



## RCAF Norseman Champions

Norseman 693 in which F/O Carl Crossley checked out on June 18, 1940. During the war 693 served in the BCATP and along the NWSR. Postwar it became CF-QAA, twice was rebuilt at Noorduyn, then was lost in a bush flying accident in March 1959. (Charles E. Hayes Col.)

### F/L Carl Crossley

Several RCAF personnel can be categorized as champions, or, kings of the Norseman. Paramount is Charles Carlton "Carl" Crossley, whose RCAF career is an amazing record of solid service in bush, mountain, Arctic and ferry flying. Sometimes this was all about the Norseman, sometimes the Norseman was peripheral or absent. However, since Crossley's wide-ranging flying in 1940-44 was intertwined, all aspects should be covered to appreciate his contributions to the war effort.

Carl Crossley was born to a farm family in King City, Ontario on September 14, 1891. With the advent of the First World War, he left the farm to enlist in the Royal Flying Corps. In 2012 some archival files surfaced, which explain how, in 1917, Crossley washed out of the RFC ground school held at the University of Toronto, School of Practical Science, Lt Brian A. Peck, Officer Commanding. One document explains this in the vague sentence: "No longer fit for service with this unit".

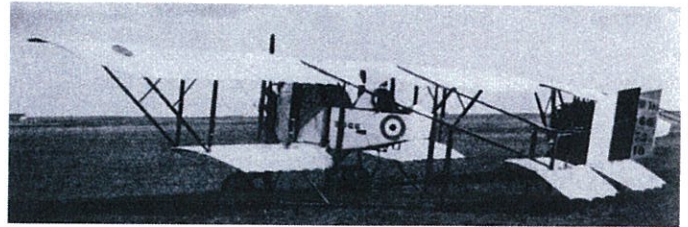
Crossley later suggests that this had to do with some missing paper work: "Recovered papers," he wrote, "and applied for admission to the Royal Naval Air Service." He was accepted as a Probationary Flight Officer in November 1917, sailed for England and trained initially at the Greenwich Naval College.



F/L Carl Crossley flew during the First World War, then amassed more than 5000 flying hours as an interwar bush pilot. From 1940-44 he was a true "Norseman Champion" in the RCAF. (LAC)



While on leave in Westmorland, England, Carl Crossley had some very good luck fishing. Here he's showing off an Atlantic salmon of about 20 pounds. (Crossley Col.)



The Caudron type in which Carl Crossley trained (and crashed) in 1918. (Imperial War Museum)



In the OPAS in the 1920s Carl Crossley serviced and piloted the WWI-vintage Curtiss HS-2L flying boat. Anyone with such experience had successfully passed through the bush flying "school of hard knocks". Shown is a typical Canadian government HS-2L circa 1922. (CANAV Books Col.)

From February 26 to April 6, 1918 he completed basic flight training at the RNAS flying school at Vendome, France. On March 23, 1918 he was involved in the crash there of Caudron N3241. He did advanced training at No.9 Training Depot Station at Lee-on-Solent on the Short seaplane and FBA flying boat.

Commissioned at RNAS Calshott on May 29, 1918, Crossley was posted to the Adriatic on anti-submarine and convoy duties with 271 Squadron. There he flew the Short 184 and Felixstowe F.3. Flying from Taranto, Italy on November 3, 1918, he had some sort of trouble with Short 1358, later noting, "1358 lost at sea". By his own calculation Crossley logged 118 hours with the RNAS. Discharged on May 19, 1919, he resumed farming in King City.

In 1921 Crossley took advantage of a Canadian Air Force refresher flying program for veterans at Camp Borden, logging eight hours on the Avro 504

trainer and SE.5 fighter. His abilities were assessed by F/L G.A. Thompson: "A good pilot, very keen and a good type of officer." F/L R.S. Grandy gave a broader assessment: "This officer is very keen and has plenty of confidence. He has natural flying ability ... His judgment is a little erratic, however, but will improve as time goes on."

One day Crossley met an RNAS acquaintance, who put him on to a job opportunity at the newly-formed Ontario Provincial Air Service. He applied, was hired in June 1926 as a mechanic, and was posted to Sioux Lookout. In 1928 he returned to flying, logging 463:45 hours that year as pilot and engineer on the HS-2L flying boat. Subsequently, from 1928-39 he was base pilot flying the D.H. 60 Moth at Biscotasing, northwest of Sudbury.

The outbreak of war in September 1939 coincided with the end of the OPAS flying season. By this time Crossley's

OPAS record showed 5262.33 flying hours over 12 seasons. He now enlisted in the RCAF, something that other veteran bush pilots were doing. Many of these men had flown during the First World War, so were beyond their prime for frontline service. The RCAF, however, needed exactly such experienced pilots on the home front.

Although he was almost 50 years old, Crossley enlisted in Ottawa on January 6, 1940. OPAS director George Ponsford provided the following recommendation: "I consider Mr. Crossley one of the finest pilots we have ever had in the Service, and have always found him diligent and willing ... His integrity is above reproach, and I would not hesitate to recommend him ..." Crossley's immediate boss in the field, P. McEwen, the District Forester at Sudbury, added:

*His record will attest his ability as a pilot and as a man ... He is keen,*



Harvard Is on the ramp at Trenton in 1940. No bush pilot hoping to fly in the RCAF would have a chance without first mastering the Harvard. Notice the careless practice of engines warming up with no one in the cockpit and no wheel chocks in place. (RCAF)

*intelligent, energetic and honest and, morally, his life is above reproach. I am very pleased to ... give unreserved attestation to Mr. Crossley's character and ability*

When Crossley was interviewed for RCAF service, one assessor had a less enthusiastic impression: "Officer calibre. Appears to have slowed down with advancing years. Experienced in the planes and engines of yesterday. Slightly bushed, but keen to serve. His experience in air operations should be of value, but this interviewer cannot say where."

Initially, Crossley was a Link Trainer instructor at Rockcliffe and Trenton. Happily, he returned to flying on April 24, 1940, going up at Trenton in Fleet Finch 1025 of the Central Flying School (Ferry Flight). Three days later he had his first twin-engine flight with F/O Ball in Anson 9939. On May 1 he inscribed in his logbook: "Certified that I fully understand the petrol system, endurance data, engine limitations and functions of the engine controls of the Anson aircraft." However, on May 16, 1940 F/O Crossley experienced an embarrassing landing in Harvard 1333. This easily could have ended his RCAF career on the spot. In his own words he reported:

*Today, on my third solo flight in a Harvard, I had the misfortune to land with the undercarriage retracted, and have been requested to submit a report giving as accurate an account as possible to what preceded. I had previously been*

*taking a check out from Flying Officer Martin, with whom I had done three landings ... and he had left me to carry on solo. The take off and climb were normal. After I had straightened out to level flight, on the downwind leg, I checked the horn, which functioned properly... Turning in for my approach, I found my position too far back for the proper glide, and deferred putting down my flaps for a few moments. At the proper point I lowered the flaps and concentrated on my approach, using enough engine to maintain a minimum of 85 mph.*

*My attention was taken by another Harvard taxiing toward my landing path ... To make sure of clearing him, I used a little throttle, and as I passed noticed him waving, but did not realize the significance, till I throttled back to land, the horn came on and the propeller ticked the ground. The aircraft jolted roughly to a stop, with the propeller blades arching back... I can only blame the human element and take full responsibility for my error.*

Crossley was forgiven this poor show and posted as a staff pilot to 1 Air Navigation School at Trenton. He flew first here on July 17 with F/O Preston in Anson 6040. As he began at 1 ANS, his RCAF logbook showed 24:25 hours flying time. On July 18, 1940 Preston checked him out on Norseman navigation trainer 693. His fourth Norseman flight (July 22) was in 680 – a "nav" exercise with P/O Ramsay as First Navigator and P/O Gibson as

Second Navigator. Next day, 1 ANS flight commander F/O Jack Hone (another former bush pilot) gave Crossley his Norseman instrument check ride. Henceforth, Crossley was flying two or three student trips per day in Ansons and Norsemans, the latter being 679, 680, 691, 693 and 698.

On September 17, 1940 F/O Crossley transferred to the communications flight at No.1 Wireless School at St. Hubert, where his immediate OC was F/L D.W. Saunders. Most of his flying now was in D.H.90 Dragonfly 7626 and 7627 but, by New Year 1941, he also had checked out on the Beech 18 and Boeing 247. About this time some superior wrote of him: "Loyal, conscientious officer who is keen on flying and has had considerable flying experience. Good habits and deportment."

In this period Crossley applied to become an overseas ferry pilot, but his lot continued mainly to do local ferrying. He finished at this posting on June 13, 1941 by ferrying Tiger Moth 4943 from de Havilland of Canada in Toronto to 1 WS at St. Hubert. Two days later he was promoted to flight lieutenant. On June 17, 1941 he began a tour at Rockcliffe with 12 (Communications) Squadron, a versatile unit best known for flying VIPs. Now he was back in Norseman country. His first two flights at "12 Comm" were with F/O Smith in Norseman 2478. Also that week he checked out on the Norseman's "little brothers", the Fairchild 24 and Stinson 105.



A typical scene at RCAF Station Trenton about the time F/O Crossley was posted there. He would fly all these types sooner or later. The Harvard in the middle is 1333, the same one in which Crossley suffered his wheels-up landing. He also flew 9939, the farthest Anson on the left. (DND PL293)



This D.H.90 Dragonfly served the RCMP 1937-40, then was impressed into the RCAF. While he was at St. Hubert in 1940-41, Carl Crossley often flew this dainty little transport in its guise as RCAF 7626. (C. Don Long)

Crossley flew many circuits in Norsemans 2477 and '78 on wheels, then checked out on floats in 2479 on June 30, after two preliminary exercises. Henceforth, he was busy with Norseman transport flights. June 25, 1941, for example, he flew 2479 with a civilian passenger (Mr. M.S. Campbell, a labour negotiator) to Arvida in the Saguenay Valley. He back-tracked the same day to St. Félicien and Roberval. Next day he returned directly to Rockcliffe, having logged 6:30 hours for this trip. On the 27th he and his crewman returned to

Arvida in 2479 to bring Mr. Campbell back to Rockcliffe.

Starting on August 12, 1941 F/O Crossley and crewman Cpl R.W.L. DesRivières were carrying the baggage for the touring Duke of Kent's party. Beginning at Longueuil, they flew to Quebec City and Murray Bay, then returned to Rockcliffe on the 15th. On September 2 they went back to Quebec City to continue with the royal baggage, having along with them the Duke's valet, LAC Hale. On September 2 they flew to Charlottetown in 2479, thence to

Dartmouth next day. On the 4th F/L Crossley returned to base via Saint John and Quebec City.

On September 9 Crossley flew A/V/M Lloyd Breadner and Air Commodore Edwards from Ottawa to Quebec in Norseman 2479. Later in September he checked out on the Canso and Goose, so was not so much a Norseman man in this period. However, on September 30 he did have G/C K.G. Nairn and some RAAF officers on a trip in 2487 from Malton to Fingal, Mount Hope and back to Malton. In October 1941 he crewed on Stranraer



YEAR	AIRCRAFT		PILOT, OR 1ST PILOT	2ND PILOT, PUPIL OR PASSENGER	DUTY (INCLUDING RESULTS AND REMARKS)
	MONTH	DATE			
-	-	-	-	-	TOTALS BROUGHT FORWARD
Aug	1	-	-	-	-
"	1	NORSEMAN	2479	SELF	LAC MOORE AIR MARSHAL BISHOP, LAKE ROSSEAU MUSKOKA
"	1	"	2479	"	LAKE ROSSEAU TO NORTH BAY
"	1	"	2479	"	TROUT LAKE - TO WANNER BAY SE
"	1	"	2479	"	RETURN LAKE ROSSEAU
"	1	"	2479	"	LAC MOORE RETURN ROCKCLIFFE
"	3	"	2479	"	SGT SCOTT LOCAL 20 HR CHECK TEST
"	3	FAIRCHILD	699	"	LAC KENDRICK LOCAL FLIGHT CHECK
"	4	STINSON	3486	"	LAC BEVSON LOCAL CIRCUITS
"	5	FAIRCHILD	699	"	LAC PETERSON ROCKCLIFFE TO UPLANDS
"	5	"	699	"	UPLANDS TO ROCKCLIFFE
"	6	NORSEMAN	2479	"	F/O SMITH NIGHT FLYING CHECK OUT
"	7	"	2479	"	CPL DESRIVIERS COMPASS CHECK "AIR"
"	8	STINSON	3486	"	SOLO LOCAL
"	12	NORSEMAN	2479	SELF	CPL DESRIVIERS
"	12	"	2479	"	SGT CAMPBELL ROCKCLIFFE - LONGUEUIL
"	13	"	2479	"	S/L SAUNDERS LONGUEUIL - QUEBEC CITY
"	13	"	2479	"	W/L RAYMOND S/L SAUNDERS S/L LABELL
"	14	"	2479	SELF	CPL DESRIVIERS SGT CAMPBELL LOCAL
"	14	"	2479	"	QUEBEC CITY QUEBEC CITY - MURRAY BAY
"	14	"	2479	"	W/L RAYMOND SGT CAMPBELL - QUEBEC CITY
"	14	"	2479	"	F/L CHOPAN CPL DER RETURN LAKE ST JAMES
"	14	"	2479	"	SGT CAMPBELL PHOTOGRAPHY - MURRAY B

GRAND TOTAL [Cols. (1) to (10)]  
Hrs. \_\_\_\_\_ Mins. \_\_\_\_\_

TOTALS CARRIED FORWARD

928 for a long delivery flight. To get the feel of a large flying boat, he made a familiarization flight at Rockcliffe on October 4 with another pre-war OPAS pilot - F/O Jay Culliton. Crossley, Culliton with Sgts Julien, McBain and Murray delivered 928 via this route:

October 8 to Remi Lake at Kapuskasing, (4:00 hours)

October 9 to Sioux Lookout (4:15)

October 10 to Lac du Bonnet (2:00) and Regina Beach (3:45)

October 11 to Waterton Lakes, Alberta (5:00)

October 14 to Patricia Bay (4:45)

F/L Crossley returned to Ottawa via Trans-Canada Air Lines. On the 17th he flew A/V/M E.W. Stedman from Ottawa to Kingston in Norseman 2487. In November he made ferry and test flights on Stranraers 950 and 952, then (November 17 to 27) captained 950 to Patricia Bay, this time via Selfridge (Michigan), Chicago, St. Louis, Fort Worth, Caballo (New Mexico), San Diego, San Pedro and San Francisco. A southerly route was followed, since the waters across western Canada were largely frozen.

In late January 1942 F/L Crossley left 12 (Comm)

A page from F/O Crossley's logbook from his 12 (Comm) Squadron days. For August 1, 1941 his passenger in Norseman 2479 was Air Marshal W.A. "Billy" Bishop, VC, whom he mainly flew around Muskoka, where Bishop had a summer home. Some Fairchild 24 and Stinson 105 flights also are noted here. 2479 was wrecked on August 21, 1942, while force-landing northwest of Torbay. Aboard the 121 (Composite) Squadron flight from Gander to Torbay were F/O C.G. Pennock, two crew and five passengers. There were no injuries. The RCAF concluded that Pennock was an inexperienced pilot and that the CO "must take considerable blame for detailing the pilot for this flight".



At 12 (Comm) Squadron in 1941 Carl Crossley flew Norseman "hack" 2487. It later served the RNoAF (1953-59), then flew commercially until a November 1969 accident. (CANAV Books Col.)

F/L Crossley's log book page noting activity with Norseman 3528 during Col J.L. Ralston's adventure of March 1942. For the last trip of the day with crewmen Cpl T. Kerr and LAC W. Law, Crossley does not note that, on landing back at "Kap", there was some serious damage to 3528. The subsequent investigation concluded: "Machine on ski landing overran snow surface and dropped three feet onto paved runway causing structural failure of starboard oleo leg tube support at weld."

YEAR		AIRCRAFT		PILOT, OR 1ST PILOT	2ND PILOT, PUPIL OR PASSENGER	DUTY (INCLUDING RESULTS AND REMARKS)
1942	MONTH	Type	No.			
						TOTALS BROUGHT FORWARD
	MARCH					
	13	NORSEMAN	3528	SELF	CPL SMITH	LOCAL FLIGHT
	13	"	3528	"	ACI LAW	LOCAL FLIGHT
	13	"	3528	"	ACI LAW	LOCAL FLIGHT
	14	"	3528	"	CPL KERR	TO NORTH BAY
	18	"	3528	"	Sgt WILKIE	TO NORTH BAY - KAP
	23	"	3528	"	LAC LAW	LOCAL
	28	"	3528	"	ACI SMITH	LOCAL
	24	"	3528	"	CPL KERR	LOCAL
	25	"	3528	"	Sgt WILKIE	KAPUSKASING - ARMSTRONG
	25	"	3528	"	PLT WALTERS	RET KAP
	28	"	3528	"	LAC LAW	ACI SMITH TO FAUQUIER
	28	"	3528	"	CPL KERR	ACI SMITH TO FAUQUIER
	28	"	3528	"	SOLO	FAUQUIER - KAP
	28	"	3528	"	SOLO	KAP TO FAUQUIER LAKE
	28	"	3528	"	COLL. RALSTON	FAUQUIER - KAP
	30	"	3528	"	W/C WILKINS	FAUQUIER LAKE TO INVESTIGATE CASE
	30	"	3528	"	Sgt WILKIE	RET KAP
	31	"	3528	"	CPL KERR	LAC LAW FAUQUIER LAKE
	31	"	3528	"	"	RET KAP WITH EQUIPMENT
	31	"	3528	"	"	TO FAUQUIER LAKE
	31	"	3528	"	CPL KERR	LAC LAW RET KAP
GRAND TOTAL [Cols. (1) to (10)]						TOTALS CARRIED FORWARD
751 Hrs. 15 Mins.						

way with a feeling that the Air Force was on its toes...

I must mention, too, Flight Lieutenant Crossley of Kapuskasing who constituted a most efficient life boat crew, he being "the cook, the captain bold, and the mate of the Nancy Brig." He succeeded in what appeared to be an impossible take-off and, although I have had a good many flights, I think the one with him was probably the most agreeable of my experience having regard to what it was taking me from and to. He is patient, industrious, and determination and resourcefulness personified.

From Kapuskasing, Crossley operated to such other cold spots as Armstrong and Nakina, logging more than 80 Norseman hours in 3528. In April 1942 he switched to 681, until returning to Ottawa in it on May 15. One of his tasks had been to deliver a Cheetah engine from Kapuskasing to Porquis Junction (near Timmins) in 681 on May 8. The Cheetah was needed by an Oxford trainer, AS941. Crossley then flew the repaired "Ox-Box" to Kapuskasing on May 12.

Through the summer of 1942 F/L Crossley was testing and ferrying various aircraft. In June he delivered Oxford X6684 from Dartmouth to Winnipeg via Montreal, Rockcliffe, Porquis Junction, Kapuskasing and Armstrong; Anson 8264 from Aylmer to Winnipeg via North Bay, Kapuskasing and Armstrong; and Lysander 2364 from Winnipeg to Lethbridge via Brandon, Rivers, Regina and Medicine Hat. From July 3 to 8 he tested five Stearman trainers at Winnipeg. Other work that month included ferrying a Harvard from Winnipeg to Weyburn, and taking three

Squadron for 124 (Ferry) Squadron. In December 1941 he delivered Hampdens AJ995, '996, '998 and AN129 from National Steel Car at Malton to Fingal, perhaps for storage. On his return trips to Malton, he travelled as a passenger in Norseman 3524. From December 22 to March 31, 1942 he was busy with Norseman 3528 at the 124 (Ferry) Squadron detachment at Kapuskasing, a busy Northern Ontario base on the trans-Canada ferry route.

On March 28, 1942 Lockheed 12A 7646, westbound from Ottawa on an inspection tour, had fuel trouble. This obliged F/L Edward H. Pritchard to belly-land 7646 on a slush-covered lake at Fauquier, about 25 miles east of Kapuskasing. Aboard was Minister of National Defence J.L. Ralston and his

party. As soon as word came from Pritchard that he was setting down, Crossley took off in Norseman 3526 with the crew of Cpl Thomas Kerr and ACI Smith. They found the Lockheed and landed. Crossley immediately flew back to base alone, perhaps with the Lockheed passengers. After his fourth and final flight that day, he made the bare logbook entry "Col J.L. Ralston Fauquier - Kap". In his report about this trip, Ralston almost revelled in telling the Fauquier story, in which he made Crossley the hero:

*I want very much to express my appreciation of the efficiency and consideration given to all of us in the Army on the trip West from which I have just returned this morning. Everywhere we were met, looked after and sent on our*

A page in the life at 124 (Ferry) Squadron: From July 15-22, 1942 F/L Crossley was very busy on the prairies not with the Norseman, but the Anson, Bolingbroke, Cornell, Crane, Harvard, Lysander and Oxford. This entailed almost 30 flying hours. On July 15 he took a local flip at Winnipeg with F/O Labella in Harvard FE349. Next day he delivered four pilots in Oxford BM808 the short distance west from Winnipeg to Carberry. He checked out on the Cornell and Lysander on the 16th and 17th. On the 18th he went by Crane from Winnipeg to a place called Sunstrum to collect Lysander 2351. (There is no Sunstrum, Manitoba, but perhaps this was Sunstrum Lake northeast of Kenora, Ontario, where 2351 could have been stranded. He returned to Winnipeg in 1:40 hours, covering about 200 miles - about the distance from Sunstrum Lake.) On July 19 Crossley flew ferry pilots by Crane to Fort William. Next day he took the same plane to and from the bombing and gunnery school at Paulson, where he test flew a Bolingbroke. On the 21st he ferried an Anson to Armstrong, Ontario, returning next day with an Oxford. Such was a typical few days in the life of an RCAF ferry pilot.

pilots in Crane FJ249 from Winnipeg to Fort William to collect Hurricanes. He finished on July 30-31 making six flights around Ontario and Quebec in three different Norsemans. His log for the month shows 62:45 hours flown on 48 different flights in nine aircraft types - impressive for an "over the hill" pilot.

### Crossley Goes West

On August 3, 1942 F/L Crossley with Sgt Brooks and LAC McMillan set off from Rockcliffe on another adventure - they were posted to Northwest Air Command and on their way in Norseman 3528. On Day 1 they reached Kapuskasing via Haileybury in 4:40 hours, then carried on:

- August 4 - to Nakina (Twin Lakes) and Sioux Lookout in 4:25 hours
- August 5 - to Lac du Bonnet, The Pas and Prince Albert in 6:45
- August 6 - to Edmonton and Cooking Lake in 3:30
- August 7 - to Fort St. John, Fort Nelson and Watson Lake in 8:05
- August 8 - to Whitehorse, Teslin, back to Whitehorse in 3:45
- August 9 - to Coffee Creek on the Yukon River in 2:15

Beginning next day, and usually operating without a crewman, F/L Crossley flew 3528 several times daily between Coffee Creek and Snag, Yukon, where an airstrip was being built for the

YEAR	AIRCRAFT		PILOT, OR 1ST PILOT	2ND PILOT, PUPIL OR PASSENGER	DUTY (INCLUDING RESULTS AND REMARKS)
	Type	No.			
1942					
	MONTH	DATE			
	JULY	-	-	-	TOTALS BROUGHT FORWARD
		15	HARVARD FE349	SELF	F/O LABELLA LOCAL CIRCUITS
		16	OXFORD BM808	-	SOLO WINNIPEG TO CARBERRY
		16	-	808	FOUR PILOTS CARBERRY TO WINNIPEG
		16	HARVARD FE312	-	SOLO CIRCUITS. 100 MILE 30° LANDING
		16	LYSANDER 2344	-	P/O MINNIN CHECKOUT ON TYPE
		16	-	2344	P/O HEARN
		17	CORNELL FE654	-	Sgt TRAVELLEE
		18	CRANE FJ249	P/O GOODLIN	SELF 2nd PUPIL WINNIPEG TO SUNSTRUM
		18	LYSANDER 2351	SELF	Sgt SMITH SUNSTRUM TO WINNIPEG
		19	CRANE FJ249	SELF	P/O WHEELER WINNIPEG TO FORT WILLIAM
		19	CRANE 249	SELF	P/O BELL WILLIAM TO FERRY HURRICANES
		19	CRANE 249	SELF	SOLO FT WILLIAM - WINNIPEG
		20	CRANE 249	SELF	P/O HERRING WINNIPEG TO PAULSON
		20	CRANE 249	SELF	P/O COOPER
		20	BOLINGBROKE 4027	SELF	Sgt MAURER PAULSON TO WINNIPEG
		21	ANSON 8570	MACHONALIN	SELF LOCAL
		21	-	8570	SELF MACHONALIN WINNIPEG - ARMSTRONG
		22	OXFORD FJ199	SELF	SOLO KAPUSKASING - ARMSTRONG
		22	LYSANDER 2403	-	- ARMSTRONG - WINNIPEG
		22	LYSANDER 2403	-	- MANTON - OTTAWA
GRAND TOTAL (Cols. (1) to (10))					TOTALS CARRIED FORWARD
Hrs. _____					_____
Mins. _____					_____

staging route. He usually carried three 400-pound barrels of diesel fuel in 45 minutes, then returned in 35. On the 10th he made four such return trips. This routine rarely varied, except when equipment parts were needed in a panic. On August 15, for example, he flew a diesel engine to Snag and, on his next trip, a tractor transmission. Next day he moved to Watson Lake, from where most of his trips (4, 5 or 6 per day) until October 14 were into Toobally Lakes in the Fort Liard, NWT area. These averaged 50-55 minutes per leg, the loads being building materials, general supplies and personnel.

F/L Crossley and Sgt Brooks had 3528 back at Cooking Lake on October 21, 1942 for changeover from floats to wheels. After some leave, Crossley returned to work with 124 (Ferry) Squadron on November 17. On the 17th and 18th he flew Anson FP805 from Malton to Winnipeg via North Bay, Kapuskasing and Sioux Lookout. On the 27th he collected Norseman 3528 at Edmonton, then he and Cpl McMillan returned to Snag from where they operated between there and Whitehorse

(about 2:00 hours each way), Whitehorse and Aishihik (about 1:15), and other destinations.

On November 1, 1942 Crossley was assessed by S/L H.O. "Hump" Madden, another pre-war commercial aviator. "This pilot is an old bush pilot", said Madden, "who is nothing if not hard working and sincere. His experience in modern aircraft is limited, but he makes up for it with general flying knowledge." In a later assessment, Madden added, "This officer is thoroughly conscientious and reliable. While with this unit he has cheerfully undertaken any task given him, however difficult or disagreeable."

January 1943 included many more Yukon flights for Crossley and McMillan in 3528. January 5 to 7 they were on what he logged as "Pipeline reconnaissance USA CANOL". That mission went from Dawson City, Yukon to Tanacross (Alaska) and Burwash Landing, Kluane and Whitehorse - all in the Yukon. January 24 to 26 Crossley supported the rescue of a pilot and the salvage of his P-39 at Baker Lake, near Watson Lake, involving 15 Norseman trips back and forth.

YEAR	AIRCRAFT		PILOT, OR 1ST PILOT	2ND PILOT, PUPIL OR PASSENGER	DUTY (INCLUDING RESULTS AND REMARKS)
	Type	No.			
1943					
	MONTH	DATE			
	TOTALS BROUGHT FORWARD				
JANUARY					
	15		NORSEMAN 3528	SELF	SyT BOURASSA DAWSON - SWAY
	15		3528	-	SWAY - DAWSON
	16		3528	-	DAWSON - SWAY
	16		3528	-	SWAY - DAWSON
	17		3528	-	DAWSON - SWAY
	17		3528	-	SWAY - FISHIHIK
	17		3528	-	FISHIHIK - WHITEHORSE
	20		3528	-	Two pass Whitehorse - Aishihik
	20		3528	-	One - Aishihik - Whitehorse
	21		3528	-	80 hour check list Cpl McMillan
	22		3528	-	4 pass Whitehorse - Aishihik
	22		3528	-	J. Wood Aishihik - Whitehorse
	24		3528	-	LT LOVE USAAF Cpl McMillan
					Vic JOHNSON Whitehorse Watamb
	24		3528	-	Sh. D. Inge To Baker Lake
	24		3528	-	LT Donahue To Watson L
	24		3528	-	4 USAAF To Baker (SALVAGE Operation)
	24		3528	-	4 USAAFC. To Watson P34 #24774
	24		3528	-	LT LOVE 3 min To Baker via Learport
	24		3528	-	LT LOVE 3 min To Watson
	25		3528	-	LT LOVE 2 min To Baker
	25		3528	-	Cpl McMillan To Watson
GRAND TOTAL [Cols. (1) to (10)]					TOTALS CARRIED FORWARD
Hrs. Mins.					

Some of the flying with 3528 during the P-39 salvage in the Yukon.

Contrasting wartime colour schemes on 787 and 788, photographed at a snowbound Arctic hamlet. F/L Crossley flew these two Norsemen. Following its Arctic adventures, 788 received the yellow treatment and was assigned to 167 Squadron at Dartmouth. Postwar, it became CF-EIB with Austin Airways of Sudbury, then finished with St. Felicien Air Service in Quebec. At St. Felicien it suffered a career-ending mishap circa 1983. The second view shows 787, which F/L Crossley and crew operated in the Keewatin District of the NWT in 1943. Here it is in the postwar colours you will see it in at Canada's national aviation museum. (Comox Air Force Museum)



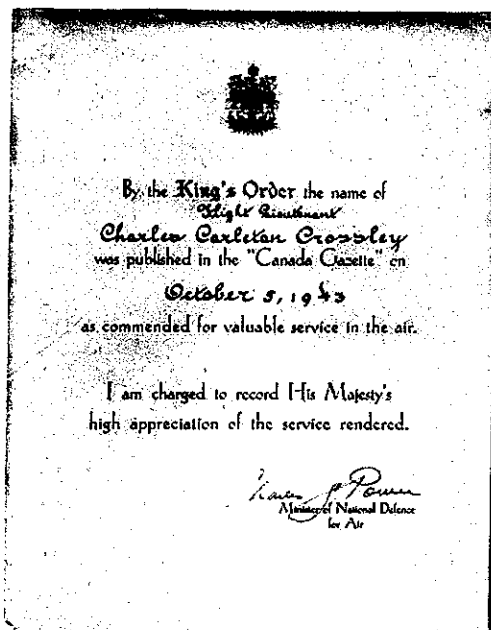


F/L Crossley now was on leave for several weeks, then back to work at Edmonton on April 8, 1943 flying 2491 until the 15th, mainly on a mercy mission from Grande Prairie. On April 27 his CO at Northwest Air Command, W/C William J. McFarlane, assessed him: "This officer has been employed in freighting supplies from Whitehorse to intermediate stations. He has proven to be a most capable pilot and has done an outstanding job under most difficult conditions with limited equipment."

In June, F/L Crossley was at Rockcliffe preparing to go north with the Eastern Arctic Survey Detachment. On June 3 he ferried Norseman 788 and 792 from Cartierville to Rockcliffe, on June 5 tested 681 and 787, then used them to train EAS pilots on floats, his students being F/Ls Fayles, Glover, Hill and Punnett, and F/Os Norris and Weeks. On June 8-9 he took Glover, Hill, Norris and Weeks on a training session into his old OPAS stumping grounds (North Bay, Biscotasing, Temagami, etc.), giving his bush flying *protégés* exercises in navigation, Norseman flying qualities, and beaching and docking techniques. He would have had them worn out by the time they landed back on the Ottawa River after 8:10 hours in the air and several on the water.

On June 22 F/L Crossley, FSgt J.E. Deland and Cpl O'Reilly departed in 787 for the Arctic as part of the EAS. On the 28th they landed at Fort Churchill. For the rest of the summer most of Crossley's flying was supporting the efforts of R. Dozois of the Geological Survey of Canada, although surveyors B.J. Woodruff and W.R. Motherwell also appear in his log. Norseman 787 criss-crossed the NWT Keewatin District to camps along the Kazan River, Yathkyed Lake and Baker Lake in the interior to Chesterfield Inlet, Repulse Post and Douglas Harbour on the west coast of Hudson Bay. There were several trips to Chesterfield Inlet for supplies and mail. The somewhat monotonous tundra was a far cry from the mountains of interior BC and Yukon/Alaska, but Crossley relished every day.

Some time early in July, F/L Crossley surpassed 1000 hours of RCAF flying – his total at month's end was 1077:50. On



September 11, 1943 he, Deland and O'Reilly plus W.R. Motherwell set out in 787 to escape the encroaching winter, flying from Chesterfield to Churchill. Two days later they continued to Sioux Lookout via God's Lake, Manitoba. On the 13th they made Remi Lake and next day continued to Temagami and Ottawa. Crossley's log for July, August and September showed 123:45 Norseman hours. On October 3 he was awarded a King's Commendation for Valuable Service in the Air, for which the certificate was signed by Defence Minister for Air, Charles G. Power.

In October 1943 F/L Crossley was on staff with 124 Squadron at its Toronto Island Airport detachment. His first job (October 15) was to deliver Tiger Moth 5905 from Toronto to 9 EFTS at St. Catharines – a 1-hour hop around the western tip of Lake Ontario. For the rest of October he ferried Ansons 6218, W9568, Harvard 3220, Moths 3980, 4919 and 4935, and Yale 3398. He flew the latter to Winnipeg from the 19th to the 25th, including a 5-day hold in Kapuskasing.

In this period the Toronto ferry flight had Norseman 692 mainly for shuttling pilots here and there. On January 17 to 18, 1944, for example, F/L Crossley made two return trips between Toronto Island Airport and St. Catharines (home to 9 EFTS), carrying eight pilots, then six in 692. On the 23rd he ferried seven pilots on the same route in Norseman 495. It's likely that these pilots were needed to ferry the 9 EFTS Tiger Moths into storage, since the school had ceased operations a few days earlier.

Crossley periodically had a Norseman to deliver. From November 10 to 15, 1943 he ferried 363 from Rockcliffe via North Bay (3:05 hours), Kapuskasing (2:30) and Armstrong (2:35) to Winnipeg (3:45). December 30 to January 4, 1944 he ferried 366 from Cartierville to Winnipeg, this time following the US route to Selfridge, Madison, Minneapolis and Fargo. En route he listed in his log for December 31, "Force landed Williams Bay", a small Wisconsin centre. Such entries usually indicated a precautionary landing due to weather or some fuel or mechanical issue.

May 1944 was F/L Crossley's last month in RCAF uniform. By then 124 (Ferry) Squadron and its sister unit, 170 (F) Squadron at Rockcliffe, were overburdened, moving hundreds of aircraft as the BCATP ran down. For May, Crossley logged just 19:20 hours in singles, 2:00 in twins, his types for the month being the Cornell, Harvard, Moth, Norseman, Anson, Crane and Goose. His final Norseman flight of the war was a local Toronto flip in 2495 with his flight commander, F/L Head. He finished his RCAF career with a flight of May 25, 1944 with F/L Head in Goose 437. He logged this trip as "solo practice".

F/L Crossley had come to the end of his second world war. At that point he tallied his RCAF flying time at 1781:05 hours. He now returned to the OPAS, this time as base pilot at Temagami. Over 1944-45 he developed and patented a system of fighting forest fires using floats modified to pick up water for dropping onto a fire. This system was tested on Norseman CF-OBJ, but not pursued further by the OPAS.

In 1946 Crossley ran afoul of OPAS director George E. Ponsford over a cooked-up charge that he had been carrying unauthorized passengers. He would not accept Ponsford's compromise of moving to another base. Instead, he left the OPAS. In 1949 he established Faraway Airways. Equipped with a Piper Cub and Seabee, operations were in Sarnia. Meanwhile, on hearing in 1954 that the RCAF was enlisting veterans as Chipmunk instructors for air cadet and university reserve squadrons, he applied for the required course to instruct on this program, but was not selected.

Having folded Faraway Airways in 1955, Crossley flew the Norseman for

Canadian Aircraft Renters, based at Toronto Island Airport. In this period he had a close shave. While en route from Churchill to a DEW Line site on May 19, 1956, he disappeared "off the radar" in Norseman CF-HCB. On May 29, by which time he was almost given up for lost, a 407 Squadron Lancaster spotted him on an ice floe near Southampton Island.

Crossley had aided in his own rescue by using a small hand-powered "Gibson Girl" radio transmitter that he carried. Just as his time was running out, the Lancaster picked up his faint signal. The task now was to reach him before the ice broke up. An all-terrain Bombardier machine set out from Coral Harbour, an RCMP Otter from Churchill. On May 31

the Otter picked up Crossley, who had suffered no ill effects. He reported that he had landed in poor weather, and that his Norseman eventually sank. He later flew for some mining companies and for Gold Belt and Bradley air services, before leaving commercial aviation in 1960. Carl Crossley passed away on April 14, 1974.

## Crossley's RCAF Record

The Crossley family loaned CANAV their father's RCAF log books, enabling us to round out the story of this "Champion of the Norseman". Total time recorded from his first RCAF flight in Fleet 1025 at Trenton on April 24, 1940 to his last in Goose 437 at Toronto Island Airport on May 25, 1944 is 1781:05 hours. Roughly speaking, about half this was in Norsemans, the rest in a host of aircraft, which Crossley ferried throughout Canada.

A tour through Crossley's RCAF log book is a dizzying one. During the war he flew 29 different Norsemans, but his main type was the Anson - 167 of them. Next in numbers he flew 58 different Harvards and 34 Tiger Moths. The complete list is important in how it portrays the nature of RCAF Norseman operations at home during the war, the great challenges the ferry pilot faced, and how well Canada's First World War veteran pilots and their protégés from the 1920s-30s contributed to the war effort. Here is the summary of the hundreds of aircraft flown by Carl Crossley in 1940-44:

*Noorduyn Norseman:* 363, 366, 495, 679, 680, 681, 691, 692, 693, 698, 787, 788, 789, 790, 792, 2409, 2455, 2459, 2466, 2477, 2478, 2479, 2487, 2488, 2491, 2495, 3524, 3528, 3538

*Airspeed Oxford:* AS941, BM676, BM678, BM808, FB623, X3349, X6684, X7038, X7147

*Avro Anson:* 1654, 1701, 2643, 3350, 4905, 4909, 4964, 5051, 6022, 6023, 6029, 6030, 6032, 6039, 6040, 6041, 6049, 6058, 6075, 6085, 6086, 6121, 6134, 6144, 6166, 6185, 6195, 6209, 6218, 6244, 6252, 6275, 6277, 6300, 6339, 6385, 6411, 6430, 6482, 6518, 6519, 6520, 6526, 6544, 6564, 6604, 6643, 6667, 6695, 6703, 6711, 6728, 6735, 6737, 6743, 6753, 6757, 6766, 6771, 6775, 6780, 6784, 6787, 6791, 6808, 6816, 6842, 6855, 6871, 6874, 6889, 6890, 6908, 6911, 6912, 6916, 6918, 6920, 6922, 6923, 6931, 6933, 6946, 6988, 7002, 7004, 7005, 7008, 7018, 7024, 7028, 7030, 7031, 7037, 7038, 7042, 7044, 7185, 7198, 7206, 7229, 7251, 7305, 7319, 7321, 7328, 7359, 7361, 7376, 7417, 7453, 7500, 7507, 7516, 7519, 7521, 7527, 7558, 7579, 7595, 7631, 8251, 8264, 8315, 8325, 8327, 8337, 8349, 8411, 8414, 8484, 8570, 8730, 8741, 8818, 9651, 9686, 9770, 9856, 9937, 9939, 10404, 10408, 11190, 11383, 11385, 12411, 11781, 11935, 11942, 11975, AX244, FP799, FP805, FP811, FP814, JS136, JS145, N5038, W1611, W1645, W2025, W2120, W2122, W2128, W2180, W9568

*Beech 18:* 7644

*Boeing 247:* 7639

*Bristol Bolingbroke:* 709, 9013, 9058, 9068, 9109, 9880, 9882

*Cessna Crane:* 7786, AJ249

*Consolidated PBY-5:* 9707, 9708, 9711

*De Havilland Tiger Moth:* 1287, 1296, 3925, 3934, 3943, 3945, 3980, 3982, 3983, 3988, 4216, 4280, 4829, 4881, 4883, 4899, 4905, 4908, 4911, 4914, 4919, 4922, 4923, 4935, 4943, 5013, 5021, 5128, 5905, 5943, 8868, 8890, 8917, 8998

*De Havilland Dragonfly:* 7626, 7627

*Fairchild 24:* 699, 4809

*Fairchild Cornell 10901, FH654, FH659, FH688, FH923*

*Fairey Battle:* 1728, 1840, 1985, 2135, R7373

*Fleet trainers:* 206, 218, 1013, 1020, 1022, 1023, 1025, 4404, 4409, 4428, 4436, 4440, 4448, 4457, 4470, 4480, 4511, 4530, 4582, 4585, 4587, 4589, 4703, 4728, 4732, 4737, 4738, 4774, 4780, 4797, 4804

*Grumman Goose:* 437, 925, 1059, CF-BTE

*Handley Page Hampden:* AJ995, AJ996, AN129, P5399, P5426, P5432, P5433, P5435

*Hawker Tomtit:* 139

*Lockheed 12:* 1531, 7654

*Lockheed Hudson:* AM758

*North American Harvard:* 1329, 1333, 1335, 1347, 2586, 2588, 2596, 2591, 2602, 2654, 2678, 2693, 2767, 2866, 2875, 2882, 2889, 2951, 2955, 2956, 2975, 3025, 3036, 3037, 3039, 3041, 3050, 3055, 3151, 3158, 3214, 3220, 3249, 3260, 3282, 3285, 3286, 3306, 3793, 3825, AH189, AJ586, AJ935, BW186, FE125, FE271, FE272, FE275, FE281, FE289, FE301, FE312, FE340, FE349, FE641, FE755, FS875, FS972

*North American Yale:* 3355, 3374, 3378, 3397, 3450, 3457, 3460, 3914

*Stearman:* FJ106, FJ829, FJ976, FJ978, FJ998, FK101

*Stinson 105:* 3471, 3486

*Supermarine Stranraer:* 928, 933, 950, 952

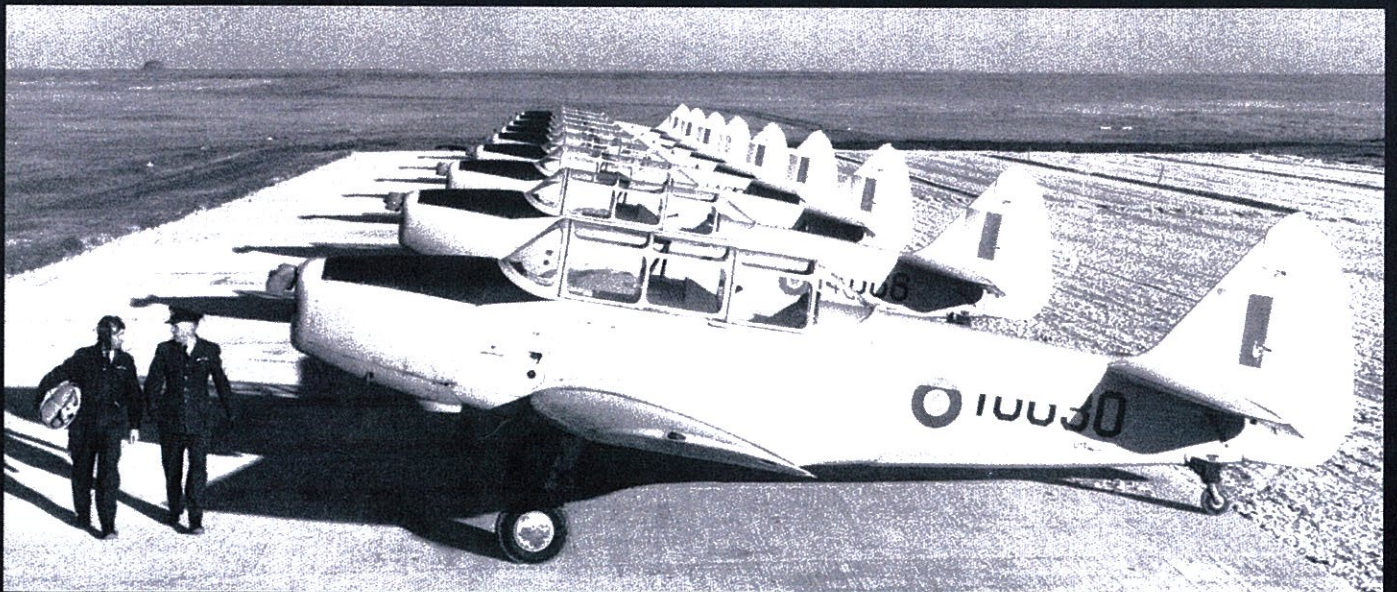
*Westland Lysander:* 441, 442, 2305, 2311, 2344, 2346, 2349, 2358, 2364, 2375, 2389, 2403, 4981

## Carl Crossley's Wartime Aircraft



Primary trainers often required repositioning from factory to schools, between schools, to and from repair depots, etc. Carl Crossley often flew these types, including the Fleet Fawn and de Havilland Tiger Moth. Fawn 206 served from 1931

to war's end. These "Tigers" were 1940 models. Such a tight formation rules out student pilots. Instructors or ferry pilots likely were doing the flying. (DND PL1954, Robert Finlayson Col.)



In mid-1942 the BCATP began replacing biplane trainers with modern Cornells, built by Fleet in Fort Erie. Shuttling around the old and new planes kept ferry pilots

hopping. These Cornells were shot in 1944 at Virden, Manitoba by the great CPR photographer, Nicholas Morant. (LAC PA176331)

The BCATP's main single engine advanced trainer was the Harvard. Next to the Anson, this was Carl Crossley's most commonly flown type. The Harvard and Norseman used the same P&W Wasp engine. (R.D. "Joe" Schultz)

Norseman 2495 which F/L Crossley often flew with 124 (F) Squadron from Toronto Island Airport. Following a varied wartime and postwar RCAF career, 2495 was consigned for scrap at 6 Repair Depot, Trenton in June 1952. (CANAV Books Col.)



Avro Anson II 7150 which flew at Rockcliffe with Test & Development Flight. During the war Carl Crossley flew more Ansons than any other type. (DND PL9659)



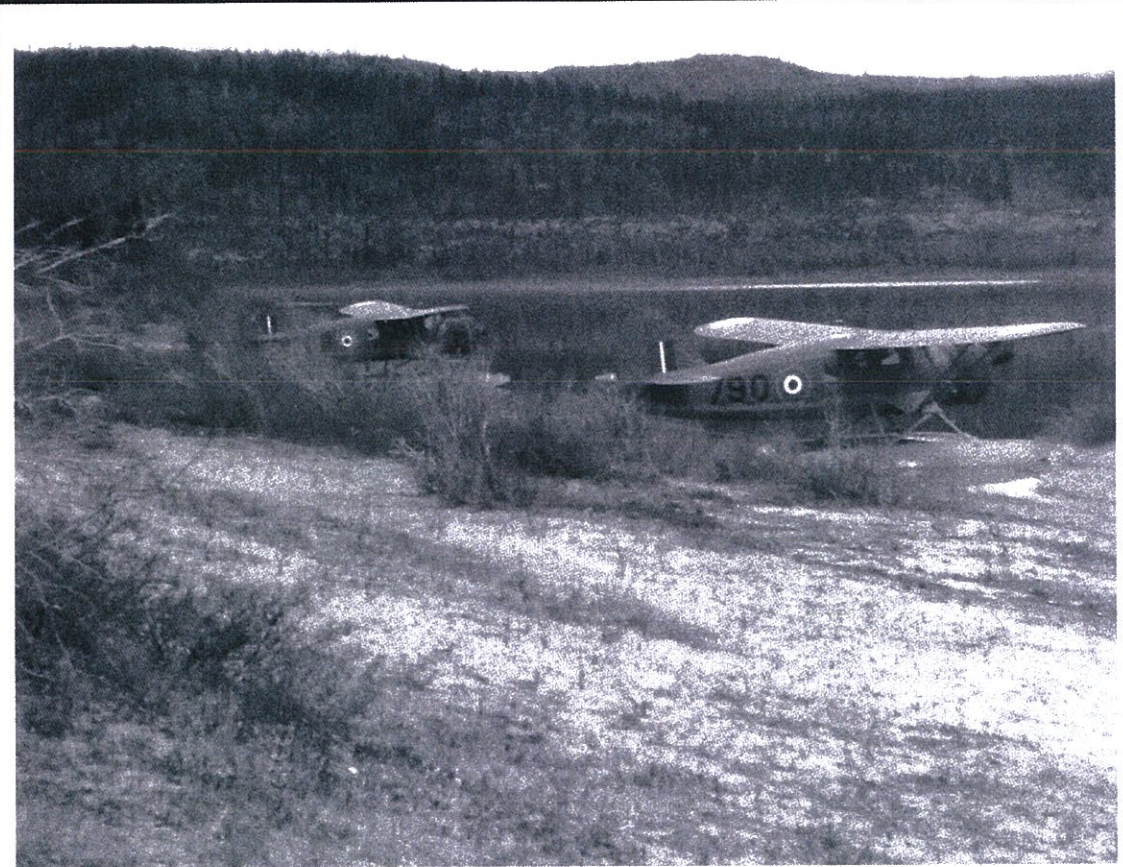
Carl Crossley also flew the Airspeed Oxford and Cessna Crane twin trainers. Leslie Corness photographed these Oxfords at Edmonton.



These Lockheed 12s appear in Carl Crossley's log. They are seen at 5 AOS, Brantford on August 15, 1941, where the Duke of Kent was officiating at an air observers' graduation. (DND RE18554-3)

Large twins which Carl Crossley flew were the Canso and Stranraer, and the smaller Bolingbroke and Hampden. The "Boly" was a very adaptable type in the BCATP, while the Hampden was specifically a torpedo bombing trainer. Shown are "Boly" target tug 9123 and Hampdens AJ990 and AJ991. (CANAV Books and Robert Finlayson Cols.)

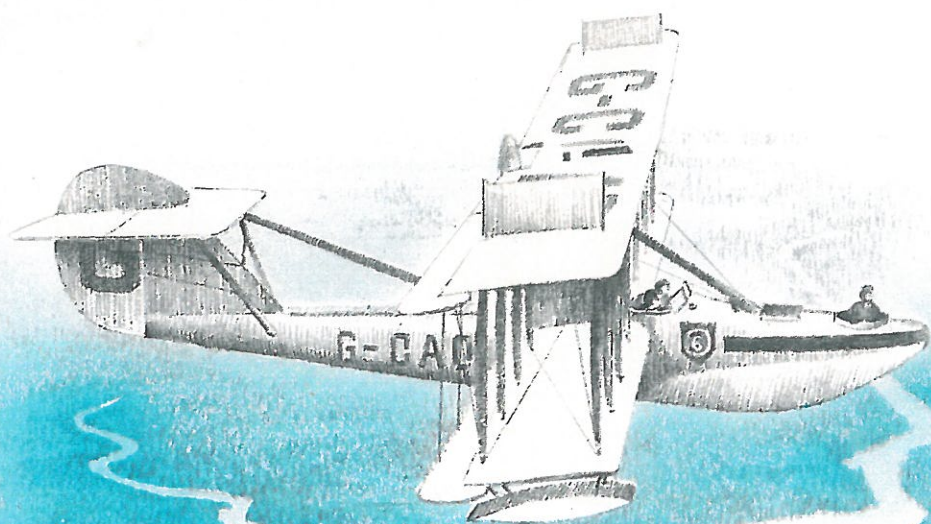




One of the 29 Norsemans flown by Carl Crossley. 790 is shown during wartime operations with the Eastern Arctic Survey Detachment. Postwar, 790 became CF-IJG with Georgian Bay Airways. It was wrecked in a 1966 landing accident. (Ernie Weeks Col.)

# THE FIREBIRDS

BY BRUCE WEST



How bush flying  
won its wings



# 16

In 1944, a revolutionary new idea in the aerial suppression of forest fires was born within the O.P.A.S., later to be taken up and implemented in forest protection by virtually all countries which had the means to use it and the kind of fire problems to which it could be practically applied. The idea at first occurred in a casual kind of way, as such inspirations often do. Carl Crossley, a veteran Air Service pilot, was sitting around chewing the rag one day with Pete Marchildon, the District Forester at North Bay. Pete had been reading the newspaper reports about all the heavy bombing raids which were then taking place in war-torn Europe.

“You know, Carl,” Pete remarked. “It seems to me that if we put our minds to it, some way could be worked out to bomb forest fires the same way things like bridges and factories are being bombed over there in the war. Only with water, instead of explosives. You know how a small fire — like the kind you get in a *chicot* sometimes after it’s been hit by lightning — will sometimes smoulder away



in some hard-to-get-at spot for days and then be fanned into a *real* fire by the first strong wind, before it can be put out by men trying to get at it overland in some place a long way from any lake where an airplane can land. Supposing you could just fly over that danger spot dropping water on it until it was doused . . . Seems to me lots of small fires could be put out like that, before they could get away on us . . .”

At first Carl Crossley thought Pete’s suggestion was a little far-fetched. After all, using “bombers” to put out fires, instead of starting them! . . . But the germ of an idea had been firmly planted in his ingenious bush pilot’s mind during that casual chat and the more he thought about it the more exciting it became.

Now, how would you go about a thing like that? Carry some water in a tank in the airplane? Or in a tank slung in some way under the belly of the machine, between the struts of the landing gear? Crossley thought about it and thought about it, from many different angles. Jack C. Dillon, who was Forest Fire Control Officer at headquarters in Toronto until his retirement in 1961, and has recorded many interesting pieces of history concerning the Lands and Forests Department, described in this way how the idea that had been bothering Carl Crossley began to jell one day in 1944 while he was flying over Algonquin Park in the KR-34:

“He encountered a mild weather front which held a bit of rain and generated some lightning. As he entered the disturbance, he noticed a small fire, just getting started and quite possibly, caused by the lightning. He had no radio to report it so he continued to his destination. On the return flight, he noted that the fire seemed to be completely subdued. He reported it to the park officials on landing to refuel, but that bit of light rain sort of spelled out the Marchildon suggestion a bit more impressively.”

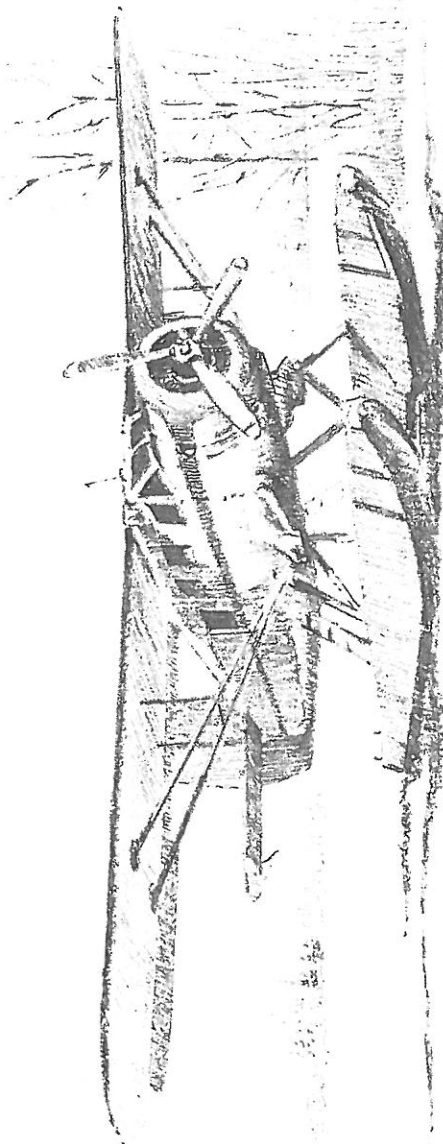
Crossley decided to do some experimenting, making use of the little KR-34. He installed a 45-gallon steel drum in the front cockpit, into the bottom of which he had welded a 16-inch length of pipe, three-and-a-half inches in diameter.



*Carl C. Crossley*

“This pipe extended below the fuselage and was intended as a snorkel,” Dillon relates. “From that protrusion, with the use of elbows and nipples, he made a further extension which carried the inlet to a fixed point adjacent to the float water rudders. He planned to inject water into the barrel while taxiing. Although this idea worked fine on his initial test — in which he managed to fill a canoe being towed along on the water beside the float — he found he could not create quite enough pressure while taxiing to drive the water up to the barrel in the cockpit.”

But Crossley wasn't about to give up his promising idea just because he hadn't managed to work out such details as quick and easy water pickups. Phil Hoffman, who was then Chief Ranger at Timagami, the scene of these early experiments, suggested that Crossley just forget for the time being about the snorkel system and merely fill his water barrel up with a fire pump and get along with the tests. Which he did.



31. STEELWIND

*The Noorduyyn Norseman*

A small brush blaze was started, to be the target of the trial run, and away went Crossley in the KR-34 to make firefighting history. On his first pass over the target, with the water rather feebly spraying out of the drum in the front cockpit, Crossley missed it clean. But on the next couple of tries — guided by some hand signals from Hoffman and Crossley's air engineer, Rene Simard, down on the ground, he hit the small fire fair and square on each pass, soaking it into almost complete extinction (and in the process, thoroughly wetting down Simard, who had been standing a little too close to the bullseye.)

It was at least a beginning, and a fairly encouraging one, at that.

"One must bear in mind," wrote Dillon, in describing this historic occasion, "that no one had carried out such an innovation previously. There existed no text books or set of directions to follow and therefore each step was pretty elemental, but none-the-less a concrete advancement of the plan. Frank A. MacDougall . . . flew into Bear Island a few days later and during his visit had a chat about the experiments with Carl, Rene, Phil and Frank Miller, Forest Protection Supervisor at North Bay. Out of that get-together a major idea emanated. MacDougall suggested to Crossley that he thought the idea might be better served by using the aircraft *floats* as a water container, rather than the barrel."

During the fall and winter of 1944-45 Crossley busily went about the job of refining this new water-dropping idea, in the Air Service shops at Sault Ste. Marie. He sized up the various available aircraft and decided that the sturdy and reliable workhorse, the Noorduyn Norseman, with its 600-h.p. Pratt & Whitney power plant, would be the best machine for the job. Next he made detailed drawings of the equipment he wanted to install in the Norseman's floats, such as a scoop-up gear for water-loading, a release mechanism, and the required baffling in the pontoons. A set of pontoons was then sent to the plant of the float manufacturing company of MacDonald Brothers, at Winnipeg, together with Crossley's detailed drawings, where the necessary changes were made and the special

equipment was installed. A Norseman was then flown to Montreal (to the Noorduyn plant) where, guided by another set of Crossley's plans, the controls for operating the water-dropping gear were fitted into the cockpit in front of the pilot's seat.

"This took time," wrote Dillon, "and it was not until August 25, 1945 that the Montreal work was finished and on that date Carl flew the Norseman to Timagami. He was now all set for action and did not have long to wait. With each float properly baffled and capable of holding between 54 and 55 gallons, which was scooped up in a matter of seconds while taxiing and took only nine seconds to jettison, Crossley had an aerial fire engine at his disposal."

On the very day after Crossley's arrival at the Timagami base from Montreal, a lightning fire was reported to Bill Adair, Chief Forest Ranger at Elk Lake. It was located in a comparatively inaccessible area in hilly country, and was made to order for such an event as the first real test of a specially fitted water-dropping machine. Crossley was more than willing to oblige when he was asked to see what he could do about the awkwardly-situated blaze.

"Carl made three drops over the fire, which was crowning on a ridge," wrote Dillon of that break-through day in a whole new technique of aerial firefighting. "This point he tackled first and then proceeded to douse the remaining area, which he described as being about 300 feet in length and approximately 30 to 40 feet in width. Rangers got into the fire that night and found it completely dormant.

"Well, that was the start, and then followed numerous tests on fires fed with various types of fuel. I was present at some and considered the idea workable and effective. In fact, I have always felt that any time we could get water on a fire from the air, whether it be created by man or nature, we were making suppression headway fast. R. N. Johnson, Chief of the Division of Research, was also present during the tests and held the same opinion."

Yet, for some reason, this water-dropping method

wasn't fully utilized until some time after these first successful experiments had been completed. Interest of the Air Service seemed to stray from the float-tank system and move for a while toward another method, which seemed much more simple and less expensive — except that it didn't work very well. This involved the dropping of actual water bombs upon the fires. These bombs consisted of special wet-proof paper bags containing about three-and-a-half gallons of water. At first, they were dropped one at a time through a hatch in the floor of the aircraft, with the idea that they would break open and shower the fire with water droplets upon impact with the ground. The trouble with this system was that if the first bag missed the target or didn't have much effect, the aircraft would have to circle for another pass before dropping the second one. The method was then improved, somewhat, by fitting the aircraft with a roller-equipped chute device down which several bags of water could be dropped by a single salvo as the machine flew over a blaze. But this evidently didn't work out very well, either, and the whole idea was finally discarded. One drawback of the water bombing method was that occasionally, when a drop scored a direct hit upon a smouldering fire, the resulting impact of a solid 35-pound blob of paper-enclosed water hitting a bed of embers, scattered them for yards around in all directions, and sometimes even started new fires in the underbrush, if they were thrown far enough.

Although it probably didn't have anything to do with the final assessment of the water bombing system, one incident during the experimental stage of the project did give Pilot Reg Parsons some guilty concern for a while during a test flight one day at Sault Ste. Marie. The discharge mechanism for the water bags would sometimes start dropping them on its own unless the hatch in the aircraft cabin's floor and the release device were securely closed and locked. On this particularly embarrassing occasion, Parson's aircraft suddenly started discharging water bombs just as he was making part of his take-off circuit across the river over the American Soo. Fortunately, the water-filled bags landed in various backyards

doing nothing more harmful than watering the grass. But Parsons shuddered for some time after that whenever he thought of the international complications which might have followed had the accidental bomb salvo made a shallow mockery out of the highly-touted undefended border between Canada and its friendly U.S. neighbor by splashing a wet and startling pattern of bursting water bags right down the main street of the American Soo!

At any rate, the water bombing method was finally given up and even then some years were to pass before serious attention was again given to the "spray" system which was eventually brought to the present high state of refinement by the introduction of various improvements. At least one O.P.A.S. pilot who was thoroughly sold on the water dropping method, and doggedly went about trying to prove its worth at every opportunity, was Tom Cooke, present Director of what is now known as the Air Service Branch of the Ministry of Natural Resources.

Following the pioneer trail blazed by Carl Crossley, Cooke went about the task of trying to develop some method by which the water could be dumped more quickly from an airplane in one mass, instead of spraying out in relatively feeble fashion from small openings in the rear of the floats, as was the case in the system achieved by Crossley at the point where the project had been temporarily abandoned. The first try at a better method was the study of the possibility of fitting the cabin of an Otter with a large tank situated near the aircraft's centre of gravity which, by the opening of a gate, could dump a concentrated load of water out the side door. The big problem associated with this idea, however, was to work out some practical way in which an opening in the side of the tank large enough to rapidly dump a large quantity of water could effectively be sealed when the tank was full. A gate which opened outward would present considerable difficulties when it came to keeping the water intact without leakage until it could be dropped. On the other hand, a gate which opened inward also presented a problem. The same water pressure which might keep it



*Thomas C. Cooke*

firmly closed could also make it extremely difficult to open in the rapid way needed to discharge a sufficient volume at the precise moment when it was required during a fast pass over a fire.

Cooke did a lot of pondering and head-scratching about that, and even had a wooden mock-up produced on an inboard tank. But try as he would, he didn't seem able to come up with a really satisfactory solution. Then one day air engineer George Gill, during a coffee break in the Soo hangar, casually offered a suggestion which may have been based on an earlier discussion with George Phillips. At any rate, Gill's remark to Tom Cooke, over that important cup of coffee, offered a brand new and startlingly simple approach to the whole matter.