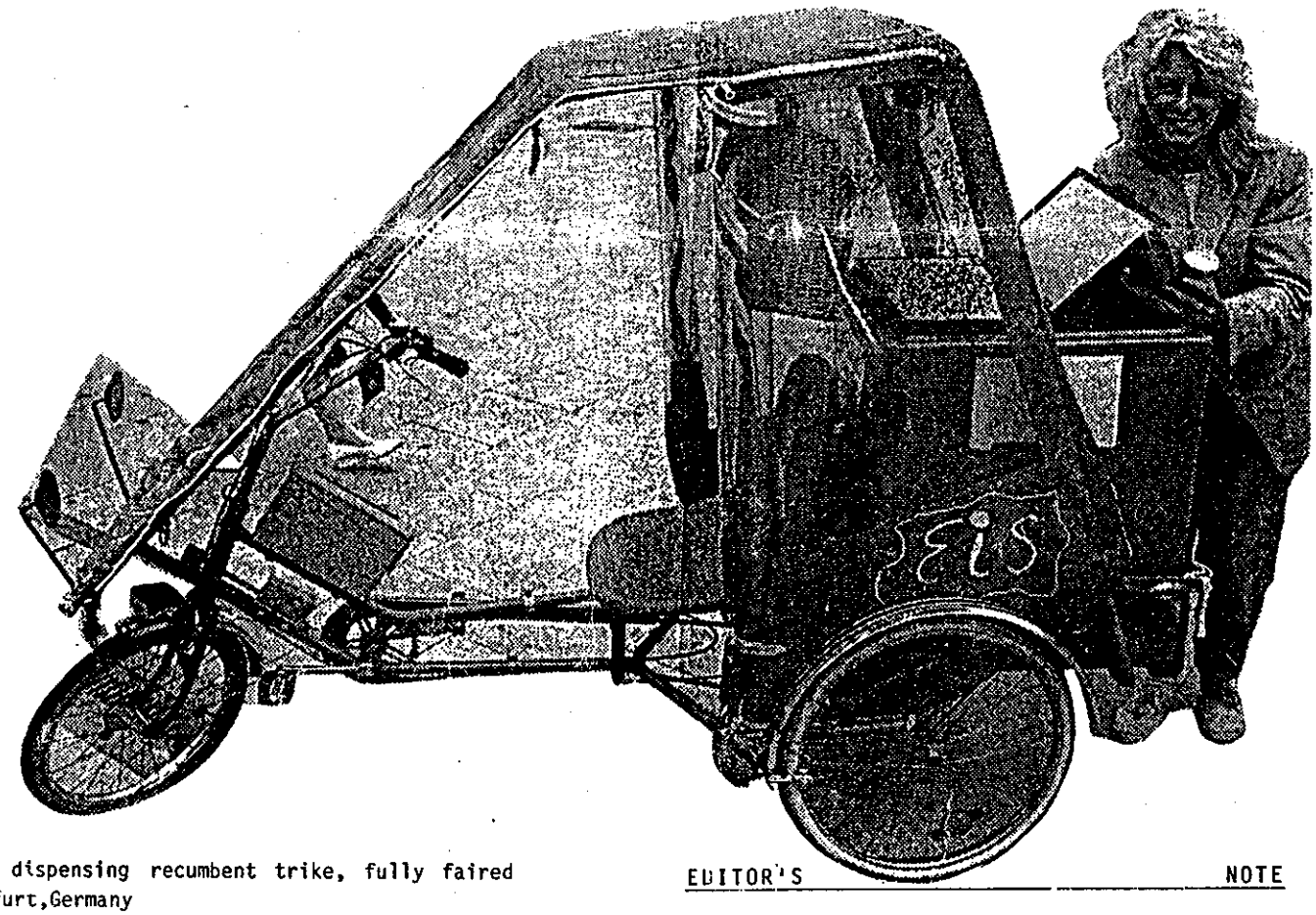
HPV TIMES

human power in motion vol 1



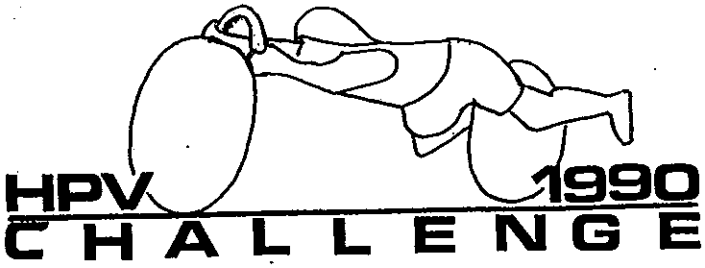
Drink dispensing recumbent trike, fully faired
Frankfurt,Germany

CONTENTS

EDITOR'S NOTE

Welcome to the first edition of HPVNews, the Aussie newsletter for exploring the human limits to pedal power. Initially motivated by the desire to go fast we hope to encourage HPV events to propagate across Australia. Off-road, air- and water-craft have been successfully used overseas for record-setting feats; and the combinati on of attention grabbing vehicles and their human frailty will continue to make these meetings popular. There are a number of groups and individuals working in isolation on HPVs and I hope this newsletter will attract the enthusiastic cyclists to contribute to the production of a national magazine and events calendar. I would like to invite all producers and riders of HPVs to consider HPVNews their own.

See you in October
Wayne Kotzur



OCTOBER 20-21

PEDAL POWER ACT HPV CHALLENGE

Canberra will see the convergence of many riders and their craft from throughout Australia as they attempt to gain recognition as national winners. A challenge laid down by the local Pedal Power ACT group has been presented in most cycling magazines, and responses have been received from as far afield as Darwin. As the First National Open, the organisers will have little experience in running the two day event, scheduled for the first weekend of Pedal Power Bike Week (20-27th October), but great expectations and fine weather should promise a good time for the contestants, the judges and the on-lookers.

Depending on the roll-up, there is to be competitions of pure speed, manageability and practicality, with the eventual winners awarded Certificates-of-Attainment in the following....

FASTEST HPV in AUSTRALIA
An accurately timed sprint over 200m, with unlimited run-up on a flat straight course.

SLEEKEST CYCLE IN AUSTRALIA
A downhill coasting event, with drive-system dis-abled to compare (approx) the aerodynamic drag of the various vehicles.

MOST PRACTICAL HPV in AUSTRALIA
Judged on such details as design, repairability, access, weight, safety and ease-of-use, this award will be decided by a questionnaire of riders and support crews. A short slalom may be included.

MOST INNOVATIVE/CRAZY HPV in AUSTRALIA
Organiser's choice

HILL CLIMBER EXTRA-ORDINAIRE
Mass-start standing-start hillclimb of 200m over two kilometres with position decided by ballot.

NATIONAL HPV ROAD-RACE WINNER
A le mans start road race, with drafting permitted, to be run on quality blacktop with some undulations, over a distance to be decided later (depending on rider experiences).

A souvenir will be presented to all official entrants, and it may be possible to provide some billetting to small groups and individuals who wish to compete. Food and drinks will be catered for on the course, which will hopefully be confined to the inner north of Canberra to prevent too many contestants getting lost on our city's notorious round-about roads. As many bike-shops here are open seven days a week, it may be possible to get last minute repairs and replacements done; especially as late-night shopping is on Friday.

Where practical, all events will be structured according to IHPVA rules (see accompaning article) and all events are open to all people powered vehicles. The ACT Challenge team is solely interested in pushing the evolution of cycling further; so that unnecessary limitations like the number of wheels, layout dimensions, age and sex categories will be ignored. We would welcome any feedback.

VOLUNTEER HPV RIDERS NEEDED

Pedal Power ACT has been loaned the collection of contemporary recumbents owned by the Museum of Unusual Bicycles, which is funded by the Canberra Tradesmen's Union Club. Some are normally displayed at the museum at 2 Badham Street,Dickson and a far greater number are held in various locations. They are looking for riders would like to try the novelty and speed of HPV racing; and compete in the Bike Week HPV Challenge in Canberra on the 20th & 21st of October.

Some models are straight production recumbents, such as the Roulandt, the Slingshot and the Hypercycle, as well as some one-off designs and children-sized ones.

Please contact Anne Marie Driver (cycle curator) at the museum on 062 480999, write to Pedal Power (GPO Box 581 Canberra 2601) or drop in at the PP office which is open Wednesdays from 12:30 to 1:30 in Room G6, Ground floor of the Griffin Centre, Bunda St, Civic.

USEFUL HPV-SPECIFIC PUBLICATIONS

Unfortunately most information is from the United States, and airmail is expensive. I would recommend joining the IHPVA as the quality of its newsletter is excellent, and the quarterly 'Human Power' which is the technical journal is similiarly good for the designer/amateur looking for the concepts behind HPVs.

1. Human Power Usually 16 - 20pages,about US$4,contributions from many of the original wave of HPV enthusiasts. IHPVA
MO Dept
PO Box 51255 Indianapolis
IN 46251-0255 USA

2. HPV News Usually 20 - 24pages,forms part of membership of IHPVA,contains a world calendar of HPV events, reviews of relevant publications,test-rides of commercial recumbents and classifieds.

3. Scientific Symposium Proceedings #1(1981), #2(1983),#3(1986) .These three weighty tomes, contain much scientific data on stream-lining, muscle physiology practical design consideration and profiles of many sucessful land,sea and aircraft. IHPVA
IHPVA US$29 (members) US$39 Otherwise

4. Designing & Building the 3wheel HPV (HUDYN Vehicles) by Tom McGriff & Jim Wolpet
c/- Tom McGriff PO Box 22444
Indianapolis IN 46222 USA

5. Recumbent Plans
Econo-bent Shortwheelbase bike US$30
Cyclo-pedia POBox 884 Adrian MI 49221-0884 USA (HPV cataloue also available extra$1)
Simple cycle Tilt steering trike US$10
William Reid 3201-4th Avenue Sacremento CA 95817 USA
Tour Easy Long wheelbase tourer US$19?
Easy Racer Inc Box 255H A Freedom, CA 95019 USA
Prelude Long wheelbase bike US$12.95
J Benditt Co. PO Box 589L Feasterville PA 19047 USA

6. HPV Fairing Consruction Techniques
Ronald Steven Blair US$30?
Blair Books 892 Grove St,San Louis Obispo CA 93401 USA

Note; So You Want to Build a HPV booklet produced by the British HPV Club should arrive in time to be reviewed next issue.

PRACTICAL VEHICLES

by Wayne Kotzur

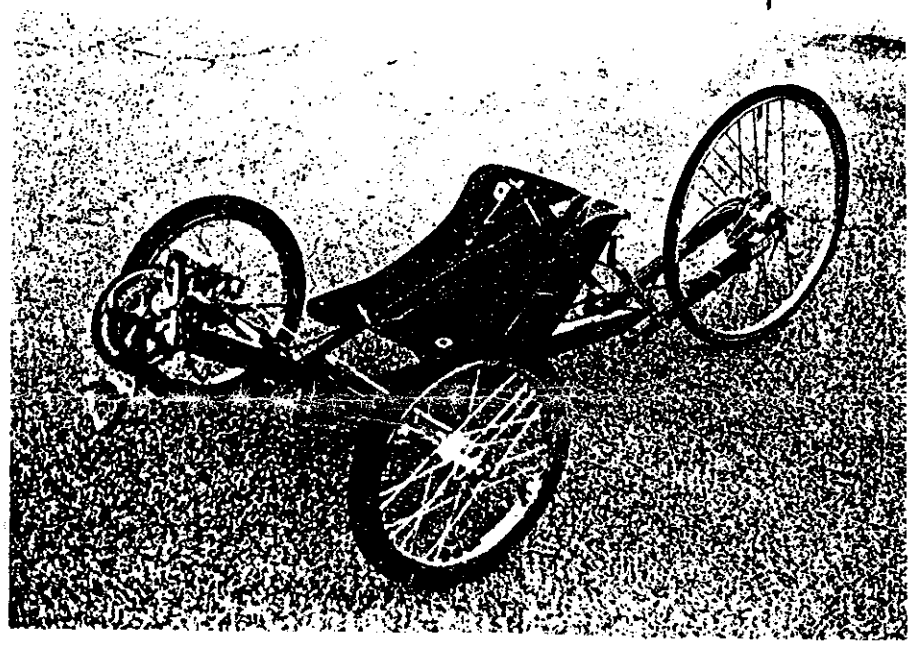
It was in the thirties that a very significant decision was made that has drastically retarded the development of small human-powered vehicles (HPVs). Despite the promise of higher speeds with greater comfort, the international cycling authorities banned bicycles and tricycles with non-standard configurations. With only minor variations in equipment, the racing cyclist of today still uses the same position that was fixed over fifty years ago. While understandable in promoting competition only between riders, the recent re-discovery of the promise of HPVs makes me wonder just what would have been achieved in those intervening years if the UCI had allowed some specialised HPV events.

Briefly put, HPVs are a diverse range of lightweight craft that now ply the air, the water, and the roads under the control of a small but determined group of riders. First revived in the USA in the late 1970s, with a contest to achieve high speeds (initially hoping to break the 50 mph barrier, last years contest pushed the barrier to over 65 mph), it has expanded its goals rapidly. This development has yet to settle into definitive designs, so I expect yet more innovation to follow.

While initially speed oriented and purpose-built racing machines, HPVs now have special interest to those of us fired by appropriate technology and the effective utilisation of resources. Non-polluting, mechanically simple, and suitable to handicapped and aged users, they should have broad potential in a car-restrained world. Human power, whether hand, foot or both, can contribute greatly to short distance travel and longer holidays - in fact it is quite possible to cover very long distances rather quickly (if you are keen enough). The 1989 HPV Race Across America, from Los Angeles to New York, which is run as a non-stop team event, covered the 4474 km in 5½ days. The winners of the RAAM found that they maintained an average speed of 65 kph on suburban roads, tending to outpace their support vehicles as they threaded through the traffic.

At the opposite extreme are very practical shop-and-commute trikes with the inherent stability and luggage capacity that has so dominated Asian cities. The lovely Leitra, with its careful attention to safety and comfort, can be found negotiating icy winter roads in Denmark. It has built in luggage trays, a fully enclosed weather shield (with demisting windows), drum brakes, and integral lights. Protecting the rider in a fall and from the icy winds of winter, it transforms a commute into a cosy bit of exercise.

The most popular design provides the rider with back support, and a semi-reclined position. This recumbent position makes the cycle more comfortable and easier to balance upon when stopped. It also produces a superior aerodynamic position, and an increased margin of safety since the front brakes can be worked harder without the rider tipping forward, and in an



Hudyn trike, USA 1980s

Hesperus Werke, Germany 1920s

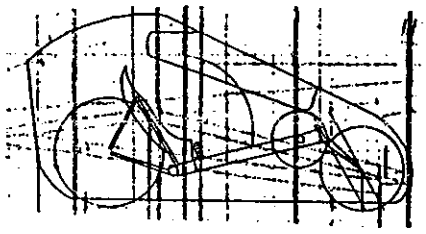
accident contact is usually made by the rider's feet (head-first is the norm on a conventional bicycle).

The two-wheeled recumbent is very popular, with a few mass-produced models in Europe, and about ten manufacturers in the USA. The long wheelbase version (LWR) is the easiest to produce as it uses all standard bicycle parts and provides an ultra-stable ride. The shorter wheelbase designs (SWR), where the front wheel is tucked between the rider and the pedal cranks, provides a more agile and shorter bike. It is becoming more common as it allows a smaller enclosure to be built about it for competitions. It has the complication of more complex routing of the chain(s) and to enable the legs to clear the steering bars. A number of other possible designs using rear steering promise a further reduction in weight and complexity, but as yet are too unstable for mixed traffic use. I am now producing my sixth recumbent, and am facing the RSWR (rear steering, short wheelbase recumbent) challenge.

I feel that HPV research and development will lead in two desirable directions - the first is the production of very light and fast pedalled vehicles; the second is to make an input into the development of power-assisted vehicles. The concentration on aerodynamics and efficiency should enable higher sustained speeds with less energy input. After all, most cars weigh over a tonne and seldom convey more than 100 kg of driver and luggage. Most of the power goes into overcoming the weight and the bulk of the vehicle. The average cyclist, who moves along at about 20-25 kph, generates about one tenth of a horsepower, whereas the average car develops a thousand times more power and yet seldom moves faster than 60 kph in traffic. The adoption of reclining positions, lightweight and efficient bodies, and full or partial fairings can reduce energy requirements dramatically. At the limit we can now see mileage marathon vehicles capable of carrying their riders thousands of kilometres on a litre of fuel■

Wayne is a full-time custom builder and designer of bikes, trikes and all other manner of pedal-powered equipment. He also produces historically accurate replicas for museum displays.

Building A World Beater



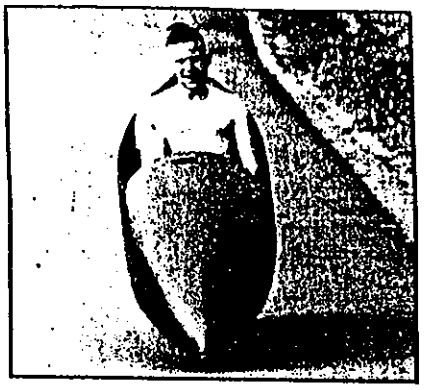
FED UP OF BEING BEATEN? WANT TO SKIP TRAINING AND STILL GO FASTER? HPVTimes PRESENTS AN EXTRACT OF BICYCLE ACTION's INTERVIEW WITH THE BLUEBELL RACING TEAM.

In 1986 Glen Thompson came third in the Vancouver 167 mile road race in Bluebell 11, which is affectionately know as Eric. It was a direct descendent of Bluebell 1 in which Tim Gartside took the world HPV record of 51.9mph in 1982. Bluebells 1 and 11 are extremely fast but the racing team has to crack 65mph, the record set by Gold Rush in the USA, to beat the world. Hence Racey Tracey...

Tracey is Bluebell 111 and is named after the windscreen strips on cars in Southend where much of the teams training is done. Tracey uses Eric as a starting point from which refinements and improvements are made.

AERODYNAMICS

Bluebell 111 has been designed specifically for improved aerodynamics. The record holder,Gold Rush, was merely the adaption of a utility cycle with a slippery fairing placed on top of a man with tree-trunk legs. The Gold Rush had lumps and bumps which caused drag, resistance and turbulence which wastes the rider's energy. Bluebell has none of these.



"We have gone for the simplest most obvious lines," said Glen, whose third-floor London flat resembles the Colditz attic in which a glider was built. The frontal area is down to 4.5 square feet, 20% less than Eric. The whole machine is just 48 inches high and 19 inches wide. It is 90 inches long, though if we use a shorter rider we can cut that. By comparison, Eric is 52"x24"x120", and you on your ancient 10-speed measure 72"x22"x64".

The fairing must be smooth, light, rigid and repairable. In the end they have choosen a double skin of Kevlar which sandwiches a rigid honeycomb layer. It will cost $16,000 and subsequent fairings almost $4000.

ROLLING RESISTANCE

After aerodynamics the tyres have the most effect on your speed.As the tyre is continually rolling it is continually deforming and all the time it does this it is absorbing a small part of the rider's energy. If you can minimise rolling resistance you will roll faster.

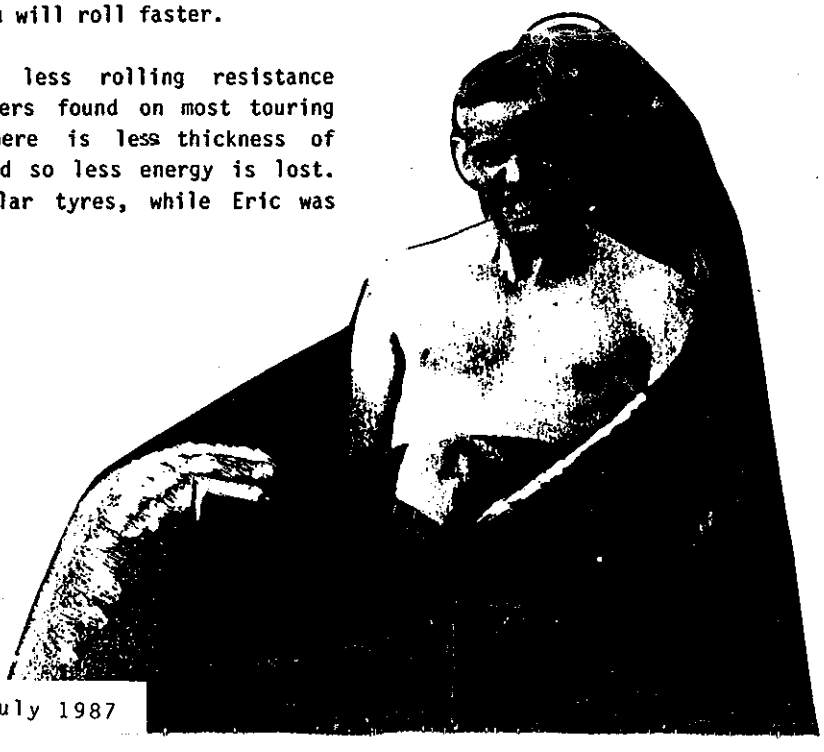
Tubular tyres have less rolling resistance than wired-on clinchers found on most touring and town bikes. There is less thickness of rubber to be deformed so less energy is lost. Gold Rush used tubular tyres, while Eric was stuck with a Moulton 17" clincher on the front, and a Panaracer Dual with Kevlar beading on the back. Glen went to Santa Barbara, California, to track down tubs for the Bluebell's 20" front wheel (a larger diameter also reduces rolling resistance). He cameback with an Argentinian Saavedra Turbo Aero straight-spoked 24Hole rim with an ALvarez Sport tub tyre. It is now kept under lock and key, while training runs are done on Araya 36H rims shod with Clement BMX tubs.Spare evenings are spent slicing the knobs of the BMX tubs.

MECHANICAL DRIVE

Tracey uses a cross-over drive, similiar to that on a tandem. The compromise in efficiency is offset by the need not to have a giant front chainring - a simple gearing up is achieved in the cross-over. The front racing crankset will have 42T, with the rear TA double will be 36 and 26, with the opposite step-up sprocket of 21T, effectively doubling their size. They lead to a Millard six-speed 13-28 block handled by an indexing Shimano derailleur; actuated by thumbshifters mounted on the bars.

WEIGHT

Surprisingly, weight is the least important factor in governing the top speeds of HPVs. Neverless, the team has spent some time shaving off the ounces. The main frame is now a 3" aluminium tube, with Columbus tubing used for the forks and seat bracket. The two headsets will have light resin cups. The seat, which was cured on the gas cooker, is made of carbon fibre. The Kevlar fairing will weigh under 5lbs. The stripped frame weighs 4.5lbs, with the h'bars of HE30 aluminium. Tracey has an all-up weight of 29lbs, 15lbs lighter than the Bluebell II.



COMPETITION RULES OF THE IHPVA
(revised March, 1989)

1.0 PURPOSE: The International Human Powered Vehicle Association supports human-powered vehicle competition and officially recognizes and maintains records for the purpose of encouraging and promoting advancements in human-power technology.

2.0 GENERAL: These rules shall apply to all events sanctioned by the IHPVA. The IHPVA supports competition in three categories of human power: those of 1) Land, 2) Water, and 3) Air vehicles; within these categories, competition is supported and records are maintained in the classes of competition outlined below. However, event organizers are free to organize other events and classes to which these rules may be applied. Events not covered by these rules may also be held in conjunction with sanctioned competitions. Rules for non-sanctioned events must be provided by the event organizer.

In general it shall be the intention of the IHPVA rules to avoid defining what type of vehicle may enter individual competitions, but to let the competition itself determine which type of vehicle is superior by a normal evolutionary process. Exceptions may be made if unavoidable (i.e. arm-powered vehicles.) The spirit of these rules is to avoid inhibiting design innovation by not establishing unnecessary restrictions.

3.0 LAND VEHICLE COMPETITIONS

3.1 Vehicle Requirements

3.1.1 Power - Vehicles must be driven solely by human power. Non-human power sources (batteries, solar cells, etc.) are permitted only for powering sensors, displays, communication equipment, and lights. Control devices, cooling fans, powered aerodynamic devices, etc., may not be powered from non-human sources.

3.1.2 Energy Storage - No device which stores energy over more than one input power cycle (e.g. one leg stroke), or which releases energy under control of the operator, may be used in any event except the road race, or speed events longer than one mile. Energy storage devices are permitted in these events provided no energy is stored before the start of the race (this means absolutely no chemical, electrical, kinetic, potential, or other form of energy storage at the start.)

3.1.3 Brakes - All vehicles must have a safe means of stopping.

3.1.4 Control - All vehicles must be controlled solely by the rider(s), with the single exception of that necessitated by the standing start as described in section 3.2.3.1

3.1.5 Integrity - No vehicle may discard any part after beginning motion.

3.2 Events

3.2.1 Competition classes - Competition events shall be recognized in the following classes:

3.2.1.1 Single Rider - The vehicle shall contain only one person.

3.2.1.2 Multiple Rider - The vehicle shall contain two or more persons.

3.2.1.3 Arms Only - Power shall be obtained by arm motion only.

3.2.1.3.1 Physically handicapped Riders - Rules to be determined. Event Directors may institute special competitions in this area.

3.2.1.4 The IHPVA shall recognize separate records for males and females in all events. However, segregated competition for males and females is to be discouraged.

3.2.1.5 Organizers Option - Classes may be combined by the event organizer for a single race, but all records will be maintained in the classes indicated.

3.2.2 Types of Events - The following race events are recognized:

3.2.2.1 200 Meter Speed Trial - The winner of this event shall be the vehicle achieving the highest average speed over a 200 meter interval. A flying start from any distance is permitted, within practical limits as established by the event organizer.

3.2.2.2 500 Meter Speed Trial - Identical to 3.2.2.1 except 500 meters.

3.2.2.3 1 Kilometer Speed Trial - Identical to 3.2.2.1 except 1 kilometer.

3.2.2.4 4 Kilometer Speed Trial - Identical to 3.2.2.1 except 4 kilometers.

3.2.2.5 10 Kilometer Speed Trial - Identical to 3.2.2.1 except 10 kilometers.

3.2.2.6 1 Mile Speed Trial - Identical to 3.2.2.1 except 1 mile.

3.2.2.7 200 meter speed trial - 600 meter start. The winner of this event shall be the vehicle achieving the highest average speed over a 200 meter interval. A flying start from not more than 600 meters before the 200 meter timed section is permitted.

3.2.2.8 1/4 mile Elapsed Time - the winner of this event shall be the vehicle achieving the shortest elapsed time to travel 1/4 mile. A standing start is required.

3.2.2.9 1-Hour Time Trial - the winner of this event shall be the vehicle achieving the maximum distance in one hour. A closed course is required for this event. A standing start is required.

3.2.2.10 12-Hour Time Trial - Same as 3.2.2.9 except 12 hours.

3.2.2.11 24-Hour Time Trial - Same as 3.2.2.9 except 24 hours.

3.2.2.12 Road Race - The winner of this event shall be the first vehicle to complete a designated number of laps on a designated course. The starting requirement may be a standing start, flying start, or LeMans start. The event organizer shall specify the exact course, the number of laps, and the type of start. No records shall be recognized for this event.

3.2.2.13 Practical/Commuter Vehicle - Rules to be determined.

3.2.2.14 Special Record Events - Members are encouraged to submit applications for new record categories to the IHPVA. Significant achievements will be recognized as new record classes.

3.2.3 Starts

3.2.3.1 Standing Start - A standing start is defined as an unassisted start from the stationary position, except that the vehicles which are unstable at low speeds may be assisted by one assistant for not more than 15 meters. The assistant may not push the vehicle.

3.2.3.2 Flying Start - A flying start is defined as a start where the vehicle may be assisted by accelerating before entering the timed portion of the course. Push assists by one or more persons are permitted. Pushers may not assist the vehicle for more than 15 meters.

3.2.3.3 LeMans Start - A Le Mans Start is defined as a start where the vehicles are parked diagonally on one side of the race course, while the racers line up on the other side of the track. At the start of the race, the riders run to their vehicles, get in, and proceed onto the course without assistance.

3.2.3.3.1 Assisted LeMans Start - An assisted LeMans start is defined to be the same as a Le Mans Start, except that a single assistant is permitted to assist the rider in getting into the vehicle and getting under way.

3.2.4 Drafting - No human-powered vehicle may be assisted in any record attempt by a pacing vehicle used for the purpose of aerodynamic assistance.

3.2.5 Change of Riders - No change of riders or removal of riders is permitted during a race.

3.2.6 Passing - in multiple-vehicle races, lapped vehicles must yield right-of-way to lapping vehicles. Blocking or obstructing the race path by weaving is prohibited. Vehicles should follow a steady predictable line during a race and avoid sudden maneuvers which might cause accidents.

3.2.7 Safety Requirements - All riders must wear Snell-approved helmets during all competition. Vehicles may be disqualified from competition due to inadequate braking capability, lack of stability, poor visibility, presence of dangerous protrusions, or other unsafe design features. Vehicles which are deemed to be unsafe may be flagged off the course by the race officials.

3.2.8 Conduct - Any competitor judged by the Race Committee to have practiced unsportsmanlike conduct during an event may be disqualified from that particular event. The Race Committee shall review available evidence before making a decision to disqualify. The decision of the Race Committee is final.

3.3 Course Requirements

3.3.1 Course flatness - Except for courses for the road race events, and the time trial events one hour and over, all courses must meet the following flatness requirement: If an imaginary line is drawn from the end of the timed portion of the event course back toward the beginning of the course but sloped upward at a slope of 2/3 percent (1 meter in 150), at no point may the vehicle course pass above this line. Curved courses may be used for any event, provided the same flatness requirement is met. The 200 meter time trap in the 200 meter speed trial events, however, must be contained in a straight section. All curved courses must be clearly marked with the limiting inside boundary. Any vehicle crossing a wheel over this boundary shall be disqualified from the run. Course distance shall be measured from the inside boundary of turns.

3.3.2 Course Measurement - In order to qualify as a record course, distances and elevation differences must be measured and certified by a registered Civil Engineer, a registered Land Surveyor, or a person with equivalent training.

3.3.3 Timing - All timing must be accomplished by automatic start and stop actuation. Timers must be certified as accurate to within 1/100 of a second in 10 minutes or 1 second per day at a temperature of 20°C, plus or minus 5°C. Certification must be by a chronographic testing service or a registered Electrical Engineer. Timing to the nearest 1/100 second is required, and timing to the nearest 1/1000 second is preferred.

3.3.4 Wind - For any run to be approved as a record, the wind velocity in any direction must not exceed six kilometers per hour (1.67 meters per second). Wind velocity measurement must be taken during the duration of the actual timed run at the finish of the course, at a level of 2 meters above the course surface. These restrictions apply to closed as well as straight courses.

3.4 Special Arm Power Rules

3.4.1 Any drive may be used for any of the events in the arm power class. Hand and foot powered machines which compete in other IHPVA race categories are allowed in the arm-power category, as long as the leg-power input is disabled.

3.4.2 There are no restrictions on riders in this class. They must not be endangering themselves or others by competing in the race. No handicaps or other equalizers will be used. All riders compete under IHPVA rules.

3.4.3 Practical/Commuter Vehicle Rules - to be determined.

4.0 WATER VEHICLE COMPETITION

next issue of HPVTimes

5.0 AIR VEHICLE COMPETITION

(to be determined)

6.0 SANCTIONING

The IHPVA will sanction events organized under these rules. In order for a record to be recognized, sanction must be obtained from the IHPVA prior to the event or record attempt. A completed application for event sanctioning and the sanction fee must be received by the IHPVA at least 30 days prior to the event. The event must be witnessed by an official appointed by the IHPVA. All contestants in a sanctioned event must sign a waiver releasing the IHPVA from liability for the event.

7.0 RECORDS

All record attempts recognized by the IHPVA must be run according to these rules. An official appointed by the IHPVA must observe the record run. The official must be in no way connected with the ownership, design, or operation of the vehicle. The official must be an entirely independent observer. Documentation of the record attempt must be forwarded to the IHPVA within 30 days after the event.

8.0 RULES INTERPRETATION AND PROTESTS

Each event organizer shall set up a race committee to interpret these rules and settle any protests. The head of the race committee shall be an IHPVA representative. Decisions of this committee in regard to the competition are final. Protests concerning record attempts must be submitted in writing to the IHPVA. These will be reviewed by the IHPVA, and a decision made within 120 days following receipt of the protest.

9.0 CHANGES

Any member of the IHPVA may recommend rule changes to the Rules Committee. Proposed rule changes will be assembled and considered once per year. Changes will become effective after approval by the Board of Directors of the IHPVA and publication of the rules.

INTERNATIONAL HUMAN POWERED VEHICLE ASSOCIATION

Membership entitles you to the following:

- ✓ 6 issues a year of ***HPV News***, a newsletter to keep you abreast of the latest developments and news of upcoming events
- ✓ 4 issues a year of ***Human Power***, a quarterly technical journal
- ✓ discounts on books, papers and other items of interest to HPV and cycling enthusiasts

Dues are $20 per year in the U.S.A., Canada, and Mexico; $25 a year elsewhere.

Please send check or money order (U.S. funds only, please) to:
IHPVA, P.O. Box 51255, Indianapolis, IN 46251-0255, USA

Dues	
$20 (U.S.A., Can., Mex.)	_____
$25 (All other countries)	_____
MasterCard or VISA**	_____
Total Enclosed	_____

Name _____

Name of business (if applicable) _____

Address _____

City _____ State/Prov. _____ ZIP/Postal Code _____

Country _____ Phone Number (home) _____ (business) _____

Occupation* _____ Age _____

*Would you be willing to volunteer your services to the IHPVA? _____ Memb. #_____ (renewal/address change)

☐ New Member ☐ Renewal ☐ Address Change ☐ Donation Enclosed ☐ ASME/Student Group

If you do NOT wish to be included in the next update of the IHPVA membership roster, provided to members only, please initial here _____

** For VISA or MasterCard, a $1 U.S. transaction charge will be added. Please complete the following credit card information and sign.

VISA or MasterCard Number (13 or 16 digits) _____

Expiration Date _____ Signature _____

VISA MasterCard

Payments to IHPVA. To keep membership dues down, we would appreciate foreign payments be made by Postal Money Order, Foreign Draft drawn on a U.S. bank with identification numbers, or charged to VISA or MasterCard accounts. All payments must be in U.S. currency. Please contact us if you are unable to pay by any of these methods.

July/Aug 90

PEDAL POWER ACT HPV 1990 CHALLENGE

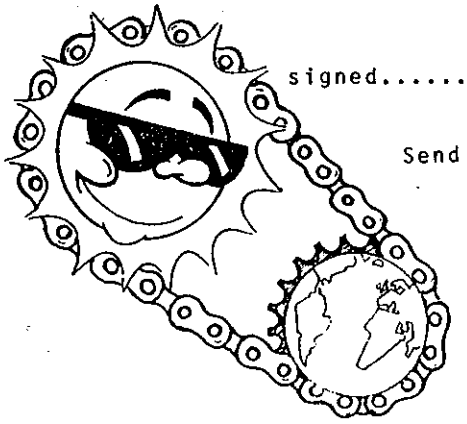
NAME(S).....
TEAM NAME.....
CONTACT ADDRESS.....
.....
TELEPHONE.....
BRIEF VEHICLE DESCRIPTION.....
.....
.....
.....
.....
.....
.....

PLEASE INDICATE ENTRY CATEGORIES
0 STRAIGHT LINE SPEED 0 HILL CLIMB
0 DOWN-HILL COAST 0 ROAD RACE
0 PEDAL PRIX VEHICLES 0 ALL (practical event)

ENTRY FEE.....$10/vehicle .....
A souvenir will be supplied to all teams and individual event certificates awarded to winners and major place getters. Full placings will be published in the next issue of HPVTimes. We are arranging to have food and drinks on site, as well as IHPVA & HPV literature.

I/we undertake the Pedal Power HPV Challenge at my/our own risk for personal injury and property damage. All non-adult participants must have the permission of parentguardians/ schools. Neither Pedal Power ACT nor any person(s) assosiated with the organisation of the ride can accept responsibility for accident or injury to participants, howsoever caused. All vehicles must be deemed safe and they will be inspected by the organisers before being allowed to compete. Helmets must be worn and properly fitted. Judges' decisions must be considered final.

signed.....



Send form to 'Challenge'
c/- Wayne Kotzur
26 Mills ST Hackett
ACT 2602

HPVTimes ANNUAL SUBSCRIPTION

Four issues per year, with an emphasis on developing an australian handle on practical and speed machines.

NAME
ADDRESS

POSTCODE

INTEREST IN HPVs general
competition
commuting/touring/air/water

dues $10/four issues. PLease send cheque/money order to HPVTimes Editor Wayne Kotzur at 26Mills Street, Hackett ACT 2602. Contributions will be gratefully accepted and photos are especially sought.