HUMAN-POWERED VEHICLE WORLD SPEED RECORD ATTEMPT, 1984

SPEED – throughout human history, there's been an obsession with this elusive, intangible, objective.

The obsession took many forms: running horses, the dive of a falcon, in more recent times trains, motor vehicles, fragile biplanes and the supersonic jet.

How fast can a human being, unassisted by other vehicles, with only the output of his/her own body, travel? In 1913, the French Futurists briefly adopted themes of pure human speed for their art.

Defining the limits of human-powered speed was slower in coming. French racing cyclists in the early 1930s experimented with bicycles surrounded with `tear-drop' fairings. The results were disappointing: the world cycling body, Union Cyclists International, banned these in 1938.

Resurgence of interest in what became known as HPVs (Human-Powered Vehicles) began in the 1970s. A first world human-powered speed record, 51.3 k/mh in 1974, set by an Olympic cyclist, followed by formation of an International Human-Powered Vehicle Association in 1976. By 1980, the record stood at 94.4 k/mh.

A RECORD ATTEMPT IN AUSTRALIA

These speed records were set in the United States. What no-one expected was an *Australian* attempt on the world record made in 1984. It produced the vehicle before you, *to this day* holding the Australian human-powered land speed record, 78.94 k/mh.

LACHLAN THOMPSON

In 1983, Lachlan Thompson, a young aerospace engineering student at Melbourne's RMIT, became interested in human-powered speed, deciding to undertake a record attempt as part of his doctorate.

Lachlan established mathematically optimum riding positions, power outputs, aerodynamic factors, considering the needs for rider and vehicle stability and control, rolling resistance, drag co-efficients and vehicle frontal area.

Not much to do with a wind tunnel mostly used to test experimental aircraft designs, or a garage in suburban Bayswater, Vic.?

BUILDING THE HPV

In spring 1983, scaled-down mock-up aeroshells were tested at RMIT. The full-sized vehicle was carefully assembled at the latter site, using fibreglass for the aeroshell, and balsa-wood struts for vehicle integrity.

Lachlan Thompson HPV under construction at Bayswater, early December 1983. Vehicle frame is fully assembled except for high-pressure tyres and outriggers. Note caliper brakes on rims, toe-clips, and joystick control.

There's more to a world record attempt than a vehicle. For a successful attempt, there had to be an experienced and capable pilot, a suitable venue, and a sponsor for a major undertaking.

All these, and more, were found, recruited, then locked in for what was hoped would be a successful world record attempt in late March 1984.

STEELE BISHOP

The pilot, Steele Bishop, from Western Australia, was at that time world pursuit champion, described as a `Super World Champion'

Starting his road racing career in the early 1960s, Steele won many road and track championships at state and national levels.

Bishop took part in the Munich Olympics in 1972, and in 1983 took the World Pursuit Championship at Zurich, Switzerland. At the peak of his racing career, Steele Bishop was an ideal rider for this event.

SPONSORSHIP

Sponsorship came from one of the world's largest corporations, General Motors, through their Australian Holden affiliate. GMH was involved in experimental vehicle work in several areas, including design of one of the first practical electric-powered vehicles, the GM Impact, in the latter 1980s.

THE RECORD ATTEMPT

Initial coasting and powered stability testing was done at the test track at GMH's Fisherman's Bend facility, Melbourne.

Lachlan Thompson wanted the world record attempt made at dawn, with wind interference at a minimum, on a well-polished section of road, for lowest possible tyre drag. Such a site was identified near Broadford, Vic, the main interstate Hume Freeway.

Unfortunately, road authorities couldn't be persuaded to close it off for the record attempt. Reluctantly, the event was shifted to GMH's test track near Lang Lang, Vic, 70 km south-east of Melbourne, in the last week of March 1984.

ON TRACK AT LANG LANG, 28 MARCH 1984

The closed track, normally used for testing prototype GMH vehicles, was only available for five days. One day was a write-off due to high winds.

Two days were used for practice, evaluating vehicle configurations. A critical component was two small outrigger wheels used for vehicle balance.

Several outrigger wheels were available, including high-pressure pneumatic tyres on machined aluminium hubs, and solid rubber tyres on plastic hubs. These were crucial to what happened on Tuesday, 28 March 1984.

In pre-dawn darkness, barely a dozen people assembled at the Lang Lang track for an event which could catapult Australia into the forefront of transportation technology.

Conditions were ideal: air movement negligible, temperatures low, and Steele Bishop ready to take his place in the record books.

Lang Lang test track, dawn, 28 March 1984: GMH technician makes final checks of HPV cockpit instrumentation. Note near-side outrigger wheel.

Steele Bishop, dressed in light-weight racing gear, climbed carefully into the cramped cockpit. The HPV's rear canopy was secured, it rumbled out of the pit area, on a 2.5 kilometre run-up on a banked circular track for a 200 metre timed section.

Cameras were officially prohibited, apart from the GMH official record. Fortunately, as can be seen, a compact camera loaded with high-speed film was smuggled in to record events for all time.
Flanked by two pace cars, Steele Bishop steered the vehicle (with very restricted forward visibility), engaging progressively higher gears, working up to a blistering 84 k/mh, though still well short of a world record.

FRICTION AND FIRE

But the HPV was in trouble. One reason was the coarse surfaced GMH track, increasing frictional drag.

A second was wind resistance. Despite the calculations of drag co-efficients and frontal area, Steele Bishop as he approached record speeds described it as `like hitting a brick wall'.

But the third and most critical was the outriggers. Intended for balance only, the port side wheel was completely off the ground.

Due to the banked track, the starboard side outrigger was solidly in contact with the road. Outward pressure forced the tiny wheel against the fibreglass fairing.

Friction turned into heat: at 22 metres a second the solid rubber tyre distorted, increasing the overheating further. As a dramatic split-second photo below shows, the HPV was on fire!

Lang Lang, c. 7am, 28 March 1984: HPV at lower right, pace cars upper left. Smoke trail from outrigger is clearly visible.

The HPV completed its circuit and returned to the pit area: the outrigger wheel was replaced, the fairing removed.

The chance of a world record vanished with the dawn. A strange sequel ensued. In broad daylight and with whatever wind, there was still a chance of a sprint record.

Lang Lang was thrown open to the metropolitan media, Steele Bishop had a crack at it before the TV cameras. No dice, the HPV missed a world sprint record by a few hundredths of a second.

Steele Bishop (in cockpit) consults Lachlan Thompson (right) after failure of world record attempt, 28 March 1984.

The media, disappointed, went home. Steele Bishop returned to Western Australia, announcing his retirement from racing. The Lachlan Thompson HPV went back to its garage in Bayswater.

Lachlan Thompson completed his doctorate paper on the project in December 1984. Despite an optimistic prediction that another record attempt could be made in 1985, no such effort transpired.

PRESERVATION AND DECLINE

The HPV's history after the 1984 record attempt is fragmentary. For years it remained hidden from public view. The original outrigger wheels were removed, replaced with a pair sticking straight out. A steel sub-frame was added, the vehicle could at least be displayed.

In the early 1990s, the HPV was transported by road from Melbourne to Wangaratta, Vic, to the Drage Airworld museum. The vehicle remained there for a decade.

The HPV at Drage Airworld, March 1997. Note steel support frame and non-authentic outrigger wheels.

Drage Airworld closed in 2002: the vehicle was moved locally, to a motorcycle museum in Wangaratta. It remained there only a short time, and in late 2004 was transported back to Melbourne, again by road. Returned to its owner, Lachlan Thompson, the HPV ended up in a garage in Pascoe Vale, Vic.

RESTORATION

The HPV was badly in need of restoration, much damaged during its various road trips, and in danger of being dumped at the nearest landfill and lost forever.

Fortunately, a happy concatenation of events prevented this. In May 2005, a member of Knox Historical Society, Ray Peace, who witnessed the record attempt 21 years before, published an article about it on the internet.

This lead to queries being made to Lachlan Thompson, now a Professor of Aerospace Engineering at RMIT, re. the vehicle's whereabouts and condition.

Lachlan Thompson in August 2005 agreed to donate the HPV to the Knox Historical Society for preservation and restoration.

HOME TO KNOX

On 28 August, the vehicle was moved from Pascoe Vale to Ferntree Gully, for storage in a secure facility until the vehicle could be restored.

The HPV being moved from Pascoe Vale, 28 August 2005

Knox Historical Society then entered discussions with Clive Carter, a local motorcycle repairer and fibreglass fairing expert. After inspecting the vehicle, Clive agreed to volunteer his services for a restoration of the HPV to its former glory.

CLIVE CARTER

Clive Carter's restoration of the HPV took hundreds of hours of patient, painstaking work. The recumbent frame was removed, and the aeroshell was cleaned and re-fibreglassed. Damaged polycarbonate panels were repaired or replaced.

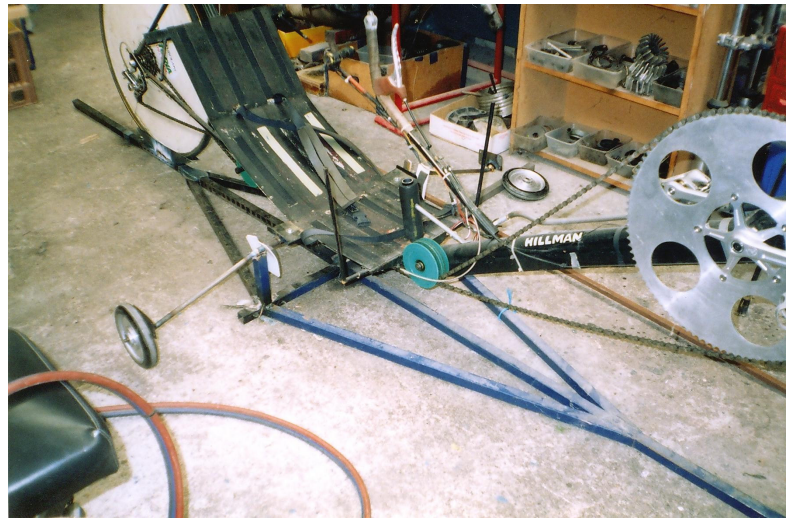
The ill-fated outrigger wheels were faithfully re-fabricated using design drawings in Lachlan Thompson's doctorate paper. Aluminium hubs were machined, tyres of the correct diameter fitted and fibreglass spat fairings re-constructed from scratch.

A new and more rigid support frame was constructed by hand, so that the HPV would no longer be damaged by transportation.

HPV aeroshell being re-constructed, November 2005. Note cutaways for HPV wheels

The outriggers were replaced at the correct angle and position specified in the original design drawings; the HPV was free-standing again for the first time in two decades.

Recumbent frame on new support frame, December 2005. Note new 24" tubular front tyre.



New outrigger wheels being fitted, December 2005. Note details of new support frame, seat padding has been removed.

With the recumbent frame and the aeroshell restored to their original condition, a final touch was added: the HPV was re-painted by hand in Holden team racing colours, completing a restoration process taking oversix months.

PERMANENT PRESERVATION

His work completed, Clive Carter returned the HPV to Knox Historical Society in 2006, 22 years from when the record attempt was made at Lang Lang.

Knox Historical Society will place this icon of Australian transport history on permanent display for future generations to ponder and marvel at.