

## From the editor

Well this is again the last edition of HUFF for the year, a much busier year for me than for a long while. When I started the editing of HUFF in 1999 to be honest I didn't think there would be a steady flow of material capable of sustaining 6 editions a year nor that 36 editions later I would still be doing the job. Of course there have been lean times but also at times so much material, HUFF had to be extended by several pages.

As I say at this time every year it's been a good innings so if anyone wants to take over the reigns and try out the editing job feel free to put yourself up for nomination at the AGM to be held shortly.

I believe the information sharing, this role performs goes a long way to bring cohesion to OzHPV as we are spread over such a big area and often have little contact with each other so consistency of a regular newsletter is most important.

Timothy Smith - [tas@ozhpv.org.au](mailto:tas@ozhpv.org.au)

## What's new

\* Battle Mountain 2005 World speedbike championships

<http://www.wisil.recumbents.com/wisil/whpsc2005/results.htm>

\* New Vic HPV Community Web site

<http://mc2.vicnet.net.au/home/vichpv/web/index.html>

\* IHPVA recognised HPV velodrome record. - <http://www.ihpva.org/>

\* HPB1 - <http://www.recumbents.com/wisil/hpb/boat2005.htm>

\* HPB2 <http://users.cyberone.com.au/heal/hpb/HPB.htm>

## Ecospeed + Greenspeed = no car need

Some people think that putting an extra power source on a HPV is tantamount to raising the National flag upside down or worse still not putting a bet on the Melbourne Cup. It's just not Australian.

In this article I hope to argue that not only can motorising your HPV loose you a lot of staunch recumbent riding friends but it can also increase the use of your pride and joy as well as giving you more opportunity for the exercise your doctor and dog so badly want you to do. How does this come about? Read on.

Living here in Tasmania one can have a wonderful lifestyle but we don't have the choices available for the 'exercise' that one can find in the city. I tried a variety of activities, but all have failed in some way or another. Partly because of time restraints and partly because I seem to get bored when staring at the wall and jogging on the spot.

As with many of us, time is a precious commodity, working, as a teacher doesn't leave a great deal left. So I looked at my day and found that I spend 1 hour (in total) in the car going to and from work. I thought this time could be taken up with exercise. So this set me on the course of finding the right solution to the problem.

## Design Challenge

To create a commuting vehicle which will not only get me to work on time but will also give me aerobic exercise when I so wish. I wanted the choice to ride hard or take the slow road home and smell the roses, so to speak.



## Limitations:

- \* I had to utilise an existing GTR Greenspeed trike (that I only used on occasional weekends)
- \* It had to be electrically powered (here in Tassie Hydro Power rules). The thought that the project would be powered by falling water appealed to my soul.
- \* It had to get me to work in about 1 hour with 20kms on the one charge.
- \* It had to be well made, reliable and simple to install
- 8 The motor should be on the vehicle and not on a trailer (to make the vehicle manageable)

I looked at many options such as:

Doing it myself <http://www.geocities.com/SouthBeach/Tidepool/2544/bike1.html>

Single speed kits like:

<http://www.currietechnology.com.au/currietechnologymenu.htm> and  
<http://burro-zvobikes.com/newkits.html>

Hub motors:

[http://www.dlmenergy.com/index.php?main\\_page=index](http://www.dlmenergy.com/index.php?main_page=index)  
 or a powered trailer:

<http://www.thunderstruck-ev.com/motobob.htm>

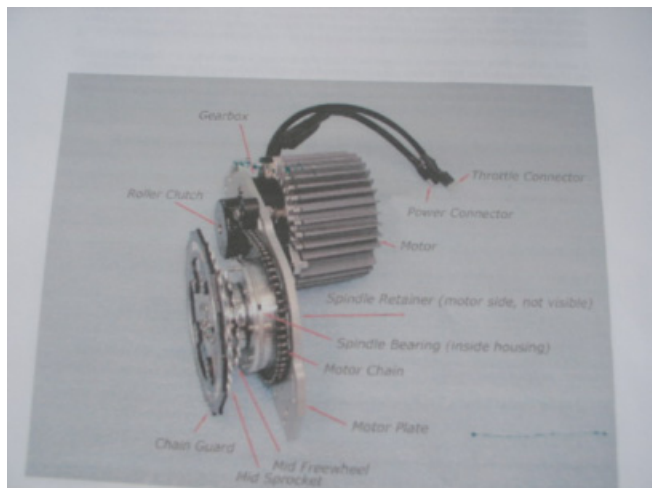
This was a complex issue if I wanted to get it right first time. I thought about all the different problems and alternatives. None of them used the advantage of the long chain route in which to place the drive unit. All the units were made for diamond frame bicycles. Then more searching I came across a small site in the USA. Could this be the answer?

<http://www.ecospeed.net/index.html>

Here I believed I had found the electric conversion for the Greenspeed Trike.

Brent Bolton runs a small company (Ecospeed), which manufactures the only mid-drive unit for recumbents I know of. The information on the site includes:

The key feature of our Electric Mid-Drive is that it mounts between a recumbents bottom bracket and rear cassette — a configuration that's almost impossible on a conventional bike

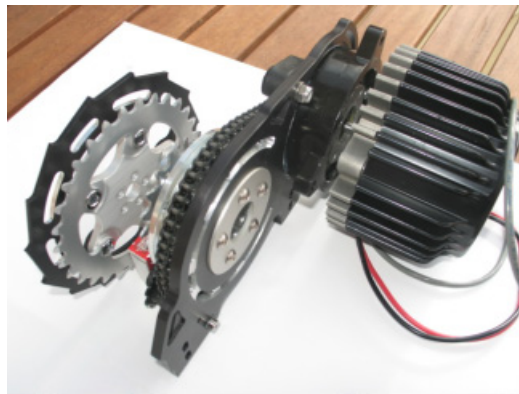


with its cramped cassette/wheel/bottom bracket relationship. This allows the motor to “see” most or all of the bike’s gear range. What that means is that performance is radically increased

His leap in design, as far as I can see, is to use the existing US ProDrive Unit, (that can be found on many diamond frame electric assist bicycles around the world) and improve on it, by adding an extra ratchet and sprocket on an already proven drive unit. With this configuration the unit becomes a small tight, narrow and powerful drive system perfect for recumbents with long straight drive chains.

Here I had found the type of gearing, midrive position and quality I was looking for. That in itself took a long time. Then after I ordered the unit many months went by as supply for different parts of the unit ran out or were not available for some manufacturing reason.

Two years went by before I finally received the unit. But before I could pick up the unit from customs I had to go through another list of requirements also fraught with problems, and more costs.



After all the problems I thought fitting the unit to the trike was going to be easy and I would be up and running in no time. The fitting was easy, unforeseen problems were not.

After making a custom bracket to attach the back of the unit to the trike frame. I was ready to test run the vehicle on the bench. To my horror the gearbox (the prodrive planetary gearbox) sounded to metallic for my liking so I took a video clip of the motor running on the bench.

I thought I would take the trike around the block to see if it would improve. IT DID NOT. I lost drive. After limping home I striped the gearbox down to find it had self-destructed and also rounding of the output shaft of the expensive motor. I could not believe my luck. In disbelief I fitted an old prodrive planetary gearbox and smaller motor to the new Ecospeed unit. WHALLA! Worked like a dream.

To his credit Brent Bolton from Ecospeed helped with the damaged motor and replaced the broken gearbox. I had one in the mail within a week.

## Evaluation of the Project:

I believe it is still too early to give a good evaluation but after the first few problems most things are going fine. The addition of the motor has changed my life in many ways and as for the people who say “that’s cheating” my reply to them is ‘NO, THE THING YOU DRIVE TO WORK IS CHEATING’



## Good points:

- \* The unit does everything and more. At a slow or fast pace, you can gear yourself and the motor to optimum RPM.
- \* The noise the unit makes is not loud and the straight cut gears tend to sing and as you change gears the note changes, a not unpleasant sound. Like a quiet version of an old fashioned supercharger.
- \* Having the mid drive unit has changed the whole concept of the trike. It is a vehicle that you can ride hard to work, charge up during the day (you and the battery), go shopping around town after work and ride the 20kms home afterwards.
- \* The vehicle gives me the freedom to choose between cycle paths, main roads, back streets and footpaths. The combinations are endless. This is something I really enjoy but didn't anticipate.
- \* Living here in Tasmania the scenery going to work (on the back roads) in the morning can be nothing more than stunning. It puts your soul in a totally different space than if you were driving to work in the car. It makes one want to get back on the trike.
- \* Parking is a dream. I park outside every shop I want to go to. No meters to worry about.
- \* I feel stronger, more positive, sleep better,
- \* I save \$10.00 per day on petrol
- \* I travel the 20km distance in 45 minutes and as I feel myself get stronger, that time should reduce a little.
- \* O yes, and one can feel so-so, green!

## Bad Points:

- \* The time it took to get to this point was amazing (in the negative)
- \* The cost. I don't even want to think about. With the trike and the whole gearbox package from the USA, damage to an expensive electric motor, import duties, conversion rates, handling fees etc', etc, etc, you could buy a cheap car. But what car (other than an Aston Martin DB6) can give you the same amount of pleasure, pain and exercise.
- \* To keep in the right RPM I use all the 63 gears on the Greenspeed and only today I found myself in the wrong gear half way up a very short steep hill (we are in Tassie!) and had to push it up the remainder. One must concentrate.
- \* If you use your own bicycle or trike you have to do the entire

USProDrive as it's meant to be on a upright



The chain has a tensioner for the front run as well as the back.  
Motor sits neatly under the seat of the touring Greenspeed trike.

fitting and working out the mounting problems yourself. Although Ecospeed manufactured the 2 major mounting brackets for the unit. This simplified the fitting a great deal.

\* I would like to see the ECOSPEED manufactured and sold here in Australia.

\* Because these units are not common you will need to have your own supply of spar parts.

\* Finding a parking spot at work with a power point can be a problem.



At this early stage I would call the project a great success. There are a few changes I will need to make. A new drive pulley I positioned is in the wrong place (by about 10mm). I will need to make a box to hold all the electrical gear (to keep them out of the rain). I would like to add a clear

windshield to prolong my riding into winter and make the early morning starts in spring a little more pleasant.

The sense of contrast I feel as I turn off from the very busy main road and into the beautiful local farms and footpaths is an amazing experience. The sounds sights and smells are so different to the hectic pace we all travel at. It just sets me up with a wonderful sense of self and a calm feeling for the day.

Finally, a friend noticed when he road the new beast that the recumbent smile gets even bigger when you ride a motorised recumbent.

John Doubleday - [john@southcom.com.au](mailto:john@southcom.com.au)

# Glenn Druery on RAAM 2005

Australia's Glenn Druery rode the Race Across America (RAAM) as part of TEAM JDRF VeloKraft in June this year. In September I spoke to Glenn about his experience, now that some time has passed for reflection.

RAAM has been described by many as the toughest race in the world – in any fiend of endeavour. In 1993 “Outside” magazine used criteria such as the “Mule Factor” – the distances involved; the “Forum” – how tough the course is; the “Anguish Index” – how hard the competitors “have to work to convince themselves that what they’re doing is only mildly inane and self-destructive;” and the “O Factor” – a combination of the cost to do the event and the drop out rate, to assess various epic races, and RAAM came out as the toughest!

Glenn’s overall impression of RAAM is that it is one of those experiences where you learn a great deal about yourself. You don’t just participate in RAAM, you live RAAM. You realise what motivates you, and what you can do, both physically and emotionally. Glenn said “It makes Paris-Brest-Paris” (the 1200km in 90 hours premier Audax ride held every 4 years in France) “look like a walk”. During the event he describes his state as “a sleep-deprivation induced RAAM blur”. There is nothing else in life – there is no escape. RAAM would make the ultimate reality TV show.

Glenn said the first 6 hours of the race were exhilarating, with hyped-up participants excitedly yelling and shouting. Glenn actually led RAAM for the first half hour or so, before being overtaken by some elite time trialists.

For Glenn, the race typically consisted of a series of 45 minute pulls at time-trial pace, in hot, humid conditions, with heart rate



Glenn at start

surging along at 180. Glenn got around 2-3 hours sleep per day – not in one hit, but 10 minutes here, ½ an hour there. He managed to wash himself just three times over the 6 ½ days of the event. First, in the desert using a solar shower, second in a family’s home along the route, and lastly in a creek. The plan

was to alternate through 4 jerseys, ensuring clean clothes, but the humidity meant that the jerseys never dried... His appearance during the event was akin to a WW1 flying ace – filthy with dirt, with cleaner sweat-streaked patches where his sunglasses had protected him from the worst of it.



Glenn in transit

Glenn described the logistics and crewing arrangements as being somewhat less than ideal – there were three beds for 11 people, and the crew became stressed and irritable, making mistakes and getting lost at one stage. Abuse and tears were not uncommon within the various RAAM crews. The strain on the crews cannot be underestimated. During the previous RAAM one solo rider had to pull out because his crew abandoned him – the strain had become too much! RAAM places a great deal of strain on the crew as well as the riders.

At times morale waned. Glenn reported that one rider decided to stop halfway across a bridge, on which cars were not permitted to stop. This rider had reached his limit and just didn’t want to go any further. With the aid of a Police car, his



Not moving

support crew eventually made it’s way onto the bridge and convinced him to continue. Glenn considered letting his tyres down just to get some rest, and endured a time when he seriously considered crashing, perceiving that this was the only honourable way out. RAAM “screws with your head”. Glenn



said he felt tired down to his toenails. It was the hottest RAAM on record. Some days would reach 45 degrees, one night didn't get below 33 degrees.

Simple things would boost morale – a beautiful sunrise, the occasional motivational word, talking with the solo riders - (Hello (20 second pause). Hi (20 second pause). How are you doing? (20 second pause). OK. (20 second pause).)

Glenn's team, Team JDRF VeloKraft, finished in 6 days 15:46, 7<sup>th</sup> place. A time penalty of 15 minutes cost them 6<sup>th</sup> place – amazing after 6 days of racing. After the finish Glenn slept for 14 hours, waking in the same position he went to sleep in. He rode about 40km on a road bike and felt pretty good. He attributes this to the thousands of k's clocked up during training for the event. He feels happy with what he did and said he could look back and say he did the right thing by the team.

Glenn's recumbent, a VeloKraft NoCom, attracted a deal of interest during the race. There was no animosity shown towards the recumbent riders by other competitors during the



Team VeloKraft finishes

race. Glenn believes his team had the fastest bikes, and that the potential of recumbents in RAAM has not been fully exploited as yet.

Glenn fuelled himself with a variety of mostly natural foods – grapes, yoghurt, nuts, berries, fruit juice, bread, protein drinks, plenty of milk, and masses of water. Amazingly he only lost around 3 to 4 kg during the race. Glenn is not a big fan of the high-priced energy gels, and was amazed at the “crap” that some other competitors ate.

Glenn plans to compete in the next RAAM as a solo competitor. He describes himself as not so much of a team player, so the solo environment should suit him better. Doing RAAM solo is a whole new challenge however, and Glenn will need to prepare well and pull together a good support team. With his level of determination I'm sure he will be there at the starting line for the next RAAM, as a solo competitor.

Andrew Stewart - [webmaster@ozhpn.org.au](mailto:webmaster@ozhpn.org.au)

# Canberra OzHPV Rally

2,3 & 4 December 2005

The Canberra OzHPV Mob are once again organising the annual OzHPV rally in Canberra. This year it's a bit later in the year to coincide with a big \$\$ Canberra cycling event - The Brindabella Challenge.

Where it suits us, we will coordinate the HPV activities with the BC events, but we will also be organising our own recumbent specific activities. It looks like our loose association with the Brindabella Challenge event will pay off in terms of promoting OzHPV. Take a look at the new website <http://www.brindabellachallenge.com.au/> and check out the sleek HPV athletes in the photo.

The entry form and program can be downloaded from the OzHPV website <http://www.ozhpn.org.au/events/2005/rally2005.htm>. It includes many activities on all three days (Friday - Sunday) so there will be something for everybody. Activities include: Come and Try's, Trike demonstration racing, Social rides, recumbent racing, food, bakeries, sightseeing, HPV videos, technical demonstrations, talks, etc.

The 2005 OzHPV Annual General Meeting will be held on the Saturday evening in conjunction with the dinner so here's your chance for a great HPV weekend and to have your say in OzHPV's future directions (no seriously, come any way).

The Mob are hoping for another good turn out this year, so start planning some leave and accommodation now.

Pete Heal - [heal@cyberone.com.au](mailto:heal@cyberone.com.au)

## OzHPV Logo result

39 members voted in the Logo vote

The voting was as follows:

HPV1	2 votes
HPV2	30 votes
HPV3	7 votes



Therefore HPV2 received the most votes

Atholl Reid - [secretary@ozhpn.org.au](mailto:secretary@ozhpn.org.au)

# OzHPV Broadford Challenge April 2006

Below is some information resulting from a Challenge Committee Meeting Wednesday 19 Oct 2005 at 1 Court St Yarraville

## Date of the Challenge:

The Challenge events will held on Saturday 1/4/06. Events will be Hill Climb, Roll Down, Time Trial, Off Road, 10-lap Road Race, Slalom, Shopping Race. There will be a Karaoke night, and a Sunday morning breakfast concourse. We didn't discuss it but I'm expecting we will have a social ride and barbecue lunch on Sunday.

There is a proposal for a 'compactness/foldability' event – this would be part of the concourse.

## Prize money

We want to attract more entrants. Therefore we propose to offer \$1000 prize money for the open Challenge. This would be split as follows:

For Men: First prize = \$250, 2<sup>nd</sup> prize = \$150, 3<sup>rd</sup> prize = \$100  
For Women First prize = \$250

If 4-6 women compete, 2<sup>nd</sup> prize = \$150

If 7+ women compete, 3<sup>rd</sup> prize = \$100

If 2<sup>nd</sup> or 3<sup>rd</sup> women's prize money isn't awarded, it will be dispersed to the men as \$50 prizes up to 8<sup>th</sup> place overall.

Trophies would be awarded for Juniors and Veterans, but no prize money.

## Promotion

The main form of promotion will be event application forms to be distributed in bike shops and at the Wonthaggi Pedal prix (to be held Feb 24-26). Specifically, we want to personally hand entry forms to Pedal prix competitors. We will encourage OzHPV members to hand forms to anyone they think would like to compete. We will also promote the event via Bicycle Victoria, what's on websites etc.

## Sponsorship

We have received offers of sponsorship from Trisled, Flying Furniture, MR Components, Typing 2000, and Reflex Fairings. Damian Harkin will continue to recruit sponsors. We need to finalise sponsors before creating the entry forms.

## Design of entry forms

Tim Marquardt will help create the entry form as an A3 foldout. One leaf is the 'cover' with the entry form on the back. The other leaf of the foldout is the race program and race rules and

on the back, sponsors logos with contact details. We will ask sponsors for artwork for this page.

## Rules

The spirit of the Challenge is to find the ideal all-round HPV to tackle a range of duties. Since we are offering prize money, the rules must be clear so Damian Harkin will edit the rules for inclusion in the entry form.

**No Changes:** The vehicle must be the same vehicle in all races. The same wheels and tyres are to be used in all events. Fairings are allowed but must be used in all events. Trailers and panniers may be used in the shopping race, but trailer users must tow or carry the trailer in all events.

**No projections:** No sharp projections on the extremities of vehicles. Exposed chainrings on recumbent bikes must be guarded, eg by a solidly mounted disk or cover. (Upright bikes don't need chainguards).

**Drop one race:** In computing the Challenge totals, the worst result of each competitor will be 'dropped'. This allows for bad luck or machine problems and it assists very specialised machines which may do poorly in certain events.

**Supported Start:** Competitors may be supported at the start.

**Drafting:** Drafting is allowed.

## Entry fees

We proposed to keep the existing \$30 entry fee plus a camping fee. There will be a late fee for entries received after 25 March.

## Video backup:

Tim suggested we video the road race as a backup incase of lap scoring problems.

For more information contact Steve Nurse - [cesnur@iimetro.com.au](mailto:cesnur@iimetro.com.au)

# Caption Competition



Tandem Overload

Have you got any funny pictures you would like to send in?

# Pondering the Future

The future of OzHPV is indeed interesting. When I bought my recumbent 11 years ago, the shop where I bought it (M5 in Middelburg, NL) gave me a pamphlet promoting the NVHPV (the Dutch OzHPV). So having retailers promote the OzHPV is, I think, a good way to let people know that OzHPV exists.

Then what did the NVHPV have to offer for me?

1. There were organised races.
2. Interesting technical articles. (I know I should translate more of these articles, but as it is I already have too little time to ride my recumbent)
3. Product descriptions: for example, each issue another bike was tested, like the RAA, NRMA and other motoring organisations do with cars.
4. A good source of new products that apply to recumbent riders: things like:
  - \* a new better rolling tyre.
  - \* mirrors for your helmet.
  - \* lights that fit on a recumbent.
5. A calendar with events so that you know when and where the recreational rides, races and world championships are held.

I think that a good way to promote a recumbent is to ride it. As Tony Romanas told me once, there are lots of people who own a recumbent but have it more as a cool device than as a means of transport. Tony and I are two of the few people in Adelaide who ride their recumbent as a form of transport.

I know that many people are interested in recumbents, because they say they have seen me riding mine. However, lots of them find the price of the bike too high, although that may change though with the recent rise in the price of petrol.

Articles in the last few issues of the NVHPV went through the history of the association. In the early days, things were loosely organized and they too struggled to increase membership but they now have around 2000 members. I think I remember reading that the Belgian HPV association had only 100. While the high population density of the Netherlands made it easier for increasing the membership of the association, I think that the following things made the NVHPV more successful:

1. The editor of the leading cycling magazine included lots of recumbent related articles in the magazine.
2. People who knew a lot about bike geometry, resistance etc., including the editor previously mentioned, contributed interesting articles to the NVHPV magazine.
3. Dealers actively promoted the NVHPV.
4. Recumbent owners rode their bikes more often, including riding them in organised events. This resulted in more people seeing the bikes and wanting one, which was good for the dealer and good for the recumbent movement.

5. Being given free space at the Dutch version of the Bicycling Australia show. I realise that it was a lot easier to organize events in The Netherlands where the people promoting recumbents only had to travel 100 km at the most, whereas here in Australia people may have to fly or drive long distances. Perhaps in future it would be possible to get the Cycling Promotion Fund to sponsor OzHPV being at the Bicycling Australia Show?

6. Held advertised try-out days where recumbent owners would get together and allow people to try-out a recumbent. These try-out events stopped about eight years ago due to the concerns about non-recumbent riders riding expensive, privately owned machines. However, once or twice a year, some shops now organise try-out events and also rent out recumbents so that people can try them out. It happens frequently that a company outing is to go recumbent riding with the whole department. These are the sorts of things that introduce recumbents to a bigger audience.

I think that there is also another big difference between the Netherlands and Australia: here in Australia, the focus is very much on trikes whereas in the Netherlands, the majority of the recumbents are 2-wheel bikes. Streamlined trikes can go very fast as long as the roads are relatively flat, but in my opinion un-faired trikes are too low and wide for city traffic and they are in general slower because of the 3rd wheel. In Australia the general public is probably more interested in a bike that is faster and more visible in traffic than they are in a low and slow(er) trike. Also, due to the Pedal Prix events, most people in Australia think a recumbent is a trike.

What probably would help a lot for the cause of the recumbent is having it featured on a scientific TV program. For me, what pushed me to buy a recumbent was seeing a TV show about the 365-day bike. This was a contest about 12 years ago where the aim was to see which bike would be faster than 30km/h while being able to carry about 20 kg of goods or something like that.

Also it would be good if there were more races. As with anything, races stimulate innovation: if you have an idea about making your bike faster you may try it out in the next year or so, whereas if you have a race next month, then you want to have it ready next month. So races would stimulate Australian innovation in recumbent building.

Maybe one day the recumbent builders here in Australia will be able to compete with the Dutch builders in models other than trikes.

I hope these random thoughts help shape the future of OzHPV.

Rob Wartenhorst



# Recumbent Bike Frame Jigs

When building a bike, it's very tempting to cut the pieces and weld them together by eyeball. I have done this before and it does work and the bike feels fine, but the bike usually tracks out a little due to slight mis-alignments, and people riding behind you will give you a hard time because your wheels are not lined up with each other. This may cause both performance and ego to suffer to some degree. What's the answer? You need a jig.

## Everyone needs a jig.

A jig holds all the frame parts and the wheels dropouts in alignment while you weld them together. This not only assures you that the bike is actually straight when you are done, it also holds all the frame tubes together which makes it easier to weld up.

In it's most simple form, a jig needs to hold the rear dropouts and front dropouts in alignment. If it can do that you can build the craziest frame in the world between them and it will still go straight down the road. It's better though, to also hold the major frame components in place. Jigs can be made out of metal or wood. Metal is better because you can make it more precise, but it is also more difficult to build.

## Building a Recumbent Bike Frame Jig

I'll discuss two methods for building two bike frame jigs, first one made from wood, then one made from metal. A wood jig is easy to build with a minimal number of tools, the metal jig is harder but lasts longer, is more precise, and won't burn if you get carried away with the torch...

## Wood Jig Materials

- \* 1 - 4x8 sheet of 3/4" MDF (flat!)
- \* 1 - 2x4 (straight!).
- \* Wood screws
- \* Recommended tools include circular saw, jigsaw, drill press, large straight edge, large square.
- \* 8 - 3/8" x 3" bolts and nuts

## Wood Jig Platform

To build your wood jig you will first need a completely flat wood base. I suggest starting with a 4x8 sheet of 3/4" MDF (medium density fiberboard). This is better than plywood because the surface is really flat, and it doesn't warp like plywood. All parts for this jig should be made as accurately as possible as any inaccuracies here will be multiplied by the inaccuracies made when building the bike parts!

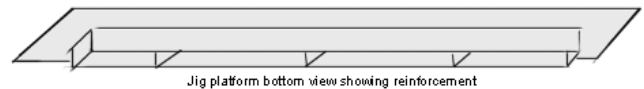
\* Cut a 2 feet wide by 8ft long strip. This is the base for your jig.

\* Cut 2 - 6" wide strips and screw them into the bottom 1.5 feet apart to reinforce the structure and make sure it stays flat. Pre-drill and counter sink your holes to prevent splintering.

\* Cut another 6" strip into 1.5ft strips to go between the reinforcement strips. One at each end and 3 in the middle should be plenty.

\* Mark a centerline down the middle of your new jig platform with something permanent like texta ink marker.

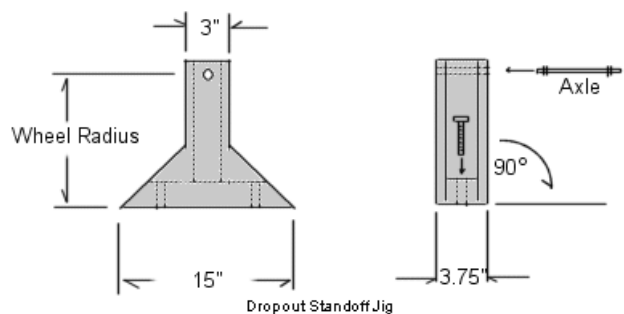
\* Drill a series of holes 3/8" holes, 2" apart exactly down the centerline. These holes will allow you to vary your wheelbase length in increments of 2 inches.



Now you have a really heavy but flat and straight platform that you can put it on some saw horses when using it, or lean up in the corner when you're not.

## Dropout Standoff Jig

The next step is making the standoffs for the dropouts. These will be made with sides of MDF and a core of 2x4. Before building these you will need to figure out whether you are using MTB or road hubs, and what size wheels and tires you will be using. MTB hubs are 135mm spacing for rear wheels, road hubs are 130mm for rear wheels and front wheels are usually 100mm. Cut a precise 2 1/4" strip from the 2x4. Draw center lines on the center of the 2 1/4" width, both sides. This will be the core of the standoff.



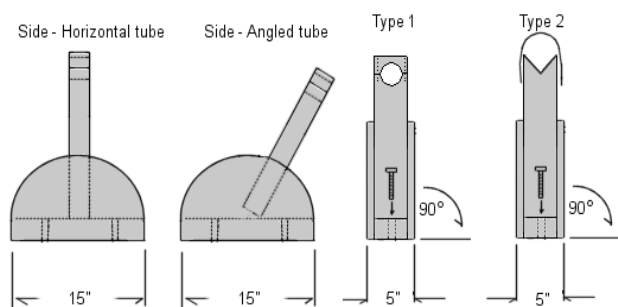
Cut out the sides of the dropout standoff jig as shown in the drawing. Make sure the bottom of the standoff is flat and square by putting it on the jig platform and using a square to make sure it is standing up straight. Fasten the sandwich together with wood screws. You will need to use either the axles from old hubs (quick release axles work best) or some 3/8 threaded rod to make your standoff axles. Measure the radius of your wheel and drill an axle hole through the standoff at that diameter. Use a drill press to make sure the hole is perpendicular to the side of the standoff. Drill 3/8" holes through the centerline the base of the standoff to mount it to the holes in the jig platform (See picture). Mount the axle in the axle hole using the thin nuts and



washers to space it to the correct width. Verify that the axle is centered properly on the standoff. Use the 3/8" x 3" bolts to fasten the standoff to the holes in the jig platform. Check that it's square to the base. Check that the axle is the same distance to the base on both sides. Check that the distance between the front and back dropout axles is the same on both sides.

## Frame Jig

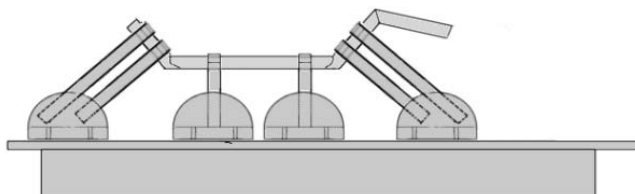
Ok, now you have the base and a way to mount your fork and rear dropouts in a solid way and make sure they line up properly. The next step is making brackets to hold the frame together while you are welding it up. For the sake of expediency we will be assuming you are building a traditional monotube recumbent.



The frame jigs are constructed in a similar manner to the Dropout standoff Jigs, except that the 2x4 does not need to be cut down. There are two ways of securing the tubes. Type 1 involves using a hole saw of the same diameter of your frame tube. Cut the hole in half and use wood screws to clamp the tube. Type 2 can be used for a range of tubing sizes and involves cutting a precision V in the 2x4, then using a metal strap to hold the tube in place. Draw a line down the center of the 2x4 on both sides of the wide face to help center the frame tube hole or V cut. By using a half circle for the side plate it is possible to adjust the frame clamp standoff to a wide range of angles. You may need two frame jigs per tube to support it securely. Side plates can be screwed to the frame support 2x4, or clamped with G-clamps to provide easy adjustability.

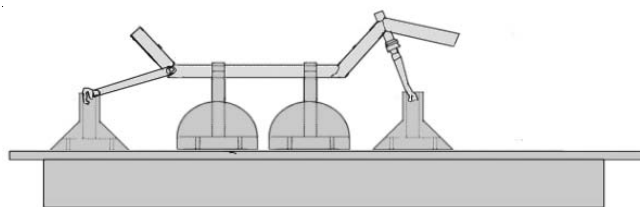
## Examples:

This not-to-scale example shows how the jigs are used to hold frame tubes together for welding.



This next drawing shows how the dropout standoff jigs are used to hold the bike in alignment while the bikes rear suspended suspension geometry is welded into place.

The wood frame jig in this document is not meant to be the ultimate tool for frame construction, but it's an easy way to make sure your bike turns out straight. If you are planning on



flat plane of reference. In this case we will be using 2x4" rectangular steel tubing. This is a fairly common item that should be available at any metal supply retailer. I suggest making your frame jig 8ft long. The cuts should be precise so use a chop saw or have your local machine shop make the cuts for you. You can build the jig from rectangular steel tubing as in the example below, or if weight is an issue (and money isn't!) you can build it from 2x4 aluminium tubing and angle material.

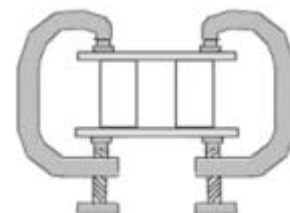
## Metal Jig Materials

\* 10mtrs of 50mm x 100mm 1.6mm thick steel tubing.

\* 60cm of 45mm wide angle iron

\* 8-steel G-clamps with at least a 160mm throat.

\* Steel cut-off saw, Welder or Brazing torch, drill press, square, tape rule, big hammer, etc.



## Steel Jig Platform

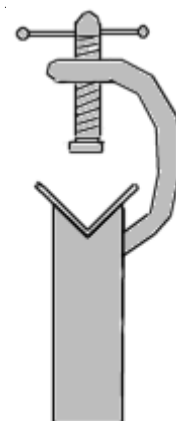
The parallel rails should be spaced 50mm apart, just wide enough that a metal 50mm x 100mm tube fits snugly at all points along the frame. Clamp the parallel tubes with a flat board on the top and the bottom to make sure it stays square and parallel. Weld a 152mm chunk of 50mm x 100mm tubing to each end (or longer for more stability). The jig platform can be supported with sawhorses to allow the frame and dropout jigs to extend below the jig platform.

## Steel Dropout Jig

The metal dropout standoff jig is made in a manner similar to the wood one above.

## Steel Frame Jigs

Due to the time involved in making metal jigs, it's recommended to make the frame jigs adjustable. This is accomplished by cutting a 90 degree V long-ways in the end of each frame support jig, and then brazing in a 254mm long piece of 45mm angle iron. Cut up a 160mm G-clamp and weld it to the frame support jig to clamp the frame tube in place. This should allow frame tubes between about 25.4mm and 50mm to be clamped. If you are using aluminum you'll need to weld



the cut up G-clamp to a steel flange and bolt it to the side of the frame jig.

Here's a frame jig, built from these plans being used to shorten a fork with a 25.4mm steerer tube from 508mm (20") to 406mm (16").

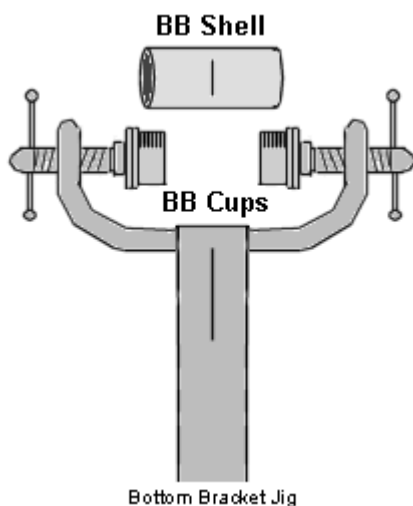


## Bottom Bracket Jig

The final jig to be created is the bottom bracket jig. While a jig using cones to properly center the BB would be preferable, making them is probably outside most of our range of skill and budget, so we'll just cheat a little.

Find yourself a scrap 10 speed bike, and surgically remove the entire bottom bracket. Discard the bike save the BB and the BB's threaded bearing cups. Make two 1.6mm thick disks the same diameter as the outside of the cups. Use a compass to make sure they are round. Drill a 2mm hole in the center to mark the exact center. Braze the disks onto the outside of the cups. Take two more 160mm G-clamps and mark the exact center of the moveable end of the clamp. Cut the clamps in half and discard the non-adjustable side. Drill a shallow 2mm hole in the center of the moveable end of the clamp. Mount the G-clamp to the bearing cup and use the shaft of a 2mm drill to verify alignment.

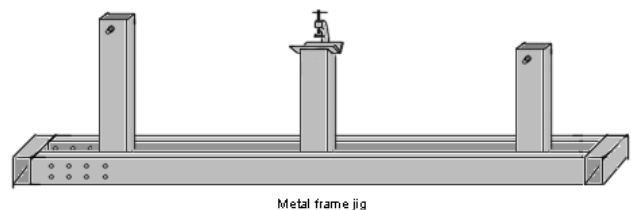
Braze the G-clamp to the bearing cup. The bearing cup should be able to flop around on the end of the G-clamp. Screw the new G-clamps with BB cups into the BB. mark the center of the BB and align it with the center of the jig standoff. Mark the cut ends of the C clamps so they can be brazed to the sides of the standoff. Verify that the BB and clamps are aligned level and straight before brazing them to the



standoff. The BB alignment jig will be a bit hard to put on and take off of a BB shell with the threads, also there is a chance that heating the BB shell will cause the BB cup threads to fuse to the BB shell. To prevent these issues you can carefully file off the threads on the BB cups until they slide into the BB shell without having to screw them in. It should be a tight fit but not so tight that it could damage the threads.



Pictured below is the metal jig base, with dropout and frame jigs. The frame and dropout jigs can be clamped into place between the rails with G-clamps, allowing maximum adjustability. Alternatively, a series of holes can be drilled through both sides of the rails to allow the jigs to be clamped using long bolts.



Frame jigs can be inserted and clamped at whatever angle is needed to build the components of your frame.

Steel construction insures alignment & won't burn when you are brazing on your rear dropouts.

A wide variety of materials can be used to make a frame jig.

The important thing to remember with each of them, is that your bike will only be as straight as the jigs your build, so measure carefully!

Ron Bottrell - [bottrell2001@msn.com](mailto:bottrell2001@msn.com)



## 2006 Tasmanian 6-Hour HPV Trial

Hi Everyone, My name is Gary Adderton and I am a teacher at Rosny College in Hobart and also the initiator through the invite of Bendigo Senior Secondary College of our college's entry into the Maryborough 24-hour for the last two years. We will be there again this year with two machines and about 26 students.

Also this year on April 3rd Tassie had its first HPV trial run on Hobarts historic waterfront. We had seven vehicles in our first race made possible by the tremendous support from RACT Hobart and many other sponsors.

In 2006 we hope to have at least 20 vehicles racing as they are currently being constructed all round Tassie.

The race will be on April 30th and commences with a short celebrity race (15 minutes) made up of the education minister, media personalities etc etc - a lot of fun. The main race starts a 9:00am and the circuit is quite unique to anything else in Australia. It is only 600 metres in length and passes through a large waterfront shed which is about 140 metres long, one corner had a painted sign on the concrete causing a lot of controlled slides after a few drops of rain fell during the race.

This invite is to all you mainlanders - come on down to Tassie and race with us in 2006.

Teams could fly to Hobart - very cheap - while others travel on the ferry with the vehicles.

Entry fee will be about \$50.

All bends are left handers and with kind permission of the RACV we are using their adapted rules to suit a 6 hr race.

Lot's of media coverage and Hobart's such a great place that is why so many mainlanders are coming down here to live.

Accommodation in local 'out of town' caravan parks, hostels, hotels etc. 20 mins out of Hobart is nearly 40km's away so you could be in quiet bush surrounds with only a short trip into the city on race day.

We will be giving out invites at the 2005 Maryborough event, so look out for several good looking Rosny College students coming your way on pit lane at Maryborough.

For more information contact [gadderton@yahoo.com](mailto:gadderton@yahoo.com) or [gary.adderton@education.tas.gov.au](mailto:gary.adderton@education.tas.gov.au)

## Membership Renewal

You should find enclosed a membership renewal notice along with this HUFF. If not please contact us as this is a reminder that all membership dues will need to be paid before the end of the year covering 2006. If we do not receive your renewal you may not be sent the Jan-Feb edition of HUFF so we ask you to renew as soon as possible for ease of administration.

## Notice of AGM for 2005

All positions will be declared vacant at the meeting. Nominations can be forwarded to the OzHPV Inc. Secretary either via email: Atholl Reid - [secretary@ozhpv.org.au](mailto:secretary@ozhpv.org.au) or in writing to PO Box 189, HRMC NSW 2310 ( to arrive no later than 7 days before the meeting) or prior to the voting at the meeting.

## Challenge Promo @ Wonthaggi Pedal Prix

I'm involved with the organisation of the Wonthaggi Pedal Prix Race, and next years race, which will be held in February is planning to be a bit different with the committee also trying to involve clubs and businesses with a 'innovation festival' thus allowing solar and wind turbine manufacturers to display their wares. This may also be a good vent for OZHPV or VICHVP to get a tent set up and generate some enthusiasm. Last year we saw 67 entries from primary, secondary and community classes. A small fee would be involved but the whole idea is still under much discussion. What do we all think?

Wayne Foon - [wayne@foons.com.au](mailto:wayne@foons.com.au)

This trike was pointed out to us on the Bent Rider Online Web site. I haven't seen a GT3 (or any Greenspeed actually) with a hard shell seat before and wondered what it would be like.



# The Albury Recumbent River Rally

Saturday morning 1st October saw a small group of recumbenteers meet at Bilson Park Albury. Peter Moller, Allan ? from Melbourne area, Dennis from Jindera (designing his 1st trike) and myself Lloyd.

The ride started at 9.30am by cycling north along Bungabrawatha Ck track to Lavington and across to Starbucks Coffee lounge at Lavington Square where suitable nutrients were consumed for the k's ahead and hills ahead. After answers supplied to the passer-by's questions and comments we rode east under beautiful blue skies and gentle breezes, up one granny low hill and onto Thurgoona via a winding undulating path to Old Sydney Rd for a few k's then onto Riverina Hwy and a few k's to Mungabarina Reserve, but being a little short on time we kept on following the Murray along Doctors Point Rd including a nice 50+ downhill run. Into Sth Albury where I rustled up another rider for the Wodonga section — after lunch.

Simon joined us on his Brompton folder as we rode down Dean St to the pool and cycle path along the scenic way by the Murray river past the##!!%^ start of the infernal %\$#@'' bypass'' 6 lane road that goes through the middle of Albury instead of a few k west of Albury. A fairly pleasant entry along the paths across, under roads up/down footpaths, through parks and eventually back to the start of our trek. Our trip to the kart track was voted out. And so we headed back to Albury via Lincoln Causeway approx 26km.



## Sunday

Bilson Park start 9:30am with an extra rider, Meg from Beechworth on a fairly light 20/20 bent bike. We took the Bungabrawatha cycle track north to the end where Ron on a Radius joined in for the ride over Jindera Gap with a good 1km run to Jindera for coffee etc also a few wedgies joined us for drinks (and Dennis with his tape for his trike project).

The 4 remaining riders headed east toward Table Top (Ettamogah) on a fairly quiet flattish good road surrounded by lush paddocks after heavy rain 2 to 3 days previously. And being a warm sunny day we saw a energetic brown snake leaving the black top. Still doing a leisurely 15 to 20 kmh we get to the Hume hwy , and up to the Pub, cafe for a bite of lunch. Meg Peter, Alan check out the pub and then we leave via the 'main drag' past grapevines eastward to Old Sydney Rd, almost a 5km downhill cruise with views of Lake Hume on the left.

Onward to Thurgoona with minimal traffic over undulating landscape we scoot, soon we pass the Kinross Pub and then west toward Lavington where Meg leaves us as she is eager to return to Beechworth , a 40 min drive. Alan and Peter wanted

a look at my amphibious trike at home, only 2 km to go. While we were discussing the pro's and con's of the design Peter gets a phone call to say his wallet had been picked up at Ettamogah and is at the sanctuary to be collected. So we whiz out in the car and pick it up, a much relieved Peter.

Back home and the fella's head back to their camp at Albury Central tourist park with many memories of the Albury Recumbent River Rally. ARRR.

Hope to see many more here next year.

Lloyd - [white3@iprimus.com.au](mailto:white3@iprimus.com.au)

If this Newsletter cannot be delivered please return to:  
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PO Box 189 HRMC NSW 2310

