

Human Power

Newsletter of the British Human Power Club

Free to members

Others: 20p

Issue 1 - July 1983

Editor: R. Ballantine

The British Human Power Club

Human Powered Vehicles Day on Sunday 29 May at Eastway Cycle Circuit, Lee Valley Park, London E15 saw faired, semi-faired and unfaired machines competing in a variety of time trials, sprints and road races. It was a fine and exciting day for all concerned and was capped with the formation of the British Human Power Club.

The BHPC exists to promote the development of human power in all its aspects. The origins however, lie firmly in human powered vehicle (HPV) competitions. Many BHPC members are veterans of the annual British Championships held under the auspices of the International Human Powered Vehicle Association based in California, U.S.A., and a few members have competed in US events with some notable successes.

A major function of the BHPC is to promote HPV competitions at the regional and national level in Britain. The events are to stimulate interest and participation for a wider public, provide testing grounds for designs, equipment and riders, and give valuable experience in actual competition. Vehicles vary considerably in design: there are machines for straight line speed trials, machines for road racing and street use, machines that can do both, and machines that defy any category. All provide useful data on aerodynamics, the efficiency and reliability of mechanical systems, cornering and braking abilities, and ergonomics.

Another important function of the BHPC is to help circulate information about HPVs. This is a period of intense research and experimentation in HPV technology and its powerplant, the human engine. One method for cross-fertilization between designers, builders and riders is a newsletter, and this requires your contributions - information about your projects, ideas and experiences. There is no reporter going to call around and do it for you; put

pen to paper if you want to be part of the action. This first newsletter is necessarily basic and modest as economy and speed are of the essence; later editions will hopefully be more enterprising and informative.

A very successful feature of the HPV Day at the Isle of Wight Cycling Festival in April was the evening Symposium, with speakers on the subjects of building HPVs, the human machine and the politics of transportation. It was a highly interesting evening and the BHPC will seek to promote further similar events.

Membership in the British Human Power Club costs £5 per year and applications should be made to the Hon. Secretary Derek Henden, 45 Charlotte Road, London EC2A 3PD. Officers are:

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|---------------------------|--------------------|
| Hon. Chairman | Mike Burrows |
| Hon. Secretary | Derek Henden |
| Hon. Treasurer | Steve Hudspith |
| Hon. Events Co-Ordinator | Richard Ballantine |
| Committee of Five Members | |
| Tony Webb | David Cormie |
| Alan Young | Peter Selby |
| Debbie Owen | |

Calendar

17 July Sunday - Eastway Cycle Track, Temple Mills Lane, Stratford, London E15. Entry forms from Les Jordan, Manager, Eastway Cycle Track, or from Richard Ballantine, c/o Bicycle Magazine, 89-91 Bayham Street, London NW1. Events will include a 10 lap Le Mans start scratch race (10 miles), a rolling start scratch race of 5 laps and a handicapped 25 lap race. Vehicles will be handicapped on the basis of previous experience and performance.

This event is being well publicised with posters, leaflets at the London to Brighton Ride and Harrogate Festival of Cycling and on television. We hope for a good turnout and very competitive racing, and members are urged to make every effort to attend.

11 September Sunday - Donnington. At this writing it appears that sponsorship is lacking for a land, sea and air human powered vehicles festival that would include the IHPVA endorsed British Championships. Organisational efforts are continuing however, and members will be advised immediately if the event becomes definite.

18 September Sunday - Zandvoort, Holland. Entry forms from Bob Rubinstein, Fiets Magazine, Lijnbaansgracht 309, 1017 WZ Amsterdam, Holland. Entry fee of f100 (about £22) includes accomodation. Zandvoort is a 4½ kilometer track with a surface suitable for

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record attempts under IHPVA auspices. There will be something like 50,000 spectators and f10,000 in prize money. The organisers have secured a 50% discount on the Harwich/Hook of Holland Ferry (out Friday, return Sunday). Costs appear to be roughly: f80 return per person, sleeping hut f35 per person, cars f200 return, and vans to 5.5 meters f400 return.

There is of course great interest in the Dutch Championships and we are investigating the possibility of an all-inclusive package tour for both transport and accomodation. Contact D. Henden or R. Ballantine for further information.

30 September through 2 October - Indiana, U.S.A. The 9th International Human Powered Speed Championships at Indianapolis. Competition sites include Indianapolis Raceway Park, sprints and flat road race course; Major Taylor Velodrome, pursuit races; Indianapolis '500' Motor Speedway, flying start speed trials; and Eagle Creek Park, hilly road race course. Vehicles are now classified as: factory stock - conventional production '10-speeds' and production recumbents; fully faired; partially faired; and non-faired.

Information and entry forms from Bill Bailey, Indiana HPVA,
340 Ripple Road, Indianapolis, IN 46208 USA. Tel 317 253 3009

The attractions of the entirely more near Dutch Championships notwithstanding, this is the big one, the event that will be attended by the originators of the HPV movement, and among other things, see determined attempts to regain to American soil the world bicycle speed record now held by the Nosey Ferret Racing Team/Tim Gartside powered 'Bluebell'. In a totally perfect universe, as scripted by the Nosey Ferrets, 'Bluebell II' will shatter records in Holland and with the spoils, journey to America to compete in the Indianapolis events. Other British competitors may write a completely different script.

But one possible outcome is a British entry, and now is the time to express interest in a BHPC charter flight to Indianapolis - for which we could probably obtain quite affordable costs. The American crowd are an extremely friendly bunch much cheered by the interest in HPVs on the other side of the Big Drink and would doubtless make every effort to facilitate a British visit. If you are seriously interested in a trip to the 9th IHPVA Championships at a per person transport outlay of about f250, so indicate to Events Co-Ordinator Richard Ballantine NOW; this kind of deal can only be effected if a sufficient number of people make an early commitment.

May, 1984 - Isle of Wight Cycling Festival. An HPV day bodes very fair to be a feature of next year's Festival. Indeed, it appears that the BHPC will be able to have shared use of the local airport for speed trials in addition to holding road races in Ryde and other towns. Those were fortunate enough to attend the 1983 event will well remember the reasonable cost and amiable climate of the holiday camp provided as accomodation, the sharpness of the competition, and the pleasure of making friends and sharing information. There's every reason to believe that the 1984 event will be an HPV equivalent of the CTC York Rally, and details will be published in the newsletter as they come to hand.

ARTICLES

Our Hon. Chairman and fashion leader Mike Burrows attempts to define the basics in

GROUND Rules

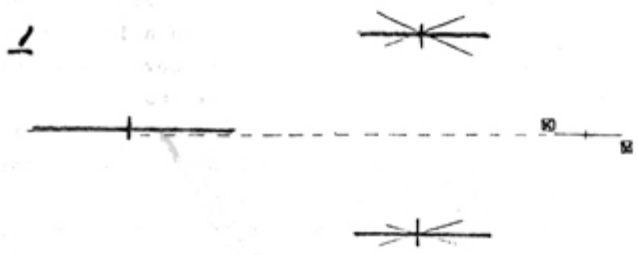
Are you bored with windsurfing? Has your home computer lost appeal? Would you like a hobby that does not have at least six magazines devoted to it, has never been the subject of an informed article in the Guardian, and is without doubt not the fastest growing sport in Britain? Then look no further for HPV racing is the one for you. It is so unfashionable that not only do we not know what attitude we should be doing it in, we are still not quite sure what we are doing it with! HPV stands for human powered vehicle, and in the broadest sense could include everything from the Oxford and Cambridge boats to the Gossamer Albatross. For the purposes of this article I will stick to HPVs with wheels - although even this has problems; the most obvious of HPVs, the bicycle, is generally not allowed to compete in BHPC events unless modified with some sort of fairing. 'So it must have a body shell' you say, but no, many of the entries do compete without any fairings at all.

Generally speaking, most HPVs are recumbents, have three wheels and some sort of shell. Nearly all are home-built; the commercial (and expensive!) availability of the American Vector being the notable exception.

Construction varies enormously - from kitchen table jobs to those requiring full machine shop facilities. Interestingly, the winning machines have not always been in the latter category. The sport is so new, with so little known for certain, that at this time it would seem to be a case of what you do, not how you do it.

One of the factors affecting the design will be the type of event in which you wish to compete. The early IHPVA events were straight line sprints timed over 200 meters with perhaps a kilometer run up. This type of event is spectacular but not very interesting for the riders, and road racing is now becoming very popular, with the more manoueverable machines gaining on the tighter circuits. Machines are also being developed for 'practical competitions' that involve grocery shopping, commuting and so on. Designing a machine to compete in more than one type of event is possible but will always involve a certain amount of compromise. A machine could well overlap two groups, but it seems unlikely that you could produce a world record holder that could also be used for the shopping (the Vector gets very close).

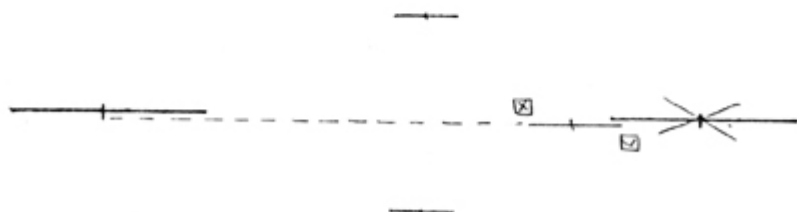
That very briefly is what the sport is about, and for anyone still interested I will give an even briefer guide to some of the mechanical possibilities and problems. The most obvious variation is in the wheel layout and drive chain. The five examples shown have all been used with varying success on a variety of machines. Several other arrangements have been tried and no doubt many remain to be tried in the future, so do not feel restricted!



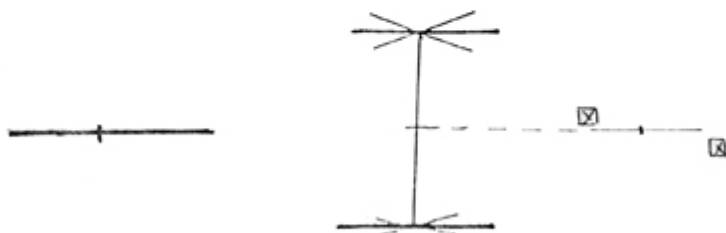
1. 'Popular' as used on Vector, Windcheetah and many others: front steering, rear drive trike with 18 to 26 inch track and 40 to 45 inch wheelbase, front wheels usually smaller than rear. Drive is most efficient with the chain in one length running over idlers where necessary but can be in stages if desired. Very compact layout most suitable for road use and circuit racing. Can be designed to use many standard cycle parts. Very stable and has a high cornering potential which can lead to problems if tubular tyres are used. Despite the fact that a tricycle, the Vector, holds the world record at 59 mph this design is bulky for straight line speed trials.

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2. The 'Specialist': front wheel drive and steering, rear wheels on a narrow track of 12 to 14 inches, long wheelbase of 8 foot or so to clear rider; Poppy Flyer the British record holder a good example. A certain amount of engineering is needed around the front wheel area and the narrow track means low stability. For pure record attempt machines this layout must have the most potential.

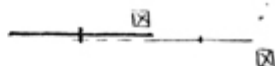
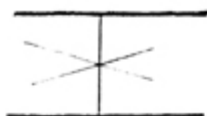
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3. The 'Obvious': the bicycle, with or without stabilisers, rear drive, front steering, almost any wheelbase depending on rider position. In Bluebell, the world 2 wheel record holder, the rider sits as on a chair with most of the body well above the wheels, and riding is as a normal bicycle. The Vortex however, has a long wheelbase with the rider fully prone and a low centre of gravity that makes it difficult to balance the machine, so that stabilisers are required at all times. Bluebell, which is based on an Avatar 2000 bicycle is seemingly unstoppable at road racing, combining as it does high cornering power, good streamlining and low weight. It is however quite high (4'6") and does get blown over occasionally so be warned.

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4. 'Engineers Only': Same layout as no. 1 but front wheel drive. If you like making things on lathes this is the one for you. The short drive chain should be very efficient but no real gains seem to have been made in competitions.

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5. 'Clever!': front drive, rear steering. Normally this would be considered a bad thing but has been seen to work in the shape of the Sturmev Archer Flying 5. The secret seems to be that the rear wheels are on the same axle which pivots on an angled pivot rather like the headset of a normal bike. This has the effect of leaning the machine into corners as you steer. The front drive is compact and efficient but the wheel behind the cranks limits its diameter to about 20 inches, depending on your leg length and how you feel about burning rubber!

If machine layout is not enough for you think about there is still rider position to consider - not to mention multi-rider machines where the drive chain/rider positions get so complex that to attempt to describe them could lead to a prosecution under the obscene publications act.

A few points on mechanics that may not be so obvious. Pedal spindles can make quite good stubb axles using standard cycle hubs. Brakes are not yet that important and many people manage with a single calliper. Sprints and tubs are best for the speed events of course, but watch it on the tighter circuits, they do roll off occasionally even when well glued. Make sure everything is strong enough, you can generate a lot of thrust in the recumbent position especially pulling away from a standing start. A low centre of gravity does not automatically give stability on the corners, so leave a little room in the body for rider movement. Bodyshells are as a rule the biggest problem. They can be made from an amazing variety of materials, but remember that a balsa wood and solar film shell will require a container or large van for transporting it, whereas a GRP shell can usually be strapped to the roof of a car.

That's about it from me. If you come to a meeting to see the real thing do not be afraid to why and what of the competitors, they are usually only too keen to tell you about their 'baby'. One final note: try to improve those things that need improving, not those things that work quite well already.

As Mike Burrows indicates, building a multi-rider HPV can be mechanically complex. Tony Webb makes a plea for

The Vanishing Multiples

In HPV racing we have all manner of events: 600 metre run up speed trials, unlimited run up speed trials, one hour speed trials, road races, place to place records, and the newest treat - velodrome racing (no doubt if Torquemada was still alive he would dream up some more). Now, for all these events there are just two categories of machine: the single and the multiple. Most promoters recognise these two categories and suitably divide the events and prize money.

Building multis however, rather like flintknapping, is becoming a dying art in Britain. America, homeland of the HPV, is still producing new multiples (and very improbable looking devices some of them are!), but here the only new machine to appear since 1981 is that cunning amalgam of bicycle and bacon slicer, the two man Poppy Flyer.

A glance at the programme for the Aspro Clear Speed Challenge (1980) reveals that some 15 multiples were produced for the event. All but two of them were British (the Vector Tandem and the terribly teutonic Landesrunner) and all but these two were built from scratch for the occasion.

Since that date there has been a decline in numbers that is both alarming and sad. So where have all these machines gone and, more important, why are no new ones being built?

Of those early machines some were obvious follies which had no future - but this also true of many of the singles built for that event. Others deserved development, but the only one with a known fate is the Hawker-Hudspith Tandem which is providing a home for a wide variety of flora and fauna in rural Gloucestershire.

There are of course problems with building multiples, its not just as simple as bolting two singles together. But its not that difficult either. Looking around the wide diversity of machinery that makes our game its obvious that most of the designers and builders could knock out a multiple without losing too much beauty sleep.

If you wonder whether its worth the effort, remember the one glittering prize, the world record, is held by the Vector Tandem, and no single is ever going to break it!

So get off your British bums, sharpen the HB, light the welding torch and have at it with a will!

But please, don't beat the Dark Horse!