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NAVY DEPARTMENT
OFFICE OF NAVAL OPERATIONS
WASHINGTON

Op-Air
0155-60

I-32-GB

Oct. 14, 1918.

[redacted]

From: Director of Naval Aviation.
To : All Naval Air Stations, Aviation Detachments, Bureaus and Naval Districts.

SUBJECT: Weekly Report - October 14, 1918.

1. Hours of patrol obtained during the past week at Naval Air Stations, together with the number of flights and seaplanes used for patrol, for week ending October 14, 1918:

PATROLS.

Stations	Flights	Hours	Min.	Aircraft in Commission	Complement at Station
Bay Shore	7	24 +	25	7 Seaplanes	
Cape May	36	117 +	18	10 "	12 Seaplanes
" "	3	20 -	57	1 Dirigible	1 Dirigible
Chatham	56	131 +	14	15 Seaplanes	12 Seaplanes
Halifax	10	27 -	50	2 Seaplanes	4 Seaplanes
Hampton Roads	75	254 -	53	28 "	48 "
Key West	77	112 +	21	6 "	18 "
Miami	44	76 -	35	3 "	
Montauk	53	120 +	20	8 "	12 "
"	5	17 -	45	1 Dirigible	1 Dirigible
North Sydney	10	24 +	14	4 Seaplanes	4 Seaplanes
Rockaway	127	347 +	40	15 "	24 "
"	33	329 -	10	5 Kite Balloons	14 Kite Balloons
"	7	35 -	33	1 Dirigible	2 Dirigibles
	543	1640 +	15		
Lighter-than-air craft total 48		4[redacted]	25		
Seaplanes, total 495		12[redacted]	50		

North Sydney reported for week ending October 7, 1918: FILE

3 flights - 4 hours 30 min. on patrol with 4 Seaplanes

Coco Solo dispatch not received in time to include in this report.

NOTE: The sign + indicates that the record for the week is greater, the sign - indicates that the record for the week is less than

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for the week preceding. Underscoring denotes best record for station.

8. Hours of flying other than patrol obtained during the past week at Naval Air Stations, together with the number of flights and seaplanes in commission and at each station, for the week ending October 14, 1918:

Stations	Flights other than patrol	Hours	Min.	Aircraft in Commission	Complement at Station
Akron	6	6	39	2 Dirigibles	
"	36	14	20	1 Kite Balloon	
"	19	34	8	21 Free Balloons	
Bay Shore	530	461	40	24 Seaplanes	48 Seaplanes
Cape May	24	13	17	10 Seaplanes	
Cape May	2		55	1 Dirigible #	1 Dirigible
Chatham	12	12	29	10 Seaplanes	
Halifax	12	28	50	3 Seaplanes	
"	3	3	5	1 Kite Balloon #	1 Kite Ball.
Hampton Roads	~~142~~ 117	X ~~239~~ 18	~~58~~ 13	22 Seaplanes m	18 Seaplanes
" "	66	24	23	4 Kite Balloons #	4 Kite Bal.
Key West	671	~~486~~	~~57~~	20 Seaplanes	36 Seaplanes
" "	13	~~22~~	5	1 Dirigible #	2 Dirigibles
Miami	1403	~~964~~	25	31 Seaplanes	78 Seaplanes
Miami Marines	366	364	7	Airplanes	
Montauk	8	6	10	8 Seaplanes	
"	1		15	1 Dirigible #	1 Dirigible
"	6	20	6	1 Kite Balloon #	1 Kite Bal.
Great Lakes	17	8	25	2 Seaplanes	
North Sydney	13	25	44	4 Seaplanes	
Pensacola	1193	803	5	69 Seaplanes	108 Seaplanes
"	7	3	50	1 Dirigible #	3 Dirigibles
Rockaway	34	13	35	15 Seaplanes	
"	5	19	13	5 Kite Balloons #	14 Kite Bal.
San Diego	557	444	5	13 Seaplanes	36 Seaplanes
	~~5046~~ ~~5121~~	~~3817~~ ~~4072~~	~~21~~ 28		

	Flights	Hours	Min.
Seaplanes.....	45~~16~~	33~~04~~	~~22~~
Dirigibles.....	29	33	44
Lighter-than-air craft.....	164	148	59
Airplanes.....	366	364	7

GRAND TOTAL FOR FLYING TIME:

Patrol.....	543	1640	15
Other than patrol.....	5121	4072	21
	5664	5712	36

m 18 experimental

Number at station

Coco Solo dispatch not received to include in this report.

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3. The following officers have been ordered abroad:

Boyd, Thomas F.	Ensign, USNRF.	Mitchell, Francis H.	Ens. USNRF
Fickinger, Robert B.	" "	Rodenbaugh, Elmer S.	" "
Johnson, Walter H.	" "	Sprunt, James D.	" "
Knight, Donald B.	" "		

4. Ensign commissions have been requested for the following men:-

Askew, Miles A.
Barnes, Albert Kearby.
Branson, Frank L.
Bridgeman, Donald Storrs
Burn, Farrar.
Champion, Robert D.
Chapman, Joseph Graham
Daum, Raymond J.
Dawson, Herbert H.
Duddleson, John Waldo.
Eastman, Gardner Pette.
Elliott, Nixon C.
Ferry, Earl E.
Hilding, Arthur H.
Hubbell, Nelson E.
Hyson, Henry P., Jr.
Hopkins, David W.
Kelsey, Robert Pratt.
Kindy, Ward B.
King, Charles Curtis.
Kittinger, Leonard T.
Leslie, Arnett W.
Lundgren, William E.
Middleton, Charles Gibson.
Morrison, David G.
Orr, Robert Clement.
Packard, Wilbur Guthrie
Pulsifer, George Hale.
Reeder, Jay R.
Richdale, Jay W.
Romney, George O.
Rowe, Reginald M.
Sheridan, Thomas H.
Smith, Ira Dorman.
Teets, John Nicholas.
Twitchell, Pierrepont E.
Tym, Norris Frnaklin.
Volckening, Lloyd Irwin.
Wheeler, Stuart Sterry.
Yerxa, Thomas Edward.

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Chatham, Mass. - October 6th.

PATROLS. Patrols were sent out every day except October 3 on which day high winds and poor visibility prevented flying. On October 4, four R-9's flew to Philadelphia in formation, Ensign Thomas Durfee leader, leaving Chatham at 6:30 A.M., arriving Philadelphia at 5:45 P.M. Stops were made at Bay Shore and at Cape May. Total flying time six hours and eighteen minutes. On September 27 an HS-2, Ensign Rouleau pilot, made a forced landing due to motor trouble, about twenty-five miles east of Chatham in a broken sea - wind velocity about thirty-five knots. Owing to keeping motor idling for 6 hours to keep plane headed into the wind, no water was shipped for thirteen hours when picked up by S.C. 265. Cause of trouble was stripping of cam shaft drive gear, due to gears being slightly out of alignment in new motor.

EXPERIMENTS (A) Considerable difficulty was experienced in HS-2L planes by having gasoline supply cut out when machine was nosed over. This was remedied by leading gasoline from fan pump to the carburetor directly and allowing the excess supply to overflow into the gravity tank. This arrangement functions while there is gasoline in the main tanks. At one time a spiral was made from 8,000 ft. and motor still idled when machine landed. To use gasoline in gravity tank with fan pump operating the pump valve should be closed. (B) It was found when an excessively hard landing was made in HS-2L and HS-1L that upper wing tended to drive forward, carrying with it the radiator and braces to the engine bed and consequently throwing the machine out of alignment. The stay wire leading from the outrigger at the tail to the wings did not furnish enough tension to hold the wing back. Two additional wires were stretched from the outrigger to the struts nearest the hull on either side. These wires took care of extra strain and no further trouble has occurred. (C) Ensign W.H.Brown and Ensign L. Freudenhein, the latter attached to the Bureau of Construction and Repair, completed a set of speed tests with an HS-2 No. A-1917 over a course of one knot at Provincetown, Mass. The boat was fully loaded, carrying three men and all necessary accessories. Conditions for the tests were not perfect, a heavy sea was running, and the wind blowing 5 (Beaufort scale) up and down the course. The results, however, were satisfactory showing about a three per cent maximum error in the reading of the air speed indicator, which read slow.

SPECIMEN RESULTS

A. With wind - r. p. m. 1600

Speedmeter read. 69.70 knots

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Chatham, Mass.

Time	58	sec.
Course	1	knot
Wind	27.	knots (up and down course)
Ground speed	94.7	knots
	27	
	67.7	knots
	69.5	average
Error	1.8	knot fast

B. Against wind - r.p.m. 1500

Speedmeter read.	55	knots
Time	1 min.	52 sec.
Course	1	knot
Wind	27	knots (up and down course)
Ground speed	32.1	knots
	27	
	59.1	knots
	55	average
Error	4.1	knots slow

(D) An interesting experiment was tried on an HS-2 plane. Graphite was painted on the bottom and the plane took the air appreciably quicker than usual, but not enough difference was noticed to warrant its general use.

RADIO . Satisfactory results have been obtained in radio telegraphy. The shore station receives messages from this and foreign countries, keeping the Patrol Officer informed of any radiograms relative to submarine activities. All the seaplanes on the station are equipped with radio transmitters, and by their means the position of every seaplane is known at all times. As many as fifty-one radio messages from seaplanes have been received here in one day. During the daytime guard is kept on 378 and 600 meters, respectively the seaplane and commercial calling wave lengths, and during the night the watch is on 600 and 4000 meters. There is no radio transmitting station here at present, but one is soon to be installed.

COMMUNICATIONS. A direct wire to Boston, Provincetown and Highland Light Radio Station has been installed in the new Communication Office; Ensign A. M. Brown in charge and three operators. A complete reference

HAMPTON ROADS - October 1, 1918.

The weather for the week was typical of the season with equinoctial storms, high winds and rough sea preventing patrols for at least a part of each day. Nevertheless patrols were sent out whenever possible although at times this necessitated flying in very rough air.

Patrol Squadron

The Patrol Squadron during the week flew 303 hours and 14 minutes and the total distance patrolled was 16,317 nautical miles. This surpasses any previous record made on this station.

The patrols at this station are so planned that at least one patrol each day uses the Refueling Station recently established by this station at Assatague, Va. By replenishing at this place a patrol covering at least 400 miles and lasting from six to eight hours is being made daily by two HS-2 type seaplanes. The planes are sent over different routes going from and returning to the station, so that the same area is not covered twice. A similar Refueling Station is being established at Manteo, N. C.

On September 27th Ensign J. V. Manners, USNRF, the officer in charge of pigeons, took the birds to sea for the first time in a seaplane. They were released twenty miles from the station and all returned safely.

Every patrol pilot has one day in six in which he is relieved from patrol duties and is trained and instructed to more efficiently carry out the duties of a pilot. Each man is instructed by photographs, charts and by conferences with the older pilots in local geography, weather conditions, how to recognize landfalls, where emergency landings may be safely made, etc. Ground gunnery and bombing instructions are given. The Flight Commanders instruct and qualify their pilots in the different types of seaplanes, as every effort is made to have them first pilots on all types of planes for patrol. During the past week the pilots have been assisting in the overhaul of a Liberty motor under competent instructors, as it has been found that in many cases forced landings and incomplete patrols were due to the pilot's ignorance of how to handle the motor.

Experimental Squadron.

On a flight to Washington, D.C., on September 25th by Lieutenant Commander [illegible] Pellinger, tests were made

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with a Western Electric Company radio 'phone set, including interphone. Clear conversation was conducted from the station with the occupants of the seaplane to a distance of fifteen miles. The operator in the plane communicated with a Minesweeper which was equipped with a radio phone, with excellent results. During the entire trip to Washington radio signals from different ships were received without difficulty. The arrival of the seaplane was reported by radio 'phone to the radio station at the Washington Navy Yard.

Further tests were made on September 29th by Mr. DeFlores and Lieutenant Stone of the Bureau of Construction and Repair, with a Servo motor operated by batteries in order to compare its efficiency with that of a Cooper Servo motor which is operated mechanically by a wind driven propeller. Tests indicated the Cooper Servo motor was more natural and could be operated by pilots with greater ease.

October 9, 1918. PATROL SQUADRON.

The weather for the past week has been very unfavorable for patrolling. High winds with frequent thunderstorms have made flying dangerous and often impossible. On Tuesday, October 1st, and again for a half day on Thursday, October 3rd, the weather was so inclement as to make it impossible to dispatch any patrols.

The week's operations have been materially handicapped by the inroads of Spanish Influenza, among both the officers and enlisted personnel; at times nearly half of the enlisted personnel of the Flying Department was on the Pinnacle List. The result of this sickness has been shown more in an increase of forced landings and shortening of patrols than in decrease in the number of patrols sent out.

The refueling station at Manteo, N. C. on Roanoke Island, is in operation so that patrols are now being despatched to the limit of their range, both North and South of the Capes; refueling at Assatague and Manteo, and the patrols from the latter place continuing to the Sub-station at Morehead City, N.C.

This station is keeping a record of forced landings or uncompleted patrols per pilot and per seaplane, in order to determine whether forced landing was due to fault of material or of the pilot.

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H-16, 3578, was delivered to this station from the Naval Aircraft Factory, Philadelphia, Pa. on October 3rd, via air route by Lieutenant (jg) P. F. Slater, USNRF. After he had left Philadelphia, word was received by this station from there, that in getting away from the water a portion of the bottom of the hull had dropped off, and apparently Lieutenant (jg) Slater did not know of this: therefore a special watch was maintained at this station with boats standing by in the Roads, as it was expected that the seaplane would sink as soon as it landed. Lieutenant (jg) Slater landed and taxied normally to the runway where inspection proved that a small portion of the outside ply of the sheathing had come off the step. He reported that he had made one forced landing en route, but neither in landing nor in getting away had noticed any trouble with the hull.

A flight was made to compare the Army two-piece helmet with the Hampton Roads helmet. After a severe test, it was decided that the Hampton Roads helmet was slightly more efficient and more practical. 10% conversation was carried on with the Hampton Roads helmet and about 95% with the Army two-piece helmet.

A flight was made to test the Hampton Roads helmet to determine if it would be comfortable. It was found after two hours in the air the helmet was very comfortable, and the operator experienced no headache.

PENSACOLA - October 5, 1918.

Navigation School.

All of the H-12 boats were out of commission during the week. An inspection of these boats showed that the fittings supporting the forward ends of the engine frames had sunk into the spar in each instance. These fittings are being replaced with new steel ones.

On October 4th, NS-1 #1099 was wrecked in Escambia Bay as a result of a tail spin. The pilot of H-16 No. 4053, which was flying near by, headed for the spot as soon as the NS-1 went into the spin and started to land before the NS-1 struck the water. All hands on the H-16 worked very courageously and efficiently towards rescuing the victims of the accident.

PENSACOLA -

GUNNERY

Eleven targets are being placed at lengthy intervals along the north shore of east bay for H-16 pilots to use when (doing their H-16 gunnery). This will eliminate the necessity of continuous turning and also give the instructor much better opportunity for grading the gunner. Careful grading is not possible on a shorter range where the targets are grouped because too much attention must be given to the flying of the plane by the pilot instructor.

STATISTICS

The following statistics have been compiled as a matter of interest:

Period:	Total hrs. flown	No. of crashes	crashes per flying hrs.	Fatalities:	Individual Fatalities	Col. Fatal
7/1/17 to 1/1/18	8,109 hrs. 51 mins.	99	.0122	2 men killed in 2 wrecks	1 every 4055 hrs.	1 every 4055 hrs.
1/1/18 to 6/1/18	26,594 hrs. 48 mins.	112	.0042	4 men killed in 3 wrecks	1 every 6648-1/2 hrs.	1 every 8864-2/3 hrs.
6/1/18 to 6/21/18	19,576 hrs. 20 mins.	43	.0021	9 men killed in 6 wrecks	1 every 2175 hrs.	1 every 3262 hrs

SICKNESS AT PENSACOLA.

This station has, of course, been seriously handicapped by the epidemic of Spanish Influenza. We have been unfortunate in having the Training and Operations Aides, all School Commanders, (Bombing, Gunnery, Navigation), and three Squadron Commanders simultaneously among those ill.

The complement in general has been so hard hit that no attempt could be made to do more than carry on practices previously installed, at reduced production commensurate with reduced personnel. Juniors of the officers force have maintained operation most creditably, without confusion and with excellent judgment on efficiency.

Miami, Florida - October 7th.

This Station is greatly handicapped by lack of men due to the present epidemic of Spanish Influenza. In order to have all available machines running, several plane crews consisting entirely of student officers will be given planes. They will be expected to make all minor repairs and to keep their respective planes in first class shape.

The Seventeenth Squadron is to be organized at this Station, bringing the total up to five (5).

Trouble has been experienced with Liberty Motors overheating. It is recommended that distilled water or rain water be used in radiators.

The Eighth Squadron devised a very clever means of getting extra work done on Sunday. Last Sunday a party for enlisted men was given by the Eighth Squadron where pop, candy, cigarettes, etc., were served and the Band played all day. Contests were inaugurated in setting up HS-2's and in knocking them out of their crates. Crews from the various Divisions and Squadrons participating. The crew from the Construction & Repair Division won the contest for setting up planes complete without motor, doing the job in three hours and forty minutes, or thirty nine and one third man hours, thereby winning the prize. A very pleasant day was enjoyed by all.

On Saturday, October 5th, 1918, 2 HS-1's acted as mother ships to three (3) N-9's. The N-9's were being flown from Key West to Miami and as it was necessary to refuel the machines during the trip, two (2) HS-1's were sent part the way to Key West where they stood by until the N-9's arrived. Upon arrival gasoline was siphoned from the tanks of the HS-1's into five (5) gallon cans and then transferred to the N-9's. Oil and water also being supplied the N-9's. A seventy (70) mile trip for an S.P. Boat taking about seven (7) hours each was thereby saved, and the time taken for the trip of the H-boats was not lost inasmuch as students were taken along and received instruction during the trip.

The Patrol Squadron is still having trouble with propellers throwing their tips. Machine 1827 was forced to land at sea in a heavy storm when a propeller tip flew off. A propeller with a light tip covering only about one fourth of the blade in width and extending down from the tip about two (2) feet along the cutting edge is being tried out in the Patrol Squadron. This propeller has given satisfactory service. for a number of hours and is still in commission.

Miami, Florida -

In addition to this method of tipping propellers it is recommended that a quarter section of a circle with a radius of two (2) feet be fitted into the space just behind the lower engine panels and against the hull. This to prevent the spray from hitting the propeller when taxying or taking off. It is believed that this new method of tipping propellers will very much reduce, if not altogether eliminate the trouble experienced in the past of throwing tips, while in the air, and in addition this protection against spray will save them from being chewed up.

Public Works Department has recently organized a Carpenter Squadron No. 1 consisting entirely of enlisted men. With this outfit it is expected that work outside of Station such as temporary runways and storehouses as required for distant re-fueling Stations will be expeditiously handled.

As a stimulus for flying hour efficiency it is suggested that profile paper fixed with a vertical scale showing hours and a horizontal scale showing days will form basis for plotting curves showing the relative standing of Stations and Squadrons. At this Station a wall frame has been fitted up containing in each end a roller to make the profile paper continuous for this purpose and so made that a two weeks period will always be in view.

Halifax - Nova Scotia, October 7th.

The Canadian and British people and officials have become much interested in Aviation. The Station receives daily visits from high officials. The Minister of Marine from Ottawa has inspected both this Station and that at North Sydney, and he seems much pleased and grateful for the assistance of the United States Navy. The British officers here, including Admiral Storey, are very much interested in our work.

Influenza has broken out at Halifax. The Station was promptly quarantined but the disease got into the Station. The Executive Officer, the Ordnance Officer, the Squadron Commander and ten (10) men have been taken to the hospital with influenza. Drastic methods are being adopted to check the disease.

Much trouble is experienced with the engines of the H.S. 2s stopping in a glide. We are overcoming that trouble by putting a stop-cock in the overflow lead---which we close when gliding---and by tapping another outlet to the carburetor feed line from the center of the gravity tank. This prevents the carburetor from being starved.

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Source - Bureau of Construction & Repair

CARE OF FLYING BOAT HULLS DURING STORAGE.

Hulls are never to be left out in the open or left lying on their sides supported by the keel and one bilge; they are to be properly checked up horizontally or placed on wooden cradles. The parts of cradles in contact with the hull should be covered with cork under sail cloth, the sail cloth being provided with proper ventilation holes, and made removable for drying. Padding is not to be used, as this has been found to rot the planking.

Boats should be washed down with fresh water periodically to prevent shrinkage. No rule can be laid down as to how often this should be done, since the damping required depends largely on the weather; the object to be aimed at is to keep the boat tight, and the washing should be carried out as frequently as necessary to attain this object. Drain plugs should be kept open until the boat is wanted.

All metal fittings must be kept properly greased or painted.

Source - O.N.I. Series LV.

In a recent test of a British DH-9a aeroplane equipped with a Liberty engine, the plane carried 450-lbs. more weight than a similar plane equipped with a Rolls Royce engine, and climbed to 10,000 feet in two minutes less time than the Rolls Royce plane.

#3.

Chatham, Mass.

catalogue by subjects is being made of all confidential and instructional information. All west Atlantic submarine activities reported are plotted day by day on Hydrographic Office map, number 5185. These graphic descriptions of the probable course taken by submarines have been found to have a stimulating effect on patrol work.

FOREIGN NEWS BULLETIN - London - Sept.14th.

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SEAPLANES

Test of H-16 785. (Curtiss) August 4,1918,
Started for 2 hours test at 2 p.m.
Load: full fuel, two engineers and pilot. (No bombs, machine guns, etc.)
Engines:- 2 Liberties, 1600 revolutions full out in air capable of maintaining altitude with this load at 1300 revolutions.
At 3:30 p.m. climbed to 2000 feet. Clouds from that altitude up made it inadvisable to go higher. Had all loose gear moved aft of the pilot's seat.
Had safety belt fastened for myself. Instructed engineers to hold on. (Had previously obtained their consent for the experiment.)
Fired one green Very's light.
Opened engines to 1500 revs. Nosed down slightly until airspeed indicator showed 75 knots, then pulled back slowly but firmly on cloche. Boat went to upside down position very readily. Engines both starved and stopped. Bilge water splashed down. Machine then carried over into a fast dive up to 120 knots. Reduced to 110, then to 60 knots and glided to water with switches off. Loss of altitude due to loop, not over 300 feet. Starboard skid fin crushed in, otherwise no breakage of strain could be detected.(785 later did several patrols.)

Note No. 77. Protection of Kite Balloons from Lightning.

The following precautions are to be observed when indications point to the approach of thunderstorms:-

Observers are to be landed and instruments removed from car. The drop lead is to be taken in if possible, and in any case must be disconnected from the car. The telephone core should be shorted to the cable at the flying end; if the drop lead attachment is fitted this can be done by a coil of bare copper wire inserted in the socket and retained in position by a screwed cover.

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Balloons are not to be retained on deck, but are to be flown, in ballast, at the minimum height which will ensure them falling clear of the ship in case of their being struck and fired.

The cable is to be efficiently earthed by a short straight length of balloon cable, secured by clips to the main cable above the final lead off block and to bare metal of the deck, following the approximate line of the cable and five feet clear of obstructions.

If insulated, the winch is to be efficiently earthed. There should be a really efficient metallic connection between the winch frame and the deck plating. It is not sufficient to rely solely upon the holding down bolts as paint, caulkings, etc., have been known to cause partial insulation, and a good connection is essential to dissipate without damage, a heavy charge caused by lightning. If it is found necessary to provide an additional connection it should be made by means of 7/16", or larger, stranded copper cable, with the ends sweated into substantial brass or copper lugs, fixed to the winch and deck by screws, the connecting surfaces being first thoroughly cleaned by scraping and filling.

Almost infallible indication of the approach of dangerous atmospheric conditions should be given by the increase of "atmospherics" in the ship's wireless telegraphy installation; such increase becomes very pronounced an appreciable time before the advent of a thunderstorm.

In exceptionally calm dry weather balloons are not to be let up at speeds greater than 150 feet per minute.

Pending the production of a discharger for fitting to balloons, it is probable that some advantage may be gained by connecting a bunch of the thin bare copper wires to the cable termination close up to the "Vee" and another similar bunch about 30 feet below it. For this purpose 3-18" lengths of ordinary light flexible cable with the insulation removed, secured at one end with the other flying free, would be suitable; for the lower position they could be soldered to a spring cable, slips to be gripped on the cable as the balloon is let up.

BRITISH OPERATIONS

Week ending July 27th.

No. of Patrols.

Seaplanes and Aeroplanes	734
Airships	62
Kite balloons	10

FOREIGN NEWS BULLETIN - -- London - Sept. 14th.

No. of Hours Flown

Seaplanes and Aeroplanes	1476
Airships	350
Kite Balloons	894

No. of Miles Covered.

Seaplanes and Aeroplanes	87152
Airships	8287
Kite Balloons	7790

By direction.