

Alfred  
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AUTOBIOGRAPHICAL NOTES

Haraden Pratt

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My birth took place July 18, 1891 in a cottage on a wooded lot at Jones and Lombard Streets in San Francisco, California where my mother's widowed mother lived.

My father, John Haraden Pratt, came from the State of Maine where he was born at Freeport, November 20, 1848, arriving in California in 1873. Studying in Germany he received a Degree from the Leipsig Conservatory of Music in 1881 and prepared for a professional career. Meanwhile his brother employed him in railroad work. His older brothers George and William came to California via Panama in the gold-rush year of 1849 followed by the eldest brother Robert who sailed around the Horn in his own vessel arriving New Year's Day, 1850. Robert later became a builder of the trans-continental railroad, the Central Pacific, having at one time charge of construction between Reno and Ogden. He retired as Assistant General Manager of the Southern Pacific Company in 1897. Father's ancestry was established in this country by the arrival from England of Matthew Pratt in 1623. His ancestors came to England from Normandy with William the Conqueror. The family remained in New England until gold was discovered in California, the last of them leaving in 1875 when grandfather Simeon Pratt was drowned in an attempt to jump on the Charles River ferry at Cambridge, Mass.

Mother's parents came from Germany, via New York and Panama in 1853. Her father was a mining engineer and, for a time, practiced in Virginia, Nevada Territory, before silver was discovered. Father married Sophie Adelheit Christian in 1890. She was born in San Francisco December 21, 1862. Her maternal lineage has been traced back to the Thirty Years' War in Germany at which time the vital statistics' records were taken to Stuttgart, Wüttemberg for safe keeping. Stuttgart was sacked and burned whereas the village of Buchau was not.

Father and mother were both telegraph operators in San Francisco. In those days these operators had their homes connected with a telegraph wire strung over rooftops and maintained by the electrician of the Western Union Telegraph Company, a Mr. Eastman. Father discovered this wire came close to his boarding house room and paid Mr. Eastman twenty dollars to install a loop. One evening someone came on the wire with a stanza from the German poet Goethe. Father, having spent several years in Germany, broke in and supplied the second stanza. Later they married.

When I was five years old mother built a home at 1530 Lombard Street in San Francisco using a small inheritance left by an aunt from Germany. The building is still there. In 1898, my parents had Mr. Eastman wire the house from attic to basement, broke out their old telegraph instruments and

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a telegraph line established. I was taught the code and this intercommunication system was used a lot. This event, no doubt, kindled my interest in electricity which was to become my career. Mother was my teacher until the sixth grade when I was sent to grammar school and then to Lowell High School. Schooling was interrupted by the San Francisco earthquake and fire that started April 18, 1906. I was at my uncle Robert's ranch sixty miles away in St. Helena for Easter vacation and experienced the quake about five in the morning, the bed rolling around an uncarpeted room while I held a glass bodied kerosene lamp, like the Statue of Liberty, to save it from being broken. The shaking lasted almost a full minute the extreme peak coming during the last portion. The house lost the tops of its chimneys which sheared off at roof level and fell in the garden. The same casualty took place at my uncle George's house some five miles away. We could see the red skies over the burning cities of San Francisco and Santa Rosa. Father could not get a permit for me to return for two weeks owing to the food shortage. For months thereafter, I stood in the bread lines daily for the family's rations. Lowell High School started again in January, the hours being from eight to one so the building could be shared with the Girl's High School for the afternoon. Girl's High was not burned but collapsed due to the poor construction that was a feature of the city's corrupt government, its beautiful City Hall and Public Library sharing the same fate. My parent's home escaped the fire by two city blocks.

It was in 1905 that I read in the Sunday newspaper that Major Squier of the Army was experimenting with wireless telegraphy between Fort Mason and Fort Alcatraz using trees instead of wires for antennas. The Signal Corps had established a wireless system there in 1900. Since I lived close to Fort Mason, I wanted to hear these signals and built crude receiving apparatus and an antenna using discarded wire the telephone linemen were throwing in vacant lots (they were replacing galvanized iron wire with copper). My cash outlay was less than one dollar for a telephone receiver from a New York mail order house. I failed to hear any signals. The quake and fire terminated these experiments but when President Theodore Roosevelt sent The Great White Fleet around the world in 1908 I tried it again. It was a school holiday and we went to the Presidio to see the fleet enter the Bay. During lunch this idea came to me. Rushing to the basement and dusting off the cobwebs, sure enough here were the signals, loud and clear. But I did not know the international Morse code they were using but I had a copy of it taken from a library book. Many of the characters were the same, others were transposed such as the number 5 in the American Morse code was the letter O in the International. Mother wrote down the characters while I translated them. The messages had to do with greetings, invitations to officers for parties ashore and acceptances. They were handled through two shore stations of the Navy, one at Mare Island and the other at Yerba Buena Island.

This experience started me again in wireless. A neighbor of my uncle in St. Helena who had at one time been a telegraph operator, purchased equipment and established a wireless

station. Needing someone to communicate with he offered me a twenty dollar gold piece if I would equip myself with a transmitter. With this I was able, in 1909, to have quite a powerful station. It was necessary to wire the house for electric lights and get the power connected. A friend who was secretary of a lumber company donated timbers with which I erected a 110 foot high guyed mast in the back lot. Every morning, for years, at seven before starting for school, I held schedules with other amateurs spread from Los Angeles to Seattle. I was able to improve my apparatus from the proceeds of profits earned on the sale of equipment that I manufactured for other amateurs in my basement workshop. One day a stray horse kicked out one of my wooden mast anchors and wrecked the structure. Another benefactor in the person of a wealthy cousin donated new materials and the mast was rebuilt in 1911 with strong iron anchors this time. Incidents in my wireless education included the burning out of fourteen light fixtures in a nearby apartment house that I had to repair, damaging a special power transformer serving my home so my operations would not blink the lights in other homes and the burning down of a 13,000 volt power line feeding the city's trolley car system when some of my antenna wires fell across it during a storm at night. Luckily, I was not even interviewed about this last casualty although the repair crew worked most of the night.

Graduating from High School in December 1909, I found that nothing was to be gained by entering college before the usual opening in September 1910, so I got a job as a wireless operator on ships. The first trip was to Seattle, Tacoma and Olympia on the S. S. Riverside, a lumber carrier. As a pay cargo she carried black powder to an explosive factory near Olympia but I did not know this until the cargo was being discharged. Broken cannisters of powder on the deck and dock urged me to take a long walk ashore until the operation was concluded. It was at Tacoma that I had a severe attack of appendicitis on a Saturday evening but I did not know the true nature of it ascribing the pain to the food which, on those ships, could have been better. The pain ceased abruptly about three in the morning and I turned in. Sunday I visited a wireless amateur friend ashore (Fred Andrews, later in charge of the army's Alaska Communication System as a commissioned Officer of the Signal Corps), not thinking any more about the indisposition of the previous night. An operation in 1942 revealed that the appendix had ruptured leaving numerous adhesions to liver and kidneys. Nature had contained the poisons and saved my life. The next ship was the S. S. Falcon, also a lumber carrier, going to Portland, Oregon. After that I got the largest oil tanker afloat, the S. S. Pectan, owned by the Union Oil Company of California but flying the British flag. I signed on and apparently had the status of a subject of the Crown for the time being.

This ship had originally belonged to the Dutch Shell Company. They named their vessels after sea shells. A sample of the shell "Pectan" was on display in the salon in a glass case. Because she could not carry a mixed cargodue to leakage

between tanks, she was acquired by Union Oil for carrying crude oil to South America. It was her first trip with wireless equipment and since there was not enough time to complete the installation at San Francisco, I was put aboard with the equipment and made the installation at sea. Also a first on the ship was refrigeration, a large box and ammonia compressor having been installed at San Francisco.. Not long after leaving Port San Luis where we took aboard cargo from the Santa Maria oil field, this compressor started giving trouble its frames developing cracks. It seems that the company's Port Captain had purchased the cheapest unit he could find in keeping with the best traditions of the shipping business. While being overhauled at the Union Works a strike took place and the ship's crew were induced to leave in sympathy with the strikers. So a new crew was shipped, mostly beachcombers and we sailed with the most motley, unkempt party of derelicts imaginable. So the only persons able to use tools were the Chief Engineer and the Wireless Operator (always called "Sparks" because of the spark type transmitters used in those days). Each time we made a repair it was completed before the ice box got warm but, finally, off the coast of Equador coming home, the final breakdown came, virtually unrepairable and, putting some of the meat in brine in casks on the boat deck, all the rest of the perishables were thrown overboard.

The first port of call was Tocopilla, Chile. Leaving there at five in the afternoon, engine trouble developed. A heavy pounding shook the ship on each engine revolution. The captain insisted on steaming eight miles out to sea off a desolate, barren, rocky coast before shutting down. By this time the shaking became ominous. The Chief found that the cover of the high pressure cylinder was cracking. Rolling almost on our beam ends the heavy and hot cover was removed and secured with the assistance of most of the forty five firemen. Disgruntled workers at the Union Iron Works had not secured large capscrews on the top of the piston and they had worked loose thus striking the cover. It fell to the two of us to get the broken studs out in this hot environment and make new screws as the spares had been thrown overboard by the saboteurs in San Francisco. I turned them out on the ship's lathe which had no screw cutting attachments. Looking for a die, the Chief found that also missing but located one having the same thread pitch but otherwise smaller. He made a rig for that and we got under way again about nine the next morning under reduced steam pressure with the damaged cover reinforced with I beams. Limping into Taltal, Chile a couple of days later, the Chief had all this work done professionally by the railroad shops there.

I had an exciting time in Taltal, a town of about 7,000 population. It was the seaport for mines in the mountains. Completely arid, all water was obtained by distillation of sea water. I had charge of the ship's motor boat and ran a ferry ashore. This gave me the opportunity of visiting other ships. I was always handsomely entertained on German vessels with beer, pretzels, coffee and cake. One was the tremendous steel sailing vessel Preussen, hauling nitrates to Hamburg. If she made the trip in 75 days (steamers did it in 60) her Captain received a bonus, otherwise he had to relinquish the ship to

another man and take a small one. I was not allowed to walk on the poop deck it having been freshly holystoned. I saw her towed to sea where all her sails were hoisted. Later that year I read in a French language newspaper found on a Sacramento street cable car, that this fine ship had been completely wrecked in a collision with a steamer in the Strait of Dover, during a fog. In 1957 I saw her ship's bell on display in the quarters of the New York Yacht Club at Mystic, Connecticut.

As we neared the Galapagos Islands further engine trouble came, due to the piston rod having become slightly bent by the previous pounding. This cracked glands admitting live steam to the engine room. Each of the three cylinders had three glands. The Chief borrowed one from each of the other two and we moved at reduced speed to keep the steam pressure down. Salt water showers were installed and the engine room crew stood under them for two hour shifts in a temperature that ran to 139 degrees in the tropics. Later, on a suggestion of the Chief, we ran a pipe line from the offending cylinder to the condenser thereby drawing off the live steam. This was fine until the condenser collapsed when we were passing Cape San Lucas at the tip of Lower California. The ship had enough evaporators to produce fresh water sufficient to make about three knots headway. The Captain wanted to put into San Diego and cursed the wireless when ordered to go to San Francisco. This was offset somewhat when I was able to report the Jeffries-Johnson fight, blow by blow, at Reno while we were off the Santa Barbara coast. The ship had been scheduled to go to Panama with a new cargo of oil and I was anticipating going up the old French canal and see the Pedro Miguel locks under construction but this was cancelled and the ship went into the yard for repair. I was assigned to a Standard Oil tanker going to Seattle. This was welcome after near starvation on the salted meat and other inadequate foods. Standard Oil ships fed very well besides paying me ten dollars a month more. This attracted a better class of men and table conversations were on a much higher level than usual.

In September, completing a few weeks as third shift (midnight to eight am) at the San Francisco shore radio station I entered the University of California at Berkeley. A strike of wireless operators was on but it was shortlived. Much of my work involved receiving batches of messages from Japanese ships bringing immigrants. These were to inform friends and relatives of their coming. The operators on these ships would start sending them soon after leaving Japan when as far away from California as 3,500 miles. Each summer and during Christmas vacations I would work on ships or at the shore station. Altogether I was on nine vessels, most of which became wrecks. The Falcon was run onto Blunt's reef on a clear moonlight morning despite the presence of its Lightship. The Pectan was run aground on San Miguel island. I was on the passenger ship Santa Rosa in May and June of 1911, making a round trip each week between San Francisco and San Diego. I left the ship to attend surveying school at the same time that Captain Alexander took his annual vacation. This man personally set the new course after passing Point Arguello about three every Friday morning going south because if it was not done correctly,

the ship might run ashore on the Point or on San Miguel Island a few miles ahead. On the next voyage, number 1112, the substitute captain gave the chore to the deck officer on duty and turned in for the night. This officer changed course, not when passing the Point Arguello lighthouse light but on the headlight of a railroad locomotive that was going up the coast. The ship ran on a sandbar and broke in half when the tide went out. For many years her boilers could be seen in the sand when passing on the day train, "The Lark".

In 1912, Congress passed the Act requiring the licensing of wireless sets, ships and operators. It contained other provisions that made the operating of amateur stations uninteresting. I used mine no longer but maintained it as father liked to listen in. Congress passed a Ship Act that took effect in 1911 that required wireless operators to be licensed. I called on Radio Inspector Cadmus in San Francisco who gave me a perfunctory examination and issued the license. It was Mr. Cadmus that gave me the 1912 license. Having made a friend of him, he issued me the first one, serial number 1201.

Having an idea that I might want to become an astronomer, I took that subject in addition to engineering at the University but, after two years, realized I was not a genius and would only be able to earn a bare living at astronomy, so dropped it. In 1912 I undertook to set up a laboratory concerned with radio communication at the University, being assisted by other interested students, principally Lewis M. Clement, S. D. Browning and H. H. Buttner. To have a good antenna we stretched a wire on a rainy day from the top of the new Campanile, then under construction, so as to be unobserved since the authorities had refused our application, made through the faculty, on the grounds that it would disfigure the campus. Up to the time I left Berkeley, nobody seemed to have seen it being so small and high up. We accomplished some fantastic receiving, getting the German stations on Jap and Nauru islands, some 5,100 and 6,100 miles away. The astronomy department asked me if I could receive signals from the station at Arlington, Virginia that were being transmitted on a program with French astronomers for the purpose of correcting the difference of longitude between Washington and Paris. This we did and the astronomers finally achieved a substantial correction between Berkeley and Washington.

Graduating in May, 1914 with a B.S. Degree, I accepted a position as assistant engineer of construction of a gigantic 300 kilowatt radio station in California intended for trans-Pacific working, the transmitting station being at Bolinas and the receiving station on Tomales Bay near Marshall. These plants cost almost \$800,000. The companion plants in the Hawaiian islands obtained the services of my amateur and college friend, Lewis M. Clement. Clement had a fairly knowledgeable boss whereas mine was completely out of his element. His name was Adolph Rau and he took a honeymoon vacation right at the time of the toughest part of the job when we were installing equipment and machinery with the aid of incomplete drawings and inadequate designs requiring the improvisation of substitutes. Telegraph service with the islands was opened in Sept-

ember. I resigned in February by which time operations had settled into a routine. Besides, the management of the American Marconi Company had become rocky, their technique had already become obsolete and greener fields beckoned. Clement also resigned and took a position with the laboratories of the Western Electric Company, later the Bell Telephone Laboratories. I took a job as a machinist at the Mare Island Navy Yard after spending two weeks seeing the Panama Pacific Exposition.

This machinist job was a dodge to get me on the payroll. It paid \$4.32 a working day but I had to work awhile in the machine shop on ships engines, reminding me of those hot days in the tropics. But soon a special Civil Service examination was opened up and I became a minor official with the title "Expert Radio Aide" which I held until 1920. Meanwhile I also qualified as an Engineer-at-Large and was offered a post with the Reclamation Service in Denver at one hundred dollars a month salary but declined this as the Navy job was much more in my line and paid considerably more. The Engineer-at-Large rating qualified me to take the week-long examination for Second Lieutenant in the Army Engineer Corps. They made this examination so tough that it was said nobody ever passed it, thus the Corps could pick persons that suited them. After the war started the Corps wrote me several times waiving one requirement after another, finally offering me a higher rank if I could get past the doctor. This I declined. The Navy work had both advantages and disadvantages. The latter comprised the opportunity of loafing extensively since I was in the position of writing my own ticket. The future seemed cloudy. A current saying was that "Above the entrance to the Civil Service was a sign ' All those who enter here give up hope forever' ". The former included no interference because nobody around the place knew anything about radio communication the Navy having only three such Experts so that I had full freedom to learn, build equipments and experiment. Soon naval officers came beating at my door whereby I acquired other responsibilities besides gaining many good and later influential friends in the Service as well as outside. I acquired a small staff, operated a laboratory, designed equipment that was built in the local yard shops, acted as inspector for items purchased from contractors, installed apparatus on naval vessels and maintained shore stations from Mexico through Alaska. Each summer the collier Saturn was fitted out to make the rounds in Alaska, provide supplies, carry a working party to make repairs and additions and relieve the crews with new personnel. In 1916 came the construction of a 200 kilowatt plant near San Diego and I became involved in some of that. With the coming of the war in 1917 the Navy took over all commercial radio communication properties and it was my lot to deal with this, keep them in running order, effect modernizations and move some of them to war uses elsewhere.

Some time after the war started I was making an installation for Commander Dodd, Pacific Coast Communication Superintendent on Goat Island. The Commander asked me if I was still using my wireless station in San Francisco because if not he would like to stop the flow of letters from self-appoint-

ed spies that were reporting my station as one perhaps communicating with the enemy. Since it was used only by father for listening in I dismantled the outside antenna and installed one in the attic under the roof.

In July 1918, I was transferred to the Bureau in Washington, D.C., and had charge of the construction and maintenance of all the Navy's high powered radio stations. These were San Diego, Pearl Harbor, Cavite in the Philippines, Tuckerton, N.J., with new ones going up at Sayville, N.Y., Annapolis, Md., El Cayey, Puerto Rico, Guam, the massive 1000 kilowatt station at Croix d'Hins near Bordeaux, France and a number of smaller ones including Vladivostok and Murmansk in Russia and Siberia. This was an interesting period for me and I took advantage of being in the Capital to attend sessions of Congress. I was present at the enactment of the taking over of the telegraphs, the Victory Bonds, the second draft law and the death of President Wilson's effort to get the United States into the League of Nations.

Resigning from the Navy Department I became an engineer for the Federal Telegraph Company of San Francisco at its factory in Palo Alto, starting January 1920. Soon thereafter the Chief Engineer, Mr. Beal, left for France to supervise the tests of the 1000 kilowatt plant near Bordeaux and I was put in charge. The company at that time was operating a public telegraph system along the Pacific Coast which started with wireless stations established in 1910 and 1911 but as the Navy took these over in 1917, the company leased circuits from the telephone company to continue the service. They had no intention of returning to the use of radio transmission but were forced into it when, about March 1920, the telephone company cancelled the leases. The reason for this was given for need of the wires to meet demands for telephone use but the real reason was a complaint from the Western Union Telegraph Company in New York because of the competition created and the telephone company officials responded helpfully. Later they came to us and offered new leases but it was too late. We had obtained injunctions from the Federal Courts in California and Oregon and had already commenced construction. I designed and built a system that provided three circuits between Portland and San Francisco with three more between San Francisco and Los Angeles. It cost about \$635,000 and the northern portion opened in 1921 and the southern in 1922. In a few years this system moved more than half of the telegraph business between the Pacific Coast cities. We also established a comprehensive service with ships at sea.

Resigning upon the completion of this project, I went to Mexico hoping to secure some business as the long period of revolution left the country with a great lack of communication facilities. With an associate named Dabney Watson and with the backing of General Goethals, builder of the Panama Canal who then had a Consulting Engineering office in New York City, we negotiated a number of contracts with the Obregon government. Shortly after returning home and before completing the financing of these, the then Secretary of the Treasury, Senor de la Huerta organized a revolution and we received a telegram cancelling everything as Mexico was forced to use all its slender funds to purchase munitions. de la Huerta was finally forced to flee



to France. I wrote off my losses on the income tax, moved to Los Angeles and purchased a small orange by-products business.

October 31, 1924 I married Florence Irene Bacon in Riverside, California. Born in Kansas but early in life she moved to the west and acquired a farm by homesteading near Twin Falls, Idaho. With her came a sixteen year old son by a former marriage, named John Morrissey. In 1925 I chanced to meet an old friend on the street. He was a lawyer named Robert A. Morton who had been assigned to my staff during the war. He told me he was the Secretary of a company just organized called: Western Air Express. Its purpose was to bid for the air mail route between Salt Lake City and Los Angeles. Henry Ford had purchased the Stout Airplane Company in Michigan that was to make metal airplanes. Ford wanted customers for this factory and had asked his Pacific Coast representative, Byron L. Graves to organize a local company to bid for this contract. Soon they secured the bid and Morton asked me to build a radio communication system for it. The Chief Pilot, C. C. Moseley did not want the Ford planes as they had not yet become stable enough for safe flying and was looking for a way out of the obligation to Ford. It came while Western Air's officers were on their way to Michigan. Before the train got to Chicago a fire at the Ford hangar destroyed the model planes so the party delightedly took the first train home and ordered planes from Donald Douglas. Douglas was a small operator but had achieved a reputation for the planes he built for the successful flights the army made around the world. The craft he made for Western Air Express (now called Western Airlines) were so good the Post Office Department ordered fifty of them for the main trans-continental line. In later years the Post Office contracted out the entire route and that was the beginning of the United Air Lines.

Building this system was a challenge. The new short wave method for radio was just coming into being but little was known about the correct wavelengths to use for particular circumstances. I made a survey. With a base station in Mr. Graves garage in Los Angeles sending signals, I toured the California, Nevada and Utah deserts with my wife in our Studebaker, equipped with a small radio receiver and later with a transmitter taking power from the car battery. Wavelengths were selected and stations built at Los Angeles; Las Vegas; Milford, Utah and Salt Lake City. Signals between Las Vegas and Salt Lake City were not always reliable so the Milford station was added later. I made another survey discovering that the mountain where the Bingham copper mine was, created a shadow on the Salt Lake airport. Renting a vacant lot behind the State Capitol and moving the radio shack there cured the trouble and one day we flew into Milford and dismantled the installation. Due to the patent situation we could not get any transmitting vacuum tubes in the United States and manufacturers abroad could not sell to us due to their agreements with the American monopoly. Luckily, I found an advertisement of a manufacturer of X-ray tubes in Hamburg, Germany who made good tubes for us. We purchased a stock sufficient to last several years. To avoid patent suit troubles we created

a Nevada corporation named Airways Radio Service, Inc. We were not worried too much because the patent owning company had been given an opportunity to provide the equipment but they refused to quote stating that they did not have apparatus suitable for the purpose. Besides, we were serving a contractor of the Government. There being no stockholder's liability in Nevada we established this company to remove further incentive for patent infringement suits.

Western Air Express opened service April 17, 1926. The pilots were all aces from the war. The weather that day was not good. Pilot Maury Graham left Los Angeles with the mail that morning. Pilot "Jimmy" James left Salt Lake City about the same time. After refueling at Las Vegas, Graham found the mountains to the northeast covered with clouds. But the mail had to get through so he followed the tracks of the Union Pacific Railroad that went through a winding canyon keeping the rails in view by looking back over his shoulder. Suddenly he saw a plane pass him below going the other way! James was navigating the same way. I had many interesting flights with these boys. One of our amusements was chasing bands of wild horses in Utah, diving right over them, zooming up and watching them gallop away. James later became President of the company. Graham, after racking up awards for flying the most miles without an accident, ran out of fuel one winter day in a snow storm just west of Zion National Park. Many weeks later the plane was found all intact with mail bags aboard and about five miles away Graham had prepared and consumed a meal and went asleep in the snow never to awake.

In 1926 Congress passed the Air Commerce Act creating an Assistant Secretary for Aviation in the Department of Commerce and providing funds for the licensing of pilots, aircraft, lighting the airways for night flying with emergency landing fields and a development program. Harris Hanshue, Western Air's President told me about this at lunch in Salt Lake City and thought I should apply for the job of running the development program. Since my orange by-products business was being whittled away by the big operators, I took the suggestion seriously and wrote Dr. J. H. Dellinger at the Bureau of Standards who had charge of the program. Dellinger, an old friend from war days, consulted the new Secretary for Air, William Mc Cracken and enthusiastically offered the position at an attractive salary. Leaving Florence to sell the company, I moved to Washington and immersed myself in an exceedingly interesting program. I had a biplane, pilot and mechanic at the old College Park Field where the army did its first flying years before. We established another center at Bellefonte, Pa., a fueling stop for the air mail route. I enlisted the Ford Motor Company for aid and they provided a tri-motor plane with their test pilot Harry Brooks and a mechanic. Other firms helped to develop apparatus and services. Our first objective was the radio range. This navigation method was useless at night due to what was called the "night effect" that caused a bending of the courses. We conquered this defect. I hired a college Professor named Harry Diamond who did pioneering work and started the instrument landing system project. Diamond achieved fame as a developer of many things, particularly the proximity

fuze, used so effectively in World War II. It was during this period that Admiral Byrd organized his first expedition to the Antarctic and South Pole. One day a young man was sent to me at College Park who was to go with the expedition, to get acquainted with our program. He was the now famous Lloyd Berkner, a leader in geophysics, atomic energy and other fields.

During early 1928 I received three offers. One was from Mr. Stanley Dollar who wanted to create a trans-Pacific radio communication system to serve the Dollar Steamship Company and their ships, another from the Bell Telephone Laboratories to head up a new aviation department and one from the Mackay Companies, successors to the radio telegraph properties of the Federal Telegraph Company. I refused the Dollar proposal after becoming disenchanted with their patent position. The Bell system offer was unattractive as I did not want to get swallowed up in a large cumbersome organization. I became Chief Engineer of the newly organized Mackay Radio and Telegraph Company. This grew out of the purchase of the system I had built on the Pacific Coast by the Mackay interests that owned the Postal Telegraph Company, The Commercial Cable Company connecting the North American and European continents and a one quarter interest in the Commercial Pacific Cable Company that operated the submarine cable between San Francisco and eastern Asia. Hardly had I taken the position when the Mackay interests were purchased by the International Telephone and Telegraph Corporation, then just rearing its head as a great telecommunication empire. Its redoubtable organizer, Col Sosthenes Behn a one time banker in Puerto Rico, acquired the San Jaun telephone system in payment of a bad debt, became interested in communications, built an island-wide telephone plant and then secured a concession in Cuba where a modern telephone system was created throughout the island connected with the United States by submarine cables between Havana and Key West. He then went to Spain where the Cuban performance was repeated. In 1928 he acquired the \$31 million manufacturing business the Bell system had abroad and purchased the All American Cable Company that served North, Central and South America. That year he acquired the telephone system in Buenos Aires and other properties in the Americas. Soon the Spanish performance was repeated in Romania.

A forward looking man, the sky was the limit when it came to promoting communication properties. Our objective was to build and expand them where we could but the going was slow. The Colonel sent for me one day to say that one of his lawyers had spoken well of me and told me not to let anybody stop me from attaining goals. This was, as he said, because some of his staff were timid, cautious and unprogressive. Hard days came with the financial crash on 1929 and Behn had to shrink his programs but this did not seem to be applied to the group I was with which at the time was expanding across the oceans to Asia, Europe and South America and to ships. Even when very hard put for funds, the Colonel would always conjure up money for a project if convinced it was worthwhile and convincing him was not too hard. The important thing was to get to him before the shrinking violet officials did. Of

course we always had to battle the entrenched officials of the long established wire and cable services with which companies we were in competition but we knew this was inevitable and prepared for it. I doubt that we would have made this headway had it not been for my old and very fine friend A. Y. Tuel who had been the Chief Operator for the Federal Telegraph Company when I built its system and who wound up as Vice President and General Manager of the Mackay Radio and Telegraph Company. A very wise man, even tempered and possessed of an enticing personality, he could overcome many obstacles. We made a great team until, unfortunately this wonderful person lost his life from heart failure in 1935.

Immediately following World War I a patent monopoly was organized in the formation of the Radio Corporation of America, in the field of radio communication. Rights held by the General Electric Company, the Marconi Company of America, the Westinghouse Company, the Electric Specialty Company and the American Telephone and Telegraph Company were consolidated. Anyone that attempted to operate systems or manufacture equipment was sued or was threatened with suit for patent infringement. Then this monopoly extended its scope by making cross licensing agreements with firms in foreign countries. They made radio communication traffic agreements with foreign operating agencies making them exclusive where they could with cross traffic agreements between themselves. As an example, they partitioned South America up and handed the pieces out to themselves. In a few years suit was brought by our Department of Justice and the patent monopoly was partially corrected but, from a practical point of view this did not help much. My company was the only one that had a good asset consisting of a shop right to a basic vacuum tube device that had been invented and developed in the laboratories of the Federal Company in 1911 and 1912. That gave us an entering wedge. For the first few years we spent large sums devising ways to avoid patented methods. Once we were sued but, after some six years, were completely vindicated by the United States Supreme Court. Obtaining communications circuits with foreign countries went very slowly and with great difficulty. Our first one was with Austria, then Hungary and soon after that with Denmark. In the Pacific we fought the monopoly first in the Philippines, then in China and lastly in Japan. In all three we secured concessions but it took six years to accomplish this. Eventually our system covered the major part of the civilized globe.

Part of my earlier activities concerned technical supervision over some of the developments going forward in South America. Starting in 1928, the parent company planned radio telephone connections between the United States, Argentina, Brazil, Chile, Peru and Colombia. Another program was for radio telephone connections between Argentina and the European countries of England, France, Germany and Spain. Another was an internal system within Brazil. Eventually all these were accomplished. I recall shortly after the New York-Buenos Aires connection was opened to public service, Colonel Behn had for a luncheon guest a prominent man from Spain. This visitor happened to mention that his brother was then in Santiago, Chile. The Colonel had a telephone brought to the table, entered a call

for the man and after a few moments was informed he was out on a golf course and that a messenger had been sent for him. The surprise when the visitor heard his brother's voice was a thing to see. He did not have the faintest idea that it was possible to talk with another continent so far away.

International telegraph rules and procedures had for years operated under Conventions and Treaties made following the holding of international conferences. When wireless telegraphy came along a Conference to study its international problems was organized by Germany and the United States because England had refused to handle a message from a German ship. This was because the Marconi Company held exclusive rights in England and was not friendly to its German competitors. This Conference, held in 1903 in Berlin, failed to get its Convention ratified because of the opposition of England and Italy but by 1906 the issues had become so vital that another Conference was held and, in 1912 still another in London. These resulted in Treaties although the United States did not ratify the 1906 Convention until 1912. The next Conference was held in Washington in 1927 attended by some ninety nations and I became a delegate for the United States. Thereafter I attended most of them until 1951. At Cairo, Egypt, in 1938 the Telegraph and Radio activities were combined into the International Telecommunications Union. Over the years I went to Denmark, Romania, Egypt, Bermuda, Paris, London and Geneva to attend these. I also attended Conferences on inter-American problems in Havana and Rio de Janeiro. Preparation for these involved countless meetings at home.

Very soon after joining the Mackay Company I was appointed a Vice President. In 1931 we purchased the Federal Telegraph Company which, after selling its Pacific coast telegraph system continued its manufacturing business. The factory was moved from California to Newark, New Jersey and its scope of activities became enlarged. One of these was the supplying of large vacuum tubes for the broadcasting industry catering to the needs of those stations and networks competitive to the National Broadcasting Company. I became a Vice President of it and later General Manager. Another development company was established to make and market selenium rectifiers. For a time I was in charge of that. During the second World War other developmental companies appeared on the scene and I became involved in them. Following the war I was appointed Vice President and Chief Engineer of the holding company American Cable and Radio Company and two of its subsidiaries, The Commercial Cable Company and All America Cables and Radio.

After the war started in Europe in 1939 it became obvious after a time that the United States would become involved. To prepare for this the National Defense Research Committee was created by the Government. It became a part of the Office of Scientific Research and Development. Dr. C. B. Jolliffe of the Radio Corporation of America with whom I had been associated at the Bureau of Standards and the 1927 Radio Telegraph Conference, was given the post of Chief of its Division 13, on Communications. He asked me to become a member of it. When he resigned in 1943 I became its Chief. This organization was established to promote technical developments

for military purposes and the top people in the science and engineering fraternities of the country became its administrators. It had its own appropriations for conducting developmental work. Even if the military officials were not in favor of a project and there were numerous cases of that, we could proceed independently if that was our decision. We did this once and one of the military departments was against it. Later, it became of such importance that a special Division was established to deal with it and the opposing Officer was transferred to another post. It was mostly in the beginning that these military road blocks were put up, for example for radar development. Not that they did not want to develop radar but they did not want any outsiders dabbling in their operations. But we progressed nevertheless, following the example of Great Britain where the best talents in England were mobilized in order to save the country. This was the organization in the United States that produced the atomic bomb. After the Committee was disbanded in 1946 the Research and Development Board of the Department of Defense was created and I became Chairman of its Communication Panel.

In 1914 I became a member of the American Institute of Electrical Engineers, organized in 1884. The same year I joined the Institute of Radio Engineers, organized in 1912 although it was a reorganization of the Wireless Institute and the Society of Wireless Telegraph Engineers both of which started in 1908. In 1935 I became a Director of the Institute of Radio Engineers and in 1938 its President. At that time it had about 5,500 members. By 1962 it had 100,000, a measure of the growth of the industry. In 1963 the two Societies were merged and today we have 160,000 members. Over a period of thirteen years I was involved in standardization activities and was, during 1939 - 1942 a Director of the American Standards Association. Secretary of the Institute from 1942 to 1965, I have been a Director continuously since 1935 and now am Director Emeritus. In the American Institute of Electrical Engineers I also helped with standards work and at one time was Chairman of its Communication Committee. The Institute of Radio Engineers awarded me its Medal of Honor in 1944 and its Founders Award in 1960.

In 1938 I received an invitation to a World Communication Convention in Sydney, Australia. This was part of a three month celebration of the 150th anniversary of the founding of Australia. I was made a Life Honorary Member of their Institution of Radio Engineers. I have belonged to a pioneer group called the Radio Club of America that started about 1909 and am a Life Member of the Veteran Wireless Operator's Association which awarded me their Marconi Medal of Achievement in 1951. At the time of graduation from college in 1914 I was made a member of the scientific honor society Sigma Xi. In New York I had a membership in the Downtown Athletic Club, 1928 to 1959.

About 1943 an industry set of Committees was established at a suggestion from the Government, to plan for post-war conditions. It was called The Radio Technical Planning Board. I became its Chairman of the Panel on Communications.

Later I became Chairman of the Board. The patterns for post-war developments in Broadcasting, Television and all other fields comprising the radio industry were set by this Board and received the blessings of the Government in-so-far as governmental regulation was involved. After the conclusion of its work the Institute of Radio Engineers and the Radio Manufacturer's Association created an independent group called the Joint Technical Advisory Committee to advise government departments should assistance be requested and I became one of its eight members. An early accomplishment was the organization of suitable standards for color television.. This Committee continues to be active. In 1952 it produced a valuable book titled Radio Spectrum Conservation followed by a new and revised edition in 1966.

During the years I held licenses to practice professional engineering in the States of New York, California, Oregon and Washington.

In 1946 I was given the opportunity of attending the atom bomb tests made at the island of Bikini in the Marshall Island group, called "Operation Crossroads". My title was: Official U. S. Government Technical Observer. Comfortably quartered on the Command ship Panamint of the Navy along with numerous other technical people including two from the Soviet Union, I witnessed the first test, visiting the target ships before and after. We were parked twenty miles away to see the explosion. I could not stay for the second test. Arriving in Honolulu on the way home, all airlines were grounded because of the loss of a Constellation. This enabled me to spend several days on the island of Hawaii until transportation facilities again became available. Arthur Van Dyck and I prepared a paper telling of our experiences that I presented to a crowded audience at the Engineering Auditorium in New York and was published by both the Electrical and Radio Engineers.

In 1950, President Truman established a "President's Communication Policy Board" consisting of Lee. A. DuBridge, William L. Everitt, James R. Killian, Jr., David H. O'Brien and Irvin Stewart as Chairman. Telecommunications in the Federal Government was uncoordinated and this Board was asked to submit recommendations for policies seeking to improve administrative procedures, the relationship of government communications to non-government communications and policies with respect to international radio and wire communications. The Board produced a report titled "Telecommunications - A Report for Progress". It recommended a permanent three-man Advisory Board to advise the President. But President Truman did not want a Board saying that there were too many of them. So one person was appointed. In June while in Spain, I was asked whether I would accept such an appointment. I flew to Washington to discuss it. The outcome was that I accepted after President Truman told me that I was the only person acceptable to all of the government departments involved. Upon concluding my European trip, I was sworn in during October 1951 with the title: Telecommunications Advisor to the President. I had previously arranged a premature retirement from the American Cable and Radio Company.

This post was established by Executive Order. I had a permanent staff of five persons. The activity was a sort of experiment since it was impractical to accomplish its objective by law. While I had a very interesting, if not frustrating time, I early realized that we would not make much progress without legislation but I could not find any Senator that was interested. To enact legislation in Congress it is usually necessary to find an enthusiastic, devoted sponsor. Since the death of Senator Wallace White of Maine, who had sponsored telecommunication legislation for many years, no successor to him had appeared. The office I held was discontinued by President Eisenhower in 1953 on the recommendation of a Board headed by Nelson Rockefeller, on the ground that too many individuals were reporting to the President. We now had at the head a man not used to conventional methods of administration having been trained in the military staff method.

As a person, President Truman was human, sociable and loyal to his people, in fact he often backed some when he knew they were wrong. He told me right at the beginning that he would back me one hundred percent and not to let anyone in Washington tell me otherwise. He also said to come to him if I needed help. I avoided seeking his aid as much as possible as he was in the habit of picking up the telephone and talking to anyone he thought would assist. Such telephone calls always stirred up officialdom and for days thereafter one could get calls asking what this was all about.. He was a hard worker and on Monday mornings his desk usually was piled high with papers that he called his week-end homework.

Soon after leaving this White House job I became associated with Fred W. Albertson, James Durkee and Carl Exselsen in a developmental enterprise operating under the name of Dualex Corporation. James Durkee who once worked for me at the Mare Island Navy Yard when he was a Chief Electrician in the Navy, had an inventive mind and had created an improved method for printing telegraph systems by radio, particularly adapted for use in aviation. This company was established to exploit his inventions. The firm Bell and Gossett in Illinois was given a license for the United States and Canada and carried on development and manufacturing activities. Bell and Gossett made pumps and heating apparatus on a large scale, was very forward looking but did not understand the way electronic development had to be done so the program lagged through lack of foresight. We finally decided to sell out to them and I retired from a business life late in 1958. Dualex Corporation was the brain child of Fred Albertson, a prominent Washington lawyer, who is one I count as a very good friend. Carl Exselsen had poor health and passed away a few years ago. James Durkee keeps fit and happy on his farm in northwestern Arkansas, raising black Angus cattle and growing mushrooms.

During our New York days we lived on Long Island at Jackson Heights, Bayside, Douglaston and finally in a very adequate two story house in Strathmore Village, Manhasset where we were during the war. Our next home was at Silver Spring, Maryland, a suburb of Washington. In 1955 we moved to Stamford, Connecticut where we acquired a house in the hills north of the Merritt Parkway. Selling this in 1959 we moved to



Pompano Beach, Florida where we got a house on a 100 foot wide canal connecting with the ocean and bought a yacht, twin diesel engines, with which we did a fair amount of cruising to the northern states and the Bahama Islands. As Florence's health deteriorated we were unable to use the boat much and it was sold in 1964. Soon after Florence passed away in August.

We were fortunate to be able to see much of the world. As a youngster I saw the Pacific Coast of the United States and part of Chile. My career in the Navy took me to many places in this country. The years in aviation extended my travels much. The many years in the International Telephone and Telegraph Corporation also involved travel. The first European trip in 1931 involved England, Denmark, Germany, Austria, Hungary, Switzerland and France. In 1937 I got to France, Switzerland, Austria, Hungary, Romania and Germany. In 1938 were in France, Italy, Egypt, Palestine and stopped in Irac, Iran, India, Burma, Thailand, Singapore, the East Indies, Australia, New Zealand, the Figi Islands and Hawaii. In 1949 we were in Paris more than two months returning by way of the Netherlands, Belgium, England, Ireland, Morocco, Tangier and Gibraltar. I had built, after the war, a large radio communication plant at Tangier and at this time went to see it. The most extensive trip was around the world in 1938. Florence joined me in Cairo, Egypt and we flew to Singapore on an Imperial Airways plane called the Short, a metal flying boat with four engines. Flying only in the daytime, it gave us a chance to see places at stop-overs, for example, Basra where I bought a Persian rug in a country village, Karachi, Calcutta, Rangoon, Bangkok and Singapore. At this place we transferred to a de Haviland land plane, also with four engines, spending the first night on the island of Lombok, the second at Darwin, Australia and the third at Charleville, Queensland. We flew by many volcanos between Batavia and Timor and crossed that bleak interior wasteland of Australia. From Brisbane we went to Sydney by night train. Returning home we came on the old S. S. Niagara, once the Pride of the Pacific as she was referred to, to Honolulu via Suva and Canton Island. From Honolulu we came on a Matson Company liner as the Niagara went to Vancouver, B.C., our destination being San Francisco.

In 1965 I expanded my travels with an auto camping trip to Alaska, Yukon Territory and the Pacific Coast states. In 1966 I toured twenty eight National Parks and Monuments plus some in western Canada.