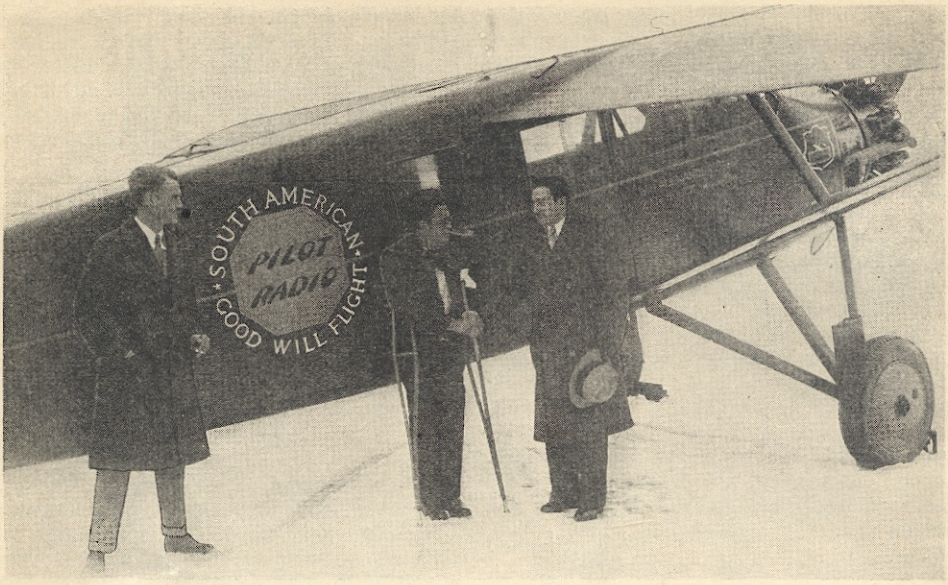


Mr. Manuel, general export manager of the Pilot company, is shown at the right, shaking hands with Mr. Bouck, while Mr. Alexander looks on. Mr. Manuel sailed from New York for Rio de Janeiro early in February, so as to be in South America to greet the fliers on their arrival there.

Rolling Down to Rio---1930 Style

Pilot Radio Plane to Make First Commercial Good-Will Flight to South America, Covering 22,000 Miles

by E. MANUEL

ON THE twenty-fifth of March, the flying laboratory of the Pilot Radio and Tube Corporation will take off from Roosevelt Field, Mineola, Long Island, on the first commercial good-will flight to South America. Starting from New York City, this flying symbol of business amity will wing its way to Rio de Janeiro, eleven thousand miles distant.

Several records will be established by this flight. It will be the longest flight ever made by any business organization in its own plane in the furtherance of the interest of its customers. It will be the first commercial good-will flight of any length ever made. It will be the first commercial good-will flight from North to South America and it will be the first time that any standard type of plane has made the complete journey from New York to Rio over the contemplated and somewhat hazardous route.

The purposes of the trip are threefold. It is hoped primarily to promote commercial good-will between the two great continents of the Western Hemisphere—the vast manufacturing country of the north and the almost unlimited agricultural land of the south, countries ideally complementary.

COMPLETE EQUIPMENT CARRIED

The flying laboratory will carry complete radio transmitting and receiving equipment, and it is believed that the flight will demonstrate beyond argument the utility of such apparatus on long distance airplane flights.

By altering the route slightly, in passing down the west coast of South America, it is expected to establish a new airway particularly adapted to the requirements of land planes. The pilot of the plane has spent several months mapping out the course.

THE CREW

A crew of two will be carried in the plane. The pilot will be William H. (better known as Bill) Alexander, a veteran with 7,000 hours flying since his first 200 hours built up in the R.F.C. during the World War. In the course of his flying time, Alexander was a lieutenant commander with the U. S. Navy, in charge of flying instruction at Pensacola, Florida. He is one of the best known mail and transport pilots in the game. He holds F.A.I. license number 1, issued in 1911; a sporting license, and the Department of Commerce transport and mechanic's licenses.

Zeh Bouck will accompany Alexander as co-pilot navigator and radio operator. Mr. Bouck is well known to the readers of RADIO DESIGN, and needs little additional introduction to them. Mr. Bouck has been closely identified with radio broadcasting since its inception, as a writer, engineer, editor and radio operator. The special airplane transmitter and receiver carried on the flying laboratory has been designed by him. Aside from his radio activities, Bouck has been associated with aeronautics for some years. He is an experienced navigator, and the editor of *Aero News* magazine. As engineer in charge of aeronautics with the Pilot Radio Laboratories, the activities of the flying laboratory have been under his direction, and he has accompanied the Stinson J-6 monoplane on all of its long flights.

THE ROUTE

The air-lane covered in the complete journey to South America and return will be twenty-two thousands miles long, and with the contemplated stop-overs will take between two and three months.

Leaving New York with letters from Mayor Walker to the heads of South American municipalities, the first stop will be made in Washington, D. C., where messages will be picked up from President Hoover and the Pan-American Union, carrying further words of commercial and general good will to the southern continent. The plane will then proceed to Atlanta, Georgia, and Miami, Florida. A ninety mile over-water hop takes the good-will flight to Havana. The next leg of the journey is another over water hop to Mexico, following the coast up to Vera Cruz, and then inland to Mexico City.

After a brief stay in the Mexican capitol, the nose of the plane will again be headed south for Guatemala City. Refueling here, the flight proceeds to Managua in Nicaragua and Panama in the Canal Zone.

The most hazardous leg of the journey now lies before the aviators—from Panama to Buena Venture in Colombia and Guayaquil in Ecuador — twelve hundred miles of cliff bordered coast, with impassable mountains on the left.

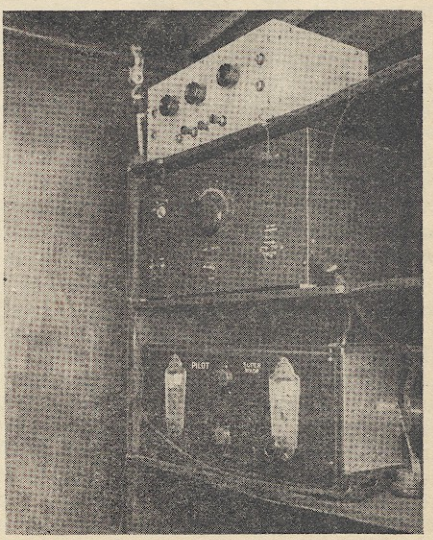
Crossing the next international border brings the fliers into Peru, with stops at Talara, Trujillo, Lima and Arica. Antifogasta, Chile, is not far away, and then the capital, Santiago. The next leg of the journey is the shortest hop in the flight, but necessitates crossing the Andes at an altitude of twenty thousand feet to Mendoza in the Argentine.

It is planned to arrive at Buenos Aires the first day of May, with a stop over of one week during the radio show there. The flight will continue to Montevideo and San Paola, and then to Rio de Janeiro in Brazil, and follow the coast north as far as Victoria and Natal.

The exact course of the return flight has not been decided upon at this writing, and its selection will be determined largely by the difficulties of the southern flight.

THE RADIO APPARATUS

The radio transmitter and receiver have been designed for airplane purposes. The transmitter consists of two 210 type tubes, especially evacuated by Eveready-Raytheon to withstand high plate voltages.



The compact radio equipment in tne rear cabin of the plane. At the bottom is a "Super-Wasp" receiver; above it is the transmitter.

The size of the Pilot plane can be judged from this picture, which shows six-foot Mr. Alexander sitting on a wing strut.

The plate and filament potentials will be supplied by a dynamotor and a storage battery, respectively. The storage battery will also operate the dynamotor, and will be charged continuously in flight by a wind-driven generator. This arrangement permits emergency transmission from the ground. A trailing wire antenna will be used for general transmitting and receiving purposes.

The transmitter will operate on wavelengths in the neighborhood of forty meters for communication with amateurs and the Pan-American airway stations along the route. It is expected that the good will flight will maintain consistent communication with North America throughout the tour via amateur radio. A six hundred meter wavelength will also be available for distress purposes.

"SUPER-WASP" USED

The receiver is a redesigned A. C. "Super-Wasp" operated from batteries. A. C. tubes are used to reduce microphonics. The receiver will be supplied with plug-in coils covering the amateur and American broadcast bands, the 600 to 800 meter ship wavelengths and the 800 to 1,100 meter aircraft bands. A loop will be available for receiving where directional effects are desired.

The entire ignition system on the plane will be shielded to eliminate ignition noises, which otherwise would cause considerable interference on a high sensitivity receiver of the type employed.

Communication will be in International Morse code, in both English and Spanish. I. C. W. will be used on the plane.

FLYING EQUIPMENT

The plane will be completely fitted out for a long distance flight. With the cooperation of the South American governments, it is understood that special permission will be granted to carry photographic equipment, both still and movie cameras. Among other equipment will be Irwin airchutes, revolvers, pistols and rifles, ammunition, emergency food rations, medical supplies, plenty of quinine, water, extra oil, air mattresses, pajamas, chewing gum, tobacco, fruit, a wind drift indicator, two compasses, two chronometer watches and three wrist watches, and a Battenberg disk.

The plane ordinarily will carry a twelve hour supply of gas. However, on particularly long hops, additional gas will be carried in the cabin, and transferred to the main wing tank by means of a wobble pump. Oil can be replenished, while in the air, by an oil pipe leading to the crank-case.

The first commercial good-will flight to South America has been made possible by the hearty cooperation of many organizations interested in the vast possibilities of Pan-American commerce. The Richfield Oil Company of New York will ship Richfield gasoline and Richlube lubricating products to all stopping places along the route. The National Carbon Company, through its subsidiary, Eveready-Raytheon, is furnishing vacuum tubes and "B" batteries. Among the other cooperating organizations are *Aero News* magazine, the Irving Parachute Company and the Stinson Aircraft Corporation.

NOTICE

All our copies of the first six issues of RADIO DESIGN have been sold, and we have none left to fill the many orders we receive for them. The only back copies we have available now are of the Fall issue of 1929, Number 3 of Volume 2. These are going fast; if you want to complete your files, order your copies now. They cost fifteen cents apiece; coin or stamps accepted. Address your orders to

Circulation Department,
RADIO DESIGN,
103 Broadway,
Brooklyn, N. Y.

How The "Pilot Radio" Made The First Bermuda Flight

The Full Story of the History-Making "Hop" in Which Radio Played an Important Part, Told by the Radio Operator Himself.

By ZEH BOUCK

ONE of the primary objects in the promotion of the recent flight to Bermuda was to determine the extent to which reliable communication with land might be maintained on an over-ocean flight. And when I write "reliable communciation," I refer to a continuous interchange of messages between the plane and land, comparable to the traffic handled by an ocean liner. That this object was achieved is demonstrated in the fact that while over fifty messages were handled, back and forth, between WHD, the radio station of the New York *Times*, and W2XBQ, the airplane "Pilot Radio," not a repeat of a single word was requested. The signals received on plane and land suffered from practically no diminution throughout the eight-hundred mile flight.

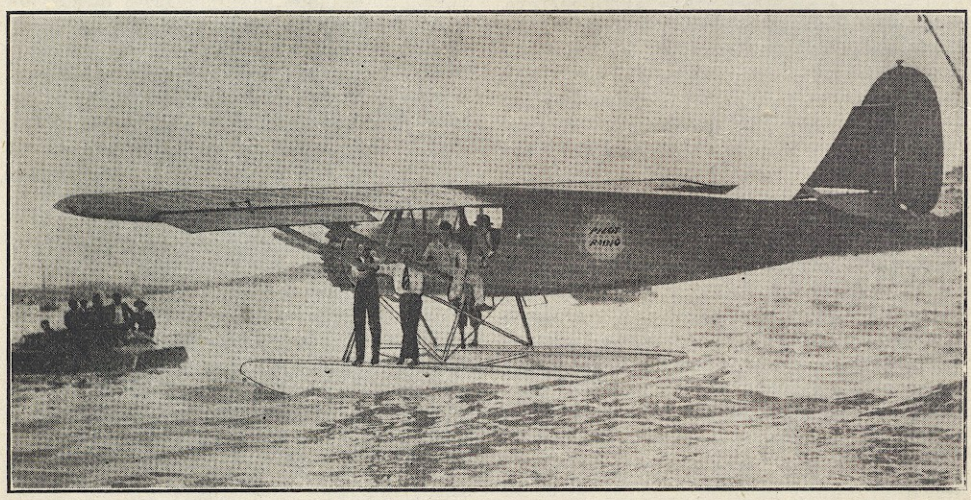
One of the last messages transmitted from New York, just before the plane alighted in Murray's anchorage, Bermuda, was to the effect that the signals were every bit as consistent and powerful as when we took our departure from Scotland Lightship the day before. As for WHD's signals, it was impossible to tune in this station to full strength, as the signals were painfully loud.

TRANSMITTER AND RECEIVER DESIGN

The transmitter and receiver were built in the laboratories of the Pilot Radio and Tube Corporation, sponsors of the flight, and the plane used in the flight was their flying laboratory. The problems confronting us were those of electrical efficiency, weight and space. Electrical efficiency involves several angles, including the ability to transmit and receive over long distances, and the necessity, from the point of view of safety, of being able to operate for a reasonable period of time from the surface of the sea.

The problem of weight is omnipresent in designing aircraft radio equipment. Space was a matter of convenience and comfort, and was both psychological and physical. A comfortable radio shack is almost essential to efficient operating.

Two transmitters, combined in one unit,



The "Pilot Radio" as it appeared after landing in Hamilton Harbor, Bermuda. Yancey and Alexander are standing on the port pontoon, and Bouck is sitting on the wing strut.

A Splendid Feat of Aerial Navigation!

ON THE morning of April 1st, 1930, the airplane "Pilot Radio," fitted with pontoons instead of its usual landing gear, and carrying William H. Alexander, Zeh Bouck and Captain Lewis A. Yancey as its crew, took off from Flushing Bay, Long Island, with the tiny island of Bermuda as its goal. This feat, never before attempted, has been considered by many fliers as a more difficult and dangerous undertaking than flying to Europe, as the island is only nineteen miles long and is a mere speck in the ocean.

Faced by darkness when only sixty miles from Bermuda, the three intrepid aviators made history by alighting on the ocean, spending the night on the tossing waves, and then taking off in the morning without assistance. On the morning of April 2nd, the plane made a triumphant entry into Hamilton Harbor, to the wild acclaim of the excited populace.

This flight was a splendid tribute to the navigating of Captain Yancey and the piloting of "Bill" Alexander, but in the minds of the public its most interesting feature was the remarkably steady radio contact maintained between the plane and New York. Zeh Bouck, well-known to the readers of RADIO DESIGN, *sent a constant stream of messages back to the New York "Times," allaying the fears usually felt for adventurous fliers who skip off into the sky and remain unheard from until the time they land safely—if they do land safely. The flight demonstrated more forcibly than ever the value of a properly designed aircraft radio installation properly handled by a capable operator.*

Because of the lack of facilities in Bermuda for repairing the damaged pontoons, the "Pilot Radio" and its crew returned to New York by steamer. By the time this number of RADIO DESIGN *reaches you the plane will already have started on the South American Good Will Flight described in the Spring issue.*

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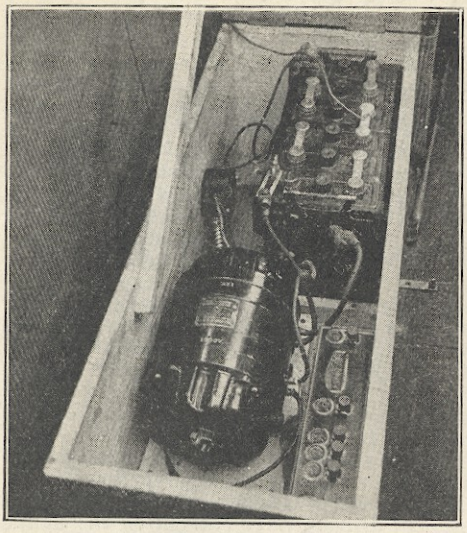
were carried, covering both long and short waves, the long-wave transmitter being effective between 600 and 1,100 meters, and the short-wave transmitter covering a band from 35 meters to 50 meters. Changing from long to short waves was accomplished by switching over inductors, the same tube and meter combinations being employed on all wavelengths. In addition, an exterior loading coil was used for transmitting on wavelengths above 700 meters. A Hartley oscillator was employed in both transmitters.

The receiver was mounted on a sliding shelf below the transmitter, both receiver and transmitter being combined in a single suspended unit. The receiver was mounted below the transmitter in order to provide the greatest possible isolation of the short-wave transmitter, and slides in and out on its shelf to facilitate changing coils. The receiver is a modification of the Pilot A. C. Super-Wasp, which is well known to all readers of RADIO DESIGN. A. C. tubes, operated in series through a suitable resistor, were employed in preference to the D. C. type in view of the lowered microphonic response.

Welcome home!
Left to right: Yancey, Alexander and Bouck, sitting on one of the pontoons of the "Pilot Radio" on the upper deck of the Royal Mail steamer "Araguaya," photographed on their return to New York on April 10th, 1930.
The wings and tail surfaces of the plane were removed in order to make the body fit on the steamer.

THE POWER SUPPLY

Power for all filaments is supplied from a non-spillable twelve-volt storage battery, which also turned over the dynamotor feeding the transmitting tube with 100 milliamperes at 1,000 volts. The storage



The power box inside the cabin of the "Pilot Radio." The 12-volt storage battery, charged continuously by the wind-driven generator on the body of the plane, operates the dynamotor, which supplies filament and plate current for the transmitting tube. The object in the lower right corner is a single 135-volt "B" battery block. When closed, the box forms a comfortable seat.

battery was charged continuously during flight (except during reception) by a wind driven generator driven by a one blade constant speed propeller. With this power combination and an emergency antenna, about ten hours of average communication is possible when the plane is down on water or land.

A convenient switch made it possible to disconnect the generator, eliminating commutator interference during reception. A send-receive switch on the radio panel controlled the filament and dynamotor, transferred the antenna from the transmitter to receiver and disconnected the plate voltage from the receiver during transmission. A separate filament switch made it possible to burn the receiving filaments while transmitting, eliminating the heating lag. The plate voltage to the receiver was supplied by a special aircraft unit "B" and "C" battery.

A trailing wire antenna was employed, measured lengths being indicated on the wire for different frequencies. The transmitter was operated, during the Bermuda flight, on 41 meters, the antenna being about ninety feet long and working on the third harmonic. This resulted in stable functioning of the oscillator (somewhat unreliable on the fundamental with close coupling) and provided a highly satisfactory pick up when receiving.

The arrangement of the radio cabin is shown in the accompanying photographs and considers the convenience and comfort of the operator. There is plenty of legroom under the folding desk, the key is located for comfortable operating, and all controls are at the fingertips of the operator. The cabin is well lighted by a window at the operator's left. There is no loose equipment. All spare parts are carried in closed shelves, and the entire layout is one that lends itself to electrical and mental efficiency.

THE FLIGHT

On the morning of April the first, 1930, with W. H. (Bill) Alexander at the controls, and Captain Lewis A. Yancey, our navigator, alongside of him, we taxied across Flushing Bay, New York, to Clason Point for our first attempt at a take-off. Our first four efforts were failures. There was practically no wind, and Long Island Sound was almost without a ripple. Under these circumstances it is next to impossible to break the suction under the pontoons and take-off a heavily loaded plane. Between attempts we lightened the ship by draining gas and discarding our anchor and kit of spare pontoon plates. Just before our fifth attempt a slight wind arose. We waited until two ferry boats crossed in front of us, to take advantage of the waves created in the wake, and Bill Alexander gave her the gun. As she gained speed, George Post, in his Travelair, taxied across our path, wide open, throwing up a choppy sea that helped considerably. In another second the "Pilot Radio" was on the step, the bumps becoming sharper and sharper as the air speed indicator rose from fifty to fifty-five, sixty, sixty-five, seventy, seventy-five miles an hour. One more sharp rap on the pontoons and we were off. We gained altitude rapidly and cleared the bridges in good style, Post tagging along with us as an escort.

Half way down the East River, I crawled aft into the radio room, let down ninety feet of antenna and called WHD, the New York *Times* radio station, and sent my first message at 9:54 A. M. to Police Commissioner Grover Whalen, thanking him for the cooperation of the New York City police in getting us underway from North Beach. At 9:55 A. M. we announced that we had swung into our course just off Staten Island, heading along a line of buoys that run 138° true.

At 9:58 we took our departure from Scotland Lightship.

About this time, WHD wanted a list of the provisions on board. We carried rations for five days, and radioed the following:

"Rations on board consist of two broiled chickens, four boxes wholewheat crackers, five pounds chocolate, twelve oranges, five gallons water, one quart of Scotch."

This message was published and transmitted, and the last item for some unknown reason created a bit of excitement. This was, I must assure you, a perfectly legitimate part of our medical stores.

About this time Yancey wanted to take a sight, which was a most efficacious way of shutting down the radio. In taking sights, Yancey opened the top of the plane, admitting a hundred-mile-per-hour blast of cold wind that worked havoc with the papers in the radio cabin, to say nothing of the good right hand.

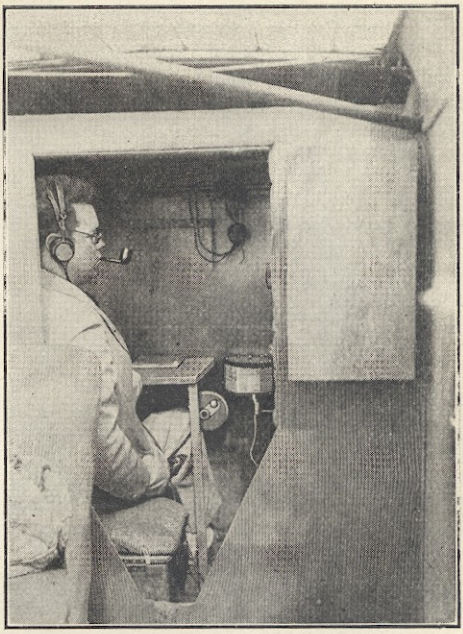
Sights are taken from an airplane in pretty much the same way they are from a ship, only in bumpy weather, such as we were experiencing, it is considerably more difficult. A bubble sextant is generally employed, which provides an artificial horizon. Captain Yancey used Longines chronographs, which are pocket chronometer to check time. Three chronographs are carried so that, if any one of them changes its daily rate of variation, it is immediately identified by reference to the other two. Our first position report was radioed in at 11:35 A.M., New York time, as follows:

"At 16:07, Lat. 39:31. Long. 72:50, Course 138, true speed 76 knots."

LANDING ON THE OCEAN

And so went the day. We were in constant contact with WHD, signals at both ends showing absolutely no diminution as the "Pilot Radio" pushed the miles away with the back wash of her prop. As evening approached, it appeared doubtful if we could make the Island before dark due to the fact that our speed had been cut considerably by unfavorable winds. A landing in Bermuda at night was a hazardous possibility, and we went into a quick huddle. I told Iverson, radio operator of the *Times*, that if we did set her down, I'd sign off for the night, rather than rig an emergency antenna to the wing tips, and "see" him again shortly after five the next morning. At 5:20 we sent the following:

"If we don't see the Islands pretty soon will set her down for the night. If we have to set her down for the night, don't let anyone worry about us. The sea is like a lake."



Looking backward from the pilot's seat into the radio cabin, where Zeh Bouck is shown with the earphones on. The inside of the plane is well lighted because of the transparent pyralin top.

At 5:50 we signed off with: "Setting her down right now. Position sixty miles north of Bermuda. Tell everyone not to worry. Please notify my wife and Goldberg. Sea calm, very. Will continue to Bermuda in the morning. Did you get all? See you five A.M. tomorrow."

And Bill set her down. From above, the sea may have looked "calm, very." But close to the surface it was another proposition. It look the finest sort of piloting, and Alexander had it, to put her down on that heavy ground swell without a crack-up. The pontoons stood the gaff perfectly. As we came to a stop, broached to on a rolling sea, Bill acknowledged our congratulations with:

"Gentleman, I'm going to be sick." He was.

A half hour later it was pitch dark, with only the stars and the stingy sector of a pale moon. This set around nine o'clock. We maintained three watches when we weren't sleeping. Yancey slept well. I dreamed of railroad trains and Bill of stomach pumps. We sighted the lights of a steamer at three different

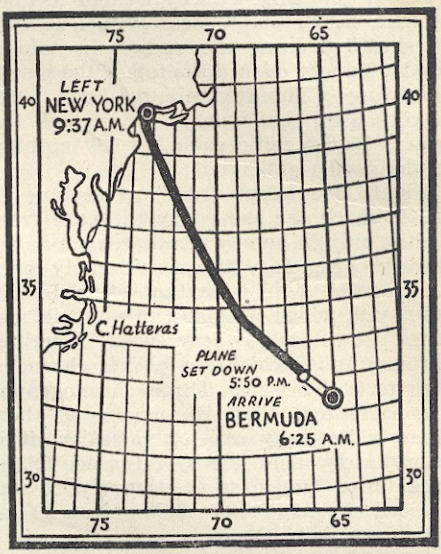
times, and finally, considering the possibility of its being a ship out from Bermuda to look for us, signaled her with a Very pistol. Two hours later she hove to. At first we talked with blinker and then hailed her. She was the *Lady Sommers*, requested by Bermuda to keep a weather eye cocked for us, and too much credit cannot be given her master for his fine seamanship and sportsmanship. We requested that she report that everything was okay with us and that we would proceed to Bermuda at dawn.

A HISTORY-MAKING TAKE-OFF

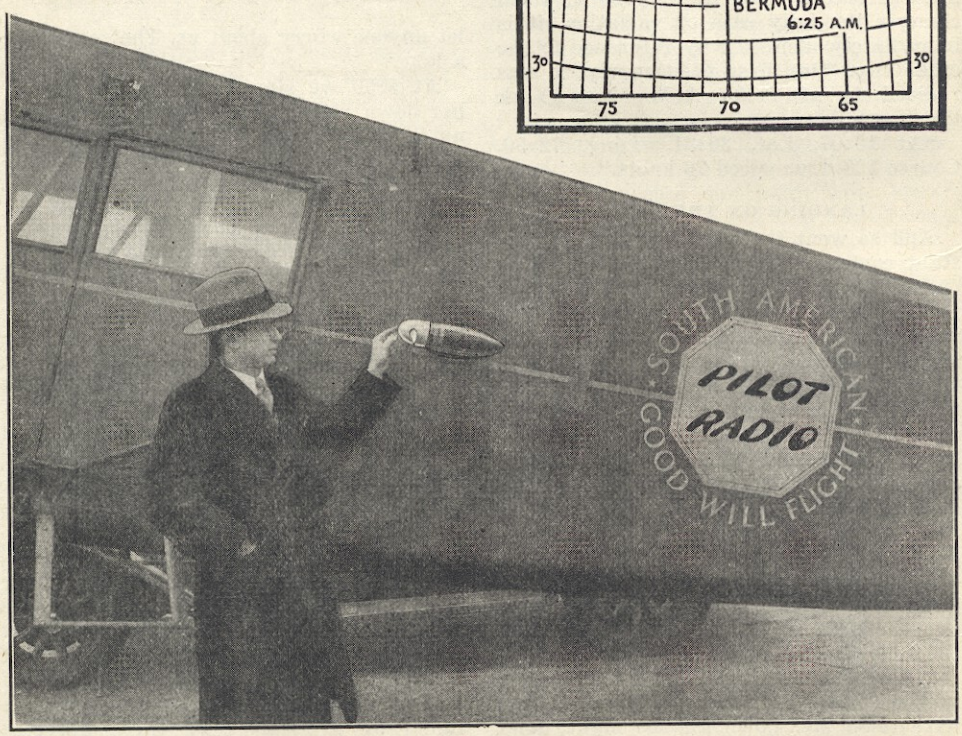
At daybreak we cleaned up the cabin a bit, tightened up a stay wire on the pontoon struts that had been loosened in the stress of landing, and took-off. Here again Bill showed his mastership of a ticklish job, and for the first time in the history of flying a plane forced down in the middle of the ocean took-off again.

Five minutes later I came in for the greatest thrill in my life. I reeled out the antenna, gave WHD a short call, threw the switch over the receiving side, and he was back at me in an instant, as loud and clear as when we were over the East River! This was at 5:50 A. M., New York time, on April 2nd. A half dozen messages flashed back and forth between the "Pilot Radio" and the New York station. Iverson told us that the more flagrant of the New York papers had given us up as lost, which news amused the lads up forward. At 6:17 we sent through the following message:

"Bermuda sighted dead ahead at 6:15



Right: The course followed by the "Pilot Radio" on its epochal flight to Bermuda. Below: The editor of RADIO DESIGN *examines the little wind-driven generator that charges the storage battery inside the cabin.*

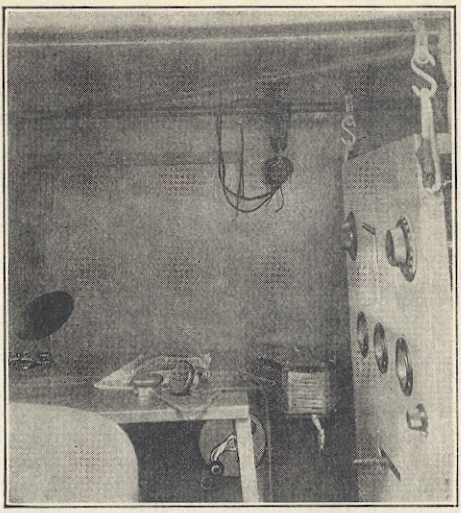


New York time, about thirty miles off," a simple, but eloquent tribute to the finest aerial navigator in the world, Captain Lewis A. Yancey.

CONCLUSION

From the radio point of view one of the most interesting observations was the absence of skip-distance effect. In a pre-flight conference with Fred Meinholtz, engineer in charge of the New York *Times* station, we roughly guessed that the signals from the plane would be lost at about five hundred miles out. It seems apparent, and reasonable, that the distance with which the skip-distance effect becomes noticeable is a function of the altitude of the radio station.

There seems little necessity for carrying long-wave transmitting equipment on trips of this nature. An airplane flying over water should be *in constant contact with a land station*—a contact which it seems is best maintained via short waves. In case of emergency the SOS can be most expeditiously handled by the shore station, without the loss of time and general confusion that often accompanies a distress call transmitted directly from sea. The elimination of the added weight makes it possible to increase the power and efficiency of the short-wave transmitter. A master oscillator design is recommended by the author, and with a modified transmitter along these lines, the now famous "Pilot Radio" will take off on the first commercial good will tour of South America about the time this magazine reaches your hands.



A close-up of the radio panel and operating table inside the "Pilot Radio." Notice the shock-cord suspension of the panel, the antenna reel under the table, and the transmitting key in the far left corner.

Last Minute News of the South American Flight

The "Pilot Radio," carrying Capt. Lewis A. Yancey as navigator, Zeh Bouck as radio operator and Emil Burgin as pilot, left New York on May 14, 1930, on the first leg of its South American trip. An extra passenger who went only as far as Washington, D. C., was Mr. I. Goldberg, president of the Pilot Radio & Tube Corporation. The four men met President Hoover, who wished the fliers good luck.

Yancey, Bouck and Burgin then hopped off for Miami, Florida, and continued from there to Havana, Cuba, Yucatan, Mexico City, Managua (in Nicaragua), and thence to the Canal Zone. Here Bouck established something of a record when he got in direct touch with the New York *Times* radio station in New York, a distance of 2,500 miles.

At the time this issue of RADIO DESIGN went to press (second week of June) the fliers were preparing for the next jump to Peru.

A Few Wrongs to Be Righted

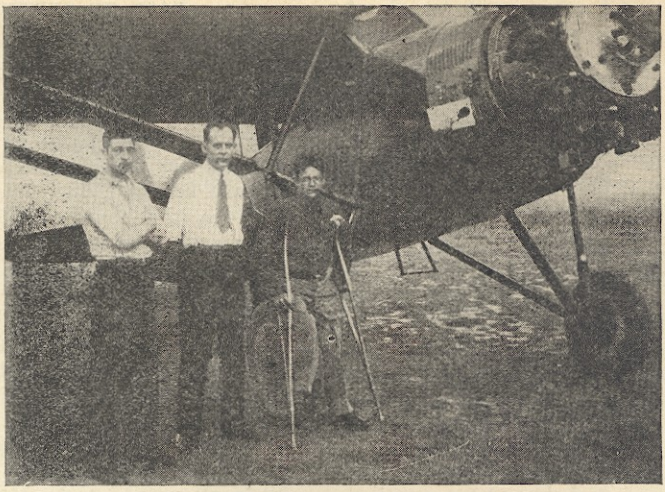
(*Continued from page* 41)

very instructive, to say the least.

Even the two-stage audio amplifier in our short-wave receivers has a good reason for existence; namely it permits us to work the detector at a low level where we get the benefit of the square-law just mentioned and in addition are able to make regeneration work smoothly and controllably.

These things are perhaps all transient, but I judge that it may have been interesting to you to run over them with me and to see how the regenerative detector —abandoned at broadcast wavelengths— is a highly useful tool at short waves. If in the process we have also discovered that the manufacturer is in this case not a stick-in-the-mud but an astute judge of value—well and good. I told you that I was not a reformer and got no delight from throwing bricks.


BERMUDA
EIIR
FIRST COMPLETED FLIGHT BETWEEN
U.S.& BERMUDA - STINSON`PILOT RADIO´1930
MONTGOLFIER 1783-1983
30c



The "Three Musketeers" on their arival in Rio: Hot, tired and dirty, but happy.

Making Radio History in South America With the Airplane "Pilot Radio"

By ZEH BOUCK

SITTING here on the terrace of the Gloria Hotel, Rio de Janeiro, rather ruminative in the early evening breeze blowing in from the "Sugar Loaf" across the harbor, it occurs to me that it is exactly three months since that hectic morning of May the 14th, when we waved au revoir to the escorting planes over Roosevelt Field, New York, and set our earth inductor compass for the general direction of South America.

Six hours before, at one a. m., to be precise, we had completed the radio installation and the final motor check-over. Both the radio and the motor had been thoroughly overhauled following our return from Bermuda, the radio transmitter being altered from a simple oscillator to an M. O. P. A. arrangement. The receiver is the same used in the Bermuda flight, an A. C. Super-Wasp slightly modified for operation from batteries. It was essential that these be given some sort of flying test before definitely starting south, and so, at one-fifteen that morning, the chocks were pulled, the plane taxied to one end of the field, and we took off into the flood lights. A half hour later we were down again, reasonably well satisfied with things in general and the arguments in favor of a few hours' sleep in particular.

Upon returning to the field at six a. m., we found the mechanics putting on the finishing touches in the way of turning the prop around one hundred and eighty degrees to take out a slight roughness in the motor.

Our South American Good Will Flight is headed by Captain Lewis A. Yancey, navigator, famous for his flight to Rome the summer before last, and the Bermuda flight made in the "Pilot Radio" with Bill Alexander and the writer.

Our pilot is Emile ("Eddie") H. Burgin, veteran transport flyer and maker of the best showing in the New York to Los Angeles races, in which flight he flew, by the way, with Captain Yancey.

The third member of the crew is the writer, in charge of communications over W2XBQ and LU4A, the latter call being the Argentine designation used for most of our experimental South American work.

The first leg of the journey was to Washington, D. C., on which we had the honor of the company of Mr. I. Goldberg, president of the Pilot Radio and Tube Corporation. We ran into some pretty nasty weather just north of Wilmington, but managed to get through to keep an engagement with President Hoover that afternoon. All of us shook hands with the President, and this was more or less our official send-off. Our next stop was Jacksonville, Florida, and from there to Miami.

AU REVOIR U. S. A.

It was on the hard coral runway of the Pan American field in Miami that the wheels of our plane last touched the soil of North America. I was going to say U. S. territory, but this would have been slightly inaccurate, for France Field, Panama, is technically within our country.

On Saturday, the 17th of May, we took off for Havana, Cuba, following the Florida coast down to the keys, and then the ninety-mile over-water hop. It was on this flight that we first came into contact with and had occasion to realize the efficiency of the Pan American airways radio communication system, by means of which all of their planes are in constant touch with two or more land stations for the handling of general traffic and the reception of weather reports along their many and varied routes.

Readers of RADIO DESIGN *will recall two previous articles by Mr. Bouck: "Rolling Down to Rio," which appeared in the Spring, 1930, number, and "How the 'Pilot Radio' Made the First Bermuda Flight." In this latest article Mr. Bouck describes the high spots of his 22,000 mile tour of South America, with Lewis A. Yancey and Emile H. Burgin. This is the very first story of this history-making flight to appear anywhere.*

The Pan American two-way radio communication system was developed mainly for plane dispatching and weather reporting purposes and it is the efficiency with which these functions have been carried out that accounts for the truly remarkable record of safe flights completed on schedule by this air transport organization, the largest and most successful in the world. Their pilots on more than one occasion have told me that they would never consider making the flights that are almost their daily diet without the invaluable co-operation of their communications department.

At the present writing there are probably close to fifty land stations being operated by the Pan American Airways, receiving TR or position reports constantly from all planes, and transmitting weather information. It is most improbable that a plane, availing itself of the facilities offered by this communication system, could be forced down without its exact position being known.

With the perfection of aircraft, weather remains the pilot's principle worry. For consistent commercial air transport, it is not sufficient to know the general weather along a route at the time of take-off. Out-guessing rapidly changing weather conditions has been responsible for the majority of crashes in the past ten years. Every fifteen minutes or so (and oftener if weather conditions alter suddenly) the radio operator on a Pan American plane hands the pilot a complete report on the conditions existing at that minute on the route directly before him, or over any particular variation, should the pilot deem it desirable to change his course.

These weather reports are taken down on a special weather report blank, arranged to save time and insure accuracy. The following questions are answered, always in this order, and every question always answered: Origin, time, date, to, General Weather Conditions, Horizontal Visibility, Height of Base of Lower Predominating Clouds (in feet), Amount of Sky Covered with Lower Clouds (in tenths), Total Amount of Sky Covered with Clouds (in tenths), Direction of Surface Wind, Force of Surface Wind (M. P. H.), Weather Conditions During Preceding Hour, Rainfall, Field Condition, Barometer and Tendency, Temperature—Dry—Wet Remarks, Signature.

The answers to these questions only are transmitted, each individual report being separated from the preceding and following item by dot dash dot dash. A completed weather report can thus be transmitted in about one minute.

EN ROUTE TO MEXICO

On leaving Havana, we ran into bad haze, but a weather report from CZ, Cozumel, the island off the eastern coast of Yucatan, told us that everything was okay ahead. Later on Merida, MY, our destination, sent us a similar report, and sure enough, the weather cleared beautifully over the Yucatan prairies, one of the most desolate and arid stretches I have ever seen. The heat fried up from the ground in definite waves that registered

on our oil temperature and in the severe bumpiness of the flight. We landed at Merida after some seven hours' of non-stop flight from Havana, two hundred miles of it being over water. After an interesting evening in this town of windmills, the capital of Yucatan, and a good night's sleep, we made an early take-off the next morning for Vera Cruz, six hundred miles north.

Once again we ran into thick weather, and seriously considered putting the ship down at Villa Hermosa, where, according to a report from the station there, VH, the weather was clear. However, a subsequent report from VC, Vera Cruz, showed clear weather ahead, and we had no hesitation in pushing through.

WE JOIN THE "MAYAB"

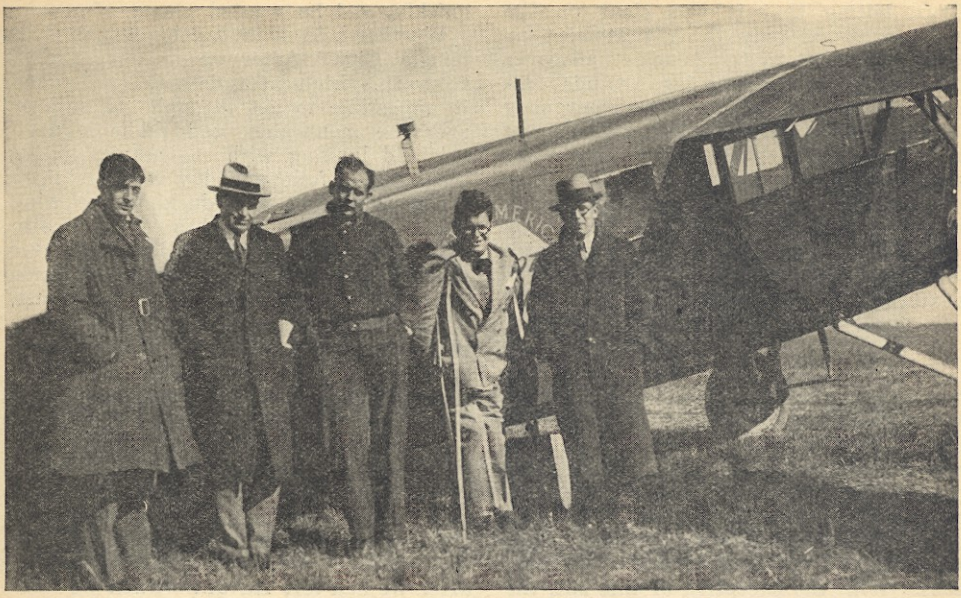
At Tejeria, where the airport is located twenty miles west of Vera Cruz, we met up with the Sikorsky Amphibian "Mayab," carrying the remains of General Sider and his unlucky companion who crashed on an attempted non-stop flight from Central America to Buenos Aires. The "Mayab" was piloted by Eric Williams, and belongs to the Governor of Yucatan. It is named the "Mayab" in honor of the virgin who was yearly sacrificed to the god beneath the "Pool of Death" in the olden Mayan rites.

It was impossible to get through to Puebla that afternoon, due to clouds over the mountains that shrouded the peak of Mount Orizaba, rising twenty thousand feet above the sea.

The next day we made the attempt along with the aerial funeral cortege, but only one plane, part of the military escort, got through—more by accident than anything else, for he literally bumped twice against the railroad running over the pass. The rest of us turned back to Tejeria after two hours of dodging the clouds that ever threatened to close in on us.

An early rain the following morning cleared before seven o'clock, and riding out from Vera Cruz on the train we could see the snow-capped glory of Orizaba a hundred miles to the west. Burgin made a quick take-off, and we reached the mountains before gaining sufficient altitude to get through. We circled for fifteen minutes, and then, fifteen thousand feet above sea level, passed south of Orizaba, towering over us, and safely into the Puebla valley.

The desolate grandeur of the Andes Mountains makes flying interesting as well as dangerous. The "Pilot Radio" passed over this spot on the way from Santiago to Mendoza.



In Buenos Aires, just before going up to establish a new radio-telephone record. LEFT TO RIGHT: *Burgin, Leigh Wade, former U. S. Army ace; Yancey, Bouck, and A. B. Hoffman, engineer for the I. T. and T. Co.*

At Puebla, a quaint Mexican half-city half-town that still echoes faintly its previous Aztec civilization, we became officially the American escort to the ashes of the unfortunate fliers, and we were requested by the Mexican Government to radio through every fifteen minutes the progress of the flight from Puebla to Balbuena Field, Mexico City. Yancey, Burgin and myself were subsequently decorated for our successful participation in the flight.

We laid over in Mexico City for a motor check-over through the always hearty co-operation of the Wright Company. While there we carried on some interesting experiments in communication from the plane on the ground, employing an emergency antenna, with Mexican signal corps stations. We actually had a hard job convincing the Army officers that the equipment in the plane was not for immediate sale.

We left Mexico City on the twenty-ninth of May for what turned out to be one of the closest calls on the flight. Mexico City is seventy-two hundred feet above sea level, twelve hundred feet higher than Puebla, where, by the way, we took down a flag at the far end of the field on our take-off. The higher the landing field the more rarified the air, and consequently higher take-off and landing speeds result. Also, the plane is more reluctant to pick up speed. We barely cleared the trees at Balbuena Field, and headed down the valley for the pass through the Puebla. We found this completely closed, and decided to try the north pass. In passing over the field we were joined by Colonel Leon in a Douglas who, we learned later, had been searching for us on the theory that we had crashed shorty after our take-off.

We found the northern pass, and were just about to shove our nose through when the oil pressure dropped, and we decided the risk was too great. Turning back to Mexico City, I raised the Pan American station and asked them to page Eddie Walsh, the Wright mechanic, at either Sanborn's restaurant or the Regis Bar, and have him rush out to the field. He arrived ten minutes after the plane, and a half hour later, with a microscopic bit of dirt removed from the oil valve, we were on our way again, after another hair-greying but skillful take-off!

As we headed into the pass, just a few minutes too late in the day, we started dodging rain squalls, with the clouds closing in behind and in front of us, and dropping down upon us from above. We were flying along, part of the time, with less than a fifty-foot ceiling. We did not dare climb through it for fear of running into Orizaba or any one of several other lofty peaks. A weather report from Vera

Cruz, telling that it was clear on the coast, was the only thing that kept us going. We were by this time actually over the hump, and were losing altitude continuously. Once we passed an emergency landing field, and someone tried to wave us down with a blanket. But we were past almost as soon as we saw it, and in the valley there was not sufficient room to turn around.

The sun shining on the sea ahead, with the mountain dropping rapidly away beneath, was a happy sight to us!

MORE BAD WEATHER

We ran into bad weather again on the hop from Vera Cruz to Guatemala City. We were fortunate here in having the company of one of the Pan American Fords making the run as part of its regular passenger service. Guatemala City is located five thousand feet above the sea, and in all but the very best of weather can be approached, by air, only through a narrow pass. With the exception of this slit, the city is surrounded by ten thousand-foot mountains. The pilot of the Ford knew the pass like a book and led us through, with a radioed warning back to us to stay far behind, because, if the pass closed in on him, he'd have to turn back quickly, and he wanted plenty of room.

Weather held us up another day in Guatemala City. After an uneasy take-off from this high altitude field, we found it impossible to get through the pass or over the mountains, and Eddie made a splendid landing with the heavily loaded plane. The following day we were more successful, and after ducking one wing dizzily under the branches of the tree to our right while lifting the left wing over the top of a second tree, we finally made altitude, and got through to the coast, where we found clear weather. We immediately radioed this fact to Guatemala, where a Ford was waiting for a break in the weather before starting north for Vera Cruz.

We made Nicaragua that afternoon in good time. Managua is about the hottest place this side of hell, and at times it is said that hell merely runs it a close second. It was here that we learned that our signals had been picked up QSA4 shortly after we had left Havana—when we were calling Cozumel for a weather report. This was about two in the afternoon, Managua time, the worst part of the day for reception, and over a distance of about fifteen hundred miles.

We spent the evening with the opera-

Even at night the "Pilot Radio" always attracted a crowd. This photo was taken at Buenos Aires. Bouck may be seen with his head sticking out of the window of the radio cabin.

The famous Christ of the Andes, located on a pass 13,000 feet above sea level, through which airplanes pass. In the background is Mount Aconcagua, the highest peak in either North or South America.

tors of the Marine amateur station NN1NIC, Lieutenant Fike and Sergeant Martin, and sent a number of messages through to Rosenthal, U2UO, in New Rochelle, New York.

WE DON'T LIKE THE LOOKS OF A FENCE

The boogey of spectacular take-offs was still with us the following morning. We were carrying a heavy load of gasoline, and the field was short, rising to a hump in the middle, with fences on both ends. With the tail slapped up against the western fence, Eddie gave her the gun, and the "Pilot Radio" rolled lumberously toward the center of the field. Finally, half way down, he got the tail up, and we gathered speed with the other fence becoming more and more definitely in the way. Desperately Eddie tried to bump her off, while I stuffed a brief-case between me and the gas tank. She'd hold the air for a second, then settle. Eddie pulled the wheel back to clear the prop—a sudden jolt and good-bye fence. But we held the air, our landing gear was intact, and we finally made altitude, dodging several bad storms in the southeast. That afternoon, at three-thirty, we landed at France Field, Panama.

At France Field our motor was given a check-over by the Pan American mechanics. Perhaps here is the place to express our appreciation for the co-operation that this highly efficient organization has offered us throughout our flight—in radio, fields and every facility at their own disposal.

Pan American and United States Army officials were interested in our radio equipment, and we arranged a schedule with the New York *Times* station, WHD, in the way of a demonstration. On arriving at the field, we discovered that the motor cut badly on one magneto, and so we were unable to fly. However, curious as to the possibilities of an emergency antenna, we strung out a wire over a step-ladder, and made contact with New York without difficulty, a distance of some twenty-five hundred miles, in daylight! We met with even greater success (as was to be expected) the following afternoon while flying, and sent through some fifteen hundred words of press and general messages.

The next hop was a long one, twelve hundred miles to Talara, Peru. Then to Lima, down past the barren Peruvian mountains topped with ancient Inca temples. From Lima to Camana, to Antifogasta, Chile, to Quinteros and to Santiago. Our radio communication during this part of the trip was with station CPU, owned by the Standard Oil Company, and located at Yucuiba, Bolivia. This is but one of the many forms of co-operation extended us by this organization.

Twice, on this trip down the desolate west coast of South America, we were

forced down by night: once at Camana, and at Quinteros. At Camana, after circling in the dangerously darkened twilight for fifteen minutes, a boy waved us toward a strip of sand used occasionally by planes for want of a better field. So we set her down, and spent the night in this quaint but uncomfortable Peruvian village.

Once again night caught us as we were heading across the mountains separating Santiago de Chile from Valparaiso and the sea. As the sun set on us, ten thousand feet in the air, it was pitch dark in the valleys and grey dusk on the shore. It was risky to try to make it, so we came down, and while concentrating on a perfectly good cow pasture, we overlooked a genuine airport not one thousand feet away!

I volunteered to stay with the plane overnight to keep off the cows, which animal has a notorious fondness for airplane fabric. Yancey and Burgin brought me out some sandwiches, blankets, a bottle of wine and a bottle of Cointreau. (The latter, however, turned out to be water, for which they paid good money!) After arguing with the cows for a few minutes on the superior delicacy of grass over linen and dope, I turned in and slept well.

The next day—Santiago.

A NEW RECORD

It was here that we made a real record by working New York City, our old friend WHD, from the ground with an emergency antenna. Pending repairs to our tail wheel assembly, we were unable to fly, but held reliable communication for several hours on two occasions, with our trailing wire antenna laid across the top of an automobile.

The hop to Mendoza, over Los Andes or Las Cordilleras, is the most inspiring flight I have ever made. Los Andes are one long range of Orizabas, the lowest pass being 13,000 feet above the sea. And it is dangerous to fly through it at less than sixteen thousand feet, due to the bumps which may drop you twenty-five hundred feet in five seconds! We passed through the southern pass at seventeen thousand feet, over the most incredible heaps of desolate grandeur I shall ever see.

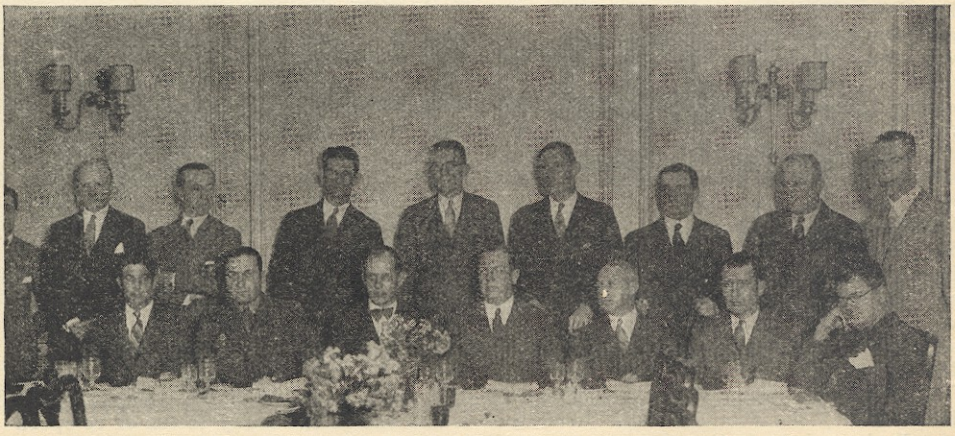
After gassing up at Mendoza, Argentina, we took off for Buenos Aires, bettter known as "B. A." Head winds as usual, and we dropped in at Villa Mecerdes for the night, one of the most beautiful airports we have ever seen. We landed at Buenos Aires the next afternoon at three o'clock, the twenty-seventh of June.

TELEPHONING AROUND THE WORLD

From B. A. we immediately established two-way radio telegraphic communication with WHD both from the ground and from the air, setting a final and definite record for airplane communication.

Then, with the co-operation of the International Telephone and Telegraph Company, we set about making an entirely different sort of a mark for others to shoot at. The I. T. and T. operates two short-wave telephone channels, one to Madrid, Spain, and the other to New York, U. S. A. These channels are absolutely

(Continued on page 49)



A luncheon at the American Club in Buenos Aires given by the Standard Oil Company. Seated, at extreme left, is Burgin, with General Pinedo, famous Atlantic flyer, between him and Yancey. Bouck is at extreme right.

Making Radio History in South America

By ZEH BOUCK

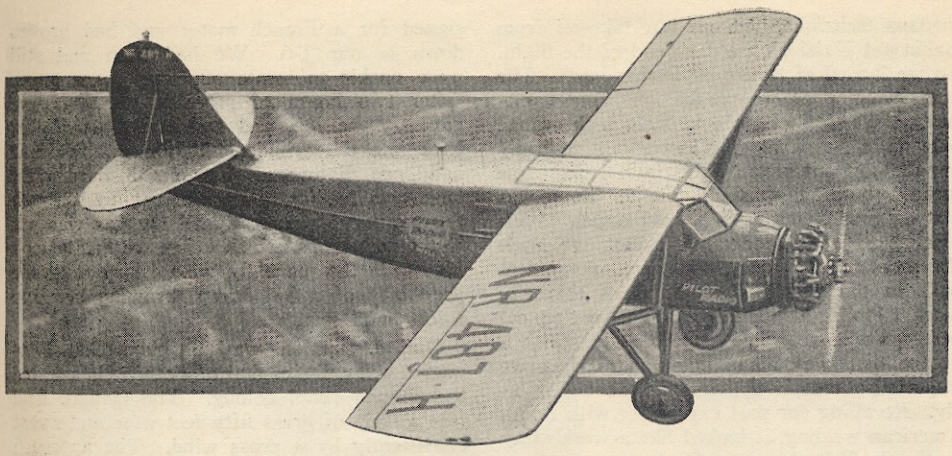
(*Continued from page* 18)

The actual talking circuit was rather complicated. For instance, in calling a New York number from the plane, the following speech circuits were tied together: The plane transmitted and received simultaneously, transmitting on about thirty-six meters and receiving, through its own carrier, on about fourteen meters. The radio wave from the plane was picked up on a field strength measuring set at Platanos, some fifty miles away. Here it was amplified, and transmitted by wire to the central station at Cuyo, and then to the New York transmitter at Hurlingham. From Hurlingham it went to New Jersey on the short-wave beam. Picked up here, it was re-amplified, put through to a central station, thence to a regular telephone central station, and via the usual land line to the number of the subscriber being called. The return voice signal went through the usual telephone central stations to a radio central station, and then to the beam transmitter at Lawrenceville, N. J. The beam was picked up on the special beam receiving antenna at Platanos, sent through to Cuyo, from Cuyo to Hurlingham, back on the air on the Madrid channel, and finally picked up on the plane!

Among the calls made were two to Mr. Goldberg, president of the Pilot Radio and Tube Corporation at Lawrence, Mass.; the San Francisco *Examiner*, to Ramon Navarro, in Hollywood; to Arthur Loew, theatrical magnate, in Glen Cove, N. Y., to the New York *Times;* calls to Mrs. Yancey, Mrs. Burgin and Mrs. Bouck; several calls to Europe, one to the S. S. *Majestic*, still a day's steaming from Southampton, via another radio transmission from London; and our crowning achievement, a call to Sydney, Australia.

This last circuit was undoubtedly the longest voice or telegraph circuit ever attempted. Transmitting over the Madrid circuit, the voice was carried on land line to Rugby, England, and then by radio again to Australia, a circuit of some eighteen thousand miles!

The flight from B. A. to Rio was uneventful. We stopped at the Aereo-Postale fields, the French air mail operating company which is co-operating with us on our flight up the east coast, at Porto Allegro and Florianapolis. We are waiting in Rio now for a final motor inspection, and expect to be away again on the final leg of the journey in a few days. Though we have already covered sixteen thousand of our twenty-two thousand miles flight, there is still much interesting territory before us. I hope in the next issue of RADIO DESIGN to tell you the story of our take-off from Natal, the flight over the two hundred-mile wide Deltas of the Amazon and Orinoco Rivers, a brief stay in the French Penal Colony at French Guiana ("Devil's Island") the hop across to Trinidad, to Port of Spain, Porto Rico, Miami and home!



Rolling Up From Rio

The Last Leg of the Historic Flight of the "Pilot Radio" Around South America

By ZEH BOUCK

THE "Pilot Radio" took-off from the Campo Alphonse, Rio de Janeiro, early Monday morning, the 1st of September, 1930. This was really our start for home, and with good luck we hoped to make Roosevelt Field, New York, in eight days and eight hops—Bahia, Natal, Para, Cayenne, Port of Spain, Puerto Rico, Miami, and New York. The motor of the plane had been overhauled in Sao Paulo, and though forced down by a sticking valve on the return flight to Rio, we figured that by now the valve guide had been worn in and our troubles were definitely behind us. New York and the cheering throng at Roosevelt Field were just beyond the horizon as we sailed forth over the beautiful harbor of Rio, stretching south in a double horse-shoe on each side of the Pao de Assucar. The sun had burned away the morning mist before we turned our tail on Copocabana and roared confidently west toward Bahia.

Two hours later the motor coughed, roughened up, and lost revs. A sticking valve again! Just east of Campos, Eddie Burgin picked a field and set the plane down. We were almost instantly surrounded by a crowd of ferocious looking natives that made up in machetes what they lacked in teeth. Armed with nothing but wrenches, Yancey and Burgin clambered out of the plane, tapped the valve back into place, and packed the rocker box with grease. We took-off again through the mass of Brazilian humanity that parted respectfully on each side of our whirling prop like the waters of the Red Sea about the Israelites. An hour later we passed over the Aeropostale Field at Victoria. We spotted the field mentally, and recalled its position when, a half hour later, we returned with another sticking valve!

We made our third take-off a half hour later, but with the time out it was obvious that we could never make Bahia that evening. We raced the shadows and dropped down on the Aeropostale field at Caravellas, just as the sun made a three point landing behind the western hills. We spent the night at a tiny hotel kept by a bird fancier, lulled to sleep at eight o'clock by the warbling of a hundred different species. We were up at three a. m., broke fast and paid our bill, which, all inclusive—dinner, rooms and breakfast for the three of us—came to fifty-six milreis. This is fifty-six thousand reis—five dollars and a half American money!

We were four thousand feet in the air before the sun sent up the first rays from the rim of the Atlantic, regilding the faded gold on the under surface of our wings. We had wasted an hour in returning to Victoria the preceding afternoon, and the gas situation was becoming unpleasantly problematical. To save miles, we cut across the fifty kilometres of water between Cayru and Bahia.

Gassing up was subjected to the usual

mañana technique, and our late take-off from Bahia put Natal on the dark end of the flight. So we landed at Recife or Pernambuco. The next morning as we revved her up, the exhaust stacks stabbing the twilight with orange blue darts, we found the motor cutting badly on the left magneto. The faulty plug was located, but, badly stuck, another hour was lost digging it out with a cold chisel. Welcoming a day of comparative rest, we made the short hop to Natal, and were prepared to bask in the friendly hospitality of this city when I looked at our tail wheel. An eloquent gesture to Yancey and Burgin called forth a groan, that was made unanimous when we inspected a completely wrecked wheel assembly. Recalling our past experience with South American welding, it looked like a week's stay in Natal. But to our gratified amazement my high school French elicited the fact that the Aeropostale mechanics could and would do the necessary welding "aujourd hui"—gratified amazement that my French worked and that the job could be so expedited.

We had considered our hop from Natal to Para one of the most hazardous in our flight, having given a believing ear to the myths of danger about the delta of the Amazon. But instead of finding it a desolate and dangerous region, it was our relief and genuine luck to discover the most consistent stretch of well populated and excellent flying country we had looked down upon since the Argentine pampas.

THAT STICKING VALVE

I write "luck," because just seven hours after taking-off from Natal, while right over the center of the legendary bad lands, our motor conked again with a sticking valve. Forced down, Eddie picked a field that any airport might envy as a runway, and glided in to his usual perfect landing. Once again we were immediately surrounded by natives, but of a wilder variety—more distinctly Indian. They watched Burgin and Yancey curiously as they tapped back the valve and hopefully stuffed the rocker box, but scattered when the motor was started. They watched our take-off from behind bushes and small trees. An hour and a half later we were over the Para River and had located our landing field, a farm belonging to a Frenchman who had marked the preferred runway with flags. We had covered 1475 kilometres in just eight hours and a half.

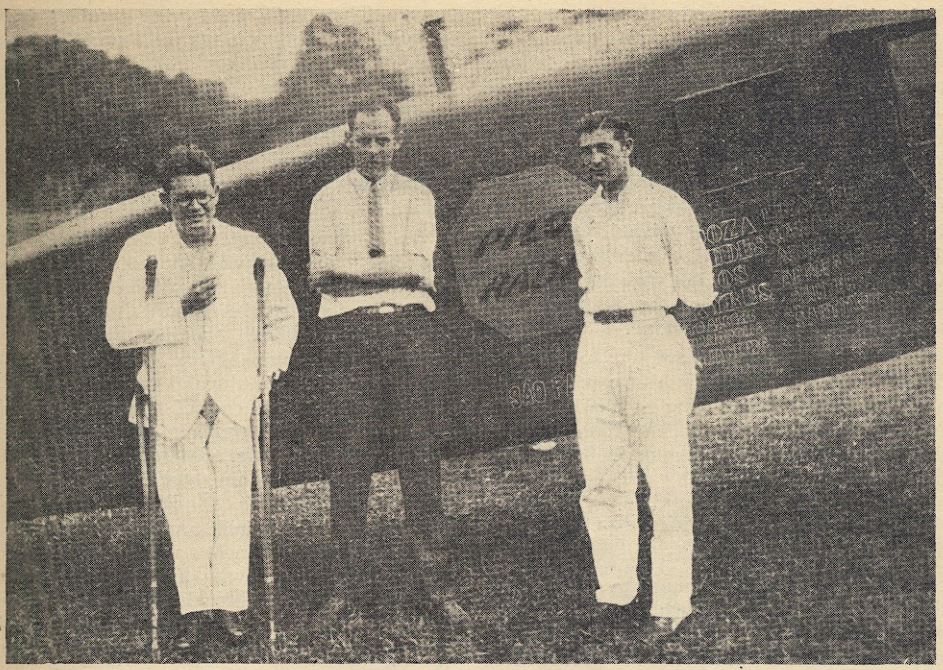
In landing on the rather rough field the fork in the tail wheel assembly was badly bent. This was straightened after a fashion, and refitted at four o'clock in the morning.

But still additional troubles added to the intriguing possibilities of a consistently sticking valve. The spark plug we had put in at Recife had gone haywire. It had been designed for a French motor and had broken down in our J-6. We had been and still were unable to locate our own spare plugs. After two hours of repeated cleanings, we gave up the job, and stuffed the dead plug back into the cylinder. In the meanwhile it had been discovered that our inboard right tank was leaking gas quite rapidly through the gauge, so practically all the gas was put in the port tanks, which, when we finally took off, made the plane fly wing heavy with the possibility of a bad bump throwing her into a left hand spin.

Our destination was Cayenne, 930 kilometres away, the capital of French Guiana and the French penal colony. The landing field was a strip of grass fifty feet wide and swept consistently by a cross wind. The approach was to side-slip down the slope of a high hill, clipping the top branches of the trees, and slip her clean to the ground to counteract the cross-wind. Eddie made one of the most difficult landings of the flight, and it is to his skill and credit that the side-swiping motion did no more damage than to wreck the already weakened tail fork.

With the tail skid repaired, but still with a leaking gas tank and a Champion motorcycle sparkplug in our number two cylinder, we took-off at daybreak the next morning, after a restful night spent in a hospital presided over by French nuns. We careened down the narrow runway, but took-off with plenty to spare and headed north for Port of Spain, Trinidad. Our course cut across the Delta of the Orinoco, north of Georgetown, for three hundred miles of the worst flying country I have ever seen. The tropical forest is unbroken except for muddy rivers, the estuaries of the Orinoco. There is neither habitation nor beach, nor any sort of place where an airplane could be put down, or its

In this article, the last of a series of three, Zeh Bouck takes up the story of the "Pilot Radio" South American Good Will Flight from Rio—where he left the reader in the last issue of RADIO DESIGN. *Bouck was the flight engineer and radio operator on all the history making flights of the "Pilot Radio." This plane was the first to fly from the United States to Bermuda, and the first to circumnavigate South America. This article tells the story of what we believe to be the first successful aircraft SOS —the first time an airplane has made contact, through a distress call, with a land station which stood by with aid until assured of a safe landing.*



The "Three Musketeers" of the air, posed for one of the last photographs of the "Pilot Radio". Left to right: Zeh Bouck, Lewis Yancey and Emil Burgin. Notice the names of the cities painted on the side of the plane.

occupants seek succor should they escape a crash—an interesting observation, made silently by all of us, with attentive ears tuned to the motor. Ordinarily the valve stuck only once every eight hours, but rules are made to be proved by exceptions.

Fog and rain drove us out to sea as soon as we began to feel fairly comfortable about being over the worst of the hop. Here, with land a faint hazy line ten miles to our left, we had to dodge repeated squalls that were building up into a hurricane. Flying low, skimming ten to fifty feet over the water, we'd fly between the dark storm centers, blinded by rain even in these comparatively calm areas, and tossed about by violent bumps.

As the southern coast of Trinidad loomed up through the mist, we could see that it was clearing to the north, while an apparently endless line squall was building up in the southern and western areas. Yancey, however, determined to brave the latter, as we had been informed that an excellent landing field existed in the neighborhood of the oil wells. And so we crashed head-on into the worst bit of weather we had yet encountered. Skimming over the palm trees, visibility was less than five hundred feet, the torrent sweeping back over the glass windows of the cabin like a tidal wave. We cut across the south western point of the island, and headed out to sea over the Gulf of Paria—into fog and worse rain. With our wheels almost in the water, I, personally, figured it was a case of a friendly obit to "Three good will fliers." I grabbed a bundle of clothing and packed it between myself and the cabin gas tank, to prevent the tank from going through my ribs in the crash. Just then Yancey got his bearings, and ordered Burgin to cut into the right. As we picked up the shore line, we found it still clearing to the north, and the sun was shining when we flew over Port of Spain. I tossed the bundle of clothing to the floor. However, neither Burgin nor Yancey wanted to land on Queens Park, and decided to fly south again in search for the field near the oil wells, which, by the way, never existed! So back we went, into the storm, with the motor spitting from rain in the carburetor, a quarter hour's supply of gas in a fast leaking tank, and a valve just about due to stick after eight hours of flying!

Back we went, headlong into the torrential rain, and sure enough, thirty-five miles south of Port of Spain, the valve stuck! We picked out an old race track, soggy and overgrown with tropical foliage, and Eddie prepared to slip her in. I tossed all our baggage aft into the radio compartment, and Yancey climbed in after it—to get as much weight

in the tail as possible and reduce the probability of the plane going over on its back as the wheels sank in the soft stuff. Once more I placed the bundle of clothing where it would do the most good. Eddie slipped over the fence, stalled the plane, and pancaked. As the wheels touched, the tail raised, but dropped again as we slushed to a quick stop, a hundred feet from the fence! Congratulations were very much in order all around. The only damage was to the tail wheel fork. A new fork was forged in a local shop while we enjoyed the hospitality of the British operators of the oil wells.

The next day I motored up to Port of Spain, and the following morning, ten minutes after I directed the placing of a white landing "T" on Queens Park, the "Pilot Radio" droned over the hills and came in for an easy landing.

BACK ON AMERICAN SOIL

We lay over in Port of Spain for two days, checking the motor, reaming the valve guide that had given us so much heart ache, and painting on the fuselage the names of all our stops since Rio. We took-off for Puerto Rico just before sunrise, Wednesday morning, the eighth of September, flying north through the sombre pass known as the Dragon's Mouth. We flew up the parabola of the Windward and Leeward Islands, watching each spot of land climb over the horizon as the last island sank beneath the sea behind us. Coming in south of the Virgin Islands, the ceiling dropped and we dodged rain squalls north of Puerto Rico, heading in the Pan American field at San Juan, virtually out of the mist. Here our wheels touched American soil for the first time since the "Pilot Radio" rolled down the soggy turf of France Field, Canal Zone, some three months before.

Eddie taxied the plane up to the passenger depot, and Yancey unfolded himself stiffly from a posture that, after eight hours of flight, was approaching rigor mortis. As Burgin unstrapped himself, I gesticulated eloquently to a gaping hole under the right wing, where, when I had last cast an eye in that direction, the gas gauge had wobbled uncertainly in the slip-stream.

"Thank the Lord!" breathed Eddie. "That thing is gone at last! We'll patch the hole and let the motor get some gas for a change. That's the last of our troubles! Jack, my lad, and we're in the U. S. A. now!"

That evening Captain Yancey opened the door between our adjoining rooms.

"How about a schedule with WHD, New York, tomorrow?"

"Okay with me. What time shall we make it? We're taking off with a pretty big load, so I'll probably have to stay up forward until noon. Then we'll want some weather from the Pan Am stations, and we'll probably have a few TR's and other traffic from Miami. How about cabling them to standby at three, Eastern daylight saving time?"

"Right-o!"

And we turned in early, under a vast net that kept the heat in and the bats and mosquitos out.

As a last gesture of Latin American "mañana," our car was late at the hotel the following morning, and when finally the motor was warm, the exhaust flames stabbed almost invisibly into the morning light. It was exactly seven o'clock Eastern daylight saving time when Burgin turned the plane around at the far end of the field, revved the motor wide open and let up on the brakes. The "Pilot Radio" lurched forward, but picked up speed rapidly on a fast runway. As the Pitot tube jabbed the wind, the airspeed needle swung over—40—50—60—70—80 miles an hour. Not sure what she would do with the load, Eddie held her down, taking the whole field, and then zoomed her over the bay. Perhaps the old ship knew it was her last take-off, and bit the air like a pursuit plane with a glorious toss of her droning motor.

From San Juan we skirted the north coast of Puerto Rico, then hopping across the ninety miles of water to Haiti, with a few minutes out, circling Santo Domingo, hit by the tropical hurricane a week before.

GOOD RADIO CONTACT

Our next water hop was sixty miles over the Windward Passage. We cut to the north at Guantanamo, heading for Sama on the north coast of Cuba. At 11:00 I crawled aft to the radio shack, let out the antenna and after listening for a few moments, called the Pan American station CMG, at Camaguey, Cuba, then about 250 miles west of us. We informed them that we were going straight through to Miami, without stop, and asked for a general weather report. He gave us the WX at Camaguey and a report of probably fine weather over the Bahamas, clean in to Miami. We told CMG that we would not pass anywhere near them, and would probably hit the ocean again to their north east.

We heard several planes working WKDL, at Miami, but were unable to pick up WKDL for some reason. We called CMG again and asked for the exact wave of WKDL, but still no luck in picking her up, though CMG reported through to us that we were QSA at WKDL. Other Pan American stations, as far south as Trinidad, were coming in with good signal strength.

Shortly after noon, CMG shut down for work on their transmitter, and I transferred

my attentions to CMM at Bayamo, Cuba, then about one hundred miles due south west.

At 1:25 we sent through the following position report to Miami, five hundred miles to the north west.

"AT 1:00 15 MILES NORTH POINT SAMA HEADING FOR GREAT RAGGED ISLAND."

At 1:51 we sent the following messages, also to WKDL.

"STANDARD OIL MIAMI—ARRIVE ABOUT FIVE REQUIRE TWO HUNDRED GAS AND TEN STANAVO 140—YANCEY."

"ROY MARTIN MIAMI BEACH—WILL ARRIVE PAN AMERICAN AIRPORT ABOUT FIVE—YANCEY."

These three messages were sent direct to Miami, but, as I still could not hear WKDL, I received my acknowledgements through CMM.

At 2:30 we sent through a TR to CMM that we were passing over Racoon Cay. A quarter of an hour later, CMM was still pounding in, and I told him that I was going to shift to a lower wave (we were operating under two licenses, the American W2XBQ and the Argentine LU4A, which provided us with a liberal allowance of frequency channels) for a schedule with New York. As I bid him cheerio, I said that I'd probably not work him later, when I returned to the Pan American 54 meter wave, as by that time I should undoubtedly be receiving WKDL. With a final 73 (best regards), I signed off, with ten minutes left for the necessary shift. The change-over included removing and replacing two receiving coils, one transmitting coil, the retuning and reneutralization of the transmitter and the shortening of the antenna. I was ready for New York at 2:59½.

At 3:00, just as I cut in the generator, one cylinder of the motor quit cold—undoubtedly a sticking valve. Hitting only on eight cylinders, the motor roughened. Burgin cut her down to about fifteen hundred r.p.m. to lessen the strain. I reeled in the antenna and went forward, to ease the flying and for instructions.

The situation was interesting—out over the open ocean in a land plane with motor trouble. With a glance at his chart, Yancey told me to raise someone quick, and I went aft again. A quick juggling of coils, neon tubes, dials and the antenna reel, consuming exactly one minute, and I was back on the Pan-American calling wave. CMM was my best bet, but to make sure that someone would reply, I interspersed the call with SOS. Before the roar of the dynamotor died down in the ear 'phones, CMM was back at me with a quick "K" (go ahead). I told him we were having motor trouble, and please standby for position report and further instructions.

Yancey knew exactly where we were. He passed me back a sheet of paper, and the following messages went back and forth in quick succession:

"POSITION SIXTY MILES WEST SOUTHERN POINT LONG ISLAND."

"LAT 22 R 25 LONG 75 R 45 HEADING GREAT EXUMA ISLAND."

"ALTITUDE 4,000 FEET BUT LOSING IT AS MOTOR IS REVVED BACK."

"HOW FAR TO ISLAND?"

"ABOUT FORTY MILES."

"HOPE YOU MAKE IT."

"SO DO WE."

Form PAA-CD-2C-1-30

PAA

WEATHER REPORT

FROM Havana TIME 2R30 DATE May 17

To: Yancey W2XBQ

GROUP 1
- General Weather Conditions: Clear
- Horizontal Visibility: unlimited
- Height of Base of Lower Predominating Clouds: 4000 Feet
- Amount of Sky Covered with Lower Predominating Clouds: two Tenths

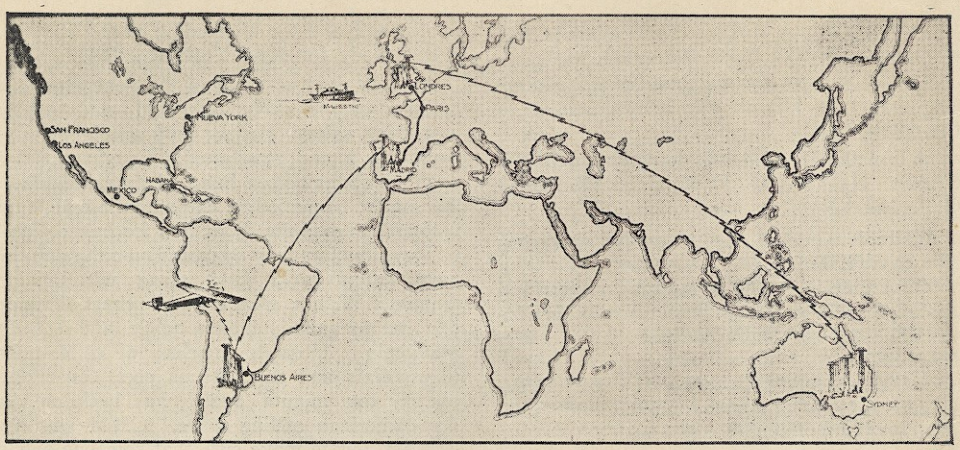
GROUP 2
- Total Amount of Sky Covered with Clouds: four Tenths
- Direction of Surface Wind: South East
- Force of Surface Wind: Ten M. P. H.
- Weather Conditions During Preceding Hour: same

GROUP 3 — Barometer Reading: 30.01 Thermometer Reading: 80 wet 82 dry

REMARKS: Field dry

Nash

Reproduction of a typical weather report received on board the "Pilot Radio" from the Pan-American Airways system. Reports of this kind, sent out regularly, safeguard numerous planes flying over the Pan-American routes.



This map shows the path followed by the radio signals during the history-making achievement of the "Pilot Radio" in telephoning to Sydney, Australia, while flying over Buenos Aires, Argentina.

"WILL YOU REQUIRE AID?"

"SURE WILL IF WE GO DOWN ON WATER."

"AM GOING TO CHARGE BATTERY FOR A FEW MINUTES. PLEASE QRX THIS WAVE. WILL BE BACK SOON OR BEFORE ANYTHING HAPPENS."

"SHALL WE SEND OUT A PLANE FOR YOU?"

"DON'T KNOW WE MAY MAKE IT."

At twenty minutes after three Great Exuma Island crawled over the horizon.

"ISLAND SIGHTED TEN MINUTES MORE TO GO ALTITUDE 1,000. PRAYERS ARE IN ORDER."

"OKAY OM WE'RE PRAYING FOR YOU."

"DON'T TAKE ME SERIOUSLY YOU MIGHT SINK US. ARE THERE ANY SHARKS AROUND HERE?"

"HELL YES PLENTY."

"STILL LOSING ALTITUDE BUT THINK WE'LL MAKE IT."

"OVER LAND EVERYTHING OKAY. SEARCHING FOR LANDING PLACE. WILL WORK YOU FROM GROUND IF WE DON'T CRACK UP. ISLAND INHABITED. TOWN AT NORTH END."

But landing places were scarce, and so was time. Choosing among several beaches and a stretch of what looked like hard sand between a beach and a low hill, Eddie picked the latter, and signaled to me that he was landing. I sent through my last message to CCM.

"LANDING NOW SEE YOU TEN MINUTES IF OKAY 73."

I reeled in the antenna, opened all switches and crawled forward. Again I threw our baggage back in the radio shack to get the weight aft. Yancey went back after the baggage, and braced himself against a cross member and the flooring.

I piled the bundle of clothing between myself and the gas tank and braced myself, grabbing a cross member above my head. I noticed that my hands were perspiring—I had been working like hell during the twenty seconds just passed—and I figured that I had better wipe them on my knees or they'd slip like a greased pig. Eddie was slipping the ship in at the moment, about twenty feet off the ground. I glanced down, and the place looked better than ever. So I didn't bother wiping my hands, and I turned around to remark to Yancey:

"Hell, this is going to be a cinch."

Eddie straightened out the plane—she began to settle—the wheels touched—and the Atlantic ocean poured over the motor and windshield! Things happened. There was a queer grinding noise, discordant cymbals and drums, two dull thuds, and I was lying on my back, on the top of the plane, with the spare parts, pistons, rings, valves, guides, valve springs, raining down upon me from under the seat I had been sitting on a split second before! Right in front of me, in the radio shack, was Yancey standing on his head. He had been so well braced that he had gone over with the plane. I bent my head backward, and saw Burgin hanging upside down from his safety belt, like a monkey on a trapeze. To my left, a half inch from my head, were the storage battery and the dynamotor which had torn loose from the floor, now on the roof. I understood the two thuds. Something salty—blood or acid from the battery I figured—was trickling down my face. I considered my probable disfigurement momentarily, until I realized that it was sea

water, scooped up by the heater in the floor, now dropping down from above.

The door was jammed. Yancey, who had by now righted himself, crawled through the window and opened it from the outside, and we all slipped out onto the wing, none of us hurt beyond cuts, bruises and a general shaking up. We had landed in a swamp. Those smooth hard sands were two feet under crystal clear water! The wheels had not turned over once!

A few moments later we had tossed some of our luggage from the plane, now filled with a foot of water, to a dry spot beyond the wing tip. As I sat on a bag gazing mournfully at the "Pilot Radio" ignominiously on her back, I saw a puff of smoke arise forward, where the gravity tank was located under the instrument board. One of our six tanks blew up before Yancey was altogether clear, blowing off the skin of his right arm. And hour later only a pall of black smoke hung over the scene of our crash.

The skeleton of the plane still lies there on its back—black and rusty against Exuma's sands. May the tropic rains fall warm and sweet upon her!

RESUME

Looking back on the flight and even considering its disastrous end, the enterprise as a whole was successful from both aeronautical and radio points of view. Ours was the first land plane ever to encircle South America. Our direct communication experiments, with the Pan American stations along our course, and with New York City from such distant points as Santiago de Chile and Buenos Aires, prove that aircraft flying can be made as safe as steamer transportation, and that at no time need an airplane ever be out of immediate touch with its home port, even if flying on the other side of the world.

Our relay experiments with the International Telephone and Telegraph Company at Buenos Aires, in which we telephoned from the flying plane to our families in America, and to prominent people as far away as Sydney, Australia, establish the prophetic fact that the passengers of the great air liners of the future will have at their disposal telephonic conveniences even exceeding those which we today enjoy in our own homes on terra firma.

Aterrizaja suave!