from being tested upon receipt as it was necessary to immediately turn it over to the machine shop for the installation of a handle in order that it could be used for oblique photography.

(3) The following comment is made on the items of major importance based on experience gained in mapping operations extending from May to September 1929.

CAMERAS - Upon arrival of the GANNET and Barge at Ketchikan, on 24 May, everything was in readiness for mapping. On 25 May the weather was not clear enough for mapping flights but clear enough to climb to the mapping altitude of 10,900 feet so advantage was taken of this opportunity to test cameras, check overlap and familiarize pilots, navigators and photographers with their duties. The following was the result of the first air tests: "T-2" Camera #1. This camera proved to be satisfactory,- the flight lasted about two hours and the photographer made twenty exposures; "T-2" Camera #2. The film tore after a few exposures. Examination showed slight burrs on the rollers, which, together with the film being brittle due to low temperature, probably accounted for the casualty, as it later proved to be satisfactory after rollers had been smoothed down with crocus cloth.

On 30 May the first mapping flights were made over Kuiu Island with the following results: "T-2" Camera #1. The film tore after fifty-one exposures. No reason could be found for this casualty other than the film was very brittle due to extreme low temperature at the mapping altitude,- the temperature being -6° F; "T-2" Camera #2. The shutters of "B" and "C" lenses missed at intervals. The plungers of all shutters were examined, and both the plungers and bushings rubbed with crocus cloth and thoroughly cleaned. Upon the next air test all shutters functioned satisfactorily.

As mapping flights on June 4, 5, and 6 proved that the shutters were not working as regularly or as satisfactorily as they should, on 7 June both cameras were taken to the Petersburg Cold Storage Plant at Petersburg, for the purpose of conducting a test to determine the action of low temperatures on the shutters and plungers. The cameras were mounted and operated as in actual mapping,- exposures being made at regular intervals and the temperature lowered

to 10° F. After forty minutes at this temperature the plungers became cluggish and after about one hour the shutters failed to function on functioned only intermittently. The cameras were then taken to a warmer room and after a period of about ten minutes at a temperature of 50° F. the plungers again functioned satisfactorily. The steel plungers of all the shutters were removed and carefully rubbed with crocus cloth to give the plungers more clearance in the brass bushings. The cameras were again tested with this increased clearance and the shutters of both cameras performed perfectly for over an hour at a temperature of 10° F. Before each mapping flight all the plungers were removed from the shutters and both the plungers and bushings thoroughly cleaned. In addition to this, a brass plate was manufactured to fit over the base of the camera to keep dirt or any small particles from getting near the plungers or bushings. This plate was removed after the plane had left the water and the camera hatch opened. It was also the practice to operate the shutters about every thirty seconds from the time of take off until ready for mapping in order to prevent possible freezing of the shutters while climbing to the mapping altitude. Even after all these precautions were taken, occasionally one or more of the shutters of both cameras failed to function. Unfortunately when the cameras were constructed, the shutters were not properly installed. The operating pad does not strike the shutter plungers squarely. This may be at least one of the many causes of shutter failure. The present shutter is a Wollansack and is very unreliable and unsatisfactory. A shutter of more sturdy construction should be used. It is understood that the Army has shifted from Wollansack to Illex shutters, and if so, a report covering the success or failure of this change should be obtained and made available for future reference.

It is recommended that, before future mapping operations are undertaken with these cameras, a complete new set of shutters be installed. These shutters should be tested in ample time to allow for changes should failures occur. The shutters should be tested for at least one hour at a temperature to which they will be subjected during actual mapping operations. It is difficult except between runs to note if the shutters are functioning properly. At the present time, the first knowledge of shutter failure is obtained usually only after the film has been developed, fixed, washed and placed on the drying reel where the film can be examined for misses. It would be a discinct advantage in saving film and time and in expediting mapping operations if the cameras had an attachment which would indicate to the photographer at once when any shutter ceased to function.

"T-2" CAMERA SPARES. The only spares furnished for the "T-2" mapping cameras were: - 1 camel's hair brush, 1 screw driver, 1 open end wrench, 1 stop watch, 2 spirit levels, 1 roll of adhesive tape. It is believed that the following additional spares should be supplied a Detachment operating in Alaska: - 1 set of shutters and mounts,

1 set of plungers and bushings, 1 set of control shafts for fourth magazine, 1 complete set of small tools similar to those supplied with the "K-3A" camera.

FILM PUNCH. Film punchings frequently dropped in lens chamber and on one occasion on rear element. It is recommended that a separate compartment be constructed to hold punchings in order to avoid the possibility of film punchings finding their way on rear element of lens and ruining detail of negative.

CAMERA HANDLE. Great care should be used in handling the camera by the strap handle. This handle is not sufficiently rugged and should be redesigned in order to prevent its pulling out so easily.

COUNTER. The counter to show the number of exposures made on a run is so mounted that the photographer is forced to read it backwards. This counter should be redesigned so that the numbers face the operator.

FILM DIAL. The film dial to indicate when the exposed section of the film has been wound off is very poorly located. A small mirror was manufactured and installed at an angle to the dial so that the photographer could see from his seat the white line indicating when the exposed film was wound off, but this was not absolutely satisfactory. As exposures are usually made at rather short intervals and the photogrpher is extremely busy keeping the camera level and watching overlap, this dial should be located so that the photographer can note when the film is rewound without changing his position.

"K-3A" MAPPING CAMERA. Upon returning from the first flight made in Alaskan waters with the "K-3A Camera #15, it was noticed upon developing the film that a bad light leack showed on all negatives. Examination showed that this leak was caused by the upper part of the cone not being properly secured. This leak was sealed with wax and adhesive tape and no further trouble was encountered until the early part of August when the shutter failed at times to fully close. Another "K-3A" Camera was requisitioned and received in Juneau. On return from the first flight with this camera the film was also noticed to be light struck. Examination showed that the leak was located where the camera drive unit fits into the case due to the poor machine fit. Wax and tape were again used successfully to cover up the defect. This model camera, while not designed for oblique work, was the only suitable one available for issue. It is far too bulky, heavy and dangerous for obliqqe photography,- especially so when wearing a furlined suit and parachute. It is recommended that a camera of lighter construction and adaptable to focus on close objects be supplied future expeditions. It is understood that the Fairchild "F-4" is a camera that may fill these requirements and merits investigation.

CAMERA HATCH. The present camera hatch in the "OL8A" plane is too small for operating the "T-2" camera. In order to compensate for crab of the plane and thus square the photographs with respect to the flight course or to introduce crab in the photographs, the camera may be rotated about its vertical axis by sliding the trunions on the circular metal bars, but the present camera hatch allows for no more than a 5° crab. It is impossible to secure a greater degree of crab due to the camera base striking the sides of the camera hatch. The camera base also strikes the top of the tatch when the camera is tilted to allow for a slight variation from level flight.

FILM.

"T-2" MAPPING FILM. On first requisition, forty rolls of hypersensitized panchromatic film 380' x 6" and ten rolls of hypersensitized panchromatic film for "D" chamber 105' x 6" were supplied. This film was shipped in two lots of equal amount. The first lot was shipped in the Navy Yard, Puget Sound and placed aboard the Barge prior to sailing for Alaskan waters,- the second lot to be shipped when requested by the Officer in Charge. After careful consideration it was decided to request immediate shipment of the second lot in order to avoid any possibility of running out of film during mapping operations and a letter to this effect was forwarded to the Bureau of Aeronautics on 2 May. This second lot however was not received in Alaska until 13 July. On 6 August, after using thirty-six rolls of film and with only four rolls remaining on hand, Mr. Sargent ordered an additional thirteen large and three small rolls. Of this amount six large and three small rolls were returned by Mr. Sargent to the Geological Survey. Approximately two rolls of film remaining on had at the end of the season were turned over to the Aircraft Squadrons, Battle Fleet. In future mapping operations it is recommended that all the film considered necessary for the project be supplied in one lot and be delivered prior to the departure of the expedition for Alaskan waters. The experience gained by the 1926 and 1929 expeditions would indicate that from twenty to twenty-five rolls of mapping film is the amount required per mapping plane for operations covering a period from May to September.

"K-3A" MAPPING FILM. Ten rolls of hypersensitized panchromatic film 75' x 9" were first requisitioned for use with the "K-3A" for oblique photography. Due to the large amount of oblique photographs required by the various government bureaus, an additional five rolls were requisitioned, practically all of which was used prior to departure for the home base.

MOTION PICTURE FILM. Six thousand feet of negative defender panchromatic film in rolls two hundred feet long were requisitioned and three thousand feet in one hundred foot rolls. Two thousand feet of

positive stock was also requisitioned. This film proved very satisfactory and no suggestions are offered.

PAPER. Grades of paper listed in the Standard Allowance List were requisitioned. The paper was supplied by the lowest bidder and while quite satisfactory it is believed that better results could be obtained if only enough paper were taken along to determine the best paper for local conditions of light and type of work required. Arrangements could then be made to purchase the required amount, grade and size at probably a saving to the Government.

DEVELOPING REELS. As the "T-2" mapping film comes in rolls three hundred eighty feet long, special developing reels manufactured by R. P. Stineman of Los Angeles, California were requisitioned. These reels hold approximately one-third of a roll or one hundred thirty feet and the complete roll of mapping film can be developed in three cuttings. This size reel is convenient to use and proved very satisfacoty. "K-3A" film seventy-five feet by nine inches can also be easily and successfully handled on these reels.

DRYING REEL. A drying reel size 7½ x 12 feet holding three hundred eighty feet of mapping film or one thousand feet of motion picture film revolved by a small electric motor was installed on the Barge and proved entirely satisfactory.

PRINTER. An Eastman Professional Printer was used and proved highly satisfactory using either AC or DC electric current.

ENLARGING CAMERA. Due to the fluctuation of electric current supplied the Barge, a parallex reflector was substituted for a Cooper-Hewitt and except for being slow proved satisfactory. It is suggested that a pair of 14" condensors with T-20, 1000 watt bulbs be substituted.

FILTERS. An excess of the amount of filters normally required should be requisitioned. On return from mapping flights the sudden change from the high altitude to the ground temperature caused the filters to collect moisture and after drying they frequently buckled. Examination to determine shutter failure also caused frequent replacements. K2, K3 and minus blue filters were used.

MOTION PICTURE CAMERAS. The two motion picture cameras used proved to be satisfactory,- one an Akley, the other a DeVry.

CHEMICALS. Chemicals were requisitioned using as a basis two rolls to the tank (twenty-five gallons of developer). The list of chemicals as requisitioned proved to be the minimum abount that should be carried.

MISCELLANEOUS. - PRINT WRINGER. Ferro typeing of large quantities of prints could be greatly expedited if a print wringer were supplied rather than the usual blotter and roller method.

TIMERS. A sufficient number of timers should be supplied to assist the photographers in developing, fixing and washing film. Two were allowed - a minimum of four should be supplied.

HEATERS. Standard Coleman Gasoline Heaters were found very satisfactory in keeping the photographic laboratory at a uniform temperature and assisted greatly in drying film.

PHOTOGRAPHIC LABORATORY. The printing and loading room of the photographic laboratory together with the light traps should be slightly rearranged in order to permit developing and printing at the same time. This work can easily be accomplished by the Ship's force if the Detachment is again organized. In other respects the laboratory is considered satisfactory.

2. GENERAL INFORMATION.

(1) STATIC. Considerable difficulty was experienced with static on the film. A careful record of temperatures was kept and every effort made to determine the cause but with very little success. It is believed possible to eliminate it or at least greatly reduce it and tests should be carried on to determine the cause and remedy.

(2) TEMPERATURES. Mapping operations were carried on at various degrees of temperature. The lowest recorded was on 30 May when the temperature at 10,900 feet altitude was -6° F., and the highest on 5 August with a temperature of 40° F.

(3) HOURS AVAILABLE FOR MAPPING. The following is based on ~~XXXX~~ light conditions in southeastern Alaska from the latter part of May until the first part of September.

May 30 to July 11.	Satisfactory light for mapping was available between the hours of 8 a.m. and 4 p.m.
July 11 to Aug 5.	Satisfactory light for mapping was available between the hours of 9 a.m. and 3 p.m.
Aug 5 to Aug 20.	On account of long shadows obscuring detail, mapping coule be carried on only between the hours of 10 a.m. and 2 p.m.
Aug 20 to Sept 8.	Lengthening shadows reduced the time limit for mapping to the hours of from 11 a.m. to 1 p.m., after this date mapping photographs would be of little or doubtful value.

The average duration of mapping flights was from three to four hours depending upon the distance of the territory to be mapped from the base. On clear days between May 25 and August 5 each mapping plane made two flights. After August 5 only one mapping flight per plane could be made. The average time to unload, clean plungers, reload and install cameras was about one hour. If additional cameras were available, time could be saved by having the spare cameras loaded and ready for installation as soon as a plane returned from first flight. This would be a valuable saving in case of camera casualty as the days available for mapping are few and far between.

3. METHODS USED IN PHOTOGRAPHIC FLIGHTS.

(1) The Detachment had four "OL8A" amphibians equipped and available for mapping flights. Two planes were used for mapping flights, one for oblique photographs, and the fourth as a standby. While these planes have not the visibility desired for a mapping plane, otherwise they are perfectly satisfactory for this type of work. Each mapping plane had a crew of three, namely, pilot, navigator, and photographer with the following specific duties:

Pilot. (a) keep plane at mapping altitude of 10,900 feet,
(b) keep plane level both laterally and longitudinally,
(c) keep constant air speed.

Navigator. (a) direct pilot along proper flight line,
(b) signal the photographer when to start and stop taking photographs,
(c) keep a record of the time and place of starting and stopping all runs.

In order to best accomplish (a) the navigator secured lines from his cockpit to the pilots arms and by pulling on the lines similar to driving a horse he directed the pilot on the proper course. Small lights were rigged in both the pilot and navigators cockpits in order to indicate when an exposure was being made. These flights were flashed on by the photographer five seconds before the photograph was being taken and off when exposure was made. The average interval between exposures was fifteen seconds, thus giving about ten seconds in which to direct the pilot on new course in case the plane was off the flight line.

Photographer. (a) start and stop photographing when directed to do s by the navigator,
(b) keep record of exposures made during run,
(c) make exposures often enough to allow for 70% directional overlap.

This overlap or rather the interval for the overlap was obtained by noting the area covered in the view finder,- the lines in the view finder being spaced so as to indicate the overlap between successive exposures. This interval of course varied according to the ground speed and the altitude of the plane above the territory being

photographed. In Alaska where the altitude varies from sea level on the shore lines to eight thousand feet, the exposure interval must be carefully watched. The shortest interval used was seven seconds and the longest thirty-two seconds. The camera must be kept level and crabbed to allow for the angle between the course and the track of the plane.

(2) FLIGHT CHARTS FOR MAPPING. Prior to each flight the mapping team carefully looked over the chart of the area to be mapped. The best available charts or maps were used for flight charts - either the Coast and Geodetic Survey to the scale of 1-200,000 or the International Boundary Commission to the scale of 1-250,000. Flight lines were drawn four and one-half miles apart and, were possible, at right angles to the shore lines. The spacing of four and one-half miles was to allow for lateral overlap of thirty percent. The purpose of placing flight lines at right angles to the shore lines was to take advantage of the Coast and Geodetic Survey Control points. As some of the flight lines extended over thirty miles with practically no land marks for reference, it required careful piloting and expert navigating to keep the plane on the proper flight line, especially so when strong cross winds were encountered. Successful mapping can be accomplished only with the greatest cooperation between the pilot, navigator and photographer. If one or the other fails to carry out his specific duties the mapping photographs will be practically valueless. One flight chart was prepared by Mr. Sargent for the navigator of each mapping plane, and one for the base to be used by the relief pilot in case of a forced landing of either mapping plane. In order to take advantage of any area that was clear of clouds, each plane was given a flight schedule with at least three choices in differenct localities. These choices were listed in order of preference and the navigator of the mapping plane could shift from one choice to another to take advantage of the most favorable weather conditions. The flight schedule also directed how each plane should proceed ~~and~~ from and return to base. This was necessary in order to have accurate knowledge where to search in case of a forced landing of any mapping plane.

(3) Method used in Numbering And Indexing Mapping Negatives. Each large island in southeastern Alaska was given an index or unit letter and the mainland arbitrarily divided into three sections and lettered "X", "Y", and "Z". On each island and the mainland flight lines were drawn and the flight lines for each unit were numbered consecutively. After a mapping flight, the film was immediately developed and examined by Mr. Sargent for overlap in order to be absolutely certain that the area had been properly covered. Each set of "A", "B", "C", and "D" negatives were numbered as follows:- The first letter indicated the unit area; this was followed by a dash then a figure which indicated the photograph number; then another dash followed by a number indicating the run, for example, V-92-~~5~~

would be interpreted as follows:- "V" - Baranof Island, "92" - ninety-second photograph of Baranof Island, "5" - photograph taken on run number five. A master chart was kept by Mr. Sargent on which flight lines were later drawn as they had actually been flown. On this chart, notations were made of the time and the photograph number at the beginning and completion of each run.

(4) FLIGHT CHARTS FOR OBLIQUES. Similar charts to those used for mapping flights were prepared for oblique photography. On these charts Mr. Sargent indicated the area and detail required and the purpose for which the photographs were to be used. The pilot of the plane flying for oblique photography located the areas and as far as possible took the photographs from the angle required. In many cases due to light conditions and mountainous country, photographs were taken at a slightly different angle in order to show the required detail. All the oblique photographs were numbered as follows:- The first letters indicated the Bureau for which the photograph was taken, this was followed by a dash then a letter which indicates the unit area, then another dash followed by a number indicating the photograph number, for example:- FS -V-5 would be interpreted as follows:- "FS" - Forest Service, "V" - Baranof Island, "5" - photograph number five of Baranof Island. The following abbreviations for the various Bureaus were used: - "FS" - Forest Service; "GS" - Geological Survey; "LH" - Lighthouse Service. A chart was prepared by Mr. Sargent showing the areas covered by the oblique photographs together with their index numbers.

(5) INSTRUMENTS. The importance of proper instruments to assist in mapping cannot be too strongly emphasized. The most important ones are:

COMPASS - The compass should be very sensitive and easy to read. It is believed an earth inductor compass might be a decided help in assisting the pilot to steer a steady course although a reliable magnetic compass should also be installed.

AIRSPEED METER - In order to assist the photographer in obtaining the required overlap and relieve him of worry caused by a sudden change in the exposure interval due to increased or decreased speed of the plane, the pilot should fly each run at a constant air speed.

SENSITIVE ALTIMETER - To keep the scale of photographs as uniform as possible, it is important that the pilot know instantly in case the plane begins to gain or lose altitude. With this in mind, it is important that a mapping plane be equipped with a sensitive altimeter graduated in tens of feet. The combined rate of climb and sensitive altimeters manufactured by the Pioneer Instrument Company and used by the Detachment were highly satisfactory.

4. WORK ACCOMPLISHED.

(1) VERTICAL PHOTOGRAPHS. (Mapping) A total of forty-two rolls of "T-2 film was developed and delivered to Mr. Sartont for the Geological Survey, Interior Department. This film covers an area of over thirteen thousand square miles not including water areas,- small bays and inlets. An idea of the total amount of territory actually mapped can probably best be obtained by stating that it is approximately the same as the combined area of the States of Masschusetts, Rhode Island and Connecticut. In order to furnish the various government bureaus with immediate information on localities in which they were interested,- approximately six hundred prints were made from the mapping film prior to delivery of this film to Mr. Sargent.

(2) OBLIQUE PHOTOGRAPHS. All oblique photographs were made with a "K-3A" mapping camera and were classified under two heads, Namely; (a) photographs taken for the various government bureaus other than the Navy Department, and (b) photographs taken for Navy Department publicity and general information purposes. Under (a) four hundred sixty-seven photographs were taken at the request of Mr. Sargent, for the following government bureaus:- Department of the Interior, Department of Agriculture, Federal Power Commission, International Boundary Commission, Bureau of Fisheries, Bureau of Public Roads, Lighthouse Service, Alaska Road Commission. These photographs included timber areas, water pow er sites, streams, bays, inlets, lakes, glaciers, boundary lines and boundary peaks, lighthouses, cities, canneries, etc. The photographs were taken from various altitudes depending upon the detail required. Many water power sites located from the vertical mapping photographs were later photographed with the "K-3A" camera at a lower altitude in order to show greater detail. A complete set of these prints together with an index was bound on holister cloth and delivered to the following:- 1.- Geological Survey at Washington, 2.- Forest Service at Juneau, 3.- Officer-in-Charge, Alaskan Aerial Survey Detachment. Special sets of prints covering selected subjects were also furnished the local representatives of the various government bureaus. Two prints of each of the above were furnished to the Bureau of Aeronautics. In accordance with instructions from the Bureau of Aeronautics all negatives were turned over to Mr. Sargent for delivery to the Forest Service at Washington, D. C., where they are to be kept on file. Under (b) two hundred twenty-five photographs were taken. These photographs cover the various activities of the Detachment from the time of departure until its return to the home base. Two prints each and all of the negatives of these photographs were forwarded to the Bureau of Aeronautics.

(3) MOTION PICTURES. Three 1000' reels of motion pictures covering an historical record of the Detachments activities were made and forwarded to the Bureau of Aeronautics. A total of approximately 8000' of negative motion picture flim was exposed - this total being cut to the 3000' after return of the Detachment to San Diego.

SECTION C.

FINANCIAL AND STORES ACCOUNTING.

1. The Supply Officer of the Detachment had two phases of supply work to perform, namely, DISBURSING and GENERAL STOREKEEPING. In view of the fact that he was charged with the procurement of funds and stores, it is very essential that he should be one of the first officers ordered to the Detachment. It was also considered very essential that ~~xx~~ a Supply Officer ordered to this particular type of duty should be well indoctrinated in Disbursing and Supply work, especially with aviation details, where a thorough knowledge of the particular type of planes and engines being used, and the nomenclature of spares is of incalculable value in the preparation of requisitions and the custody and issue of stores.

2. The following report on the activities of the Supply Department of the Alaskan Aerial Survey Detachment is divided into two phases, namely; (A) FINANCIAL ACCOUNTING and (B) STORES ACCOUNTING.

(A) FINANCIAL ACCOUNTING.

(1) As this Detachment's work was placed immediately under the Commander in Chief, Battle Fleet, requisition for funds was made on the Fleet Paymaster, Battle Fleet, to be deposited with the Federal Reserve Bank, San Francisco, California. This enabled the Supply Officer to draw funds through the medium of exchange for cash checks for such cash payments as were necessary, and obviated any delays that might have occurred through sending funds by express or other safe means of transmission.

(2) The Supply Officer of a detachment on independent duty should not only be thoroughly familiar with all disbursing work in connection with aviation detachments, but he should also have as his assistant on the pay rolls and public bills, a storekeeper thoroughly versed in this particular line of work. Since the financial accounting connected with a detachment of this kind, insofar as it pertains to disbursing, would obtain no matter where the detachment was based, it will not be elaborated upon in this report.

(B) STORES ACCOUNTING is subdivided under the following headings: (1) PROCUREMENT, (2) ACCOUNTING, (3) EXPENDITURES, Report of.

(1) PROCUREMENT.

(a) As soon as the Officer in Charge received orders to this Detachment, two requisitions for photographic supplies were prepared and forwarded to the Bureau of Aeronautics for approval and designation of source of supply. As the Supply Officer had not at that time reported for duty (and did not report until more than a month later), these requisitions saved a great deal of delay in assembling these necessary supplies, although a few of the stores were not received until just prior to the departure of the Detachment from the Navy Yard, Puget Sound.

(b) Upon the reporting of the Supply Officer, he immediately took steps toward the requisitioning and obtaining of other stores necessary for the Detachment, such as plane, structural and engine spares, office equipment, and miscellaneous material for maintenance and upkeep. Through the personal supervision of the Material and Engineer officers, only actually necessary material, adequate for safe and successful operation away from a base of supplies, was requisitioned. The work of the above mentioned officers brought about a great saving of time in the preparation of requisitions and the procurement of stores, and also obviated requisitioning many extraneous items. Too much stress cannot be paid to this all important step in fitting out a Detachment of this kind, as the fullest cooperation of officers vitally concerned not only makes for a very complete stock of necessary supplies, but also shortens considerably the time of getting a detachment away on its mission. A list of the stores considered necessary for a detachment of this kind is included in the Material Report.

(c) In connection with the procurement of supplies, the experience of the 1926 Alaskan Aerial Survey Expedition showed that if contracts were made at different points of delivery in Alaska for gasoline, lubricating oil, and fuel oil for the tender, a great saving in procurement of these items could be effected. Therefore, the matter of making contracts for delivery of these items was taken up with the Bureau of Supplies and Accounts by radio, with the result that the Supply Officer, Navy Yard, Puget Sound entered into contract with the Standard Oil Company of California for the delivery of these items at times and places specified by the Officer in Charge of the Detachment. Due to the peculiar conditions obtaining in Alaska, it is believed that, should a future Detachment be sent to Alaska for aerial mapping, contracts should be let for all possible points of delivery for gasoline, fuel oil, lubricating oil, and kerosene, time of delivery to be ample to cover a complete summer's work.

(2) ACCOUNTING.

(a) With the invaluable assistance rendered by the Supply Officers attached to the Naval Air Station, San Diego and the Aircraft Squadrons, Battle Fleet, all stores, spares, etc., as soon as drawn from store, were immediately boxed or crated, and held in a storeroom assigned to the Detachment pending loading on the GANNET. In this connection, attention is invited to the fact that within two weeks from the date of submission of the first requisition after the reporting of the Supply Officer, all stores, with a few exceptions had been drawn, and were ready to be loaded on the GANNET. Due to the assistance rendered by the Supply Officers cited, not a single case of loss was found, nor was any damage due to breakage or bad handling encountered.

(b) The method of accounting used in the Supply Department of this Detachment can best be set forth by the following paragraphs taken from the Bureau of Supplies & Accounts letter L10-5(1)/EG3(AS) dated 9 March 1929, - "Alaskan Aerial Survey - Accounting for Material."

1. The Bureau of Aeronautics in accordance with reference (a) has directed in reference (b) the shipment to and accumulation of certain specific materials by the Commanding Officer of the Alaskan Aerial Survey Detachment at San Diego, and further states that other miscellaneous items of flying equipment, supplies and material are believed to be locally available. In Order that the material may be properly accounted for and the proper information furnished the Bureau of Supplies and Accounts from which adjustment of appropriations charges can be made as and when determined necessary, the following returns will be required.

2. The Supply Officer of the Alaskan Aerial Survey Detachment will prepare Naval Supply Accounts returns accounting for all material invoiced to the Detachment under that account, and all Naval Supply Account material, upon issue to the Detachment from that account will be expended on S&A form 69 as a charge to the current appropriation "Aviation Navy, subhead 3." It will not be necessary to submit any report of expenditures afloat (S&A form 20) as it is desired the consumable material be expended from the Naval Supply Account on itemized invoices (Form 71) as a charge to "Title V-53" and the appropiration mentioned above. Expenditures of non-consumable material from the Naval Supply Account will be reported on itemized invoices as a charge to Title "B" and the appropriation hereinbefore mentioned. The invoices will be abstracted separately depending upon whether the charge is made to Title "B" or Title "V-53". Especial care will be taken to insure that the quarterly transfer statement (S&A form 69) is signed by the Supply Officer and approved by the Commanding Officer of the Survey Detachment before its submission with the Naval

Supply Account Return.

3. An Appropriation Purchases Account Return will likewise be rendered accounting for all material invoiced to the Survey Detachment under Title "X", Appropriation Purchases Account. Expenditures of the material will be accomplished on invoices (S&A form 71) direct from the Appropriation Purchaes Account, charging Titles "B" and "V-52" in the manner outlined above for expenditures from the Naval Supply Account. No expenditure from the Appropriation Purchases Account will be reported on any transfer statement as an appropriation charge, but the invoices will, in addition to showing the title chargeable, be inscribed with the current appropriation "Aviation, Navy, sub-head 3" in order that the expenditure may be properly allocated in the cost records of the Navy.

4. An equipage return Title "B" with separate balance sheets, for each department as may be determined necessary, will be submitted, prepared in a manner similar to the equipage return for a vessel afloat. In this return all expenditures are reported to Title "B" whether made by the Supply Officer from the Naval Supply Account and Appropriation Purchases Account Returns of the Survey Detachment as mentioned in the preceding paragraphs, or made direct by the Supply Officer furnishing the material.

5. All of the above mentioned returns will be submitted to the Bureau initially, for the quarter ending 30 June 1929. Subsequent returns will be rendered quarterly thereafter, except that upon completion of the survey duty a final return will be rendered at the earliest practicable date.

6. It is understood that the Supply Officer of the Survey Detachment will not be required to act as Commissary Officer inasmuch as the enlisted personnel of the Detachment will be subsisted by the GANNET in the same manner as was done at the time of the survey made in 1926.

7. While acting as Disbursing Officer for the Detachment, the Supply Officer will not pay claims for the per diem allowance authorized by Section F, paragraph 14(a), of the Pay Bill Instructions which provide for a per diem of $7.00 in lieu of other travel allowances to be paid officers, warrant officers and enlisted men for actual time consumed while travelling by air under competent orders, and a per diem of $6.00 for actual time consumed in making aerial surveys. The claims will be prepared on Standard Form 1012 "Reimbursement Voucher" and submitted to the Bureau of Supplies and Accounts for payment in accordance with Section F, paragraph 14(f) of the Pay Bill Instructions."

CHARLES MORRIS."

ANALYSIS OF EXPENSES FROM DATE OF COMMISSIONING TO DATE OF DECOMMISSIONING
ALASKAN AERIAL SURVEY DETACHMENT, YEAR OF 1929.

	To June 30	July	August	September	October	Gain by Inv.	Final Exp.
EXPENDITURES FROM APA-X	3031.07	-------	5779.11	-------	274.21	3411.51	5935.70
EXPENDITURES FROM NSA-X	1704.12	1342.71	1279.30	1025.68	2036.57	262.82	7125.65
TOTALS	4735.19	1342.71	7058.50	1025.68	2310.78	3411.51	13061.35

ANALYSIS OF EXPENDITURES

Purpose of Expenditure	To June 30 APA-X	To June 30 NSA-X	July APA-X	July NSA-X	August APA-X	August NSA-X	September APA-X	September NSA-X	October APA-X	October NSA-X	GAIN
Plane Expense	283.78	68.99	------	------	879.03	142.53	------	------	------	9.38	6.58
Barge Expense	66.32	275.47	------	100.37	------	220.12	------	17.00	------	1737.19	1652.51
Photographic Laboratory	313.79	19.30	------	------	437.40	238.23	------	------	49.06	------	509.56
Film	2367.18	------	------	------	4328.54	------	------	------	225.15	------	335.18
Gasoline	------	916.52	------	1110.35	------	484.25	------	947.06	------	20.02	185.00
Oil, Lubricating	------	48.53	------	131.99	------	185.48	------	6.30	------	------	-------
A&R Section	------	375.31	------	------	134.14	64.10	------	------	------	269.98	722.68
Flight Expenses of Personnel					See Below.						
TOTALS	3031.07	1704.12	------	1342.71	5779.11	1334.71	------	970.36	274.21	2036.57	3411.51

Total Expenditures	$16472.86
Total gain by inventory on decommissioning	3411.51
Total expenditures covering material	13061.35
Travel expenses Personnel San Diego to Alaska	700.00
Travel expenses Personnel Alaska to San Diego	1330.00**
Grand total of expenses	$15091.35

(**) Not yet settled by Bureau of Supplies & Accounts.

Expenditure for photographic laboratory	$ 548.22
Expenditure for film	6585.69
Expenditure for gasoline	3293.20
Expenditure for lubricating oil	372.30
Expenditure for planes	1377.13
Expenditure for Barge	763.96
Expenditure for A&R Section (On Barge)	120.85
Expenditure for travel expenses	2030.00
	$15091.35

SECTION D.

AVIATION PERSONNEL.

Complement - Recommendations for Future Detachments.

1. The Chief of Naval Operations issued orders on 18 February for the organization of the 1929 Alaskan Aerial Survey Detachment. At the request of the Bureau of Aeronautics, the Bureau of Navigation issued orders to Lieutenant Commander A. W. Radford, U.S.Navy, detaching him from duty at the U.S.Naval Air Station, San Diego and directing him to report to the Commander in Chief, Battle Fleet as Officer-in-Charge of the new detachment. The selection of the personnel was delegated by the Chief of Naval Operations to the Commander in Chief, Battle Fleet from the forces under his command. There was an abundance of volunteers, but naturally considerable difficulty was experienced in securing their assignment without seriously handicapping the organizations from which they were drawn. In order to make the Detachment self supporting while operating at a great distance from the nearest Naval Air Station, the qualifications and previous experience of each volunteer were carefully considered before his orders to the Detachment were requested. Finally however, the following officers and men were assembled and assigned duties as indicated below:

Lieut-Comdr. A.W.Radford (Naval Aviator) Officer-in-Charge,
Lieut. E.F.Burkett (Naval Aviator) Executive, Operations, Navigation, Communications,
Lieut. R.F.Whitehead (Naval Aviator) Photographic, Aerological,
Lieut. C.F.Greber (Naval Aviator) Engineer, Radio, Athletic,
Lieut(jg). L.P.Pawlikowski (Naval Aviator) Assistant Operations, Flight, Material,
Lieut-Comdr. A.C.Smith (MC) Medical, Welfare,
Lieut. E.F.Carr (SC) Supply, Disbursing

PLANE CREWS - READ,E.W.,ACMM, - In Charge,
#1. COX,T.L.,ACMM - DAVENPORT,H.R.,AMM1c - *BURDA,T.J.,Sea2c,
#2. JOHNSON,P.,AMM1c - TAYLOR,E.,Sea 1c - *ROWE,H.R.,Sea2c,
#3. RENEAU,H.E.,AMM1c - LOFGREN,F.,AMM1c - WATSON,C.B.,Sea1c,
#4. TRAFTON,H.W.,AMM1c - EARLE,M.S.,AMM2c - MUSGROVE,W.L.,Sea1c (Parachutes).

PHOTOGRAPHIC DETAIL. HAASE,J.M.F.,CP - In Charge. HOUSER,B.L., P1c; NEWMAN,A.N.,P1c; MOORE,K.J.,P1c; BLATTMAN,C.,P3c.

ASSEMBLY AND REPAIR. CUSTER,A.Z.,ACM - In Charge. TORIGIAN,J.A., AMM1c; PONDER,D.W.,ACM1c; STEWART,T.C.,AM3c.

OFFICE FORCE. LORE,D.D.,CY, General; KOLMAN,H.A.,CSK, Disbursing; BURNETT,W.F.,SK1c, Supply; HARPER,T.A.,AMM2c, Flight Records;

AEROGRAPHER. HASSELL,W.S.,Aerog 1c.

RADIO. HICKS,W.L.,CRM; COZINE,V.S.,RM2c.

MEDICAL. ENGLISH,E.B.,PhM1c.

COMMISSARY. KELLEY,E.M.,ComStd; ENCALADA,F.R.,SC3c; *ABEL,B.C., Sea2c; *SMALL,C., Sea2c.

TRANSPORTATION AND UPKEEP. McGUIRE,P.,BM1c - In Charge; WYNNE, M.J.,Sea1c, Chauffer; *SCHWAMP,H.L.,Sea2c; *BURGE,R.,Sea2c.

OFFICERS MESS ATTENDANTS. BARTOLO,T.,MAtt1c; TANCHOCO,D.,MAtt2c.

TOTAL - 40.

NOTE I. (*) These six seamen second class were transferred to the Detachment at the Navy Yard, Puget Sound, from the U. S. Naval Training Station, Great Lakes, Ill. During the summer their duties were rotated so that each man was alternately assigned as crews messman, compartment cleaner and member of a plane crew.

NOTE II. When plans were first being made for the organizationof the 1929 Detachment, the Commander in Chief, Battle Fleet, recommended that as many as possible of the personnel who had been on the 1926 Alaskan Aerial Survey Expedition, be included in the 1929 Detachment, resulting in the assignment of the following named Officers and men who had made the first trip: Lieutenant E.F. Burkett; Lieutenant R.F.Whitehead; Lieutenant Commander A.C.Smith, (MC); Lieutenant E.F.Carr, (SC); LORE,D.D.,CY; KOLMAN,H.A.,CSK; KELLEY,E.M.,ComStd; and MOORE,K.J.,P1c.

2. For a four plane photographic unit based on a covered barge accompanied by an aircraft tender and operating on detached duty, the above complement for the aviation detail was sufficient with the following exception: Due to the fact that two Naval Aviators were used on each mapping flight, one more Naval Aviator or one Chief Aviation Pilot would have been most valuable in cases where it became necessary to shirt base and conduct mapping flights on the same day. It was also found necessary to take obliques on

the same days that mapping flights were conducted - a procedure which left no pilot for the stand-by plane at the base. The total number of personnel would not be increased by substituting a reliable and experienced Chief Aviation Pilot for the Aviation Chief Machinist's Mate as leading chief in charge of plane crews and this change is recommended.

3. As an aid in assemblying personnel for a similar detachment the following list is given, showing the personnel allowed this detachment and the personnel recommended for a future detachment:

Enlisted Personnel of the A.A.S.D. by ratings.	On Board	Recommendations for personnel by ratings, for future detachments.
Plane Crews		
CAP	0	1 Leading Chief and in charge of plane crews.
ACMM	2	0
AMM1c	5	4 Plane captains, one to be a qualified rigger.
AMM2c	1	4 One to be a qualified parachute man.
S		
Sea1c	3	4 Should have had previous experience on planes.
Sea 2c	2	0
	13	13
Photographic Detail		
CP	1	1)Experienced in aerial
P1c	3	2)photography.
P2c	0	1
P3c	1	1
	5	5
Assembly & Repair		
ACM	1	1
AMM1c	1	1 Machine shop man.
ACM1c	1	1
AM3c	1	1 Welder.
	4	4
Office Force		
CY	1	1 General correspondence, files, records, stenographer.
CSK	1	1 Disbursing.
SK1c	1	1 General storekeeper.
AMM2c	1	0)Flight and
Y3c	0	1)Engineering logs.
Miscellaneous		
Aerog1c	1	1
CRM	1	1 Qualified in aircraft radio.
RM2c	1	1

Enlisted Personnel of the A.A.S.D. by ratings.	On board	Recommendations for personnel by ratings, for future detachments.
PhM1c	1	1 Qualified aviation medicine.
ComStd	1	0
SC1c	0	1
SC3c	1	1
BM1c	1	1 General upkeep of barge.
Sea 1c	1	1 Truck driver.
Sea 2c	4	4 Messmen and compartment cleaners.
MAtt 1c	1	1
MAtt 2c	1	1
	14	14
Total - All Rates	40	40

Although the ratings on board do not in each case correspond with the ratings recommended, attention is called to the fact that orders for each man were requested only after consideration had been given as to his qualifications to perform duties to which he would be assigned. For example, two of the three seamen who were assigned to the plane crews had had previous aviation experience and had successfully passed the examination for aviation machinist's mate third class and were awaiting advancement to that rating when ordered to this Detachment. It was therefore only natural that they should fulfill the duties not of seamen but of aviation machinist's mates.

4. Due to a shortage of storekeepers in the Aircraft Squadrons, Battle Fleet considerable difficulty was experienced in securing the assignment of two men of that rating to the Detachment. This number is considered absolutely necessary as the services of one is required for disbursing work and the other for general storekeeping.

SECTION E.

MATERIAL.

Amounts requisitioned - Amounts in use or expended - Amounts recommended for future detachments of a similar nature.

1. In deciding on the material for the Detachment the heads of the various departments at first made up a tentative list of spares and material needed. These lists were discussed by all concerned. Finally a list of spares and material needed was agreed upon and divided into two groups. The first group consisted of spares to be obtained at San Diego,- either from the Naval Air Station or the Central Stores of the Aircraft Squadrons, Battle Fleet. This group contained structural spares for the four Loening Amphibians (OL-8A), engine spares, flight gear, photographic equipment, tools, radio equipment, etc. The second group consisted of spares mostly used on or for the upkeep of the Barge and were to be obtained at the Navy Yard, Puget Sound. Requisitions for this material were then submitted to the Supply Departments of the Naval Air Station, San Diego, the Aircraft Squadrons, Battle Fleet, and the Navy Yard, Puget Sound. Requisitions for most of the photographic material were made out a month or more before the actual commissioning of the Detachment on account of the necessity of purchasing some of the material through open purchase.

2. The material obtained at the Naval Air Station, San Diego, was boxed in small cases so that it could be stowed in the holds of the GANNET. The cases were numbered, and itemized lists of the contents of each case were made in order to facilitate locating any particular spare. The bulky spares were crated and stored on the upper deck of the GANNET. The two engines, well "pickled" by the Engineering Department of the Naval Air Station, were stored in crates on the stern of the GANNET. The wing spares, in two crates, were secured over the engines and lashed to the upper deck of the GANNET. Upon the arrival of the GANNET in Bremerton, all stores, except the wing and engine crates were transferred to the Barge. In Juneau, the wings were taken off the GANNET and stored in a warehouse; in Ketchikan they were secured on the dock.

3. On the Barge, sections of the overhead were allotted to the various departments. Photographic material was stowed over the photographic laboratory, dry stores for galley use over the mess hall

office supplies over the office, medical supplies over sick bay. The structural spares, engine parts and propellers were stored in the vicinity of the general issue room and were left crated until required for use. Materials stored in the storeroom were items for which daily or frequent use would be found.

4. A list of all material carred by the Detachment is given in the following report. It should be vary valuable to any future expedition of a similar nature. In the list are three columns, column one "Amount Requisitioned", column two "In use or expended", and column three "Amount recommended for future." In column one appears the amount requisitioned by the Detachment. In column two the title "B" material is listed that was in actual use although not necessarily expended, and also in the same column is shown the amount of any title "X" material that was expended. From experience gained during the past summer's operations, the amounts of supplies and equipment recommended for future work of a similar nature are shown in column three.

5. A list of all medical supplies is contained in the medical report - Section F.

Stores requisitioned and used for maintenance of four (4) "OL-8" planes and base for 1929 Alaskan Aerial Survey Detachment.

Structural Spares - Obtained from Naval Air Station, San Diego.	Req.	In Use or exp.	Amount Recommended.
Ailerons, right and left	8 Ea	0	8
Elevators, right and left	2 Ea	0	2
Float, wing tips	6 Ea	2	6
Landing gear, (less wheels, tires, tubes)	2 Set	0	2
Rudders	3 Ea	0	3
Stabilizers, right and left	2 Ea	0	2
Airplane fabric	1 roll	200 yds	1
Propeller blades (3792)	12 Ea	9	12
Hubs, spare (4566)	2 Ea	1	2
Center section fittings	1 Ea	1	2
Stabilizer struts, (front R & L)	2 Ea	0	2
ditto (rear R & L)	2 Ea	0	2
Wing end bows	3 Ea	1	3
Aileron struts, inner and outer	2 Ea	1	2
Tail skids complete & 4 extra bolts	2 Ea	1	2
Wing ribs	3 Ea	0	3
Terminal fittings	2 Set	0	2
Gas pumps, hand, complete	2 Ea	1	2
Drum and shaft assembly cable	2 Ea	0	2
Wires, center section	8 Ea	0	8
Wires, streamline inter	2 Set	0	2

	Req.	In use or exp.	Amount recommended.
Pumps, bicycle, hand	3 ea	3	3
Wheels, 36 x 8	10 ea	0	4
Tires, 36 x 8	12 ea	1	8
Tubes, 36 x 8	12 ea	1	8
Covers, hand hole, duraluminum & rubber	6 ea	2	6
Tanks, main gas	1 ea	1o	1
Tanks, oil	1 ea	0	1
Wind shields, front and rear	2 ea	0	2
Wing, center section	1 ea	0	1
Wings, lowers, right and left	2 ea	0	2
Wings, upper, right and left	1 ea	0	1
Air bottles for Oleo Landing Gear, charged to maximum capacity	12 ea	12	12
Parachutes, seat pack, silk thread	14 ea	14	16
Silk for patches, webbing, hooks & eyes, canvasspare parts, pilot chute cord, needles and miscellaneous gear for repairs to same, also khaki canvas and hand sewing machine.			
Cord, shock absorber, 1/2 & 5/8 diam.	50 ft	20	50
Thimbles, 1/8"	72 ea	12	72
Turnbuckles, cable, forked end $\frac{1}{4}$ x $2\frac{1}{4}$ barrel	25 ea	5	25
Turnbuckles, eye both ends $\frac{1}{2}$ x 4 barrel	25 ea	5	25
Cable, extra flexible 1/8 7x9	1 sp	50 ft	1
Cable, extra flexible 5/32 7x19	1 sp	50 ft	1
Wire, spring steel $\frac{1}{4}$"	5 lb	0	5
Aluminum 14,16,18 & 20 gauge	20 sht	2	20
Dural, 14 & 20 gauge, each	2 sht	1	2
Copper, 14,18 ' 22 gauge, soft, each	2 sht	2	2
Tubing, copper 1/8, $\frac{1}{4}$, 3/8 & 5/8, each	20 ft	0	20
Rubber hose, 5/8 and 1"	60	60	100
Hose clamps, 5/8 and 1"	48 ea	12	48
Cotter pins, 3/32 x 1	2 box	2	2
Die form fittings, gas for $\frac{1}{4}$,1/8,3/8 copper tubing, connections, elbows, tees, nuts, unions and shut off cocks	6 ea	2	6
Washers, steel $\frac{1}{4}$,3/16,5/16,3/8,$\frac{1}{2}$,5/8,$\frac{3}{4}$	1 gro.	1	1
Washers, dural, all sizes stocked, ea	1 gro	1	1
Dural machine screws & nuts 10/32,8/36,6/40	4 gro	4	4
Steel ditto	4 gro	4	4
Dural wood screws 4 to 12,all lengths, ea.	4 gro	2	4
Rivets, alum., all sizes & lengths stocked	1 gro	1	1
Rivets, tin ditto	1 gro	1	1
Steel bolts and nuts, all dia. to $\frac{1}{2}$"	50 ea		50
Aviation S.A.E. all lengths to 4"	50 ea		50
Spruce, assorted.	180 B.F.	180	180
Ply wood,mahogany 1/8,3/16,$\frac{1}{4}$ thickness	12 sht	12	28 ea
Paint, alum.	10 gal	10	20
Dope solvent	20 gal	15	20

	Req.	In use or exp.	Amount Recommended.
Paint, red, insignia	5 lb	5	10 lb
Paint, red, stripping	1 lb	1	5
Paint, white, insignia	5 lb	5	10
Paint, white, stirpping	1 lb	1	5
Paint, blue, insignia	5 lb	1	5
Paint, blud, stripping	1 lb	1	5
Paint, yellow, insignia	5 lb	1	5
Paint, yellow, stripping	1 lb	1	5
Bitumastic	5 gal	1	5
Oxide primer	5 gal	2	5
Dope, yellow pigment	5 gal	5	5
Dope, nitrate clear	15 gal	10	15
Marine glue	1 gal	1	1
Pitcairn varnish	20 gal	20	20
Paint, black, flat	0 gal	8	10
Paint, black, deck	0 gal	8	10
Paint, white, flat	0 gal	8	10
Paint, white enamel	0 gal	8	10
Engine Spares - Obtained from Naval Air Station, San Diego, Calif.			
Engines, Pratt & Whitney Wasp.	2 ea	0	2
Tool kits, for Pratt & Whitney Engine	2 ea	0	2
Station tool kit, for Pratt & Whitney Engine	1 ea	1	1
Eclipse hand starter, inertia	1 ea	0	1
Cylinders assembled	8 ea	1	8
Spark plugs, (BG4 recommend BG4B)	672 ea	600	672
Magneto drive assembly	4 ea	0	4
Magneto coupling, assembly	4 ea	0	4
Magneto link rod, assembly	4 ea	0	4
Magneto, Scintilla 9 R.R.H.	2 ea	0	2
Magneto, booster	3 ea	0	3
Carburetors, NA 1/7A	3 ea	0	3
Oil pump assemblies, complete	2 ea	0	2
Fuel pumps	4 ea	0	4
Fuel pumps, brackets	1 ea	0	1
Oil pump, pressure relief springs	4 ea	0	4
Oil pump, pressure relief cups	4 ea	0	4
Oil pump, pressure relief plungers	4 ea	0	4
Oil pump, pressure relief bodies	4 ea	0	4
Rocker assemblies exhaust valves.	8 ea	0	8
Push rods	16 ea	1	16
Gaskets, all parts. Assorted varieties			
Elbow primers	4	0	4
Stud replacement for all 5/16 studs	24	0	24
Cam, inlet and outlet	1	0	1
Magneto shaft keys	4	0	4
Magneto ring coupling	4	0	4
Screws, oil pipe flange	12	0	12
Screws, propeller hub	4	0	4
Screws, wire clip	4	0	4

	Req.	In use or exp.	Amount recommended
Alemite fittings, Zerk	1 gr	100	1 gr
Coil assemblies complete	2	0	2
Control ring, gun	4	0	4
Oil pipe, feed lower	4	0	4
Oil pipe, sump	4	0	4
Breathers, forward and after	2	0	2
Piston rings	8	0	8
Piston rings plugs	16	0	16
Piston rings, compression left & right	24	0	24
Piston hand ring, assemblies	8	0	8
Exhaust flange	9	0	9
Exhaust pipe (all cylinders sets)	5	0	5
Covers, inner rocker bearing	16	0	16
Covers, outer, rocker bearing	16	0	16
Bearings, ball #201	32	2	32
Rocker arm covers	16	2	16
Push rod cover, tubing assemblies	8	0	8
Valves, intake and exhaust	8	0	8
Safety rings, intake and exhaust	8	0	8
Valve springs, inner	30	0	24
Valve springs, outer	30	0	24
Sets for NA1/7A carburetor #44 - 45 - 46 27 and blanks	6	0	6
Ignition wire, high tension	50 ft	50	75
Nuts and bolts all sizes used in assemblies assorted varietys for Pratt & Whitney engines	24	0	24

Instrument spares - Obtained from Naval Air Station, San Diego.

Climb indicators	2 ea	2	4
Air speed meters	3 ea	0	4
Compasses - Aviation BuAer Mk IV	4 ea	1	4
Temperature gauges oil and fuel	4 ea	0	4
Altimeters	4 ea	2	4
Stop watches	2 ea	0	2
Airplane clocks, Waltham	4 ea	0	4
Binoculars	2 pr	2	2
Adapter plates for 2¾" rd. Dial Alt	3 ea	0	3
Tachometers	4 ea	0	4
Tachometer cables	8 ea	0	4
Air pressure gauges	4 ea	0	4
Oil pressure gauges	4 ea	0	4
Turn indicators	4 ea	0	4
Inclinometers	4 ea	0	4

	Req.	In use or exp.	Amount recommended
Flight Clothing - Obtained from Naval Air Station, San Diego, Calif.			
Flying suits, winter	16 ea	8	16
Flying suits, summer	36	16	24
Helmets, winter, (those furnished were all too small)	12	0	24
Helmets, summer	18	18	24
Moccasins, winter, fur lined	11	8	18
Gloves, winter, guantlet	12	12	24
Jackets, leather, flying	18	18	24
Air inflated life belts	12	12	24
Goggles, pilot type	7	7	12
Goggles, passenger type	12	12	18
Masks, face, chamois	12	8	12
Waders, canvas, water proofed	6	5	12
Scarfs, neck	12	12	36
Fillers, spare for gloves	12	12	12

A general increase in flight gear is recommended to give an assortment of sizes for numerous officials and members of the various Federal Departments that make flights over interested areas. Assortment of sizes should be carefully checked. In general most of the flight gear was too small. Heavy winter flying clothing should be carefully inspected upon receipt. This gear deteriorates in storage to such an extent that even though unused it may not be fit for issue.

Radio Equipment - Obtained from Aircraft Squadrons, Battle Fleet.			
Armatures, generator for SE 1386 A	2	0	2
Batteries, lead acid K.R.R.146	6	6	6
Batteries, lead acid K.R.R.32	8	8	8
Batteries, plate SE 2469 22½	60	20	60
Bearings for 1386 generators	4	0	4
Brackets, receiver	10	2	10
Brushes for 1386 generators	4	0	4
Chokes, grid S.E. 4355	5	0	0
Chokes, plate SE 4356	2	0	2
Condensers, compensating SE 2410	2	0	2
Condensers, plate blocking SE 2408	2	0	2
Condensers, grid coupling SE 2409	2	0	2
Dial, accordance with drawing 48 AA 219	2	1	2
Generators, radio SE 1386 A	4	2	4
Generators, radio SE 1376 B	2	1	2
Helmets, radio	4	2	4
Insulators, antenna SE 4357	2	0	2
Insulators, wing SE 2951 A	8	4	8
Insulators, load out SE 2558	6	0	6

	Req.	In use or exp.	Amount recommended.
Insulators, hold off SE 2549	6	1	6
Insulators, bulkhead SE 1263 A	16	0	16
Keys, flame proof SE 1443 A	8	3	8
Leaks, grid, for 1375	4	0	4
Leaks, grid SE 1336 A	2	0	2
Meters, ant. amp S06 SE 2989	1	0	1
Meters, milliamps 0 to 500 SE 2945	1	0	1
Meters, volt 0 to 15 SE 2957	2	0	2
Meters, volt DC 0-2 0-60 SE 2971 A	2	0	2
Meters, ant. amp. SE 2572	1	0	1
Propellers, wind driven CZ 2852 A	2	2	2
Propellers, wind driven CZ 3852 B	4	2	4
Propellers, wind driven CZ 3851 A	5	1	5
Protective device CD 888	2	0	2
Receivers SE 2465 A	2	2	2
Reels, antenna SE 1299	6	3	6
Resistance OSC control	2	1	2
Rheostats field SE 4347	2	0	2
Transmitters, SE 1385 A	2	2	2
Transmitters and receiver comb. SE 1375 B	1	1	1
Transformers, plate SE 4350	5	0	5
Transformers, filament SE 4351	5	0	5
Transformers, plate for SE 1375 B	1	0	1
Transformers, filament for SE 1375 B	1	0	1
Transformers, audio amp. CAY 4342	4	0	4
Tubes, vacuum CG 1984	20	4	20
Tubes, vacuum CG 2566	12	3	12
Tubes, vacuum CW 1344	66	20	60
Chokes, plate for SE 1375 B	4	0	4
Barge Equipment - Obtained from Navy Yard, Puget Sound.			
Fire extinguishers, foam type	12	12	12
Charges for above	24	24	36
Axes, hand	6	6	6
Buckets, deck	36	36	50
Belts, life, kapok	50	5	50
Running lights, port and starboard	1 ea	1	1
Towing light	1	1	1
Lanterns, kerosene	6	6	6
Lye, case	1	1	1
Soap, salt water, lbs	100	100	200
Soap, castile, bars	50	50	100
Soap, powder, lbs.	96	96	144
Brooms, corn	24	12	24
Swabs, deck	24	12	24
Brushes, scrub, deck	24	6	24

	Req.	In use or exp.	Amount recommended
Brushes, hand	24	24	48
Handles, deck brush	24	24	48
Cans, garbage	6	6	6
Lamps, electric light, 100 W, 115 V.	100	100	150
Lamps, electric light, 60 W, 115 V.	60	60	100
Heaters, Coleman, gas radiant	6	6	12
Pyrene refils	20	10	20
Mattresses, bunk	45	45	45
Blankets	100	100	100
Sheets, officers	24	24	24
Pillows	50	50	50
Spreads, bunk, officers	24	24	24
Pillow cases	100	50	100
Towels, face, officers	24	24	48
Mattress covers	100	100	100
Tar, coal, gal	5	0	5
Shellac, clear, gal	6	6	10
Shellac, red, gal	5	5	25
Paint, white, inside, gal	5	5	25
Paint, spar, gal	5	5	25
White lead, in oil, lbs	5	2	5
Linseed oil, raw, gal	5	3	5
Linseed oil, boiled, gal	5	2	5
Turps, pure, gal	5	0	5
Beeswax, lbs	2	1	2
Cotton, calking, lbs	5	1	5
Brushes, all sizes general use up to B2	6 ea	6	12
Rain coats	24	24	48
Rain hats	25	25	48
Rubber boots, hip	25	25	25
Fuses, electric, plug type 6A - 25 A	12 ea	12	24
Sockets, electric, standard	12	12	36
Sockets, two way	12	12	36
Cord, lamp	750 ft	600	750
Paper, toilet	300	200	300
Miscellaneous -			
Padlocks, store room	24	24	24
Padlocks, small	24	24	24
Nails, 6-8-10-12-30-60 Pd, common, lbs ea	25	20	25
Nails, 6-8-10-12-20-60 Pd, finishing lns ea	10	8	10
Gas, acetylyne, drums	6	3	6
Gas, oxygen, drums	6	6	9
Rags, cleaning, bales	2	2	4
Chamois, skins	48 ea	30	48
Tape, friction ½" x ¾" rolls	24 ea	12	24

	Req.	In use or exp.	Amount recommended.
Steel wool, rolls	24	24	48
Rubber tubing, ¼", ft	40	20	40
Wire, copper safety 14-16-18 gauge, lbs ea	10	10	10
Flash lights, hand	50	26	50
Flash light, batteries	50	50	100
Flash light, lamps	100	100	200
Gasoline cans, 5 gal capacity	5	5	5
Fuel pumps, hand, for gasoline drums	2	2	2
Oil cans ½ pt capacity	12	6	12
Truck, 1½ ton	1	11	1
Dolly for handling planes	0	1	1
Carpenter Shop Equipment - Obtained from Aircraft Squadrons, Bat Flt			
Mitre box	1	1	1
Wood workers vise	1	1	1
Mitre box saw	1	1	1
Back saws	2	2	4
Cross cut saws	2	2	4
Rip saws	2	2	4
Key hole saws	2	2	4
Hack saws	6	6	6
Hack saw blades, fine	72	72	144
Hack saw blades, coarse	72	72	144
Planes, all types	1 ea	1	2
Wood chisels, all sizes	3 ea	3	6
Combination squares	2	2	4
Hatchets, wood cutting, hand	2	2	4
Rules, 6 ft	6	6	6
Rules, caliper	6	6	6
Ratchet screw drivers	4	4	4
Screw drivers, 4-6-8-10-12 inch	3 ea	3	3
Hammers, claw	2	2	8
Wood clamps	4	4	4
Wood screws, #4 to #12 all lengths flat and round head, brass, gross ea	2	2	4
Copper tacks 1/2, 3/8, and 3/4 inch, gross, ea	2	2	4
Brads, #14 to #22, all lengths, gross, ea	2	2	4
Lumber, white pine, select ½" & ¾"x12", ft	1000	1000	2000
Metal & Machine Shop Equipment - Obtained from Naval Air Sta., S.D.			
Oxy-Acetylene Welding torch, small	1	1	1
Oxy-Acetylene Welding torch, large	1	1	1
Emery wheel, portable	1	1	1
Torches, gasoline, quart	12	12	12
Tap and die sets USS thread ¼ to 1" ea	1	1	1
Tap and die sets SAE thread 1/8 to 1" ea	1	1	1

	Req.	In use or exp.	Amount recommended.
Threading tools, set	1	1	1
Thickness gauges, sets	2	2	4
Hand drills	2	2	2
Breast drills	2	2	2
Drill sets, 0 to 60, sets each	6	6	6
Drill setc, 1/16 to 1/2", sets each	6	6	6
Ball peen hammers	3	3	3
Straight peen hammers	3	3	3
Tin snips, straight	2	2	2
Tin snips, curved	2	2	2
Calipers, spring, outside	2	2	2
Calipers, spring, inside	2	2	2
Pliers, gas, 6-8-10-12" each	12	12	12
Pliers, diagonal cutting.	6	6	6
Pliers, end cutting	6	6	6
Bolt cutters, 14"	1	1	1
Galley and Mess Hall Equipment - Obtained from Navy Yard, Puget Sd.			
Section 3 Coal Range, convertible to oil	1	1	1
Mess tables	4	4	4
Mess benches	8	8	8
Missellaneous items, kinves, pans, pots, mess gear, based on number of men in Detachment, 50% extra for breakage.			
Office Equipment - Obtained at Navy Yard, Puget Sound.			
Desk, flat top, 6 drawer	1	1	1
Desk, typewriter, 3 drawer	1	1	1
Table, flat top	1	1	1
Chairs, office	4	4	4
File cabinet, steel	2	2	2
File cabiner, wood	1	1	1
Typewriter, Underwood 10" - #5	2	2	2
Typewriter, Underwood 18" - #3	1	1	1
Addint Machine, Burroughs, 9 column	1	1	1
Safe, paymasters #2	1	1	1
Paper, typewriter, 8 x 10½ white, ream	10	10	20
Paper, typewriter, 8 x 10½ green, ream	10	10	20
Paper, typewriter, 8 x 10½ onionskin, ream	10	10	30
Paper, typewriter, 8 x 13" white, ream	5	5	10
Forms, GSK, Disbursing and Navigation as required			
Rubber stamps as required for detachment			
Envelopes, 2½ x 3½, ea	200	200	400
Envelopes, 3½ x 8½, ea	500	500	1500
Envelopes, 5 x 11, ea	100	100	200
Envelopes, Manila 10 x 20, ea	50	50	100
File cards, cardboard	250	200	250

	Req.	In use or exp.	Amount recommended.
Clip boards	6	6	12
Files, Shannon	6	6	12
Pencils, pens, pen holders, clips and miscellaneous office equipment as needed.			
Aerological Material Received from Naval Observatory, Washington, D.C.			
Pilot Balloon Balance Aero.	1	1	1
Watch, Timer, Aero	1	1	1
Hydrograph Friez	1	1	1
Aerograph 2 hr. clock movement	1	1	1
Aerograph 4 hr clock movement	1	1	1
Anemometer	1	1	1
Barometer Aneroid	1	1	1
Baragraph	1	1	1
Theodolite Aero X.A.E.	1	1	1
Thermograph Weekly Friez Bu Aero 26 USN	1	1	1
Compass, Portable	1	1	1
Air plane clock, Waltham	1	1	1
Pilot Balloons	200	120	200
Standard Navy Photographic Material obtained from Naval Air Station, San Diego.			
Filters, 3", K1, K2, K3.	12	12	12
Filters, 5", K2, K3	24	12	24
Filters, 3", Minus Blue	24	12	24
Filters, 5", Minus Blue	24	12	24
Camera, view, 6 1/2 x 8 1/2	1	1	1
Lens, for 6 1/2 x 8 1/2 camera	1	1	1
Case, for 6 1/2 x 8 1/2 camera	1	1	1
Holder cut film 6 1/2 x 8 1/2 camera	12	12	12
Lens, board for 6 1/2 x 8 1/2 camera	1	2	2
Camera, Graflex tel 4 x 5	1	1	2
Lens P. 34	1	1	2
Lens P. 35	1	1	2
Case for 4 x 5 Graflex	1	1	1
Magazine for 4 x 5 Graflex	1	1	1
Camera, Moving picture hand held, 100' model	1	1	1
Lens, tel. 6" focus for above	1	1	1
Case for 6" moving picture camera	1	1	1
Changing bags	2	2	2
Developing and fixing box	1	1	2
Floating lid for above	1	1	2
Focusing cloth, silk finished fabric band edges, 40 x 46	1	1	1
Developing outfit portable studio complete	1	1	1
Motion picture, four screens, three nesting tanks and five drying racks.	1	1	1

	Req.	In use or exp.	Amount recommended.
Enlarging outfit 8 x 10, revolving back complete with negative carrier, spring finger kit and one sheet of flashed opal glass, 11 1/2 x 11 1/2	1	1	1
Projection lens for above	1	1	1
Film developing hangars 4 x 5	24	24	24
Film developing hangars 6 1/2 x 8 1/2	24	24	24
Film rewind, sliding disk 6"	1	1	1
Film rewind, lazy spool	1	1	1
Film splicing block	1	1	1
Film reels, all metal 10"	4	4	2
Film cans, one reel	4	4	2
Filters, set, Wratten Tech, K1, K2, K3, B, C, G, and F, cemented in "B" glass, 3" square in leather case	1	1	1
Filter holder, adjustable 3"	1	1	1
Funnel, enamel, 1 qt cap	2	2	2
Hydrometer, tested	6	6	6
Iron, heating, electric	2	2	2
Knife, etching	2	2	2
Lamps, safe light, portable 5 x 7 drop cord type, with #0,1,2, and 3 safelight	3	3	3
Lamps, dark room, W&W 8x10 with #0,1,2, and 3 safelight	3	3	3
Mortar and pestle, 1 qt	1	1	1
Paddles, print, hard rubber	6	6	6
Paper holder, magazine 6 1/2 x 8 1/2	1	1	1
Motion picture printer complete	1	1	1
Roller, print double 8"	1	1	1
Scales, soda, weights to 4 pounds	2	2	2
Scales, studio weights to 2 oz.	2	2	2
Tanks, portrait, film washing, 10 3/4 x 16 1/2 x 10 1/2	1	1	1
Timer with minute and second hand	1	1	3
Trays, enamel, 8 x 10	1	1	3
Trays, enamel, 11 x 14	0	0	2
Trays, enamel, 16 x 20	1	1	3
Tripod with 6 1/2 top	1	1	1
Tilting top for tripod	nl	1	1
Trimmer 10" metal	1	1	1
Trimmer 20" metal	1	1	1
Pails, white enamel 12 qt cap	4	4	4
Bottle, glass stopper 32 oz	6	6	6
Bottle, glass stopper 2 gal	3	3	3
Bottle, glass stopper 5 gal	2	2	2
Brushes, camels hair 3"	6	6	6
Bulbs, electric, 30 W. Orange	6	6	6
Bulbs, electric, 30 W. Ruby	6	6	6
Clips, photo wooden	72	72	72

	Req.	In use or exp.	Amount recommended.
Chamois, 26 x 23"	14	4	14
Cloths, polishing	24	24	24
Cotton, absorbent, rolls	10	10	20
Cement, film	2	2	4
Glass, ground, 6 1/2 x 8 1/2	3	3	6
Graduates, visible 32 oz	6	6	6
Graduates, visible 8 oz	3	3	3
Graduates, visible, engraved 1 dram	2	2	2
Gum Arabic, pounds	10	10	10
Jugs, measuring, 1 qt cap	2	2	2
Kodaloid, medium, sheets	12	12	12
Tubes, opozine.	6	6	12
Paper, blotting, lintless, 19 x 24, quires	6	6	12
Paper, gummed, 1/2" black, rolls	2	2	6
Paraffine, pure, pounds	2	2	4
Pencils, negative	12	12	24
Pens, mapping	6	6	12
Pins, push, glass, doz	12	12	24
Plates, ferrotype, heavy 18 x 24"	24	24	48
Preservers, negative 4 x 5	500	250	500
Preservers, negative 6 1/2 x 8 1/2	500	250	500
Preservers, negative 8 x 10	1000	1000	1000
Rods, stirring, hard rubber	6	6	6
Rods, stirring, thermometer	6	6	6
Screens for safelights for dark room lamp WW	5 x 7,	16 - 16 -	16
Screens for safelights for dark room lamp WW	8x10	16 - 16 -	16
Tubing, rubber 1/2", feet	12	12	24
Film, aero hypersensitized 24 c.m.x 75'	10	10	20
Film, cut, Com Ortho 4 x 5 doz	30	30	40
Film, cut, Com Ortho 6½ x 8 ½, coz	12	12	24
Film, cut Com Ortho Panchromatic 6½ x 8½	24	24	36
Film, cut Com Ortho process 6½ x 8½	12	12	24
Motion picture positive 400 ft rolls	5	5	45
Paper, contact, S.W.,glossy soft 6½x8½ gr	15	15	45
Paper, contact, S.W.,glossy medium 6½x8½ gr	30	30	45
Paper, contact, S.W.,glossy hard 6½x8½ gr	15	15	25
Paper, contact S.W. for aerials, glossy soft 7 1/2 x 9 1/2 gr	30	30	45
Paper, contact for aerials, glossy hard 7 1/2 x 9 1/2 gr	30	30	40
Paper, enlarging, fast S.W.,glossy 6½x8½ gr	30	30	40
Paper, enlarging, fast D.W.,glossy 11x14 gr	3	3	6
Paper, enlarging, slow,D.W., medium rough 11 x 14 gr	3	3	6
Acid, acetic glacial, lb	50	25	50
Acid, citric, powdered lb	5	5	10

	Req.	In use or exp.	Amount recommended.
Acid, oxalic, lb	5	5	10
Acid, pyrogallic, crystals, lb	100	100	150
Acid, sulphuric, lb	2	2	6
Alum, pottassium, powdered, lb	50	50	100
Alum, chrome, lb	20	20	30
Bichloride of mercury, oz	8	8	10
Glycerine, lb	10	10	20
Hydrochrome, lb	24	24	36
Metol (elon), lb	6	6	12
Potassium bichromatic, lb	2	2	4
Potassium bromide, lb	10	10	15
Potassium ferricyanide, lb	2	2	4
Potassium iodide, lb	1	1	3
Potassium meta bisulphate, lb	30	30	45
Potassium permanganate, lb	4	4	6
Sodium, carbonate anhydrus, lb	400	400	600
Sodium, hyposulphite, pea crystals, lb	1200	1200	1800
Sodium, sulphite anhydrus, lb	200	200	300
Leather belting, 1/4", ft	25	25	50
Below are non-standard items.			
Washer, print, "Pasco", large size	1	1	1
Reels, Stineman for developing tri-lens camera film, to hold 130' film	2	4	4
Paralax reflector for 8x10 enlarging camera	1	1	1
Coleman Heaters	2	2	2
Printer, Eastman Professional, 8 x 10	1	1	1
Cameras, "K-3" for oblique work	2	2	2
Cameras, "T-2" for mapping	2	2	2
Film, motion picture panchromatic 200' rolls	30	30	40
Film, motion picture panchromatic 100' rolls	30	30	40
Paper, P.M.C.#1 normal 8 x 10 gr	20	20	30
Paper, P.M.C.#1 contrast 8 x 10 gr	10	10	15
Film, cut panchromatic 4 x 5	60	60	75
Film, panchromatic for "T-2" camera, rolls	40	40	50
The following material was loaned to the Detachment by the Central Stores, Aircraft Squadrons, Battle Fleet.			
Shovels, long handle, square point	3	3	3
Shovels, long handle, round point	3	3	3
Axes, wood	6	6	6
Adzes	3	3	3
Picks	3	0	3
Buckets, deck, general purpose	36	36	50
Manila line, 6 thread, coil	1	1	2
Manila line, 9 thread, coil	1	1	2

	Req.	In use or exp.	Amount recommended.
White line, 12 thread, coil	1	1	2
Chain fall, 1 ton	1	1	1
Material not stocked, but needed.			
Hinges, butt, brass, 2 x 2			48
Hinges, galvanized, 3"			48
Hasp and staples			96

SECTION F.

MEDICAL.

Equipment - General Conditions in Southeastern Alaska.

1. The Medical Officer reported to the Officer-in-Charge at the Naval Air Station, San Diego on 30 April, 1929. Previously, about 15 March, a requisition for medical supplies had been prepared by the Medical Officer and, after approval by the Officer-in-Charge, forwarded to the Bureau of Medicine and Surgery. That Bureau approved this requisition in toto and all items had been received from the Navy Yard, Mare Island by the Supply Officer, Naval Air Station, San Diego prior to 6 April. A list of all medical stores and supplies requisitioned is appended to this section of the report.

2. The Medical unit of the Detachment consisted, in addition to the Medical Officer, of two Pharmacists Mates 1c, one regularly assigned to the U.S.S.GANNET and one attached to the Aviation Detail.

3. Having accompanied a similar expedition to southeastern Alaska in the summer of 1926, the Medical Officer was familiar with local conditions. Barring occurrence of epidemic diseases, not likely to be encountered, the maintenance of health of personnel resolved itself largely into a problem of individual selection and rejection prior to departure. This was possible with the personnel of the Aviation Detail but not with the crew of the GANNET. Before the Detachment left its base at San Diego each member was examined physically and the unfit were rejected. A dental examination was also made and all necessary dental work performed.

4. The medical and surgical equipment consisted of the standard Navy field supply items: #1 Medical officers kit; #5 Medical chest; #6 Surgical chest; #14 Operating chest, and a few articles from the regular supply table, such as additional gauze, cotton and some of the more commonly used drugs, a portable operating table, Army stretcher and embalming outfit. An electric sterilizer would have been much better than the portable kerosene burning sterilizer contained in the operating chest.

5. Before leaving San Diego the Medical Officer also had prepared two standard operating room laporotomy packs, containing

sheets, towels, gauze pads, operating room caps, gowns, gloves, etc.,- each pack being sufficient for use in an emergency operation. These packs were put up in muslin, thoroughly sterilized, wrapped in oiled paper and canvas and painted in order to insure their remaining sterile. A copy of the requisition for medical and surgical supplies is appended.

6. Each plane was equipped with the standard Navy Medical aviation first aid kit. Each plane was equipped with a stock of emergency rations for use in case of a forced landing in an uninhabited area. These rations were put in an ordinary five gallon tin, the top closed and soldered to make it entirely watertight. A list of the rations follows:-

3 lb. can sausage,	3 lb. can corned beef,
15 pieces hardtack,	1/2 lb. butter,
2 1/2 lbs. bacon,	2 lbs. sweet chocolate,
2 lbs. dried fruit,	2 lbs cheese,
2 lbs coffee,	1 carton cigarettes,
2 lbs sugar,	1 tin of sulphur matches,
2 Candles,	Fish hooks and lines,
Salt - Pepper,	1 can for making coffee,

2 Pieces paraffin soaked paper for making fires.

7. Aboard the Barge, the dispensary and sick bay was a space seven feet by twelve feet and contained two folding wall bunks, a portable operating table, portable sterilizer, dispensary counter, shelves, etc. The attic space overhead acted as a medical storeroom.

8. The health of the personnel was excellent during the entire summer. No epidemic diseases or serious food poisoning cases developed. One case of acute appendicitis developed and was taken ashore and operated upon in a civilian hospital in Juneau. Juneau and Ketchikan each have an excellent civilian hospital. Wrangell and Petersburg each have a fairly good small hospital.

9. The climate of southeastern Alaska is delightful during the summer months, except for the excessive rainfall. The climate compares favorably with that of Seattle or Portland except there is a greater rainfall. The rainfall is from forty-seven to one hundred sixty-eight inches per year.

10. The general health conditions of southeastern Alaska are excellent. No endemic or marked epidemic diseases are present. A considerable portion of the native (Indian) population are either tubercular or luetic. This is the result of overcrowding and lack of ventilation in their huts, and the absence of any great amount of knowledge concerning personal and general hygiene. There are no poisonous snakes, fruits or berries in Alaska.

11. The Barge used as a base for the aviation section of the Detachment was a standard Navy ammunition barge 110' x 30'. Partitions were built in, dividing the interior into a galley, mess hall, office, photographic laboratory, crews' sleeping quarters, barber shop, radio room, store room, work shop, chief petty officers' living room, dispensary and sick bay, officers' quarters, Commanding Officers' quarters, crew and officers' heads and showers. The natural ventilation employed was ample and satisfactory at all times. The installation of wash basins, shower baths and electric lights added greatly to the comfort of the personnel. The food was of excellent quality, plentiful in quantity, and prepared and served in a most appetizing manner.

12. In equipping future expeditions for operations away from organized bases, it is believed that the floating barge base used by this Detachment should always be considered much more efficient and healthful than tents.

Requisition For Medical Supplies.

Drugs - Class #1 - Expendable.

Item	Drug	Unit	No. Ordered.
1-003	Acetphenetidin	1 oz.cton.	6
1-007	Acid, Acetylsalicylic	"	6
1-009	Acid, Boric	1 lb.btl.	1
1-017	Acid, Salicylic	¼ lb.ctn.	2
1-023	Acid, Tartaric	¼ lb.btl.	1
1-025	Alcohol	1 Pt.btl.	24
1-053	Camphor, gum	½ lb.btl.	2
1-059	Chloramine	2 oz.btl.	2
1-061	Chlorinated lime	1 lb.btl.	12
1-065	Cinchophen	1 oz.btl .	1
1-067	Cocaine hudrochloride	1/8 oz.vial.	1
1-071	Collodion flexible	1 oz.btl.	3
1-073	Creosote carbonate	"	6
1-079	Ether	¼ lb.tin.	12
1-081	Ethyl chloride	60 gm.tube.	3
1-085	Eugenol	1 oz.btl.	1
1-103	Glycerin	1 lb.btl.	2
1-109	Iodine	1 oz.btl.	3
1-111	Lard, benzoinated	1 lb.tin.	1
1-116	Liniment, soap	1 pt.tim.	6
1-121	Magnesium sulphate	4 lb.tin.	3
1-129	Mercuric salicylate	1 oz.btl.	1
1-141	Methyl calicylate	1 lb.btl.	1
1-143	Neo-Arsphenamine	9 gm.amp.	50
1-147	Oil, castor	1 lb.btl.	2

Item	Drug	Unit	No. Ordered.
1-169	Ointment, merc. strong.	½ lb.jar	2
1-171	Ointment, merc.chl.mil.	dco.tubes	400
1-183	Paraffin-wax, comp.	¼ lb.pack.	6
1-185	Petrolatum, inc. an.	1 lb.can	2
1-191	Phenol	1 lb.bot.	2
1-193	Potassium & Sod. Tart.	1 lb.bot.	2
1-211	Pterolatum, liq.hvy.	1lb.can	2
1-219	Procaine hydrochloride	5 gm.bot.	3
1-225	Quinine sulphate	1 oz.bot.	3
1-233	Silver protein, mild	1 oz.bot.	2
1-235	Silver protein, strong	1 oz.bot.	2
1-237	Soap, castile	1 lb.pack.	12
1-243	Sodium bicarbonate	1 lb.ctn.	1
1-247	Sodium borate	1 lb.ctn.	1
1-265	Sodium thiosulphate,5gm.amp.	5 in pkg	12
1-267	Solution of crosol,comp.	1 lb.bot.	6
1-269	Sol. epinerphrine,hydro.	1 oz.bot.	2
1-271	Sol. formaldehyde	1 lb.bot.	6
1-295	Talc, purified	1 lb.ctn.	1
1-327	Tinct. of opium, camph.	1 pt.bot.	2
1-329	Trinitrophenol,20% in water	¼lb.bot.	2
	Tablets - Class #2 - Expendable.		
2-015	Coryza	100 in bot.	2
2-027	Mercurous chl. mild. comp.	bot.	2
2-031	Mixt.glycyrrhiza,comp.bot.		1
2-041	Pill,vegetable cath.N.F.	bot.	1
2-061	Tonic	bot.	2
	Biologicals - Class #4 - Expendable.		
4-011	Antidiphtheric,serum 10,000 un.	vial	5
4-035	Antitetanic serum,human, 1500 un.	vial	6
	Diets - Class #5 - Expendable.		
5-005	Soups, assorted	½ pt.tin	48
	Surgical Instruments & Appliances - Class #6 - Expendable.		
6-039	Catheter, soft rubber, set		1
6-067	Lavage tube, sft.rubb. one		1
6-075	Needle,sp.punct.3½" 18 g.one		3
6-081	Needle,st.hupo.1½" 21 g. one		12
6-083	Needle,steel,hypo.1½" 20 g. one		12
6-087	Needle,st.hypo.2" 18 g. one		12
6-095	Needles,suture, intest, asst. btl.		1
6-117	Syringe, intramuscular,gl. 2CC one		3
6-121	Syringe, intramuscular, gl. 10CC one		3
6-123	Syringe, intramuscular, gl. 20CC one		3

Item	Drug	Unit	No. ordered.
Equipment - Class #7 - Non-expendable.			
7-573	Table, operating, small	one	1
Surgical dressings - Class #8 - Expendable.			
8-001	Aircraft First Aid pkg.	one	3
8-007	Bandage, cott.elast.3"	doz.	6
8-013	Bandage, gauze, 2½"	doz.	12
8-015	Bandage, gauze, 3"	doz.	12
8-025	Bandage, plaster of paris	doz.	3
8-029	Bandage, suspensory	one	6
8-039	Cotton, absorb. 1 lb.roll	roll	10
8-055	Gauze, plain	roll	10
8-067	Ligature, catgut, pl. #1	Tube	12
8-069	Ligature, catgut, pl. #2	tube	12
8-121	Ligature, s.w.g.fine	tube	6
8-123	Ligature, s.w.g. mod.	tube	12
8-125	Ligature, s.w.g.coarse	tube	12
8-135	Muslin,	yards	100
8-151	Plaster, adhesive	roll	3
8-157	Shade, eye, single	one	3
8-167	Tubing, rubb.dr.size 1	tube	6
8-169	Tubing, rubb dr.size 2	tube	6
8-171	Tubing, rubb.dr.size 3	tube	6
8-173	Tubing, rubb.dr.size 4	tube	6
Surgical dressings - Class #9 - Non-expendable.			
9-001	Pouch, hosp.corps.large	one	1
Dispensary & Laboratory supplies, miscellaneous, Class #11 - Expendable.			
11-017	Bottle, poison,blue,200CC	one	3
11-025	Bottle, 100CC	doz	5
11-027	Bottle, 200CC	doz	5
11-029	Bottle, 500CC	doz	1
11-031	Box,ointment, tin	doz	3
11-035	Box,powd,rect.	doz	3
11-045	Capsule,gel.size 00	box	2
11-047	Capsule,gel.size 0	box	2
11-049	Capsule,gel.size 1	box	2
11-057	Corks,bottle #4	doz	5
11-059	Corks,bottle #5	doz	5
11-061	Corks,bottle #6	doz	5
11-063	Corks,bottle #7	doz	5
11-067	Corkscrew	one	1
11-095	Envelope,drug	100	2
11-125	Jar,shelf,oint.500gm.	one	6
11-127	Labels,direction, bottle	pad	1
11-131	Labels,direction,poison,bot.	pad	1
11-149	Medicine dropper	one	12

Item	Drug	Unit	No. ordered.
11-157	Paper, filtering, round 10"	Pkg	3
11-167	Paper, wrapping, blue	quire	6
11-169	Paper, wrapping, white	quire	6
Dispensary & Laboratory equipment - Class #12 - None-expendable.			
12-091	Hot plate, electric	one	1
Hospital & Nursing Supplies - Class #13 - Expendable.			
13-001	Applicator, wood	bundle	1
13-003	Atomizer, hand	one	3
13-013	Bag, ice, rubber	one	1
13-015	Bath, eye	one	1
13-023	Brush, for paraffin	one	3
13-047	Gloves, oper. med. size 7	pair	6
13-049	Gloves, oper. med. size 8	pair	6
13-069	Irrigator, rubber, complete	one	1
13-071	Medicine glass	one	12
13-081	Spectacles, smoked glass	one	6
13-091	Thermometer, clinical	one	6
13-093	Tips, rubber, for crutches	one	4
13-095	Tongue dropressor, wood	pkg	1
13-107	Tumbler	one	6
Hospital & Nursing Supplies - Class #14 - None-expendable.			
14-005	Bandage roller	one	1
14-011	Bedpan, agate	one	1
14-013	Bucket, agate	one	2
14-015	Clock, small, with second hand	one	1
14-021	Crutches	pair	2
14-033	Jar, dressing, agate	one	2
14-035	Litter, Army type	one	1
14-037	Pitcher, agate	one	2
14-055	Urinal	one	1
Bedding & Linen - Class #15 - None-expendable.			
15-005	Blanket	one	4
15-013	Pajama coat	one	6
15-015	pajama trousers	one	6
15-017	Pillowcase, cotton	one	6
15-021	Sheets, cotton	one	12
15-029	Towel, hand	one	12
Stationary - Class #17 - Expendable.			
17-029	Pad, prescription	pad	6
Surgical Instruments & Appliances - Class #7 "Ba".			
7---	Chest, Medical, complete unit #5	one	1
7---	Chest, Surgical, complete unit #6	one	1
7---	Chest, operating, complete unit #7	one	1
Mortuary equipment - Class #21 - Non-expendable.			
21-011	Embalming outfit	one	1

SECTION G.

AEROLOGICAL.

Climate - General Condition of the Weather - Days Suitable for Mapping - Facilities for Obtaining Weather Reports.

1. The climate of southeastern Alaska greatly resembles that of the coastal region of the Pacific Northwest between Eureka, in northern California, and Seattle, Washington. While the precipitation is greater, there is not nearly so much fog. Many people living in the States do not realize that southeastern Alaska enjoys a temperate climate and that navigation is open the year round. The mean annual temperature at Ketchikan is 44°, and it is 42° at Juneau; and the range between summer and winter mean temperatures is only about 30°. The Weather Bureau records show that the mean temperature at Sitka for the month of January is 1° higher than the January mean at St. Louis and 5° higher than the mean at Boston, as well as higher than the January mean for Chicago. Of course the temperatures at sea level are considerably higher than in the mountains, but excepting for a few mines all industry is carried on at the lower elevation. Much rain falls in southeastern Alaska, and this condition causes more or less discomfort to people who have lived in the States and have not become accustomed to it. Precipitation is much heavier in the southern part of this region, averaging one hundred fifty-six inches at Ketchikan, one hundred forty-seven inches at Fortman Hatchery, eighty inches at Juneau, and eighty-two inches at Sitka, while it is only twenty-four inches at Skagway and twenty-one inches at Klukwan, farther north.

2. The aerological equipment of the Detachment was furnished by the Naval Observatory at the request of the Bureau of Aeronautics. Shipment was made direct to the Navy Yard, Puget Sound. The list of material was made out by the Aerological Section of the Bureau of Aeronautics and was sufficient to establish a first class aerological observatory afloat. Shortly after the receipt of this equipment, all instruments were calibrated and installed for tests. After arrival at Ketchikan, the latter part of May, routine observations and forecasts were commenced and continued daily until the Detachment departed for Seattle on 7 September.

3. Through cooperation with the U.S.Army Signal Corps at Ketchikan, arrangements were made for regular weather reports from the following stations: Ketchikan, Wrangell, Petersburg, Craig, Sitka, Haines, Soapstone Point, Cordova, Hinchinbrook Island, Tenakee, Port Althorp and Juneau. These reports were received

twice daily and proved of great assistance as local observations were often misleading. Coded weather reports were received twice daily from the U.S.Weather Bureau over the "NPG" radio broadcast, from which regular weather charts were drawn.

4. As the only weather forecasting station in Alaska is located at Juneau, arrangements must be made for own forcasting when operating elsewhere.

5. Balloon soundings were made daily, weather permitting, at 0500 and 1100. On days suitable for mapping, the pilots and navigators were furnished a memorandum giving the force and direction of the wind at the mapping altitude of 10,900 feet to assist them in allowing for drift when flight lines were flown across wind.

6. The weather in southeastern Alaska is usually the same throughout the entire area,- although occasionally a clear area can be located in spite of apparently general unfavorable conditions, and successful mapping accomplished. With this in view it is important to arrange for weather reports at least twice daily from as many local stations as possible. On one occasion while based at Juneau, four successful mapping flights were made in the vicinity of Glacier Bay where it was cloudless, while at Juneau and to the southward the entire area was cloudy with occasional rain.

7. If the weather is unsuitable for mapping in the morning, it seldom clears sufficiently during the day to permit mapping operations. Frequently the weather is clear enough for mapping early in the day but clouds form by noon. The first mapping weather after a rain is usually extremely clear, but after a day, even though cloudless the weather becomes slightly hazy with the haze increasing in density with the passage of each clear day.

8. During the past season's work in southeastern Alsaka eighteen days were clear enough for mapping: May 30; June 4, 5, 6, 15, 23; July 10, 11, 17, 18; August 1, 2, 3, 4, 5; September 1, 5, 6. Of the ~~xx~~ 104 days spent in Alaska rain fell on 73.

9. The weather experienced by this Detachment was similar to that of the summer of 1926 and is what may normally be expected during a seasons work in southeastern Alaska extending from May to September.

10. After the return of the Detachment to San Diego, all aerological records were forwarded to the Bureau of Aeronautics, and all aerological equipment turned in to the Supply Officer, Naval Air Station, San Diego, for shipment to the Naval Air Station, Sand Point, Washington.

SECTION H.

AIRCRAFT RADIO.

General - Performance - Remarks.

1. In making plans for the survey some difficulty was experienced in deciding just what aircraft radio equipment was desirable and necessary. The weight of the SE 1385-A transmitter and SE 2465-A receiver seemed excessive but the proven power and range of this set was much greater than that of any other available. It was finally decided to requisition two transmitters and two receivers of this type and to take in addition an SE 1375-B transmitter receiver. Two of the four planes were wired for radio equipment prior to leaving San Diego (No. 1 and No. 4) but radio sets were not carried on the flight between San Diego and Seattle going or returning. The use of the larger set was fully justified during the summers work and on the flights to and from Seattle. Only Plane Number One carried radio on those flights but the performance of the set was perfect. After arrival in Alaska both spare radio sets were installed in Plane Number Four, tested, calibrated and removed. The SE 1375-B set proved practically useless for the following reasons, (a) short range of the transmitter, (b) frequency range too high, (c) only base station (GANNET) could be worked satisfactorily on a predetermined frequency.

2. Only a few minor troubles were experienced. Two fans developed vibration and had to be replaced while the CW 1344 tubes after being in use a short while could become paralyzed or lost their life. Care was taken to insure that the tubes operated at their normal filament voltage rating according to their tip coloring but the reason for their going dead could not be determined. This necessitated carrying plenty of spare tubes in the plane. An improved installation of the antennae reel and lead out insulator should be made as the present one causes too much strain on the reel. On one occasion the reel handle broke and on another the reel mount broke requiring the operator to haul the antennae in by hand and pile it in the bottom of the cockpit.

3. In fitting out another expedition for work in Alaska the plan of taking two of the most powerful and rugged aircraft sets available should be followed. The smaller sets are almost

entirely useless. Practically all flights require operation at distances of well over one hundred miles under atmospheric conditions which are generally very unfavorable. No high frequency aircraft set was available for this expedition. The excellent results obtained with the aircraft radio were due in a large measure to the efficient cooperation of Canadian Government, U.S. Army and U.S.Navy radio stations.

SECTION I.

COVERED BARGE YF - 88.

1. Immediately after orders had been issued for the organization of the 1929 Alaskan Aerial Survey Detachment, the Navy Yard Puget Sound commenced overhaul and reconditioning of Covered Barge YF-88. This Barge was originally a standard 110' x 30' Navy ammunition lighter but had been converted for use as living quarters workshops, offices, storerooms, and photographic laboratory for the aviation detail of the 1926 Alaskan Aerial Survey Expedition, upon the completion of which it had been delivered to the Navy Yard, Puget Sound. A photograph of the plan of this Barge is included elsewhere in this report.

2. The Barge was equipped for hot and cold running water and wired for electric lights and power. Twenty-seven standee bunks were installed in the crews bunk room, twelve in the Chief Petty Officers Quarters, two in the stateroom assigned to Mr. Sargent and one built-in bunk in the Commanding Officers Quarters. Two ranges fitted for burning kerosene were included in the galley equipment and all meals for the enlisted personnel of the aviation detail were prepared and served on the Barge. At such times as the GANNET was away from the base, the Barge was moored to the dock, and light, water and telephone connections rendered it self sustaining as headquarters for the Detachment. The use of a Barge on a project of this nature, where a frequent shift of base is necessary, is considered far superior to the use of a temporary camp or shore base.

3. While the Barge was very satisfactory as a mobile base, the following additions or alterations would greatly increase its usefulness:

(1) The bow should be covered with steel sheathing to protect it from floating logs while being towed,

(2) The structure below decks should be strengthened and divided into four watertight thwartship compartments,

(3) Lockers should be installed for stowage of clothes of enlisted personnel,

(4) Wash basins should be installed in forward part of Barge for use of the crew.

4. Upon the return of the Detachment to Seattle in September, the Barge was turned in to the Supply Officer, Navy Yard, Puget Sound. Standee bunks, cooking stoves, water tanks, wash basins, piping, and electric wiring were left intact and ready for use by any future Detachment.

SECTION J.

Report of Mr. R. H. Sargent, Representative of Departments of Interior and Agriculture and Liaison Member. Conception of Original Idea - Resumption of work in 1929 - Work Accomplished - Comparison of Aerial Survey with other Methods.

1. The use of photographs taken from mountain tops as a means of facilitating the mapping of a country antedates the World War by many years, but the utilization of the aeroplane as a means of transporting cameras for such a purpose and the development of suitable cameras for this type of photography was in its infancy in 1917. The inestimable value which aerial photographs proved during the war gave an impetus to their rapid development immediately following its close.

2. The application of the underlying principles of the cameras employed in map making appears to have been first made by Theodore Schiempflug, an Austrian army engineer but the idea of adapting the cameras for surveying in the United States and the method of using the pictures obtained with them originated with Major J. W. Bagley, now of the Corps of Engineers, U. S. Army, while he was connected with the U. S. Geological Survey where he had alrady made extensive use of the panoramic camera in Alaskan topographic surveys. At the present time there are several firms who are in the commercial business of making aerial photographs for the purpose of map making but there are only one or two who are equipped to turn out correct topographic maps showing the relief by means of contours. So far as the writer knows, all ofthese firms are employing one lens cameras of long focal length and the pictures cover only about one and one-half square miles of country. Major Bagley, having been trained in Alaska in the art of mapping on a reconnaissance scale, recognized the futility of covering great areas of country with such cameras and accordingly set to work to devise a camera suitable for mapping large areas. With the most valuable and able aid of Messers Fred Moffet and J. B. Mertie, geologists of the Alaskan Branch, U. S. Geological Survey and co-workers with him in Alaska, Bagley devised a three lens camera for this purpose. By later development and improvement a

four lens camera has been constructed, two of which were used by the U. S. Navy's 1929 Alaskan Aerial Survey Detachment.

3. For several years a cooperative arrangement between the Army Air Corps and the Geological Survey of the Interior Department has been in operation for the making of aerial photographs of certain portions of the United States with Bagley cameras. The use of these photographs has proved of great value in the topographic mapping of the country by the topographic branch of the Survey. During the time that such work was being executed in the States, it was eagerly watched and sincerely hoped that ~~xxxx~~ such photographing might be extended to Alaska where the conditions are most fitting for the greatest amount of value to be obtained from aerial photographs. In 1925 the project of a cooperative arrangement for such work in southeastern Alaska was presented to the War Department by the U. S. Geological Survey. After due consideration, the War Department declined to undertake the work with the money available from the Geological Survey. Accordingly the proposition was put to the Navy Department which considered it favorably and undertook the work during the summer of 1926.

4. The expedition of 1926, known as the Alaskan Aerial Survey Expedition was under the leadership of Lieutenant Ben H. Wyatt, U.S.Navy. The equipment consisted of three Loening amphibian planes, the tender GANNET, a 30' x 110' Barge (Navy Designation YF-88) equipped as living quarters for the aerial and photographic personnel and dark rooms and workshops for the photographic and mechanical units. Two "T-1" (3 lens Bagley) and one "K-3" (one lens Fairchild) cameras together with numerous smaller cameras and movie cameras completed the photographic equipment. The total personnel included one hundred twelve men. It was my pleasure to accompany the Expedition in the capacity of Interior Department representative and liaison officer between the Expedition and the several government bureaus functioning in southeastern Alaska.

5. The results of the 1926 Expedition netted thirty-two rolls of the tri-lens negatives making a total of five thousand seven hundred sixty combined photographs and covering an area of approximately ten thousand square miles of countty. In addition to this many valuable obliquo photographs were taken at the request of several bureaus, namely: the Geological Survey, Forest Service, International Boundary Commission, Bureau of Public Roads, Bureau of Fisheries, War Department and few miscellaneous pictures for other bureaus. One complete set of the mapping photographs is on file at the Alaskan Branch, U. S. Geological Survey at Washington, and another set in the office of Mr. Charles H. Flory, Forest Supervisor at Juneau, Alaska. The mapping films were turned over to the Geological Survey where they are permanently kept. The

original negatives of all of the obliquo pictures are in the hands of the Navy Department in Washington, but the Forest Service there has made duplicate negatives for their own use and has offered to make prints desired by the general public at a very nominal cost. Since the completion of the printing of the mapping photographs of 1926, the information on about two thousand six hundred square miles of country has been compiled in the form of a base map entitled - "Map of Part of Ketchikan-Hyder Region."

6. As an asset in mapping a country these photographs are invaluable, especially in southeastern Alaska where the difficulties to mapping by the usual ground methods are very great. To acquire the accurate information regarding streams, isolated lakes and other similar features by the usual methods would well nigh be impossible and extremely costly and slow. There is no way of estimating the monetary value of these photographs.

7. In addition to the value of these photographs in map making they have proved of inestimable value to the U. S. Forest Service. During the past year and a half that the prints of the 1926 work have been in the office of the Forest Service in Juneau, it has been realized that these photographs are of great value in estimating the area of the forests and to a large extent the quantity of the timber on the areas over which the pictures were taken. It was on the basis of the knowledge of their great value that the Forest Service as well as the Geological Survey was willing to urge the continuation of the mapping in 1929. With this knowledge as an argument for its continuance, Mr. Charles H. Flory, Forest Supervisor of Alaska, with the full assurance of the officials of the Geological Survey of their cooperation, presented the matter to Admiral Charles F. Hughes, Chief of Naval Operations, Navy Department, who gave it his favorable endorsement and personal attention to the end that the 1929 expedition was organized. The original conception of the actual scheme in 1926 was a coordinated cooperation between the several governmental activities functioning in Southeastern Alaska, and the plan of the 1929 expedition was on the same basis.

8. The Navy Department has, of course, contributed by far the greatest amount to the cooperation by detailing the GANNET and her crew together with the planes, photographic equipment and aviation and photographic units. The Interior and Agriculture Departments have defrayed the expense of only the film, chemicals, paper and the minor items incidental to the actual taking of the photographs with the gasoline consumed while on photographic flights, and the expenses of the aviation crews when away from base. As an assurance of cooperation, the Director of the Geological Survey directed letters to the chiefs of each of the following bureaus and I had the pleasure

making they have proved of inestimable value to the U. S. Forest Service. During the past year and a half that the prints of the 1926 work have been in the office of the Forest Service in Juneau, it has been realized that these photographs are of great value in

of personally visiting these chiefs to orally present the matter: Forest Service, Coast and Geodetic Survey, Bureau of Public Roads, Bureau of Fisheries, General Land Office, Bureau of Lighthouses, U. S. Coast Guard, Federal Road Commission, International Boundary Commission, Road Commission of Alaska, U. S. Army Engineers, Rivers and Harbors, and the Signal Corps.

9. Such of the bureaus as had boats in southeastern Alaska issued instructions for such boats to stand by to render aid at such times as it may be needed. There were approximately forty boats large and small which were pledged to aid when needed. In addition to this, the Lighthouse Service has most generously loaned the use of their dock at Ketchikan and furnished light and water when the GANNET was away from the dock. The Forest Service at Juneau rendered numerous types of aid such as making arrangements for light and water and telephone connections and paying for same and giving the use of their boats on several occasions and otherwise being of general service. The Bureau of Fisheries also supplied boats and attended to numerous matters of business in connection with the general program of the Detachment. The aid which the Signal Corps of the U. S. Army rendered was very considerable in facilitating the transmission of regular messages and in rendering special service when desired.

10. In addition to this cooperation of the Federal Bureaus, there were many instances of courtesies shown the Detachment as a whole by private individuals and corporations. Most noticeable among these was the kindness of Mr. L. H. Metzger, General Superintendent of the Alaska-Juneau Mine at Juneau and numerous members of his staff. Through their courtesy the entire personnel of the Detachment were invited to go through the underground workings of the mine and the mill,- approximately one hundred men availaing themselves of the opportunity. They were taken in three groups on three separate days,- two for enlisted men and one for officers. Mr. Metzger personally accompanied the officers and one group of the men. The courtesy of the Catholic Parish Hall and gymnasium at Juneau was granted the men and on two occasions Father Bernard R. Hubbard, an explorer and lecturer of the University of Santa Clara, San Jose, California gave the members of the Detachment special lectures on his travels which were greatly enjoyed. Reverend A. P. Kashevaroff of the Territorial Museum at Juneau gave two special talks on Alaska and its people to the members of the Detachment. At Petersburg, where the Detachment was based for three weeks, particular mention should be made of Mr. Earl N. Ohmer, Mayor of the Town, who did everything in his power to facilitate the work of the Detachment and to make the men welcome. He had a beach for the planes cleared upon arrival and made a berth for the GANNET and Barge at his float.

11. During the summer, a visitor's register was kept in the demonstration room which contains the names of six hundred three visitors and it is known that many others were on board who did not register. Among the visitors were many tourists from the steamers passing through, and it was not at all uncommon for them to state that their visit to the Detachment was the most interesting part of their Alaskan trip. At Juneau a banquet on the Barge was given by the officers to Governor Parks and about thirty-five of the prominent residents of the city.

12. In round numbers, the photographic results of the expedition were forty-two rolls of tri-lens and ten rolls of "D" or fourth lens mapping film, making a total of over twenty-five thousand single photographs covering an area of approximately thirteen thousand square miles. The films have been delivered to the U.S. Geological Survey where they are filed for future use. In addition to these, the negatives of four hundred sixty-seven oblique photographs were turned over to the Forest Service for use and distribution. One complete set of prints of these oblique photographs mounted on cloth, was turned over to the Forest Service office at Juneau and another set forwarded to the Geological Survey at Washington, D. C. In addition to these, fifty mounted prints of lights and lighthouses in southeastern Alaska were turned over to the Office of the Lighthouse Service at Ketchikan. Over two thousand additional prints of oblique photographs have been given to numerous federal bureaus and officials for various purposes. Approximately one hundred fifty prints from the mapping film were delivered to the Bureau of Public Roads, the Forest Service and the Army Engineers at Juneau for immediate use in studying road, water power and harbor improvement problems. A special mosaic map of the Juneau water front was made from vertical photographs taken with the "K-3A" camera from three thousand feet altitude and turned over to the Army Engineers at Juneau.

13. One of the valuable services which the Detachment rendered was the taking of numerous Federal officials on flights of importance in connection with their official duties. Thirty such flights were made with twenty-one different persons including the following: Honorable George A. Parks, Governor of Alaska; Mr. Henry O'Malley, Chief of the U. S. Bureau of Fisheries, Department of Commerce; Mr. Charles H. Flory, District Forester of Alaska; Dr. Philip S. Smith, Chief Alaskan Geologist, U. S. Geological Survey; Major Malcolm Elliot, U. S. Army, President, Alaska Road Commission; Major Douglas H. Gillette, U. S. Army, Chief Engineer, Alaska Road Commission; Mr. Harry Watson, Secretary to the Governor of Alaska; Mr. John A. Thayer, U. S. Forest Service; Mr. B. D. Stewart, U. S. Geological Survey, Supervising Mining Engineer in Charge and Federal Mine Inspector; Mr. B. F. Heintzleman, Assistant District Forester,

Forest Service, Juneau, Alaska; Mr. E. C. Guerin, Cadastral Engineer in Charge, General Land Office, Juneau; Mr. J. P. Williams, Forest Service, Juneau; and Lieutenant W. W. Scaife, U. S. Coast & Geodetic Survey.

14. It is impossible to estimate, in dollars and cents, the value of the results of the expedition;- in fact it will be years before the total worth of the results can possibly be determined. Only those who have experienced the difficulties of conducting topographic mapping by ground methods in such a country as southeastern Alaska can appreciate the invaluable aid of the mapping pictures. In this country, where climatic conditions are almost at their worst, topographic mapping is slow, arduous and costly, not only because of the inclement weather but also because of the heavy blanket of timber and almost impenetrable underbrush. Accurate topographic mapping by ground method is well nigh impossible, at least within the bounds of warranted cost. By such methods, the topography of the shore lines and mountain ridges can be obtained with comparative ease but accurate discovery and mapping of the valley bottoms with the many lakes and sinuous streams is prohibitive. For this purpose the aerial photographs are invaluable and will serve to make the maps of the islands and mainland of southeastern Alaska much more accurate and possible of accomplishment in much less time. A short account of the manner of using the prints will be of interest to those familiar with the more common methods of map maping. Contrary to the general belief, the finished prints are not joined together to make "mosaics" but are used in a modified plane-table method, known as the radial-line method, to determine the positions of chosen points. Lines are drawn from the station points of two or more pictures to objects common to both, and the intersections of these lines determines the positions of the objects, just as on the plane table. The station points of the pictures are the images of points on the ground above which the airplane was flying at the instant of exposing the film. They are the central points of the B pictures from negatives that were in a horizontal position when exposed but are points displaced from the centers of negatives that were inclined to the horizon plane and when so displaced are in error by an amount depending on the amount and directionof the tilt of the plane. The importance of maintaining a horizontal positinn for the B negative when the exposure is made therefore becomes apparent. It is necessary to establish the positions of the station points on the compilation sheet in order to use them for locating additional points, and this is done substantially as follows: Three or more points whose positions on the ground have been determined by one of the usual surveying methods must be identified on the first of each series of photographs. These known points serve to determine the scale of the map, the azimuth of the

line of flight, and the position of the station point of the picture. This last-mentioned object is accomplished, as in the three-point method of plane-table surveying, by drawing radial lines from the station point to the images of the known points on the pictures and shifting these lines over the plotted positions of the known points on the compilation sheet till the lines pass through the plotted points. If, furthermore, the known points are common to the first two sets of photographs they serve also to orient the second set with reference to the first by a similar application of the three-point method. Continuing this process the draftsman is able by choosing suitable points common to the overlapping sets of pictures to join all the pictures of a flight, or more accurately, to plot from the successive sets of overlapping pictures the positions of as many common points as he may need or be able to identify. All this work is done on a sheet of tracing linen, not on the pictures themselves, and yields a series of strips representing individual flights which in turn must be assembled into the final sheet. The separate sheets are not necessarily on the same scale and when of different scales are adjusted to one another by the known control point. This control for scale, azimuth, and geodetic position was furnished by the charts of the United States Coast and Geodetic Survey. This method of using the pictures gives the positions of stream courses, roads, and similar features, but does not make it possible to draw contour lines and construct a topographic map. Other methods must be used if topography is to be represented. Such maps are the basis upon which the information collected by geologists of the Geological Survey is correlated, and they are absolutely essential to a complete investigation of the geology and mineral resources of a region. It is as yet only estimated as to how valuable these photographs will be to the geologist in connection with his field work and office study in correlating information previously obtained, but it is believed by those who have given it consideration that their value will be great.

15. As has been stated, these photographs have served a most valuable purpose to the Forest Service in the study of timber resources of the area. The development of the pulp wood resources of southeastern Alaska is being stressed by the Forest Service and active investigations are being carried on at the present time toward the construction of possibly two pulp and paper mills. In these investigations, the prints of the 1926 expedition have been frequently consulted and those taken during 1929 will add to the information already at hand.

16. The mapping film will undoubtedly save many hundreds of dollars for the Bureau of Public Roads in studying possible routes for proposed highways. One concrete instance of this is the selection of a route for a roadway from tide water up the Taku River to

the International Boundary. The discovery and subsequent development of valuable ore deposits along the valleys of the Taku and Chullsaukway Rivers has made it imperative to build such a road, and a study of the prints which have been made from the mapping film of that region has greatly facilitated the survey. There are, many other instances in which they will provoextremely valuable. The Bureau of Public Roads was one of the heavy contributors to the appropriations for carrying out this season's survey.

17. The discovery of heretofore unreported lakes and water power resources has been one of the most valuable results of these aerial surveys. Indeed it is this particular type of information which can be most nearly evaluated at the present time. A lake later named Lake Grace was discovered near Ketchikan by the 1926 expedition and proved to be of great value, for it was the key to the water power situation and pulp development of Revillagigedo Island as it was capable of developing 10,000 horsepower required to complete a pulp mill for this locality.

18. During the 1929 expedition several heretofore unreported lakes and very valuable water power sites were discovered and photographed. One of these was by far the most spectacular of the entire expedition. The building of a pulp mill in the vicinity of Juneau was contemplated and the survey of the water power resources had just been completed. The lakes which were to be used were Long, (Welker), Crater and Speel Lakes which necessitated the building of about forty miles of high tension power line at a tremendous expense and at great physical outlay. This line would have been very costly to keep up, the leakage would have been great, and the lind in constant danger of being put out of commission by land slides. While flying over the area adjacent to Taku Inlet on one occasion, Commander Radford viewed a large lake high in mountains wheeh he reported on his return to base. By subsequent investigations, this lake proved to be of great value as a water power asset, and it is believed that by utilizing it in conjuction with Turner Lake near at hand, a sufficient amount of pow er will be secured to warrant the abandonment of the Speel River project for the present at least. If this is true, it will mean an immediate direct saving to the Company of approximately $600,000 and ultimately of approximately $1,000,000. Such discoveries justify the costs of the expeditions many times over.

19. While the actual results of this years aerial survey will not be known for several years, from a casual study of the film of the 1929 expedition, I estimate that water power resources aggregating no less than 100,000 year round horsepower will be located from these photographs. Such information is most valuable to the Federal Poser Commission, the Forest Service and southeastern Alaska in general.

20. Much of the shore line of southeastern Alaska has already been delineated by the U. S. Coast & Geodetic Survey but there are a few areas which have not been charted which have been covered by the photographs of this year. The photographs should prove very valuable to that service. The detail which they show is so complete that any shore line which is adequately controller by triangulation could easily and accurately be delineated from these photographs. Practically every large glacier of southeastern Alsaka was photographed with the tri-lens camera.

21. The oblique photographs which have been made are undoubtedly the most complete and most wonderful group of photographs which have ever been made in Alaska if not in North America. The photographs were taken of especially requested areas and subjects for the Forest Service, Geological Survey, International Boundary Commission, Lighthouse Service, Bureau of Public Roads, Federal Power Commission, Bureau of Fisheries, and Army Engineers. The Forest Service will probably derive the greatest value from these photographs as a means of studying timber, railroad and highway routes and possible water power sites. In the vicinity of Glacier Bay several pictures were taken of an area on which reforestation is taking place after the recession of the glacier ice. These photographs are a very valuable asset as a record of the state of the timber growth at this date.

22.- Photographs of many valuable lakes which are sources of potential water power were taken for the Federal Power Commission. In several instances the lakes were discovered by this expedition. These photographs will be very valuable in studying these water power sites in the office of the Commission in Washington.

23. The International Boundary Commission is charged with keeping the boundary between Alaska and Canada well marked. The pictures taken of the International Boundary furnish information which would otherwise cost the Commission many thousands of dollars and they also make an excellent record of the condition of the line at this time.

24. The photographs which were taken for the Bureau of Fisheries will undoubtedly be of value to them in studying the spawning grounds of the salmon, and will serve as record for the several canneries which were included in the photographs.

25. Undoubtedly the Geological Survey has gained greatly from a scientific standpoint, for many of the pictures which were taken for other Federal bureaus will be of intense interest and great value to the Survey.

26. During the summer, both vertical and oblique photographs were taken of practically all the glaciers of southeastern Alaska. These will not only serve as record of the state of the glaciers in 1929, but I believe glaciorologists will find them of much value in a study of the action of a moving glacier. I also believe that the collection of photographs made by this expedition will compare most favorably with any collection taken anywhere in the world in the same space of time and certainly the diversity of purposes in which they will be employed is unique. Some of these pictures excell in beauty any grandeur anything which I have heretofore seen.

27. I feel that the work of the expedition has been a great success in every way. There are still many square miles of country and many resources along the Alaska Coast of which similar photographs would be extremely valuable and I sincerely hope that such an arrangement may be continued until all these areas have been photographed.

R. H. SARGENT,
Topographic Engineer,
U. S. Geological Survey.

SECTION K.

U.S.S.GANNET, AIRCRAFT TENDER

Personnel - Navigation - Radio Communication -

Special Equipment Desired or Needed.

1. The GANNET reported for duty with the Alaskan Aerial Survey Detachment at the Naval Air Station, San Diego on 1 May 1929, and after loading stores and embarking aviation personnel, departed on 6 May for Navy Yard, Puget Sound arriving on 11 May. Prior to arrival at the Navy Yard, a request for a number of desirable repairs was made and the following repairs were accomplished:

(a) Manufacture weather screen for lower bridge,
(b) Renew linoleum in after crews quarters,
(c) Repair leak at frame 75, starboard quarter,
(d) Repair anchor engine,
(e) Reef out, harden down and recaulk boat deck,
(f) Overhaul five airport frames, install three lenses.

The above repairs were accomplished in most excellent manner and a fine spirit of cooperation was maintained between yard officials and ships officers.

2. The GANNET'S allowed complement prior to departure was forty-six men and four officers but the complement was later increased by two men. The GANNET had on board at the start of the cruise sixty-one men and four officers,- the number of men being fifteen in excess. The vessel could hardly have operated successfully on detached duty for any length of time with less than this number actually on board without working a hardship on the crew,- having in mind the chances of sickness and lack of opportunity to get additional men if needed. The crew worked and labored under very trying conditions at times,- especially in handling the cumbersome eight inch towing hawser without a towing engine.

3. A full outfit of rain clothes was obtained prior to departure, but as the material was of an inferior quality, the crew would become soaking wet after a short time in the heavy rain which was very frequent. However, there were few cases of sickness during the entire stay in Alaskan waters.

4. During the rainy weather the ship was very uncomfortable. This class of vessel, being without the proper accommodations, provided no facilities for recreation, and liberty conditions were only

fair in the small cities of Alaska. The prices to amusement places were very high and the programs compared with the 25¢ theatres of the States. Dancing pavilions charged $1.00 admission. Outside of the movie houses and dance halls there were no other places of amusement. While at Petersburg and Juneau a number of baseball games were played between teams selected from the Detachment and a few games were played with the town teams. The games invariably started after six oclock at night for thereason that usually when it was good baseball weather it was also good mapping weather, requiring that the games be played after mapping hours. Considering the circumstances, the entire personnel is to be commended for the fine spirit of morale maintained during the cruise of practically four months.

5. Prior to departure from Bremerton, a number of requests were received from pilots who wished to be engaged for the cruise. No pilots were deemed necessary and none were taken.

6. The GANNET with Barge YF-88 in tow departed Bremerton for Ketchikan, via the inside passage on 20 May, arriving 24 May. The weather was favorable. Quite some rain was encountered but no thick weather. A stop of six hours was made during the night at Blinkensop Bay and Namu Harbor. The stop at Blinkensop Bay was made on account of a signal received from the Barge saying that "they were pounding heavily," the wind force six, and sea quite rough. Upon anchoring no damage had occurred but some of the crew of the Barge were sick.

7. The entire trip was uneventful. British Columbia waters are not as well lighted as those of southeastern Alaska. However, in spite of the paucity of lights in British Columbia waters, the turning points and the various reaches are well marked by suitable aids to navigation. The courses were taken from the Coast Pilot and followed without the slightest difficulty. However, when strong winds and tidal currents were encountered the speed was greatly afftected,- amounting sometimes to as much as three knots. With strong beam winds the Barge would tow decidedly on the lee quarter, which affected the steering. It is considered dangerous to navigate these waters during thick weather with a tow.

8. Radio communications were excellent. Some difficulty was experienced in trying to operate with Navy Radio Sitka while at Juneau, but the cable stations at Juneau and Ketchikan cooperated with us admirably. At both Juneau and Ketchikan a telephone was installed on board and messages over the cable were phoned to the ship immediately upon receipt. The Barge and ship each installed a small oscillator radio set which allowed both to be in constant communication while underway.

9. Radio broadcast receiving sets were installed on both the GANNET and Barge. Due to local conditions it was difficult to get the various radio programs until very late at night. At about 2200, Los Angeles, Portland, Seattle, Salt Lake City, Astoria and Denver broadcasting stations were heard plainly.

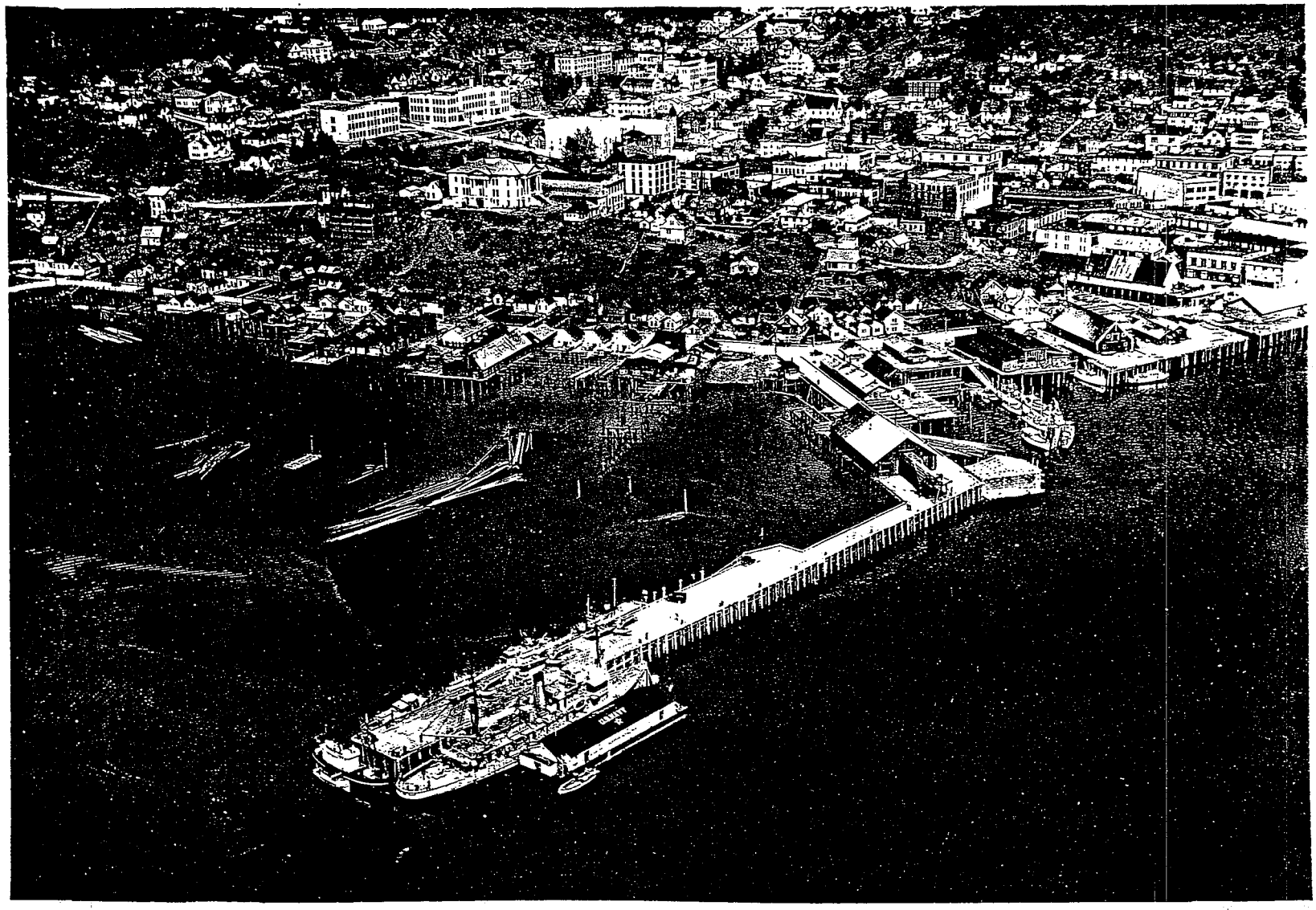
10. The radio installation on board the GANNET was a 250 watt A.C.W. tube transmitter used as the main transmitter and originally made for the Alaskan Aerial Survey Expedition of 1926. It was designed and built by the Radio Material School at the Naval Training Station, San Diego, and consisted of parts taken from various equipment. It was not standard and caused much difficulty in obtaining spare parts. Good results were obtained while the ship was at sea in open spaces but conditions near and around Juneau, Petersburg, and Ketchikan were unfavorable. Very favorable conditions for communication were found while at Skagway.

11. The GANNET being without a towing engine, a new eight inch manila hawser was obtained which was very satisfactory,- though very hard to handle by the limited number of men available. While at Juneau and on the return to Ketchikan, the planes were secured on the dock,- the GANNET'S boom working very well when lowering the planes into the water. The thirty foot motor launch would stand by, lying across the ships stern, to tow the planes clear as they were hoisted out. The bight of a twenty-one thread line, twenty-five fathoms long was put over the cleat on the bow of the plane and both parts were then given to the launch. As the fall was unhooked, the bow of the plane being towards the ship, two sixteen foot crutches well padded and manned by four man, would be placed against the propeller hub and the plane shoved clear of the ship,- the launch going ahead at the same time. The ends of the twenty-one thread line were taken to the stern sampson post and the plane towed well clear of the ship. When clear, one end of the tow line was let go. It would unreave itself from the cleat, eliminating the necess ity of having a man on the bow of the plane to cast off. Over two hundred complete hoists were made without the slightest damage. At times the hoists were made under very trying conditions of wind and tide.

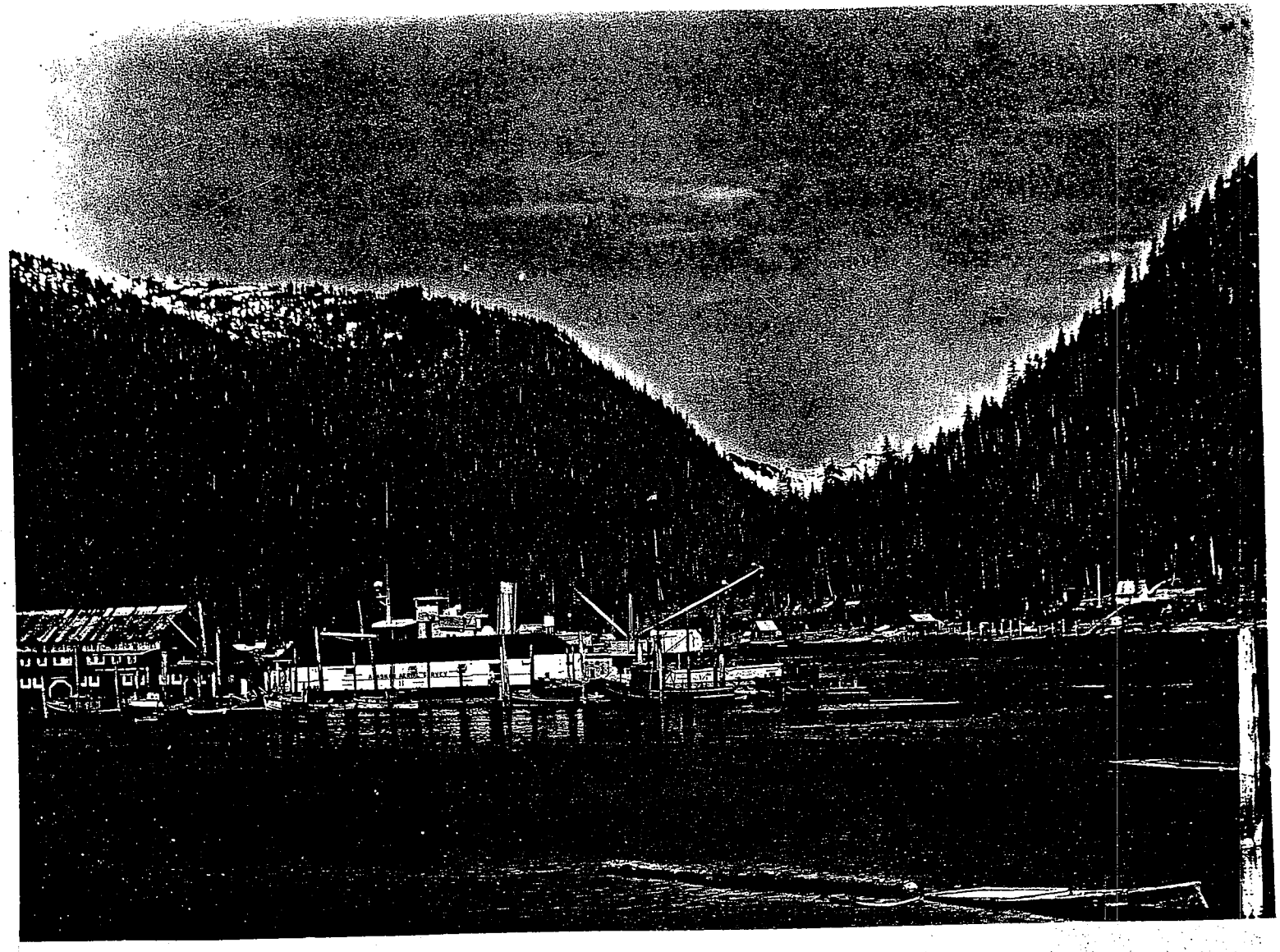
12. While towing the Barge a good long scope was kept on tow in open spaces. The scope was shortened when navigating narrow spaces, and the Barge was taken alongside when entering harbors and while going through Wrangell Narrows. The Barge was fitted with two anchors and one anchor chain of one hundred twenty fathoms. The chain was kept bent while underway. The forward part of the hull of the Barge should be sheathed with about a ten pound plate, to eliminate the danger of putting holes in it by floating logs, which are very numerous in these waters. A sharp

lookout was kept at all times for floating logs. In some cases the logs were so numerous that they could not be dodged. Only by slowing down could they be avoided so as not to damage the Barge. Steaming at night when logs cannot be seen is apt to prove dangerous. The Barge was towed at an average speed of over seven knots most of the way.

13. It is recommended that in future work of this kind, particular attention should be paid to requests for personnel. The radio and navigation personnel complement should be filled. Additional men in the deck force are very essential for handling the towing hawser. Two chief quartermasters should be on board so as not work a hardship on one man taking soundings during thick weather. No additional material is required in excess of ships allowance, except that a good eight inch hawser should be on board for towing.

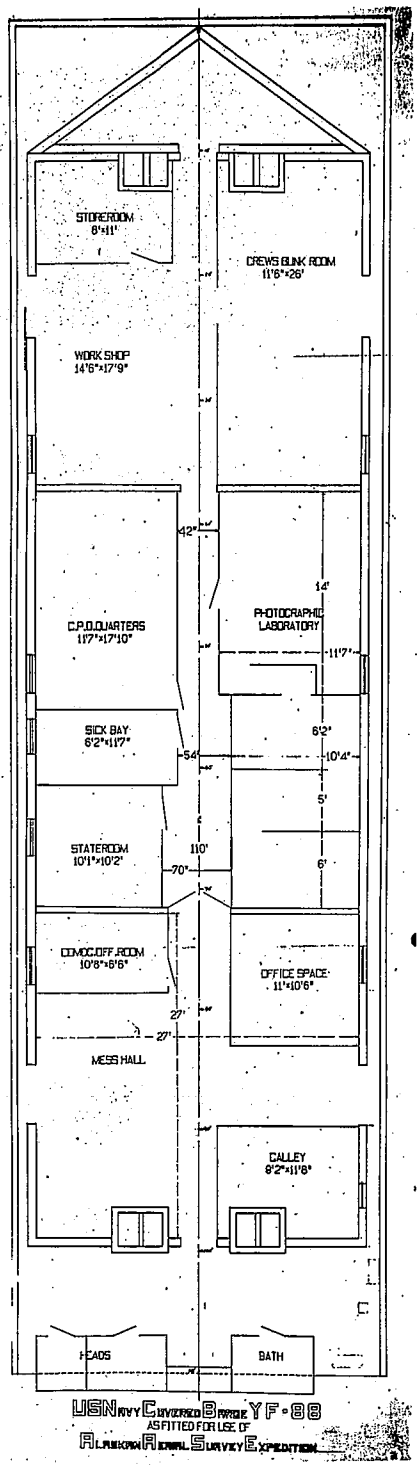


U.S.S.GANNET, Barge and planes 1, 2, and 3 on Government Dock at Juneau, Alaska. The planes were hoisted on and off the dock by the GANNET.

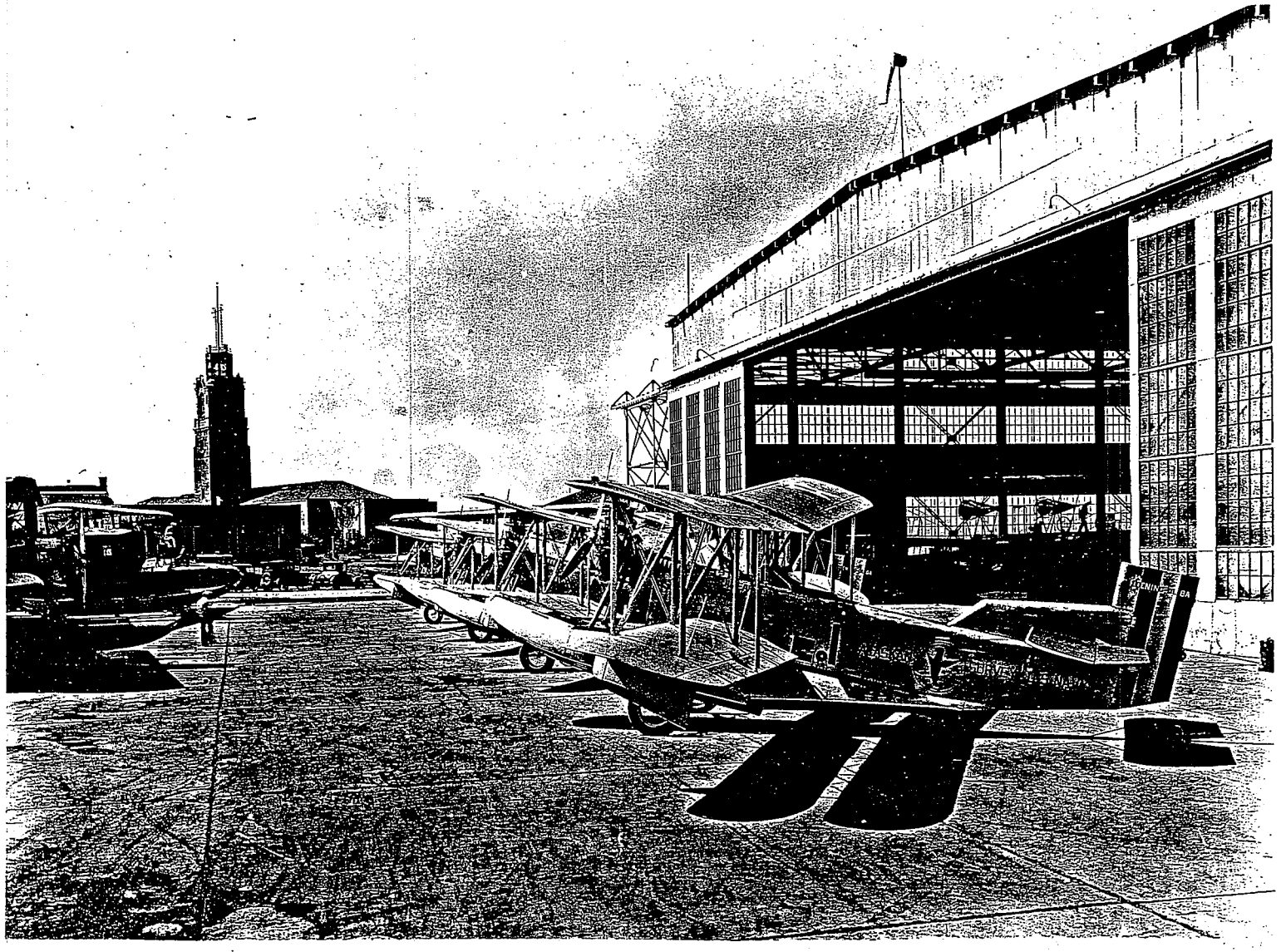


U.S.S.GARNET and Barge at Citizens Wharf, Petersburg, Alaska.
The planes operated from the beach across Wrangell Narrows
shown in right center of photograph.

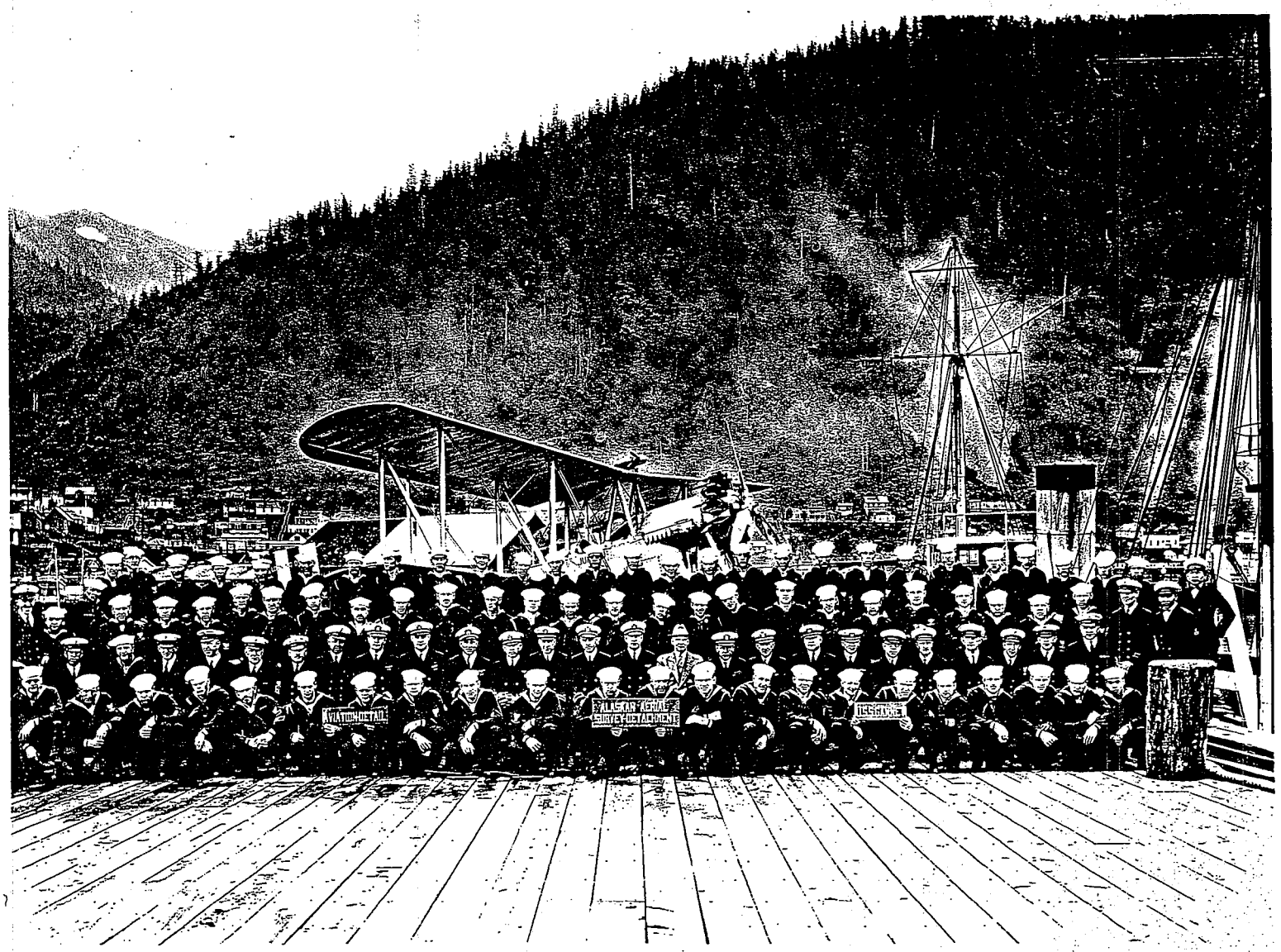
City of Ketchikan, Alaska, the first base of the Alaskan Aerial Survey Detachment. The GANNET, Barge and planes are at the Lighthouse Dock shown in center foreground.



Plan of Barge Yoke Fox 88.



Alaskan Aerial Survey Detachment planes, JUNEAU, KETCHIKAN, PETERSBURG and SITKA on the beach at Naval Air Station, San Diego, California after returning from Alaska.



Officers and Crew of the Alaskan Aerial Survey Detachment at Juneau, Alaska. Mr. R. H. Sargent, Department of Interior is in civilian clothes in center of photograph.

Cameras used by the Alaskan Aerial Survey Detachment.

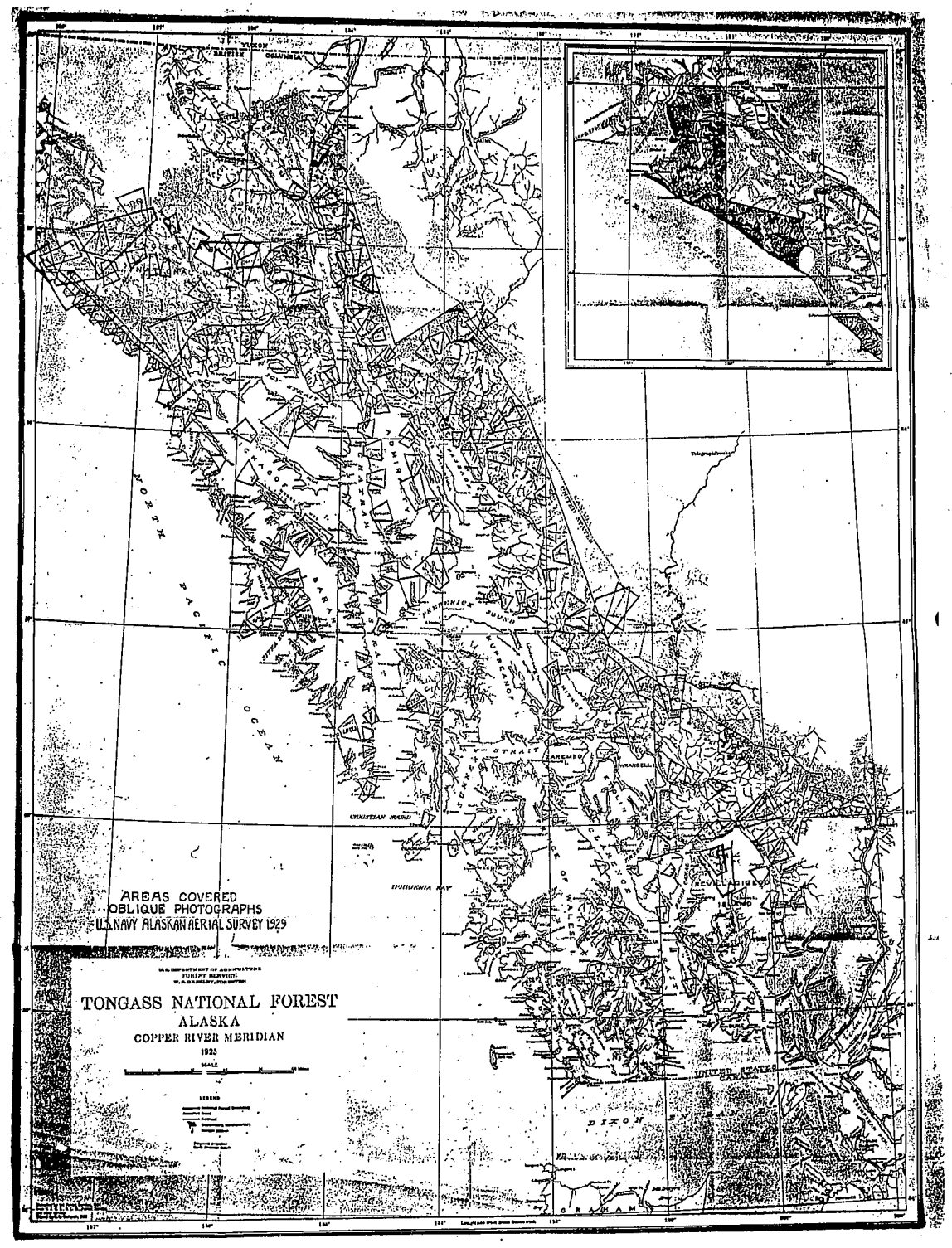


Chart showing approximate location of areas covered by oblique photographs in 1929.

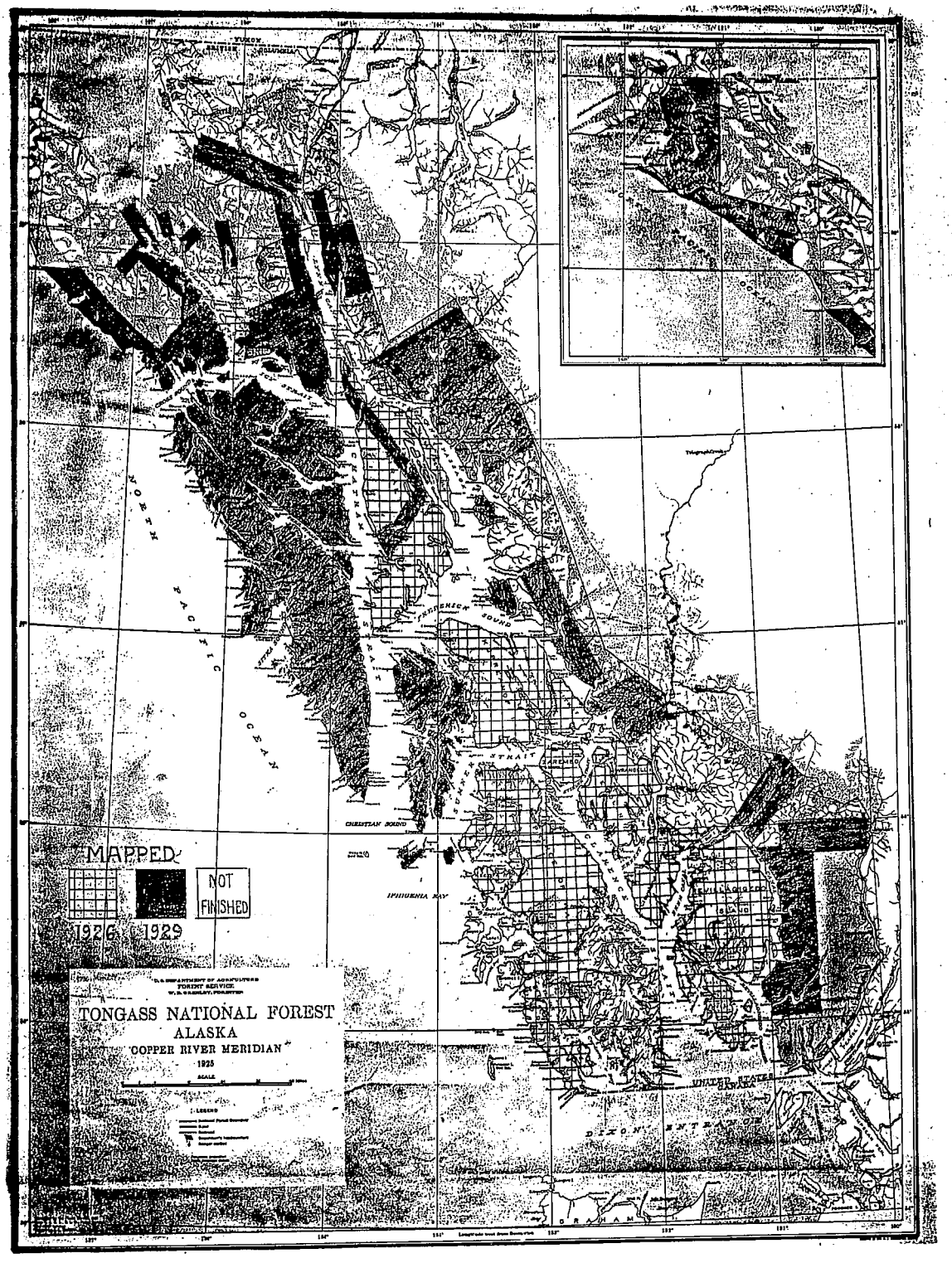


Chart showing areas mapped by 1926 and 1929 surveys and unfinished areas.