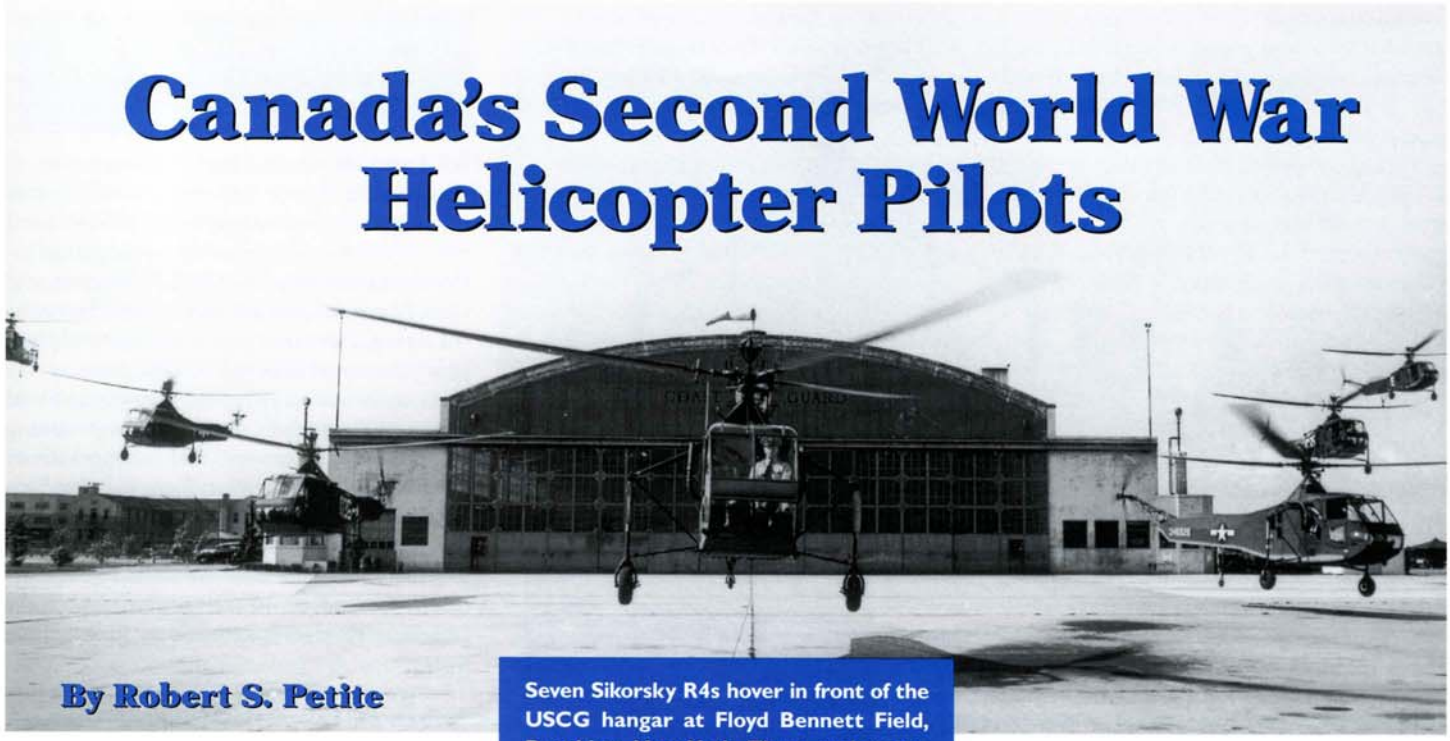
Canada's Second World War Helicopter Pilots



By Robert S. Petite

Seven Sikorsky R4s hover in front of the USCG hangar at Floyd Bennett Field, Brooklyn, New York. These underpowered, two-place rotorcraft were widely used to train both military and some commercial pilots in the mid-1940s.

IN MARCH 1943 the Royal Canadian Navy decided to allow RCN personnel to train as pilots and observers with the British Navy in the Fleet Air Arm. They would be members of the Royal Canadian Navy Volunteer Reserve (RCNVR). At the time, the RCN had no air arm of its own.

The potential for using the helicopter to protect ship convoys from German submarines was being considered, and, as a result, the British government had ordered 250 Sikorsky helicopters. The plan was to have British pilots trained on helicopters in the United States. The Canadian military in Ottawa recommended to the British Admiralty that 10 RCNVR officers be included in the initial training. The Admiralty confirmed that a number of Canadians in the RCNVR would be accepted. Canadian personnel would then be loaned to the Royal Navy for operational duties.

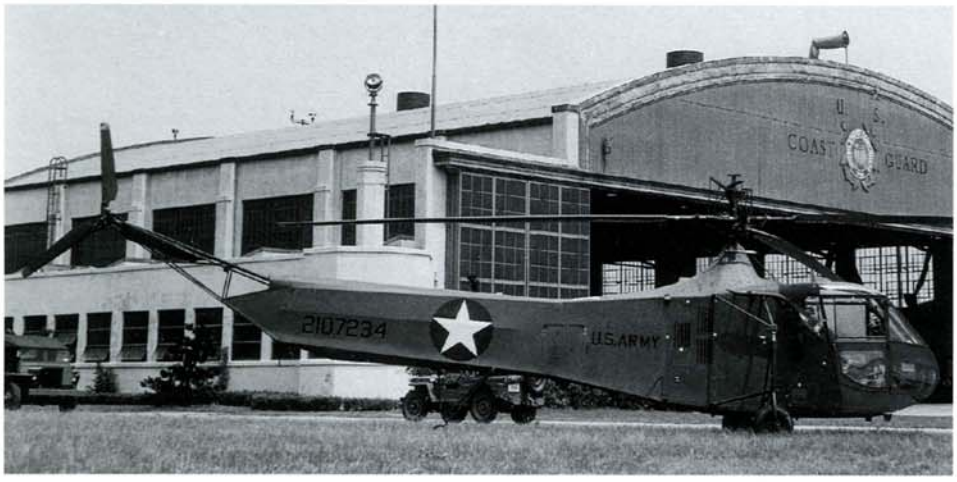
British Royal Navy Flying School

Arrangements were made to have instructors trained at the U.S. Coast Guard Air Station at Floyd Bennett Field, Brooklyn, New York, in 1944. By January 1944 the British had already received three Sikorsky YR4 helicopters. The first YR4A had been damaged on July 4, 1943, and was being repaired. The two other YR4Bs, FT834 and FT835, embarked on the British freighter *Daghestan* on January 6, 1944, in a convoy bound for England. The helicopters were to be evaluated during the crossing.

Except for a few days, the flying weather was not very suitable during the 16-day trip. On January 16, Lt. Stewart Graham, USCG, made a short 30-minute flight, and F/L "Jeep" Cable, RAF, followed the next day. Strong winds and a rolling freighter made flying difficult. Eventually the YR4B's performance was deemed too marginal for use as an anti-submarine warfare aircraft.

At the end of May 1944 there was a corps of 12 U.S. Coast Guard-trained British officers who had taken the first helicopter (instructors) course. Major J. Richardson, British Army, was the initial student. No Canadians were part of this group. Lieutenant Commander E.A.H. Peat, RNVR, who had soloed on the Sikorsky XR4 back in June 1943, was chosen to command the Royal Navy Helicopter School at Floyd Bennett Field. On June 1, 1944, the school was commissioned. The RAF delegation in Washington, D.C., turned their helicopter personnel over to the British Admiralty delegation to assist the Royal Navy in training new pilots. Between June and December 1944, student helicopter pilots came from all over the British Commonwealth.

It was originally planned to train 30 helicopter pilot crews by November 1, 1944. Initially, preference was given to six naval pilots with at least 500 flying hours, including operational experience. The remaining 24 naval pilot candidates were to come from the Service Flying Training Schools (SFTS) in Canada. The British set up separate flight training classes, but worked side by side with the USCG in ground school training. Ten Sikorsky YR4Bs and R4Bs were used as training helicopters, all in British markings.



USCG

The first production Sikorsky YR4A is seen at Floyd Bennett Field during a ferry flight to Wright Field at Dayton, Ohio, in 1943.

E. MARSHALL

The first four Canadians to train on helicopters with the Royal Navy get a look at an early Sikorsky YR4B in June 1944. Left to right are Lieutenants E.M. Marshall and J.P. Fournier, RCNVR, and Sub Lieutenants W.D. Jackson, RNVR, and K. Parker, RCNVR.

USCG

Inset: A class portrait of the first helicopter training course pilots. Seated, left to right, are Lt. Eric Marshall, SLt. Alex Mulicrane and Lt. Paul Fournier. Standing are SLt. Ken Parker, Midshipman Giles Davies and SLt. Bill Jackson.

Canadian Pilots Train on the Sikorsky R4

A select group of seven Canadians who had joined the British Fleet Air Arm trained as helicopter pilots under the guidance of the Royal Navy at Floyd Bennett Field between June and December 1944.

On March 23, 1944, the British Admiralty selected five Canadians, Lieutenants J.P. Fournier, J.W. Stewart, E.M. Marshall, F.P. Foulds and F.H. Leigh Spenser, as pilot candidates for the first course in June. Foulds and Spenser were replaced as both were required for duties within their respective naval units and were not available.

Lieutenants J.P. Fournier and E.M. Marshall, RCNVR, attended the first course in June, along with SFTS graduates from Canada, SLt. W.D. Jackson, RNVR, and SLt. K. Parker, RCNVR. The second course in August included SLt. L.F. Page and Lt. J.W. Stewart, RCNVR. No Canadians attended the third course, which started September 20. Lt. Cdr. D.L. Foley, RNVR, was the British Naval Liaison Officer (Air) at the U.S. Naval Air Station, Norfolk, Virginia, under Captain Casper John, Royal Navy, the head of the British Admiralty Delegation in Washington. Through his Chief of Staff, Foley was able to obtain permission to convert to helicopters in late November at Floyd Bennett Field after the Royal Navy had completed its main training program.

A few other Canadians in the military also flew in the Sikorsky R4 with the USCG. Lt. Stewart Graham, USCG helicopter pilot No. 2, gave demonstration flights to both Major Don Campbell, Royal Canadian Army, and Air Commodore Powell, RCAF, in June 1945.

First Pilot Training Begins

J.P. Fournier became interested in flying while in England with the Royal Navy. He went over in 1940 on loan from the Royal Canadian Navy for officer training. After obtaining his pilot's licence, he eventually ended up serving with operational squadrons ashore and on the aircraft carrier HMS *Indomitable* flying Albacores and Swordfish. In January 1944 he was authorized for home leave and returned to Montréal, Quebec.

Fournier recalls, "I was instructed to report to the Senior British Naval Officer in New York upon the completion of my leave. I was posted to an aircraft ferrying group piloting naval aircraft to Norfolk, Virginia, and San Diego, California. After several months of flying, I was told that I had been selected for a course on helicopters. I had never seen a helicopter and quickly made my way to Floyd Bennett Field where the Royal Navy training school had been set up. I had the opportunity to go for a familiarization flight that day. This was my first introduction to this new aviation activity. I met Marshall, Jackson and Parker there a short time later. We all had an opportunity to look at our training helicopter, the Sikorsky YR4, and started flying in early June 1944.

"Igor Sikorsky gave us a lecture on the helicopter. He was somewhat difficult to understand due to his thick accent. I often thought he was well over one's head the way he explained the intricacies of flying helicopters. The R4 was quite underpowered and difficult to control at first. Autorotation practice was right to the ground. Ground resonance was critical in the R4. We were all quite young and the element of danger flying the early R4s didn't seem to affect us. Everything was new and exciting.

"Having completed the helicopter pilot course in July 1944, I returned to the U.K. and test flew fixed-wing aircraft at the Fleet Air Arm's main overhaul and repair base at Donibristle, near Edinburgh, Scotland. I did not get near a helicopter again until early 1945 at Royal Naval Air Station Twatt in the Orkney Islands."

A Royal Navy YR4B is seen during hovering practice near Rockaway Beach, Long Island.

J.C. REDFIELD

Bill Jackson and Ken Parker were both at No. 31 SFTS, Kingston, Ontario, when they heard about the Royal Navy Helicopter School in the United States.

Bill remembers, "We had just finished our advanced training on Harvards in May 1944, and when the Royal Navy was giving us our wings, they asked for volunteers. Ken and I thought that this would be a good deal.

"After arriving in New York we were commissioned and then reported to the Royal Navy at the USCG air station in Brooklyn. They gave us a line that they wanted to see if someone could come straight out of advanced training on fixed-wings and immediately learn how to fly helicopters. I can tell you there were some long faces when they saw how easily we were able to fly these new machines.

"Training commenced on June 3, 1944. My first lesson was on air experience flying YR4B FT838 on June 9 with instructor F/L Bradbury, RAF for 25 minutes. After 7 hours and 30 minutes dual training, I soloed on July 3 in YR4B FT837 after 10 minutes.

"The early Sikorsky R4s had some very severe limitations. You couldn't fly above 250 feet, and on a hot day with more than 5 gallons of gas the R4 wouldn't even get off the ground. We couldn't fly in the rain or in winds over 15 to 20 knots. On one occasion during a training exercise with F/L Bradbury over Rockaway, near Jamaica Bay, fog closed in on us. We managed to land the R4 in a tennis court. In full flying gear, I walked over to a toll booth on the nearby highway bridge and asked to use their phone in order to call Floyd Bennett Field. The toll bridge operator panicked until I explained we were flying a helicopter, not an airplane!

"I completed my helicopter training with a total of 32 hours on the YR4B and R4B by July 26, 1944. Both Ken Parker and myself finished training together during July. We returned to England to fly operationally on fixed-wing aircraft. Parker was killed December 1945 in a Barracuda over the North Sea, and I started flying helicopters the same month."

After a stint in Yarmouth, Nova Scotia, at the Naval Air Gunnery School, Lt. Eric Marshall, RCNVR, was posted to Floyd Bennett Field in May 1944.

"It was a very busy place. The Royal Navy was operating their school right next to the USCG. Our course included six people. Bill Jackson and Ken Parker were the other Canadians besides myself and Paul Fournier. Two British officers, Giles Davies and Alex Mulicrane, made up the rest of the first class.

"I started training on the Sikorsky YR4 FT838 on June 9, 1944, with my instructor SLt. John Jeffreys, RN. The YR4 was very underpowered. Hovering was difficult at first, until I caught on. After 7.2 hours of dual with Jeffreys, I soloed on July 1, 1944, in FT836, after being checked out by F/L Bradbury, RAF. I believe three other students soloed the

P. Fournier

Above: Paul Fournier (in the right-hand seat) and Bill Jackson check out an R4 cockpit.

Aerial view of the world's first helicopter training base at Floyd Bennett Field, June 1944. A combined dress muster of personnel is underway with the small British unit standing to the right in front of a Royal Navy Sikorsky R4.

USCG

same day. We were all very competitive and keen to learn.

"We used to practise close to Rockaway Beach. One day I was flying dual with instructor Jeffreys. I had already done a couple of landings and takeoffs. Jeffreys got out to observe my flying, as many of the instructors used to do, watching the students from the beach. As I lifted off, the right side came up first, resulting in the left wheel contacting the ground. Next thing I knew the right side wheel touched. All I could think of was, 'Gosh, this was ground resonance. Here I go.' I pulled up the R4's stick and wobbled into the air. The helicopter began to pitch and yaw and shake. Somehow I was able to settle it down and came around to land. I could see John standing below with his hands up in the air. I got it down and expected the worst. Jeffreys came over. He said to try it again. I lifted off with no problems after that. That's the closest I ever got to encountering ground resonance in the early YR4.

"Another interesting part of the course was landing and taking off from the 'Mal de Mer', or the 'seasick' deck platform. Because of the platform's movement, which simulated a rolling deck on the ocean, one always had to approach it into the wind. You had to make sure your wheels were locked when touching down. The difficulty was dropping the R4 just when the platform was about level. On taking off and getting high enough in a hover, one had to watch that the pitching deck did not hit your tail. It was very nerve-wracking. You needed all the cushion of air you could get in order to build up your speed and take off. However, I don't remember any incidents with the R4s using the platform.

J.C. Redfield

Igor Sikorsky prepares to test an early hoist at Floyd Bennett Field, 1944. The pilot is USCG Commander Frank A. Erickson. Sikorsky's R4 was the first helicopter to go into full production and military service.

"My training was completed on July 31 with about 33 hours on the R4. Shortly before the end of the course I was asked to stay on as an instructor and was both surprised and pleased even to be considered. After receiving some additional instructional training in August from F/O Whittle and F/L Arkell, my experience flying the YR4 and R4B increased dramatically over the next four months. My first student was SLt. Little. I also trained Lt. J.W. Stewart, another Canadian."

In addition to instructing students on the R4, Lt. Eric Marshall was involved in other interesting duties, including the first night flying done by the Royal Navy in Sikorsky R4Bs. He also worked with the USCG testing a rescue hoist and had the chance to fly in the Sikorsky R5 and R6. He ferried British R4Bs from the Sikorsky plant in Bridgeport, Connecticut, to Floyd Bennett Field. Marshall first met Igor Sikorsky at the factory, and was able to get a personal tour with the other R4 ferry pilots.

Before flying five R4Bs back to Floyd Bennett Field, they were warned not to fly under the George Washington Bridge on the Hudson River. Marshall found it tempting, but followed orders and flew over the top of all bridges along the way.

He completed his instruction duties during November, finishing with Lt. Cdr. Callingham, RN, and F/O Dunn, RAF. He returned home to Montréal temporarily. The main training program for students finished on November 24, 1944. The British unit at Floyd Bennett received orders to move the aircraft

D. Foley

Above: Lt. Cdr. Dennis Foley takes off from the deck of the USS *Charger* in 1945. The yellow bands applied to the R4 offered improved visibility from the air in case of a forced landing.

Right: In this view Lt. Cdr. Foley is seen with USCG Commander W. Snyder to his left. Foley was the British Naval Liaison Officer (Air) at Norfolk, Virginia.

and instructors back to England on January 1, 1945. The R4s were to be flown to Norfolk, Virginia, and shipped on the escort carrier HMS *Thane*.

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SLt. Len Page, RCNVR, also went directly to the helicopter training school from the SFTS in Kingston, Ontario. "I had not requested to learn to fly helicopters. It was right out of the blue. Why I was picked, I have no idea!

"My training began August 5 on Sikorsky R4B KK970. Lt. Sharpe, RN, was my main instructor. Most of our flying was done over a bog near the airbase on 30- to 40-minute flights, as one tended to get tired from the heavy controls. Autorotations were done each time we went up. It was quite scary at first, as you came down pretty fast! I soloed during a five-minute flight on August 14, 1944, after only 5 hours, 15 minutes of training. Typical trips included the local beaches to buzz the bathers and flying alongside moving trains to wave at the passengers.

"After completing training by September 7, 1944, I had over 37 hours of flight time on the R4. Another Canadian at the school, Johnny Stewart, RCNVR, also completed his training and went back to England with me. I don't believe he ever flew helicopters after that. I eventually returned to fixed-wing aircraft and never got back onto helicopters until July 1945 in the Orkney Islands, replacing Lt. Paul Fournier at Scapa Flow."

P. FOURNIER

Above: Lt. Paul Fournier, on the left, with the visiting Senior Wren Officer. Beside her is the local Wren Commanding Officer and the Base Commander at Twatt in the Orkney Islands. April 6, 1945.

Left: Lt. Fournier lifts off from Twatt. With him is the visiting Senior Wren Officer for her first helicopter flight.

Last Canadian Trained by the Royal Navy

Lt. Cdr. Dennis Foley, RCN, RNVR, had been at Floyd Bennett Field on numerous occasions and seen the R4s flying. He was able to return to the USCG base and become qualified on the R4 before they were shipped to England. "The Royal Navy had finished their courses and were getting ready to pack up and go to the U.K. I was fortunate that there were plenty of aircraft and instructors. My first flight was on November 28, 1944, in the YR4. On December 2, after 6 hours and 30 minutes of dual training, I soloed in the R4 and finished the course in early December, becoming the last Canadian trained on a helicopter before the end of the war."

Largest Cross-Country Helicopter Flight

Because he was familiar with the coastline, Lt. Cdr. Foley was put in charge of arranging the transfer of the 11 R4 helicopters to Norfolk, Virginia, for the trip by carrier to England. A week before the formation flight, Foley and Lt. Cdr. E.A.H. Peat flew an R4 down to Norfolk to familiarize themselves with the proposed route.

On December 14 the 11 YR4 and R4Bs were fueled and loaded with parts, supplies and personal gear. They took off in formation toward Norfolk. Piloting the Sikorskys were a Canadian, a Scot, an Australian, a New Zealander and several Englishmen. At the time, the 5-hour, 40-minute flight was the largest cross-country helicopter trip ever attempted, with few resulting problems.

The helicopters were not loaded until December 30, 1944, because of the late arrival of the carrier. Lt. Marshall arrived from Montreal to accompany the pilots and aircraft back to England. The ship sailed on January 3 for Belfast, but owing to bad weather and gusty winds no attempts were made to fly any of the R4s during the crossing. After unloading some Corsair fighter aircraft in Ireland, HMS *Thane* headed for Glasgow, Scotland. On January 16, the escort carrier was struck by a torpedo.

Lt. Marshall remembers the day: "Halfway across the Irish Sea we were hit by the torpedo. It knocked the stern off her and a lot of the helicopter mechanics were killed. No helicopter pilots were hurt. Everything was mixed up at the time. Things were hairy trying to get ashore in a snowstorm. The carrier was towed into the Clyde estuary by a destroyer and grounded.

"We were able to get most of the R4s up and flew them first to Abbotsinch on January 17, 1945. This was the last time I flew the Sikorsky R4. I was sent back to Canada in May 1945 and joined a group that was to become the nucleus of Canada's Fleet Air Arm."

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Lt. Cdr. E.A.H. Peat finished his assignment in the United States and returned to England later in January 1945. This was the end of the Royal Navy's helicopter training school in the United States. Co-operation between the USCG and the Royal Navy helped to play an important part in the initial development of the military helicopter for rescue and antisubmarine patrol protection.

Two British R4Bs remained in the United States. KK979 was at Floyd Bennett Field under repair. KK998 had been at the U.S. Navy Patuxent River test facility for most of 1945. Both machines were turned over to Lt. Cdr. Dennis Foley at Norfolk, Virginia. The R4s were used for various trials and experimental work, including deck landings, communications, mine sweeping, rescue and medevac operations during 1945.

Wartime Helicopter Use in the U.K.

In addition to the 11 R4s on HMS *Thane* and the two on the *Daghestan*, some R4s were also shipped to England in the middle of 1944. R4 deliveries had been delayed somewhat, and as a result fewer pilots were now required. The larger Sikorsky R5 was cancelled owing to a reduction in the number of ships being lost to enemy submarines. The operational use of helicopters was also under review by the British military.

Sikorsky YR4s were at Hanworth and used by the Royal Air Force. They were moved to the Airborne Forces Experimental Establishment Beaulieu, Hampshire, in March 1945.

One of the first naval helicopter flights was set up in the Orkney Islands at Royal Naval Air Station Twatt in early 1945. Other flights were operated at the gunnery school on Whale Island, and at Surrey, Portland, Gosport and Tralee.

Lt. J.P. Fournier had been flying as a test pilot at the Fleet Air Arm repair base near Edinburgh, Scotland. He was told he would be going to 771 Squadron at Scapa Flow in the Orkney Islands. Several R4s had been delivered in crates, with plenty of spare parts, tools and a complete maintenance crew. Fournier

L. Page

Lt. Cdr. Len Page sits in the cockpit of R4B KK969 with his crew alongside in Portland, England, 1945. Note the special dolly used to move the helicopter on floats up the slipway.

was made officer in charge of the helicopter unit and saw to the assembly of the R4s.

"I received permission to land an R4 on one of the gun turrets of a battleship. This was carried out successfully. We also used one of the helicopters to try some fishing on a local creek . One day I took a Fleet radar officer to Stroma Island to calibrate a radar transponder. It only took a few hours to do the work. Previously, it had been a two-day trip by ship. The next successful exercise was using the helicopter to assist in the calibration of a ship's radar. One had to hover at a known height and distance of about eight miles away in sight of the ship. Ship radar calibration became a popular helicopter application.

"As well, we did have our share of incidents. In February 1945 one pilot got too close to a parked aircraft and struck it. The Sikorsky R4 was damaged beyond repair. Another time, one of the R4s was being used for a short flight by the Captain of HMS *King George V*. Shortly after takeoff the engine quit and the helicopter settled into the ocean and began to sink. Both the pilot and the captain escaped safely and the machine was eventually salvaged.

"Several months after VE day, May 7, 1945, I was repatriated back to Canada and discharged from service. Lt. Cdr. Len Page, RCN, was my replacement in charge of Helicopter Flight No. 2 at RNAS Twatt."

B. Jackson

Lt. Bill Jackson demonstrates the hovering ability of the R4B (KK977) while two officers pretend to hold the rotorcraft up in the air.

Page recalls, "I only saw Fournier for a few days at Scapa Flow before he left in July. We had three Sikorsky R4Bs. I flew them on fleet requirement work and lots of ship radar calibration duties. We also experimented with aerial photography. I thought we were the only ones using helicopters at the time."

Page, along with Alan Bristow, continued to fly the R4s until after the war. The Home Fleet was moved from Scapa Flow in August, and 771 Squadron departed for Worthy Down before finally basing at Portland in September 1945. Lt. Cdr. Page stayed on helicopters until May 1946 when he was discharged from the Royal Navy and returned to Canada.

Back in the United States, Lt. Cdr. Dennis Foley was continuing to build up time on the R4s assigned to him at Norfolk, Virginia. On May 11, 1945, he located a missing downed aircraft with one of the Sikorsky R4s and assisted in the rescue of the pilot. For his actions, Foley received the Sikorsky Winged S Air Rescue Award, given to airmen who were involved in life-saving missions while piloting a Sikorsky helicopter.

The Second World War officially ended September 2, 1945. All helicopter production was cancelled. Sikorsky's rapid development and progress came to a dramatic stop. Over a period of three years and four months, the company had delivered 131 R4s, 65 R5s and 219 R6s to the U.S. Army Air Force, Navy and Coast Guard and the British Navy, for a total of 415 helicopters.

Post-War Military Helicopter Flying

Lt. Paul Fournier had already returned to Canada, and was now working in a new career in civil aviation.

Lt. Cdr. Foley was still flying R4s at Norfolk, Virginia. He continued to do so until December 1945, when the Royal Navy's office was shut down. He reported back to the Royal Canadian Navy in Ottawa, January 1, 1946. The Royal Navy was willing to turn over their two remaining U.S.-based Sikorsky R4Bs to Canada.

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Foley recalls, "The RCN was not interested in the two war-surplus R4s. The Royal Navy had said Canada could just fly them away. I offered to pick them up but was told by the senior Air Officer that the Canadians wanted jets, not bloody helicopters!" The R4s were finally turned over to the U.S. military.

In early 1946, Lt. Cdr. Foley was posted overseas to the Royal Navy's R4 assembly and repair base at RNAS Worthy Down for maintenance courses. At the time, few trained helicopter pilots remained in the Royal Navy, as many had been RNVR and had already left the service.

Foley remembers, "The Air Engineering Officer had been at Floyd Bennett Field. There were no pilots to test fly the repaired R4s, so he arranged for me to do the testing after school hours, lunch time and on weekends. I picked up the odd R4, delivered a few for overhaul to a facility near London, plus flew the engineering commander out to a couple of crash sites."

Lt. Cdr. Len Page flew R4s with Helicopter Flight No. 4, Portland, until May 1946. He helped to check out several new helicopter pilots during that time and flew plenty of radar calibration flights and torpedo trials. Page recorded more than 154 hours of flight time on the venerable Sikorsky R4 before leaving military service in May and returning to Canada. He eventually met up with Eric Marshall and joined Intercity Airlines in Montréal, which was constructing Canada's first helicopter, the SG-VI.

Lt. Bill Jackson joined Lt. Ken Reed and Lt. Allbeury in December 1945 at Helicopter Flight No. 1, Whale Island, and later went to RNAS Gosport, Helicopter Flight No. 5. "I was there for about seven months. Reed and I were the only ones flying the R4s at the time. Helicopters were still not that common over there. I remember flying one to an RAF station in the Midlands. Everyone just swarmed around it.

"We moved to Gosport as the Royal Navy was consolidating their helicopter operations. This was also the Admiralty's Trials and Development Unit. There we had the opportunity to further test the R4, determining how high it could reach and doing steep turns."

Jackson flew his last helicopter on June 16, 1946, at Gosport on a local flight, giving dual instruction to a Lt. Elgee. He left the Royal Navy and returned to Canada having accumulated over 144 hours on the R4.

During the Second World War, seven Canadians had trained on the Sikorsky R4, the world's first practical helicopter. Lt. Cdr. Dennis Foley was the only one to stay in military service and fly helicopters with the Canadian Navy. Their pioneering efforts and initiative marked the beginning of rotorcraft development and use across Canada. ✈

Ode to the R4

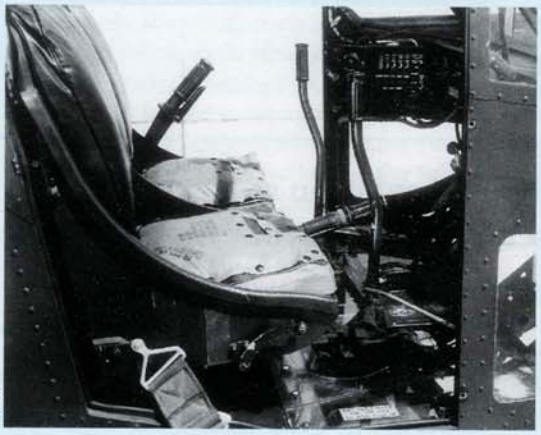
The main rotor had three blades, a swash plate and hydraulic dampers, while the tail rotor had three blades. In the cockpit, a collective pitch control lever was situated between the pilot and the copilot seats. To give instruction, the instructor manipulated the lever with his right hand, allowing the pupil to use his left hand.

Normal pilot position was on the right-hand side. The pitch lever had a twist-grip throttle. On the top of the instrument panel was a pitch indicator. This was merely a hollow tube, marked off in degrees with an indicator that moved up or down as the pitch lever was raised or lowered.

Before takeoff, the pitch indicator was set at 4½ degrees, and engine RPM at 2,300. This setting was to provide the desirable pitch for engine RPM to achieve takeoff and hover. There was also the azimuth, or cyclic control stick, which didn't exactly function like a normal aircraft control column.

To assist the pilot while flying, due to the necessary change in stick position for varying loads, there was an ingenious trim system. Attached to the azimuth stick at the front and back were four metal rods. These were fitted from just above the floor to about three-quarters of the way up the stick. On each rod was attached a metal slide, which was connected to a rubber bungee, the other end of which was attached to the floor. By adjusting these bungees, the stick could be held to almost any position forward, back, left or right. This was necessary because of the large change in stick positions owing to load change.

Sikorsky R4 cockpit. The collective pitch control lever with a twist grip throttle is situated between the two seats. The pilot position was to the right. In front of the seats is the azimuth stick or cyclic. Note the bungee cord at the bottom of the right side azimuth stick. Sikorsky pilots had no benefit of hydraulic assistance on helicopters of that era.



USCG

With only the pilot flying, the helicopter tended to tilt to the right, so the stick had to be held over to the left to keep the helicopter level. By using the bungee, the pilot could position the stick to the left without having to keep pressure on it; otherwise it could be very tiring.

The anti-torque device was very much the same as it is today and was intended to provide lateral thrust to balance the torque. Dual rudder pedals controlled the pitch of the three-bladed tail rotor. A wheel (parking) brake lever was located beneath the instrument panel. Between the seats was a large rotor clutch and brake lever.

To start the R4 a pilot really needed three hands. There was an ignition switch, the throttle had to be operated, the azimuth stick had to be held centred, and the clutch lever was manipulated to slowly engage the clutch while engine RPMs were increased. As the clutch started to engage and load the engine, engine RPM had to be steadily increased to maintain a minimum of 1,000 RPM, while the anti-torque had to be used to prevent the helicopter from moving from the torque effect. No two helicopters seemed to fly the same.

The airframe was constructed of steel tubing, fabric covered. The main rotor blades had a steel spar, aluminum ribs, a balsa wood leading edge and a piece of piano wire for its trailing edge, and were, of course, fabric covered. A rubber strip was added to the leading edge and covered with another brass strip. The purpose was to protect the leading edge of the blade, for without the rubber, if we flew in heavy rain the fabric was apt to peel back. R4s had a dual rotor and engine tachometer, rate of climb indicator, altimeter, needle and ball, fuel gauge and oil temperature gauge, and some had cylinder head temperature gauges. The R4 was really underpowered with its 180-horsepower Warner Scarab engine. In hot weather, when we operated with a half load of fuel and two people on board, a running or jump takeoff was usually necessary.

In 1945, while giving a dual flight instruction and doing some ground manoeuvres, which we normally did to try to get the pupil familiar with the controls, the pupil let the helicopter take over. The standard procedure to stop forward motion was to ease the azimuth stick back and apply pitch. The pupil panicked and snapped the stick back hard. The blades looped and the tips struck the rear of the fuselage. All three blade tips were damaged. We flew home three feet off the water; it was rough, but not so bad that we could not make it.

If a pilot was making a let-down and allowed the airspeed to really drop off, while at the same time reducing pitch, creating a high rate of descent, the controls would go sloppy and the helicopter would start to almost fall free. It was a case of pushing the azimuth stick forward, and, providing one had sufficient height, the helicopter eventually would get its nose down, gain the desired airspeed and return to normal control. The same problem could occur when flying over hilly country or a cliff where there was a violent updraft. There have been numerous fatalities owing to this phenomenon.

The R4's tail wheel assembly was particularly high. This was to allow the helicopter to be in a level position when on the ground. At the training school, since the helicopter parking area was rather restricted and the R4 only had parking brakes, if a pupil taxied a helicopter in that area, it was taxied backwards. To taxi an R4, it was necessary to get the weight off the tail wheel, which, in fact, meant the helicopter was balanced on its two main wheels.

If the student pilot gave too much forward stick, the helicopter could nose over and the main rotor blades would hit the ground. Main rotor blades were in short supply. A modification was fitted consisting of two small wooden skids, rubber-mounted, to prevent the main rotor blades from striking the ground if the helicopter nosed over.

B. Jackson

Close-up of an R4B piloted by Lt. Bill Jackson.

Before startup it was good practice to walk the rotor blades back and forth to exclude any air that might have got into the damper system, which could cause quite a bit of vibration. Many pilots waxed the main rotor blades; others didn't keep the blades clean. At the tip end of the main rotor blades were drain holes about one-eighth of an inch in diameter. If these were plugged up with dust, dirt, wax or whatever, the track of the rotor blade would alter, causing an out-of-track vibration frequency.

Hovering was not an easy thing to learn in a R4 owing to the anticipated correction required; that is, the pilot had to anticipate the helicopter's movement and correct before the helicopter actually made the move. The main problem was the lag in the control system and, until this was mastered, hovering could be very tiring.

Long trips could also be very trying, and to correct this a spade-type grip was installed on the azimuth stick that could be adjusted for height. The grip could be lowered so the pilot could rest his arm on his knees, making the trip less fatiguing. These controls had no servos during this period, and pilots built up good muscles flying the R4.

R4 autorotations could be a bit dicey owing to the landing gear and the high tail wheel configuration. I have never heard of anybody running one on; it was always a flare and a zero airspeed landing. Many schools did not allow pilots to try autorotations; they merely demonstrated or gave a followthrough with an instructor. Looking back, the R4 really did sterling work.

Dennis Foley, RCN, RNVR