HA5 Hoverhawk MK3

HOVERCRAFT

By Rod Hutter, Vice President

Winnipeg was the first Canadian city to receive, train employees, and utilize such a craft in an operational setting.

Police discover missing hovercraft still lost

By Gerald Flood

A missing hovercraft definitely is missing, Winnipeg police have found.

Police have been searching for the HoverHawk Executive hovercraft since August, after it was suggested the craft could be used by the Winnipeg fire department for river rescue.

But no one could find the machine, which had been donated to the police department in 1971 by H. C. Paul Ltd.

Fire officials recalled that it had been stored for a time in a firehall at St. Mathews Avenue and Empress Street.

And police said it had been returned to H. C. Paul owner, Harry Paul, in April 1972.

But Paul said he could not remember the craft being returned, and so the hunt began.

Police Chief Herb Stephen said yesterday that although his department could not find the machine, it did locate a former H. C. Paul employee who recalled receiving it from police and who has signed documents to that effect.

Stephen said Paul has since said that he really can't remember whether police returned the craft.

"Once we went back to H. C. Paul, it's out of our hands and we have no concern beyond that," Stephen said.

Coun. John Steel (Grant's Mill) said police appeared to be taking the hovercraft, which rides on a cushion of air, too lightly.

Steel insisted Stephen produce the documents for protection, parks and culture committee, which asked for the investigation.

He said the issue has aroused public curiosity and committee members should see evidence proving it had not been lost or stolen while in the city's possession.

Stephen agreed to submit the documents at the committee's next meeting.

Meanwhile, a police report said the craft, which rides on a cushion of air, was rejected for rescue work because it holds only two passengers, one to operate the machine and one to perform the rescue.

"There was no room to accomodate the person rescued," the report said.

The Winnipeg Police Museum occupies the large glass atrium at the front of Station Duty in the Headquarters Building tower at 266 Graham Avenue, and this area contains a number of larger vehicles and motorcycles. While passing through the entrance doorways on either side, most have probably noticed the small hovercraft on display in the east corner. Though it may seem out of place for a Police Museum, this Hoverhawk MK3 HA5 Hovercraft has an interesting story individually, while at the same time being part of a more globally significant series of events.

The Hoverhawk was manufactured by Hover-Air Limited at their production plant located in Whittlesey, Peterborough, England. The vehicle, bearing serial number #065, was one of 121 Hoverhawks commercially built between 1967 and 1971 as the first two-seater hovercraft ever to be mass produced. The Winnipeg Police Department received this hovercraft from the North American Distributor around September of 1971, in the hope of establishing a market for the machine. The public relations overture quickly failed as the craft's limitations immediately came to light and numerous problems arose. The hovercraft was returned to the distributor shortly afterwards in April of 1972, and hovercraft operations were never considered again by the Police.

Hover-Air Limited - History

A hovercraft is defined as a vehicle that is supported above the surface of land or water by a cushion of air produced by downwardly directed fans (Merriam-Webster Dictionary).

According to historical information made available through the Hovercraft Museum in the United Kingdom, the term "Hovercraft" was initially patented in 1954 by Englishman Dr. Christopher Cockerell along with a prototype classified as his "invention". By 1958, hovercrafts were being manufactured with support from the government, and soon afterwards numerous designs were being assembled by ship and aircraft builders. Through the 1960's and 1970's, hovercraft development continued throughout the world.

Hover-Air Limited was a British company founded by Lord and Lady Brassey of Apethorpe, who were considered pioneers of light hovercraft in England. Lord Brassley notably also became the first President of the "Hover Club of Great Britain" which helped spur the development and production of many lightweight models of hovercraft.

Hover-air commenced operations in 1966, and their Hoverhawks were specifically designed for private, commercial, and agricultural use. These light hovercrafts were sold and used in many countries including Canada, the USA, Mexico, Sweden, Germany, Holland, South Africa, Zambia, Singapore and others throughout South America.

Three models of Hoverhawks were built in succession and all essentially arose out of the machine's continuous evolution:

Mark 1 — only three were built primarily for demonstration purposes.

Mark 2 — were the same body and engineering as the Mark 1 but had an improved skirt.

Mark 3 — had increased speeds by switching from Velocette Viceroy motorcycle engines to "Wankel" rotary engines.

Multipurpose

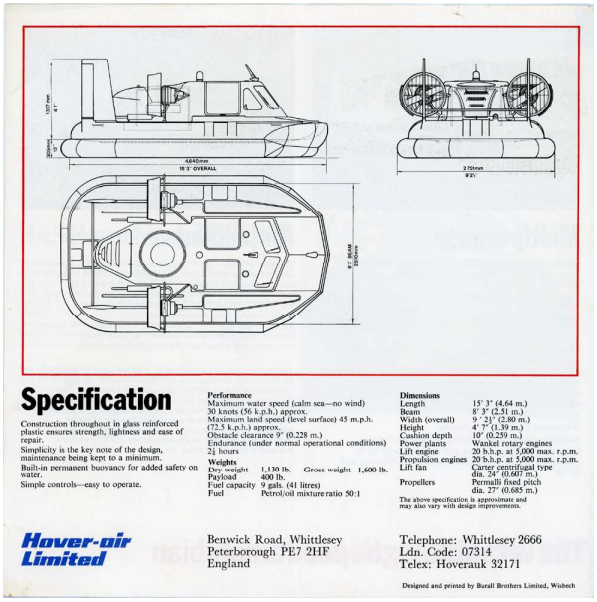
Whether the transport problem is on water, swamp, land, snow or ice, the "HOVERHAWK" can provide the economic answer.
Customs, Police, Harbour Authorities, Fisheries—for patrol work.
Constructional Engineers, Oil Companies and other firms—swift transport of executives, engineers, surveyors and service mechanics.
General Communications—easy access to areas impassable through flooding, mud, ice and snow.
Military—patrol work, pilot training and personnel carrying.
Health—swamp and river spraying against insects and disease, speedy transportation of doctors and medical equipment.
Rescue—on mudflats.
Waterweed Control—by spraying.
Publicity—ideal for eye-catching promotional media.
Sport—wild-fowling, fishing and joyriding with all the excitement and thrills of motor racing, speedboating and flying.

Amphibious

This versatile high speed amphibian is the result of experience and knowledge gained over the years and includes many of the advantages of the successful Hoverhawk Mark II together with the following improvements designed to keep the "HOVERHAWK" Mark III ahead of the field.
Improved and more streamlined hull
Re-styled throughout Better finish More spacious cockpit
Greater headroom Easier access Better visibility
Less noise and vibration Optional extras available

Hover-Air Limited was formed in 1966 and granted a licence by Hovercraft Development Ltd. and British Hovercraft Corporation to manufacture and sell light hovercraft. The Company is established in a modern factory at Whittlesey, Nr. Peterborough. Hover-Air's current range of light hovercraft, which has resulted from a steady development of earlier machines, includes the single seat high performance HA22 Hoverlark in addition to the well-proven HA5 Hoverhawk two-seat craft now in Mark III guise.

The versatile high speed amphibian



Specification

Construction throughout in glass reinforced plastic ensures strength, lightness and ease of repair.
Simplicity is the key note of the design, maintenance being kept to a minimum.
Built-in permanent buoyancy for added safety on water.
Simple controls—easy to operate.

Performance
Maximum water speed (calm sea—no wind) 30 knots (56 k.p.h.) approx.
Maximum land speed (level surface) 45 m.p.h. (72.5 k.p.h.) approx.
Obstacle clearance 9" (0.228 m.)
Endurance (under normal operational conditions) 2½ hours

Weights
Dry weight 1,130 lb. Gross weight 1,600 lb.
Payload 400 lb.
Fuel capacity 9 gals. (41 litres)
Fuel Petrol/oil mixture ratio 50:1

Dimensions
Length 15' 3" (4.64 m.)
Beam 8' 3" (2.51 m.)
Width (overall) 9 ' 21" (2.80 m.)
Height 4' 7" (1.39 m.)
Cushion depth 10" (0.259 m.)
Power plants Wankel rotary engines
Lift engine 20 b.h.p. at 5,000 max. r.p.m.
Propulsion engines 20 b.h.p. at 5,000 max. r.p.m.
Lift fan Carter centrifugal type dia. 24" (0.607 m.)
Propellers Permalli fixed pitch dia. 27" (0.685 m.)

The above specification is approximate and may also vary with design improvements.

Hover-air Limited

Benwick Road, Whittlesey
Peterborough PE7 2HF
England

Telephone: Whittlesey 2666
Ldn. Code: 07314
Telex: Hoverauk 32171

Designed and printed by Burall Brothers Limited, Wisbech

Hoverhawks in North America

Winnipeg businessman Harry Paul of H. C. Paul Limited held the North American distribution rights for the Hoverhawks. From his offices located at 945 King Edward Street, Harry hoped to develop the hovercraft market starting right in his home city. Believing a good recommendation could lead to the sale of the Hoverhawks to other Major Canadian Police Departments, Harry offered one as a donation to the Winnipeg Police, who at the time were responsible for water rescue and recovery within the city limits. Training on the machine would also be offered and provided by the company.

Winnipeg Police Chief Norm Stewart was receptive to the offer as the hovercraft reportedly could be used during the spring and fall when operations were normally hampered by the lengthy times it usually took for the river to either freeze or the winter ice to melt. A hovercraft by design could traverse land, water, and ice with ease, and not be restricted by the weather.

The Winnipeg Police Experience

According to Police Notice #215 issued by Acting Chief J. C. Webster on September 16, 1971, four Winnipeg Police officers along with the Chief Mechanic were selected for training:

- Patrol Sergeant **Kenneth A. R. Porter**
- Constable **Kenneth G. Britton**
- Acting Detective **Glen Albert Pancoe**
- Constable **Murdo James (Jim) Drever**
- Chief Mechanic **John Hutton**

Classroom Training commenced on September 20, 1971, with a familiarization lecture being facilitated by Jerry Cousins of H.C. Paul Ltd. Physical training followed immediately afterwards on September 21, 1971, however the group was divided in half with Porter and Britton being the inaugural pair to be hands on with the machine. They initially attended the H. C. Paul Ltd offices first thing in the morning and were driven 60 miles to a small lake situated on

Acting Detective Pancoe with the hovercraft

the west side of Teulon where the hovercraft could be operated on both land and water. Both would have to be deemed proficient, after which Pancoe and Drever would be trained.

The officers quickly discovered the Hoverhawk was quite ill-suited for water rescue in Winnipeg and in many ways a complete disaster because of its size and design. As the hovercraft required low sloping and more gentle terrain to enter and exit the water, their first obstacle would be the extremely high riverbanks that typically bordered the Winnipeg waterways.

Other immediate and glaringly obvious limitations included:

- Small size – Difficult to control
- Limited seating – 2 persons
- Limited payload – 400 lbs
- Stability issues

Of the four officers selected for training, Acting Detective Pancoe came with a significant amount of experience when it came to hovercrafts. Having previously obtained his pilot's licence in 1962, Pancoe was already familiar with most of the instruments and controls found in the hovercraft. Additionally, through his employment with the Canadian Armed Forces Air Reserve, Pancoe had already been involved with studying hovercrafts over the previous two years and fully understood their operating principles.

After completing his Hoverhawk training between September 28 and October 4, Pancoe put pen to paper and outlined the problems being experienced with the hovercraft. In a Special Report to Acting Chief Webster dated October 11, 1971, Pancoe wrote the following points:

1. *Due to the small size of this machine, it is extremely difficult to operate with full control, especially in a wind of even low velocity. It makes intricate landings or pin-point operations almost impossible.*
2. *The hovercraft tested seats only two persons, therefore if a rescue of another person, for example a drowning victim, was to be attempted, a third party could easily set the craft off-balance causing it to be practically inoperable. With only one operator it would be almost impossible for the operator to operate the craft and also assist the victim to board it.*
3. *The hovercraft cannot be set down on water for more than 2 minutes as water immediately starts to enter the air holes in the apron. I might suggest that this could be eliminated by having "one-way" valves in these air holes so that water could not enter them.*

Pancoe concluded that even if conditions were ideal, the Hovercraft had limited use and could not offer much in the way of actual performance to effect rescues. Factoring in the overall expenses for maintenance, storage, and operation, the hovercraft became unfeasible for any type of effective use by the Winnipeg Police.

Aside from observations and experiences of the Winnipeg officers, it is well known that by their very design hovercraft can be very difficult to operate and control, and thereby require a vast amount of practice and skill to become proficient with their maneuvering.

Hovercraft travel faster over hard flat surfaces like sand or dirt versus water or grass. This handling characteristic becomes critical when transitioning from one surface to another. Travelling fast on land and going onto water without slowing down can lead to the hovercraft "pitching in" and flipping. Transitioning from water to dry land can lead to the opposite effect, as the hovercraft will speed up upon exiting the water. Operators have often shot through parking lots by accident instead of stopping on the ramp when leaving the water without slowing down.

When on top of water, the air pushing from below the skirt actually blows a depression into the water's surface. As the hovercraft attempts to move forward, it must get out of this depression which is referred to as "getting over the hump". Once it is out of the depression, the hovercraft can actually travel faster for less power.

Training exercise in 1971.

As hovercraft have no contact with the ground, in order to turn they must direct thrust from their propulsion engines in the opposite direction to the one they want to go. If they need to stop quickly, the operator will have to spin the hovercraft completely around 180 degrees until they are facing the opposite direction, and then apply full thrust.

For the Hoverhawk, stopping on land can be done by first reducing lift until the skirt touches the ground to slow the hovercraft down, then secondly, rapidly dumping the lift via special dump valves. The Hoverhawk has a separate engine for thrust and is therefore more controllable in this respect than a hovercraft with only one engine for lift and thrust. (An early mistake commonly made when beginning to learn in a single engine hovercraft was to pull back on the throttle to reduce speed when needing an emergency stop. This unfortunately also stopped the lift, and the hovercraft would hit the ground and sometimes flip right over.)

All these issues were more than enough to make the Winnipeg Police Executive abandon the project. The Hoverhawk operations were concluded with the craft being returned to H. C. Paul during April of 1972.

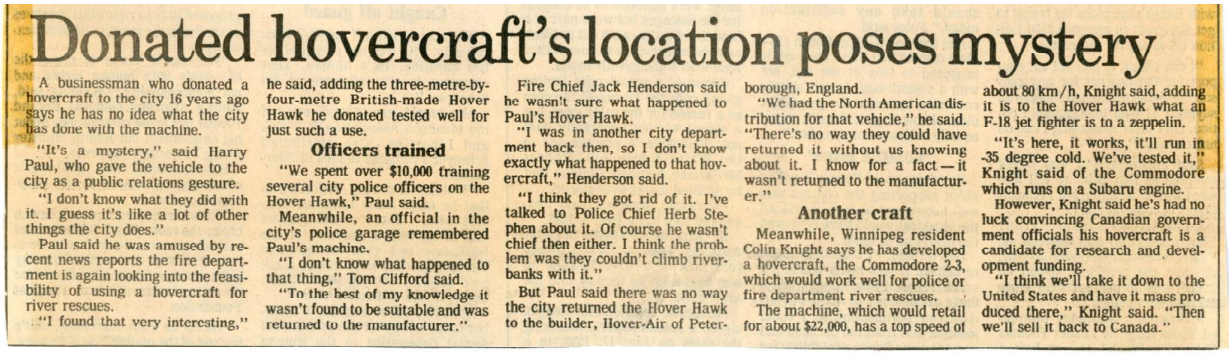
Resurgence with the Fire Department and Media Controversy

Nothing further arose on the topics of hovercrafts and the city until 15 years later in July of 1987, when the Winnipeg Fire Department started exploring the idea of acquiring one for water rescue. For the exact same reasons – ability to traverse over land, ice and water over the fall and spring months – the Fire Department leaders felt a hovercraft would be an excellent tool in their water rescue arsenal.

Winnipeg Fire Chief Jack Henderson approached City Hall with a proposal which garnered questions and sparked debate over what happened to the original hovercraft donated to the Police in 1971. The media became involved and newspaper reports arose asking questions about "the lost hovercraft" and why the Police would not use a hovercraft when the Fire Department were wanting to acquire one for the exact same reasoning.

Politicians and citizens demanded answers to all these questions. At the same time the Fire Department had their own problems. They were looking to spend a significant amount of money on a controversial piece of equipment while experiencing their own financial woes. According to newspaper reports covering the hovercraft debate, the Fire Department was also under a hiring freeze after an audit report released in January recommended the elimination of 148 firefighter positions and the decommissioning of 8 pumper trucks from their existing fleet of 31 to save an estimated $7 million dollars. Since the report, 20 positions had already been eliminated through attrition, but the Fire Department was still seeking direction from city politicians as to the exact actions to be taken.

Investigating reporters determined the hovercraft donated to Police was last reported sitting in Firehall #16 situated on St. Matthews Avenue. This station



Donated hovercraft's location poses mystery

A businessman who donated a hovercraft to the city 16 years ago says he has no idea what the city has done with the machine.

"It's a mystery," said Harry Paul, who gave the vehicle to the city as a public relations gesture.

"I don't know what they did with it. I guess it's like a lot of other things the city does."

Paul said he was amused by recent news reports the fire department is again looking into the feasibility of using a hovercraft for river rescues.

"I found that very interesting," he said, adding the three-metre-by-four-metre British-made Hover Hawk he donated tested well for just such a use.

Officers trained

"We spent over $10,000 training several city police officers on the Hover Hawk," Paul said.

Meanwhile, an official in the city's police garage remembered Paul's machine.

"I don't know what happened to that thing," Tom Clifford said.

"To the best of my knowledge it wasn't found to be suitable and was returned to the manufacturer."

Fire Chief Jack Henderson said he wasn't sure what happened to Paul's Hover Hawk.

"I was in another city department back then, so I don't know exactly what happened to that hovercraft," Henderson said.

"I think they got rid of it. I've talked to Police Chief Herb Stephen about it. Of course he wasn't chief then either. I think the problem was they couldn't climb riverbanks with it."

But Paul said there was no way the city returned the Hover Hawk to the builder, Hover-Air of Peterborough, England.

"We had the North American distribution for that vehicle," he said. "There's no way they could have returned it without us knowing about it. I know for a fact — it wasn't returned to the manufacturer."

Another craft

Meanwhile, Winnipeg resident Colin Knight says he has developed a hovercraft, the Commodore 2-3, which would work well for police or fire department river rescues.

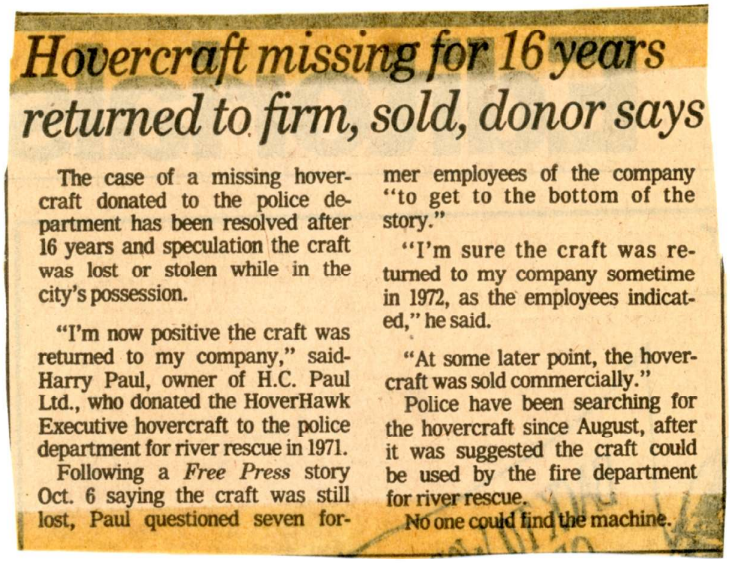
The machine, which would retail for about $22,000, has a top speed of about 80 km/h, Knight said, adding it is to the Hover Hawk what an F-18 jet fighter is to a zeppelin.

"It's here, it works, it'll run in -35 degree cold. We've tested it," Knight said of the Commodore which runs on a Subaru engine.

However, Knight said he's had no luck convincing Canadian government officials his hovercraft is a candidate for research and development funding.

"I think we'll take it down to the United States and have it mass produced there," Knight said. "Then we'll sell it back to Canada."

however no longer existed in 1987. To fuel suspicions and debate further, the now retired former Police Chief Norm Stewart refused to comment when questioned by the media. As far as he was concerned, the hovercraft had been returned.



Hovercraft missing for 16 years returned to firm, sold, donor says

The case of a missing hovercraft donated to the police department has been resolved after 16 years and speculation the craft was lost or stolen while in the city's possession.

"I'm now positive the craft was returned to my company," said Harry Paul, owner of H.C. Paul Ltd., who donated the HoverHawk Executive hovercraft to the police department for river rescue in 1971.

Following a *Free Press* story Oct. 6 saying the craft was still lost, Paul questioned seven former employees of the company "to get to the bottom of the story."

"I'm sure the craft was returned to my company sometime in 1972, as the employees indicated," he said.

"At some later point, the hovercraft was sold commercially."

Police have been searching for the hovercraft since August, after it was suggested the craft could be used by the fire department for river rescue.

No one could find the machine.

When the media interviewed Harry Paul however, he instead claimed to have no idea of what happened to the machine he donated to the City as a Public Relations gesture. He also suggested the mysterious circumstances surrounding the hovercraft were "like a lot of other things the city does". Paul claimed his donated Hoverhawk tested well in 1971, and he found it curious the city was again examining the feasibility of a hovercraft for the exact same reasons after dismissing his machine.

The media went on to interview and question other individuals known to be involved with the Police hovercraft. Police Garage mechanic Tom Clifford admitted he did not know what happened to the vehicle, but believed it had been found unsuitable and was returned to the manufacturer. Fire Chief Jack Henderson did not know what happened with the hovercraft, and Police Chief Herb Stephen also believed it was returned.

Paul remained adamant the hovercraft had not been returned directly to the manufacturer in England as he would have been made aware of such a transaction.

Due to all the attention, the Police commenced an investigation in August of 1987 to determine what exactly occurred with the "missing Hoverhawk" once and for all. Though Police investigators never located the actual machine, by October they had tracked down a former employee of H. C. Paul Ltd. who absolutely recalled the hovercraft being returned by Police and had signed documents to prove it.

Harry Paul also concurred with the Police. He had contacted seven former employees of his company and based on their accounts was now absolutely certain the Hoverhawk had been returned in 1972. Other than a faint recollection the Hoverhawk had been sold commercially afterwards, nobody knew the actual whereabouts of the machine or what might of happened with it.

Hoverhawk Redux

Over the years Museum personnel would constantly hear vague or obscure reports of a small hovercraft sitting derelict in a compound somewhere in the north end of Winnipeg. Despite all these accounts, no one could recall or pinpoint the exact location. It wasn't until April of 2003 that a solid clue arose, when a young officer told Curator Jack Templeman that he spotted a hovercraft being stored in a fenced compound somewhere on the north side of the railway tracks, close to the Arlington Street bridge.

Museum Board member Garth McCombe took to the road and began driving through the streets and back lanes of the surrounding area. His efforts were rewarded with the discovery of the former Winnipeg Police Hoverhawk sitting in the back of a compound at 765 Dufferin Avenue. The machine was easily identifiable by its still visible serial numbers and decaling.

The Hoverhawk had obvious damage and clearly experienced a significant amount of wear and tear over the years. Considering no other Police Department other than Winnipeg was known to have possessed such a machine, the desire to acquire the hovercraft as a historical item remained strong.

Museum personnel located the Hoverhawk's current owner Don Ullett of Fedora Equipment, who readily agreed to sell the hovercraft for an agreed price of $7,000 with $2,000 being returned to the Museum as a donation. On April 11, 2003, the Police Museum became official owners of Hoverhawk MK-3 HA5-0065.

Restoration Efforts

The Museum used a flat deck trailer to move the hovercraft into a Police building for storage. Aside from some cosmetic damage and two missing gull-wing doors, the Hoverhawk appeared to be complete and mechanically intact. Research commenced on the machine, and the Museum contacted the Manitoba Hovercraft Club based out of Inwood, Manitoba, looking for their experience and assistance with a proposed restoration project.

Club members Gord Gowie and Ron Findlay inspected the machine and confirmed the Hoverhawk was essentially complete. Other good news involved the three engines that did not appear seized or damaged. The thrust propellers were also in good condition along with the lift fan. Overall, the Hoverhawk was assessed at being a worthwhile restoration project and it could be brought back to operational condition.

On September 15, 2003, Museum personnel brought the hovercraft to an indoor heated building at Lake Agassiz Marine in Gimli as directed by the Manitoba Hovercraft Club where they planned to commence restoration efforts. Unfortunately, over the ensuing months - for many understandable reasons and changing life circumstances - delays occurred and not much was accomplished with the Hoverhawk other than the Museum accumulating a storage bill with the building's owner.

Not wanting to accrue additional expenses, on April 14, 2005, the hovercraft was returned to Winnipeg and placed into storage with the Police Evidence Control Unit who had a secure building at 850 Empress Street.

From here the Museum took the lead for restoration efforts. Part of this included working with Acryl Design at 740 Century Street who fabricated the missing plexiglass gull-wing doors which even in 2004 cost $1,430.90 to reproduce.

Getting There

Restoration efforts continued to move slowly. Finding a company that could commit to the extensive fiberglass work needed for the restoration proved more difficult than anticipated while at the same time costs were rising and Museum volunteers were exceptionally busy with other projects.

Fearing the work may never get done, Curator Templeman pushed the project forward in April of 2012 where he had the Museum Board approve $12,000 to complete fiberglass restoration work. This was increased to $15,000 shortly afterwards after the Museum received a quote from a fabricator willing to take on the project.

By February of 2013, the Hovercraft was moved to J. C. Custom Fiberglass in Oakbank, Manitoba, where company owner Joachim Lutz commenced repairing the fiberglass exterior and gel coat.

The Fiberglass work concluded by November of 2013, and the hovercraft was returned to the Museum Warehouse. Loose ends were then addressed including replacement of the gas tank that was rotted out. Reassembling of the hovercraft commenced with volunteers Derk Derin and Rick Enns taking the lead along with Curator Jack Templeman and other helpers.

By June of 2014, volunteers had completed the hovercraft reassembly and the only remaining items consisted of reproducing the decals. These were manufactured and installed to wrap up the long-term endeavor.

Due to the size of the hovercraft, it could not fit through the doors of the current Museum located within the Training Academy at 130 Allard Avenue, or any entrances to the Public Safety Building at 151 Princess Street. By this time however, a new Museum space was already being constructed on the Main Floor of the former Canada Post Building tower that would soon become the new Winnipeg Police Headquarters Building. Part of Museum designing included large exterior doors for the Main Museum and front atrium that could accommodate the movement of large vehicles in and out of display areas.

By March of 2016, the Hoverhawk was moved from the warehouse into the atrium display area of the new HQ Building. It has remained there since as a static display ,and though it is very much capable of being started and operated, no Museum personnel have ever held the desire or mustered the courage to do so. Probably sound reasoning based on the experiences of previous officers training on the hovercraft in 1971.

Though the small Hoverhawk MK-3 did not turn out to be the answer for the Winnipeg Police or be the cutting edge for advancements in water rescue, its historical importance is great. Winnipeg had the distinction of being the first Canadian city to receive, train employees, and utilize such a craft in an operational setting.

The Hoverhawk itself also has global historical significance. Despite its limitations, it still was the first commercially massed-produced light hovercraft geared towards public sales.

Things Not Said

After purchasing the Hoverhawk in 2003 , Museum Curator Jack Templeman tracked down the members who were trained in its operation, and spoke with them about their experiences.

In an email dated October 17, 2003, Jim Drever shared his memories about the hovercraft and how his training unfolded.

Drever was paired with Glen Pancoe and two employees from H. C. Paul. The four spent a week and a half out at Norris Lake (by Teulon, Manitoba)

Hoverhawk MK3 HA5-065 Specifications

- Length: 15’ 3” (4.64 m)
- Width:
  - 8’ 3” (2.51 m) Beam
  - 9’ 2.5” (2.80 m) Overall with skirt
- Height: 4’ 7” (1.39 m)
- Weight: 1,130 lbs MK-3
- Power: 3 x Sachs Wankel air-cooled rotary 21 BHP engines (note: 1 engine used for lift, and 2 engines used for thrust)
  - Lift Engine: 20 BHP at 5,000 max rpm
  - Propulsion Engines: 20 BPH at 5,000 max rpm
- Maximum Speeds:
  - Over Land: 45 mph (72.5 kph)
  - Over Water: 30 knots (56 kph)
- Cushion Depth: 10”
- Obstacle Clearance: 9”
- Payload: 2 persons / 400 lbs
- Category: Fully Amphibious
- Fuel Capacity: 9 gallons (41 litres)
- Fuel Type: gas/oil mixture at 50:1

(from original brochure)

"playing" with the hovercraft (aka: learning to operate). The group took turns with one officer and one H.C. Paul employee partnered together. While switching back and forth, Drever and his partner passed their down time hunting ducks by the edge of the lake.

Ken Britton and Ken Porter took the first turn at training and were accompanied by Chief Mechanic John Hutton. During this initial training, Hutton tipped the hovercraft and almost rolled over which caused a fright. At one point the teetering craft was completely on its side with the one engine blade hitting the water before it came back down and righted itself. Hutton supposedly wrote "a damning report" on the machine afterwards.

For his own impression, Drever stated the rotary engines made the hovercraft a delight to operate and he enjoyed the experience of running it along the lake.

Drever liked that the Museum acquired the hovercraft and expressed a strong interest in seeing the machine once fully restored. Though he passed away in November of 2017, Drever certainly would have had the opportunity to see the Hoverhawk after its debut at Museum Grand Opening on June 16, 2016.

SPECIAL FEATURES

- This was the first Hovercraft to use a molded glass reinforced plastic hull. [The design was meant to ensure strength, lightness, and ease of repair (brochure)].
- The bag skirt was simple and more stable than those developed for larger craft.
- The Mark 1 and mark 2 versions used standard motorcycle engines, reducing the production costs and making the craft available at an affordable price.
- It was the fastest light hovercraft of its era.
- Control was achieved by use of the rudders or by differential throttle making it very maneuverable (provided all 3 engines were working).
- The craft was small enough and light enough to be towed on a trailer by a car and stored in a garage.
- The hydraulic swing-over steering made it possible to steer from either side of the craft.
- This was the only small craft othis type to have a covered control cabin.
- Skirt development started with a simple pop-riveted bag skirt made from a type of rubberized canvas dinghy material which proved to have too much friction. Hover-air then went on to use "Hypolon", a Dunlop manufactured material with a nylon weave coating which proved more successful but did not preform well on wet sand. The later skirts were made from neoprene coated nylon with welded seams. This material proved excellent on water but built up a large amount of static electricity when operated over wet or long grass.
- At the time existing larger hovercraft only operated on water while the Hoverhawks were designed to traverse any type of reasonable flat terrain.
- To this end, the Hoverhawks really did attempt to overcome a number of developmental problems known to exist with the overall operation of hovercrafts.

(courtesy of The Hovercraft Museum U.K.)