

## Letter from the Editor

As always, just before I start the layout to HUFF my stress levels rise as I look at what appears to be not a lot of content. Well this time as you can see all moderation has been completely thrown out the window and we present our biggest edition ever. Thanks to all the contributors - it's rewarding to see your material in print so keep the articles coming.

For those of you receiving the HUFF electronically you may have noticed it's not so good printed out. This file is optimised for viewing on the screen and quick delivery. We use a much bigger file for the master so feel free to request this file (from me) if it suits you better.

Timothy Smith - [tstrike@ihpva.com](mailto:tstrike@ihpva.com)

## Lola land yacht specs....

The specifications of "Lola the land yacht" (who we sailed across the wide Nullabor "seas" in August 2000!): By Ian Humphries.

Lola's tubing choices and frame design were entirely by Ian Humphries - it worked for Bec and I but I do not guarantee it will work for anyone else - I tried to err on the strong side with my choices though and think the specs are fine for the most demanding uses....like touring across continents....Some advice to begin with though: Never ever attempt to plan, source all parts and tubing and build your first tandem in 6 weeks while trying to also work a demanding 9-6pm job! There were definitely some frustrating and rushed moments! Allow at least 6 months if you can! Lola was the 7th bike I'd built and my

*Continued on page 7*

## Greenspeed OzHPV Challenge 2001

The Greenspeed OzHPV Challenge, not to be confused with the 6 hour Challenge has now been held ten times starting in 1990 and every time it seems to get better, in the quality of competition, vehicles and the events.

### What is the Challenge?

The Challenge is an event like no other consisting of eight events held over a weekend combined to ascertain the practicality of your HPV. You can either compete in individual events or for the overall prize. The emphasis is on competing in everything and having a machine that will do everything. Changes can be made to the vehicle between events to make it perform better for that event eg. off-road Tyres for the enduro, fairing for the speed events or smaller wheels for lower centre of gravity. Designing a vehicle for a particular event is encouraged to develop vehicles to be lighter, more robust, faster or even have better storage for carrying luggage, depending on the race you are entering. For example the drag race needs a lightweight, aerodynamic vehicle for fast acceleration. On the other hand the off-road event needs a robust vehicle that can take a fair bit of abuse.

### Where is the Challenge held?

Previously held in ACT for over ten years, it has been relocated to Werribee, Victoria. The venue will be the VUT training track at Melways 206, K5.

### What can you ride at the Challenge?

Anything that is human powered eg. bicycle, tricycle, in-line skates or even a unicycle. As long as the only form of forward drive is provided by a human/s, your mind is your only limitation.

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## What rules are there for my vehicle?

None really, as long as it passes basic safety requirements and you wear an approved helmet you are ready to race.

## Am I competing against everybody?

Only people in your class eg. Women, Men, Junior and Team.

## When is the Challenge?

On the 1st and 2nd December. Registration 8-9 am each day.

## What will I see at the Challenge?

Most of Australia's leading recumbent manufacturers and homebuilders will be there. Most of these machines will be available to ride between events, lunchtime or full-time from the manufacturers tents. You will also witness what recumbents can and can't do with bikes and trikes etc going through their paces. Sundays' racing in the Mall should provide for a great spectacle with tight cornering sprint events with plenty of sliding.

## Do I need to be fit?

No, the Challenge is all about coming along and trying every machine in sight. The Challenge is a national event for everyone around Australia to meet and have fun and test his or her metal against someone else's. The challenge is to better the speed you did last year in the 200m sprint, finish the road race, complete the enduro in one piece or stay upright in the criterium.

## Events

**Road Race:** The approx. 20-kilometre road race consists of 20 laps around the marked circuit. The start is unassisted. The race ends when the first entrant completes 20 laps. Each further entrant finishes their next lap after the winners twentieth lap, the times and laps completed place the remaining contestants.

**Time Trial:** Riders are released every thirty seconds, generally in registration order, for a single lap of the road race circuit. Riders can receive assistance at the standing start. Fairings are encouraged. Vehicles may compete in both faired and unfaired (with same rider/s) out of registration order but must be registered with the chief marshal for two runs beforehand and their points tally will only consider their best time.

**Enduro:** The Enduro is an off road race with a Le Mans start over an undulating course.

**Shopping Race:** The shopping race is a test of the practicality of the vehicles. Vehicles race around a tight and challenging course, stopping to collect and deliver a load of shopping. The shopping race points will be based on both time taken to complete the course and the amount of shopping carried.

**Twin Drag:** This 200-metre event will be run on a knock-out basis consisting of heats of two competitors in registration order. The start is unassisted. Times are recorded for yearly comparison, not point scoring. Placing will be dependent upon the last heat which the vehicle won, therefore all but the winner will share equal placing.

**200m Sprint:** An unlimited run-up to a set out 200m stretch with timing gates, the points in order of fastest times. Fairings are encouraged. Vehicles may compete in both faired and unfaired (with same rider/s) out of registration order but must be registered with the chief marshal for two runs beforehand and their points tally will only consider their best time.

**Criterium:** The criterium is a quick race with many corners. The field of entrants will be broken into manageable numbers for each heat, and the winners (1st, 2nd, and 3rd) of each heat will compete in the final. The criterium uses a Le Mans start.

**Dual Slalom:** A combination of sprint and slalom ride. Depending on the numbers of competitors, fastest riders/ winners of heats go into the finals.

## Rules

Helmets must be worn at all times during all events. Vehicles must be safe and in good working order. Adequate control and braking must be demonstrated to the marshals at registration time. Vehicles must not have dangerous projections likely to harm competitors or spectators. Vehicles may be modified between events but once an event has started attached components must be carried for the entire event. Vehicles are allowed to use energy storage devices only if they are charged during the event from human power. Such devices must be fully discharged before the event commences. Separate batteries for cycle computers are acceptable. Vehicle and rider numbers must be adequately attached and clearly visible to timekeepers. Two numbers will be provided at registration, one for the rider and one for the vehicle. Riders will not be able to race if their numbers are not clearly visible. Entry is at the risk of the entrant. The safety of all vehicles is the responsibility of the entrant. All types of human powered craft are allowed. There are no restrictions on layout, fairings, drive systems, materials or number of riders. However, in crowded events, preference will be given to non-standard cycles. Decisions of the judges will be final and all requests by the marshals must be obeyed promptly in the interests of smooth and safe competition. If a vehicle fails to complete a timed individual start due to mechanical failure or crashing, they may be given a second chance at the sole discretion of the chief marshal. Re-runs in the case of uncompetitive times will not be granted.

We have confirmation that Greenspeed will again be our major sponsor for the Challenge. Keep 2 days of competition with options for some sort of mass ride in the afternoon on one of the days.

## Accommodation

Werribee South Caravan Parks is considered to be the closest budget Accommodation but we have a full list of a variety of accommodation options available on request or download it at:

<http://sunsite.anu.edu.au/community/ozhpv/werribeeaccommodation.rft>

# The “Swiftlet” Performance trike from MR Components

I'm not sure owning 3 trikes is really absolutely necessary....but ...a new lightweight and high performance trike has joined my “fleet” of HPVs... You could easily call this purchase part of an obsession with fast lightweight HPVs and optimum efficiency....this one though is really “just for racing” and should appear at the Brighton World HPV Championships in August if everything goes well over the next few weeks... I guess it's really a bit of a luxurious excess, but I'm trying really really hard not to feel too guilty.



So I've spent the last couple of weeks discussing a new design for a lightweight race trike with Michael Rogan of MR Components in Hastings, Victoria, Australia (who can be contacted via his web site at <http://www.peninsula.starway.net.au/~mrogan/> but the new “Swiftlet” doesn't appear on his site yet.)

Michael has been very enthusiastic about this project too and his design skills, manufacturing knowledge, racing experience, experience with aluminium / aluminium frames and TIG welding skills have been central to the project. The “Swiftlet” race trike or “son of the 12.5kg Ultra Swift” project aimed to build a super-fast, road-ready, race-trike of eleven or so kilograms i.e. around 25-26 lbs. It was to be a trike that could ALSO be set-up for long-distance Audax events with mudguards / fenders, speedo, front and rear lights AND simple corflute aerodynamic tailbox cum luggage-storage-hold-all and still weigh under 13.6kg.

## **\*My Swiftlet\***

Michael built two prototypes of which the second is mine - they are identical except mine has a wider track (600mm). Michael used the first one as a test-bed and has “attempted destruction tests” with it to make sure mine will be fine.... The Swiftlet race trikes have an all aluminium / aluminium post-weld HEAT-TREATED frame (with very very shiny brushed and

clear coat finish) developed and built by Michael Rogan (with some design suggestions from me!). The Swiftlet like its road-riding siblings is fitted with a brake on each of the two front wheels for on-road riding capability and fast all-weather stopping. The Swiftlet is designed primarily for fast racing though and therefore incorporates a few design features not normally found on the standard and proven road-going and racing Ultra-Swifts. The most noticeable feature is the use of a padded aluminium / aluminium hard shell seat rather than the more forgiving shock-corded webbing of the Ultra-Swifts and standard Swifts.!

My Swiftlet in on-road mode is kitted up with fairly standard off-the-shelf componentry including:

- FULL (1.5x normal length) mudguards on all 3 wheels
- 2 x 37mm front Primo Comet tyres (37-349)
- 47mm rear Tioga Comp Pool tyre (47-406)
- Lightspin 6 volt side-wall dynamo
- Sigma-sport cycle computer
- Union 6volt 3 watt 74mm diameter front light
- Vistalight 300 series 5 LED rear light with batteries
- TWO velocity water bottle cages
- Safety Orange flag pole and flag
- Shimano SPD road pedals
- Rear-view mirror
- Rear pannier rack.

The total on-road / road-going fully accessorised weight of my new MR Components Swiftlet with the above parts fitted is 13.6kg or just under 30lbs - this weight was viewed with my own eyes. So the MR Components Swiftlet when FULLY kitted up for on-road Audax events almost weighs less than ALL its competition without their accessories! The Swiftlet is, in fact, the lightest commercially available trike I know of. (I'm not really sure how much the “specials” with “special bits” from AVD weigh but I don't \*think\* they weigh this little). And the Swiftlet is without doubt pretty darn good value and will cost much less!! I'm going to be doing a bit more riding of it on the weekend I hope so expect some further reports soon...



2/July/2001 ..after the weekend....

.....Well now I've spent a few more hours getting acquainted with Swiftlet....I've done about 3 hours slalomming around on bike paths now and an hour or so trying to come to grips with the forces that the Swiftlet generates when hooning around an empty carpark ;-). Its "lightweight" is very noticeable - acceleration and direction changes are pretty quick and easy and withstanding the centrifugal forces on tight turns becomes your only concern - stability with the narrow 600mm track certainly seems excellent!

Michael Rogan also has designed in a ton of ground clearance on the Swiftlet - in the order of 90-110mm, which makes hitting road debris very very unlikely.

Steering elements are protected behind the main cross member too, out of harms way....

There is just a single large diameter drive side chain pulley and no internal hub or crank gearing for maximum efficiency and therefore maximum performance. The rear derailleur hanger is a standard replaceable MTB Alum. piece. The crank to seat distance is adjustable via a sleeved sliding "boom" arrangement.

Handlebar attachment points are welded directly to the kingpins as per Michael's original design for the Swift and Ultra Swift and the aluminium/aluminium handlebars feel very stiff and strong enough to lean on when cornering hard and climbing on and off the trike. The steering is simple and robust and has the advantage that the steering movement does not see your arms moving forward and back at the sides so an aero tailfaring can be fitted very snugly to the seat and rider without needing to be trimmed to reduce arm interference. Even without a tailbox the Swiftlet is obviously very quick.

All wheels are quick release (needing no tools for removal) with 24 spokes each. The two front wheels are 349mm (16") to minimise frontal area and aerodynamic drag and provide optimum strength to weight. The rear wheel is 406mm (20") to enable the use of a long cage rear derailleur which \*maximises\* the all-derailleur gear range. It has two front dual-pivot rim brakes with ultra-short cable-runs for excellent stopping power.



### \*Swiftlet build quality\*

To this avid enthusiast and home-builder the fat TIG welds look pretty darn smooth and fine and of professional quality. It really is a \*beautifully\* hand-crafted trike. The trike was set-up and ready to ride when I collected it. Michael had added all the accessory mounts and attachment points to the frame that I'd ordered, had assembled my second-hand parts onto the frame and even road-tested them. The evenly brushed finish is very shiny and bright in direct sunlight.

I think it quite safe to say that a very cool looking, lightweight, road-capable performance race trike is born!

### \*A Lightweight trike which fits in a BAG?\*

Michael Rogan says that he has bought the additional tubing to transform the Swiftlet (with one or more simple sleeved frame joints) into a "pack it away into a duffle bag trike" too. I'd guess this will save lots of dollars in shipping charges for overseas buyers .

Enquiries to Michael Rogan at MR Components:  
[mrogan@peninsula.hotkey.net.au](mailto:mrogan@peninsula.hotkey.net.au)

Ian Humphries

## Swift now selling in Canada

The first shipment of Swift Touring trike frames has arrived in Orillia.

Our first impression as we excitedly opened the crate, was of the quality workmanship that Michael Rogan has built into these trikes. OK, OK, I'm selling these trikes and therefore I may have a bias - so you judge for yourself when you see them!



Parts have now been ordered - and should be here (where have we heard that before?) by early next week! Now though, we're dealing in Canada - not half a world away!

Murray

<http://www.recumbenttrikes.ca/index.html>

# Reflex Trike

For my eighteenth birthday, my parents gave me a Greenspeed GTS tourer value at approx. \$4200.00 dollars. To suit my personal needs, all controls have been moved to the left hand side; three gear selectors for the three speed rear hub, seven gear rear cluster and three gear cluster on the crank as well as a hand operated brake for the front steer wheels (fitted with drum brakes).

Some six months after, I decided to buy the fairing to give me an all weather means of transport. One of the reasons is that I cannot get a drivers licence, which is really restrictive. So rain hail or shine, I'm on the move with the trike.

The fairing was purchased from Don Elliott (Vic.) Who delivered it to Melbourne for transport to Canberra at our expense. The unit is made of fibreglass and is sold unpainted to allow a personal selection of colour and comes with a perspex windscreen. Cost was approx. \$2600.00.

## Installation

First problem encountered was the positioning of cut-outs necessary to take the front wheel and axle assemblies and the rear drive wheel. The end result is reasonably ok but it would have better if Don had done these to suit the trike and then reinforced around the holes for greater body strength.



Second problem was determining the method and location of supports to attach the fairing to the trike frame. Basically it has to hang from the frame but permit limited upward movement whilst not allowing any movement in front to back direction.

The windscreen and its frame have been attached by pop rivets and this is proving quite satisfactory. We are still having problems selecting the best methods of securing the "targa" roof and boot cover. We are tending to favour quarter turn auto-body panel fasteners (as used on race and drag cars) for the boot cover and rubber "ute cover" connectors for the targa roof. These different methods appear to provide the best



options particularly when I have to remove and refit these two body parts using only one hand.

## Performance

Straight line performance has been slightly improved but on uneven or rough surfaces, speed has been reduced.

Turning circle has been increased due to fouling of the front wheels on bodywork.

The fairing with roof fitted in wet weather is a real bonus; very little rain gets into the cockpit when in motion.

Top speed recorded has been 100.8 kph prior to the fairing being fitted.

Overall, on a good surfaced roadway the trike performs very well but on some cycle-ways and rough cracked or weedy surfaces, it is not so good because of flex and the fragile construction of the fairing.

**Brett Edwards - Canberra**



Fairings available from D & H Enterprises Pty Ltd  
 RMB 6315/156 Bittern Dromana Rd  
 Merricks North Victoria 3926  
 Ph (059) 897 296  
 Fax (03) 59897576  
**info@dhenterprises.com.au**

# New Greenspeed Trikes

Greenspeed has just designed three new production trikes.....  
And it just so happens that two of them are tandems.....

We have had a couple of GTT owners who want a faster tandem and a couple of people wanting tandem/solo convertibles so we are building a convertible and Race Tandem suitable for road use. i.e. not quite as radical the GLR, but it will considerably lower, leaner, and meaner than the GTT Touring Tandem. The third machine is a rather radial trike, which is only known as the GTX.

## GTX

I've seen quite a few requests on the HPV Internet Mailing List for a narrower trike but of course as you narrow the track of trike, it becomes less stable. Along with that has been the request for a more compact trike to fit into small apartments, to take on aircraft and in cars \*without\* the bother of dismantling, or accepting the extra complication, cost, weight, and lack of stiffness that can go with a folding machine.

We have also had people who have liked the lightweight, the narrowness, and the great reduction in air drag of our GLR race trike, yet found the low ground clearance a problem for touring, for which was not designed.

So how could a designer design a trike that would be even more compact, have more ground clearance, and yet STILL have the superb GS road holding and handling?

Well the GTX is an experiment in this direction. I have designed a new wheel which is only 37mm wide, i.e. the same width as the tyre itself! Will such a wheel be strong enough? Well so far the Greenspeed wrecking crew have failed to destroy it!

Will it stand up to every day use? Who knows - only time will tell. The good part is it enables us to have an overall width of only 700mm or 28" and still have a track of 660mm or 26".

How to improve the ground clearance yet still use the GS cross over steering? Well our engineer, Paul Sims has managed to squeeze the steering linkage into the space between the seat and the top of the main tube, and threaded it under the cross member, thus there are now no handle bars or steering linkage

under the main tube. This is something I'd been looking at for many years, but did not think was possible. Thus we have been able to improve the road holding and handling over say the GTR, with a MUCH narrower over all width and track. (The GTR and GTO width is 880 to 900mm, and track is 800mm).

We have also reduced the length over the GLR by increasing the seat angle to 25 degrees, and using a 16" rear wheel.

Thus the overall length comes down from 211 cms of the GLR to 182cms.

We have also been hearing a lot of complaining lately by a couple people who felt that our trikes were not stable under single wheel braking. Of course with centre point steering I have found and demonstrated many times that there is absolutely NO pull on the handle bars due to braking on one wheel, unlike the pull on the handle bars which is produced by steering geometry which has, say more than 10mm of steering offset or scrub radius.

Thus the neat thing about using the thin wheels is they allow a fair amount of \*negative\* scrub radius, thus setting up a handle bar pull in the opposite direction, to which the trike might turn from the overall torque reaction from one front wheel braking. Thus the GTX should have automatic compensation.

Well, the GS factory have managed to finish the prototype in time for my departure in a few hours time for Brighton (UK), and the new specially CNC machined drum brake hubs are being spoked into wheels as I type!

Spec. sheet and photo's now available on request for the GTX.

Ian Sims, Greenspeed [ian@greenspeed.com.au](mailto:ian@greenspeed.com.au)  
<http://www.greenspeed.com.au>



*Continued from Page 1*

most ambitious project - but I've built 10 HPV's now so Lola didn't quite cure me.....

Frame: (Cromoly tube from British International Trading in Seven Hills in Sydney, other tube from any old local steel shop...)

Boom 51mm OD 1.2mm wall steel.

Boom sleeve 54mm OD 1.2mm wall steel.

Down tube 57mm OD 2.4mm wall cromoly.

Front top tube 44mm OD 1.2mm wall cromoly.

Front bottom tube 54mm OD 1.2mm wall cromoly (internally sleeved/reinforced where it joins down tube).

Rear top tube 41mm OD 1.2mm wall cromoly.

Rear bottom tube 51mm OD 1.2mm wall steel.

(Note: all main frame tubes fitted nicely together / overlapped from front to rear 51-54-57-54-51).

Rear "up" tube 44mm 1.2mm wall.

Top and bottom tubes joined with small lengths of scrap thin wall 25mm OD tube.

Rear bottom bracket brazed into 51mm OD tube located between top and bottom tubes.

Rear bottom bracket at 400mm above ground level.

Old touring bike rear triangle (cromoly) with additional cromoly mid chain stay added.

Rear dropouts reinforced with additional steel plate and brazing.

Stem and above seat steering handlebars - 25mm OD from old bike top tubes and 22.2 mm OD cromoly tubes for grips Forks Ballistic 600XL oil damped elastomer and spring suspension forks (with additional harder elastomer for tandem use)

Top seat mounts are 25mm OD tube with square sleeved clamped sections on top for front/rear adjustment Lower seat mounts were 44mm OD tube bent to clamp around frame top tube and can be moved along tube.

Seats were removable and adjustable along the top-tube but fixed at 45 degrees Seats are made mostly from 16mm OD cromoly with three rear stiffeners.

(seats though can be made just as easily from cut and bent old bike seat stays).

Seat bases at approx 500mm above ground level.

Seat material plastic coated mesh "shade cloth" with shockcord lacing at rear.

Weight of complete bike with racks was measured at approx 25kg (with one thin very very quick coat of KILLRUST "Ultra Blue").

**Miscellaneous:**

I did a full scale sketch/drawing to estimate the final layout and tube lengths before I bought the tubing to eliminate wastage.

Tubes were mitred for joins using printed output from Giles Puckett's shareware mitre program. (<http://www.ihpva.org/people/tstrike/tubemiter.exe>) All cutting, mitreing and filing was done by hand. A drill is about the only power tool I use.

I use an oxygen-acetylene rig and standard nickel-bronze brazing rod.

Front boom adjustment is there to tension timing chain and reduce package size to fit whole tandem and seats into just one bike box! Rear top and bottom tubes sleeve inside front top and bottom tubes and this is where the frame comes apart.

Lola's head tube angle was 69 degrees, with fork offset of around 40mm which gives probably too-much low-speed "flop" but my commuter SWB bike at the time had similar geometry so I was used to it and found no real problems with this except at 10kph into a strong headwind with strong gusty sidewinds on the last day of the tour ! (I've since experimented with reverse rake or NEGATIVE offset forks and I think reverse rake forks give SUBSTANTIALLY BETTER handling at low TANDEM climbing speeds!! My now favourite SWB recumbent geometry sees at least 85mm of "trail" with 0 to 20mm of NEGATIVE fork offset)



4 pannier capacity rear rack made from two old bike seat stays and 9.5mm and 6mm cromoly tube. (rear pannier rack had two "levels" - tent sat on lower level and large "dry-bag" on top level) Additional rack of 6mm cromoly bolted to rear of front seat and seat mounts and held standard "rack-top" bag.

Two extra small racks also of 6mm cromoly behind each seat held various odds and sods.

2 litre PET bottle cages made from 6mm cromoly tube bent by hand around a paint tin - these were located under down tube, and three behind and under rear seat. Additionally there were

4 normal bottle cages and we each had a 2 litre water bladder drinking system so we had a total of 15-16 litres total water capacity which gave us the flexibility to camp anytime and anywhere we wanted.

### Parts:

(most parts obtained from Greenspeed via mail-order and Cheeky Monkey Cycles in Pitt St Sydney).

Front Disk brake: Hope Pro-Series Hydraulic 185mm disk (the only tandem rated disk I could get).

Rear Tektro V-brake.

New Deore rear derailleur.

Old Deore front derailleur.

8 speed Shimano bar-end shifters.

8 speed 11-34 cassette.

(lots of) 8 speed Sachs chain.

3 Greenspeed 70mm nylon chain pulleys (only one drive side pulley though).

Shimano STX cartridge bearing headset.

CPI (175mm front / 170mm rear) tandem crankset (from Ian Christie Cycles in Melbourne) with 110pcd 34/48/61 chainrings.

Shimano XT disk hub front and Sachs disk hub rear .

14g stainless spokes laced into 36 hole rims (wheels built by Greenspeed).

New tandem rims are ARAYAs since the original Velocity Taipan machined sidewall rims developed sidewall cracks after less than 1000km. (Greenspeed thankfully replaced the original rims).

Tyres: MAXXIS Ringworms (similar to Hookworms) rated at 110psi (run at ~40-50psi after rims developed cracks).

Cable-joiners are ones made for Moultons (similar ones available from Greenspeed).

Thornproof tubes were carried but not used.

Spare tyre was not used.

Sadly though, as number 9 bike built by me was a SWB bike specially built for Bec, Lola will get less use I think, and so will be offered for sale in December 2001 (after she has a bit of a spruce up and a few additional coats of killrust paint or a powder-coat added). Contact me at my hotmail address if you are interested in purchasing Lola the land yacht.....the price is as they say very negotiable!

Peace and Love and Happy HPV Building

Ian Humphries - [ianrjhumphries@hotmail.com](mailto:ianrjhumphries@hotmail.com)

## Lean Mean and Hungry trike part 2

This is a continuation of the article from the previous edition.

The steering assembly is as shown in the drawing. Note that the track rod is not quite straight (it dips a little in the middle). This is for two reasons, firstly to clear the thighs when pedaling, and also to make the ball joints line up more closely to the bell cranks, as they lean inwards due to kingpin inclination. The steering rods each start under the bell crank, and go backwards to the side sticks. These steering rods are bent to clear the nuts on the track rod ball joints.

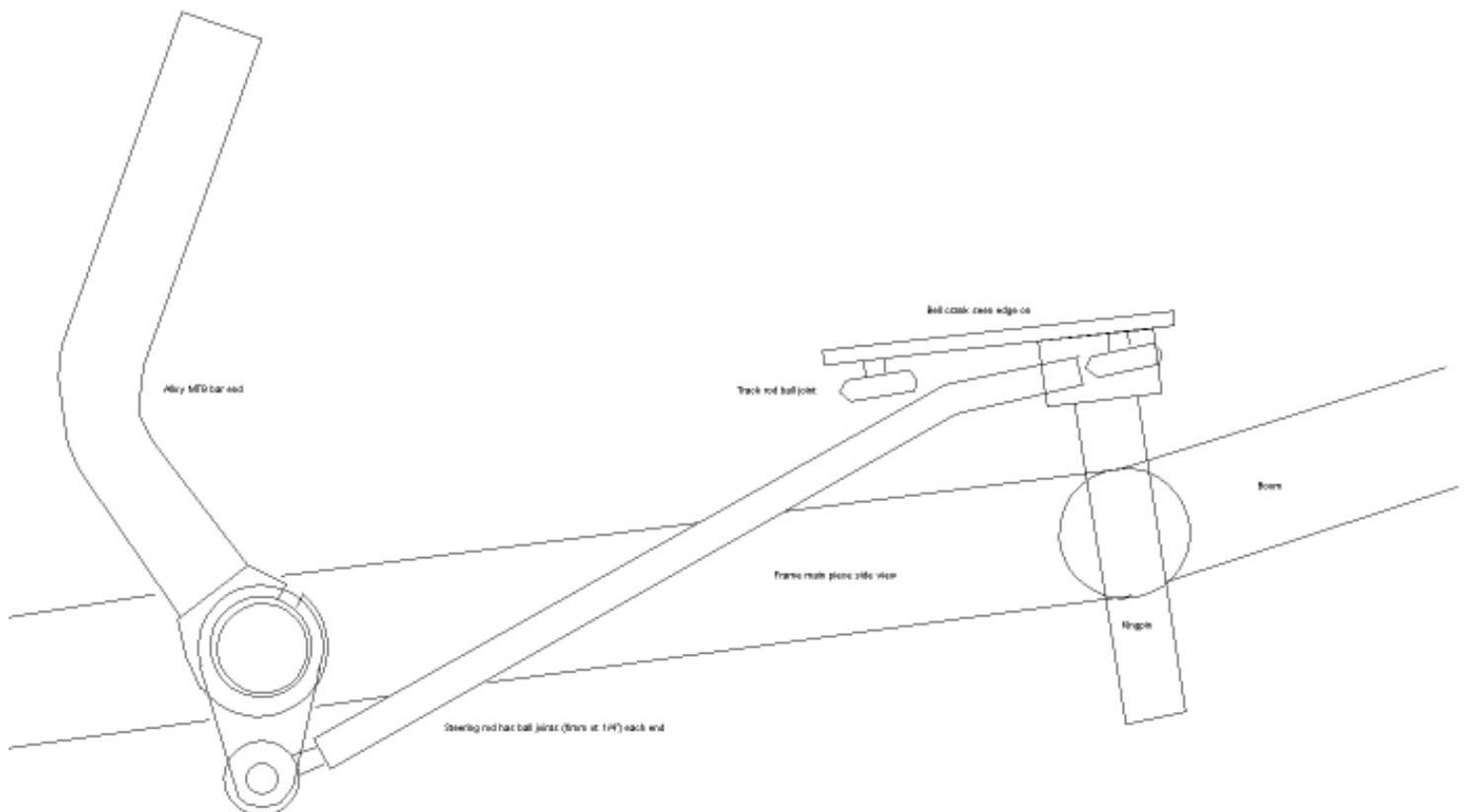
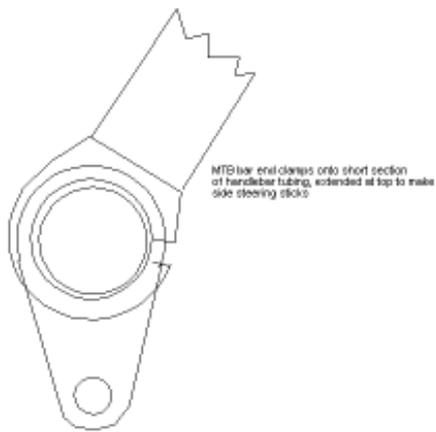
The side sticks are alloy MTB bar ends. They are extended by about 90mm to take a handgrip so the hand is about 200mm from the pivot. They clamp around short bits of 7/8" handlebar tube. These in turn have a bushing inside (the same as the ones for the kingpins, 5/8" ID) and these pivot on little stubs brazed to the frame. Attached to the 7/8" tube is a crank (that points straight down) that takes the ball joint on the end of the steering rod.

The leverage from hand to pushrod is about 5:1. I've never had any problems with steering reaction to the hand, because the steering is pretty close to centre-point.

### Giles Puckett



More drawings on next page .....



# Covering your Butt

What's the most important piece of a recumbent that makes it instantly more comfortable to anybody trying a recumbent for the first time?

## The Seat

Recumbent seats come in about as many different designs as you can think of and there are several different types of materials that can be used to make a seat. Fibreglass is popular in Europe. The Americans like a combination of a padded "fat" bike seat with a mesh back. Aussies like full mesh, probably because of the climates we live in, possibly because of "the Greenspeed influence", but most likely because they are just plain comfortable.

I set out to try and write a full design criteria for recumbent sets but gave up and decided to describe the method and materials I use for recumbent seats.



An alternative seat material - can always use it as a tow rope too

## Frames

Personally, I make my seat frames from 5/8<sup>th</sup> x .035 cro-moly/531 steel tubing. This has worked well for me over the years. Greenspeed and other commercial frame builders use larger diameter (3/4" or 7/8" ?) tubing on their production frames, probably because they don't want any problems later on with **b r e a k a g e s**. Aluminium in 3/4 or 7/8 and a generous wall thickness would be good although there are difficulties in bending and welding for the average home-builder. Personally, I found the 5/8<sup>th</sup> steel material as light as aluminium in larger sizes. Bending the 531 tubing is difficult without the right equipment. The Muffler Shop can probably bend tubing to your

The seat on Matthew Heal's new SWB recumbent.



requirements at a price but wont be able to go down to 5/8<sup>th</sup>. My 5/8<sup>th</sup> hand bender is intended for plumbing duties but handles 531 nicely with some care.

## Frame design

Generally I try to make seat frames fairly simple. Straight back, looped top rail two supports or spreaders. The supports should be evenly spread over the length of the seat. Again, the commercial manufacturers put in more supports for strength. The seat back can reach to just below the top of the shoulders – about 550mm. If you have the time and material, you can put another bend in the rails to form shoulder supports. You can also incorporate a bit of a kink in the lower back to form a lumbar support – personally, I have never felt the need to do this.

Seat back angles and the angle of the lower seat section can vary to suit your overall design of recumbent. I like a back angle of around 45 degrees from horizontal on my swb bikes. The lower seat section is turned up 5 – 10 degrees to keep the rider from sliding forward. Laying the seat back more can improve your aerodynamics and can also effect overall balance, of the bike and leg lengths. It's all a compromise.

## Mesh Material

Once you have the seat frame in place it's a question of what type of material to use for the "sling" seat. I've seen seat belt type webbing used on German bikes, wrapped around and interweaved. A home made bent turned up at a Canberra ride recently with a seat made of water ski rope. "The Tour de Nullarbor" record setting trikes used tensioned Goretex fabric seats. Seats can be made of canvas if you have access to an industrial sewing machine. By far the most popular material, in Australia anyway, is a nylon coated mesh used in outdoor furniture and Greenspeeds. This material can be obtained in a variety of colours and patterns. Greenspeed sell Nylex Breezeway by the metre in the plain colours of green, red, blues and yellow. Some upholsterers and outdoor furniture makers carry it in patterns, checks and pastels if that turns you on.

## Attachment

The most common way of attaching the mesh to the frame is to sew seams down both sides of the mesh seat, punch in brass eyelets, wrap the mesh around the frame and lace it all up with metres of bungy cord. This works well for some people, however I have found that it can add unnecessary weight and create pressure points where the cord crosses over. I picked up on ideas from a number of manufacturers such as Lightning



Typical mesh and bungy arrangement on Duncan's KOTZUR Tandem.

and Peter Holloway. My mesh seats are cut and seamed to be slightly narrower than the inside measurement of the frame. I get my trusty outdoor furniture man to weld the seams with hi-frequency welding machine which virtually fuses the two layers of material together. Holes are punched through the material at intervals down the seam about 20mm

apart. A cheap brake cable is inserted the full length down the seam. Nylon zip ties are used to attach the mesh to the frame by passing individual ties through the holes in the mesh. You can also use nylon cord, or bungy cord if you want a bit of "give". The zip ties work well and give a nice uniform effect. Easy to replace damaged ones if you stack too. The end result is a nice taught seat back that gives plenty of support and is compliant enough to adapt to your body shape. There are no pressure points.

Peter Heal - [Peter\\_Heal@amp.com.au](mailto:Peter_Heal@amp.com.au)

## Bits and Pieces

### Bike Display in Wagga

I had a phone call from Wagga Cycle Club: they are organising a display/information day for all types of bikes on the 23rd September and requested would anyone with a recumbent like to display it as there is apparently quite a bit of interest. Contact Jillian Hellier ( 02) 69211651

Michael Rogan

### New Logo Web site

Finally LoGo Trikes has a website. Nothing flash, just compact, easy to navigate and quick to load.

Martin Arnold - [llesscar@dingoblue.net.au](mailto:llesscar@dingoblue.net.au)  
<http://LogoTrikes.netfirms.com>

### Brecht goes the Pyrenees!!!!

This is not intended as any kind of self promotion but I'm just bursting with pride coz one of my babies just crossed the Pyrenees!!

Brecht from Belgium just sent me a very brief email me to say that he has made the crossing. This came as a shock as the last

time I spoke to him he said he was going to do the East Coast of OZ!

You know...ya put ya hart 'n' sole into every machine so it nice to see them reach their potential.....Hhhaaaa. I have an emotional attachment to this particular trike (affectionately known as Cog) and didn't really want to part with it when Brecht came along (hence the soap story). The next time someone asks me 'how they go up hills' I'll have a strange sense of confidence!

Ben from Tri-Sled out... [trisled@start.com.au](mailto:trisled@start.com.au)

### Retro Grouches - Sturmey Lives!

The local bike shop in Canberra who actually sells recumbents asked me to pass on that they have discovered a whole cupboard of Sturmey Archer parts including hub bodies, pawls, pawl springs, planetary cogs, drive cogs and many more bits all at 1974 price.

I reckon they would take an unreasonable offer for the whole as a job lot. Contact Ben at Canberra Cycles on 02 62804984. [ben@canberracycles.com.au](mailto:ben@canberracycles.com.au)

Tell him Pete sent you.

### Earth Cycles

I can confirm that Earth Cycles, maker of the Dragonflyer trike in America are out of business (or going out). I'm currently working with Sean to get my Dragonflyer I ordered 6 Feb 2001, with delivery to be mid-May 2001. Still waiting, but the current plan is for delivery around Labor Day (early September).

Dave Polaschek [davep@davespicks.com](mailto:davep@davespicks.com)

### Encyclopedia lives on

Ed: In the last HUFF I mentioned that Encyclopedia was no more - well I've subsequently found this now isn't the case. Here's more...

I am continuing with Encyclopedia under a new company called Velomedia. We have improved the website and I think the book will also be better than before. The new edition is the 2002 edition and you can order that from Greenspeed.

Alan Davidson  
 Velomedia Ltd  
[www.encyclopedia.com](http://www.encyclopedia.com)

### HPV DVD : Request for Opinion & Contribution

Now that the fourth HPV CDROM (2001) project is over for over half a year, I began to muse again. Admittedly, I said never doing another HPV CDROM again after finishing the 1999 one. Then, still having lots of good material that didn't find its way on the the 99 CD due to lack of space, I decided to do a "millenium edition" after all.

This month I was approached by a "young lad", having not yet experienced the burden of compiling and creating such a CD about a follow up project, offering his help.

It didn't take that much convincing to get the thinking process started on my side.

Well, now I am reaching out, to the depth of the HPV virtuality asking for comments, and in the end contribution of material, about/for a HPV DVD. CD-ROMs, with internet bandwidth eversteadily increasing, are a thing of the past.

The time frame for release would be a vaguely 2 years from now. Distribution most likely being done via the HPV chapters around this world. And it being a DVD (no discussion needed about technology, please), video should be a big part of it.

Now, in order to bring such a disc to life, contributions are needed, videos, photos, sketches, you name it. I would act as "clearing house", and also edit if necessary video, and put things together in general.

The questions I have, are mainly the following:

- Is there enough interest in such a product after all (those who can access DVD, also most likely have access to moderately fast internet connections)?
- Are there enough contributors?
- Is the material from hobbyists "worthy"? (video that is)

What do you think? Is it worth to spend too many hours in my spare time in front of a PC to get the job done?

"Temporarily relocated to Texas, moving to Washington soon, to return to Germany next May".

Oliver Zechlin [oliver.zechlin@gmx.de](mailto:oliver.zechlin@gmx.de)  
<http://www.liegrad.com>

**Ian Humphries - World Champion**

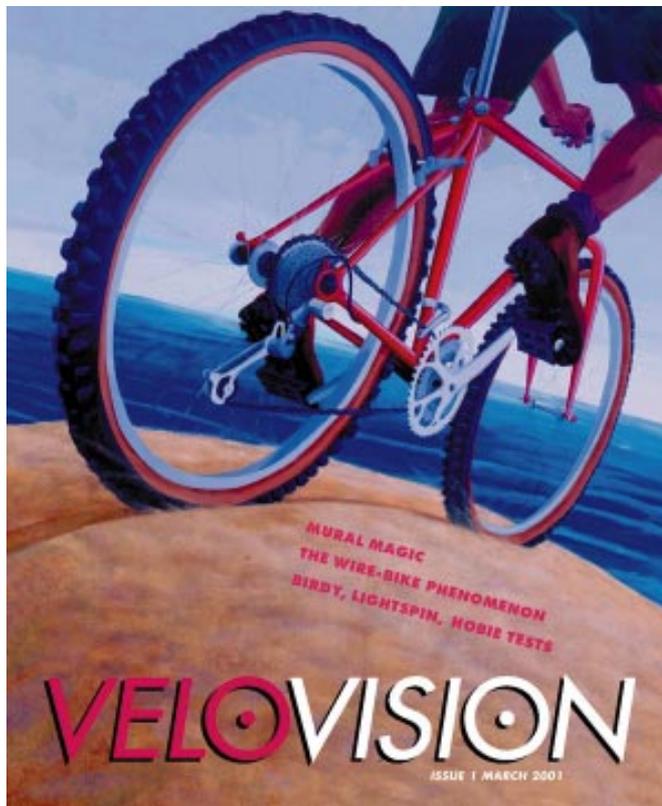
For those that haven't kept up. Ian Humphries is now 2001 World Champion in the Multi track unfaired class. Good one Ian. Results and piccys at these sites.

Peter Heal

<http://homepages.tesco.net/~BHPC/whpvc2001/Worlds01.html>  
<http://www.crosswinds.net/~legslarry/whpvc2001/WorldsPics.html>

# VELOVISION

I've had the opportunity to have a look at the second edition of a new quarterly cycling magazine from the UK called Velovision. The editor, Peter Eland was Technical Editor for Open Road and their excellent publications and this shows in the new mag. It's not specifically recumbent orientated but caters for all those passionate about cycling but whose interest is in the practical applications of cycling, bikes as a transport solution, and cycling as a bridge between like-minded people across the world. It builds on the editor's work on the late lamented Bike Culture Quarterly and shows a similarity to Bicycle magazine.



Peter says "It will contain authoritative technical material, intriguing stories of cycling people and communities from across the world, cycling art, history and literature, and of course the latest from the world of specialised cycle design: workbikes, recumbents, folders, family cycling and more.

Velo Vision will take limited advertising. Display adverts only, at least at first, and concentrated in a section at the back of the mag. In this way I hope to preserve the 'ads-free' feel of most of the magazine, while providing a platform for specialist suppliers, whose adverts will, I hope, be a positive benefit to readers."

Copies are available for \$15 from Greenspeed, 69 Mountain Gate Drive, Ferntree Gully, VIC 3156, Phone 03 9758 5541

<http://www.greenspeed.com.au>

For daily news updates check out the web site at <http://www.velovision.co.uk>



# World Human Powered Speed Challenge

Preparations for the World Human Powered Speed Challenge are heating up. The new name has been approved and the competitors are racing to get ready for the most exciting Human Powered Vehicle event ever conceived. The event will take place from October 1st to 6th on the State Highway 305 course near Battle Mountain, Nevada.

This year the Blue Yonder Challenge Team, featuring Sydney Olympic Gold Medalist Jason Queally is coming from the UK to take on last year's champion and World Record holder Sam Whittingham and aerodynamicist/athlete Matt Weaver.

The World Human Powered Speed Challenge is not only an opportunity to set a world record for speed, it also represents the World's Fastest Human propelled by his own power in the most efficient vehicles ever designed. The marriage of maximum athletic power and high level aerodynamic and engineering result in shockingly fast speeds.

The International Human Powered Vehicle Association has approved Sam Whittingham's 72.75 mph (116.50kph) record set on the same course last October racing George Georgiev's Varna Mephisto.

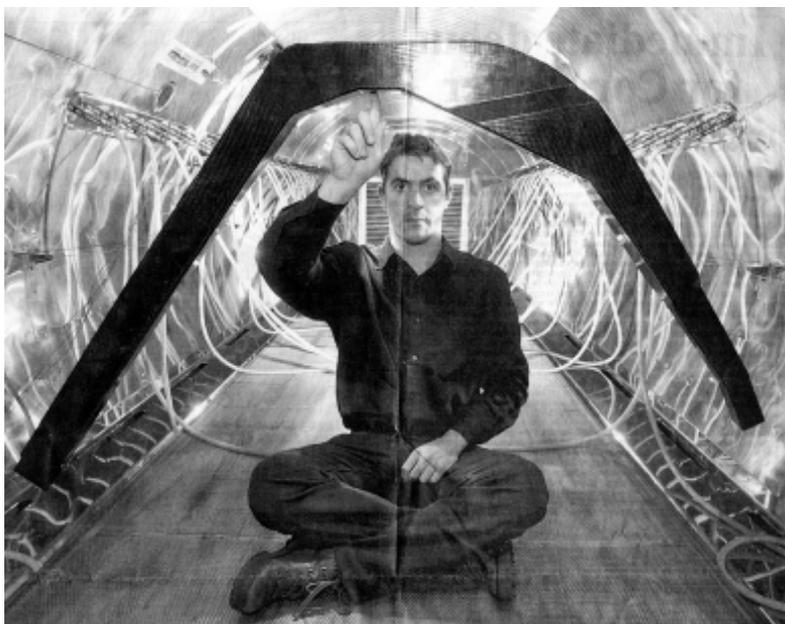
This year Canadian Sculptor George Georgiev is preparing a new bike that will go even faster and Sam Whittingham has dramatically increased the intensity of his preparation. Californian engineer Matt Weaver is looking to build a new bike based on his extensively natural laminar flow aerodynamic theories that he feels will ultimately result in a quantum leap in speeds. Last year Matt clocked 2nd fastest time in history by clocking a speed of 68.32 mph (109.92kph) in his video camera navigated Kyle-Edge vehicle.

On the other side of the Atlantic Ocean, The Blue Yonder Challenge designer Chris Field of racing bike company Dunlap Hotta is working with the renowned racing car chassis builder Reynard to build an incredible new bike with a aerodynamic shape designed using computational fluid dynamics to slice

through the atmosphere at world record speed. Their racer, Jason Queally, is a national hero after winning the Gold Medal in the Sydney Olympics and he is narrowing his focus on this record attempt.

The Blue Yonder Challenge will be the focus of a BBC documentary complete with Formula 1 announcer commentary and Helicopter camera coverage. It is expected that this year's World Human Powered Speed Challenge will ignite an even greater interest in the record by new teams of top cyclists and builders seeking this prestigious World's Fastest Human title.

The course will be improved this year by moving the timing traps 1/4 mile from their current location. This move will optimize the course and make it easier to manage the road blocks. It is expected that this change could improve speeds up to 1/2 mile per hour.



Jason Queally with the carbon fibre chassis of the 'Blue Yonder'

You can learn more about the event, competitors and their machines by checking out the websites following. There will also be a webpage dedicated to the event on the [www.Wisil.recumbents.com](http://www.Wisil.recumbents.com) website in the near future.

Sean Costin - Race Organizer  
[seancostin@aol.com](mailto:seancostin@aol.com)

For last year's Results:

<http://www.wisil.recumbents.com/wisil/speedruns2000/worlds-fastest-bicycle-2000.htm>

<http://www.ihpva.org>

For Blue Yonder Challenge:

<http://www.dunlop-hotta.co.uk/>

<http://www.thetimes.co.uk/section/0,,99,00.html>  
<ftp://ftp.ihpva.org/incoming/Queally.jpg>

For Matt Weaver:

<http://www.speed101.com/>

For the Varna Team

<http://www.varnahandcycles.com/>

Info on the 2001 North American Championship being held on 31 August and 1 September, in Quebec Canada:

[http://www.geocities.com/torowa\\_ca/north\\_am.htm](http://www.geocities.com/torowa_ca/north_am.htm)

# Coming Events

## Melbourne Recumbent Riders

<http://home.vicnet.net.au/~vichpv/>

Sunday 9th September: Return journey 40km. A very easy ride from Somerville to Stony Point and back on a bitumen bicycle track. Ideal for all bicycle and tricycle types. We leave Somerville railway station (Melway 148F1) at 11.30 sharp. Trains from Frankston depart at 9.00 & 11.05 and arrive at Somerville at 9.15 & 11.20. The fare is a suburban one. We pass Tyabb, and follow Hastings Western Port Marina (Melway 154K12) and onto the famous Bittern Coastal Wetlands Boardwalk which will be an exiting and adventurous experience. We end up at Stony Point Caravan Park Picnic area for lunch and visit HMAS Cerberus, time permitting. We return via the same route to Somerville Railway station car park. Trains to Frankston depart at 4.29pm and 6.29pm. Phone to confirm. Robert. -92481268 work - 95781539 home. Mobile Jana - 0415867011 [robert.waryszak@vu.edu.au](mailto:robert.waryszak@vu.edu.au)

October 6th or 7th: Robert Waryszak is organising these rides  
Phone: 03 92481268 e-mail: [robert.waryszak@vu.edu.au](mailto:robert.waryszak@vu.edu.au)

Sunday 11th November: Corflute clinic & trial of Ozhpv timing gear at Hawthorn Bike track. I will bring along some corflute (corrugated plastic) sheets and do my best to explain how to attach it to your HPV to make it go faster. Contact: Steve Nurse, Mobile 0409 836271 [cesnur@eisa.net.au](mailto:cesnur@eisa.net.au)

## The Australian International 24 hr Pedal Prix

<http://www.nexus.edu.au/TeachStud/aipp/>

Scrutineering: Friday 21st September, Judging 22nd September  
24 hour Endurance race: Saturday 22nd - Sunday 23rd  
Held at Sturt Reserve, MURRAY BRIDGE, S.A

Sunday 21st October: **6 hour Sprint race** held at Sturt Reserve, MURRAY BRIDGE, S.A.

<http://www.nexus.edu.au/TeachStud/aipp/SPRINT/welcome.htm>

Sunday November 4th: **3 Hour Pedal Prix** at Festival of Cycling, Bonython Park, Adelaide.

## Sydney Recumbent Riders

<http://sunsite.anu.edu.au/community/ozhpv/srriders.htm>

Sunday October 21st: Parramatta Park, meet at 10am on at the western end of Parramatta Park near the children's playground for social gathering, talk and try session and possible ride. Ian will be back by then, but contact me for any details... There will be a group riding from the inner west via a fantastic route every Sydney cyclist should know ;-).

Contact: Tony\_Jack 02 9845 6857 (w) 02 9518 8252 (h)  
[Tony\\_Jack@wsahs.nsw.gov.au](mailto:Tony_Jack@wsahs.nsw.gov.au)

## Murdoch University eV Challenge

<http://eng-sun3.murdoch.edu.au/~pcalais/Event.html>

27th October: This is a competition for teams to design and build a cheap but effective electric vehicle and then compete with it against other teams. Competitors will be tasked with driving around a closed circuit, relying solely upon a specified amount of battery storage. The winning team will be the one that travels the greatest distance in 60 minutes. Aimed mainly at schools, there will also be an open category available to TAFE college, university, business and private teams. For schools that can't build their own electric vehicle, there will also be a design competition where the winning team will win the chance to compete using the STAWA STEALTH II. The event will be held at Murdoch University- the spirit of the event will be to build an inexpensive but safe and effective machine in an environment of open-ended learning and team work.

## RACV Maryborough Energy Breakthrough

<http://avoca.vicnet.net.au/~energybr/>

Friday 16th - Sunday 18th November

## WA HPV

<http://users.wantree.com.au/~ocean/cycling/wahpv/index.html>

The meeting place for Fremantle recumbent riders is every second Sunday at 9:00 AM at Gino's Cafe on South Terrace, Fremantle (it's on the cafe strip).

Contacts: Geoff Law [geofflaw@bigpond.com](mailto:geofflaw@bigpond.com) or Gary King [ocean@wantree.com.au](mailto:ocean@wantree.com.au)

If this Newsletter cannot be delivered please return to:

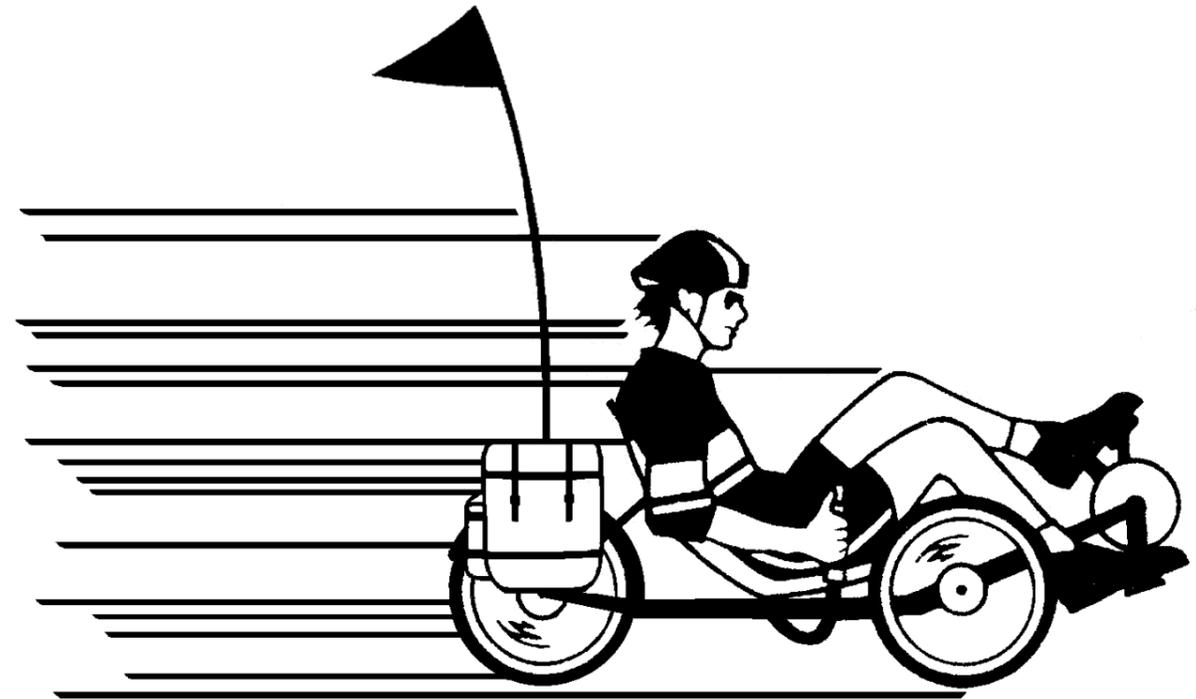
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*Info/entry forms @ <http://sunsite.anu.edu.au/community/ozhpv/>*

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