



All photos courtesy Dr. Carrol Voss

Dr. Carrol Max Voss

by Martin J. Pociask

This article is based on an interview between *ROTOR* magazine editor, Martin Pociask and Carrol Voss, helicopter aviation pioneer.

ROTOR: Let's start from the beginning. Tell our readers about your family roots.

Voss: My father, Herman, and his parents immigrated to the U.S. from Prohn, Stralsund, Germany, in 1882, settling in Amherst, near Kearney, Nebraska, where they had friends. Grandfather built a sod house. My dad went to China in 1904 as an Evangelical Church missionary. He married my mother, a teacher from Pennsylvania. Due to people problems and threats, the U.S. govern-

ment pulled out all missionaries and their families in 1927. Dad purchased a small farm near Kearney, Nebraska, so that my brother, Lawrence, and I could go to school there.

ROTOR: Can you describe what life was like on a farm in the Midwest?

Voss: Brother Lawrence and I hoed the weeds out of dad's sugar beets. We also helped harvest the beets, corn, and alfalfa. I recall seeing the large summer dust clouds headed our way. When they hit, it was as black as night. All the traffic came to a stop.

ROTOR: Living on a farm, you developed an early interest in agriculture.

Voss: Yes, our ten-grade country school, Alfalfa Center, was not a large school. It only had four graduates during the 1934-1935 school year. Our basketball team was obviously called the Hay Seeds. My teacher gave me a book on *Flying With Lindberg*, by Donald Keyhoe. This was only eight years after Lindberg's flight.

ROTOR: You were introduced to flight shortly after graduating from Alfalfa Center High School. Can you speak of the circumstances that led you to a life of aviation?

Voss: I was reading many articles on flying, and I had my first flight in a "Jenny," from a pasture field. I carved wooden model airplanes, and was asked to prepare an airport model exhibit at the Buffalo County Fair. I recall seeing Amelia Earhart fly over our farm in a Pitcairn Autogyro on her coast-to-coast trip in 1931. Autogyros were being used for spraying forest caterpillars in the 1930s, using fish oils and lead arsenate.

ROTOR: You received a scholarship from Sears Roebuck and Company that enabled you to attend Agricultural College at the University of Nebraska, where you graduated in 1941. Tell our readers what your major in college was.

Voss: The Sears scholarship, for \$100, paid the college bill for the first year, and got me off the farm. I selected a major in Entomology. Graduation was in 1941. I was accepted at the University of Wisconsin for graduate work. I contacted several universities for graduate work in Entomology, and accepted an offer from the University of Wisconsin.

ROTOR: Tell us about your graduate school studies at the University of Wisconsin.

Voss: Studies included mixing materials for pest control at the Kenosha Insect Laboratory.

ROTOR: While attending the University, your formal education was disrupted by World War II. How



Dr. Voss at the controls during his time in the military.

did the turning of this page in history impact your future?

Voss: This page had quite an impact on my future. Most students and fellows back home were enlisting in the summer of 1942. I did the same and went through a complete training program in the Navy Air Corps.

ROTOR: You had an incident involving the arrival of a very special guest. Tell us about it.

Voss: One afternoon, after solo practice, a frantic radio call went out, "Cadet Voss, get off the runway fast; Eleanor Roosevelt's plane is landing." We cadets had a nice visit with her.

ROTOR: You were a member of a group called the "Tailenders." Can you explain?

Voss: I was in a group called the Tailenders. The name was dedicated to those members of the Mount Vernon Flight Prep School, Third Battalion, who, through no fault of their own, have names at the tail end of the alphabet. This group composed Platoon Twenty-Four. Last to chow, last to classes, last to barber shop, laundry details, as well as last to all musters. The members of the platoon will, however, be

remembered as leaders in all situations and encounters.

ROTOR: You went by your middle name while in the Navy.

Voss: In the Navy, I used my middle name, Max. I did not know if I would be assigned to a fighter plane. I felt nobody would fear a pilot who went by the name of Carrol. So, Max sounded a lot more forceful. In the end, I was assigned to stay as an instructor on PBY Catalina, flying boats at Jacksonville Naval Air Station, Florida. I was able to get a check-out in a PBM Mariner flying boat.

ROTOR: You were involved in a PBY accident on January 2, 1945. Can you tell us about it?

Voss: With a wind from 090 degrees, I was making an approach from south to north on ramp #4. Having one port canvas sea anchor over, the after station was having difficulty with the second port anchor. As one anchor was insufficient, I used starboard power to hold the plane in line. This headed the plane for the ramp at increased speed. I was about ready to go around again, and had let the nose start out, when the second anchor took hold. Judging that I had sufficient distance to set up for the



Dr. Voss at the controls of one of AGROTORS aircraft.

ramp, I gave a burst of starboard throttle, which, coupled with both anchors, pulled the plane back in line for the ramp. However, being close, I was unable to set up drift of the plane, with the east wind blowing toward the ramp. Cutting the starboard engine and tripping anchors proved insufficient to pull out. By then, the plane was moving slowly enough so as to scrape and stick slightly to the ramp. This gave the students and myself a good object lesson on the advisability of never rushing a ramp approach.

ROTOR: I understand that during this time you met and married your future wife.

Voss: We met when Ensign Josephine Harding, a U.S. Coast Guard SPAR from Maine, was transferred to Jacksonville from Charleston, South Carolina. A WAVE friend introduced us. We did not waste much time back then. We met in July 1945, were engaged in August, and were married in October, at the end of the war. I took her up in a PBV Catalina and in open cockpit Navy Stearman, and soon found out that she was not interested in becoming a pilot. In fact, I probably alienated any interest that she might have had in aviation. My wife thought that she married Max. She got Carrol instead! So we have been married over 60 years.

Brother Larry's first wedding as a minister was ours. His last, before passing away over 10 years ago, was for our son, Philip, in New Hampshire. My best man at our wedding was Warren McConnell, a flight instructor friend. I received a letter from Warren in 2002. He wrote, "By the way, do you remember the time you and I took a Stearman airplane for a ride with you in the front cockpit, and I was in back. I got sick and you flew through a rain shower to wash the plane off, so no one back at the base would know I got airsick." How terrible for another instructor.

ROTOR: After the war, you went back to the University of Wisconsin to pursue a doctorate degree. Tell us what life for the newlyweds was like, and the projects and focus of your studies.

Voss: The university set up a trailer park for veterans to use the GI Bill. Our first daughter was born in 1946. With more than one child, a family could apply for a double-sized trailer. That was a real population incentive, because everyone wanted more space. Our second daughter was born, and we moved up. Each summer, I worked at the Rhinelander seed potato growing area (northern Wisconsin). I mapped the flight movements of potato and green peach aphids,

which spread viruses to new potato plants.

ROTOR: How were you introduced to the helicopter, and how did you see the role of this new means of flight supporting agriculture?

Voss: I read aviation magazine articles, and the helicopter was being used experimentally for crop protection. Also, a group of Bell helicopters was sent to Argentina for locust control. A quote from Lawrence D. Bell in the American Helicopter Magazine, in 1946, read, "The helicopter is ready now to go to work for industry, agriculture, and government agencies. Later, we will see its widespread use by individuals. It is our firm belief that the helicopter is designed to play an increasingly important role in the lives of all peoples of the earth." The helicopter seemed, to me, to be a natural for agricultural work. Joe Mashman put on the first dust demonstration with the Model 30 using flour.

ROTOR: List some of the companies you have worked for.

Voss: I started with a helicopter license from the New England Helicopter Service (NEHS) in spring of 1949. Lee Plympton had some gypsy moth, forest, and tobacco spraying. Also, the USDA did some mosquito spraying, using an early Sikorsky R4B helicopter. My first job was as a dust loader and salesman for Ed Robinson, Helicopter Services, Syracuse, New York. He had a Bell 47 B3, as well as a Kaman K225, on lease from the factory. At the end of the summer, out of work, I attended the Navy Helicopter Flight School in Lakehurst, New Jersey, as a Lt.j.g. This brought me to a total of 100 hours, enough hours for my first Ag checkout by Harry Mitchell, from whom I received several years of good agricultural experience. Peter Schlesinger sold the operation to Jim Ricklefs, who needed equipment for Alaska. Art Fornoff, Bell's salesman for the region, had me pick up a new 47D-1 from the Texas factory and fly it to Tucson, Arizona, and work with cotton growers there (1953)

"Helidusters"). At the end of the season, I returned to NEHS in Rhode Island. Lee Plympton allowed me to pick an area for agricultural work, and he would support it with three helicopters and crews. There was fruit work in Gettysburg, Pennsylvania, as well as truck crops in Maryland. We developed a mist blower attachment for very small spray drops and better coverage. This attracted the U.S. Department of Agriculture for a one-year test contract on banana spraying by Sigatoka Control in Ecuador, South America. The program was successful with one to two gallons total spray per acre, leading to many contracts for NEHS. They pulled all the Gettysburg helicopters and sent them to South America.

ROTOR: You established AGRO-TORS Inc. in 1958. Can you tell our readers about that start?

Voss: Having had two operations sold from under me, I went to the bank and borrowed \$15,000 to start AGROTORS. I bought a 47B cabin helicopter and had it modified to a 47D1, by Vincent Colicci, for use in agriculture. I hired pilots and engineers with experience from NEHS, who also did not want to go to South America to work. Vincent Colicco, in Rhode Island, purchased the GAZDA helicopter at an estate

sale. It was a one of a type prototype, and traded it to me for a set of dust equipment. We were all short of cash in those days. The year that I had three Bell helicopters working, I went to the bank for the usual winter loan, and indicated that I had four helicopters counting the Gazda. Knowing what agricultural ships should earn, they allowed the Gazda to be counted and did not elaborate on what it was. It was a flying ship, when Hal LeMont built it in 1945. This was for Antoine Gazda, inventor of the Oerlichon machine gun.

ROTOR: The house you and your wife purchased and lived in, in Gettysburg, until your retirements has a history too. Can you elaborate?

Voss: Our house had been used as a hospital for some of the wounded from the civil war battle. This was written up in a book, *A Vast Sea of Misery*. Sheriff Lightner's 115-acre farm became the hospital for the Second Division, First Corps on July 1. A surgeon mentioned that when he took possession of Mar's "White Church," he also used the house and barn of Mr. Lightner and others that were convenient. A Private John Chase, who was in the 5th Maine Battery, left a good account. He wrote, "After being wounded 48 times, I was taken to the First Army Corps Hospital—a farm owned by

Isaac Lightner. They laid me down beside the barn, where I waited three more days before my wounds were dressed. The surgeon let me lie there to 'finish dying.' After lying on the barn floor for several days, I spent a week in the house. From there, I was removed to Seminary Hospital." Private Chase survived the war. The house is now a bed and breakfast establishment.

ROTOR: Tell us about when AGRO-TORS established a flight training school.

Voss: We needed a good flight school for our own employees, so we made it available for others. We trained the first group of Pennsylvania State Police, along with the Virginia State Troopers, in the mid-1960s. We also had many students from overseas.

ROTOR: Did your pilots need special training to perform agricultural work?

Voss: The agricultural pilot must be able to pre-plan and lay out all intricate details needed to accomplish his mission. This will include contacting the customer and setting the time and location to meet him. What is the pest? What are the materials recommended for controlling the pest? The label for that material needs to be checked thoroughly to determine the exact amount to use, and directions for safe handling and environmental hazards. He must check his aircraft and accessories to determine readiness and proper nozzle setup for the job. Next, his ground man needs to be directed on his responsibilities to be at the location with support truck, water, fuel, and other necessities. On arrival, a proper loading site needs to be set up, and the chemical and mix reviewed with the ground man and customer. Fields to be treated need to be checked with the customer and the adjoining land or crops considered. Another thing to review is where the wires and obstructions are located. The pilot should draw a map. Depending upon the toxicity of the material, how close can he spray to homes, livestock, and other crops.



Dr. Voss' fleet of early Bell 47s became a common sight in the farms of southern Pennsylvania.

ROTOR: Are there other considerations?

Voss: Yes. One must determine how scattered the fields to be treated are, which determines the flight cycle per load and how much fuel to carry. How many gallons or pounds should he start with, to complete the field cycle? By now, it is obvious that if any of these arrangements do not fall properly into place at the right time, it will create a stress for the pilot when he is under pressure to complete the job before the wind picks up. This applies to one job assignment, but the pilot may be performing a series of jobs in different locations, each of which requires the same level of detail.

ROTOR: You did some early work on “Flying in the Wire and Obstruction Environment.” Tell our readers about your contributions.

Voss: I prepared a tape for HAI entitled *Flying in the Wire and Obstruction Environment*, and used this at our HAI agricultural group meeting. Let me say this, it would be impossible to be an Ag pilot without wire strikes at times. One of my most memorable was when two wires appeared in front of me as I entered a field and I went between them both. One went over the bub-

ble and broke on the swash plate. The other caught on the skid and was dragging behind, balling up a bunch of potatoes. I could feel the drag and landed immediately in the potato field. On checking the ship and unfastening the wire on the skids, I fired up and returned to the shop for a thorough check. Mistake number two was flying back instead of bringing a mechanic out to check the damage first.

ROTOR: Since a lot of Ag work requires low flying, how did you stress the importance of safety and awareness?

Voss: The low flying required an individual who had an awareness of the many wires and obstructions in fields. I once tested a new method to interview a new Ag pilot applying for work. When he came in, I told the secretary to hold him for a minute, while I strung a wire at neck height across my office door. Then I told the secretary to send him in.

ROTOR: You became a consultant on international aerial application programs. Tell the reader some of the countries where you worked, and the projects you undertook.

Voss: We operated in Liberia, in

West Africa, spraying Firestone rubber tree plantations for disease. Of course, Ecuador, South America, for Banana Sigatoka disease control. This was the first effort of this type in the world. In 1975, I was part of a six-man FAA and industry team to Russia to share information on Ag aviation. I represented HAI, and Bob Moore represented Bell Helicopter. Russia demonstrated their aircraft in applications.

In 1970, the World Bank made a proposal to the government of India for the improvement of crop protection, by expanding aerial application equipment, services, and training. On the way over, our team stopped off in Japan to visit one of the major helicopter operators to gain insight into some of the techniques in crop pest protection. Goetz von Gontard was the leader of our group. He was an ex-Luftwaffe pilot. The chief pilot for the Japanese company was an ex-Navy Zero pilot, and I was an ex-Navy pilot. So it was interesting that now we were all working together, looking for better aviation methods to battle a common foe — the insect.

The World Congress on Aero-Space Education was held in Cairo, Egypt, in October of 1979, under sponsorship of President Anwar el Sadat. I spoke about the uses of helicopters in agriculture, and Shannon Lucid, of NASA, spoke on the role of astronauts in future manned space programs. She spent time on the MIR Space Station with the Russians. The Egyptian Gazette covered the meetings, including a commendation from U.S. President Jimmy Carter.

ROTOR: In 1976, the World Health Organization (WHO) asked that you represent them, and assist in research and to prepare future bid contracts to fight the disease called Onchocerciasis, caused by the black fly. Can you tell a little about your role in the eradication of this dreaded disease afflicting millions in several West African nations?

Voss: Imagine my surprise to receive a call from the World



Controlling disease in Ecuador in 1956. From left to right: Dr. Desrosiers, the plant pathologist in charge, Dr. Voss, Vincent Colieci, and Dr. Mallory, the Director of Station in the region.

Health Organization (WHO), in Geneva, Switzerland, asking if I would be available as a consultant to WHO, to work in Upper Volta, West Africa, on an Onchocerciasis black fly control program. There was an interest in running tests, which included the Tsetse fly, for sleeping sickness. The German government supplied a Bell helicopter 47 G4 and crew. I worked with French and German entomologists who did not speak English, so we shared a few arguments on techniques. We were able to demonstrate control of the black fly vector by spraying a band of chemicals across the river, upstream of breeding areas and larvae under water. HAI member, Evergreen Helicopters, did the contracts for over 20 years, and it was a WHO success in disease control. We spent time in Geneva working up contracts and the number of helicopters needed.

ROTOR: You were also involved in fighting the desert locust (*Schistocerca gregaria* Forsk). Can you describe your involvement?

Voss: In 1986, the desert locust came on strong in several West African nations. In 1987, the U.S. Agency for International Development (USAID) rapidly put together a group of entomologists with aviation backgrounds to assist in drawing up specifications for treating the locust hordes. I was assigned to Gambia and Niger. A group of men from NASA came in one afternoon to check my maps. They were looking for an emergency landing field for the space shuttle. Later in the year, several of us made an Environmental Programmatic Assessment of the methods and effectiveness of various programs. Morocco had the best-organized program. The man he put in charge had orders to keep the hungry swarms from flying over the Atlas Mountains to the fertile valleys, or he would be executed — the ultimate incentive.

ROTOR: Tell us about a tour trip you took with your wife to Timbuktu that turned exciting.



An interesting... and typical landing zone for one of Dr. Voss' helicopters in Africa. Dr. Voss pioneered the use of aerial spraying to combat the locust population in 1986.

Voss: One weekend, my wife wanted to fly to Timbuktu on the edge of the Sahara desert in Mali. So we chartered a two engine Aero Commander from the local airlines, along with another tour couple. I noticed that on the split windshield, one half was so bent, cracked, and scratched, that it was not possible to see through it. Then, the captain (by four bars) sat behind that half, while the co-pilot used the windshield that he could see through. Upon my question, the captain said that the co-pilot needed some experience. On arrival, there was a dust storm. With no radio electronics, the pilots were nervously looking out the side windows. They finally spotted the airport and made a diving turn to a landing. The airport had economical facilities — four posts, a thatch roof for shade, and four benches. Sign said, “Timbuktu International Airport, Terminal 3.” A ride to the hotel was free — by camel!

ROTOR: Tell us about your involvement with the HAI.

Voss: I attended a Helicopter Association of America (HAA) meeting in California in 1953, while working for the New England Helicopter Service. I became head of the Agriculture Committee and organized annual meetings. Also, as I mentioned earlier, I represented

HAI on an agricultural trip to Russia in 1975.

ROTOR: Your son, Tim, was also very involved in the business and with HAI.

Voss: Tim was trained and flew agricultural work for many years. He was on the Government Contracting Committee, as well as the Aerial Application Committee. He became President of AGROTORS, Inc. after my retirement in 1985.

ROTOR: During your long career, you have met many industry giants, both aviators and aviatrixes.

Voss: I did meet a few. Art Newman, Carl Brady, Arthur Fornoff, E.E. “Tug” Gustafson, Joe Mashman, C.W. “Wes” Moore, James Rickleffs, Pete Schlesinger, Arthur “Art” Young, Stanley Hiller, Lester Morris, and Charles “Chuck” Yeager. Each helped me with much information on operations and the history of helicopters.

ROTOR: Winning awards and recognition is nothing new to a man who has built his career on excellence. In 1995, you were awarded the Twirly Birds highest honor, the Charles Lester Morris Award. It's nice to be recognized by your peers.

Voss: Regarding recognition by



Dr. Voss (right) and helicopter pioneer, Joe Mashman look over the data on the early model Bell 47B that they are standing next to.

peers, I appreciate the note Joe Mashman wrote in my copy of his book, *To Fly Like a Bird*, dated June 19, 1992. “We have both been privileged to have participated in pioneering this industry. I cherish the memories of our long association to further mature our industry. You have earned the highest regard and admiration from all of your peers, and I am delighted to be one of them.”

ROTOR: In 1999, your company was cited by New York City Mayor Rudolph Giuliani, who thanked AGROTORS and its pilots for the company’s rapid response to controlling mosquitoes and the spread of West Nile Virus in that city. Tell us about that proud moment.

Voss: I went to New York to photograph these pilots. They flew evenings and into the night, using GPS. One New York flight officer was in each helicopter; and they served as a guide and handled the local radio traffic.

ROTOR: On January 26, 2000, AGROTORS Inc. also received HAI’s 1999 “Salute to Excellence” Igor I. Sikorsky Award for Humanitarian Services for the same New York City Mosquito Control Program. The award is presented to the person or persons who best demonstrates the value of civil rotorcraft to society by

saving lives, protecting property, and aiding those in distress. Five AGROTORS pilots were named as recipients; John “Jay” Allison, Gary B. Dahlen, Victor E. Gray, Daniel J. Riley, and Bonnie Wilkens. I’ll bet that made you proud.

Voss: These were pilots I helped train, so pride was a natural. Mr. J. M. Haver, New York Office of Management, wrote, “As a helicopter pilot myself, I believe I am qualified to say I have never seen pilots as professional and capable as those who were employed by AGROTORS. Mayor Giuliani has publicly thanked the pilots and I want to take this opportunity to echo his sentiments.”

ROTOR: On February 13, 2001, the award was more personal. That year, you were awarded the 2000 “Salute to Excellence” Lawrence D. Bell Memorial Award, recognizing an individual who has exhibited excellence in management leadership, and who is recognized for long and significant service to the helicopter industry. I think that pretty much is an accurate characterization of your many contributions. What do you wish to say about this award?

Voss: The Lawrence D. Bell Memorial Award and the later Bell Helicopter Hall of Fame Award

were big moments in my retired life. Quoting from a past Bell test pilot about the Bell 47, “Those who revere the Bell 47 for all its strengths, claim, to this day, that what the Bell 47 does well, no other helicopter even remotely challenges.” All my time has been in the Bell 47. I never got a turbine check-out in the Navy. I did have time in the Sikorsky HO3s and the HRP Piasecki “Flying Banana,” which were not turbine engines.

ROTOR: You have written numerous papers, articles, and in 2002, an autobiography titled *Wing and Rotor: The Highs and Lows*. From reading your book, I get the sense that through your faith, family, and passion for flying, you loved every minute of it.

Voss: That is correct. I enjoyed very much the ability to operate a helicopter, especially in the rather difficult flying of agricultural aviation. I could see the results of crops being saved. Also, in looking back, I can realize the importance of having good, well trained, personnel working for me.

ROTOR: Dr. Voss, what advice do you have for the new generation of rotorcraft pilots, on how they might best help promote the helicopter, and to discover new uses for it that will benefit society?

Voss: There must be new uses that have not been developed. There have been large-scale forestry spray jobs using 35 or more helicopters. Advice — learn to do a good job, and regardless of how rough the work, keep a pleasant countenance and smile, and show an interest in the work. A happy disposition is always easy to work alongside. Become a good dependable pilot.

ROTOR: Thank you so much for agreeing to interview with *ROTOR*. Best wishes and much gratitude from an appreciative industry. 🙏

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