

## AIRCRAFT YEAR BOOK

NAME.	RANK.	DUTIES.
Williams, Walter D....	1st Lieut.	..Operating Costs, Buildings and Grounds.
Albro, Ames S.....	2nd Lieut.	..Administrative and Executive; Field Service Personnel.
Beveridge, John.....	2nd Lieut.	..Assistant to Lieut. Page (engines).
*Johnson, Cortlandt S...	2nd Lieut.	..Assistant to Capt. Christine.
Shangraw, Clayton C...	2nd Lieut.	..Assistant to Lieut. Page (radio).

## PROCUREMENT DIVISION

Hall, Chalmers G.....	Colonel	....Chief, Procurement Division.
Reardan, John D.....	Major	....Asst. to Chief, Procurement Division; Chief, Purchase Section; Acting Chief, Production and Inspection Sections.
Broughton, John J.....	Captain	....Asst. to Chief, Production Section.
Callaghan, Wm. J.....	Captain	....Chief, Follow-Up Branch, Purchase Section.
Eding, Gerrard J.....	Captain	....Asst. to Chief, Inspection Section.
Nesbitt, Arthur E.....	Captain	....Chief, Purchase Branch, Purchase Sec.
Gray, George A.....	Captain	....Asst. to Chief, Purchase Branch, Purchase Section.

## REQUIREMENTS DIVISION

*Jones, Byron Q.....	Major	....Asst. to Chief, Supply Group, and Chief, Requirements Division.
Payne, Halbert E.....	Captain	....Chief of Records and Statistics; in charge of compilation of Equipment Manual and General Air Service. Requirements.
*Jones, Aaron E.....	1st Lieut.	..Asst. to Chief, Requirements Division.

## ENGINEERING DIVISION

*Harms, Henry W.....	Major	....Asst. to Chief, Engineering Division; Liaison Officer with McCook Field.
York, John Y.....	1st Lieut.	..Air Service Representative with Ordnance Committee, Ordnance Dept.
Howard, Dudley B....	1st Lieut.	..Assigned to Patents Section, Eng. Div.
*Harmon, Ernest E.....	2nd Lieut.	..Acting Chief, Patents Section.

## FINANCE CONTACT DIVISION

Volandt, Wm. F.....	Captain	....Chief, Finance Contact Division; Recorder, Air Service Section, War Department Claims Board; Contracting Officer in settlement of claims.
Emerson, Wilbur T....	1st Lieut.	..Chief, Finance Contact Section, Finance Contact Division.

## MATERIAL DISPOSAL &amp; SALVAGE DIVISION

Hall, Chalmers G.....	Colonel	....Chief, Mat. Disp. and Salvage Division.
*Graham, Harry.....	1st Col.	....Asst. Chief, Mat. Disp. and Salvage Div.
Grady, Clyde.....	1st Lieut.	..Chief, Control Section.
*Pilot.		

## ADVISORY BOARD

- Fuller, A. L.....Lt. Col.  
 \*Kilner, Walter G.....Major  
 \*Fickel, Jacob E.....Major  
 \*Walsh, Raycroft .....Major  
 \*Dargue, H. A.....Major  
 Reardan, John D.....Major  
 \*Cousins, Ralph P.....Captain  
 \*Simons, J. W., Jr.....Major .....Chief, Administrative Group.  
 Gillmore, W. E..... Lt. Col. ...Chief, Supply Group.  
 \*Feichet, James E.....Lt. Col. ...Chief, T. & O. Group.  
 \*Hickam, H. M.....Major .....Chief, Information Group.

## INFORMATION GROUP

- \*Hickam, H. M.....Major .....Chief, Information Group.  
 Jones, E. L.....Captain ....Chief, Dissemination Division.  
 \*Seaton, D. S.....Captain ....Chief, Special Division.  
 Clayton, A. J.....1st Lieut.  
 \*Healy, J. A.....1st Lieut.  
 \*Andrews, W. V.....1st Lieut.  
 \*Spalding, J. H.....1st Lieut. ..Chief, History Division.  
 \*Mills, C. H.....1st Lieut. ..Library Division.  
 Carey, E. F.....2nd Lieut. ..Property Officer.

## TRAINING AND OPERATIONS GROUP

- \*Lt. Col. James E. Feichet, Chief, Training and Operations Group.  
 \*Major W. C. Sherman, Assistant Chief, Training and Operations Group.

## TRAINING DIVISION

- \*Capt Maxwell Kirby, Chief, Air Service Training.  
 \*Capt. L. N. Keesling, Assistant Chief, Air Service Training.  
 \*1st Lt. R. J. Brown, Chief, Reserve Section.  
 1st Lt. J. E. Lynch, Chief, Schools Section, O. I. C., Educational and Vocational Training.  
 \*1st Lt. C. C. Moseley, O. I. C., Pilot Schools.  
 \*1st Lt. J. C. Kennedy, Chief, Tactical Units Section.  
 \*1st Lt. H. S. Kenyon, Asst. Chief, Tactical Units Section.

## OPERATIONS DIVISION

- \*Capt. H. E. Hartney, Chief of Operations Division (Temporary).  
 \*Capt. Howard T. Douglas, Assistant to Chief.  
 \*1st Lt. James B. Carroll, Chief, 2nd Section.  
 \*1st Lt. St. Clair Street, Chief, 3rd Section.  
 \*2nd Lt. Clarence E. Crumrine, Chief, 4th Section.

## CIVIL AFFAIRS DIVISION

- \*Capt. H. E. Hartney, Chief, Civil Affairs Division.  
 1st Lt. W. D. Wheeler, Assistant Chief.  
 \*2nd Lt. G. W. Goddard, Chief, Photographic Section.  
 \*Pilot.

## BALLOON AND AIRSHIPS DIVISION

- \*Major P. E. Van Nostrand, Acting Chief, Balloon and Airships Division.
- \*Major Frank N. Kennedy, O. I. C., Engineering Section.
- 1st Lt. Robert S. Olmstead, O. I. C., Training Section.
- 1st Lt. Philip Schneeberger, Assistant to O. I. C., Engineering Section.
- 1st Lt. Clifford E. Smythe, O. I. C., Gas Section.
- 2nd Lt. William C. Connolly, Assistant O. I. C., Material Section.

## COMMUNICATIONS DIVISION

- \*Lt. Col. C. C. Culver, Chief, Communications Division.

## MEDICAL DIVISION

- A. E. Truby, Colonel, Chief.
- Benjamin Warriner, Major.
- Edgar T. Hitch, Major.
- William J. Freebourne, Captain.

## ENGINEERING SECTION

## McCOOK FIELD, DAYTON, O.

- |                                  |                                    |
|----------------------------------|------------------------------------|
| *Major Thurman H. Bane.          | *1st Lieut. Harry A. Sutton.       |
| *Major Virginius E. Clark.       | *1st Lieut. John P. Van Zandt.     |
| *Major Howard C. Davidson.       | *1st Lieut. Raymond E. Vaughn.     |
| *Major Alfred H. Hobley.         | *1st Lieut. Lorenzo L. Snow.       |
| *Major Edward L. Hoffman.        | *2nd Lieut. Reuben D. Biggs.       |
| *Major Lawrence W. McIntosh.     | *2nd Lieut. Donald L. Bruner.      |
| *Major Harold S. Martin          | *2nd Lieut. Wallace R. Fletcher.   |
| *Major Carlyle H. Wash.          | *2nd Lieut. Albert C. Foulk.       |
| *Captain Charles C. Benedict.    | *2nd Lieut. Kenneth G. Fraser.     |
| *Captain Arthur W. Brock, Jr.    | *2nd Lieut. Geo. W. Haskins.       |
| *Captain Reuben H. Fleet.        | *2nd Lieut. Albert F. Hegenberger. |
| *Captain Harrison W. Flickinger. | *2nd Lieut. Arthur L. Johnson.     |
| *Captain George E. A. Hallett.   | *2nd Lieut. Bayard Johnson.        |
| Captain John V. Costello.        | *2nd Lieut. Oakley G. Kelly.       |
| *Captain Rudolph W. Schroeder.   | *2nd Lieut. Chas. N. Monteith.     |
| 1st Lieut. Edwin E. Aldrin.      | *2nd Lieut. Chas. L. Morse.        |
| *1st Lieut. Ernest W. Dichman.   | *2nd Lieut. Fred'k W. Niedermeyer. |
| 1st Lieut. Harold R. Harms.      | *2nd Lieut. George W. Polk.        |
| *1st Lieut. John A. Macready.    | *2nd Lieut. Carl W. Pyle.          |
| *1st Lieut. George B. Patterson. | *2nd Lieut. Mark H. Redman.        |
| *1st Lieut. Kellogg Sloan.       | *2nd Lieut. Leigh Wade.            |

## STUDENTS IN ENGINEERING SCHOOL, MC COOK FIELD

- \*Major Frank D. Lackland.
- \*Captain Norman J. Boots.
- \*Captain Clinton W. Howard.
- \*Captain George C. Kenney.
- \*1st Lieut. Carl A. Connell.
- \*1st Lieut. Donald P. Muse.
- 1st Lieut. Frank B. Lyndall.
- \*Pilot.

## ARMY AREA AIR SERVICE OFFICERS

## FIRST ARMY AREA

*First Corps Area*—Includes the North Atlantic Coast Artillery District and the States of Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island; headquarters, 99 Chauncey Street, Boston, Mass.

Air Service Officer, Maj. Leonard H. Drennan.

*Second Corps Area*—Includes the States of New York, New Jersey, and Delaware; headquarters, Governors Island, New York. The island of Porto Rico, with the islands and keys adjacent thereto, is, for administrative purposes, attached to the Second Corps Area.

Air Service Officer, Maj. Henry L. Watson.

*Third Corps Area*—Includes the States of Pennsylvania, Maryland, Virginia, and the District of Columbia; headquarters, Ft. McHenry, Md. (temporarily at Baltimore, Md.).

Air Service Officer, Maj. Albert L. Sneed.

## SECOND ARMY AREA

*Fourth Corps Area*—Includes the States of North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi, Arkansas, and Louisiana; headquarters, Ft. McPherson, Ga. (temporarily at Charleston, S. C.).

Air Service Officer, Maj. Henry B. Clagett.

*Fifth Corps Area*—Includes the States of Ohio, West Virginia, Indiana, and Kentucky; headquarters, Ft. Benjamin Harrison, Indiana.

Air Service Officer, Maj. Ira Longanecker.

*Sixth Corps Area*—Includes the States of Illinois, Michigan, and Wisconsin; headquarters, Ft. Sheridan, Ill. (temporarily at Chicago, Ill.).

Air Service Officer, Maj. William C. McChord.

## THIRD ARMY AREA

*Seventh Corps Area*—Includes the States of Missouri, Kansas, Iowa, Nebraska, Minnesota, North Dakota, and South Dakota; headquarters, Ft. Crook, Neb.

Air Service Officer, Capt. Ira A. Rader.

*Eighth Corps Area*—Includes the States of Texas, Oklahoma, Colorado, New Mexico, and Arizona; headquarters, Ft. Sam Houston, San Antonio, Tex.

Air Service Officer, Maj. Henry C. Pratt.

*Ninth Corps Area*—Includes the North Pacific Coast Artillery District, the South Pacific Coast Artillery District; the States of Washington, Oregon, Idaho, Montana, Wyoming, Utah, Nevada and California; headquarters, Presidio of San Francisco, Cal. (temporarily at San Francisco, Cal.). The territory of Alaska is attached to the Ninth Corps Area for administrative purposes.

Air Service Officer, Capt. Henry H. Arnold.

*The Hawaiian Department*—Includes the Hawaiian Islands and their dependencies; headquarters, Honolulu, Hawaii.

Air Service Officer, Maj. John F. Curry.

*The Philippine Department*—Includes all of the Philippine Archipelago and troops in China; headquarters, Manila, P. I.

*The Panama Canal Department*—Includes the entire Canal Zone; headquarters, Quarry Heights, Balboa Heights, Canal Zone.

Air Service Officer, Capt. Millard F. Harman, Jr.

## NUMBER OF OFFICERS AND MEN

(As of Nov. 12, 1920)

## OFFICERS

Regular Army Officers on Duty with Air Service.....	9	
Regular Army Officers Detailed with Air Service.....	95	
Regular Army Officers Commissioned in Air Service.....	854	
Temporary Officers in the Air Service.....	110	
Temporary Officers in Hospitals.....	18	
Temporary Officers Allotted to other Organizations.....	4	
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Total officers.....	1,090	1,090

Exclusive of officers in hospital or allotted to other organizations (22), there were the following divisions: Military aviators, 5; airplane pilots, 688; balloon observers, 70; airplane observers, etc., 74; non-flyers, 231. According to rank there were the following: Major general, 1; brigadier general, 1; colonel, 2; lieutenant colonel, 13; major, 106; captain, 152; first lieutenant, 307; second lieutenant, 509.

## MEN

Assigned in U. S. and Insular Possessions.....	7,452	
Unassigned in U. S. and Insular Possessions.....	525	
Flying Cadets.....	276	
Overseas.....	90	
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Total enlisted men.....	8,343	8,343
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Grand total strength, A. S.....		9,433

## LOCATION OF AIR SERVICE UNITS

## WINGS

1st (Headquarters), Kelly Field, Tex., 2nd (Headquarters), Langley Field, Hampton, Va.

## GROUPS

- 1st Day Bombardment Group: Headquarters, Kelly Field, Tex. Troops: 11th, 20th, 96th and 166th Day Bombardment Squadrons and 258th Heavy Bombardment Squadron.
- 1st Pursuit Group: Headquarters, Kelly Field, Tex. Troops: 27th, 94th, 95th and 147th Pursuit Squadrons.
- 1st Observation Group: Headquarters, Manila, P. I. Troops: 2nd and 3rd Observation Squadrons.
- 1st Surveillance Group: Headquarters, camp at Fort Bliss, Tex. Troops: 8th, 90th and 104th Surveillance Squadrons.
- 1st Army Observation Group: Headquarters, Langley Field, Hampton, Va. Troops: 1st and 12th Army Observation Squadrons.
- 2nd Observation Group: Headquarters, Honolulu, Hawaii. Troops: 4th and 6th Observation Squadrons.
- 3rd Observation Group: Headquarters, France Field, Canal Zone. Troops: 5th (not yet joined) and 7th Observation Squadron.

## AERO SQUADRONS

- 1st Army Observation, Mitchel Field, Garden City, N. Y.  
 2nd Observation, Fort Mills, P. I.  
 3rd Observation, Camp Stotsenburg, P. I.  
 4th Observation, Luke Field, Fords Island, Hawaii, Flight A, Schofield Barracks, Hawaii.  
 5th Observation, Mitchel Field, Mineola, N. Y.  
 6th Observation, Luke Field, Fords Island, Hawaii.  
 7th Observation, France Field, C. Z.  
 8th Surveillance, McAllen, Tex., Flight B, D. S., Cp. Bragg, N. C.  
 9th Corps Observation, Mather Field, Calif., Flight A, D. S., Fresno, Calif. Flight B, D. S., Red Bluff, Calif.  
 10th Corps Observation, Bolling Field, Anacostia, D. C.  
 11th Day Bombardment, Kelly Field, San Antonio, Tex.  
 12th Army Observation, Nogales, Ariz., Flight A, Douglas, Ariz.  
 20th Day Bombardment, Kelly Field, San Antonio, Tex.  
 27th Pursuit, Kelly Field, San Antonio, Tex.  
 50th Observation, Langley Field, Hampton, Va., Flight A, Fort Screvens, Ga. Flight B, Langley Field, Hampton, Va.  
 88th Observation, Langley Field, Hampton, Va.  
 90th Surveillance, Sanderson, Tex., Flight A, Del Rio, Tex.  
 91st Corps Observation, Rockwell Field, Calif., Flight A, Puryear Field, El Cantro, Calif.  
 94th Pursuit, Kelly Field, San Antonio, Tex.  
 95th Pursuit, Kelly Field, San Antonio, Tex.  
 96th Day Bombardment, Kelly Field, San Antonio, Tex.  
 99th Corps Observation, Bolling Field, Anacostia, D. C.  
 104th Surveillance, Camp at Fort Bliss, Tex., Flight B, Post Field, Fort Sill, Okla.  
 135th Observation, Post Field, Fort Sill, Okla., Flight A, D. S., Fort Leavenworth, Kans.  
 147th Pursuit, Kelly Field, San Antonio, Tex.  
 166th Day Bombardment, Kelly Field, San Antonio, Tex.  
 258th Heavy Bombardment, Aberdeen Proving Ground, Md.  
 614th Construction, Camp Travis, Tex.

## AIR PARK COMPANIES

- 2nd, Kelly Field, San Antonio, Tex.  
 5th, Kelly Field, San Antonio, Tex.

## AIRSHIP COMPANIES

- No. 8, Camp Owen Bierne, Fort Bliss, Tex.  
 No. 10, Langley Field, Hampton, Va.  
 No. 16, Brooks Field, San Antonio, Tex.  
 No. 19, Langley Field, Hampton, Va.

## BALLOON COMPANIES

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|------------------------------------|----------------------------------------|
| No. 1, Ross Field, Arcadia, Calif. | No. 5, Brooks Field, San Antonio, Tex. |
| No. 2, Ross Field, Arcadia, Calif. | No. 6, Brooks Field, San Antonio, Tex. |
| No. 3, Fort Ruber, H. T.           |                                        |
| No. 4, Fort Leavenworth, Kans.     |                                        |

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|-----------------------------------------|----------------------------------------|
| No. 7, Brooks Field, San Antonio, Tex.  | No. 21, Fort Kamehameha, H. T.         |
| No. 9, Fort Omaha, Nebr.                | No. 22, D. S., Princetown, Mass.       |
| No. 11, Brooks Field, San Antonio, Tex. | No. 23, Post Field, Fort Sill, Okla.   |
| No. 12, Fort Omaha, Nebr.               | No. 24, Fort Winfield Scott, Calif.    |
| No. 13, Ross Field, Arcadia, Calif.     | No. 25, Ross Field, Arcadia, Calif.    |
| No. 14, Fort Winfield Scott, Calif.     | No. 26, D. S., Princetown, Mass.       |
| No. 15, Ross Field, Arcadia, Calif.     | No. 27, Manila, P. I.                  |
| No. 17, Manila, P. I.                   | No. 28, Lee Hall, Va.                  |
| No. 18, Aberdeen Proving Ground, Md.    | No. 29, Lee Hall, Va.                  |
| No. 20, Lee Hall, Va.                   | No. 30, Lee Hall, Va.                  |
|                                         | No. 31, Goodman Field, West Point, Ky. |
|                                         | No. 32, Camp Benning, Ga.              |

## PHOTO SECTIONS

- |                                       |                                             |
|---------------------------------------|---------------------------------------------|
| No. 1, Camp at Fort Bliss, Tex.       | No. 11, Honolulu, Hawaii.                   |
| No. 2, Kelly Field, San Antonio, Tex. | No. 12, France Field, Canal Zone.           |
| No. 4, D. S., Camp Knox, Ky.          | No. 14, Mitchel Field, L. I.                |
| No. 6, Manila, P. I.                  | No. 15, Crissy Field, San Francisco, Calif. |
| No. 7, Langley Field, Hampton, Va     |                                             |

## ARMY SERVICE CORPS

- Provisional Guard Company No. 3, Germany, A. P. O. 927.  
 Provisional Guard Company No. 9, Germany, A. P. O. 927.  
 Provisional Guard Company No. 12, Germany, A. P. O. 927.  
 Provisional Guard Company No. 13, Germany, A. P. O. 927.

## AIR ASSISTANTS ASSIGNED BY U. S. AIR SERVICE FOR DUTY ABROAD

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|-----------------------------------------------------------------|------------------------------------------------------------------------|
| *Major Melvin H. Hall,<br>American Embassy,<br>London, England. | *Lt. Col. James E. Chaney,<br>American Embassy,<br>Rome, Italy.        |
| *Major J. H. Brereton,<br>American Embassy,<br>Paris, France.   | *Major Benjamin D. Foulois,<br>No. 7 Wilhelmplatz,<br>Berlin, Germany. |
|                                                                 | Lt. Col. Edward Davis,<br>American Embassy,<br>The Hague, Netherlands. |
- \*Pilot.

## AIRCRAFT

## CLASSIFIED LIST OF AIR SERVICE FIELDS, STATIONS, DEPOTS, ETC.

## CLASS I—ACTIVE STATIONS

## FLYING FIELDS

NAME.	P. O. ADDRESS.	SPECIAL FUNCTION.
Carlstrom Field.....	Arcadia, Fla. ....	Pilot School.
Kelly Field.....	San Antonio, Tex. ....	Border Operations and Training.

NAME.	P. O. ADDRESS.	SPECIAL FUNCTION.
Langley Field .....	Hampton, Va. ....	Flying Field.
March Field .....	Riverside, Calif. ....	Pilot School.
Mather Field .....	Sacramento, Calif. ....	Operations,
Mitchel Field .....	Garden City, L. I., N. Y. ....	Operations,
Post Field .....	Ft. Sill, Okla. ....	Obs. School.

## EXPERIMENTAL FIELD

McCook Field .....	Dayton, Ohio .....	Aeronautical Engineering
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## BALLOON SCHOOLS

Army Balloon School.....	Ft. Omaha, Nebr. ....	Balloon Training.
Army Balloon School.....	Lee Hall, Va. ....	Balloon Training.
Brooks Field .....	San Antonio, Tex. ....	Dirigible Training.
Ross Field .....	Arcadia, Calif. ....	Balloon Training.

## AVIATION GENERAL SUPPLY DEPOTS

Avia. Gen. Supply Depot	Americus, Ga. ....	Gen. Supply Depot.
and Souther Field.		
Avia. Gen. Supply Depot	Fairfield, Ohio .....	Gen. Supply Depot.
and Wilbur Wright Field		
Avia. Gen. Supply Depot...	Houston, Tex. ....	Gen. Supply Depot.
Avia. Gen. Supply Depot...	Little Rock, Ark. ....	Gen. Supply Depot.
Avia. Gen. Supply Depot...	Middletown, Pa. ....	Gen. Supply Depot.
Avia. Gen. Supply Depot...	Richmond, Va. ....	Gen. Supply Depot.
Avia. Gen. Supply Depot...	San Antonio, Tex. ....	Gen. Supply Depot.
Avia. Gen. Supply Depot...	Washington, D. C. ....	Gen. Supply Depot.
Avia. Gen. Supply Depot...	Morrison, Va. ....	Gen. Supply Depot.

## AVIATION SUPPLY &amp; REPAIR DEPOT

Avia. Supply and Repair	Rockwell Field, Coro-	Sup. & Repr. Depot.
Depot.	nado, Cal.	

## WAREHOUSE, MATERIALS DISPOSAL &amp; SALVAGE DIVISION

Storage Warehouse.....	Detroit, Mich. ....	Storage Warehouse.
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## TEMPORARY STORAGE DEPOTS

*Barron Field.....	Everman, Tex. ....	Temporary Storage.
Chanute Field.....	Rantoul, Ill. ....	Temporary Storage.
Dorr Field .....	Arcadia, Fla. ....	Temporary Storage.
Ellington Field .....	Houston, Tex. ....	Temporary Storage.
*Gerstner Field .....	Lake Charles, La. ....	Temporary Storage.
*Chapman Field .....	Miami, Fla. ....	Temporary Storage.
Love Field .....	Dallas, Tex. ....	Temporary Storage.
Park Field .....	Millington, Tenn. ....	Temporary Storage.
*Rich Field .....	Waco, Tex. ....	Temporary Storage.
Scott Field .....	Belleville, Ill. ....	Temporary Storage.
*Taliaferro Field .....	Hicks, Tex. ....	Temporary Storage.
Selfridge .....	Mt. Clemens, Mich. ...	Temporary Storage.

\*Under process of abandonment. Still under jurisdiction of C. A. S.



## AIRCRAFT YEAR BOOK

## REPAIR DEPOTS

NAME.	P. O. ADDRESS.	SPECIAL FUNCTION.
Avia. Repair Depot.....	Dallas, Tex. ....	Repair Depot.
Avia. Repair Depot.....	Montgomery, Ala. ....	Repair Depot.
*Avia. Repair Depot.....	Speedway, Indianapo- lis, Ind.	Repair Depot.

## ARTILLERY FIRING CENTERS

Godman Field .....	Camp Knox, Stithton, F. A. Firing Center. Ky.
Pope Field .....	Camp Bragg, Fayette- ville, N. C. F. A. Firing Center.

## AIR SERVICE MECHANICS SCHOOL

Kelly Field .....	San Antonio, Tex. ....Mechanics School.
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## PHOTOGRAPHIC SCHOOL

Langley Field .....	Hampton, Va. ....Photographic School.
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## AERIAL COAST DEFENSE

France Field .....	Panama Canal Zone....Aerial Coast Defense.
Luke Field .....	Pearl Harbor, H. I....Aerial Coast Defense.
Philippine Dept. ....	Manila, P. I. ....Aerial Coast Defense.
Langley Field .....	Hampton, Va. ....Aerial Coast Defense.
New Dorp. ....	Staten Island, N. Y. ....Aerial Coast Defense.

## ORDNANCE PROVING GROUND

Aberdeen Proving Ground..	Aberdeen, Md. ....Ord. Proving Ground.
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## CORPS AREA AND DEPARTMENT AIR SERVICE OFFICERS

First Corps Area.....	99 Chauncey St., Bos- ton, Mass.	C. A. A. S. Office.
Second Corps Area.....	Ft. Schuyler, N. Y. ....	C. A. A. S. Office.
Third Corps Area.....	Baltimore, Md. (Temp.)..	C. A. A. S. Office.
Fourth Corps Area.....	206 Riggs Bldg., Charles- ton, S. C. (Temp.)	C. A. A. S. Office.
Fifth Corps Area.....	Ft. Benjamin Harrison, Indiana.	C. A. A. S. Office.
Sixth Corps Area.....	230 E. Ohio St., Chicago, Ill. (Temp.)	C. A. A. S. Office.
Seventh Corps Area.....	Ft. Crook, Nebr. ....	C. A. A. S. Office.
Eighth Corps Area.....	Ft. Sam Houston, Tex..	C. A. A. S. Office.
Ninth Corps Area.....	Sante Fe Bldg., San Francisco, Cal. (Temp.)	C. A. A. S. Office.
Hawaiian Dept. ....	Honolulu, H. I. ....	D. A. S. Office.
Panama Canal Dept. ....	Canal Zone .....	D. A. S. Office.
Philippine Dept. ....	Manila, P. I. ....	D. A. S. Office.

## DISTRICT OFFICES

Buffalo, N. Y. ....	2050 Elmwood Ave. ....District Office.
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Name	P. O. Address	Special Function
Boston, Mass. ....	99 Chauncey St. ....	District Office.
Chicago, Ill. ....	230 E. Ohio St. ....	District Office.
Portland, Oregon .....	Yeon Bldg. ....	District Office.
New York, N. Y. ....	Starr & Borden Aves., L. I. City, N. Y.	District Office.
San Francisco, Calif. ....	Sante Fe Bldg. ....	District Office.

## PLANTS

U. S. Fabric Inspec. Depot..	Saylesville, R. I. ....	Fabric Inspec.
U. S. Aeron, Engine Plant..	Long Island City, N. Y., Starr & Borden Aves.	Aeronautical Eng.
Goodyear Tire & Rub. Co.	Akron, Ohio .....	Balloons.

## U. S. BORDER PATROL AIRDROMES

McAllen Airdrome .....	McAllen, Tex. ....	Border Patrol.
Laredo Airdrome .....	Laredo, Tex. ....	Border Patrol.
Marfa Airdrome .....	Marfa, Tex. ....	Border Patrol.
Del Rio Airdrome.....	Del Rio, Tex. ....	Border Patrol.
El Paso Airdrome .....	El Paso, Tex. ....	Border Patrol.
Douglas Airdrome .....	Douglas, Tex. ....	Border Patrol.
Sanderson Airdrome .....	Sanderson, Tex. ....	Border Patrol.
Calexico Airdrome .....	Calexico, Calif. ....	Border Patrol.

## CLASS II — INACTIVE STATIONS

## FLYING FIELDS

Bolling Field .....	Anacostia, D. C. ....	FLYING FIELD.
Rockwell Field .....	Coronado, Calif. ....	FLYING FIELD.

## AIRCRAFT YEAR BOOK

## NAVAL AVIATION

OFFICERS ASSIGNED TO NAVAL AVIATION ON DUTY IN  
NAVY DEPARTMENT

## OFFICE OF NAVAL OPERATIONS

Capt. T. T. Craven, U. S. N.  
 Commander W. J. Giles, U. S. N.  
 \*Commander Kenneth Whiting, U. S. N.  
 Commander R. M. Griswold, U. S. N.  
 \*Lt. Comm. P. N. L. Bellinger, U. S. N.  
 \*Lt. Comm. R. E. Byrd, U. S. N.  
 \*Lt. Comm. Zachary Lansdowne, U. S. N.  
 \*Lt. Comm. J. P. Norfleet, U. S. N.  
 Lt. Comm. C. Y. Johnson, U. S. N.  
 \*Lt. Comm. N. B. Chase, U. S. N.  
 \*Lt. Comm. Wadleigh Capehart, U. S. N.  
 Lt. (J. G.) James J. McAtee, U. S. N. R. F.  
 Lt. Ernest J. Fuller, U. S. N. R. F.  
 Lt. (J. G.) Chase E. Mathews, U. S. N. R. F.

## BUREAU OF NAVIGATION

Lt. Comm. R. M. Griffin, U. S. N.  
 \*Lt. W. L. Richardson, U. S. N. R. F.  
 Lt. (J. G.) C. N. Keyser, U. S. N. R. F.

## BUREAU OF ENGINEERING

Lt. Comm. S. M. Kraus, U. S. N.  
 \*Lt. Comm. B. G. Leighton, U. S. N.  
 Lt. Chas. F. Goob, U. S. N. R. F.  
 \*Lt. H. W. Roughley, U. S. N. R. F.  
 Lt. Howard W. Kitchen, U. S. N.  
 \*Lt. (J. G.) E. B. Koger, U. S. N. R. F.  
 \*Lt. (J. G.) M. E. Williams, U. S. N. R. F.  
 Lt. (J. G.) M. Z. Bishop, U. S. N. R. F.  
 Lt. (J. G.) Joseph C. Jennings, U. S. N. R. F.  
 \*Ens. Wm. Miller, U. S. N.

## BUREAU OF CONSTRUCTION AND REPAIR

Commander J. C. Hunsaker, U. S. N.  
 Lt. Comm. Garland Fulton, U. S. N.  
 Lt. Carl B. Harper, U. S. N. R. F.  
 \*Lt. Edw. W. Rounds, U. S. N. R. F.  
 \*Lt. (J. G.) Chas. E. Baugh, U. S. N. R. F.  
 Lt. (J. G.) W. G. Brown, U. S. N. R. F.  
 Lt. (J. G.) Chas. H. Chatfield, U. S. N. R. F.  
 Lt. (J. G.) W. S. Diehl, U. S. N. R. F.

\*Pilot.

Lt. (J. G.) Raymond D. MacCart, U. S. N. R. F.  
 Lt. (J. G.) Chas J. McCarthy, U. S. N. R. F.  
 Lt. (J. G.) Chris. A. Rodegerdts, U. S. N. R. F.  
 \*Lt. (J. G.) Walter C. Wilson, U. S. N. R. F.

## BUREAU OF ORDNANCE

Lt. Comm. J. W. Rankin, U. S. N.

## BUREAU OF SUPPLIES AND ACCOUNTS

Lt. Comm. Emory D. Stanley, U. S. N.

## YARDS AND DOCKS

Lt. K. B. Bragg, U. S. N.

LIST OF OFFICERS AT NAVAL AIRCRAFT FACTORY,  
LEAGUE ISLAND, PHILA.

Comm. G. C. Westervelt, U. S. N.  
 \*Comm. H. C. Richardson, U. S. N.  
 \*Comm. R. D. Weyerbacher, U. S. N.  
 Lt. S. S. Pierce, U. S. N. R. F.  
 Lt. W. McFellers, U. S. N. R. F.  
 \*Lt. R. W. Fleming, U. S. N.  
 Lt. R. S. Barnaby, U. S. N. R. F.  
 Lt. (J. G.) W. B. Dunlap, U. S. N. R. F.  
 Lt. (J. G.) R. Emerson, U. S. N. R. F.  
 Lt. (J. G.) V. N. McKenna, U. S. N. R. F.  
 Ens. W. A. Sprout, U. S. N. (T).

COMMANDER AIR FORCE, ATLANTIC FLEET  
Capt. A. W. Johnson, U. S. N.COMMANDER AIR FORCE, PACIFIC FLEET  
\*Capt. H. C. Mustin, U. S. N.

\*Pilot.

GRADUATES OF NAVAL ACADEMY WHO ARE ALSO NAVAL  
AVIATORS AS OF NOV. 1st, 1920.

## CAPTAINS.

H. C. Mustin.  
 G. W. Steele.  
 COMMANDERS.  
 W. G. Childs.  
 Kenneth Whiting.  
 R. W. Cabannis.  
 A. C. Read.  
 L. H. Maxfield.  
 H. C. Richardson.  
 R. D. Weyerbacher.  
 J. H. Towers.

## LIEUTENANT

COMMANDERS.  
 A. H. Douglas.  
 Geo. D. Murray.  
 Harold B. Grow.  
 Wm. Masek.  
 C. P. Mason.  
 M. A. Mitecher.  
 V. C. Griffin.  
 L. L. Babbitt.  
 H. T. Bartlett.  
 G. D. Chevalier.

B. G. Leighton.	H. W. Hoyt.
H. B. Cecil.	R. G. Pennoyer.
E. W. Coil.	R. W. Fleming.
D. W. C. Ramsey.	John F. Maloney.
R. E. P. Elmer.	John D. Price.
V. D. Herbster.	Calvin T. Durgin.
Newton H. White, Jr.	A. J. Selman.
R. D. Kirkpatrick.	R. M. Farrar.
J. C. Montfort.	J. J. Ballentine.
R. R. Paunack.	F. B. Connell.
E. W. Spencer.	E. L. Erickson.
Paul Cassard.	J. S. Farnsworth.
P. N. L. Bellinger.	J. G. Farrell.
R. E. Byrd.	F. C. Fechteler.
Wadleigh Capehart.	V. F. Grant.
N. B. Chase.	W. S. Factor.
Zachary Lansdowne.	J. B. Kneip.
J. P. Norfleet.	A. C. McFall.
LIEUTENANTS.	K. McGinnis.
Homan J. Miller.	A. W. Radford.
Harry V. Baugh.	Hugo Schmidt.
F. W. Wead.	J. H. Strong.
R. E. Davison.	C. W. Wieber.
C. J. McReavy.	G. B. Woolley.
W. D. Thomas.	H. E. Halland.
Homer Clark.	C. H. Havill.
F. B. Stump.	

LIST OF NAVAL AIR STATIONS AND FIELDS WHERE EXPERIMENTAL WORK OR TRAINING IS CARRIED ON.

Rockaway, L. I.	Coco Solo, C. Z.
Anacostia, D. C.	Pearl Harbor, T. H.
Hampton Roads, Va.	Lakehurst, N. J.
Pensacola, Fla.	Cape May, N. J.
San Diego, Calif.	Dahlgren, Va.
Carlstrom Field, Arcadia, Fla. (Courtesy U. S. Air Service).	
Great Lakes, Machinists School.	
Naval Training Station, Great Lakes.	
March Field, Riverside, Cal. (Courtesy U. S. Air Service).	
Mineola, Mitchel Field, L. I. (Courtesy U. S. Air Service).	

NUMBER OF OFFICERS AND MEN

The total personnel, officers and enlisted men, assigned to Naval Aviation, as of December 15, 1920, was 7,883. Of this number 624 were officers, classified as follows: 376 qualified aviators, heavier-than-air and lighter-than-air; 39 student aviators; 114 ground officers; 95 staff officers. Of the 376 qualified aviators, 244 are in the Naval Reserve, 60 hold temporary commissions and 72 are regular officers in the U. S. Navy. Forty more graduates of the Naval Academy began aviation instruction December 1, 1920. Including reserves and temporary commissioned officers, 52 aviators were attached to the Atlantic Fleet and 50 to the Pacific Fleet, as of November 1, 1920. Of the enlisted personnel, 4627 had aviation ratings and 2632 general ratings, as of November 1, 1920.

## NAVAL OFFICERS PERFORMING AVIATION DUTIES ABROAD.

\*Lieut. R. G. Pennoyer, London.

\*Lieut. F. P. Culbert, Berlin.

\*Pilot.

DATA ON UNITED STATES DIRIGIBLE Z.R.-2 (FORMERLY THE R-38)  
AND PLANS FOR FLIGHT TO UNITED STATES IN 1921

Successful operation of lighter-than-air craft over both land and water during the war, and proof of its usefulness in national defense, impelled Naval Aviation to recommend an airship building program. To save time and gain experience, the R-38, one of two dirigibles under construction at the Royal Airship Works, Bedford, England, was purchased from the British Government. It was renamed the Z.R.-2, another, an American airship under construction in the United States, having been named the Z.R.-1.

The compilers of this volume are indebted to Naval Aviation for release of certain data concerning the Z.R.-2 and an account of typical airship operations, which probably has anticipated the methods of operating the giant dirigible which the Navy Department hoped to fly to the United States soon after its completion in February, 1921.

A detachment of 72 U. S. Naval Aviation officers and men were in training for this purpose at the Royal Air Station, Howden, England, for many months in 1920. The party, headed by Commander L. H. Maxfield, had navigated the R.-32, a British dirigible similar to the R.-34, and also received technical instruction at the Royal Airship Works at Cardington, Bedford; and at the Sunbeam Motor Works, Wolverhampton, where the power plants for the Z.R.-2 were assembled.

In 1919, the airship R.-34 made an epochal round-trip flight across the Atlantic. Huge as that craft appeared, it is almost one-third smaller than the Z.R.-2 and has only half the cruising range. This would seem to indicate the possibility of the Z.R.-2 not only flying the Atlantic in 1921, but actually continuing on, possibly without pause, until it reaches the Pacific Ocean.

The Z.R.-2 is approximately 700 feet long and more than 85 feet in diameter. It has a gas capacity of 2,720,000 cubic feet, as against 2,000,000 cubic feet for the R.-34. The disposable lift of the Z.R.-2 is about 45 tons, while that of the R.-34 is only about 25 tons. The economic cruising speed of the Z.R.-2 is around 60 miles an hour. There are six engine cars.

Airship terminals at Lakehurst, N. J., and Cape May, N. J., were being completed late in 1920. It is expected to establish a

terminal on the Pacific Coast. The hangar at Lakehurst is the largest in the world and was designed to house the Z.R.-2 and permit the assembling of the Z.R.-1.

In daily routine aboard the big airships, the first thing done is to take "lift and trim." This means calculating the total lift of the airship by adding up the amount of ballast — i.e., water, gasoline, oil, etc., on board, and noting its location on a chart. In this way a record of the airship's daily lift and variation from day to day is noted. Thus, if to-day's lift is appreciably less than it was yesterday, and no gas has been valved, there is obviously a loss somewhere, and a search for leaks in the gas bags is made. By noting the location of ballast on board, the "trim" — i.e., the tendency for lightness or heaviness in one end of the ship or the other — can be seen and compensated for if necessary, it being desirable to keep weights distributed as evenly as possible along the length of the ship to avoid stresses on the hull structure.

After "lift and trim" is taken, the airship is thoroughly cleaned. Engineers then do any necessary work on the engines and cars, riggers inspect controls, gas bags, valves, the outer cover, fin surface, etc., and do the necessary upkeep work, and, where there is a wooden hull, carpenters inspect and repair the framework.

Once a week the purity of each gas bag in the ship is tested, this serving as a check on the general condition of gas tightness of each bag and the ship as a whole. As the purity of the gas directly affects the lift of the ship no pains are spared to keep the gas bags always in the best possible condition.

In preparing ship for flight it is first necessary to know how large a crew is going to be carried and the length and nature of the flight, as knowing this it is then possible to figure out just how much gas is needed to give the necessary additional lift, how much ballast and fuel must be carried. The officer in charge of the operation having figured out just what is necessary, informs the Chief Engineer and gas plant how much gas will be needed. Members of the crew take their respective stations. Gas is taken into the ship through a central gassing hose about twelve inches in diameter with leads off to each gas bag, and comes in directly from the holders through large gas mains sunk in the hangar floor. Four riggers are detailed to put water ballast aboard as it is needed when the lift increases from incoming gas.

When the ship is gassed, fuelled and ballasted, a very careful "lift and trim" is taken and charts made out showing the amounts and location of all fuel and ballast. These charts are posted in the control car and are referred to by the operating officers during

flight. Engineers finally check and run all engines and the ship is ready for flight. When the ship is ready to go out, the flying crew gets on board, sufficient ballast being discharged to compensate for the weight of the crew taken on board. As soon as the ship is clear of the hangar the ship's nose is turned into the wind, in which position it is guided to the desired point for taking off.

The ship in flight is operated as far as possible along the lines of seagoing operation and orders are given and watches stood and relieved similarly. In the present ships where the radio cabin is in the control car there is also a radio operator always on watch. In the power cars there is one engineer always on watch. Orders from the control car to power units are transmitted by engine telegraph similar to ship engine telegraphs but especially designed for airships.

Meals are served at regular times. There are two cooks attached to two of the power units and hot coffee or chocolate and a certain amount of hot food can be served. One of the crew is assigned as cook, and he prepares and serves the meals. In landing, which is done at a set time as received by radio from the Station or Base, the crew are piped to landing stations where they remain with as little movement as possible while the ship is put in trim and its buoyancy checked and regulated. The station is radioed for the ground wind, its direction, the temperature, and barometric pressure which, when received, enable the Captain to make the necessary landing calculations.

The following is the personnel of the Z.R.-2:

## OFFICERS

*L. H. MAXFIELD, Comdr., USN.— Commanding Officer	*M. H. ESTERLEY, Lieut., USNRF.
V. N. BIEG, Lieut. Comdr., USN.	W. R. TAYLOR, Lieut. (MC), USN.
*E. W. COIL, Lieut. Comdr., USN.	J. H. KYGER, Lieut. (SC), USN.
*H. W. HOYT, Lieut., USN.	*J. H. HYKES, Ensign, USN.
*R. W. PENNOYER, Lieut., USN.	*W. J. MEDUSKY, Ensign, USN.
*C. G. LITTLE, Lieut., USNRF.	*S. S. HALLIBURTON, Ch. Mach., USN.
*T. B. NULL, Lieut., USNRF.	H. T. DYER, Comdr., USN. (special representative Bureaus of Engi- neering and Construction and Re- pair).
*J. B. LAWRENCE, Lieut., USNRF.	
*A. R. HOUGHTON, Lieut., USNRF.	
*Pilot.	

## ENLISTED MEN

ALLER, C. I.	CBM	CASS, C. W.	CMM (A)
BROOM, C. H.	CMM (A)	COLLINS, G. F.	CR (R)
BURNETT, J. C.	CY	COONS, R. M.	CMM (A)
CARLSON, A. E.	CQM (D)	CROWL, L. E.	CMM (A)
CHRISTENSEN, H.	CQM (D)	CULLINAN, J. W.	CMM (A)
COLLIER, J. H.	CCM (A)	CUTLER, F. H.	Y-3
COLEMEN, L. K.	CMM (A)	DEEM, C. M.	MM-1 (A)



DICKERSON, T. D.	CMM (A)	McCARTHY, J. F.	QMI (D)
DOWNNS, E. S.	CPM	McCAULEY, C. J.	MMI (A)
FRANK, C. W.	QM-1 (D)	MOORMANN, F. F.	CMM (A)
GALATIAN, A. B.	CMM (A)	O'CLAIRE, H. H.	CBM
HANCOCK, J. T.	CMM (A)	PECKHAM, F. L.	CQM (D)
HARRIGAN, J. J.	CQM (D)	PETTIT, A.	CBM
HECKBERT, C. A.	BM-1	RUSSELL, W. A.	CMM (A)
HEGEL, M. C.	Y-3	SHIELDS, S.	CCM (A)
JONES, R.	MM-1	STEELE, W. J.	CMM (A)
JULIUS, W.	CMM (A)	STEVENS, L. T.	CMM (A)
KNIGHT, S. H.	QM-1	THOAMS, T. L.	CQM (D)
LAY, M.	CBM	WALKER, N. C.	QM-3 (D)
LAMKEY, W. A.	CMM (A)	WATERMAN, J. E.	E-1 (R)
LEONARD, J. J.	CQM (D)	WELCH, G.	CMM (A)
LEWIS, E. C.	CQM (D)	RILEY, E. M.	CY
LOFTIN, A. L.	MMI (A)		

#### SUMMARY OF WORK AT NAVAL AIRCRAFT FACTORY

The annual report of the Chief of the Bureau of Construction and Repair, for the fiscal year 1920, states with regard to the Naval Aircraft Factory:

"Experimental and research work along various lines has continued at a somewhat limited pace during the year, due to curtailment of appropriations and consequent reduction in personnel."

During the year, four more flying boats of the N.C. type, which crossed the Atlantic, were built, and two more are under construction. The Bureau also undertook the development of a design for a seaplane larger than any in existence, a 60,000 pound flying boat. The design embodies several new features, including metal wing structures and a unique power plant of nine Liberty engines in three groups, each group being geared to a single propeller.

During the year work progressed on the construction of a 1,940,000 cubic foot rigid airship similar to the German L.-49 class.

A series of F.-5 boats drawn from store has been altered in an effort to determine possible improvements as follows: one boat fitted with folding wings, one with tandem Liberty engines, one with streamline wire, one with new type of bottom, one with fireproof wings, and one with a well for a mapping camera.

#### AERONAUTICAL ACTIVITIES, BUREAU OF ENGINEERING

In an endeavor to provide a suitable power plant for aircraft of apparently ever-increasing size, the bureau has taken up the question of multi-engined power plants driving a single propeller with a view to using either a single unit of this type in large aircraft, or a number of such units. During the year, such units were under development and construction, the types developed including those suitable for installation in both seaplanes and airplanes and types for installation in rigid or non-rigid airships.

Aviation may very shortly expect to have available air-cooled engines of domestic manufacture equal in performance to the better types of water-cooled engines now in use.

There have been interesting developments in composition, metal and variable pitch propellers.

The development in radio has been mainly along the following lines: lightening of apparatus, improvement in receiving facilities, elimination of confusing noises, improvement of inter-communication.

## MARINE CORPS

### MARINE CORPS OFFICERS ON ACTIVE DUTY AS QUALIFIED NAVAL AVIATORS

#### MAJORS.

Alfred A. Cunningham.  
Thomas C. Turner.  
Francis T. Evans.  
Roy S. Geiger.

#### CAPTAINS.

Robert J. Archibald.  
David L. S. Brewster.  
Benjamin Goodman.  
Walter E. McCaughtry.  
George W. Martin.  
Harvey B. Mims.  
John A. Minnis.  
Arthur H. Page, Jr.  
Russell A. Presley.

#### FIRST LIEUTENANTS.

Basil G. Bradley.  
Kenneth B. Collins.  
Frank H. Fleer.  
Harold C. Major.  
Francis P. Mulcahy.  
Stanley H. Ridderholk.  
Ford O. Rogers.

Thomas R. Shearer.

#### SECOND LIEUTENANTS.

Amos P. Booty.  
Hayne D. Boyden.  
Walter V. Brown.  
Arthur L. Caperton.  
Franklin G. Cowie.  
Guy B. Hall.  
Donald E. Keyhoe.  
Goodyear W. Kirkman.  
Duncan W. Lewis.  
Edw. G. MacFayden.  
George L. Murray.  
Herman J. Norton.  
Horace D. Palmer.  
Jacob F. Plachta.  
Eugene Rovegno.  
Lawson H. Sanderson.  
Christian F. Shilt.  
Russell L. Stephens.  
Leo Sullivan.  
Harold H. Titus.  
Sherman H. Zea.

### AVIATION STATIONS OF MARINE CORPS

Marine Flying Field,  
Marine Barracks,  
Quantico, Va.  
Marine Flying Field,  
Marine Barracks,  
Parris Island, S. C.  
Squadron "D,"

Marine Aviation Force,  
Santo Domingo City, D. R.  
Squadron "E,"  
Marine Aviation Force,  
Port au Prince,  
Republic of Haiti.

A flying field similar to the one at Quantico is being established at San Diego, California.

Enlisted personnel for Aviation are trained at Aviation Mechanics School, Great Lakes, Ill.

On account of the flying field at Quantico not being completed some officers have been sent in the past to the U. S. Air Service Field at Arcadia, Fla., for advanced training.

### OFFICERS AND ENLISTED MEN IN MARINE CORPS

As of November 1, 1920, there were 1,034 officers and men in Marine Corps Aviation, of which 58 were officers, 4 warrant officers and 972 enlisted men. There are 285 Marine officers qualified as naval aviators.

## AERONAUTICAL BOARD

The object of this Board is to prevent duplication, and to secure coordination in Aviation matters of the Army and the Navy, to draw plans for new projects, for the construction of aircraft, for experimental stations, for coastal air stations, for stations to be used jointly by the Army and the Navy, or for extensive additions thereto.

The membership of the Aeronautical Board is as follows:

ARMY.	NAVY.
Major General Chas. T. Menoher, U. S. A., Chairman.	Captain Thomas T. Craven, U. S. N.
Lt. Col. J. E. Fechet, A. S.	Commander J. C. Hunsaker, U. S. N.
Lt. Col. A. W. Fuller, A. S.	Commander W. S. Pye, U. S. N.

### WORKING COMMITTEE

Lieut. George C. Tinsley, A. S.      Comm. Vaughn K. Coman, U. S. N.

### TECHNICAL COMMITTEE

#### OPERATIONS, HEAVIER-THAN-AIR

Captain H. E. Hartney, A. S.      Comm. Kenneth Whiting, U. S. N.

#### OPERATIONS, LIGHTER-THAN-AIR

Major P. E. Van Nostrand, A. S.      Lieut. Comm. Z. Lansdowne, U. S. N.

#### DESIGN AND CONSTRUCTION, HEAVIER-THAN-AIR

Maj. Henry W. Harms, A. S.      Comm. H. C. Richardson, U. S. N.

#### DESIGN AND CONSTRUCTION, LIGHTER-THAN-AIR

Major G. E. A. Hallett, A. S.      Lieut. Com. G. Fulton, U. S. N.

#### AERONAUTICAL POWER PLANTS

Major H. S. Martin, A. S.      Lieut. Comm. S. M. Kraus, U. S. N.

### SECRETARY

Lieutenant A. J. Clayton, A. S.

The name of the Board, which had formerly been the Joint Army and Navy Board on Aeronautics, was changed by the Secretary of War and the Secretary of the Navy on December 29, 1919, to "The Aeronautical Board." Shortly after this the Joint Technical Board on Aircraft Except Zeppelins was dissolved and its functions taken over by the Aeronautical Board. Ten officers, five from the Army and five from the Navy, were then assigned to the Aeronautical Board as a Technical Committee in connection with the drawing up of projects for the development of aeronautics and air stations. The addition of the Technical Committee brought the number of officers assigned to the Board to a total of nineteen.

During the past year the Aeronautical Board has considered and made

recommendations upon many questions concerning the aeronautical work of the Army and Navy dealing with policy, production, purchase and sale of material, selection and construction of aeronautical sites and bases, training, operations, and the general functions of aircraft, with a view to securing coordination and preventing duplication of activities wherever possible.

Among the important recommendations recently made by the Board is the general policy relating to the use of Government landing fields and facilities by civil and commercial aircraft, which provides for the use of landing fields for emergency purposes, but does not permit of the use of such a field as a base for the operation of commercial aircraft.

### THE HELIUM BOARD

The Helium Board (Army and Navy) in connection with the Bureau of Mines<sup>1</sup> has continued its development of and experiments with helium gas, for use in future lighter-than-air operations by the Army and Navy Air Services. Colonel C. DeF. Chandler, A. S., U. S. A., and Commander A. K. Atkins, U. S. N., constituted the membership of the Helium Board in 1920.

<sup>1</sup> See also Bureau of Mines report in Appendix.

## THE AIR MAIL

### PERSONNEL

Otto Praeger, Second Assistant Postmaster General.

Major L. B. Lent, Supt. of Engineering.	Charles I. Stanton, Supt. of Flying Operations.	Carl F. Egge, Supt. of Mail Transportation.
	D. B. Colyer, pilots, etc.	
	J. C. Edgerton, radio.	
	Charles Fay, inspection.	
	G. L. Conner, Chief Clerk.	
	E. W. Majors, Chicago Repair Depot.	
	C. A. Parker, Bustleton Repair Depot.	
	E. J. Scanlon, Newark Supply Depot.	

### DIVISION SUPERINTENDENTS

P. W. Smith, Supt. New York-Cleveland-Wash. Division.....	Hazelhurst Field, Hempstead, L. I., N. Y.
J. E. Whitbeck, Supt. Cleveland-Chicago Division.....	Air Mail Field, Cleveland, Ohio.
E. W. Majors, Supt. Chicago-Omaha Division.....	Air Mail Field, Maywood, Ill.
C. F. Egge, Supt. Twin Cities-St. Louis Division.....	Air Mail Field, Minneapolis, Minn.
A. R. Dunphy, Supt. Cheyenne-Salt Lake Division.....	Air Mail Field, Cheyenne, Wyo.
J. A. Jordan, Supt. Pacific Division.....	Air Mail Field, Reno, Nev.

### AIR MAIL PERFORMANCE

MONTH.	MILES FLOWN.	PERFORMANCE PER CENT.	LETTERS CARRIED.	COST.
1918				
May (15 days).....	5,324	78.87	190,000	\$ 3,682.11
June .....	10,685	94.97	523,240	9,922.71
July .....	11,855	97.57	678,680	10,001.46
August .....	11,984	99.96	663,520	9,555.67
September .....	10,900	100.00	608,000	9,638.74
October .....	11,617	98.68	671,520	9,841.76
November .....	11,118	98.07	674,160	10,673.68
December .....	8,415	77.23	711,120	13,300.46
	81,898	93.17	4,720,240	\$76,616.59

MONTH.	MILES FLOWN.	PERFORMANCE PER CENT.	LETTERS CARRIED.	COST.
<b>1919</b>				
January .....	9,653	82.00	724,200	\$13,741.58
February .....	9,307	88.18	619,560	13,645.16
March .....	10,699	92.59	701,240	13,880.29
April .....	11,105	95.06	667,080	13,516.44
May .....	22,578	96.92	1,065,060	17,715.66
June .....	30,835	99.65	1,425,880	30,891.62
July .....	56,577	96.04	1,948,160	41,134.36
August .....	58,022	98.43	2,274,800	40,614.59
September .....	56,308	98.60	2,227,520	34,861.53
October .....	50,437	86.27	2,203,800	35,609.03
November .....	41,757	86.91	2,163,360	31,127.58
December .....	35,782	73.61	1,649,840	33,909.86
	<u>393,060</u>	<u>91.18</u>	<u>17,670,500</u>	<u>\$320,647.70</u>
<b>1920</b>				
January .....	33,952	69.83	1,725,000	52,551.66
February (Hardest winter)...	32,647	71.02	1,489,680	46,004.12
March .....	37,861	77.25	1,694,440	44,725.71
April .....	41,890	86.16	1,682,640	55,343.40
May .....	54,132	90.72	2,044,480	57,004.83
June .....	49,867	69.74	2,360,200	80,209.43
July .....	74,002	96.39	2,576,040	85,993.59
August .....	116,023	.....	.....	70,074.30
September .....	.....	.....	.....	.....
October .....	.....	.....	.....	.....
November .....	.....	.....	.....	.....
December .....	.....	.....	.....	.....
	<u>440,374</u>	<u>93.52</u>	<u>13,752,480</u>	<u>\$491,907.04</u>
1918.....	81,898	93.17	4,720,240	\$76,616.59
1919.....	393,060	91.18	17,670,500	320,647.70
1920.....	440,374	93.52	13,752,480	491,907.04
	<u>915,332</u>	<u>92.62</u>	<u>36,143,220</u>	<u>\$889,171.33</u>

PLANES IN SERVICE

TYPE	ENGINE	HORSE POWER.	MAIL CAPACITY.	NUMBER NUMBER	
				IN SERVICE.	ON ORDER.
Curtiss J. N.-4-H....	Wright Engine...	150	200 lbs.	7	None
Standard J. R.-1-B....	Wright Engine...	150	200 lbs.	7	None
Curtiss R.-4-L.....	Liberty-12 .....	400	400 lbs.	17	None
D. H.-4 Remodeled.	Liberty-12 .....	400	400 lbs.	40	12
Twin D. H.....	2 Liberty-6.....	400	600 lbs.	20	None
Curtiss H. A.....	Liberty-12 .....	400	800 lbs.	2	None
Glenn L. Martin....	2 Liberty-12.....	800	1500 lbs.	3	None
Junker (J. L.-6)....	B. M. W. ....	200	1000 lbs.	4	None
L. W. F. (type V)...	Isotta Fraschini...	250	500 lbs.	1	Pending

## LIST OF AIR MAIL FIELDS

PLACE.	FIELD.	HANGARS.
Washington, D. C. ....	College Park, Md. Field leased—exclusive use.	Owned by P. O. Dept.
Philadelphia, Pa. ....	Bustleton, Pa. Field leased—exclusive use.	Owned by P. O. Dept.
New York, N. Y. ....	Curtiss Field, Hempstead, N. Y. Use of field leased from Curtiss Aeroplane and Motor Corp.	3 Hangars, 60'×100', leased from Curtiss Corporation.
Newark, N. J. ....	Heller Field, Newark, N. J. Nominal rental for field—exclusive use.	Hangar owned by P. O. Dept.
Bellefonte, Pa. ....	Nominal rental for field—exclusive use.	Hangar 60'×100' owned by P. O. Dept.
Clarion, Pa. ....	(Emergency) Municipal field—nominal rental.	Municipal Hangar, 60'×60'—nominal rental.
Cleveland, O. ....	Nominal rental for use of Glenn L. Martin Field.	Hangar 100'×100' owned by P. O. Dept.
Bryan, O. ....	Field leased, nominal rental, exclusive use.	Hangar 80'×100' leased, nominal rental, exclusive use.
Chicago, Ill. ....	Maywood, Ill. Field leased.	3 Hangars 90'×100' owned by P. O. Dept.
Rantoul, Ill. ....	Chanute Field (Army Air Service). No rental.	No rental for hangar (Army Air Service.)
St. Louis, Mo. ....	No rental for field—municipal.	Owned by P. O. Dept.
La Crosse, Wisc. ....	Municipal field—no rental.	Municipal hangar—no rental.
Minneapolis, Minn. ....	Field owned by Twin City Aero Corporation. Not exclusive use.	Owned by Twin City Aero Corp, exclusive use of hangar. Nominal rental.
Iowa City, Iowa ....	Public Field—no rental.	1 Hangar, 60'×100'.
Omaha, Nebr. ....	Public Field—no rental.	Exclusive use of Hangar, 100'×100'.
North Platte, Nebr. ....	Public Field—no rental.	Exclusive use of Hangar, 80'×90'.
Cheyenne, Wyo. ....	Public Field—no rental.	Exclusive use of Hangar, 80'×90'.
Rock Springs, Wyo. ....	Public Field—no rental.	Exclusive use of Hangar, 80'×90'.
Salt Lake City, Utah. ....	Public Field—no rental.	Exclusive use of Hangar, 80'×100'.
Elko, Nev. ....	Public Field—no rental.	Exclusive use of Hangar, 60'×100'.
Reno, Nev. ....	Public Field—no rental.	Exclusive use of Hangar, 60'×100'.
San Francisco, Cal. ....	Public Field—no rental.	Exclusive use of Hangar, 80'×100'.
Washington (College Park) and Newark Fields used by the New York-Washington Route.		

Philadelphia (Bustleton) is the Eastern Repair Depot.  
Rantoul (Chanute Field) and St. Louis Fields used by the Chicago-St. Louis  
Route.

LaCrosse and Minneapolis-St. Paul Fields used by Chicago-Twin City Route.  
Chicago (Maywood) is also the Western Repair Depot.

## TRANSCONTINENTAL AIR MAIL CONTROLS

<i>Curtiss Field, Long Island, New York —</i>	<i>Field Distance.</i>
Bellefonte, Pa. ....	230 miles
Clarion, Pa. ....	100 miles
Cleveland, Ohio ....	100 miles
Bryan, Ohio ....	165 miles
Chicago, Ill. ....	155 miles
Iowa City, Iowa ....	191 miles
Omaha, Nebr. ....	233 miles
North Platte, Nebr. ....	248 miles
Cheyenne, Wyo. ....	205 miles
Rock Springs, Wyo. ....	237 miles
Salt Lake City, Utah ....	163 miles
Elko, Nevada ....	235 miles
Reno, Nevada ....	200 miles
Sacramento, Calif. ....	97 miles
San Francisco, Calif. ....	92 miles
Totals.....	2651 miles



MISCELLANEOUS GOVERNMENTAL  
FOREST FIRE PATROL RECORD

MATHER FIELD, CALIF.: (From May 17th, 1920.)	
Number of patrols.....	120
Area covered .....	1,693,735 sq. miles.
Flying time .....	411 hours.
Fires discovered .....	137
Number of planes in commission July 31st.....	5
RED BLUFF, CALIF.: (From May 20th, 1920.)	
Number of patrols.....	135
Area covered .....	1,456,360 sq. miles.
Flying time .....	372 hours.
Fires discovered .....	105
Number of planes in commission July 31st.....	6
FRESNO, CALIF.: (From May 16th, 1920.)	
Number of patrols.....	124
Area covered .....	1,235,000 sq. miles.
Flying time .....	439 hours.
Fires discovered .....	65
Number of planes in commission July 31st.....	4
MARCH FIELD, CALIF.: (From May 20th, 1920.)	
Number of patrols.....	138
Area covered .....	801,171 sq. miles.
Flying time .....	500 hours.
Fires discovered .....	40
Number of planes in commission July 31st.....	4
MEDFORD, OREGON: (From July 1st, 1920.)	
Number of patrols.....	29
Area covered .....	345,180 sq. miles.
Flying time .....	110 hours.
Fires discovered .....	25
Number of planes in commission July 31st.....	4
EUGENE, OREGON: (From July 1st, 1920.)	
Number of patrols.....	39
Area covered .....	715,645 sq. miles.
Flying time .....	163 hours.
Fires discovered .....	92
Number of planes in commission July 31st.....	6