

# RCN

RECUMBENT CYCLIST NEWS

## 1998 Trike & Tandem Buyers' Guide



### RCN road tests

- Comfort Cycle Chaise-3
- Earth Cycles Dragonflyer





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**“THE RECUMBENT HAS FINALLY COME OF AGE” - Washington Post**



# Three serious guys... Three fun wheels

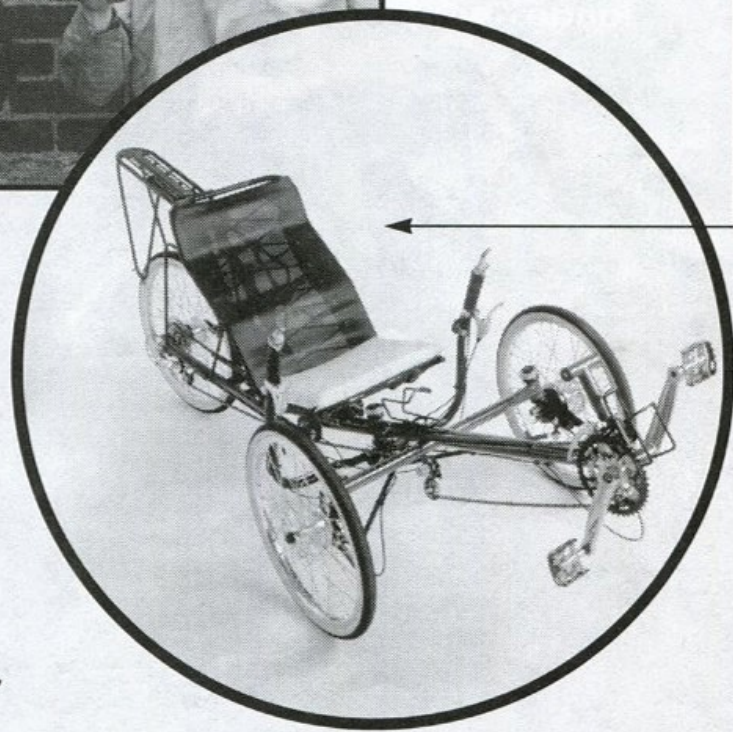


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**"It's been awhile since I've been  
this jazzed up about a trike."**

— Bob Bryant, RCN

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**"The most comfortable trike I've  
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— Bob Bryant, RCN

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**Earth Cycles™ Dragonflyer™ Trike**



# RECUMBENT CYCLIST NEWS

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Bob Dixon of Seat of  
the Pants Company and  
the world famous  
Windcheetah trike

### Contributors

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# RCN

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# Editorial License



## RUMORS, SUSPICION... INTRIGUE.. IN THE 'BENT BIZ

**R**UMORS... SUSPICION...  
INTRIGUE... are alive and well  
in the 'Bent World. The million  
dollar question is, will 'bents  
hit the big time in '99? Boy, I sure keep  
hearing rumors to this effect. Bike sales  
are still stagnant, the BMX or roadie  
resurgence did not take hold, and now  
even Geoff Drake from *Bicycling* says  
'bents are okay in his recent column.  
Even though he wasn't that comfortable  
on the recumbent seats he tried.

Dealers who have the foresight to  
get into 'bents are claiming that they  
are more popular than tandems. Supply  
seems to be the biggest problem  
for them. This may all change when  
we go to Interbike this fall. There are  
rumors of container loads of 'bents  
from big boys. I can't say for sure, but  
here are the rumors we've heard.

Trek has long denied recumbent  
*rumors* and I keep hearing them. Most  
recently, I have been told that Trek guys  
showed up at a recumbent dealer's  
place on a 'bent mission last fall.  
Another dealer said, "go to the Trek  
booth first." Yet another supplier  
claims that he was asked to speedily  
develop a 'bent-specific part for  
Trek...for a SWB ASS? The rumored  
SWB showed up at the **Midwest  
Recumbent Rally** in late May. RCN  
reader Kurtis Cherek emailed us first  
thing after coming home from the Rally  
to fill us in on the surprise Trek SWB  
(though we'd heard rumors over the  
last few weeks...). In RCN SuperSpy  
fashion, Kurtis rushed to develop the  
film and had rushed to RCN to be  
included in this issue—Thanks Kurtis!

The Trek reps were saying "about  
\$1500" and "in stores by December."  
Other notables were 3" diameter alu-  
minum frame, dual 20" wheels, a mid  
drive, RANS seat, rear shock and ASS.  
Onlookers questioned the ability to sell  
a fully suspended aluminum 'bent for  
so little and the response was "the  
buying power" of Trek! Other reports  
stated that the bike has not been  
approved as a '99 model...and were

unsure that it would be at Interbike in the  
Fall. As for the design, one test rider said  
that the new bike was very tall—taller  
than a 700c V-Rex. We've also heard that  
Trek may have as many as 6 or 7 proto-  
types of different styles and the "Wiscon-  
sin SWB" may not be *the* one, but to  
expect 'bents!

I haven't seen the bike live or ridden  
it, though we have been in contact via  
email with the Trek designers. The word  
is that we should be getting a test version  
if the project is approved for production.

We've heard that **Schwinn** may have  
'bents—though we then heard that about  
'99 Stingrays and Krates. **GT** and **KHS**  
are rumored to be playing with 'bents.

The new BikeE CT is being built in  
the Giant factory in Taiwan. Windcheetah  
designer, Mike Burrows, is still employed  
at Giant and I have heard rumors of 'bents  
beyond the **Giant BikeE**.

The new BikeE should be available  
by the time you read this, and **RANS** is  
rumored to be importing Tailwinds and  
Rockets—possibly late season.

**Dick Ryan** has a Taiwanese-built full  
suspension LWB ASS (U-joint steering a  
la Velocar) prototype. Ryan is currently  
looking for an investor for his company,  
and with a takeover, comes the new bike.

**Radius** (makers of the Hornet, Viper)  
of Germany has filed for bankruptcy. I  
then received a call from **Nils Palm**, who  
said he's taking over Radius. People have  
asked me about the Wind and Gecko,  
'bents advertised by a shop called Recum-  
bent Barn. These are the Nils Palm  
recumbents. Nils said the Wind and  
**Gecko** (proclaimed as great by the 'barn)  
will be taken out of production, in favor  
of a new \$1700 full suspension Nils Palm  
**Radius Hornet II** SWB and a dual sus-  
pension LWB/Compact called the **C4**,  
which comes with fenders, lights, suspen-  
sion, chain tube, V-brakes and a Sachs 3x7  
21-speed for just \$1200.

Now that I've shared my best rumors  
with you...what a year we have to look  
forward to.

Viva Recumbency  
Bob Bryant.





# 'BENT MAIL

WE WANT TO HEAR FROM YOU

**Directions for use:** Send your cards, letters, RANTS, gum wrappers, feedback, response, pictures, articles, newsletters, newspaper clippings and whatever to:

RCN, PO Box 58755, Renton, WA 98058-1755

**Email to:** DrRecumbnt@aol.com If you disagree with an RCN opinion or have a differing viewpoint or experience—we want to hear about it! RCN reserves the right to edit submissions for clarity, content and space limitations. If you write to RCN and **DO NOT** want your name, email address or letter published, please make this request in the letter.

## TOP SECRET PROTOTYPE

I was out debugging my new/old Rans Response this morning when an unidentified 'bent pulled up behind me. It was the prototype of Dick Ryan's newest creation being tested by his son. We stopped and I got to look at it and ask a few questions.

Here is a quick summary:

1. Short LWB
2. Full Suspension with lower trailing arm.
3. Aluminum Frame
4. Built overseas in Taiwan
5. Adjustable ASS with universal/C.V. joint just above the headset and an adjustable angled steering column braced to the frame top tube. The brace slides and maybe extends to adjust column angle.
6. Traditional looking Ryan seat.
7. 26" rear 20" front wheels.
8. V-brakes front and rear.
9. I'm guessing at around 23-24' seat height with a higher BB than current Ryans.
10. Fabrication and finish looked very nice.
11. Retail price target is around \$1200.
12. Hope to release product in around 90 days (are those real days or "recumbent days"???)

Bob Silverman

*Bob, one Ryan prototype has been built. Whether this bike comes to market is a big "if" at this time, though we can hope—Bob, RCN.*

## KUDO'S FOR KENT

I just have to send many kudos to Kent Peterson for his uproariously funny article in RCN #45 (LWB Superguide) wherein he describes his experience with the "Joetator" recumbent built for him by Joe Kochanowski. Newspaper columnist Dave Barry has "nuthin'" on Kent. I read the article aloud to Jeff and I laughed so hard,



*The top secret Ryan prototype #1*

guffawed uncontrollably at times, that I actually had an asthma attack! Tears rolled down my face from laughter and there were moments where I couldn't read anymore without stopping to catch my breath. My stomach even hurt! I cannot remember reading anything that was so completely entertaining and enjoyable. If you don't subscribe to RCN (and you really should), at least order #45. You'll be glad you did. This column was truly a work of art. Thank you, Kent!

I am again amazed at the quality of RCN. There hasn't been a bomb issue yet; you have a lot to be proud of.

Shari Bernhard,

shari@norman.mkt.hcsc.com

*Shari, you can imagine how many times I've read that article and I still laugh out loud. Joe, Kent and the NW gang are really fun! Be careful not to pump up Kent's ego too much or I won't be able to afford him...—Bob, RCN.*

## TREACHEROUS, TILLERED BUNNY HOPPING LWB SLUGS!

Although I ride a SWB recumbent, I carefully read the latest RCN LWB buyer's guide issue. When you talk about how stable LWB are, I think you're seriously understating their rearward weight bias. When shopping for my bike (Angletech V-

Rex GL63), I also test rode a Rans Stratus and a Vision Metro. To me, the extremely light feel of their front wheels made them seem treacherous, as if they'd skid out from under me given the slightest provocation—turning a corner with sand or gravel present, perhaps. Also, I could imagine "bunny-hopping" (lifting the front wheel off with each pedal stroke) all the way up the steeper hills here in northern Colorado, because of their rearward weight bias.

I didn't care for the exaggerated LWB steering tiller effect and the fact that their handlebars—especially on the Stratus—were so long that they flexed as if they were made of rubber. To me, that isn't the stable handling that's supposed to be a characteristic of LWB recumbents.

I realize that my impressions might have been different had I ridden an LWB/CLWB with USS or been a shorter rider (better c.g.). And finally, riding a LWB felt like driving a sluggish bus in comparison to driving a responsive sports car (SWB).

I'm not claiming that SWB are superior in any way, but I'd sure encourage prospective buyers to decide for themselves. I went into the test rides fully expecting the LWB/CLWB bikes to be more stable, and in my opinion they were far worse than the SWB bikes. I came away with impressions



that they were exactly the opposite of what I expected. Thanks for taking the time to read this, and for all the work you put into making RCN possible.

Frank Calloway  
fcalloway@earthlink.net  
*Frank, A performance LWB should have a weight distribution of 60/40 (front). I can guarantee you that bunny hops won't be a problem. Compacts are another story and need to be sized according to the rider and terrain. As for which design is stable, try riding a SWB USS down your Colorado hills, and then a properly sized LWB ASS. As for your findings, the difference you may be feeling is the SWB requires less input than does the LWB. If you are very tall, forget a LWB. And, after all, this was the LWB buyers' guide, though we still love SWB 'bents too...and are in desperate need of a '99 SWB ASS fix—Bob', RCN.*

**EASY RACERS & XL SIZED RIDERS**

I did a comparison on the weight of Easy Racer owners. I counted sixty of our most recent customers—men only. Using a break point of 180 pounds, there were: 17 under 180 pounds, 43 over 180 pounds and of the 43, 20 were over 200 pounds with an average weight of 197 pounds for all men. Note 15 men over 230 pounds. If you factor in that most men over 200 pounds may be fudging by 5-10%, then our average rider is certainly well over 200 pounds.

If there is something to be learned from this, it is that manufacturers better build for BIG guys.

Gardner Martin  
Easy Racers, Inc.

**V-REX PUSHES READER OVER THE EDGE**

I had been looking into 'bents for a while now, and was finally pushed over the edge by RCN #44. The review on the Rans V Rex was more than I could stand...it's parked in my shop right now! After only the first 75 miles (I just got it Friday) I have to admit that I've never had so much fun on a bike. Yesterday was extremely windy, but there I was, peddling into a 40 mile an hour headwind with a smile on my face! Unbelievable. On the way home and with a little gravity and that tailwind, was blowing down the road at 37 mph...whatta gas.

Thanks for the great mag. I applaud your results. 'Bent on.

Larry Menzel  
lmenzel@millcomm.com

**RYAN ASSEMBLY**

Thanks for your great LWB Buyers' Guide. I would like to point out that even though we sell direct, we reimburse new owners of Ryan recumbents for full assembly at the bike shop of their choice. We generally ship directly to that bike shop, and owners never see their bikes until they are completely assembled. I love the RCN!

Dick Ryan,  
Ryan Recumbents

**EASY RACER vs. STRATUS**

You are obviously a great fan of Easy Racers products and you believe that they may be the best LWB ASS around. However, there are those including myself that do not agree with you especially when compared to a Rans Stratus. You state on page 44 that the Stratus has a more comfy seat, ride, better components... You also state that the Tour Easy has slightly better handling, handlebars and fairing options. Do these latter reasons give the edge to Tour Easy. I think not and I believe you are somewhat biased. Tour Easy handlebars hit my knees on turns if I have them adjusted for maximum comfort for my hands. I also think that the Tour Easy frame is much too stiff and its seat is uncomfortable compared to the Stratus. Comfort is, after all, the primary reason most of us ride recumbents.

Last Sunday I went on a recumbent ride with HPV's of Southern Ontario. We had eight recumbents show up for an 80 km ride through the rolling hills north and west of Toronto. I am not in the best of shape so I found myself the slowest 'bent going up the hills. This I attribute not to the bike but to my lack of adequate conditioning as you allude to in RCN #45. However, when it came to the downhills, my Stratus was clearly the fastest 'bent. I was able to pass most others while coasting and they were pedalling hard. All of the group were surprised at the ease in which I could catch them all on the downhills. Can you explain this phenomenon?

Joe Guttman

The Bicycle Spokesman

*Joe, I try not to be biased. I weigh all the facts and offer my EDITORIAL OPINION and do not hide this fact in any way shape or form. I have nothing financial to gain if an RCN reader buys a Rans, Vision or an Easy Racer. I do hope they buy the right bike for them.*

*I have ridden and tested both the Stratus*

Please send 'Bent Bits to:  
RCN, POB 58755, Renton, WA 98058.

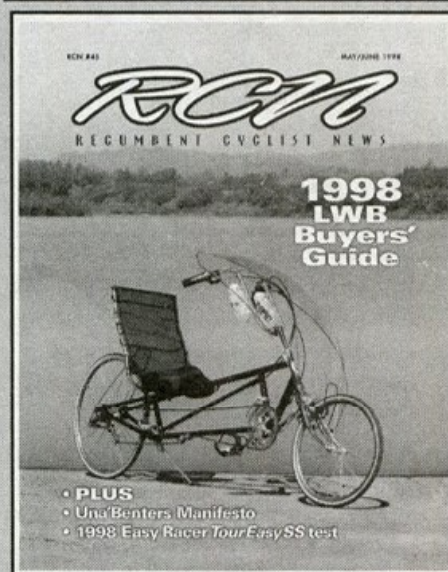
◆ **Kryptonite Pocket Lock**

You're riding your bike and have to run into a store or make a quick pit stop. You tell yourself, "I'll just leave my bike here just for a minute. Everything should be okay" But a little voice says, "I hope it's here when I come out." You nervously look outside every few minutes hoping that somebody doesn't steal your bike.

The Kryptonite Pocket Lock will help protect your investment and give you some peace of mind.

It doesn't take the place of a U-Lock or a big heavy cable & lock, but it weighs in at only 3 oz. and can easily be carried in your pocket or bike bag. It's perfect for those times when you have to leave your bike for just a few minutes. This combination lock has a plastic coated cable is 3.75' long and self-retracting.

These great locks are just \$9.99. RCN subscriber bonus... 2 for \$15.99! + \$4 S/H. People Movers a Tel. 714/633-3663.



**Have you received your RCN#45, yet?**

All active subscribers should have received this issue. If you have not, give us a call. The postal service occasionally misplaces RCN issues. Call 253/630-7200.



## ■ 'Bent Bits

- ◆ **TITANIUM GOLD RUSH!?**  
Rumor has it that Gardner Martin of Easy Racers, Inc. is negotiating with Ti builders for a limited edition Titanium Gold Rush Replica LWB recumbent. This one will be expensive and rare. If you're interested, give Easy Racers a call at 408/722-9797.
- ◆ **BOLT-ON SUSPENSION**  
The folks at Shockster have come up with a bolt-on rear suspension. RCN#46, Windcheetah-article writer, Ed, Gin, has just intalled this unit on his faired and customized Lightning. The Shockster has an adjustable preload dual coil spring, double-action shock absorber, weighs less than 3-pounds, has 3 inches of travel and Ed reports NO POGO! The cast aluminum and CNC machined Shockster sells for \$325. Ed belives this unit could be adapted to many 26" wheeled bikes, such as the Vision, V-Rex, Easy Racer and Visions. Contact Shockster at 1-888-Bike-911; www.shockster.com. Tell them your ead about it in Recumbent Cyclist News.
- ◆ **QUESTION OF THE MONTH: Above-seat steering=ASS, ABS or OSS?**  
RCN has always used ASS (we have been known to be a pain in the.... In a seemingly politically correct move (or just to be different from RCN), the folks at Vision use ABS, for Above-Bar Steering. Recently the folks at Bicycling have coined OSS, for Over-Seat Steering. Granted, the ABS is out because it is known for anti-lock braking in cars. Our ASS is NOT politically correct. Now that the Bicycling guys have started making up their own descriptive terms (I thought we were the only mag that did that), maybe we should adopt OSS?  
—OSS—Over-Seat Steering  
—USS—Under-Seat Steering  
Please feel free to drop us a note about the OSS vs. ASS debate.

## ■ 'BENT MAIL....

and Easy Racers extensively. To me, the ride and handling are more important than the difference in components. When I am pushing into a corner at 30 mph, I want a stiff bike. Because I have broad shoulders, I want a bike with narrow bars for better aerodynamics. I want to use a Zzipper fairing—the Easy Racer was designed around the fairing, so it fits like a glove. None of the Rans bars fit a Zzipper fairing as well, some model adaptations are being improvised by dealers (Rans bars are wide).

The reason that the Easy Racers LWB bikes have the edge is because that is what they specialize in. Rans has not given the Stratus as much refinement over the years and this is demonstrated in the bike's ultimate dial-in and handling. The trick to the Easy Racers design is in the use of an over-size fork and years of refining the head tube angle, a custom built/designed fork, carefully dialed rake/trail and handlebars. In comparison, Rans uses an off-the-shelf fork. My only problem with the Stratus is that I have never been able to get them dialed-in perfectly to me. The handlebars are: too wide (B), too flexy (T) and too golf cart-like (C). They are either too close, or too far away. A local rider just solved this problem by using a Look Ergo adjustable position stem—though an expensive upgrade. Angletech has installed an Easy Racer bar on a Stratus. Zach Kaplan installs T-bars on Easy Racers.

The Stratus doesn't have as wide gearing, nor does it have the wide gearing potential unless you go to the Shimano Nexave parts or a 3x7 hub. This has to do with the chain idler. The Easy Racer idler springs extra chain to make wide range gearing work very well. The Easy Racer chain line is also better than the Stratus. Without the idler, the Stratus chain will drag on the frame, not so with the Easy Racer.

As for the frames, both are equal. Rans may even have the edge in build quality, and the Rans wet spray paint is definitely more attractive, however, can be too soft. Rans has the seat war won hands down. I prefer a Rans seat on my Easy Racer and find it superior to any other recumbent seat on any other bike.

Both bikes are world class. Some riders will like the comfort, flex and softer ride of the Stratus (RCN's Marilyn Bryant now rides a '98 Stratus with T-bar), others will like the more aggressive high performance bliss of an Easy Racer, still others love a Compact or SWB.

As for performance, I have noticed that the faired Easy Racers in our group accelerate to much faster speeds than other bikes on the downhills (our Stratus owners are not regular

riders). The key is aerodynamics, rolling resistance (larger wheels), weight distribution and rider weight.

Easy Racer or Stratus, the LWB ASS gives me an edge that I like and both are among the most dialed, predictable and time proven recumbent designs on the face of the 'bent earth. My personal performance is pretty predictable. The local NW riders can figure that if I am on a Compact, I'll be following up the rear; if I'm on a SWB ASS, I'll be riding in the middle of the pack, and if I'm on my LWB ASS with a Zzipper fairing, I'm a steam roller, baby! Though no matter what I ride, I spend a lot of time chasing Kent Peterson and Doug Wood on his R45 hardtail with tailbox and Zzipper—Bob, RCN.

### VISION PEDAL STEER

I write this letter in regards to past letters regarding Vision test rides. You talk about pedal steer on short boom bent and I agree that this can be a problem if one does not have a smooth cadence. I have had my R45 for 2 months and I've found that by decreasing my cadence to no more than 100, that pedal steer is no longer a problem. I have also found that the Vision seat is far superior to the Rans seat if one takes the time to fine tune the foam in the seat at your local foam shop. I bought a basic R45 frame and had my local shop build it up with ultra light parts. After putting other lightweight parts on the bike I still fond that the overall weight of the bike was 25 lbs. Vision said that it was because I went with the 16" wheel instead of the 20" Baloney! This should have weighed in at minus 23 lbs. with no problem. This is still the greatest bent bike I've ever owned.

Ray Forsyth  
dlancast@mail2.quiknet.com

### THE ROAD WARRIOR

From what planet is Joe Kochanowski? I thought you could RANT! (the Joetator and Una'Benter Manifesto-RCN#45)

Francis Celino

### NOT RENEWING

I bought my first recumbent last Spring. Since I have bought a 'bent and probably won't buy another for several years, I no longer read RCN with the same urgency. I thought about not renewing, but very quickly realized that your publication is critical to the recumbent rider and we have a responsibility to support your efforts.

Robert Slaterbeck □



# 'Bent News

What's Happening in the 'Bent World

## World's First Flying Recumbent Bike!?

How does it happen that a Virtuoso Dixieland Banjoist entertaining at Disney World's Magic Kingdom should invent the world's first "Flying Bicycle?" The Flying Bicycle was introduced at the mammoth Experimental Aircraft Association air show in Oshkosh, Wisconsin this week.

It's easy to understand if you know Orville "Lee" Floyd, III. Orville, a pilot since his teens conceived and co-designed the Para-Cycle with Robert Baslee, so that he could fly to work. Orville keeps his newly flight tested Ultra-Light Para-Cycle in his garage. Orville pedals the recumbent tricycle to a small field near his home, transforms it and flies to a field near Disney World. Once Orville arrives near Disney's entrance, he converts the machine back to a tricycle and pedals to work. Orville enjoys a freedom for which most of us long, commuting in one of the safest flying machines ever invented.

The 21-speed Para-Cycle has a 40 HP engine that allows it to fly to 10,000 feet.

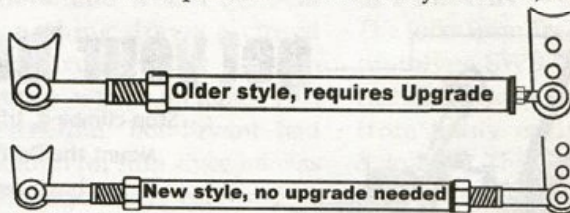
Para-Cycles sell for \$8995. There is no license required and it weighs just 147 pounds. For more info contact Para-Cycle at 407/877-7129 or [WWW.para-cycle.com](http://WWW.para-cycle.com) □



## VISION LWB STEERING RECALL

It has come to our attention that a part we buy from a supply company for use in our long wheelbase steering connector rod broke on a customer's bike. to take any chances, so we are providing an upgrade part at no charge.

The connector rod is an integral part of the steering mechanism on LWB Vision bikes. If this part breaks the rider will lose the ability to steer the bicycle, and an accident resulting in serious injury or death could occur. While this case seems to be an isolated incident, we do not want



The connector rod is an integral part of the steering mechanism on LWB Vision bikes. If this part breaks the rider will lose the ability to steer the bicycle, and an accident resulting in serious injury or death could occur. While this case seems to be an isolated incident, we do not want

part in question. Please examine the attached diagrams, they will help you determine if you need to make the part change.

If you find you need the new replacement rod-end bearing, please call us and order part "LWBUP." There is no charge for this kit. Vision Tel. 206/467-0231 □

## 'Bent News

### ◆ RECUMBENT HISTORY

The best article we have done on recumbent history was written by David Gordon Wilson for his book, *Human Powered Vehicles*. The chapter on recumbents was printed in RCN#29. For more complete works, we suggest the following books:

- *Human Powered Vehicles* by David Gordon Wilson and Allan Abbott
- *Bicycling Science* by Frank Rowland Whitt and David Gordon Wilson

Most of the commercially built 'bents available today have been designed by those starting out as HPV racers and hobbyists. This is grass-roots design at its finest.

### ◆ PHIL WOOD/ULTEGRA

Kelvin Clark reports that **Angletech** now offers Phil Wood bottom brackets that work with the new Shimano Ultegra Road Triple crankset for those retrogrouches who don't want to use the Shimano splined unit.

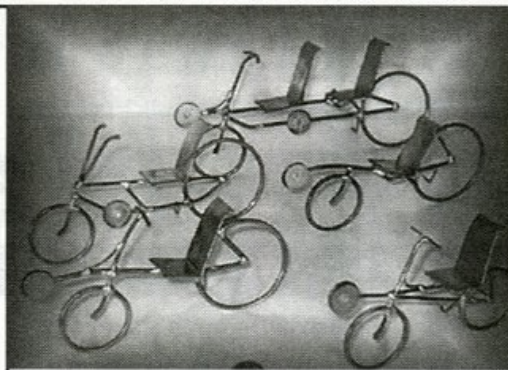


## ■ '99 Buyers' Guide

### ◆ Give us your input on our 1999 printing schedule

We are in the process of planning our 1999 print schedule. We are considering the following options for next year:

1. Same as 1998 with segmented Buyers' Guides
  2. 1996 format: 4 RCN regular issues and a huge double+ (2) issue Buyers' Guide (6 total issues).
  3. 6 RCN issues with a new larger separate Buyers' Guide as a subscription option.
- We would like your feedback. Leave us a voice mail at 253/630-7200 "#" or email [DrRecumbnt@aol.com](mailto:DrRecumbnt@aol.com) (remember, no second "e" in recumbent)



## World's Smallest Recumbents!?

George Goehl makes some beautiful recumbent bicycles. These things are real works of art. Unfortunately, I won't be road testing any of these beauties because they don't come in my frame size. In fact, they don't actually roll. But they look great perched on a desk or cabinet.

George brazes up small brass models of some of today's more popular recumbents. For Christmas my wife bought me a 6-inch long replica of my Rans Rocket and I can't think of a nicer gift for that recumbent fan on your gift list. I recently talked with George and he said he started doing recumbent sculptures because he started seeing the bikes "everywhere" and customers started asking for recumbent models. Prices start at \$12.50. Sculpted from \$50. <http://www.kiva.net/~studio33/recumbent/> or Studio 33, Box 897, Nashville, IN 47448—*Kent Peterson.*



### John Charlton and his 12 Cent 'Bent. RCN Goes After the Establishment in the RCN#47 "Homebrew issue"

Watch for our upcoming issue:

- Dumpster Diving for Bike Parts. Learn secrets from the pros.
- Cheap and easy ways to get 'bent!
- Building a 'bent from a BMX bike.
- The truth revealed on industry hype (hoax?) of index shifting!
- The truth revealed about pricey parts!

We are looking for submissions, but you'll need to hurry. As you read this, we will be finishing up the issue.

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# The Midwest Recumbent Rally

By Eric Geoffrey  
V a n n

beezodog@concentric.net  
www.concentric.net/~Beezodog/

Take A Magic Carpet Ride, the recumbent rally is alive and well here in the Heartland. Over the past two weekends (May 23-24 - Midwest 'Bent Roundup at Hales Corners, WI and May 30-31 - Midwest Recumbent Rally at Stevens Point, WI) things have been quite exciting for those seeking to buy, swap or just hang out and talk 'bents. The most fun at any of these gatherings still boils down to riding the bikes themselves. So whatever name you give these fun-filled get-togethers, in the final analysis its all about *the ride*.

## THE EVENT

Connie and I drove to the Midwest Recumbent Rally at Stevens Point, Wisconsin. I had not been looking forward to the 4-hour drive but as it turned out the weather was cool with a bit of wind, and just perfect for test ridin.

Rolf and Barb Garthus put on a very well organized shindig. This years event was situated at Pfiffner Pioneer Park Lodge about a quarter mile from their store. Things began to happen at 9 am on Saturday. There were foodstuffs for the early arrivals and two shorts rides during the day. The first of these rides was a 12-mile tour beginning at about 10:30 am. The second 25 mile ride was held later in the afternoon. Lunch was on your own. But the registrants were treated to a catered BBQ Picnic that evening.

On Sunday the "Super Tour" was the main attraction. It began at 9 am and was a ride through some very scenic countryside using a well-marked clover leaf route.

## CELEBRITIES

Events such as these are more commonplace each passing year. The idea is to generate interest in recumbents and provide

## It's All About the Ride

Hostel  
Shoppe 



*Spy photo of the new Trek SWB  
photo by Kurtis Cherek*

a chance for on the spot sales for those driving in from out of state.

RCN provides a focus of interest for many 'bent riders (and would be 'bent owners). And nothing draws a crowd quicker than the rumor that a given recumbent celebrity will be on hand. This event was no exception. Bob Bryant had asked me to stand in for him since he was unable to make the journey eastward as his 5 year old son Dan had broken his leg.

I spotted Vision's Grant Bower setting up a bike for a participant. Behind him stood John Schlitter of Rans making adjustments to one of his bikes for a different person. And there stood Mark Colliton chatting V-Rex with a group of folks who

wanted to know anything and everything about his involvement (Mark is the V-Rex co-designer). Mark was unable to bring his original V-Rex prototype now set up as a dual 24" bike, or his new Rolf-wheel equipped dual 650 'Rex. Lee Eckroth was there to show the new BikeE's.

## HANGIN' AND TALKIN' 'BENTS

While I schlepped about, Connie, my wife of 30 years was donning a helmet and hopping aboard the Vivo and V-Rex with all the abandon of a teenager. She's in a quandary about which bike to purchase. We both ride Rans Glisses and want a SWB to round out our stable. I've been eyeing the Rans Vivo (as have many of you) and she has been looking with longing at the V-Rex.

The crowd for the most part was lined up 10 deep waiting to take test rides on Easy Racers, Lightning P-38s, Visions and BikeEs, the Rans V-Rex, Vivo, Stratus and Screamer, ComfortCycle and Linears. There was a 1/4-mile test track which circled the Lodge. If folks weren't waiting for test rides, then they stood nearby swapping riding yarns about their favorite bikes.

## SPY REPORT

The folks from Trek showed up with their prototype SWB recumbent. They were rushing to finish it while fielding questions from many excited 'bent enthusiast onlookers. This SWB ASS full suspension bike is rumored for '99 production. Trek was listening closely to what test riders had to say about the prototype.

## DEMO RIDES

Rolf and Barb did a great job of organizing the test ride area. You grab a helmet and plunk down your drivers license. The





## Trek SWB Spy Photos



The Trek prototype was outfitted with dual 20" wheels, V-brakes and a shifting 24-spd. mid-drive. The question is will they build it?—Cherek

bike is adjusted for you and you ride off onto the test track to see how the bike handles. Everything about the setup in

The frame is 3" dia. aluminum, the rear suspension is a Cane Creek, the front is a SR Duo Track, Trek ASS and weighs 30 lbs.—Cherek

Stevens Point was first rate.

These bike demo sessions are vital to the intelligent selection of recumbent bikes.

You don't need to sit and talk about the quality of ride a given bike gives, you can wait your turn in line and test ride the bike yourself. Then make up your own mind. This may sound 'peachy,' but I feel passionately about this issue.

### THE RIDE

No matter which bike or what your involvement with it is, the final analysis, is nevertheless about the ride. I'm not speaking here about bike handling—but RIDING!

It's that intangible high you get from being outdoors, conquering a hilly route that a year before you'd been unable to finish. It's about feeling stronger and having shared a sense of

accomplishment with a riding partner

Talking 'bents and just hangin' should never be allowed to become a substitute for the ride. So if you see me just hangin' sometime and not ready to board my Gliss and join the ride, chide me for forgetting my own words. It's the ride.... □



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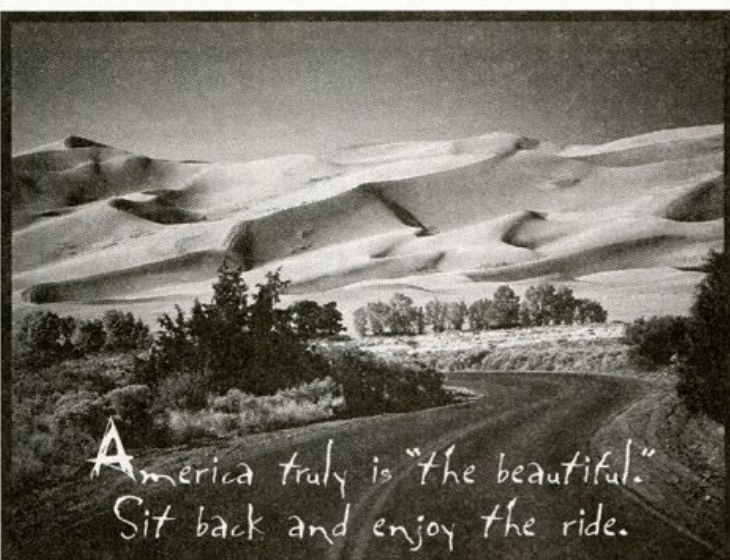
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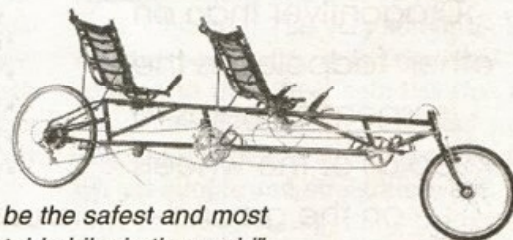
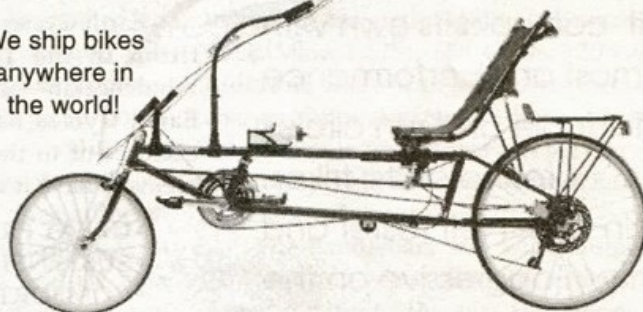


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## A Tadpole Trike Born In The USA

**By Robert J.  
Bryant**

DrRecumbnt@aol.com

I was amazed at how well I rode in our 'bent pack on my first open road 50-mile ride. The Dragonflyer is the most comfortable trike that I have ridden. It can hold its own with most any performance tadpole and run circles around delta trikes. In fact, I felt faster and more aggressive on the Dragonflyer than on other tadpoles as the suspension helps to keep all of the wheels on the ground—certainly better than the unsuspended trikes and especially the delta trikes.

Imagine my excitement when I learned of a new recumbent trike manufacturer offering a new high performance/touring tadpole trike (two wheels in front). This is not some flatland city trike, or retirement village roadster, but a serious world class trike ready to take on the icy streets of Minneapolis, or the open roads of America. Oh yeah, I nearly forgot, it's built in the USA.

Earth Cycles is run by chief designer/builder Shean Bjoralt in Minneapolis, Minnesota. His SWB bikes have enjoyed a good regional success—and are mostly known for their hemp seats. The SWB business is overflowing with good designs, and Bjoralt's model wasn't getting enough notice on a national level. Shean picked up on the fact that there is a large demand for enthusiast tadpole trikes—prices are high and delivery is very long.

Earth Cycles has some tough competition in the Trice, Greenspeed and Windcheetah—all excellent trikes, though Earth Cycles has brought some new excitement to the mix. The Dragonflyer seems to have it all:

- **GREAT PRICE—\$2995**
- **SUSPENSION—Maintenance free!**
- **COMFORTABLE SEAT**  
(to US comfort standards)
- **63-SPEEDS**
- **TRIPLE-TOUGH 20" WHEELS**
- **NO POGO**
- **NO PEDAL STEER**
- **BUILT IN THE USA**

### ■ DRIVETRAIN

The Dragonflyer has a high quality Sachs/Shimano drivetrain that operates nearly silent. The drive system is noticeably more "free flowing" than other trikes—with an exceptional chain line. Short chain tubes direct the chain through the USS to the gear step, chain cross-over (2-chain drive/single cog driving to the front and another to the back) at the suspension pivot point. A high

quality sprung derailleur cage-style idler springs the forward chain. Dragonflyers come stock as 63-speeds with a Sachs 3x7 hub, Shimano Deore LX microdrive triple crank and a matching front derailleur.

The Deore LX derailleurs are shifted by the best shifters on the face of the planet, the Shimano Ultegra Bar-Con (bar end). They sit up on top of the wide "U" shaped bars—offering near perfect ergonomic 'bent perfection. The 3x7 shift lever is mounted lower on the left bar. Downshifts can be triggered without moving your hand, though an upshift into overdrive requires moving your hand, though this is not an issue as this trike is very stable. The Shimano Micro-drive crankset's ramped chainrings make front shifting better than the majority of recumbents available. In fact, I can't think of another that had shifting that was as good. Most 'bent designs require the use of larger chainrings (road cranks) to achieve acceptable gearing. The Dragonflyer achieves it with the step up cross-over gear at the pivot point and the under and overdrive internal gears of the Sachs 3x7. The gear inch range is 13-124 and perfect for just about every type of terrain. Hammerhead's may says it's too low-range. Higher gearing could easily be had, though shifting quality would be compromised without the ramped chainrings.

The brakes are Sachs VT5000 dual drums on the front wheels with a cross-over linkage a la Greenspeed (left brake handle controls the right front brake and visa versa). This is the way to stop a tadpole. The trike can easily be braked with either hand with either front wheel. Having both brakes connected to one lever just doesn't work as well. The levers are from the new Shimano Nexave group—if there is a recumbent component group—the Nexave is the closest thing to it. The Sachs drums offer smooth braking, though not as high powered as a V-brake or Magura. Drums are the perfect, reliable and user-





*Our Earth Cycles Dragonflyer test trike with pannier—Peter Litwinczuk*

friendly brake for a tricycle. The only component missing on the Dragonflyer is a parking brake for the rear wheel. Trikes tend to roll away if a brake is not set. A side pull parking brake to the rear wheel would be ideal. Comfort Cycle's Jim Kueber recommends a velcro strap to hold the brake lever as a simple solution.

The wheel quality was exceptional. The Sachs hubs are beautifully finished and the wheels are hand-built by a pro wheel builder with stainless steel spokes. The triple set of 406mm Primo Comet tires is perfect for sport touring, though a tougher tire should be used for commuting or touring. The Comets are not as good a choice as the Tioga Comp Pools that come on Trice and Greenpeeds.

#### ■ DESIGN

The tadpole trike is truly the enthusiast's choice for a fun and fast recumbent trike that the rider can ride hard and aggressively push into the corners testing his/her trike skills and the limits of the given design. Designer Bjoralt carefully researched bicycle, tricycle and motorcycle suspensions before building the Dragonflyer. Many designers believe they have the key

to a no pogo suspension, unfortunately, some of these theories require high air shock pressures to accomplish this. Bjoralt says the true key to no pogo lies in the German Ostrad and Radius Viper designs. This means the placement of a mid-drive cross-over gear at the suspension pivot point. And guess what—it works!

I've become rather intimate with my shock pump as of late, and must admit to concerns about shrapnel explosions with some of these shocks that require max shock air pressure (more on that in an upcoming RCN). The Dragonflyer has a custom elastomer that is maintenance free—no air or shock required. It works fantastic and offers a super smooth ride—smoother than any trike we've tested, as well as truly no pogo'ing or bobbing up and down.

The steering geometry is Ackermann centre-point steering. Squint your eyes and the front end is similar to a Greenspeed—which has set the standard for proper steering geometry for a tough touring/commuting/usable performance trike.

#### ■ FRAME

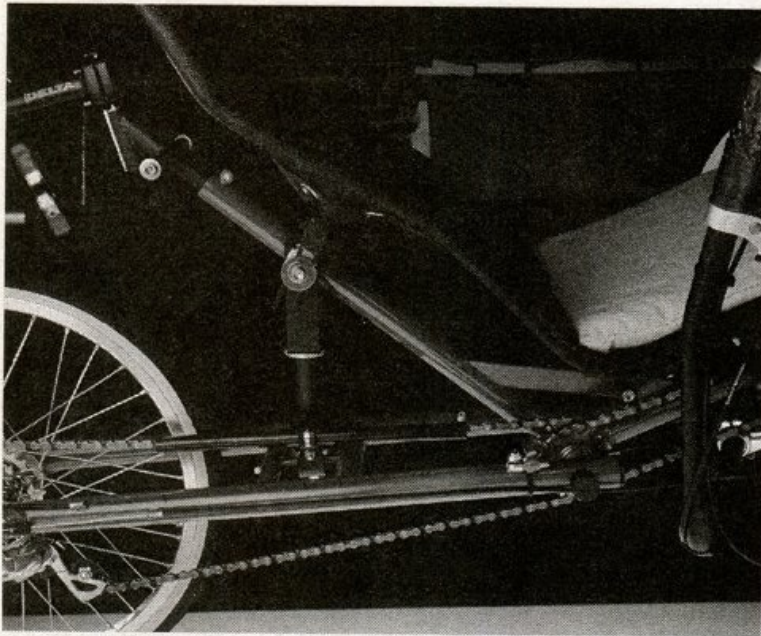
The TIG welded frame, swing arm and pedal boom are beautifully fabricated of

CroMo steel. The dropouts and all clamping surfaces and bolts are stainless steel. The frame tubes are smaller in diameter than other trikes, though the tube walls are thick (Main: 1.625 x .058; Cross: 1.25 x .049). Riders in the 6' range will require a no charge optional extended boom, or there may be some unnecessary boom flex. The Dragonflyer is painted a beautiful Emerald Green powdercoat.

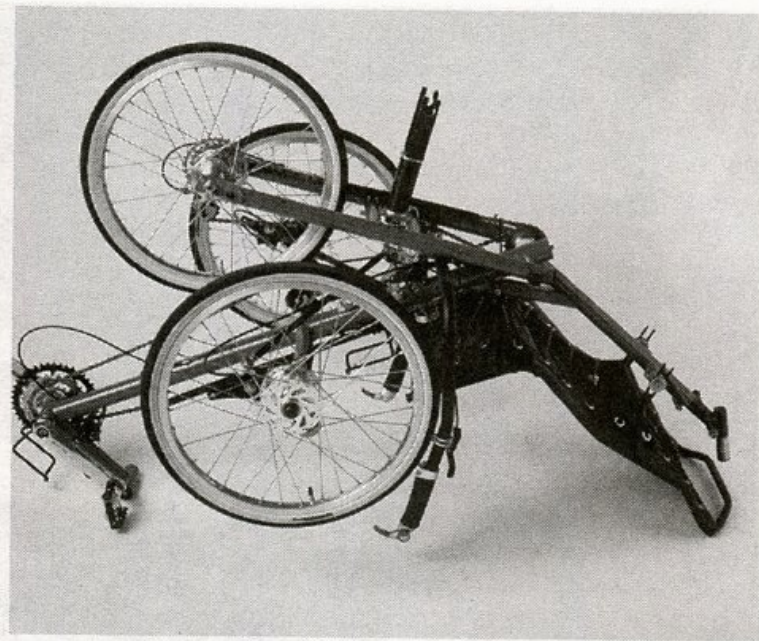
The handlebars are wide aluminum "U" bars that pivot on a headtube with an Aheadset under the seat to dampen the road vibration. The very tough looking steering connecting rods criss-cross and connect to the wheel spindles that also swivel on Aheadsets in their head tubes. The whole system is amazingly high quality, yet simple and straightforward. The lines of the trike, especially the rear-end suspension, are very slick and give the Dragonflyer a look all its own. The 20" wheels and medium-height seat make the trike look small. Both of my kids thought it was for them. The local NW riders were equally impressed on the Dragonflyer's 50+ miles maiden voyage.

There are clever details at every point of the trike. There is a water bottle braze-





Dragonflyer rear suspension/swing arm—Peter Litwinczuk



Dragonflyer folded—Peter Litwinczuk

on on the boom, pump braze-ons inside the stays. A rear derailleur micro-adjust (the kind used for road bike down tubes) is located within arms reach down along the right side of the swing arm. There are braze-ons, two on each side for fender mounts — with allen bolts in them already. A lower front rear fender mount allen bolt is in place. An allen bolt on each side of each front wheel spindle is in place for front fenders (coming soon). There are trailer hitch allen bolts on each side of the swing arm at the drop outs as well. An amidship mount pannier rack sets behind the seat, keeping the pannier weight low and centered properly. Bjoralt says they'll carry 40 pounds of stuff. An optional Delta mountain bike seat post mount rack fits on the back side of the pannier rack mounts and was the only option on our test trike.

#### ■ SEAT

The aluminum seat frame is powdercoated black. The nylon mesh is laced with poly cord. The seat is mounted with one allen bolt through the mainframe member, and the reclining seats use two more allen bolts and Vision-style seat forks.

The seat has an intense lumbar in the back shape that fit my low-upper mid back great. The top of the seat rolls backward into a cross support. At 6', I'm taller than the designer, so I could feel the cross support when I pushed hard back into the upper section of the seat. A no charge optional taller seat is available and is on the way to RCN.

The comfort from the mesh back seat and Hemp covered seat pad is excellent and worthy of comparison to the best Ameri-

can recumbent seats and perfect for world travel. The seat base has a high quality, though rather thin, Sunmate foam pad (earth friendly temper-foam like pad made with mostly natural fibers designed for people who sit all day) that shapes to your hiney. The pad is covered with an Earth Cycles trademark Hemp cover.

The Sunmate pad is not that cushy. In my initial 50-mile shakedown ride, I was starting to develop recumbent-butt after a few hours on the trike. I then reclined the seat back a bit, which helped, though can bring on neck discomfort. Nevertheless, this is the most comfortable recumbent trike seat I've found.

#### ■ THE RIDE

Right out of the box the Dragonflyer rode perfectly. My adjustments and learning curve took all of about 30 minutes. I clipped into my SPuD's clipless/platform pedals (included with the trike!) and I was on my way down the road.

It was getting dark and I didn't want to venture out on my regular loop, so I rode laps around my block. It's only .2 miles, so around and around I went. There's a long wide "S", a near hairpin, straightaway, a sharp turn, fast downhill, another sharp turn and a one long block climb—and no cars. This trike has a very low climbing gear, yet the high gear is big enough to pedal fast. I love 63-speed triple 20" trikes. The gearing for urban assault use always is perfect. Hey, if it's not, there's always your choice of any one of 62 more gears to choose from.

I rode it hard, with every lap, I intensified the power, rolling it into corners—and admittedly, trying to get one of the wheels

off the ground. And, I was unable to do it—sides or the rear, all wheels stayed on the ground (this is no guarantee that you won't be able to do it though). The handling is steady and stable. The Dragonflyer has a very smooth ride, with absolutely no pogo and minimal pedal steer (common on recumbent trikes). The shock placement on the Dragonflyer makes riding easier. You just don't have to fight the side-to-side stresses of tadpole trike riding as much as with other trikes. The swing arm and shock make for some controlled torisional flex. This in turn improves cornering while decreasing tailwagging/pedal steer which helps to keep the wheels on the ground—all while offering a smooth suspended ride. There is also a slight flex in the main cross-member, which adds to the ride comfort.

The Dragonflyer has smaller diameter tubing than other trikes, though the tubing is thicker walled than usual (1.5" x .049"). I experienced some boom flex, though Earth Cycles said this was out of the ordinary and shipped out an XL sized boom for my 45" X-seam.

The Dragonflyer has rather "extreme" rider ergonomics with the high bottom bracket/pedal (BB) position. If you are sensitive to BB height, be forewarned that the BB is a full 5" above the seat. The adjustable seat recline does tame the extreme riding position a bit, though to compensate for the BB height, I reclined the seat and experienced some toe numbness and neck strain after long rides, though this is par for the course for my body. The taller seat may help this situation. The ergonomics of the Dragonflyer are less extreme than the Windcheetah, Greenspeed or Trice.



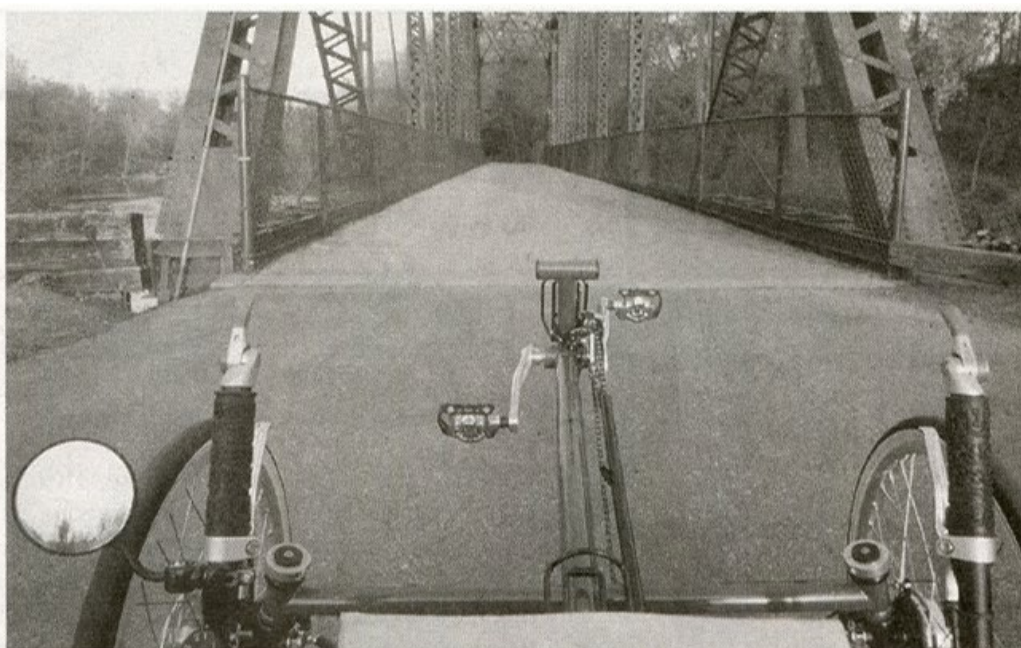
Riding a tadpole recumbent trike through a tight corner is the dream of many—a handling feel that just cannot be duplicated with any other vehicle. Its very different from riding a two-wheeler. Since most roads are crowned (high center in the middle of the road and round off to the sides), and we ride on the outside edges of these surfaces, your body can be off-center or even crooked when riding a trike. With the required body english 'finesse'—leaning into turns, weighting and dewatering from one side or the other—total upper body relaxation is not always available to a trike rider. All the trikes I've tested take more energy to propel, though I love not having to clip-out at stops.

I was amazed at how well I rode in our 'bent pack on my first open road 50-mile ride. The Dragonflyer is the most comfortable trike that I have ridden—it has a smooth, predictable and confident ride. It can hold its own with most any performance tadpole. In fact, I felt faster and more aggressive on the Dragonflyer than on other tadpoles. The key is that the suspension helps to keep all of the wheels on the ground—certainly better than the unsuspended trikes, though I doubt there would be much actual speed difference between the Dragonflyer and other similar trikes. My upper body was definitely more fatigued than usual after the 50 mile ride—something that never happens when riding my two wheeler.

#### ■ EARTH CYCLES

Earth Cycles is a relatively new company, and a small one to boot. Designer/builder Shean Bjoralt has proven that he can compete and build one very nice trike, though keep in mind that it is a new trike, our test version is one of a handful built so far. For any new design, there is a learning curve and changes will be made. There may even be unforeseen problems, though in the six weeks of testing our Dragonflyer, we sure didn't notice anything.

Dragonflyers are sold direct through Earth Cycles only and there is a lifetime frame warranty. Our trike came shipped in a large triangular shaped box. The trike was packed better than any trike we've taken delivery of. The fact that it comes from the USA makes shipping a breeze and no customs duty to mess with. The trike arrived by semi-truck and was delivered to my door. The only adjustment we had to make was the boom and front chain length. This is one item that we hope Earth Cycles will do for the customer. A simple X-seam mea-



*View from the big chair of the Dragonflyer trike—Peter Litwinczuk*

surement and front chain pre-cut to length could make the new trike owner's experience even better. There is an owner's manual and assembly is very straightforward. One slightly annoying feature of assembly is that a few US allen wrench sizes are required, though these are included. The reason for the non-metric sizes is that they are stainless steel clamps and bolts.

Our only other rant is the mediocre rearview mirror. It's plastic with flimsy mounts and vibrates on the side-sticks. Peter Ross has the right idea with the Trice, in a moped mirror mounted from a custom mount above the left front wheel headset

It was great to finally test an American tadpole that rivals the world's best. (no offense to our worldwide friends, but we needed one). Finally a designer who understands my trike rants and 'bent pet peeves. While I laid in bed last night, reflecting on the day's activities, I thought to myself that the trike should be painted red, white and blue, and that I should get one of Peter Fonda's red, white and blue Easy Rider helmets and play Bruce Springsteen's "Born in the USA" on a boom box tied to the rear rack. The trike comes with a two piece flag pole (and frame mount), so I'm looking for an American Flag to fly.

Just as there are two wheelers for tourists/commuters and hammerhead performance riders, the trike market is split in a similar way. My first impression of the Dragonflyer was of an ultimate tourist/commuter—leaving the high performance to the hard-tail tadpoles and rolling legends like the Windcheetah. This initial response was premature, as the designer is a former roadie racer and designed the Dragonflyer

to be real-world fast, as well as being a comfortable tourist/commuter.

As recumbent trikes go, the Dragonflyer is a deal at \$2995. Also consider that shipping charges will be much less than imported trikes. This trike has brought some of the best features in the recumbent world to one vehicle. This is a sweet ride guaranteed to put a smile on your face. From the well thought out little details, to the no pogo—no pedal steer smooth suspended ride, Earth Cycles has nearly thought of everything on the Dragonflyer. It's been awhile since I've been this jazzed about a trike.

Don't sit on the fence too long, as the Dragonflyer will be a very popular trike with enthusiasts. This is one very cool tadpole trike. Earth Cycles has done their homework and brought the best enthusiast trike design aspects that the industry has to offer—to the Dragonflyer. □

## Specs at a Glance

Model.....	Dragonflyer
Type.....	Tadpole trike
Weight.....	41 Pounds
Wheelbase.....	40 Inches
BB height.....	16.5 Inches
Seat height.....	11.5 Inches
Price.....	\$2995

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**RCN**

# The Comfort Cycle

A New Kind of Recumbent Trike

**By Robert J.  
Bryant**

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He continues,

"They have a bad habit of ground looping and can turn turtle" (Ground Looping is an airplane term which essentially means that the rear wheel wants to lift up and spin the trike around).

"Look at any two-wheel in front trike that's been ridden for awhile and you'll see a front end out of alignment." He summarizes by adding, "Their front ends and steering are just too complex."

The Chaise-3 is a unique trike. The designers have their own ideas about what a recumbent trike should or should not be. Don't get the idea that this trike was built to race. It's not a racer. It's not a "performance" trike. It is exactly what the name implies—a Comfort Cycle. A trike for common folks to cruise, tour, and ride in total comfort.

The Chaise-3 is often misunderstood. Many enthusiasts, including myself, just don't have a grip on what the Comfort Cycle is all about. It took until the 12th hour before press-time for me to figure it out. Luckily for me, the Comfort Cycle guys are quite patient with my rants.

With this in mind, the Chaise-3 accomplishes everything it's set out to do, and more. It is a simple, user-friendly design that has many benefits over the more performance oriented tadpole.

### ▲ CHAISE-3 DESIGN HISTORY

The Comfort Cycle trike is the long time dream of company co-owner, Bart Hiatt. Bart has a long history in the recumbent business, dating back to his years in Ohio and Peach Ridge Cycles. The inspiration for the Chaise-3 was the Coo's Bay Flyer designed several years ago by Don Harse, another Ohio recumbent maverick. Don had the prototype and the first few Coo's Bay trikes built by HPM's Jan Vandertuin. Trikes in many configurations were available on a custom basis, and plan-sets were available. With Don Harse's semi-retirement from the 'bent business, he gave Bart full blessings to evolve the concept into what is now the Comfort Cycle Chaise-3.

The Coo's Bay trike was much lower than the Chaise-3, and had a better center of gravity because of it. The Chaise-3 has a seat height of 18" and a significant amount of weight on the rear wheels. The Chaise-3 frame is two distinct sections. The rear section is built like a chariot. It is very stiff if you are judging it by the road shock, but

still flexes pretty good, as it is, after all, a trike. The seat is an integral part of the rear frame section, though the back comes off via allen bolts, as does the rear rack bar. The rear frame mates to the forward monobeam at a plate just forward of the front edge of the seat. The two sections are connected via six allen bolts—and the steering rods. The forward frame section includes a sliding bottom bracket extending out to a head tube. Careful attention is necessary to keep the crank centered when tightening it down on the boom. The mix of a very busy rear section with lots of add ons, matched with the almost spartan minimalist forward section is an odd one. It's almost like the designer got tired when he got to the front of the trike.

### ▲ DELTA PASSION

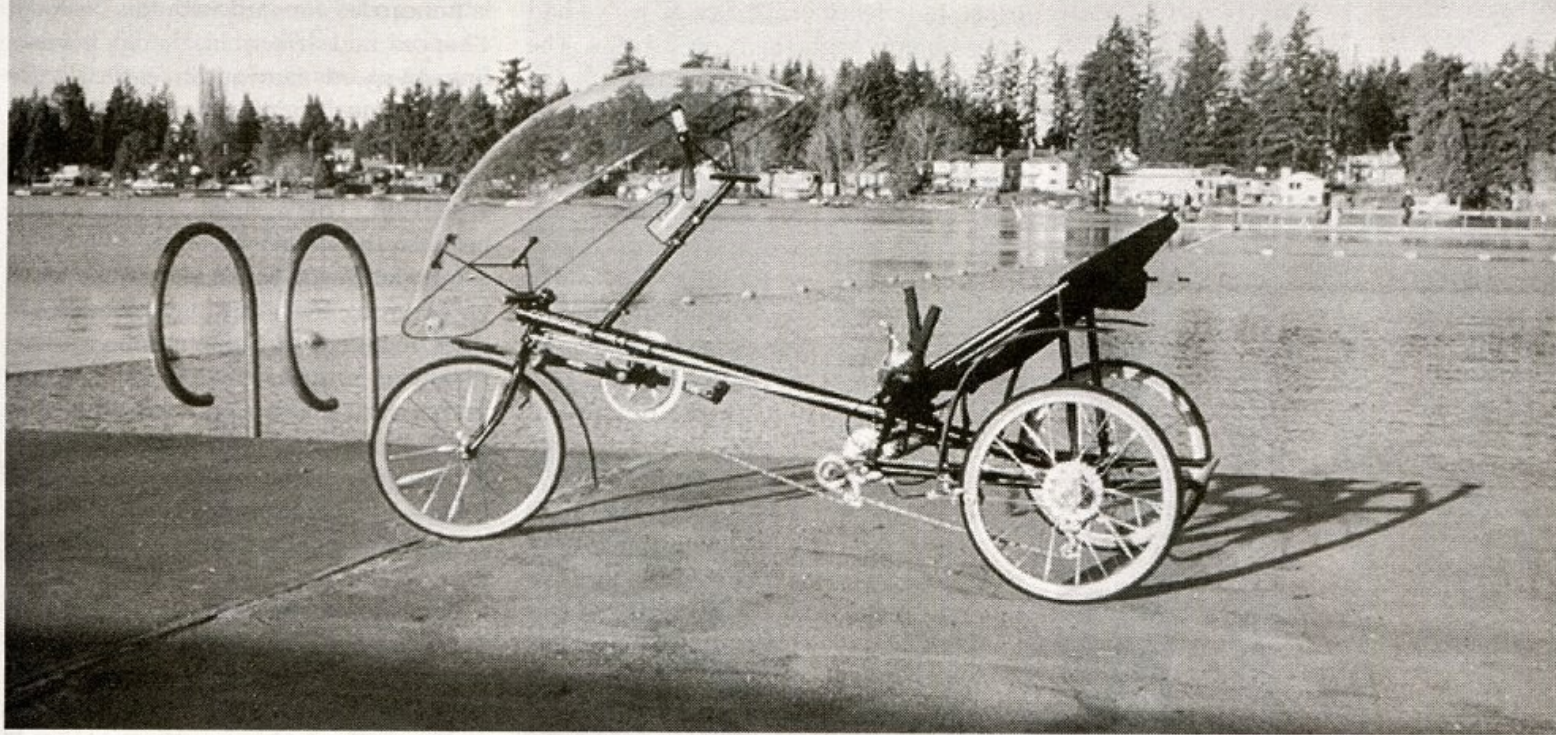
Designer Bart Hiatt is passionate and outspoken about his chosen design. And he should be, he's been involved with this particular design for several years.

Designer Hiatt speaks his mind, "Two wheel up-front trikes are completely unstable and are unsafe on the road," says Hiatt. He continues, "They have a bad habit of ground looping and can turn turtle" (Ground Looping is an airplane term which essentially means that the rear wheel wants to lift up and spin the trike around). "Look at any two-wheel in front trike (tadpole) that's been ridden for awhile and you'll see a front end out of alignment." He summarizes by adding, "Their front ends and steering are just too complex." These are bold statements about Comfort's tadpole competition, and the opinion of builder Bart Hiatt.

I didn't quite get it. Even after the first draft was done, I didn't quite understand. Comfort owners do. Several midwest dealers order a dozen at a time, and the Chaise-3 owners are loyal. Bart explained to me that the idea behind the design is to keep all of the systems simple, thus the two rear



# The Chaise-3



*Chaise-3 with optional fairing (old style) at Lake Meridian in Kent, WA—RCN*

derailleur shifting, one-wheel drive, frame mounted brakes and most of all, the delta design needs no complex steering geometry. I had the most difficult time understanding why the rear end of this trike was built like a roller-chariot fortress, and the front is a minimalist monobeam. "That's the beauty of it," says Bart. "The head tube angle changes, as it leans into a corner. As this is happening, there is a slight flex in the Phil Wood rear axles, all helping to move the trike in the new direction" says Bart. I do enjoy a good tadpole trike, though what Bart says about the design complexities is true. A tadpole front end must be bulletproof and the steering geometry correct. Most mere-mortal recumbent enthusiasts are not capable of front-end alignments. I know I've never given my car one. And I've certainly messed up the alignment of more than one test tadpole trike.

Bart's passion for his design is convincing and his thoughts on trike complexities do make sense, though the rest may be a bit extreme, as I haven't "ground looped" any trikes recently. I like to see passion from designers. Corporate bikes designed by committee are not as exciting or as bold. The passion flows at Comfort Cycle. These folks are serious and that's what I like to see.

## ▲ FRAME

The Comfort Cycle frame is built in Winnsboro, Texas. Our test trike was brazed of 4130 aircraft CroMo steel. This is retro traditional bike building at its finest. What differentiates this process from days of old, is that fillets are not filed or filled and the joint almost has the appearance of a MIG weld. Frames built after June '98 will be TIG welded—which is probably an upgrade. The frames are powdercoated yellow or black with custom paint options available. All of the Comfort Cycles we've seen were very nicely built with excellent finish quality.

## ▲ COMPONENTS

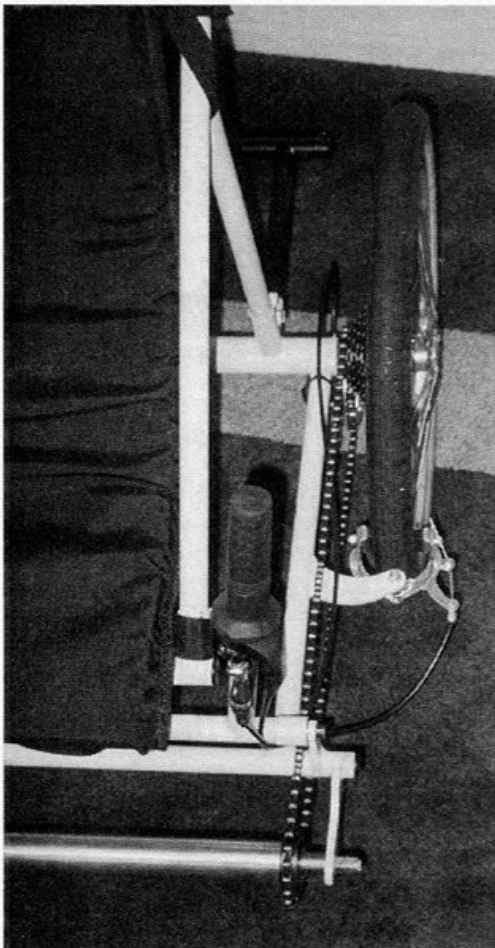
The Chaise-3 has a mix of exceptional and other semi-mediocre components—though upgradable. The rear hubs and axles are Phil Wood wheelchair hubs—bulletproof and exceptional. The front hub is also a Phil Wood and the wheels are actually built in the Phil Wood factory—outstanding! They are hand-built with stainless spokes and alloy nipples on Sun SL 17 rims. The 406mm 20" x 1.5" Primo V-Monster tires are an RCN favorite. Primo Comet 1.25" tires are an option. The wheels stayed true during our test—and survived our "on-two-wheels" torture test.

The Sachs Neos drivetrain is fine quality. The mid-drive and left (while seated) drive wheel Sachs Aris freewheels are shifted by two rear derailleurs making for a total 49 speeds on our test trike. The Sachs twist shifts are a favorite with recumbent riders and take less effort than the similar Grip Shift. Shimano bar end Bar-Cons would be the most ideal set up, though are difficult to find these days.

The shifters are mounted on the ends of the two steering side-sticks. These pivot at the frame, and with the two steering rods, one comes back as the other goes forward when turning. The side-sticks are nearly vertical. Twisting to shift and pushing forward and pulling backward make for a unique control experience. Comfort says that a new "S" bar that rises, goes forward, and then rises again, with more adjustment options is on the way.

There is a slight degree of play in the steering, that didn't seem noticeable in the ride. The steering is quick and perfect for slow-medium speed maneuvers, though very quick when you get into high speed, high performance riding. In a mid '98 update, Comfort is adding two steering rod settings that will dampen the steering and provide better high speed manners. The Chaise-3 design has limitations due to the





Chaise-3 jack shaft and drive-side

lightly loaded front wheel.

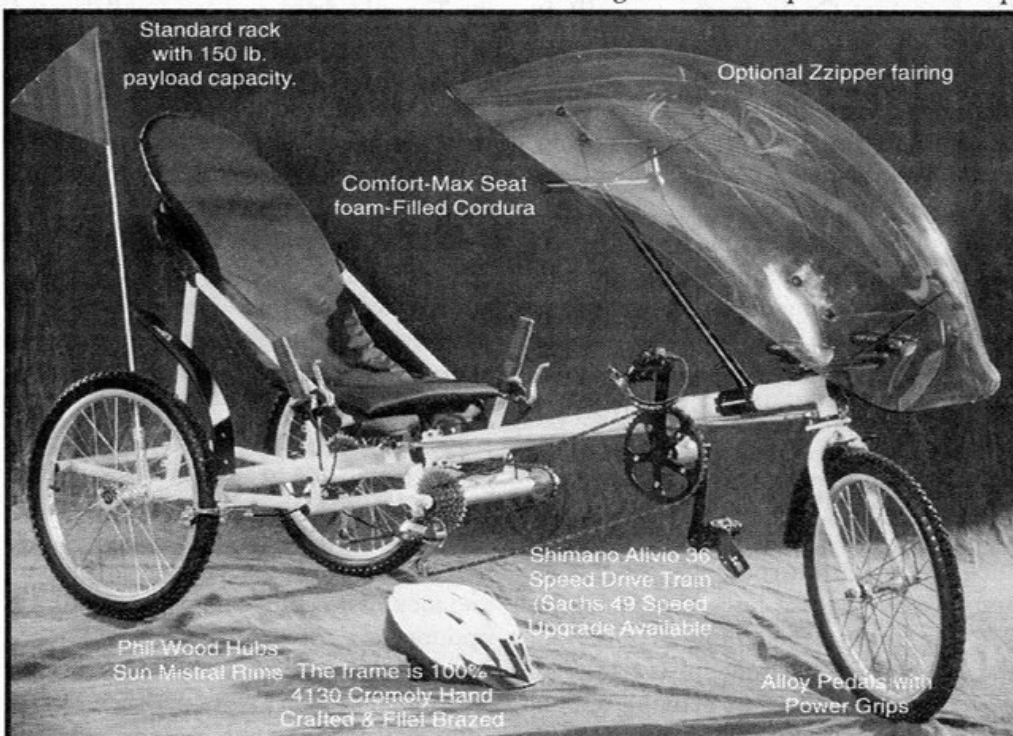
The Chaise-3 has a mediocre crankset for such an expensive trike—a Dotek, though it is a top-of-the-line Dotek 210 Pro. This is adequate for an entry level recumbent, though out of character for a \$2200 trike. In defense of the Dotek, we've had no problems with them on BikeE's. The most important feature of a crankset on the Chaise-3 will be a chainguard, as our test trike didn't have one, and the chain was thrown many times during the first part of our test. The fact remains that recumbents with single front chainrings (no double or triple crankset), and the lower end cranks do throw the chain more often. Comfort does offer an upgrade to your choice of single crankset. They carry a 110mm chain guard that will bolt on the outside of chainrings up to 53 teeth. So if you agree with my RANT, throw on something nicer—as the Chaise-3 deserves it.

The Comfort Cycle has a huge jack shaft that crosses the frame at the mid-drive to connect the front and rear chains and hold the mid-freewheel gears. This system is overbuilt and tough and not surprisingly built by Phil Wood. This section of the drivetrain has been completely trouble free. The mid-drive shifts pretty well. It has a longer learning curve and requires careful set-up,

but once accomplished it offers 49, count them 49-indexed gears. We had index shifting woes on the left rear wheel derailleur due to the axle bolt coming loose (and lack of a correct wrench to tighten it). Unfortunately, the simplicity theory of trike design is not carried forward with this overbuilt 49-speed mid-drivetrain, though it works fine, 49-speeds is overkill—especially for the “common” comfort seeking tricyclist.

Comfort's Phil Wood wheelchair hub axles require a 3/4" bolt to hold the left rear wheel on. There is a big nut that fits between the frame and wheel to hold the axle tight. The problem is that this wheel was coming loose during our early test rides, thus throwing off our index shifting. The problem has been solved by the factory. First they are tightening down the axle bolt more, and second, a 3/4" “skinny” bicycle type wrench will be included with Chaise-3 trikes from now on. The drive system is original and initially overly complex, though the overall design makes for a more simple overall system.

The Chaise-3 comes with some unexpectedly great stock pedals. They are not terribly expensive, but they work well—Wellgo ATB platforms with Power Grip straps. A very nice touch. Look for an upcoming report Power Grips in RCN#47.



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### ▲ BRAKING

The Chaise-3 uses two low-end alloy non-quick release basic Dia Compe road side-pull caliper rear wheel brakes—and they work great. Low-tech-retro-roadie at its finest. The brakes are connected to twin ATB-style levers mounted open-end up on the steering side-sticks and connected individually. The brake towers are an integral part of the frame and solve the problem of complex trike braking systems. For technoweenies, Magura hydraulics are optional on the Chaise-3.

The Chaise-3 has no parking brake, but needs one desperately. During our time, it was always rolling away from its mooring. It does, however, stand up on end for storage. I was afraid it would come down on one of my kids or my truck, so I bungeed it to something. Comfort's Jim Kueber says that a velcro leg band holding one brake-lever works great, has no moving parts, is simple and is a great low-tech solution.

### ▲ CHAISE-3 COMFORT

The Chaise-3 hammock style seat is the Don Harse trademark and found on all of his designs. (Don once built a SWB, too. Rumor has it Comfort has a SWB prototype.) The "Comfort-Max" seat is a high quality foam filled Cordura. The seat positioning allows your body to push into it and lets your body form the design, just like laying into a hammock.

We were able to try out and rant about the seat as it was being updated. The quality was fine, though the adjustment range needed work. The problem has been solved, and Bart says I won't sink so far into the hammock. The Comfort Max seat is comfortable, though I just didn't get the kind of back shape and comfort that I was accustomed to. The hammock design is more oriented toward cruising comfort than optimized for power generating performance.

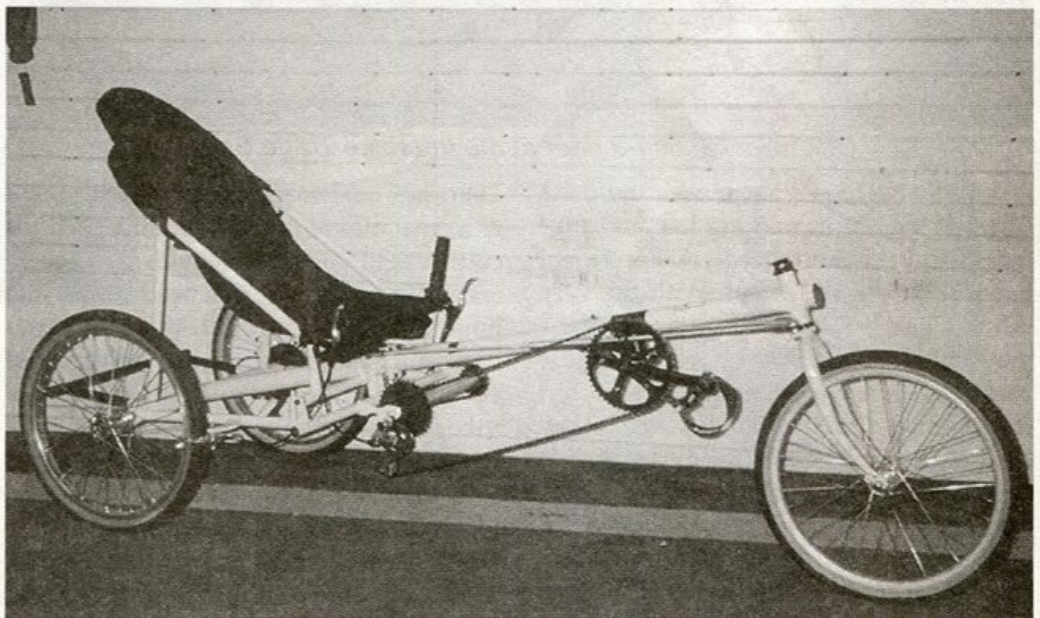
### ▲ CHAISE-3 PERFORMANCE

How does it perform? My advice is don't buy this trike if you're looking for out and out speed. Comfort's Jim Kueber and Bart Hiatt disagree. Jim takes demo trikes out to club rides. He then lets a fast ride leader ride the Chaise-3. He says they are inevitably fast, because they are far more comfortable. Jim also says the Chaise-3 has been very popular with women riders.

The Chaise-3 is definitely not up to the performance level of the Windcheetah—or the Dragonflyer. In fact, I found it to be a quite average performer—a hybrid of recumbents. The delta trikes I've tested all



*Don Harse's original Coo's Bay Flyer, a close relative to the Chaise-3*



*Comfort's Chaise-3 at People Movers in Orange, CA*

have two things in common: all have high c.g.'s, which means that they tip over if pushed. The higher c.g./rider position makes them easier to be seen in traffic, though not without a price. The other common trait is excellent low-medium bike trail handling, that quickly becomes a handful on a fast descent (though now Comfort has additional steering settings). The Comfort is a unique trike, and every aspect of its ride demonstrates this.

**FLAT LAND**—The Chaise-3 is right at home on the open bike or beach trail, or even city street. It's stable, maneuverable and a blast to ride. The balance is so good, that I was able to learn to do a quick weight shift, and put the Chaise-3 on two wheels. I was able to ride it around on two wheels indefinitely and on command (See Kent Peterson's web site: [www.halcyon.com/peterson/bentkent.html](http://www.halcyon.com/peterson/bentkent.html)), providing the left

(drive wheel) was still on the ground.

I love riding trikes, but feel very insecure in our busy suburban area traffic. On a two lane road where cars are traveling 50+ mph, I was stressed out, to say the least. Now around a quiet street, bike trail or school parking lot, the Chaise-3 shines.

**HILL CLIMBING**—Climbing on trikes is enjoyable, as there are no balance worries, though it is slow going. The reasons for this are the weight, seat flex, the forward frame flexes and the heavily loaded rear wheels. The Chaise-3 has a unique climbing trait. With the one wheel drive (left wheel), in steep climbs with heavier riders, the one-drive wheel can cause the front wheel to bunny hop, move left an inch or so left, touch down, repeat—with each pedal stroke. Designer Bart Hiatt said my experience was rare, though he had heard of it before.





*Unknown Chaise-3 rider at the Interbike Trade Show*

**DESCENTS**—What makes the delta Chaise-3 a blast in parking lots and bike trails at low-medium speeds, makes it a real handful on a fast descent. With the very quick Chaise-3 steering geometry the movements can be fast. I never was quite comfortable in my test course descents at over 20-mph. Bart says he's had his Chaise-3 at over 50-mph in the East Texas vertical real estate. He added that you do get accustomed to the quick handling, though reminded me that they've added two other steering geometry settings to dampen (slow down) the steering. The Chaise-3 is easy to learn to ride, though any high speed riding I would ever do on it would have to be away from traffic.

**▲ OPTIONS**

Our Chaise-3 came outfitted with the optional Primo Comet tires. These are the same great 406mm recumbent tires that we can thank BikeE and Vision for. They now come in 305, 349, 406, 451 and 559mm (26") sizes. Commuters and tourists should opt for the stock Primo V-Monsters. The optional "Apex" one-bolt fenders are an RCN favorite. I originally saw these on Bike Friday's. I have all the different sizes (20" and 26" in several shapes) in my shop and I can mount them in 5 minutes or less to nearly any 'bent. They work well, are simple, tough though they have a hardware store-chic about them—not beautiful, but very functional.

Comfort offers some neat options.

There is a dashboard mirror mount, which is a great idea as mirror placement is difficult. A light package includes twin flashers and two front halogen head lamps. The huge Bushwhacker multi-purpose cargo pack trunk takes advantage of the huge area behind the seat. A ledge off the back of the trike (in between the rear wheels) is actually a rack or with a little adaptation a cargo rack. Comfort says that you can put up to 150 pounds of stuff back there.

Comfort Cycle has been involved in some alternative auxiliary power projects. They plan a NASA designed 3/4 H.P. electric motor option that ties into the jackshaft. The battery packs will either be mounted behind the seat, or up front.

The latest option is the tandem trike "hitch." Two Chaise-3 trikes can be linked together with an optional trailer hitch on the back of one Chaise-3, and the inserting of the second Chaise-3's front fork into the 360 degree swiveling quick release clamp—a most unique tandem/single combo. This has to be the best choice for couples where one rider may put on more miles.

**▲ CHAISE-3 FAIRING**

I requested a Chaise-3 fairing to try out. RCN readers know that I am one of Karl Abbe's biggest fans and put Zzipper fairings on every bike I can. Comfort buys Zzip Designs experimenter kits and builds their own mounts. The mounts are nicely done, though have a very limited adjustability range.

The low seating position and incline of the forward frame section (boom) have most riders looking through two thicknesses of Lexan. After a short time of this, my eyes went blurry and I thought I was back in the 60's on a magical mystery tour. The optimum placement for Zzipper fairings and Zzip Experimenter kits is so that the rider looks slightly over the top of the bubble and NOT through the distorted view of the lexan. Bart Hiatt has reconfigured the fairing by moving it farther outboard on the bike and down a bit lower. Bart says he's had a few complaints from owners who now can't see through the fairing. I guess you can't please everyone.

**▲ COMFORT CREW**

Comfort Cycle Chaise-3 trikes are sold through dealers across the USA as well as direct where there is no dealer. Direct customers are offered completely assembled Chaise-3 trikes shipped in a custom box, requiring only the installation of the front wheel, though we recommend dealing with a Comfort Cycle dealer if you can. The 49-speed Chaise-3 retails for \$2295.

The Chaise-3 is an excellent value, and the finest delta trike that we've tested. Comfort Cycles is committed to recumbency. Bart Hiatt and partner Jim Kueber are attentive and working very hard to refine the Chaise-3, and their hard work is duly noted. The delta trike is at its best for flat city commutes, bike trails, and country road touring. The ideal customer is a rider not looking for the Ferrari performance, but a more relaxed, balance-free 3-wheeled LWB kind of feel. As Bart Hiatt says, "what other recumbent can you cruise along, and smell the flowers—at 3mph." □

**Specs at a Glance**

Model.....	Chaise-3
Type.....	Delta trike
Weight.....	42 Pounds
Wheelbase.....	62 Inches
BB height.....	13 Inches
Seat height.....	18 Inches
Price.....	\$2295

**Comfort Cycle**

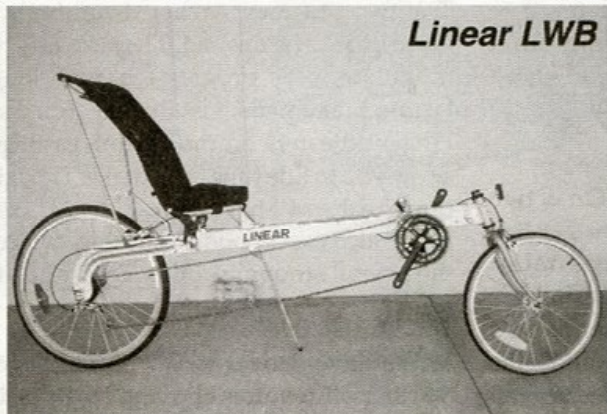
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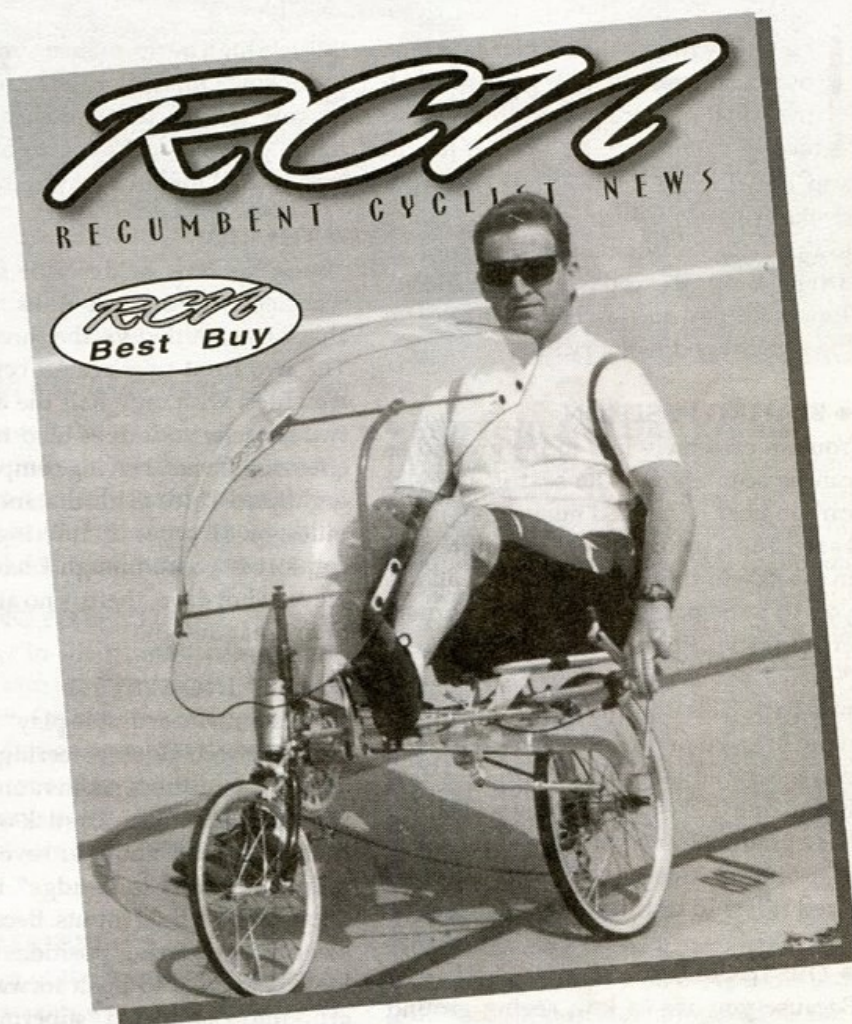
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by Ed Gin

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I have now ridden the Windcheetah just over 1,500 miles. I have gone through the ritual of getting used to the position of the seat vs. BB bracket height and developing an efficient pedaling stroke. There is a distinct learning curve to this vehicle. What's it Like? It's like driving a gokart except you have to pedal. Tons of fun, joy, and fascination in relearning a childhood memory.

#### ◆ SEATING POSITION

You are extremely low to the ground as can be seen above. The seat is a kevlar carbon fiber reinforced bucket that is not as rigid as it seems, it does flex quite a bit in the side to side direction which allows you to anticipate and lean into corners efficiently. Position is moderately "OPEN" similar to the Tour Easy but laid way back. This uses the thighs and quads more so and de-emphasizes the gluts. You can easily adjust your position a few inches due to the nature of the seat which has a gradual transition from seat back to seat bottom, this has allowed different sized riders to test the bike.

#### ◆ OBSTACLES

Because you are so low, seeing ground obstacles is a little difficult, compound the fact that you now have 3 tire tracks to worry about, add in the higher speeds this bike will allow, and it's a new ball game. Pick the lesser of the bumps is the philosophy I follow. Luckily the seat is "fully mounted" on rubber isolators that really take off the edge of many bumps and tame road imperfections.

#### ◆ COMFORT

The bucket fits well for the majority of riders that have ridden this trike. A long 1.5 inch thick pad runs along the entire seat with a 2-inch headrest, just below the height of the rear of my helmet. Because

this is a high performance, meaning "compromising" mount, with the high pressure narrow tires, stiff chassis, narrow front track, you will feel a lot more road shock transmitted to the seat system.

#### ◆ THE RIDE

"Busy," is how to describe it. On a two wheeler, with one tire track, you get less shock transmitted vs. the three tire tracks. The two front tires are off center and are weighted with only half the amount on a two wheeler so it does tend to nullify the effect somewhat. Having completed several organized rides with distances over 100 miles, on all types of differing terrain, the comfort is good, though I haven't ridden on very hot days, there is no air circulation in the seat design.

#### ◆ STEERING SYSTEM

There is "no measurable play" in the rather petite tie-rod/U-joint steering system creating a very direct, positive and quick responding effect. The joystick was a little bit twitchy at first, but after several hundred miles, I learned to "nudge" it to turn or apply smooth light inputs. Because you can steer from differing positions on the fly, I have been able to push forward both my arms into a simulated "superman position" on fast descents. It's interesting that reinforced nylon tie rods are spec'ed vs. aluminum or composite ones, perhaps designed for shock absorption?

#### ◆ BUMP-STEER AND STABILITY

From all test riders on this bike and my experience to date, there has been not a single incident of "bump steer" observed. This is a true tracking trike and at higher speeds, the stability is reassuring. Many times I have ridden "hands off" to demonstrate this, on crowned roads and curved ones. On one descent at over 40 mph, I hit a pothole with the left front tire with no problems at all.

#### ◆ BRAKING SYSTEM

The two Sturmey Archer drum brakes leave little to be desired. They are easy to modulate, very progressive, with long lasting brake pads, just like on your car. Finger adjusters on the custom castings allow you to fine tune each brake. Though the bike doesn't have a "real" rear brake, just a nice cast "spoon" parking device, the overall stopping ability is very good.

#### ◆ BALANCING

Trikes have it over two wheelers here. Starting off requires clipping in the pedals and riding off—a no brainer affair. Speeds can vary from 0 mph on up without worrying about falling over. At stop signs and intersections it is reassuring to just sit and relax till the light changes. No energy is wasted on balancing while waiting. On super steep climbs if you must stop and get off, just put on the brakes, rest, and continue up in a little while. In slippery conditions, snow, sleet, or rain, balance is maintained.

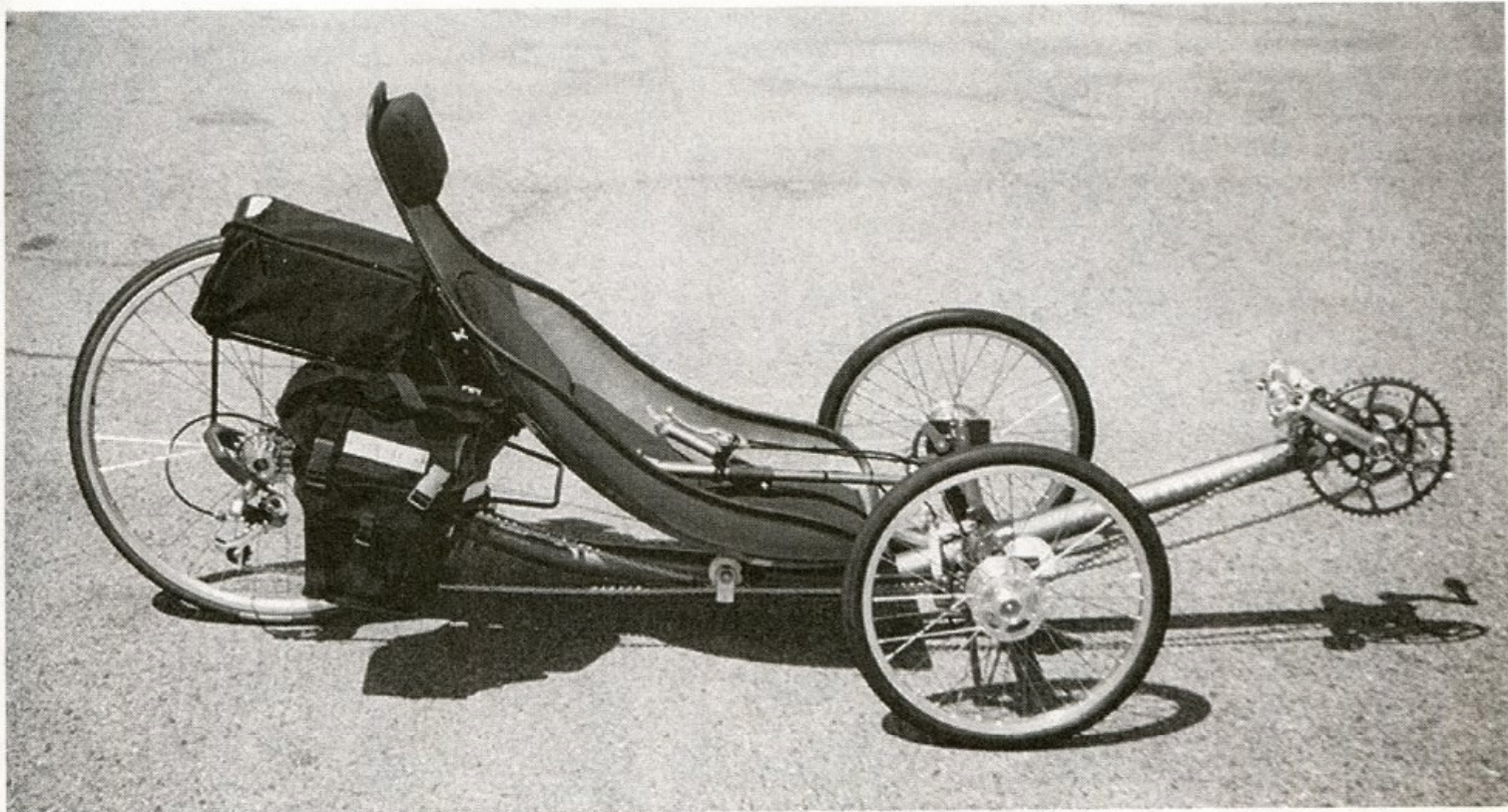
#### ◆ CORNERING

Extremely high cornering speeds can be attained with experience, the very low center of gravity helps. On the bike trails where the pavement makes smooth transition to hard pack you can cut the corners with one of the front wheels and smooth out the turns to maintain higher speeds than staying on the pavement. This also helps to minimize tire scrub.

#### ◆ FLIPPING OVER AND 2 WHEELING

Yes, I have flipped the trike. Fooling around on a huge skid pad of ice caused me to flip it as I slid sideways off the ice onto the pavement, instant end-over. I saw it coming and rolled twice, no damage except to the ego. Two wheeling this bike is relatively easy to do, especially if you corner hard and take chances. To control it is dependent on how much run off





*The Windcheetah with touring rack and panniers*

you have left in the turn. I don't recommend this very often.

#### ◆ VISIBILITY BY DRIVERS

A major concern for all cyclists is safety and visibility to the motoring public. I have ridden about half the mileage on the streets and have noticed that drivers give me "more" room as they pass. Because I am so low to the ground, my uniqueness attracts more attention, similar to riding fully faired. Is it more safe, I guess so if they see me. The judicious use of the mirrors is recommended. Approaching intersections requires more caution because crossing traffic will not see you till you enter it.

#### ◆ TAILWAGGING

There was noticeable tail-wag (or pedal-steer) at first when I pedaled above 18 mph and had an inefficiently jerky stroke. There was no loss of directional control, though the wag did bother me a bit. Pulling on the pedals alleviated it in the beginning but now that I have developed a smooth stroke, there is not much wagging even at high cruising speeds.

#### ◆ DRIVING SIMILARITIES

Turning on this trike is like driving a car in that you feel the sideways tossing of your body. The cradling effect of the seat is similar to the security felt in racing bucket seats in vehicles. It is an odd feeling at first because on two wheelers you tilt to absorb

side motions and the transfer of weight is directed downwards towards the seat vs. sideways on a trike. You do get used to it in a short amount of time once the stability is recognized and confidence reassured.

#### ◆ TRASHING POTENTIAL

Being so low to the ground has the tendency to get you much more dirty than being up higher. On a recent rainy ride with BikeE and V-Rex companions, I got trashed significantly more than they did, especially since it was on a rainy, damp, muddy bike trail. Fenders are available in the touring package.

#### ◆ EXOTIC MATERIALS

Though much of the bike is custom, many of the components are easily replaceable. The proprietary bottom bracket, rear axle, front hubs, use standard sealed bearings which can be replaced easily. The front hubs are propriety but costs about \$60, not too bad considering. The rear hub is standard Phil Wood wheelchair design.

This is a rigid setup and with heavy pedaling, the deflection is noticeable due to the seat moving on the rubber isolator mounting system, actual frame movement is slight.

Since the Seat of the Pants company has taken over production in the last several years, reliability has been excellent in contrast to the past when these frames were sold as kits to be assembled.

#### ◆ SHIFTING AND DRIVETRAIN

The Ultegra bar-end shifters and Campy derailleurs with Hyperglide cluster shift perfectly and access to all three chainrings is buttery. High tension side is maintained by two nylon sealed bearing pulleys, one quite larger than the other. Chainline angle at the seat is about only 25 degrees to minimize losses, with the second high tension pulley angle at less than 5 degrees. The return chainline is nearly straight as it goes through nylon guides and can be heard somewhat at first but is tolerable and not noticed after time.

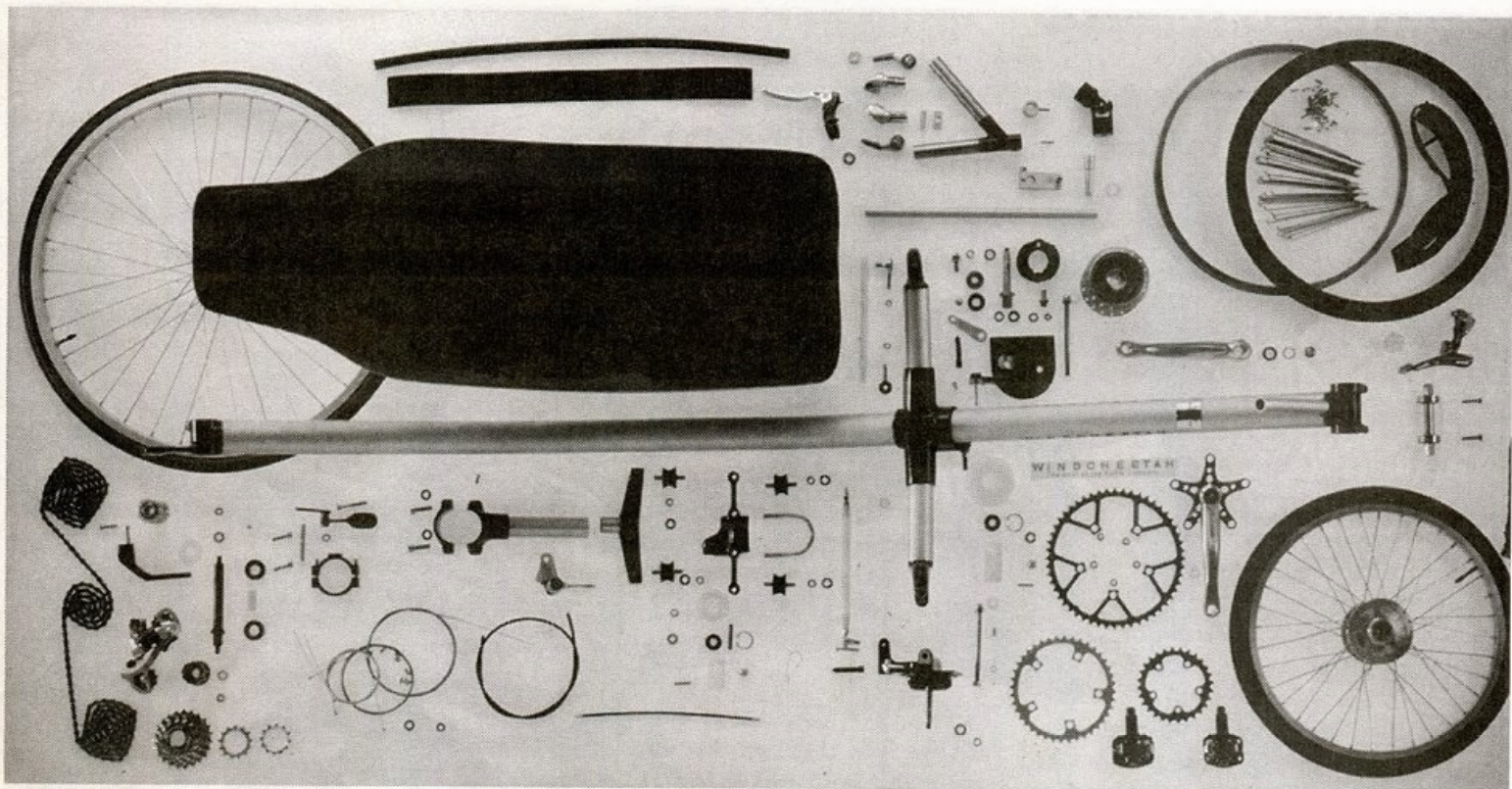
#### ◆ AERODYNAMICS

This is the single most important issue regarding speed on a bike. Note the much lower riding position compared to the Y-Bike rider. Some theories state that closer to the ground air move less than higher up. I am less than half the height of Jeff, subsequently, my total frontal area is less than half his. Add the wind resistance of the front wheels and there is still a major advantage compared to the upwrong, wedgie, horsey, traditional, regular, mass produced, platform (whew!, have I covered it all)?

#### ◆ ROLLING RESISTANCE

Most of the weight is shared amongst the two front tires. The rear tire is shielded by the rear seat and only a few inches in the slipstream (See below picture) and with the lighter weight that it carries, not much roll-





Windcheetah parts—Seat of the Pants Company

ing resistance occurs here. My counterparts are always boasting, "You have three distinct tire tracks in the wind whereas we have only one with the second wheel directly behind the first one.....you are saddled with a "Major" disadvantage, big time!" I think they are exaggerating things a bit, the total of the three tires does result in more rolling resistance than a two wheeler, though not by much.

In quick turns, you can hear the tires scrubbing. Yes, this is inefficient and does slow you down a bit. The worst thing is that tire wear is noticeably greater, especially the front turning ones.

#### ◆ SAFETY AND WIDTH

Because this trike is only a little over 25 inches wide. It can easily be moved in between doorways, and occupies nearly the same width as most bicycles. The wheels only stick out a few inches beyond my legs. This is a very compact package!

I've ridden with the right tire really close to the curb and at times off the pavement "straddling" as you might say. This has put me over more to the right than others in front of me. I attribute this riding style to the safety of the three wheel stance.

With a vehicle this low, safety flags or spinnies (wind socks) are recommended.

Due to the low BB height and minimum pedal clearance, caution is advised approaching driveways. I have scraped my heels while approaching ramps. With a size 10.5 shoe I have less than 2.5" of ground

clearance on the flats.

#### ◆ SPEED

The Windcheetah is the fastest unfaired bike I have ridden on the flats and straight roads. Let me qualify this biased, subjective, non scientific, OPINION. On open territory, in organized rides, I can maintain pace-line speeds aerobic, a task that I could only duplicate and exceed in a fully faired bike. This I attribute to the excellent aerodynamics of the bike. However, on a twisting, winding trail, with tons of turns, the speed effect is reduced due to the scrubbing of the tires, caution about oncoming skaters, riders, and the fact that speeds above 20 mph are illegal and dangerous. Take this bike to the open country and have a ball. Racing configurations of this trike go over 50 mph on the flats and have been timed at over 70 mph on descents.

#### ◆ HILLS

Because this is a lightweight trike having all aluminum construction with lots of titanium parts, it helps in hill climbing. Add in the stiff seat design and you have a great climbing bike, better than even the Lightning unfaired. Two local overpasses are my testing grounds and I have gone over them at speeds approaching level cruising velocity. On several long climbs I have only had to use the granny gear once. I'm not stating that you will climb like mad, only that the bike has lots of potential.

On the downhills, this is the fastest



Windcheetah joystick controls

## Specs at a Glance

Model.....	Windcheetah
Type.....	Tadpole trike
Weight.....	31 Pounds
Wheelbase.....	41.5 Inches
BB height.....	13.5 Inches
Seat height.....	7.5 Inches
Price.....	\$4200

### Seat of the Pants Co.

England

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coasting unfaired vehicle I've ever ridden. On numerous tests in organized rides, I have even out coasted tandem teams, the usual champions in this league. It will be interesting to compare it to Bill Murphy's low racer or the M-5, Festina type bikes.

◆ **CONCLUSION**

As much as this bike costs to acquire, there are other trikes that perform very well and are less expensive. The Greenspeed and Trice are fine examples to consider.

Having ridden a fully faired bike for quite awhile, I got addicted to speed, espe-

cially on descents. The down side is that unfortunately, high speeds equate with danger in cross winds, not the time to fall down. Throw in the fact that I'm diabetic with poor healing properties, and I have a dilemma. That is why I investigated the trike kingdom.....to eventually fully fair this vehicle and minimize side wind effects at all times, including fast descents.

This is the single most "IMPORTANT" aspect about this trike. If you ever get a chance to ride one, do so, it is well worth it. Your test ride will speak for itself. Can I have my cake and eat it too!? ☐

*Fast Eddie Gin, as he is known in his home town of Chicago has been riding bikes for over 40 years, many spent on wedgies. Recumbent cycling is his new drug of choice used to control his diabetes in conjunction with diet. His challenge to train regularly through harsh midwestern winters, mandates shelter in the form of full fairings. Ed has led seminars on homebuilding full bodies of coroplast (People Movers video). Ed is self-employed as a desktop publisher. Ed's wife Shirleen loves her new Rans Tailwind and son Garrett (7) wants one too. Ed's youngest son, Brandon (5) prefers a trike since he's still on training wheels. See Ed's web site at: <http://www.mcs.net/~gkpsol>*

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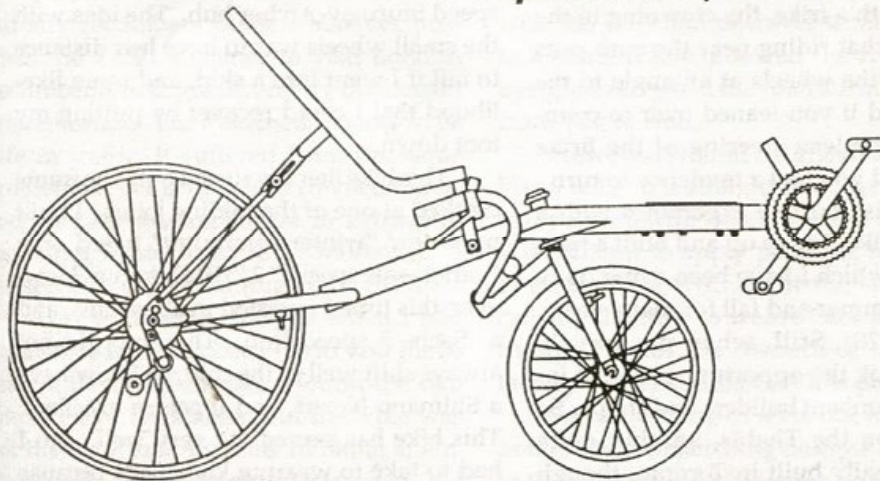
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**By Michael  
Wolfson**

wolfson@statcan.ca

Virtually every road is crowned at its highest at the center line, and slopes off to both sides for storm drainage. On a bicycle, this doesn't matter, because you naturally ride with the plane of the wheels and the rider oriented vertically. But with a trike, the crowning in the road means that riding near the curb puts the plane of the wheels at an angle to the vertical.

I have now been commuting almost every day for about five months on a new recumbent trike from Germany called a Culty. I bought this trike after more than a year of rather intensive research, and about a decade of recumbent experience.

In fact, my first recumbent was a mail-order Brike—a lean-to-steer delta (two wheels in back, one in front design, similar to a Fun Cycle). I was captivated by the Brike, which I first saw in a tiny ad in the back of Popular Science. Once I tried out the Brike, I was immediately disappointed. First, its handling was not very good; and it was too low to the ground for me to feel safe in traffic. Most importantly (and obviously), I found it very uncomfortable to ride with my back tilted to the side. Why so? Virtually every road is crowned at its highest at the center line, and slopes off to both sides for storm drainage.

On a bicycle, this doesn't matter, because you naturally ride with the plane of the wheels and the rider oriented vertically. But with a trike, the crowning in the road means that riding near the curb puts the plane of the wheels at an angle to the vertical. And if you leaned over to counteract this, the lean steering of the Brike kicked in and you had a tendency to turn.

After this abortive experience with a recumbent trike, I gave up and built a two-wheel SWB which I have been using daily in spring, summer and fall for many years. (See RCN #28). Still, when my travels allowed, I took the opportunity to visit interesting recumbent builders and shops. So I have ridden the Thebis, another delta design originally built in Toronto, though now out of production (See RCN #10).

The Thebis had an ingenious integrated front pedal/front hub, with side stick controlled rear steering, and exquisite engineering and fabrication, including CNC machined titanium and epoxied aluminum.

(In fact, my SWB's seat is from a Thebis.) But I found the steering difficult. While it was adjustable, it was either too fast, making the bike difficult to control at higher speeds, or too slow making the turning radius for low speed maneuvering too large. The engineering, while beautiful, seemed too sophisticated to promise long term reliability (e.g. universal joints for rear drive + rear steering). And with a seat height like a two-wheeled recumbent, you could not corner at any speed. So again, I decided that two-wheeled recumbents were the only kind worth considering.

The only season when I wasn't using my SWB recumbent was the winter, though by 1990 I had begun commuting by bicycle year round. The main reason for changing bikes for the winter commute was that I had too much invested to subject my beautiful machine to the corrosive environment of Ottawa winters (i.e. the salt put on the roads to melt the ice). So I used an upright "clunker" for my winter commuting. This started out as a cheap 20" folder with a 3 speed Sturmey-Archer hub. The idea with the small wheels was to have less distance to fall if I went into a skid, and more likelihood that I could recover by putting my foot down.

This bike literally rusted out! The frame cracked at one of the folding joints. I built up a new "winter commuter" based on a "garage sale special" 24" BMX frame. However, this time I invested in alloy rims, and a Sachs 5 speed hub. This hub did not always shift well in the cold, so I now have a Shimano Nexus, and it seems excellent. This bike has served me very well. But I had to take to wearing knee pads because it seemed that every winter, I would have at least one or two falls that I couldn't avoid, and my knees generally took the hit. The winter of '96-'97, I managed to find some Nokia studded tires, and didn't fall once.

My concerns over skidding and falls in





*The Culty FWD trike—Michael Wolfson*

winter commuting wouldn't be a problem on a trike. But I had put the idea of a recumbent trike out of my mind because of the discomfort associated with the crowning on the road.

Still, in my travels, I continued to check out any recumbent bikes whenever possible. So I had a chance to visit London Recumbents in England, and try the elegant Windcheetah. But it seemed too low to be safe in traffic; it suffered from the same problems of being tilted on crowned roads, and was far too expensive to subject to Canadian winter road salt. Moreover, I missed the suspended ride of my SWB.

My views were changed when I had the chance in December 1996 to visit Flevo Bike in the Netherlands. I found the two wheel Flevo unridable, but the trike was not that bad, and it got me thinking again. There were in fact two problems with the standard rigid frame trike designs. One was that you couldn't orient the seat vertically when the road was sloped. The other was that you couldn't lean into corners.

One apparent solution to the second problem was lean steering. That was what

attracted me to the Brike in the first place. But the Flevo was very unusual in that it had two axes of rotation. One axis, between the seat and the FWD front wheel, controlled steering. The other axis of rotation, between the rear axle and the seat, aligned with the direction of travel when moving in a straight line, allowed the rider to sit upright even when the road surface sloped from side to side.

However, I found it difficult to ride the Flevo trike in a straight line, because you really steer it with your trunk and legs. And it is difficult to apply pedaling force with alternate legs without at the same time causing the trike to weave back and forth, though one of the owners of the Flevo factory demonstrated that it is possible.

So I didn't buy a Flevo, but when I got home, I began sketching designs and playing around with different concepts. I couldn't resist the idea any longer, so over the summer, I built a prototype FWD delta trike with two axes of rotation—one for steering, and one to lean into corners or keep upright on sloping surfaces as required. It was a failure. I could ride it,

but it took so much arm strength to keep the front part of the frame oriented vertically, that it was difficult to steer, and very tiring. Also, the steering was very twitchy.

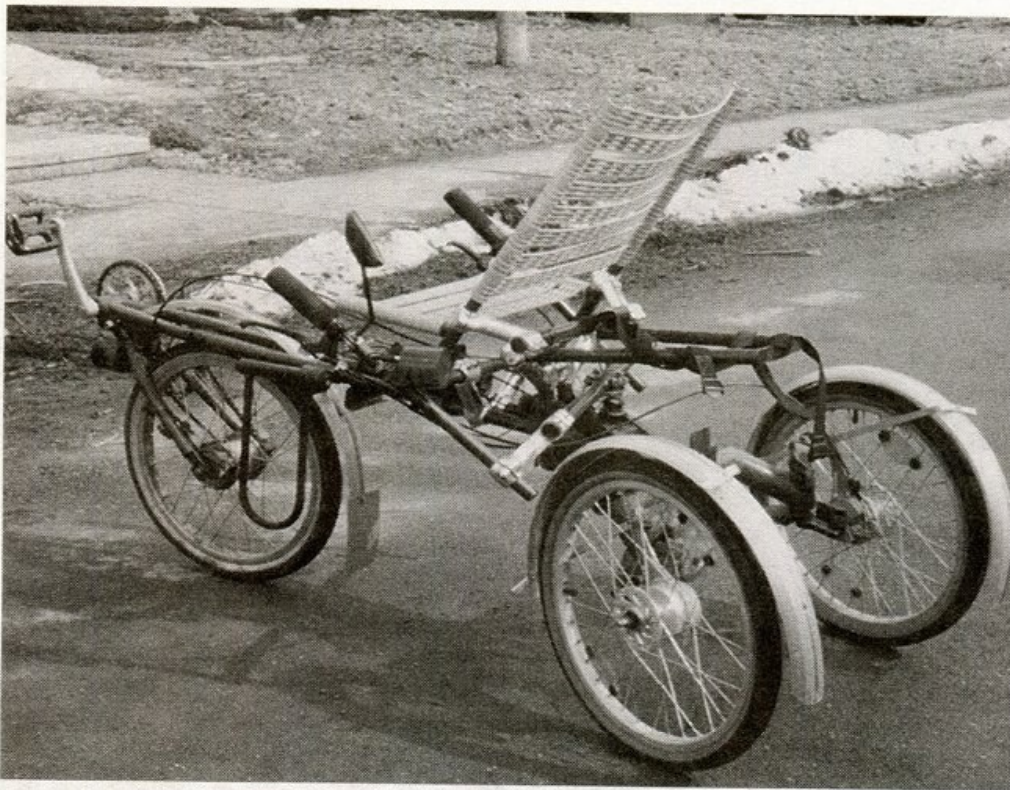
So for my next step, I got rid of one axis of rotation. This left me with something like my original Brike, and more importantly, something like the now out of production Raven—a beautiful looking lean steer FWD delta trike. However, I still found the steering on my revised prototype very twitchy.

With the help of the internet trike mailing list ([www.ihpva.org](http://www.ihpva.org)), I was able to figure out the problem—I needed a greater distance between the rear axle and the steering axis.

By this time in my prototyping, it was early fall, and I was getting a bit frustrated. Then I heard about the Culty, a "strange" German trike. I tried to find out more about it, first seeing a picture in Encyclopedia 4, and Oliver Zechlin's HPV CD. What I saw seemed really neat.

As it happened, I had to be in Washington D.C., so when I learned they had a Raven in stock, I made a side trip to Mt. Airy Cycles to try it out. I was quite disap-





*The weird and wonderful Culty trike from Germany*

pointed. While the side stick steering design was beautifully done, the 20" wheels were the skinnier 451mm and was not designed to take the fatter 406mm BMX size or the knobbies I needed for winter.

When I took the Raven for a ride, I found the steering counter-intuitive (as with the prototype I had been building)—you have to "turn right" to go left. I suppose I could relearn the correct instincts, but at one point going down a hill at some speed, I turned the wrong way and ran off the road. Fortunately, at Mt. Airy, it was a back road with no traffic and wide shoulders. Then, pedaling up a not too steep hill, with perfectly dry pavement, I found the front wheel was spinning. The problem was that my center of gravity was so far back that there was almost no weight on the front wheel, so very poor traction. This was definitely unacceptable for my winter needs, so I gave up on the Raven.

It then turned out that I was going to have an opportunity to be near Stuttgart, Germany, where the Culty is made. So I phoned over to see whether I might come by and try one out. Thomas Poreski, one of the people responsible for the Culty, speaks good English, and invited me to stop over at their factory. Well, after inspecting the design and engineering, I tried one out, and was truly impressed. All the complex and subtle design trade-offs that I had come to appreciate had been cleverly addressed. So, throwing my bank book to the winds, I

bought it, took it apart, boxed it up, and brought it back with me on the plane.

Now I had violated one of my basic principles, which was not to subject an elegantly engineered expensive cycle to Ottawa's road salt. But the least I could do was minimize the expected damage. So when reassembling the trike, I used some old bicycle inner tubes to enclose the steering linkages, and I built rear fenders to keep the snow and slush off the rest of the trike.

So what is this Culty, and what are its neat features? From the picture, it is difficult to tell, because a number of elements are rather complex. Basically, there are two assemblies. The front wheel, pedals, and seat make up one. The rear "axle" and wheels make up the other. But the front assembly also includes a fully suspended (swinging-hinged at the front near the bottom bracket) front fork (like the Flevo), using elastomers, and a rear carrier rack. The rear assembly is also fully suspended via a central parallelogram of rectangular tubes with elastomers inside. The side sticks that control the rear steering are connected indirectly, via tie rods and ball end joints, such that they reverse the direction of handlebar motion in relation to the rear wheels. The result is that when you point the side sticks left, you turn left.

And finally, there are two effective axes of rotation. The first is the steering, which has kingpins at each rear wheel. The second is like the Flevo trike. The two main

assemblies are connected by the equivalent of a bicycle front fork bearing, aligned horizontally in the usual direction of motion, just under the rear of the seat. This allows the seat + pedals + front wheel to lean at any angle to the vertical. In fact, the system is nicer than this. The bearings connecting the front and rear main assemblies are a standard ball race at one end, but tapered needle bearings at the other, apparently to handle the higher loads. And there is another elastomer or rubber cylinder placed to keep the front from flopping over, and to offer resistance to the "lean" axis.

The trike comes with 20" 406mm BMX size wheels all around. The front wheel had one of the new Sachs Elan 12-speed hubs, and caliper brakes, while the rear wheels each had a Sachs drum brake hub. The axles were nonstandard 12mm for extra strength. The brake lever on the left side stick has a fitting so that it pulled the cables for both rear brakes simultaneously, and the lever also has a gizmo in it so that you can lock the rear brakes for parking. The brake lever on the right was for the front wheel. The trike came with Schwalbe Spezial City Marathon 1.25 tires. I substituted my Sachs 7-speed drum brake hub from my SWB, so I could put the new Sachs Elan 12-speed hub on my 2 wheeler. I put wider tires on all around as narrow tires are overrated.

This is where I had my first problem. The front frame assembly does not offer enough clearance for tires wider than 1.75."

My second problem was that when I reassembled the trike, I did not know to pay any attention to the toe-in of the rear wheels; so I got it wrong. I finally phoned Thomas in Germany to ask why my rear tires seemed to be wearing so quickly. He said that I needed about 1cm of toe-out. Once I made that change, the trike went much faster and handled much better.

The seat is similar but different from most recumbent seats. It has steel tubes forming the sides. However, instead of nylon mesh fabric, it has a series of industrial strength plastic bands. The seat is quite comfortable, but in the cold weather it was very open to the wind. This was remedied by weaving two sheets of closed cell 1/8" packing foam through the bottom and back.

The trike has three carrying points. The one I've been using is a "rack" extending back from the seat (actually two parallel frame tubes about 8" apart). The advantage of this rack is that it is suspended, so that my portable PC which is typically in my briefcase, is subjected to less shock from road bumps. Another carrying point is on



the unsuspended rear axle. It is designed for a German case of beer(!), as shown in one of the pictures in the Culty brochure. The disadvantage of these two carrying points is that they are at the rear, so they tilt the weight balance away from the front drive wheel. The third carrying point is for a plastic folding box suspended beneath and slightly in front of the seat. I did get one of these boxes, but it seemed too flimsy to trust with my portable PC. I have recently mounted it, and it is very convenient—just throw stuff in. Depending how it works out, I'll either beef it up or rig up something better, since carrying my briefcase here will also hopefully give better uphill traction in the snow by shifting more weight onto the front wheel.

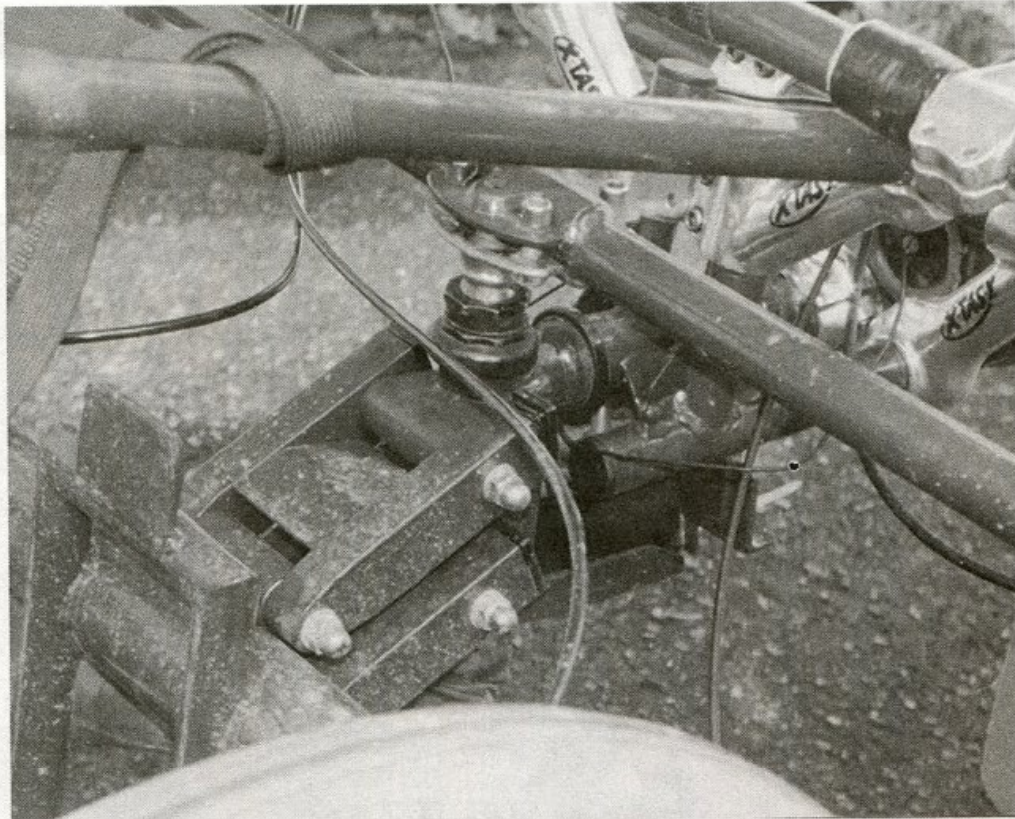
So how has the bike performed? Generally excellently. There is a modest hill as soon as I leave in the morning to cycle to work, and only on the worst snow days did I have to push the trike up. I did get enough traction, even with my briefcase on the rack.

And what about the sloping road surfaces? Well it is a bit strange not always having the handlebars aligned parallel to the front wheel axle and seat bottom. But now that I have to be aware of it, it is striking how often the cross slope of the roads I travel on changes. This is something you never notice on two wheels. And yes, it is definitely comfortable to be able to remain vertical when going straight even though the road is sloped from side-to-side.

And turns? Yowee! Leaning into the curves as if you were on a two wheeler is great, though there is considerable resistance to leaning more than 20 or 25 degrees to the vertical, because of the rubber damper in the frame. Moreover, I have the feeling that with the lean, I am able to take corners much faster than regular trikes (i.e. no lean), even with much lower seats (hence lower centers of gravity). I suspect that with the other trikes, I'd either have to lean way over, or I would be lifting the inside wheel on the turn.

The suspension is effective, but also perhaps a bit bouncy. For example, when pedaling up the hill nearby in the lowest gear, the front tends to bounce in sync with my pedaling (though this is just as likely a result of my less than complete mastery of proper pedaling form). It is a change, though, to have to think always about three tracks (rather than one on a two wheeler) when trying to avoid bumps and potholes.

The snow is gone now, so I have gotten out my two-wheel SWB recumbent. This past week, I did a bit of comparison



Culty rear suspension/pivot/mainframe—Michael Wolfson

riding. I do find the Culty very comfortable and lots of fun. With its limited gearing (the Sachs 7-speed hub), I can't get going as fast as on my two wheeler (which now has the Sachs 12-speed hub x 4 derailleur gears on an intermediate mid-drive axle). But when I do go at close to top speed, coming down a hill, it is still a bit scary. The steering seems very stable. But when I try to induce a weaving motion, I find myself really holding tightly to the steering for fear that the trike will go into some sort of uncontrollable oscillation. It may not; but I haven't had the nerve to push it to the limit.

The other main point is that the pedals are lower than the seat, unlike my 2


wheeler and this makes the trike more comfortable, and probably more inviting for new recumbent cyclists. As to the future, my main plan is to figure out some sort of fairing or enclosed body - mainly in anticipation (fear?) of next winter's frigid wind chill factors. □

■ **Culty Contact:**

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 Fax. 07231 972812

Infoadresse: Thomas Poreski  
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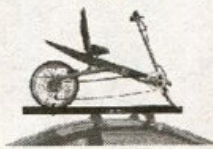
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# RCN

## 'BENT SUPERGUIDE

ALL ABOUT RECUMBENT TANDEM & TRIKES

By Robert  
J. Bryant

**R**ecumbent tandems are the road limos of the bicycle world. No matter how you cut it, they are long. They are also expensive, with the best ones costing over \$3,000.

For the 'bent educated, selecting a tandem isn't that difficult. All of the tandem manufacturers build singles. Go out and ride the single to see if you like the riding position, seat and ergonomics of the design.

Tandem uses are pretty straightforward, but every model differs a bit. The LWB (Ryan) is LONG, and that's an understatement. It's a road-limo, and we love it. The LWB rear-SWB front tandems (Double Vision & Screamer) are probably the best idea, but they differ in stoker position, rider-adjustment, wheel placement, heel interference, who will ride it (kids? non-cycling spouses?), performance levels and frame design. There are also a few side-by-side tandems and even tandem-quads.

The best benefit is tandeming with a spouse, friend, wife or your kids. From what we've seen, the best are the most expensive models. There are no inexpensive recumbent tandems available, though we have heard Compact tandem ramblings.

### ■ TANDEM DESIGN

There are SWB style tandems that have the captain's bottom bracket/pedals ahead of the front wheel, with a fairly high captain's riding position. Most of these models have a LWB or Compact stoker riding position to help make the bike shorter. LWB tandems are rare, the Ryan DuPlex (formerly designated the "Fleetwood") is the reigning king of the road, though even the LWB tandems have high captain's seat heights, and require tall captains.

Most tandems use a 26" rear wheel and a 406mm 20" front wheel. This is the optimum set up for serious road use, long tire life and ultimate rider stability under very heavy tandem loads.

The available tandems come in above-seat steering (ASS) and underseat steering (USS). Some models may have a captain with ASS and underseat bars for the stoker.

### ■ TANDEM STEERING/HANDLING

Tandems follow suit with their single counterparts in ride characteristics, however, they are all stable, more so than the comparable singles. An important issue that comes into play is captain seat height, holding the bike up and ergonomics. It is here that the bikes vary a great deal.

The USS tandems are touring cruisers with a more passive attitude. The SWB ASS style tandems are the more aggressive performance oriented, though where we draw the line blurs a bit. There is nothing to say that a fast team on a USS tandem will be slower than a fast ASS tandem. The difference is two motors and solo vehicle aerodynamics. Another exception to this rule would be the tandem trike. ASS or USS on a trike is a moot point, as your outside wheels are still wider than your bars. In your choice between ASS and USS—go with whatever is the most comfortable.

As for performance, go for the bike that works best for you, stick with a 20" front wheel and get your team into shape. That makes more difference than design types. Tandem recumbent teams are just like tandem uprights. They can be very fast on the flats, breathtaking on the downhills and you'll need serious legs up hills. It will be much like your wedgie tandem, but you will need to train even harder to spin all of the way to the top.

### ■ TANDEM DRIVETRAINS

Tandems require much tougher wheels, beefier tires and the most durable components. Don't be a cheapskate when you order. Keep in mind that all parts will be seeing double-duty. Upgrades for the purpose of durability are worth it.



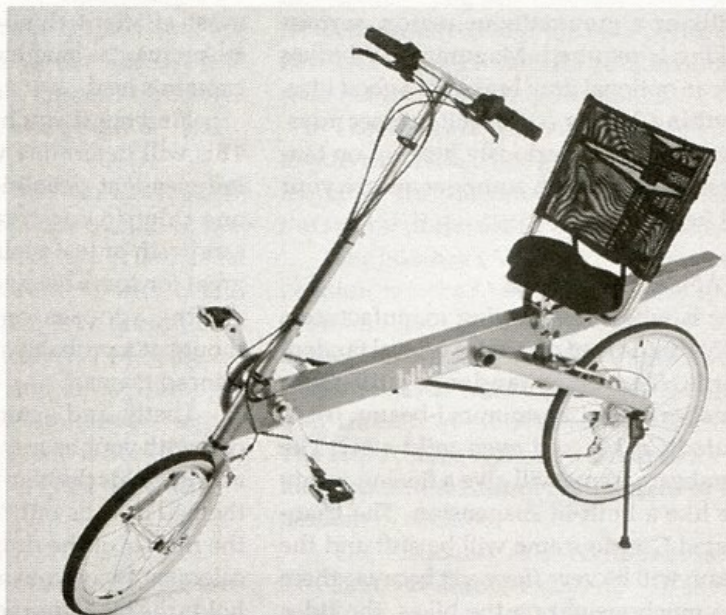
The cool new Vision headbadge  
logo—Vision



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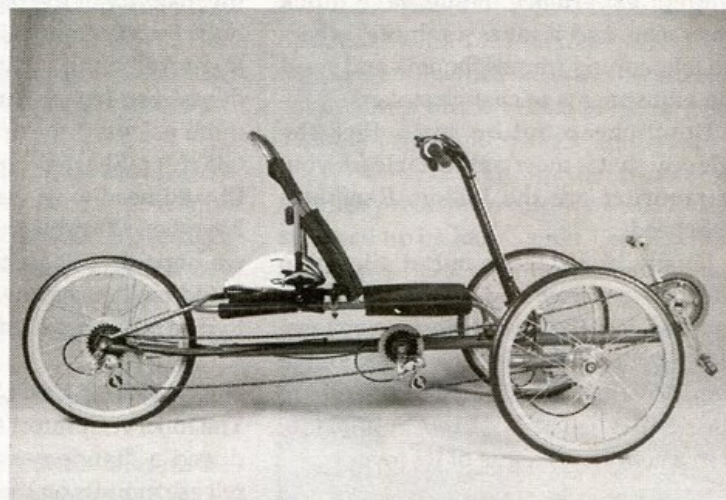
## RANS SCREAMER

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## THE '98 "ALTITUDE"



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For any tandem that will be ridden in a hilly or a mountainous region, serious braking is required. Maguras or V-brakes with an optional drag brake are a good idea. Anything less is for beach cruiser toys. Brakes and rims seriously heat up on tandems and top-notch components are your best bet.

### ■ TANDEM FRAMES

Here is where the varying manufacturers really venture out of what is typical tandem design. There are tandems built from monobeam steel, aluminum I-beams, triangulated CroMo and even mild steel. The monobeam frame will give a flexing comfy ride like a built-in suspension. The triangulated CroMo frame will be stiff and the I-beam will be very flexy, yet because there is so much weight on the bikes, the rides can sometimes be jarring, even though the long frames are flexing.

How the seats adjust can make or break a tandem experience. Some have quick release seats and it takes a minute, others have telescoping frames, booms and need chain adjustments to change stokers.

Don't cheap out on seats. Pick the single seat that is most comfortable for you. Our favorites are the Vision, Rans and Greenspeed.

Finally, don't cheap out at all. These tandems are pricey, and we haven't been impressed with the less expensive versions. The most popular tandems are the Double Vision, Screamer and Ryan DuPlex, all are fantastic. The Greenspeed is very cool too, and in a complete league of its own.

### ■ TANDEM TECHNIQUE

If you are coming from a recumbent single, the transformation should be an easy one. Plan your training rides in a quiet area without cars to bother you. Practice your starts, stops and learn to talk to your teammate. Call out shifts, brake, coast and do it

until it's second nature. Your team will be most efficient this way, otherwise your stoker may be hanging back waiting for the captain's lead.

Find out if you have similar cadences. This will determine whether you need an independent pedaling system that allows one rider to coast, take a break, make a sandwich or just plain loaf along. It works great for some teams, especially with non-cycling spouses or parents with kids, though it's probably unnecessary for experienced teams.

Lastly, and again, learn to communicate with your teammate. Assign tasks such as who holds the bike up at a stop, who uses the bell or calls out "on your left," who is the master of the drag brake, and who accelerates away from a stop, while the other holds the bike up, and clips into the pedals

### ■ TANDEM MAKERS

There are several tandem makers, though the majority of the recumbent tandems are built by Vision and Rans (Screamer) with Ryan following right behind. These tandems are wonderful, however, they are more awkward to captain if you are not a tall rider. Shorter captains are tougher to fit, and need to try before they buy. There have been Compact tandem rumors, and we hope they come to be, as our industry could really use a low bottom bracket easy to ride tandem suited for smaller captains.

### ■ COMFORT CYCLE

The folks at Comfort Cycle have just introduced a "tandem-train" option. A quick release mounts on the back of the first trike. Remove the front wheel from the second trike and clamp it into the quick release. See the Comfort Cycle road test for more info.

### ■ DOUBLE VISION

Guess what? This is our favorite tandem for the '98 season. Do you want to know why?

You actually have a chance of getting one this season if you order today. The Double Vision is no second choice, it's different in a lot of ways, though a great tandem.

Somebody must have hidden the books on tandem bicycle design from Grant Bower and Joel Smith when they came up with the Double Vision. It has a huge diameter stainless/CroMo/aluminum frame that comes apart in the center, telescopes and the wheelbase even changes for differing tandem duos. The frame flexes and offers a comfy ride and a very unique bicycle to say the least.

Vision invented the really cool Independent Pedaling System so the stoker can be limo'ed around in leisure or make Martini's (please don't drink and ride...). Rans liked it so much, they put it on their bike. Vision has made it available to any manufacturer who would like to use it.

The Double Vision has a high captain position mounted just behind the head tube (very close), making for the most forward riding position you'll find on any recumbent—and a stiff ride for the captain. I wouldn't want to ride solo on this tandem. The bike works only with USS. The Double Vision's stoker position is more SWB-oriented than the Screamer. The Double Vision's seats like to be *very* reclined, as do most Visions, and more so than any other recumbent tandem.

The telescoping frame offers the shortest possible wheelbase for the owners, however, stoker adjustment is a hellish thought, let alone exercise. It requires that you set the frame length, sight align and tighten it, and set the cable and chain lengths. If you plan to do this more than once in the bikes lifetime, get the optional dealer demo adjusters (even dealers complain about these) or have your dealer set the bike up with a second proper length chain and extra cable housing left on the bike. The Vision requires a tall captain as well. Cap-

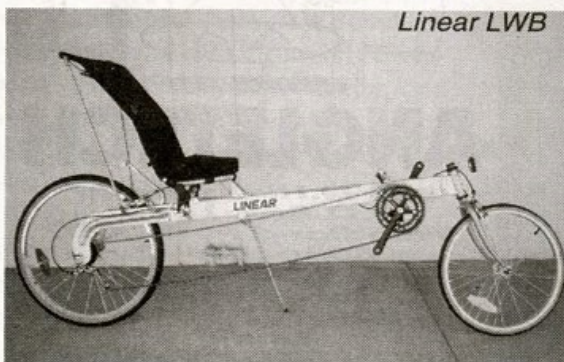
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Linear Compact



tains in the mid 5' range will be intimidated by this tandem.

The laid back Vision riding position is very comfortable. With our praise of other seats, we have received a few emails from those who love their Vision seats. The Vision seat is comfortable, though we still think they could improve it. The seat base foam quality could be improved, there is no lumbar curve, and the velcro seems to stretch and "push through" more than other seats. There is a seat horn, though recline the seat and you can't feel it.

Just after press time for RCN#44, we took a tour of the Vision factory in Seattle to see a real working recumbent manufacturing facility. 20+ visionaries turn out hand crafted, built-in-Seattle 'bents in your choice of style and color. The fabrication quality has drastically improved, the move to mainly Shimano components is exceptional. The Rapid Fire shifters work excellent on all of the '98 Visions, and the component packages work better and more predictably than the ESP systems we've tried.

Ricky Comar has designed a slick new Vision head badge logo that looks like a microbrewery label. The powdercoating is now done in house. Joel Smith has the fabrication facility down to a 'bent science, and between the entire Vision crew, the '98 Visions are looking better than ever (look for a full report on our suspended Vision rides this fall).

Vision is getting to be a recumbent powerhouse. You do need to subscribe to the SWB/direct USS design theory or yearn for the modular personally customizable designs, and probably most of all be a smaller to medium height/weight rider (okay, maybe even a taller lightweight rider) to really appreciate these bikes.

✓ '98 News & Rumors: Vision has brought their powdercoat painting in house, and now buys parts directly from Shimano. The IPS (independent pedaling system) allows riders to cruise at varying cadences as well as one rider hold the tandem up, and the other can power away from stop lights. Vision has matching fender sets and a shop rack stand adapter for mega diameter frame tubes. The Vision tandem is looking good.

◆ Road Tests: RCN#34

### ■ FOOLS CROW

The Daisy Mayhem is Fool's Crow's dual 20" tandem. Daisy's are built on a special order basis with any custom features or components that you can dream up—and they specialize in bikes for shorter riders.

◆ Road Tests: No road test available...yet.

### ■ GREENSPEED

If you thought the Ryan Duplex was big and long, take a look at the Greenspeed. Then add one of Ian's tandem trailers to haul the kids around and you'll be nearly as long as an RV.

The Greenspeed tandem is available with a wide range of options including two different S & S coupler set ups. It is also the most expensive tandem in this issue. The Greenspeed tandem is in a league all its own. The tandem test trike we were expecting was abruptly and disappointingly canceled due to a miscommunication and it was very late. At this point, it doesn't look like we'll see another in quite some time.

### ■ LINEAR

The Linear tandem is not the star of the Linear line. While Linear builds many Com-pacts and folding LWB bikes, only a few tandems are built.

The design started as a dual LWB format like the Ryan DuPlex, though was changed after the first season to a SWB front section/LWB rear. The Linear I-beam flexes noticeably and is the least rigid of the tandems we've tried.

The seats are right off the Linear LWB, a high back with your choice of lumbar bend or not. The seat positions are fixed, (adjustable recline is an option). Linear does USS only, and the captain seat is very high, though we don't have an official dimension. Linear's component spec is spotty, so ask questions about what is available and what is optional.

Our time on the Linear tandem has been very limited. We've never had a tandem here to test, though we did some riding on the Linear tandem at People Movers in California. Our primary criticism is the very steep head tube angle and odd front end/steering geometry that comes with this bike. Linear is a respected manufacturer who builds fine recumbent bikes, unfortunately, it seems as though the tandem has not had the refinement time and research and development (R & D) that its competition has had.

✓ '98 News & Rumors: The web's BikeRoute webmaster, Marty Krieg is riding a double Linear across the USA in the year 2000 (www.bikeroute.com)

◆ Road Tests: No road test available.

### ■ RANS SCREAMER

This is the most aggressive and high performance recumbent tandem made. While riding on the Slumgullian tour last year, John and Janice Schlitter were out and out

incredible riding this machine. They were fast, climbed well and the bike performed flawlessly (though they did get Slumgullian road rash on one fast downhill).

The Screamer has an almost fully triangulated frame (except for the last few inches of the boom tube) that is certainly the stiffest of the SWB captain tandems.

The bike has a V-Rex/Vivo-like captain position, matched with a Stratus-like stoker position. Very tall captains (or teams), may opt for the longer boom frame option. The captain seat is rather high, but the most user-friendly of the SWB captain tandems. The Flip-It stem vertical ASS makes for the most optimum control ergonomics of any tandem in the fleet.

The Shimano/ESP components are excellent, the seats are superior (of course, you know that). We especially like the quick seat adjustments, no telescoping boom, boom alignment, boom bolts and most of all—no messing with the chain(s).

Rans offers the Screamer with the optional Vision I.P.S. (Independent Pedaling System) which allows the stoker to coast, take a break, read a book, or get out a loaf of bread and make a sandwich.

The Screamer instills confidence, handles predictably and screams. It can be summed up by Rans' credo, "Speed Comes, Pain Goes." Get on the phone and try and get one (yeah right).

## RCN AWARDS Trike & Tandem

For a complete listing of 1998 Editor's Choice Awards, please see RCN#43 Jan/Feb '98

The following Awards are the editorial opinion/Rants of RCN Publisher, Robert J. Bryant. We painstakingly review each model's specs, ride them and even test them if we get the chance. The award winning bikes are really in production, available and are really good.

▲ **BEST 'Bent Trike—1998** (best in class): *The Greenspeed GTR20/20. The trike from the land down-under is worth the wait.*

▲ **Trike Notes:** Earth Cycles trike gives the Greenspeed a real run for the money. Our Trike arrived, but too late to test for this issue. Our Greenspeed tandem test trike was canceled at the last minute.

▲ **BEST 'Bent Tandem—1998** (best in class): *The Rans Screamer.*

For a complete list of 1998 RCN Awards, see RCN#43.



Angletech does upscale custom spec Rans Screamer tandems with all kinds of dreamy stuff including Sachs 3x7's, custom forks, suspension forks, , Ultegra, Nultegra (Ultegra + Nexave), Magura, White Industries, custom paint and more. Angletech builds the coolest tandems on the planet.

✓ '98 News & Rumors: Rans now offers the option of the Vision IPS. An "XL" boom version is available for tall teams and a rumored dual 20" more compact tandem has surfaced recently.

◆ Road Tests: RCN#34 stock Screamer; RCN#42 more about Angletech.

## ■ RYAN DUPLEX

Mirror, mirror on the wall who builds the freaking longest recumbent of them all? And we're not kidding, this is the road limo of road limos. It's not the sportiest, and Dick Ryan seemingly made little effort to help me get it in the back of my minivan. S & S Couplers may have been completely inspired to produce their product by the Ryan tandem alone (actually, they weren't).

Once you get past the extreme length of this bike, you will find it to be an exquisite example of recumbent comfort for two. Dick "the Godfather" Ryan is among the pickiest of 'bent builders. He won't tell you this, but his standards are very high. His bikes take much more time to build with the USS linkage and seat mounting hardware than most 'bents. Dick has been building LWB USS 'bents since his Avatar days in the early 1980's. Dick pretty much invented the modern day recumbent tandem, though not many people give him credit for it. The finish detail is fine, the components are exceptional. Dick's son, Karl, is the chief welder. They still build them in their small Boston shop for several lucky souls who take the leap of faith that a ultra-long USS tandem is the way to go.

Both stoker and captain are in the same ergonomic position, with a very relaxed and reclined seat back and low BB/pedals. This makes stops, starts, climbing and low-speed work less intense. The bridged, triangulated full CroMo frame is built in the traditional way and is a bullet proof brick house of a frame.

Dick is a closet retro-grouch and seeks out Shimano bar-cons, custom made bar-ends mated to a Nexave Megarange cassette for mountain climbing. The bike comes in black or red powdercoat and you can still see the hand crafted ultra smooth and impressive TIG weld beads that connect the CroMo tubes.

Not to mention, again, the length of

## RECUMBENT TANDEM

- ▲ Most are very stable
- ▲ The ultimate tourers
- ▲ Bring 'bent cycling fun to others
- ▲ Family recumbent fun
- ▲ A couple's equalizer
- ▲ You'll have somebody to make sandwiches and peel bananas

- ▼ Long....a road limo
- ▼ Ridiculous to transport
- ▼ Good ones are expensive
- ▼ Make sure braking is adequate when you go down mountains
- ▼ Slower on hills
- ▼ Don't work as well with small kids
- ▼ High captain's position (SWB)

this tandem, you may want to buy the optional S & S couplers, or a Ford Super Wagon to haul the thing in.

✓ '98 News & Rumors: The coolest innovation from the team that builds the longest two wheeler there is—an S & S coupled Ryan DuPlex as well as a case that it fits in.

◆ Road Tests: RCN#32 (reader).

## ■ S & B TANDEM

The S & B's basically a stretched out version of the SWB USS single. It is one of the lowest priced tandems, though is not really in the same league as many of the other bikes. The S & B seats are hard fiberglass shells with very little padding or foam. The bike does not use traditional tandem cranks and components, while it does use a Sachs 3 x7 to get 21 gears. The double mid crank connected to the front crank on the same (right) side is a cost saving drivetrain.

S & B fabrication is decent, they tend to use a more generic parts mix, often BMX, and the spec is not specific, so ask what you get and what upgrades are available.

The USS is direct with no linkage, and the head tube angle is *very* laid back to keep the bars close to the captain. This laid back theory makes for a heavy road feeling on the front wheel, which is a 16" x 1-3/8", which many consider marginal for tandem use as it is not tandem rated, has a very limited tire choice, and will not handle heavy loads or XL-size teams very well. The S & B seats do not have an infinite adjustment, and have limited travel and recline adjustment. This set up is archaic and needs a redesign. S & B is venturing out into the world of high priced 'bents. The question is whether they can compete at this level.

◆ Road Tests: No road test available. □

## GLOSSARY

**ABOVE-SEAT STEERING (ASS):** Handlebars above the seat, knees or frame-Above-Seat-Steering. A standard bicycle type steering similar to that of a hot rod/Stingray type bicycle of the 60s.

**ALUMINUM:** AL, or Alum. A lightweight ductible, tarnish resistant material.

**BAR-ENDS:** Handlebar extensions most often used on USS bikes to bring the controls closer to the rider.

**BOTTOM BRACKET:** (BB) pedal axle & bearings, sometimes called boom-bracket.

**BRAZING:** A frame joint is created by flowing brass around the tubing junctures. Builders then either file/sand the joints smooth or leave them natural.

**CARBON-FIBER:** A high tech, high strength composite material that is black in color.

**C.G.:** Center-of-gravity

**CHAIN-IDLER:** A modified skateboard wheel, derailleur pulley or custom-made wheel that carries the chain slack on SWB and some LWB models.

**COMPACT:** CLWB or MWB recumbent

**COROPLAST:** Plasticized cardboard that works great for homebuilt recumbent fairings

**CLWB:** Compact Long Wheelbase 47"-60."

**CroMo:** Chrome-moly steel.

**DELTA:** Two-wheels in the rear trike design.

**DOM:** Drawn-over-madrel. This is a type of higher quality HiTen steel.

**FWD:** Front Wheel Drive

**GEAR INCHES:** Formula used to determine range of gears: front chainring divided by rear cog multiplied by drive wheel dia.

**GRIP SHIFT:** A trademark of the SRAM Corp. A brand of twist-grip shifter.

**HiTen Steel:** High tension or mild steel.

**HPV:** Human Powered Vehicle.

**INDIRECT STEERING:** Underseat steering via a rod linkage that connects the handlebar to the fork.

**KEVLAR:** A high strength, bulletproof composite material that is gold in color.

**LWB:** Long wheelbase 60"-71"+ (crankset low and behind front wheel).

**LOW-RACER:** A SWB recumbent built as low as possible for HPV racing (may exceed our wheelbase range for a SWB).

**MAGURA:** A high quality, strong German hydraulic caliper brake.

**MID-DRIVE:** A mid-ship mounted, wide-ratio, two-chain drive freewheel shifted by a rear derailleur.

**MTB:** A dated abbreviation for mountain bike.

**MWB:** The same as CLWB. Formerly used to describe longer SWB bikes.

**NEXUS:** Shimano's internal 4/7 speed hubs.

**PEDAL STEER:** Pedal-induced steering input that makes the bike more difficult to track straight. This generally happens on SWB models with wheelbases of less than 39" or a very laid back head tube angle.

**RCN:** Recumbent Cyclist News founded by Robert J. Bryant in 1990.

**RWS:** Rear-Wheel Steering.

**SWB:** Short-Wheelbase 33"-47" (crankset high and in ahead of front wheel).

**TIG WELDING:** Tungsten-Inert-Gas; a proven no-lug process common with MTB's.

**SACHS 3 X 7:** This is the Sachs Internally geared three speed with 7-spd. freewheel (21 speed total).

**STEERING ROD:** The steel or aluminum rod that connects the fork to the bars.

**STEERING STRUT-RISER:** An ASS extension that rises from the stem or head tube to raise the bars over the legs.

**TADPOLE:** Two-wheel in the front trike design.

**UNDERSEAT STEERING (USS):** Steering via handlebars beneath the seat.

**V-BRAKE:** A new and strong style of cantilever brake that has high arms in a "V" formation.

**X-SEAM:** A measurement used for recumbent fitting. This measurement simulates the distance between the seat back/base out to the farthest reach of the pedal stroke.

**ZIPPER:** A Lexan fairing by Zzip Design.

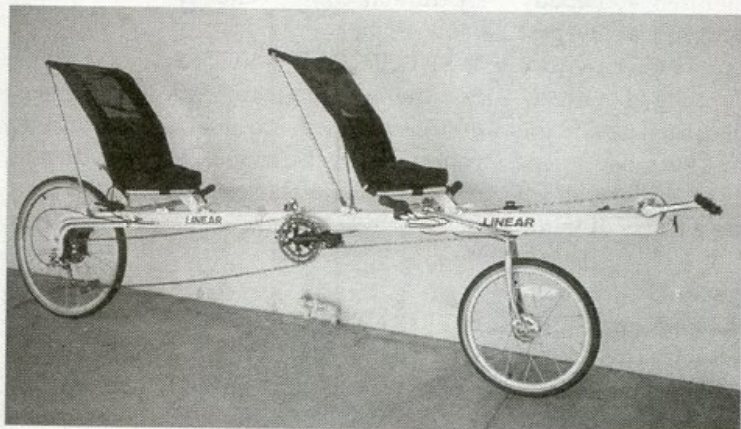




Ed Deaton's Fools Crow Daisy Mayhem dual 20" tandem



The Ostrad tandem available through AngleTech



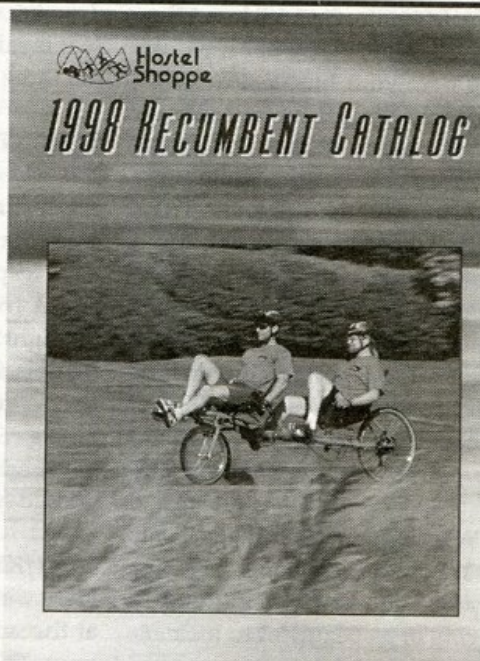
The Linear tandem



The S & B tandem

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# ■ RECUMBENT TRIKES

**M**any recumbent fans have fantasies about zooming all over town in a fully enclosed, weather-proof, futuristic, streetable pedal powered three wheeler. This is just a fantasy for most of us as the commercially available models of this type will set you back over \$10,000 to even \$20,000 before you get them stateside (the Solar/Electric assist Twike is nearly \$20K!). Enthusiast trikes are costly to build and very expensive, however, they are the most fun you can have on three wheels. The low-cost trikes are best used for recreational/beach cruisers. They are heavy, have low-end components and just adequate braking systems. True world-class performance road-worthy trikes come with a hefty price tag.

## ■ TRIKE DESIGN

Trikes take up more than twice as much of the road compared to a two-wheeler, you are not as maneuverable and, you must compete with cars for a bigger share of that road. Many trikes are low, thus harder for drivers to see (some owners and manufacturers argue that this is not an issue).

The ultimate commuter? I'll leave that for you to decide. Consider what it would be like riding with your butt as low as 7" off the ground and your head 39" above the road. Imagine riding on a two lane road where autos pass you at 50 mph while cursing that you belong on the sidewalk. Trike lovers are very devoted.

My trike testing has been both the most fun—racing around on roads, parking lots and bike trails; as well as the most stressful—riding in traffic, especially on narrow busy suburban roads where the cars go by at 50+ mph) that I deal with at RCN.

There are three basic types of recumbent trikes:

◆ **TADPOLE:** Two wheels in the front, one in back (Trice, Greenspeed...) These are the human powered slot cars, nothing is more fun to ride or as beautiful to look at.

◆ **DELTA:** Two wheels in the rear, one in front (Comfort Cycle, HPM Tritan). These trikes are more pedestrian, with higher seats. They are the most like a LWB recumbent with two wheels on the back. Both the Comfort Cycle and HPM can easily be put on two wheels, heck, I can even ride the Comfort Cycle on two wheels (see Kent Peterson's web site). The fact that they can tip over makes the high speed stability

questionable, thereby limiting them to bike trail speeds for casual, less aggressive riding. The optimum rider is somebody who may want the benefit of no balance necessary. My time on these trikes has been enjoyable, though I definitely was riding slower than my two wheelers or a tadpole trike.

◆ **OTHER:** Anything goes in the trike biz. There have been lean steer trikes, rear steered trikes and even center pivot and/or FWD trikes. Every so often, somebody new comes out with a better idea. The best known is probably the Thebis, whose Canadian government funding of this technologically advanced trike dried up and the company disappeared. The most recent example is the very cool Tricumbent, which disappeared shortly after a flurry of initial interest dried up.

The majority of trikes built are the delta cruiser trikes, such as the ReTrike.

The low-slung racers with two wheels in front are the ones most appealing to RCN readers. There is no experience quite like zooming around a parking lot in a three wheel human-powered sports car. The drawback to these trikes is that when the seat is raised (to see and be seen in traffic), the three wheelers can roll more easily.

## ■ TRIKE PERFORMANCE

Trikes are usually slower than two wheelers due to the increased weight and frontal area. Many trikes can roll-over if pushed hard (especially deltas).

A trike can be a good performer with the right set up. Look for high performance models from Crystal (Trice), Greenspeed and Windcheetah. The Windcheetah has racing records, though I still haven't found any high performance trike faster than a good two wheeled recumbent.

## ■ TRIKE STEERING

Here we go again, how a trike is steered is at the whim of the designer and anything goes. The Comfort Cycle has two steering rods and pivoting side sticks, the Trice and Greenspeed have USS, the ReTrike has ASS bars and the Windcheetah has a joystick that rotates on a U-joint that lays in your lap. Each steering type works well for the intended design. I actually prefer USS on trikes, as it doesn't have any aerodynamic penalty given the track of the dual front or rear wheels.

## ■ TRIKE WHEELS

Performance trike wheels take a beating. Everyone wants to carve hard corners to see how they handle (try to roll them over). This takes its toll on wheels and tires. Cheap wheels will be toast in a few seasons. Skinny tires are out of the question for seriously used trikes. It is possible to ruin a set of front tires on a tadpole in a weekend if you ride hard enough. Trike wheels need to be hand-built with the highest quality durable components. No exceptions.

## ■ TRIKE COMPONENTS

For the reasons stated above, you need good stuff. If you are looking for a touring/commuting vehicle, look for user-friendly commonly available components. Specialty items will leave you stranded when they break.

## ■ TRIKE FRAMES/SEATS

One of the joys of cycling is the way in which we can carve through turns by shifting our weight. Recumbent trikes require a more intense body English to carve turns, but instead of the bicycle banking into a turn, the weight shifts, tires scrub and the spokes, hubs, wheels and frame are stressed doing something that comes so easily to a two wheel bicycle frame. What this means to the new owner is that a trike should be damn strong. If it's not, you're buying an expensive toy or human powered ego trip designed not to be ridden.

Frames need to be stiff vertically, horizontally as well as torsionally. Monostays will flex even more on a trike, so look for a good warranty (or known bulletproof design). During my past ten years working with recumbents, I've seen trikes in serious commuting use be destroyed beyond repair. Think about where you will get replacement parts, how accessible the manufacturer is to provide these parts or whether they can be purchased or repaired locally.

Tadpole steering geometry is an aspect that makes or breaks a trike design. An Ackermann automotive, or Greenspeed Centre-point type steering geometry or "Zero-Scrub" is what is necessary on tadpole trikes. Anything less and the designer hasn't been doing their job. The reason for this is when you add two wheels to the front (or rear) of a recumbent, you have severely complicated the rather simplistic and low tech steering approach of a bicycle.





*Comfort Cycles in a local Texas parade. Bart Hiatt (far left) on the prototype SWB. Note: tandem "train" on right.*

A flimsy, poorly designed or poor quality front end/steering geometry is a true measure of how good a trike is.

Two manufacturers seem especially interested in keeping their trikes simple enough for most any owner/shop to work on them (Greenspeed and Trice). Yet others have many custom parts.

#### ■ TRIKE COST/AVAILABILITY

For the most part, trikes are expensive and the finish quality/components/seats/paint are just not on par with a good two wheeler, yet they cost 2+ times as much.

The most popular enthusiast recumbent trikes come from overseas (England & Australia). Shipping is very costly. Our Greenspeed trike was near \$500 to ship to the USA. One dealer brings them in a half dozen at a time to cut down on shipping costs (People Movers).

Aside from Comfort Cycle, the USA built enthusiast trikes are built in very small quantities and are difficult to find in dealers. Most of the popular designs are still very rare and not a lot of trikes are built and sold.

If you think six weeks is bad for a BikeE Air Tech, try 3, 6 or even 12 months. Plan well ahead when you decide to take

the plunge and order a recumbent trike.

#### ■ THE TRIKES

With the exception of Huffy/ReBike, all recumbent trikes are built in small quantities by custom builders. Here is a listing of the trike manufacturers that we know of:

#### ■ ANGLETECH

Kelvin Clark builds the former Gary Hale, Richard Rau (Pedalcraft), Quadraped. This is a gorgeous tadpole trike, with hand and foot cranks. It works great for riders with a special need, or somebody who just wants the most invigorating recumbent tricycle on the face of the earth. This trike has a higher c.g./seating position, is busy and has a learning curve. I actually was present when Kelvin rode it for the first time along the Green River in Kent several years ago.

Kelvin brought in Nobilette Cycles as the contract builder, while continuing the "Angletech finesse" and continued research and design of the Quad have made it even better. The frames are built and painted in Colorado and assembled at Angletech.

The Quadraped has three 20" wheels, a 35-speed drivetrain (with mid-drive) a BB that is lower than the seat (rather close

to the ground too), and arm and leg cranks for the most invigorating recumbent ride you'll ever have.

The seat is the only lacking aspect of this trike. It works great for the intended design—upright seating position, low BB, arm and leg cranks. The seat is a bit on the small side, and is a bit less comfortable than other Angletech recumbents. The seat frame back slides on the twin top frame tubes, as does the seat base mesh. This seat is not really suited for larger riders.

The Angletech trikes are of impeccable quality, the best we've seen on any trike. These tadpole trikes are different in that the bottom bracket is lower than the seat, which actually makes them more user-friendly.

The TriSpeeder is a foot pedal only version of the Quadraped and utilizes a Rans steering column. These trikes are built in small batches, so plan well ahead if you are interested in owning one. They are sold direct through Angletech

#### ■ COMFORT CYCLE

Bart Hiatt, Jim Kueber and company are fast becoming the trike-building powerhouse in the USA. They tell of midwest dealers ordering them ten at a time and the product just keeps improving.



The Chaise-3 is unique in that it is a delta trike, with a hammock style mesh seat, a monotube front frame that allows the solo front wheel to camber in the turns, yet retain a very simple and straightforward design.

The drivetrain is a mix of Sachs and Phil Wood parts. Yes, Phil Wood makes the hubs, jackshaft, and even laces the wheels for Comfort. Forget all you know about trikes, and give the Chaise-3 a try. It's by far the best trike deal in the USA with the best availability in the world enthusiast trike market.

✓ **NEW FOR '98:** Comfort Cycle is looking for a subcontractor to produce a full commuter body for the Chaise-3. Primo Comet tires and hydraulic brakes are now optional. Phil Wood hubs will be used all around, disc brake and receiver hitch rack options will be available soon.

◆ **Road Tests:** RCN#46(this issue).

#### ■ CRYSTAL TRICE

The Trice was the first recumbent tricycle that I rode back in 1990. Ken Trueba (former US contract builder) and I met in a parking lot in Portland, Oregon. It was an awesome experience, and most 'bent fanatics will have an ear-to-ear grin after their first ride.

Peter Ross has been building trikes for

years. I have tried at least a half dozen generations of the Trice, and the 1998 version is by far the best. Our test trike arrived too late for a complete test, but it's almost rolling and will be featured in a future RCN.

The Trice comes shipped in a tiny box and requires an advanced assembly and we had some difficulty. We recommend a dealer purchase on this trike.

The frame is in three sections: rear triangle, mainframe/cross support and front boom. The fabrication quality is the best we've seen from Crystal, though the U.K. powdercoat is not quite as nice as we're accustomed too.

The Trice has a redesigned idler, chain tubes, and a low and reclined sling seat. It was too reclined for me, so Peter shipped an optional head rest/seat cap. The Trice has dual front drum brakes (connected to one lever) and a parking caliper brake with locking mechanism. What makes the Trice different from the Greenspeed and Dragonflyer is the use of a 26" rear wheel, which makes it ride a bit differently.

We're looking forward to riding and testing the new Trice.

✓ **'98 News & Rumors:** The Trice seat will detach from the frame without removing the seat cover. The hose-clamps are gone and a new plastic clamp is now used. The

## RECUMBENT TRIKES

- ▲ Extremely responsive
  - ▲ Slot-car like handling
  - ▲ No balance required
  - ▲ Very low to the ground
  - ▲ Best fun on a recumbent
- 
- ▼ Most trikes are heavy
  - ▼ Ridiculous to transport
  - ▼ Very expensive
  - ▼ Make sure braking is adequate
  - ▼ Frame needs to be torsionally stiff & tougher (triangulation)
  - ▼ Slower than a two-wheeler
  - ▼ Very low to the ground
  - ▼ Requires body English

wonderful megarang Shimano Nexave components are now used along with an optional 63-speed via Sachs 3x7. A rear trunk is available, and a fiberglass front fairing will be coming soon.

The spec of the US Trice may differ from the factory spec. Custom spec and paint options are available from the US distributors (People Movers & Fool's Crow). Fool's Crow reports that they have just completed a Trice with a Zap motor.

◆ **Road Tests:** RCN#16.



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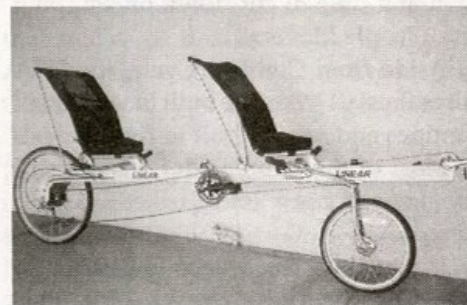
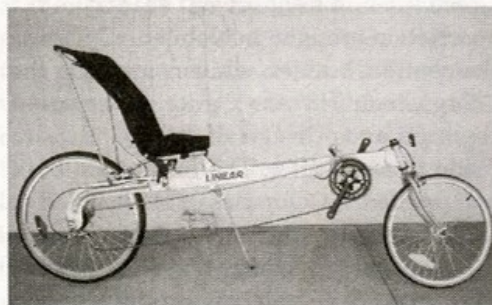
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## ■ EARTH CYCLES

The Dragonflyer trike was designed from the ground up offering state of the art features at a price lower than that of the imports. This trike has a two-chain drive, with mid-drive at the maintenance free suspension pivot point for true no pogo suspended ride. Designer Shean Bjoralt researched bicycle and motorcycle suspension before coming to the conclusion that this was a way to utilize an effective suspension without loss of power or performance. The trike has a true Ackermann and centre point steering geometry and no pedal steer along with a 10' turning radius. The rear wheel even folds back under the trike frame for easy storage. The Dragonflyer offers an adjustable recline seat angle with a hemp covered Sunmate pad and SPD pedals are stock! A custom mid-mount pannier rack and a Delta MTB rack make cargo carrying a breeze. The pannier rack will take up to 40 pounds of stuff.

✓ '98 News & Rumors: This is a new tadpole trike with suspension and built in the USA and sells for \$2995 mfr. direct.

◆ Road Tests: RCN#46(this issue).

## ■ FOOLS CROW

Ed Deaton and the gang at Fool's Crow are the eastern USA rep for Peter Ross' Crystal Trice trike. Trice are available in Euro-spec, custom spec and can even be custom painted in the USA.

◆ Road Tests: Trice test upcoming.

## ■ GREENSPEED

Ian Sims is the recumbent trike master. He lives, eats, breathes recumbent trikes. Heck, he even tows a trailer with his shop trike. The Greenspeeds have become world famous for their superior quality, design and handling.

Our last Greenspeed test was in RCN#30 (issue is available for \$6/\$8 post-paid US/Airmail in US funds). We tested



*The S & B trike in winter—Mark Tessmer*

the GTR 20/20 three 20" wheel, 3x7 equipped 63-speed trike and it is one incredible trike with a durability record beyond reproach.

What makes the Greenspeed special is the front end/steering geometry, toughness and incredible front wheel braking (individual brake levers).

Even as many kudos as the Greenspeed has received, it is not perfect. It is built in Ian's small factory in Australia and MIG welded. Traditionally MIG welding is slated toward entry level lower priced recumbents. Components and other services relating to the building of recumbent trikes are more costly or not as available as they are in the USA, making them more expensive or in comparison, not as good quality. The Asian money market and high cost of shipping has made the Greenspeed a costly trike to purchase in the USA.

The Greenspeed seat is not a seat I thought I'd be comfortable on. The very

laid back angle of 35 degrees takes most of the pressure off your tail end and places it on your back. The seat is made from a basic nylon mesh that is shock-cord laced to an integral (part of the frame) CroMo steel frame. Greenspeed is now offering other seat recline angles in their full line of trikes, tandem trikes and SWB recumbents.

◆ Road Tests: RCN#30.

## ■ HUMAN POWERED MACHINES

Jan Vander Tuin's HPM is associated with Eugene Bicycle Works (EBW) and the Center for Appropriate Transportation (CAT), which is HPM's retail outlet. At CAT Jan is just as involved with teaching the Eugene area teenagers how to work on bikes, as he is building his own bikes.

The Tritan started life as a Ryan Vanguard trike. It is a delta design, with a rather high c.g., one-wheel drive, mesh seat (with no seat horn), USS, a 24-speed drivetrain with a disk rear brake and a front linear pull

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brake. HPM's craftsmanship is very nice and all bikes are custom built.

HPM builds a FWD utility/cargo trike for commercial purposes as well as SWB, LWB and folding and cargo uprights.

◆ **Road Tests:** RCN#41.

#### ■ LANDSTRIDER

We've been aware of this trike built in California for years. The builder has never sent us printed info. The "ladder" frame design, solo drum brake and internal gearing are unique, though inadequate.

#### ■ LEITRA VELOMOBILE

The Danish Leitra is the only fully enclosed production recumbent tricycle that we are aware of that is commercially available. Due to the high cost (over \$8,000), they are rare in the USA. Designer Carl George Rasmussen has built 160 Leitra's. There are thousands of kilometers of owner ridden miles, primarily throughout the roads of Europe. I did a web search and 5,700 sites popped up. The best one was by a Leitra fan at <http://pw2.netcom/~karpeter/Leitra.html>, or go to Yahoo and do a Leitra Recumbent Tricycle internet search. Info on the Leitra can be had by sending four international reply coupons to: Leitra, Box 64, DK-2750, Ballerup, Denmark.

#### ■ PASHLEY

The Pashley PDQ<sup>3</sup> tadpole trike was unveiled in the U.K. this past Spring. The former Counterpoint Triad (Presto trike) has about the same spec as the PDQ SWB, with twin Sturmey Archer hub brakes. Dekker Service Imports the PDQ.

#### ■ PEOPLE MOVERS

People Movers is the large recumbent dealer in Orange, California that specializes in trikes. Jim & Linda Wronski import Greenspeed, Trice, Rubicon as well as sell Comfort Cycle.

People Movers imports Greenspeeds six at a time and specs the Australian built framesets with: Sun Rims, your choice of tires (V-Monster, Comet, Conti), LX, XT, Nexave or Sachs 3x7, and a Shimano Exage LX 28/38/48 triple crankset. Greenspeed prices starting at \$3200 US dollars.

People Movers imports the U.K. built stainless steel Rubicon trike. It is a tadpole, built of rectangular stainless steel. These are custom built trikes for the rider. The drivetrain is Sachs with Hope Hydraulic disc brakes and a 26"/20" wheel combo.

◆ **Road Tests:** No road test available.

#### ■ PEUGEOT/QUETZAL

Peugeot offers a delta tricycle rear end that bolts on to existing two wheel Quetzal recumbents. We were unable to try it.

✓ '98 News & Rumors: A new indoor trainer is available for \$129.99. An adapter for Thule and Yakima roof racks is available for \$139.99.

◆ **Road Tests:** RCN#45 (C-90 LWB USS).

#### ■ RETRIKE

The ReTrike is the bargain beach cruiser of the recumbent trike genre. You'll get entry level stuff, Shimano index shifting, and a low-tech cool bike that your neighbors and friends will love to try. ReBikes are painted bright colors, have a neat logo and all that chrome shines up nice.

The ReTrike is heavy and best for fitness riding or cruising, though is too heavy for commuting, touring or sport riding.

ReBikes are built in Ohio, USA by Huff. You can order from a dealer or the ReBike website.

◆ **Road Tests:** No road test available.

#### ■ SIDEWINDER

This is a unique dual FWD trike combined with full differential, side-to-side disc brakes along with rear wheel steering. The Sidewinder can turn on its own diameter

for maneuvering in tight places or the thrill of spinning 360's.

The drivetrain is a Sachs/Shimano 21-speed and the frame is made from HiTen steel with a powdercoat finish. The trike folds, and weighs 49 pounds.

✓ '98 News & Rumors: Sidewinder has deleted all of their low priced models and now offers the more enthusiast deluxe model at \$1895. For more info, contact: Sidewinder Cycle Co., 5757 Kanan Rd., Ste. 180, Agoura Hills, CA 91301. Tel. 818/991-7770 or [www.sidewinder.com](http://www.sidewinder.com)

◆ **Road Tests:** We'd love to test it, but Sidewinder has not offered us a test trike.

#### ■ S & B RECUMBENT

Jack and Smitty have been involved in recumbents for years. Smitty is a former partner of Milton Turner in the original Hyper Cycle SWB from the early 1980's. The S & B SWB are inexpensive, simple and low tech fun bikes.

The technology is true to the S & B way—a simple low tech design. The S & B trike comes only as a 6-speed, though a 3x7 hub could probably be installed. The stock set up has just one rear drum brake which is only adequate for beach cruising. Optional dual drums are recommended for any kind of serious riding.

The trike has direct USS, the same as the SWB models. The trike will not take a front crankset due to chainline and trike frame cross-members. The front wheel spindles and axles are the simplest possible way to do it, though some may say not tough enough. Jack Baker reports that there have been no problems. The trike we rode used off-the-shelf wheels with a longer bolt to mount the front wheel to the spindle.

✓ '98 News & Rumors: S & B has introduced the new S & B "Speedster" trike. This is a very low delta style trike with an 8" seat height! Be aware that this trike is best cruising on the flat beach paths of

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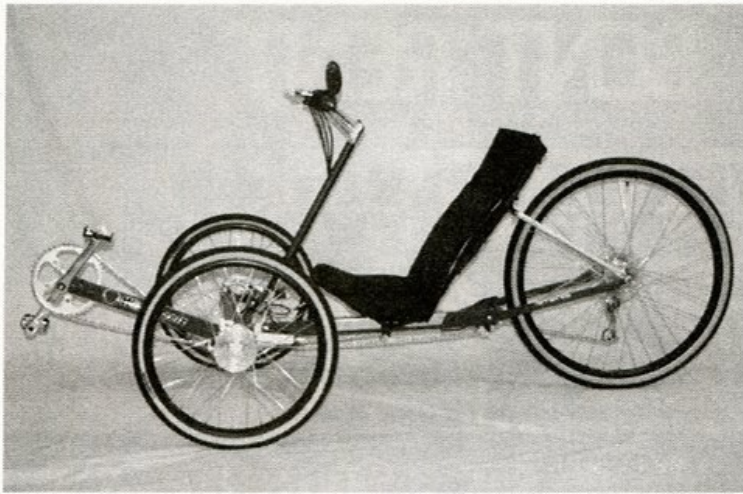
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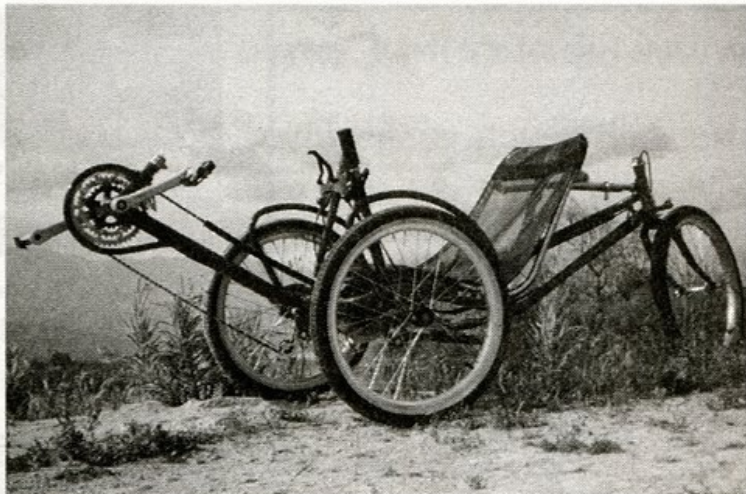
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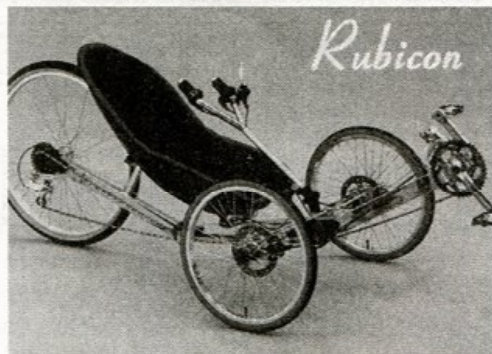
*The elusive WizWheelz Terratrike*



*The Sidewinder FWD rear-steered trike*



*The ReTrike*



*The Rubicon—People Movers*



*The PDQ<sup>3</sup>—Harrison Evans*

southern California as the weight is heavily loaded toward the rear end of the trike—and has a rider weight limit. Also, be sure to ask about the brake options.

#### ■ TWIKE

The Twike is a delta trike (2 wheels in back) for two (side by side), with a solar electric assist, built in Switzerland. We've never been successful in getting their attention, but there is a rumor that they may be built under contract in the USA. The USA contact is EV's NW at Tel. 206/762-4404, or <http://www.halcyon.com/evsnw> or Twike's web site at <http://www.twike.ch>.

#### ■ WINDCHEETAH

Need we say more. This is Mike Burrows' classic three wheeled speedster. The frame is aerospace aluminum bonded to cast aluminum lugs, the rear wheel mounts from one side, the controls are mounted on a joystick that lays in your lap, and the composite seat is something that looks like it's right out of the space shuttle.

Windcheetah is entirely in a class of its own technology-wise. Superstrong, superlight materials specified to exacting tolerances are used. Titanium, aluminum, carbon Kevlar are integral in the design. 140 precision machining operations and each

Windcheetah requires 25 hours of skilled hand finishing.

The Windcheetah is the fastest recumbent trike on earth and the highest performance hi-tech trike money can buy. The racing model has broken many human powered speed records. Andy Wilkinson broke Olympic cyclist Chris Boardman's record for the 37.75 mile TT circuit on the Isle of Man by over 5 minutes, and recorded a staggering downhill speed of 75 mph! Also in '96, Wilkinson broke the Land's End to John O'Groats record on a Windcheetah (41 hours and 4 minutes), knocking almost 4 hours off the record he set in 1990 on a conventional bike.

✓ '98 News & Rumors: A touring package with mudguards, rear rack and panniers is new, along with a host of hitech options. A racing version with a full Kevlar body and magnesium lugs does exist, but fits narrow track racing machines only.

The "Speedy" uses 17" Wolber/Moulton front wheels, though a 406mm 20" model is rumored.

◆ Road Tests: Road test upcoming.

#### ■ WIZWHEELZ TERRATRIKE

Our long promised WizWheelz test trike has never arrived. The Terratrike has a SWB style ASS steering that is different than

most trikes. The seat is from Rans. The frame is rather petite with monostays, along with the #200 pound rider weight limit. The trikes are sold direct, with a limited number of dealers.

✓ '98 News & Rumors: WizWheelz is working on a full body fairing as well as kids, water and snow versions, as well as the all terrain, "tracknoped."

◆ Road Tests: Who knows if or when this test trike will ever show up. WizWheelz has not been very good with follow-through.

#### ■ VELOMOBILES

There are not many, if any, fully faired velomobiles available in the USA. Greenspeed, Earth Cycles, Comfort Cycles are all working on prototypes, but do not currently offer a full fairing. The Windcheetah fairing is for racing only. The Leitra is the velomobile for commuters and tourists. Expect a long wait and healthy price tag. The \$17,000 full bodied Swiss Twike, side-by-side solar-electric assist trike is rumored to finally have a US distributor.

#### ■ GENERAL 'BENT INFO

For more general information see the '97 RCN Buyers' Guide RCN#38, RCN#43 (Compact), 44 (SWB) and 45 (LWB). The info included in this buyers' guide is



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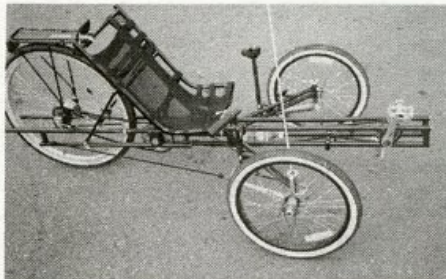
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#### RCN RATINGS

RCN offers the only Recumbent Bicycle Buyers' Guide in the world today. RCN also *RATES* the bikes—which is unlike almost any other buyers' guide on the planet! You won't find reformatted brochure material in RCN—we tell it like it is. Bicycles are built up, ridden, rated, and critiqued. We can only conclude that manufacturers who do not submit test bikes are afraid to compete with the best in recumbency.

We use a potential five star system with the following *SuperGuide* ratings:

- ★ Poor—needs work
- ★★ Fair—edging toward Good
- ★★★ Good and better median
- ★★★★ Very good—superior
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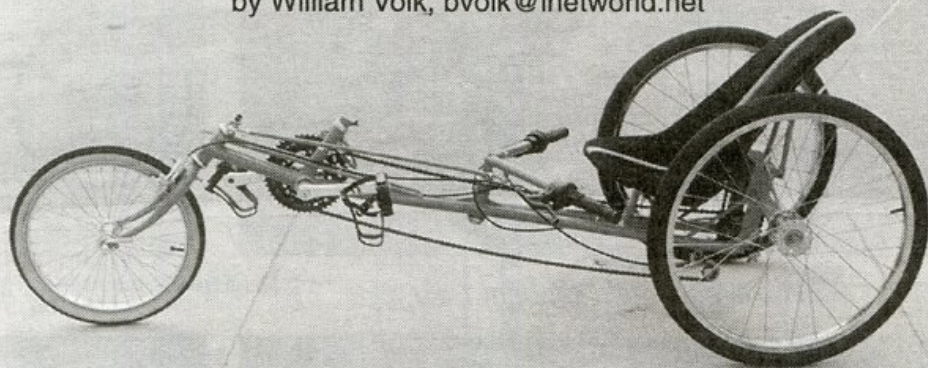
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Watch for RCN#47, the homebrew issue coming early fall and then our 1999 preview in November. □

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## A Quick Peek at... The S&B "Speedster" Trike

by William Volk, bvolk@inetworld.net



**M**y first real job was working for a software company back in the early '80's. My boss had an expensive hobby. He collected Porsche automobiles. Three in total, a new 911, an insanely fast 911 Turbo, and a 1957 Speedster. I loved the Speedster most of all. I remember riding through the streets of Carmel in that wonderful car. It was small, light, and fast. Very unconventional for the era of large tail-finned autos, the Speedster weighed in at around 1500 pounds and sported a very aerodynamic body. A true original that went against the trends of the day.

S&B have been involved with recumbents since the Hyper Cycle days, about the same time I was riding in that Porsche. I've owned two of their bicycles during the last four years and have over 20,000 miles of experience with them. I like the quality, I like the strength, but mostly I like the fact that I managed to get a custom built 4130 CroMo recumbent for less than a grand.

S&B started producing trikes a few years back. Their popular "tadpole" (2 wheels in front) "Venice Beach" trike has always been a bargain (it's now \$910). So when they told me that they had a new "delta" (one wheel in front) low-racer trike, I was intrigued. When I heard it was going to be called the "Speedster" and sell for \$2800 I was determined to get my hands on one.

Most of the "performance" trikes, such as the Greenspeed, Windcheetah, and Trice, are of the tadpole design. S&B decided to take a different route and build a low riding delta trike. The rider sits just

ahead of the rear axle. Delta trikes are supposed to be more "tippable" than the tadpole design, but with an 11" seat height and 30" track the Speedster is quite stable. I've had two test rides with the trike and really tried hard to tip it over with no success.

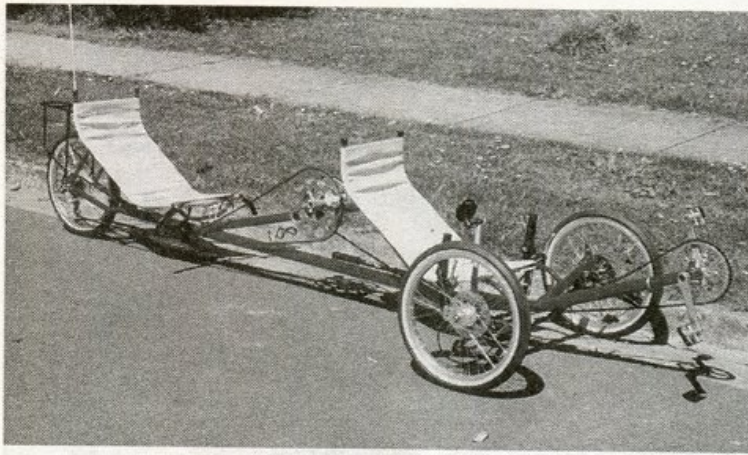
It's a well thought out design. Like most trikes it uses USS, but with a single front wheel it can turn quite sharply even with a longish 60" wheelbase. The lightly loaded front wheel doesn't have any problems with "flop" even with an extreme 45 degree angle.

There's an intermediate gear that runs a second chain from the freewheel to the rear axle. This allows the use of conventional sized chain rings with 20" wheels. Only one rear wheel is driven/braked, but I didn't seem to have much troubles with that. The bike I tested had a 16" ERT0 349 front wheel and 20" 451 rear wheels. They will build with 20" 406 wheels, which I prefer and is fast becoming the industry standard.

This is no bargain-basement bike. The components are high quality and include: Deore LX cranks, Dura-Ace derailleur in the back, Sturmey Archer rear drum brake, and a chromed solid 4130 steel axle. There's a side-pull in the front... but the rear brake does most of the work. Phil Wood wheel-chair hubs are used on the rear wheels. The bike is custom sized and equipped. I expect they would be up for any selection of components you would like.

I think this may be one of the fastest delta design trikes out there. It's fun to ride, and it's easy to get on and off. They can build versions for heavier, taller, or smaller riders. Each trike is built to order. It's a nice alternative design that is still a good deal for a customized piece of hardware. □





*The Greenspeed Tandem Trike*



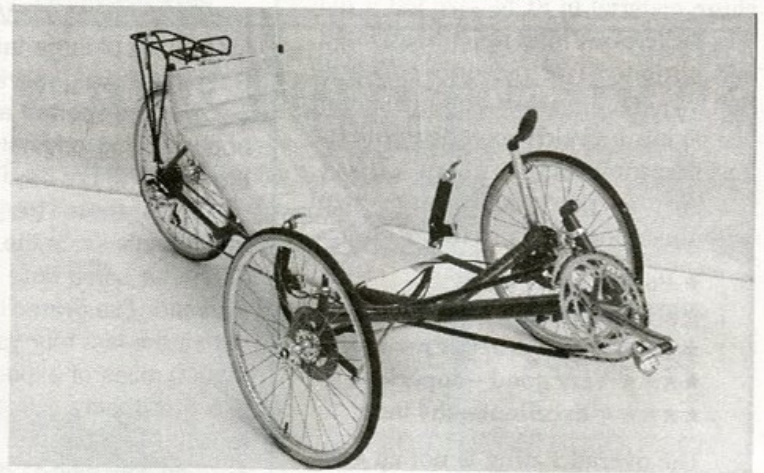
*The Angletech TriSpeeder—Angletech*



*Carl George Rasmussen and the Leitra Velomobile*



*The Swiss solar assist tandem Twike*



*The Greenspeed GTS high performance trike*

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*Photo courtesy of Gary Brooks*





### Rans Screamer

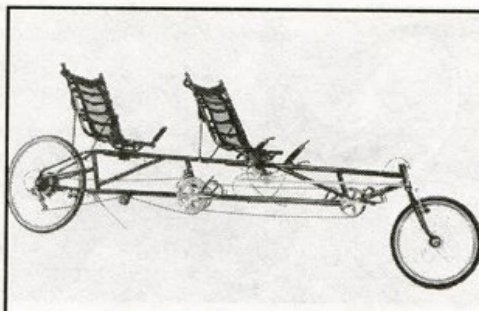
- SEAT COMFORT: ★★★★★
- RIDE SMOOTHNESS: ★★★★★ 3/4
- HANDLING: ★★★★★
- PERFORMANCE: ★★★★★
- FRAME/BUILD-FINISH QUALITY: ★★★★★
- COMPONENTS: ★★★★★
- BRAKING: ★★★★★
- CHAIN MANAGEMENT: ★★★★★ 3/4
- VALUE FOR MONEY: ★★★★★
- OVERALL RATING: ★★★★★
- SUGGESTED USE:

✓ Recreational ✓ Sport touring ✓ HD touring

■ NOTES: The Screamer is our choice for Editor's Choice for Best Recumbent Tandem. It's fast, easy to ride and handles best at speed. It also seems to be a bit faster than the others, though no easier to haul around. Vision IPS is now an option.

■ TEST BIKE PROBLEMS: We have experienced soft paint on several Rans test bikes. We had a minor glitch with the Magura brakes and front shifting wasn't perfect. On one ride into Black Diamond we couldn't get her into granny low on a hill climb. The Rans tandem is very difficult to find this season. The biggest problem with any Rans bike is availability. The ESP can be a bit finicky.

■ M.S.R.P. \$3995/\$4350 (I.P.S.)



### Ryan DuPlex

- SEAT COMFORT: ★★★ 1/4
- RIDE SMOOTHNESS: ★★★★★ 3/4
- HANDLING: ★★★★★
- PERFORMANCE: ★★★★★ 1/2
- FRAME/BUILD-FINISH QUALITY: ★★★★★
- COMPONENTS: ★★★★★
- BRAKING: ★★★★★ 3/4
- CHAIN MANAGEMENT: ★★★★★
- VALUE FOR MONEY: ★★★★★ 1/4
- OVERALL RATING: ★★★★★
- SUGGESTED USE:

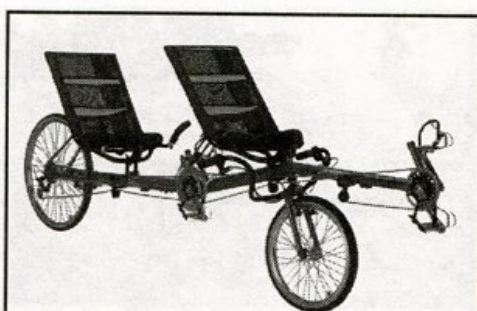
✓ Recreational ✓ Sport touring ✓ HD touring

■ NOTES: We have had never actually been given the opportunity to test the Duplex, though we have seen and ridden them several times. The Ryan is the only true LWB tandem, and it has USS too. The bike hasn't changed much, aside from component updates. Keep in mind that this is a loooong bike.

The S & S Coupler/travel box option is a good one.

■ TEST BIKE PROBLEMS: Our biggest complaint about the Ryan is the intense assembly process, though Ryan does reimburse direct customers for bike shop assembly. The Ryan tandem is available through dealers. The seats are comfy, though be forewarned about the Ryan seat horn.

■ M.S.R.P. \$3800/\$4200 (S & S couplers)



### Double Vision-ATP

- SEAT COMFORT: ★★★★★
- RIDE SMOOTHNESS: ★★★★★ 3/4
- HANDLING: ★★★★★
- PERFORMANCE: ★★★★★ 3/4
- FRAME/BUILD-FINISH QUALITY: ★★★★★
- COMPONENTS: ★★★★★
- BRAKING: ★★★★★
- CHAIN MANAGEMENT: ★★★★★
- VALUE FOR MONEY: ★★★★★ 1/4
- OVERALL RATING: ★★★★★
- SUGGESTED USE:

✓ Recreational ✓ Sport touring ✓ HD touring

■ NOTES: This is a sweet tandem. The only one that works well for kids or shorter adult stokers (telescoping frame/expanding wheelbase). We like the Shimano components, comfy seats, suspension option (front) and Vision deserves kudos for their incredible IPS (independent pedaling system) that even Rans now uses. I.P.S. is a no charge option.

■ TEST BIKE PROBLEMS: We didn't have any problems whatsoever with our Double Vision test tandem. The telescoping frame makes stoker changes very time consuming. Sight alignment of the two frame sections is crucial or you may be going down the road crooked.

■ M.S.R.P. \$3800 (82)/\$4600 (85)

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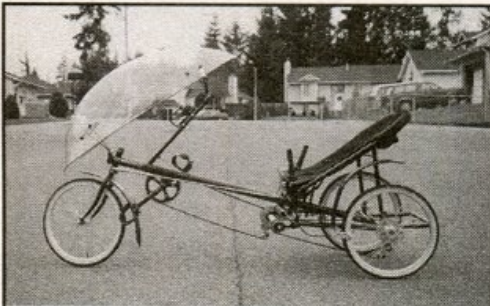
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## Comfort Cycle Chaise 3

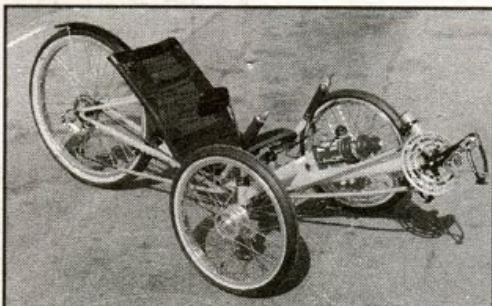
- SEAT COMFORT: ★★ ★ 1/4
- RIDE SMOOTHNESS: ★★ ★ 1/4
- HANDLING: ★★ ★ 1/4
- PERFORMANCE: ★★ ★ 1/4
- FRAME/BUILD-FINISH QUALITY: ★★ ★ 3/4
- COMPONENTS: ★★ ★ 3/4
- BRAKING: ★★ ★ 1/2
- CHAIN MANAGEMENT: ★★ ★ 1/4
- VALUE FOR MONEY: ★★ ★ 1/2
- OVERALL RATING: ★★ ★ 3/4
- SUGGESTED USE:

✓ Cruiser/Recr. ✓ Sport touring ✓ LT touring/comm.

■ NOTES: See our full review of this trike in this issue. Bart Hiatt's Chaise-3 is the most unique recumbent trike in this magazine. From the 49-speed dual rear derailleur drivetrain, to the "hammock" seat, the very cool Phil Wood parts, and the very interesting design theory which has the head tube ever so slightly changing lean angle with the front wheel. The tandem-train is like no other tandem. Comfort's Jim Kueber even offers on-site recumbent sales training to dealers.

■ TEST BIKE PROBLEMS: We had a few problems with this trike. Most were updated during our test and the bugs have been worked out.

■ M.S.R.P. \$2295 + \$75 shipping



## Crystal Trice

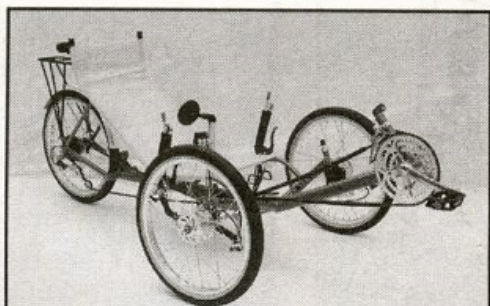
- SEAT COMFORT: ★★ ★ 3/4
- RIDE SMOOTHNESS: ★★ ★ 3/4
- HANDLING: ★★ ★ 3/4
- PERFORMANCE: ★★ ★ 3/4
- FRAME/BUILD-FINISH QUALITY: ★★ ★ 3/4
- COMPONENTS: ★★ ★ ★
- BRAKING: ★★ ★ 1/2
- CHAIN MANAGEMENT: ★★ ★ 1/2
- VALUE FOR MONEY: ★★ ★ ★
- OVERALL RATING: ★★ ★ 3/4
- SUGGESTED USE:

✓ Recr. ✓ HD touring/HD commut. ✓ High Perf.

■ NOTES: This is a newly redesigned Trice. The frame comes apart for easy shipping (though in a small box). The seat recline is laid back. A price increase has the Trice in the same price range as the Dragonflyer and just under the price of a Greenspeed—both tough competitors. The US dealers, People Movers and Fools Crow, are your best bet on the Trice. Spec, paint, and shipping options can vary between builder and dealers.

■ TEST BIKE PROBLEMS: Our Trice had been delayed. It finally showed up at the very last minute. Manufacturer-direct assembly is intense and not for the faint of heart. Our trike is still not rolling.

■ M.S.R.P. \$2995 + shipping



## Greenspeed GTR 20/20

- SEAT COMFORT: ★★ ★ 3/4
- RIDE SMOOTHNESS: ★★ ★ 3/4
- HANDLING: ★★ ★ 1/4
- PERFORMANCE: ★★ ★ ★
- FRAME/BUILD-FINISH QUALITY: ★★ ★ ★
- COMPONENTS: ★★ ★ ★
- BRAKING: ★★ ★ ★
- CHAIN MANAGEMENT: ★★ ★ ★
- VALUE FOR MONEY: ★★ ★ 1/2
- OVERALL RATING: ★★ ★ ★ 1/4
- SUGGESTED USE:

✓ Recr. ✓ HD touring/HD commut. ✓ High Perf.

■ NOTES: Our Greenspeed experience was among the best we've had. Ian Sims trike design and steering geometry is quite simply, the best. This trike was designed to circumnavigate Australia and is tough!

■ TEST BIKE PROBLEMS: Our Sachs rear derailleur lasted 50 feet. Other than that, the trike was perfect. Possible problems would be the lack of an adjustable seat recline (and VERY laid back seat angles). Being that the builder is in Australia, the warranty is kind of a moot point, the GS is MIG welded where most other high-end trikes are TIG'ed. There are long delivery times.

■ M.S.R.P. \$4400 + \$700 shipping (Aus.dollars)



## Earth Cycles Dragonflyer

- SEAT COMFORT: ★★ ★ ★
- RIDE SMOOTHNESS: ★★ ★ ★ 1/2
- HANDLING: ★★ ★ ★
- PERFORMANCE: ★★ ★ ★
- FRAME/BUILD-FINISH QUALITY: ★★ ★ ★
- COMPONENTS: ★★ ★ ★ 1/2
- BRAKING: ★★ ★ ★
- CHAIN MANAGEMENT: ★★ ★ ★
- VALUE FOR MONEY: ★★ ★ ★ 1/2
- OVERALL RATING: ★★ ★ ★ 1/4
- SUGGESTED USE:

✓ Recr. ✓ HD touring/HD commut. ✓ High Perf.

■ NOTES: See our full report in this issue. We are very impressed with this new entry into the tadpole trike arena. It's a great value, beautifully crafted, suspended and BUILT IN THE USA!

■ TEST BIKE PROBLEMS: The Sunmate seat pad is a bit thin and can cause recumbent butt for larger riders, or with the seat too upright. Our upper chain tube slipped in the clamp and derailed the chain, though it was an easy fix. We hope Earth Cycles will start shipping trikes with the front chain preset to riders x-seam and take as much care with RCN readers' trikes as they did with ours.

■ M.S.R.P. \$2995 + shipping



## HPM Tritan

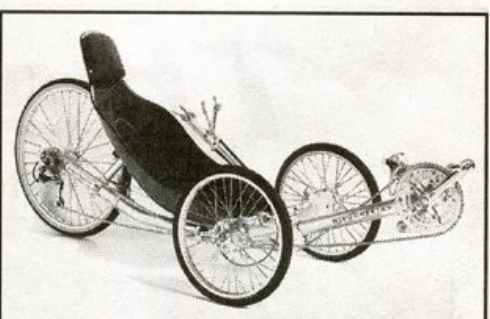
- SEAT COMFORT: ★★ ★ 1/2
- RIDE SMOOTHNESS: ★★ ★ 1/2
- HANDLING: ★★ ★ 1/4
- PERFORMANCE: ★★ ★
- FRAME/BUILD-FINISH QUALITY: ★★ ★ 3/4
- COMPONENTS: ★★ ★ 3/4
- BRAKING: ★★ ★ 1/4
- CHAIN MANAGEMENT: ★★ ★ 1/2
- VALUE FOR MONEY: ★★ ★ ★
- OVERALL RATING: ★★ ★ 3/4
- SUGGESTED USE:

✓ Recreational ✓ Sport Touring ✓ LT touring/ commut.

■ NOTES: The HPM Tritan is a delta trike based on the Ryan Vanguard. It started life as a Ryan trike. It has a high c.g. and can tip, but it's a friendly three wheeler for those looking for a LWB style trike that does not require any balance. HPM trains youths in bike repair, HPV building and fabricating and is associated with the Center for Appropriate Transport. Expect long deliveries on this trike.

■ TEST BIKE PROBLEMS: The Tektro V front brake did not offer optimum performance. The rear disc brake is an acquired taste. Assembly takes more finesse than other trikes.

■ M.S.R.P. \$1695



## Windcheetah

- SEAT COMFORT: ★★ ★ 1/2
- RIDE SMOOTHNESS: ★★ ★ 3/4
- HANDLING: ★★ ★ ★ 1/2
- PERFORMANCE: ★★ ★ ★ 1/2
- FRAME/BUILD-FINISH QUALITY: ★★ ★ ★
- COMPONENTS: ★★ ★ ★
- BRAKING: ★★ ★ ★
- CHAIN MANAGEMENT: ★★ ★ 3/4
- VALUE FOR MONEY: ★★ ★ ★
- OVERALL RATING: ★★ ★ ★ 1/2
- SUGGESTED USE:

✓ Sport Touring ✓ LT touring/ commut. ✓ High Perf.

■ NOTES: The Windcheetah is the recumbent tricycle that enthusiasts dream about. It is the most high tech, technologically advanced and uniquely designed (by Mike Burrows) recumbent trike in the world. This is true kinetic work of art and a legend.

■ TEST BIKE PROBLEMS: Windcheetah has had some rough times in the past with distributor woes, and before that bonding problems. From what we have seen, all problems are ancient history. The Windcheetah is worthy of its reputation. New is a lifetime warranty on this light, high tech bonded aluminum frame with an unequalled racing history.

■ M.S.R.P. \$4200



LWB 'BENT LISTINGS	TYPE & DIMENSION	FRAME & SEAT	COMPONENTS
<b>Greenspeed GTR 20/20 Tandem Trike</b> Tel. (011) 61 3 9758 5541 greenshp@ozemail.com.au www.ihpva.org/com/Greenspeed/ \$7400 Aus. dollars	<b>C-SWB/S-SWB USS</b> WB: 98" SH-12" TRACK: 35.5" C-BBHT- 18" S-BBHT- 18" WT-63 <b>Colors:</b> Green, yellow, red, blue powder <b>Gear Inches:</b> 15-126 C-Captain, S-Stoker	<b>Frame:</b> MIG 4130 CroMo steel frame <b>Seat:</b> Reynolds 531 frame, Nylex mesh <b>Sizes:</b> One-size-fits-most; sliding boom; 4"- 6'6"; telescoping boom	<b>Drivetrain:</b> Sachs 3x7 63-spd., Shimano Bar-ends, Sachs 32/42/52, Sachs Power Discs, Sachs/ Shimano BB/HS, 406mm 20" (3) Tioga Comp Pool tires
<b>Linear Tandem</b> Tel. 319/252-1637 www.bikeroute.com/Linear/ Linear.html \$2800	<b>C-SWB/S-LWB USS</b> WB: N.A. SH-N.A. C-BBHT- N.A. S-BBHT- N.A. WT-N.A. <b>Colors:</b> Anodized silver, blue, gold black <b>Gear Inches:</b> 26-104	<b>Frame:</b> Rectangular aluminum frame, USS bars, stays, CroMo fork <b>Seat:</b> Aluminum frame, nylon mesh, foam pad <b>Sizes:</b> One-size-fits-most; sliding seats	<b>Drivetrain:</b> Shimano/Sachs 21-spd., 26" RW, 20" FW
<b>Fools Crow Daisy Mayhem 20/20</b> Tel. 850/224-4767 edde@ifn.net www.foolscrow.com \$3200 + shipping	<b>C-SWB/S-LWB ASS</b> WB: 75.5" SH-24" C-BBHT- 23.5" S-BBHT- 18" WT-42 w/o drag brake <b>Colors:</b> Custom <b>Gear Inches:</b> 19-107	<b>Frame:</b> 1.75" .049 CroMo frame and fork (Ballistic susp. fork option). <b>Seat:</b> Aluminum frame, nylon mesh <b>Sizes:</b> Custom, specializing in fitting shorter riders	<b>Drivetrain:</b> Shimano Deore XT/ Ultegra, Rapid Fire 24-spd., XT BB, Ritchey HS, XT V-brakes, Shimano XT tandem hubs, Sun Rhynolite rims, 20" 406 (2) w/Avocet slicks
<b>RANS Screamer</b> Tel.785/687-7475 bikes@Rans.com www.rans.com \$3995	<b>C-SWB/S-LWB ASS</b> WB: 74.5" SH-25.5/23.5 C-BBHT- 12.5" S-BBHT- 25.5" WT-46 <b>Colors:</b> Blood Red <b>Gear Inches:</b> 26-104	<b>Frame:</b> TIG CroMo, fork, Flip It stem <b>Seat:</b> RANS ventilated mesh back, composite base, nylon covered foam <b>Sizes:</b> One-size-fits-most (XL captain option); sliding seats	<b>Drivetrain:</b> SRAM GripShift ESP 9.0/900, Ritchey Logic 26/38/54 tandem triple, Magura HS11 hydraulic brakes, Shim. HS, Ritchey HS, XT tandem hubs, Sun Rhyno hims, 26" RW w/Ritchy Tom Slick 1.4, 406mm FW w/Avocet Fas Grip
<b>RANS Screamer IPS</b> Tel.785/687-7475 bikes@Rans.com www.rans.com \$4350	<b>C-SWB/S-LWB ASS</b> WB: 74.5" SH-25.5/23.5 C-BBHT- 12.5" S-BBHT- 25.5" WT-46 <b>Colors:</b> Crazy Plum <b>Gear Inches:</b> 26-104	<b>Frame:</b> TIG CroMo, fork, Flip It stem <b>Seat:</b> RANS ventilated mesh back, composite base, nylon covered foam <b>Sizes:</b> One-size-fits-most (XL captain option); sliding seats	<b>Drivetrain:</b> SRAM GripShift ESP 9.0/900, Ritchey Logic 26/38/54, Vision IPS, Magura HS11 hydraulic brakes, Shim. HS, Ritchey HS, 26" RW, 406mm FW
<b>RANS/Angletech Screamer GLS24IC</b> Tel. 719/687-7475 Anglezoom@aol.com www.angletechcycles.com \$5369.99	<b>C-SWB/S-LWB ASS</b> WB: 74.5" SH-25.5/23.5 C-BBHT- 12.5" S-BBHT- 25.5" WT-48 <b>Colors:</b> Crazy Plum, Red <b>Gear Inches:</b> 17-134	<b>Frame:</b> TIG CroMo frame & Nobilette custom CroMofork, RANS Flip It stem <b>Seat:</b> RANS ventilated mesh back, composite base, nylon covered foam <b>Sizes:</b> One-size-fits-most (opt. XL Capt.)	<b>Drivetrain:</b> Grip Shift ESP 9.0 SL, White/Gripshift (White rr. der./shift.), Ritchey Logic crank, Magura HS33, Sachs PC41 chain, Phil BB, Chris King HS, 26" RW, 20" FW
<b>RANS/Angletech Screamer GL63</b> Tel. 719/687-7475 Anglezoom@aol.com www.angletechcycles.com \$3999.99	<b>C-SWB/S-LWB ASS</b> WB: 74.5" SH-25.5/23.5 C-BBHT- 12.5" S-BBHT- 25.5" WT-46 <b>Colors:</b> Crazy Plum, Red <b>Gear Inches:</b> 17-150	<b>Frame:</b> TIG CroMo frame & Nobilette custom fork, RANS Flip It stem <b>Seat:</b> RANS ventilated mesh back, composite base, nylon covered foam <b>Sizes:</b> One-size-fits-most (opt. XL Capt.)	<b>Drivetrain:</b> SRAM GripShift ESP 9.0/900 SL, Sachs Quartz 3x7 Ritchey Logic 26/38/54, Magura HS24 hydraulic brakes, Shim. HS, Ritchey HS, 26" RW, 406mm FW
<b>Ryan DuPlex/DuPlex S &amp; S</b> Tel.781/979-0072 ryanbike@ryancycles.com www.ryancycles.com \$3800/\$4200 (S & S Couplers)	<b>C-LWB/S-LWB USS</b> WB: 103" SH-25" C-BBHT- 15" S-BBHT- 15" WT-53 <b>Colors:</b> Red or black powdercoat <b>Gear Inches:</b> 23-123	<b>Frame:</b> TIG CroMo steel frame & fork; optional S & S coupler/take-apart frame. <b>Seat:</b> Aluminum frame, nylon mesh <b>Sizes:</b> One-size-fits-most; sliding seats	<b>Drivetrain:</b> Shimano Deore LX, Bar-Cons, Specialized 32/42/52 crank, Phil hubs, Shimano BB, Tioga HS, Shimano V and Arai drag brake, Phil hubs, Bontrager rims, 26" RW w/Tioga City Slicker, 20" FW w/Haro 1.5 slick
<b>S &amp; B Double Panther Tandem</b> Tel. 310/608-0008 s_brecumbent@hotmail.com www.bikeroute.com/S-B \$2795	<b>C-LWB/S-LWB USS</b> WB: 72" SH-19" C-BBHT- 19" S-BBHT- N.A. WT-42 <b>Colors:</b> Powdercoat <b>Gear Inches:</b> N.A.	<b>Frame:</b> TIG CroMo steel frame <b>Seat:</b> Fiberglass shell with foam pad/ vinyl cover. <b>Sizes:</b> One-size-fits-most; sliding seats	<b>Drivetrain:</b> Shimano 21-spd., Grip Shift, drum brakes, Shimano BB, Tioga HS, 26" RW, 16" FW
<b>Vision R82/R82 IPS<sup>1</sup></b> Tel. 206/467-0231 ATPVision@aol.com www.visionrecumbents.com \$3800	<b>C-SWB/S-LWB USS</b> WB: 77" SH-26/21" C-BBHT- 20" S-BBHT- 17" WT-45 <b>Colors:</b> Red, yellow or misty purple <b>Gear Inches:</b> 24-115	<b>Frame:</b> TIG 4130 CroMo and stainless steel frame, CroMo fork <b>Seat:</b> Aluminum frame, nylon mesh, foam pad. <b>Sizes:</b> One-size-fits-most; sliding boom/telescoping frame	<b>Drivetrain:</b> Shimano RX100/ Ultegra, RSX Rapidfire 24-spd., Ritchey tdm. 30/44/54 (Opt. I.P.S.), Dia Compe VC7 Cantilever brakes, KMC Chain, Sun rims, Shim. tandem hubs, 26" RW w/ IRC Duro tire, 406mm 20" FW w/Peregrin tire
<b>Vision R85/R85 IPS<sup>1</sup></b> Tel. 206/467-0231 ATPVision@aol.com www.visionrecumbents.com \$4600	<b>C-SWB/S-LWB USS</b> WB: 77" SH-26/21" C-BBHT- 20" S-BBHT- 17" WT-45 <b>Colors:</b> Red, yellow or misty purple <b>Gear Inches:</b> 24-115	<b>Frame:</b> TIG 4130 CroMo and stainless steel frame, CroMo fork <b>Seat:</b> Aluminum frame, nylon mesh, foam pad. <b>Sizes:</b> One-size-fits-most; sliding boom/telescoping frame	<b>Drivetrain:</b> Shimano XT/Ultegra, XT Rapidfire 24-spd., Ritchey tdm. 30/44/54 (Opt. I.P.S.), Magura Hydraulic and Arai drag brake, KMC Chain, Sun rims, Shim. Phil tdm. hubs, 26" RW w/ IRC Duro tire, 406mm 20" FW w/Peregrin tire

<sup>1</sup> Double Vision tandems are available with or without IPS at no additional charge



LWB 'BENT LISTINGS	TYPE & DIMENSION	FRAME & SEAT	COMPONENTS
<b>Angletech Quadraped</b> Tel. 719/687-7475 Anglezoom@aol.com http://www.angletechcycles.com \$4099.99	<b>Tadpole</b> (2 whl. front) <b>ASS</b> (ft/arm crank) WB: TRACK: SH-20.5" BBHT- 13" WT-44-47 Colors: Custom deep powder Gear Inches: 17-141	<b>Frame:</b> TIG CroMo steel mainframe, alum. bars/stem, <b>Seat:</b> Cromo frame, Cordura mesh <b>Sizes:</b> Fits riders 5'2"-6'7"; sliding seat and boom	<b>Drivetrain:</b> Shimano 105, Bar-Con 35 spd. (mid-drive), Sugino Fuse crank, Sachs drum brakes w/caliper drag brake, Shimano HS, Phil BB, 406mm 20" (3) Haro slicks
<b>Angletech TriSpeeder</b> Tel. 719/687-7475 Anglezoom@aol.com http://www.angletechcycles.com \$3599.99	<b>Tadpole</b> (2 whl. front) <b>ASS</b> WB: 48" TRACK: 34" SH-N.A. BBHT- N.A. WT-39 Colors: Custom deep powder Gear Inches: 17-141	<b>Frame:</b> TIG CroMo steel mainframe, alum. bars/stem, <b>Seat:</b> Cromo frame, Cordura mesh <b>Sizes:</b> Fits riders 5'2"-6'7"; sliding seat and boom	<b>Drivetrain:</b> Shimano 105, Bar-Con 35 spd. (mid-drive), Sugino Fuse crank, Sachs drum brakes w/caliper drag brake, Shimano HS, Phil BB, 406mm 20" (3) Haro slicks
<b>Comfort Cycle</b> Tel. 1-888-UcomfyY 903/342-7745 www.comfortcycle.com barth@comfortcycle.com \$2295 + \$100-\$150 S/H	<b>Delta</b> (2 whl. back) <b>USS</b> WB: 62" TRACK: 31" SH-18" BBHT- 13" WT-42 Colors: Black, yellow powdercoat Gear Inches: 9-109 (w/46-T.)	<b>Frame:</b> TIG CroMo steel frame & fork <b>Seat:</b> Cromo frame, Comfort Max form fitting sling Cordura mesh with foam base <b>Sizes:</b> Sliding bottom bracket	<b>Drivetrain:</b> Sachs Centera (2), Sachs Twist 49 spd. (mid-drive), Dotek crank, Dia Compe caliper brakes, Phil hubs, Power Grip Pedals, 406mm 20" Primo V-Monster
<b>Crystal Engineering Trice</b> Tel. 011 44 1326 378848 (UK) tricehpv@globalnet.co.uk \$3000	<b>Tadpole</b> (2 whl. front) <b>USS</b> WB: 39" TRACK: 32" SH-11" BBHT- 16" WT-39 Colors: Powdercoat Gear Inches: 21-113	<b>Frame:</b> Mannesman cold drawn Hiten steel, Columbus 531 stays <b>Seat:</b> Alum. frame, Terylene mesh <b>Sizes:</b> One-size-fits-most; sliding boom	<b>Drivetrain:</b> Shimano Nexave, Shim. bar-con 24 spd., Shim. 26/36/46 crank (Sachs 3x7 opt.), Sturmey Archer drum brakes w/drag, Shim. BB/HS, 26" RW, 406mm 20" FW
<b>Earth Cycles Dragonflyer</b> Tel. 612/335-5048 e-cycles@spacestar.net www.spacestar.net/users/e-cycles \$2995 direct + S/H	<b>Tadpole</b> (2 whl. front) <b>USS Suspension</b> WB: 40" TRACK: 31.5" SH-11.5" BBHT- 16.5" WT-41 Colors: Powdercoat Gear Inches: 13-124	<b>Frame:</b> TIG CroMo steel mainframe <b>Seat:</b> Cromo frame, sling mesh <b>Sizes:</b> One-size-fits-most; sliding boom; 4'11" - 6'6"	<b>Drivetrain:</b> Shimano, Sachs 3x7 21-spd., Shimano Deore LX crank, Sachs drum brakes, SPD Pedals, 406mm 20" (3) Primo Comet
<b>Greenspeed GTR 20/20 Touring<sup>2</sup></b> Tel. (011) 61 3 9758 5541 greenshp@ozemail.com.au www.ihpva.org/com/Greenspeed/ \$4400 Aus. dollars	<b>Tadpole</b> (2 whl. front) <b>USS</b> WB: 39" TRACK: 31.5" SH-12" BBHT- 18" WT-39 Colors: Green, red, yellow, blue Gear Inches: 15-126	<b>Frame:</b> MIG 4130 CroMo steel mainframe <b>Seat:</b> Reynolds 531 frame, Nylex mesh <b>Sizes:</b> One-size-fits-most; sliding boom; 5" - 6'6"; telescoping boom	<b>Drivetrain:</b> Sachs 3x7 63-spd., Shimano Bar-ends, Sachs 32/42/52, Twin Sachs drum brakes (opt. Disc), Sachs/Shimano BB/HS, 406mm 20" (3) Tioga Comp Pool 90 psi tires
<b>Greenspeed GTS 20/20 Sports Tourer</b> Tel. (011) 61 3 9758 5541 greenshp@ozemail.com.au www.ihpva.org/com/Greenspeed/ \$5200 Aus. dollars	<b>Tadpole</b> (2 whl. front) <b>USS</b> WB: 40" TRACK: 31.5" SH-10" BBHT- 16.5" WT-35 Colors: Powdercoat Gear Inches: 20-129	<b>Frame:</b> MIG 4130 CroMo steel mainframe <b>Seat:</b> Reynolds 531 frame, Nylex mesh <b>Sizes:</b> One-size-fits-most; sliding boom; 5" - 6'6"; telescoping boom	<b>Drivetrain:</b> Sachs Quartz 24/42-spd., Shimano Bar-ends, Sachs 32/42/52, Sachs VT drum brakes (opt. Disc), Sachs/Shim. BB/HS, 451mm 20" (3) IRC Roadlite EX tires
<b>Human Powered Machines Tritan</b> Tel. 541/343-5568 cat@efn.org http://www.efn.org/~cat \$1695	<b>Delta</b> (2 whl. back) <b>USS</b> WB: 73" TRACK: N.A. SH-22" BBHT- 15.5" WT-39 Colors: Powdercoat Gear Inches: 16-83	<b>Frame:</b> TIG 4130 CroMo steel frame and fork, alum. USS <b>Seat:</b> Aluminum frame, nylon mesh <b>Sizes:</b> One-size-fits-most; sliding boom; 5" - 6'5"; sliding seat	<b>Drivetrain:</b> Sachs 21-spd., Shimano Bar-ends, Shimano 24/36/50, Sachs disc & Tektro V brakes, Shimano BB/HS, 406mm 20" (3) Primo V-monster tires
<b>ReTrike</b> Tel. 1-888-ReBike (732-4531) http://www.rebike.com \$599 + shipping	<b>Delta</b> (2 whl. back) <b>ASS</b> WB: 51" TRACK: 30" SH-22-26" BBHT- N.A. WT-50 Colors: Red Hot powdercoat. Gear Inches: 30-60	<b>Frame:</b> Hiten steel mainframe <b>Seat:</b> Nylon covered foam back rest, padded saddle with adj. tilt. <b>Sizes:</b> One-size-fits-most	<b>Drivetrain:</b> Sachs 21-spd., Shimano Bar-ends, Shimano 24/36/50, Sachs disc & Tektro V brakes, Shimano BB/HS, 406mm 20" (3) Primo V-monster tires
<b>S &amp; B Trike</b> Tel. 310/608-0008 s_brecumbent@hotmail.com \$990(6-spd.)/\$1395 (24-spd.)	<b>Tadpole</b> (2 whl. front) <b>USS</b> WB: 60" TRACK: N.A. SH-20.5" BBHT- 17" WT-35 Gear Inches: N.A.	<b>Frame:</b> TIG 4130 Cromo/Hiten <b>Seat:</b> Fiberglass shell/foam pad/cover <b>Sizes:</b> One-size-fits-most; sliding seat	<b>Drivetrain:</b> Shimano 6 or STX 24 spd., Dotek or Sugino crank, rear drum brake (opt. front drums), Shim. BB, Tioga HS, 20" RW, 16" FW
<b>S &amp; B Speedster</b> Tel. 310/608-0008 www.bikeroute.com/S-B \$2795	<b>Delta</b> (2 whl. back) <b>USS</b> WB: 60" TRACK: N.A. SH-10" BBHT- N.A. WT-34 Colors: Powdercoat	<b>Frame:</b> TIG 4130 Cromo <b>Seat:</b> Fiberglass shell/foam pad/cover <b>Sizes:</b> One-size-fits-most; sliding seat (Rider weight limit—225 pounds)	<b>Drivetrain:</b> Shimano Deore LX 21 spd., Shimano crank, Shimano BB, Tioga HS, 20" RW w/Sachs drum hub, 16" FW w/ Phil hub, Primo tires
<b>Windcheetah-Seat of the Pants</b> Tel. 011 44 161 928 5575 (UK) sales@windcheetah.co.uk www.windcheetah.co.uk \$4200	<b>Tadpole</b> (2 whl. front) <b>ASS Joystick</b> WB: 41" TRACK: 26" SH-7.5" BBHT- 13.5" WT-31 Colors: Green/bronze or yellow/silver Gear Inches: 31-108	<b>Frame:</b> 6000 Series Alum./bonded with Loctite 638, cast lugs <b>Seat:</b> Carbon Kevlar shell/ foam, cover <b>Sizes:</b> Three sizes; sliding seat	<b>Drivetrain:</b> Shimano XT 24-spd., RX100 DT road shifters, TA 24/42/52 crankset, Sturmey Archer drum brakes, 17" Wolber/Moulton FW (2), 26" RW
<b>WizWheelz TerraTrike</b> Tel. 616/940-1909 wiz@iserv.net www.wizwheelz.nvo.com \$1995 with 30 day MBG	<b>Tadpole</b> (2 whl. front) <b>ASS Bars</b> WB: 42" TRACK: 29" SH-12" BBHT- 14" WT-34 Colors: Powdercoat Gear Inches: N.A.	<b>Frame:</b> 4130 CroMo steel with ASS <b>Seat:</b> RANS <b>Sizes:</b> 5'4" to 6'4" (200 pound rider weight limit)	<b>Drivetrain:</b> Sachs 3x7 21-spd., Sachs Power Grip shifters, Sachs VT5000 drum brakes, 26" RW w/ 3x7 hub, IRC Metro tire; 20" 406mm FW, Sachs hubs, Primo Comet tires

2 The Greenspeed trikes are also imported by People Movers and spec'ed in the USA with prices from \$3200 US dollars



# The Notebook of an Unreasonable Man

By Kent Peterson

[peterston@halcyon.com](mailto:peterston@halcyon.com)  
[Http://www.halcyon.com/peterston/bentkent.html](http://www.halcyon.com/peterston/bentkent.html)

## Snow White & Red Rose

Kent's Mission: A 'bent beat from the back alleys, garages and dumpsters where new bikes don't come powdercoated and old bikes live on with the help of duct tape, hose clamps and determination.

It all began with a little white bike. I'd bought the bike, a homebuilt bike in the Tour Easy style, for a good price off the internet. The bike was too small for me, but it fit my wife fine. She dubbed the bike Snow White in honor of its white paint job. The bike was cute but it sported a floral print seat that made me cringe. Christine thought the bike looked fine.

One thing Christine didn't like was the narrow tires on her bike. She was used to bikes with big fat road hugging tires and the skinny tires made her nervous. Was there anything I could do about that? I told her I'd think about it.

The eventual solution presented itself in the form of another internet post. This was a note from Zach Kaplan detailing how he'd modified his Gold Rush to take a 26" (MTB size) rear wheel and a 20" (BMX) size front wheel. These wheels have a smaller diameter than what a stock Tour Easy comes with but it would let me run some fatter tires. I scrounged some wheels out of my big junk pile and I used some T-brackets and bolts from my local hardware store to adapt the brakes to fit the smaller wheels.

Right around this time an amazing coincidence happened to me. My sons and I were out walking when we spotted an old recumbent exercise bike that the local health club was tossing out. The bike was trashed but the seat on it was perfect. It looked exactly like an old style Tour Easy seat. It would be a shame for such a fine seat to end up in the garbage. So I brought it home for Snow White.

The new seat and the smaller wheels had an interesting side effect. I could now slide the new seat back a bit further and now I could actually fit the bike. I took it

for a test spin. Hmm, it seems pretty fast. I rode it to the bike shop and bought a bike computer for it. I hooked up the computer that evening and did a few more test runs. By golly, the bike really is fast.

The next day I rode Snow White on one of my known test routes, the 12 mile ride from my house up to the velodrome parking lot at Marymoor park in Redmond. Dang! This is a fast bike. I tied my previous best time for the course. But I set that record on my Rocket with its tailbox and an experimental front fairing. Today I was riding an unfaired Tour Easy clone that I was still getting used to. Maybe I'd had a tailwind. I set out for home to get more data.

As I was leaving the parking lot, a pack of lycra-clad racer types were pulling out at the same time. I fell in behind them, but the trailing rider looked down his nose at me and gave a very condescending look that seemed to say "I hope you don't think you can ride with us on that!" A whole bunch of colorful things to say rolled through my head but I settled for a simple "on your left" as I pulled around the entire pack in a smooth burst of acceleration. The pack became a tiny dot in my rearview mirror and then disappeared entirely. Snow White set a new record for the return trip home.

There isn't enough paper in this entire magazine to describe the negotiations that went on at my house over the ownership of Snow White. Ultimately, Christine and I came to an agreement. She would keep Snow White. I could borrow Snow White for this summer's big race, the Cannonball, but the bike would still be hers. I could also borrow the bike to train on. But we agreed, the real solution was for me to get a bike like Snow White for the Cannonball.

And of course the world's fastest Tour Easy style bike is a Gold Rush.

Now a lot of people have the crazy idea that Bob Bryant can just call up Gardner Martin and Gardner will drop everything and make a Gold Rush magically appear in Bob's garage in a matter of days. Let me tell you, it doesn't work that way. I know, I tried. Bob does have a Gold Rush, but it's too big for me. We needed another one.

The problem is, Gardner's bikes are in high demand. At the time I was trying to score a bike for the Cannonball, there was a twelve week wait. Gardner is an honorable guy and all the folks ahead of me in line would have to take precedence over my desire to have a hot race bike. The Cannonball was less than 12 weeks away so a Gold Rush was not in the cards. I could train and race on Snow White, but now that Christine had agreed that I should get another bike, I was anxious to make it happen.

We fell back to plan B which involved building another bike like Snow White. Gardner was super helpful with tips and advice about how to go about building up the bike. He sold me the handlebars, stem, fork, idler and a factory refurbished Cobra seat. My friend Tony Licuanan knew a recumbent-friendly local builder who would fit the bike into his schedule. If everything went according to plan, I'd have my bike ready six weeks before the Cannonball.

During its development we referred to the bike as the "Snow Clone." Rick Gnehm, our local framebuilder, is a real pro and he used Snow White as the prototype but he also used his years of experience in building track and road race



bikes. I was very nervous throughout the whole process and kept sane by letting Tony keep track of most of the details while I distracted myself with training for the race on the other bikes in my fleet.

We deviated from Snow White's design only when it made sense. Rick made the new bike an inch longer to better fit me. The clone also had a longer headtube to match Gardner's original design and fork. Snow White lacked the diagonal frame brace that stiffens a real Tour Easy. We wanted the frame to have the strength and stiffness of a good race bike, so Rick included the bracing tube. The final key difference was that this bike was being built specifically to accept the 26" rear wheel.

Rick's brazing work and attention to detail were astounding. The new bike was made from a combination of Reynolds tubing and some .035 straight gauge CroMo. Rick hand picked each tube and finished everything off with perfectly positioned braze-ons for each cable stop.

Rick finished the frame right on schedule. Tony had cooked up a deal to get the frame powdercoated at a local bike manufacturer. Since we were relying on their good graces, we didn't have a lot of choice about what color the bike would be. It would depend on what color the powdercoater was set for when Tony got there. I expressed my preferences and told him to hold off painting it until the sprayer was set for a really ugly color. "But if it's something normal like Silver, Black or Red go for it!" I instructed Tony.

The next night Tony showed up at my door with the frame. "Close your eyes," he said. When I opened them I was holding the most beautiful rose red frame I've ever seen. My wife said I was only slightly less excited than when our children were born.

"I suppose you're going to stay up all night building up the bike." "Me? Nah," I said as I feverishly inventoried the parts I had on hand. I guessed the bike could be assembled in six hours. I left the frame sitting on the kitchen table and went to bed.

Some guys insist that their bikes be equipped with the latest, greatest, lightest, niftiest components. I'm not one of those guys. I built the bike up with recycled parts I'd scavenged from various bikes I'd found at thrift stores and swap meets. Yes, I had the shiny new frame and shiny new Easy Racer parts but the rest of the bike was the simple solid stuff that works fine but is rather out of fashion in this age of index shifting, hydraulic brakes and 9 speed titanium freehubs.

I went to the local bike shop to get the last few parts to put Red Rose on the road. I put on the final touches, gave the bike a couple of test spins around the neighborhood. Sunday would be the big test ride.

Sunday brought less than ideal riding conditions but my friend Ken and I went out for a wet, hilly, magnificent ride. Ken was riding Snow White and I was on Rose Red and we covered 75 miles in five hours. Red Rose maxed out at 38.5 mph on one descent but that limit was imposed by the weather and my last shreds of common sense as I feathered the brakes.

Red Rose exceeded all my expectations. The bike was fast and comfortable but I was also really impressed at how well the bike climbed and accelerated. These would be key factors in the 274 mile Cannonball race from Seattle to Spokane.

As I write this, that race is still a month away. My friend Andy has decided to ride this race on his shiny new Lemond upright bike. Andy used to be a bike messenger, he mountain bikes, he bike commutes and he puts on a lot of miles. Neither Andy or I expect to win the Cannonball, but we both are intent on finishing. Andy wants to finish before I do and I, of course, want to come in ahead of him. But it's a friendly competition and we decide to get together for a friendly morning training ride.

At 5:45 am I meet Andy under the freeway at Lake Washington Boulevard. Andy takes a look at my new bike, makes some generally complimentary comments and says, "Let's go." We point the bikes south and punch the pedals.

Now you have to understand that Red Rose goes from zero to 20 mph in less time than it takes you to read this sentence. In fact, Red Rose passed 20 in about the time it took you to read "Now you ha." Andy is quick on the Lemond, but not that quick. And Lake Washington Blvd SE headed down toward the bike path is a kind of choppy chunk of pavement. The kind of pavement that makes skinny horsey tires skittery. Red Rose is not skittery. Her tires hug the pavement like a rediscovered long lost love and every turn of the pedals is turned into more space behind me. Andy's bike is a little dot in my rearview mirror.

I slow up by the turn onto the bike path and Andy catches up. I go a little easier on him on the bike path. When we turn onto the road again we've got a section with a decent climb. I gear down and spin, Andy stands and sprints. He goes past me and says "the recumbent's one weakness..." "Yeah," I say but I'm not worried. At the

crest of the hill, he's not too far ahead of me. I slide off my granny gear, pedal a couple of times and then slide onto my 58 tooth big ring. One, two, three pedal strokes and I'm closing fast. A few more spins and I'm up close to 30 MPH. I stop pedaling, pull around Andy and do a picture perfect relaxed pass. "Damn!" is the last thing I hear as he disappears from view.

Now it's rolling hills and I'm not in the mood to mess with the granny gear. A little bit of momentum, mixed with some determination and Rose is climbing like Ally McBeal's hemline. I hold back a bit so Andy can somewhat keep pace, but not enough to let him take me on any hill. As we pull into Renton, I realize I'm not sure of the route he takes so I ease off a bit more and say, "You lead."

As we cross the railroad tracks at the south end of the lake, Andy pinch flats his rear tire. While he changes it we discuss various equipment strategies for the Cannonball. "Fat tires, man," I say. "Yep," Andy agrees, "you've got superior technology." It's only a few minutes and we are back on the road.

I follow Andy through Renton at a pretty good clip because we're now into a Boeing rush hour. Stop and go city riding isn't my favorite thing but Rose is pretty agile. As an ex-messenger, Andy is in his element. At one point a van turns in front of him and I see his life pass before my eyes but Andy has the reflexes of a cat and everything is fine.

We make it through the worst of the traffic and are now headed north along the lake shore. Andy's clipping along at 22 to 23 mph and I'm riding comfortably behind him. When we get up around Seward Park and Lake Washington Boulevard traffic is lighter and I take the lead. We verify that yes, at any instant if I want to leave Andy behind all I have to do is punch the pedals. "That damn bike!" Andy sputters, "and you don't have anything fancy on it. You've got Matt's old mountain bike wheel on the back for God's sake. And it's not even true!" "Yep," I say, "I just kind of slapped this together. But I've got some time before the Cannonball. When I get the fairing on, the bike'll be fast." Andy just makes a kind of groaning wimpery sound.

But there still is another month of training and tweaking before the big race. Who'll win, who'll lose? Who knows? Stay tuned to RCN for the report of Kent and Andy's grudge match. And Joe "Road Warrior" Kochanowski and John "Rocketman" Williams will be racing as well. □



**By Richard Drdul**

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**C**arrying your recumbent on your car is usually pretty straightforward—pop it on the roof or hang it off the back. Unless, of course, your recumbent is a LWB or a tandem.

I prefer to carry my bikes on the roof of the car. Unfortunately, standard roof-top bicycle racks are designed for upright bicycles, and don't accommodate bikes with wheelbases longer than about 43 inches (109 cm). What's needed to carry a tandem or a LWB is a tandem rack.

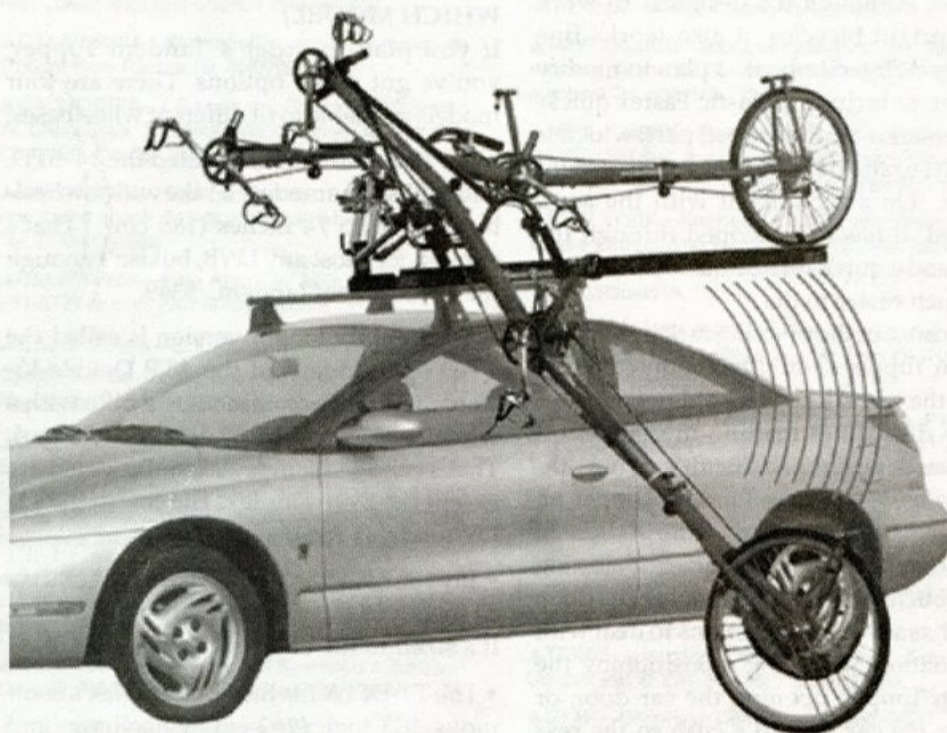
#### PROBLEMS WITH TANDEM RACKS

There are several tandem racks on the market, and all will fit Yakima, Thule or other rack systems. But the best one by far is the Tandem Topper by ATOC.

In my unenlightened days when I rode a wedgie tandem, I used to use a Yakima tandem rack. It was difficult to load or unload the tandem—I had to lift the bike up in the air and hold it over the rack while my wife maneuvered the forks into the fork mount. Then I dropped the back end of the tandem into the cradle for the bottom tube, threaded the straps past the chain, and cinched them up.

That description illustrates two big problems with the design of the Yakima tandem rack (and the same can be said for Thule, Rocky Mounts and other tandem racks). The first problem is that I needed someone there to help me—there was absolutely no way I could do it myself. The other problem was that the rack supported the rear of the bike by the frame, not the rear wheel. That might work for most upright tandems, but it wouldn't work at all for a recumbent.

So when we ordered a Rans



Screamer, I sold the Yakima rack and bought an ATOC Tandem Topper. This is clearly the best tandem rack available, and can handle any two-wheeled recumbent.

#### WHAT'S SO GOOD ABOUT THE TANDEM TOPPER?

The advantages include:

- The fork mount pivots. This means that I can load the tandem by myself. All I have to do is remove the front wheel, lift the front of the bike up and drop the fork into the fork mount. The rear wheel remains on the ground. Then I lift the rear of the bike, and drop the wheel into the wheel tray. It doesn't get much easier than that.
- The rack supports the bike by the rear wheel, so it doesn't matter what kind of weird frame design the bike has.
- The skewer holding the forks is 9mm in diameter, which means it's virtually impossible to bend when placing the forks in the mount. Some rack manufacturers use wimpy 6mm skewers that can bend easily—not so with ATOC.
- You can use the rack to carry a SWB or Compact, although you won't be able to use the pivoting fork mount, and will have to hoist the bike up the old fashioned way. ATOC does make racks for SWB and Compact bikes.
- The rear half of the rack can be removed when not in use or when carrying shorter bike, so that hatchbacks and tailgates can be fully opened.
- The fork mount holds the forks 4 inches (10 cm) above the wheel tray, which provides clearance for fenders. With some racks, the forks attach at the level of the wheel tray, and the bottom edge of the front fender hits the tray.
- The rear wheel strap is made of hook-and-loop material, and is long enough to work with high-profile aero rims or composite wheels.
- The rack is constructed from a proprietary, high-strength aircraft grade aluminum alloy structural beam, so it's strong.
- Because it's aluminum, it won't rust. Much of the hardware is made of stainless steel so it won't rust, either. Where I live, it rains a lot, and I've had steel racks rust out.



## ANY PROBLEMS?

I haven't encountered any problems with the Tandem Topper. The only "problem" (really just an inconvenience) is that because of the pivoting fork mount, the fork and handlebars of the bike have to be immobilized so that they do not rotate relative to the rest of the bike. A strap is included with the Tandem Topper for this purpose. Although it's designed to work with upright bicycles, it also works fine with my ASS recumbent. I plan to modify the strap to include a plastic Fastex quick-release buckle on the looped part, which is intended to slip over the seat on an upright bicycle. On a recumbent with the seats removed, it has to be looped through the frame, and a quick-release buckle will make that much easier to do.

Because of the pivoting fork mount, the Tandem Topper should be mounted at the side of the car. Although I did not encounter any difficulties loading my tandem, I have heard reports of difficulties from others who have used the Tandem Topper on cars with narrow roofs and wide bodies. In this case, apparently the cranks or chainring might touch the edge of the roof or the door. ATOC has several suggestions to deal with this situation, including repositioning the Tandem Topper, opening the car door, or parking the car next to a curb so the rear

wheel is a few inches higher.

The only other possibly negative observation I can make about the Tandem Topper is that the warning stickers are ugly. I realize that ATOC's lawyers have good reason for wanting these stickers on the rack, and that by making them so obnoxious, no one could fail to notice them. Fortunately, they peel off easily.

## WHICH MODEL?

If you plan to order a Tandem Topper, you've got a few options. There are four models available to fit different wheelbases:

- The standard model is called the TT-STD, and will accommodate a bike with a wheelbase of up to 74 inches (188 cm). That's enough for most any LWB, but isn't enough for a recumbent tandem. \$349.

- The slightly longer version is called the TT-DV (in honour of the ATP Double Vision), and will accommodate a bike with a wheelbase of up to 82 inches (208 cm). That's enough for every recumbent tandem, except the Ryan Duplex. The cost of the TT-DV model is \$364.

- If your bike has a wheelbase longer than 82 inches (208 cm), then there's the TT-321. It's sized to the bike's wheelbase. \$475.

- The TT-DPLX fits the Ryan Duplex's enormous 103 inch (262 cm) wheelbase, and

costs \$450.

A taller fork mount is available, which is designed for bikes with low rider front racks. I don't know of many recumbents on which you could use a low rider rack, but if you need extra front wheel clearance (such as with fenders), then consider this option. The taller fork mount provides more than 8 inches (20 cm) of clearance, as compared with the standard 4 inches (10 cm) of clearance.

You will soon be able to order the Tandem Topper with ATOC's Topper Lok, which is a 9mm skewer designed to incorporate a padlock. And if you want to lock the Tandem Topper to the rest of the roof rack system, the clamps are compatible with Yakima's SKS accessory locks.

## ■ WHERE DO I GET ONE?

To find out who sells the Tandem Topper in your area, contact ATOC at:

ATOC Inc.  
6615 180th Street  
Lynnwood, WA 98037

1-800-286-2021  
425-745-2131  
<http://www.atoc.com> □

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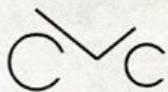
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▲ **ALABAMA—North Georgia:** First Sat./month, 9am@Hokes Bluff, City Hall-Call Dave Tel. 205/492-3454 or burgess@cybrtyrme.com

▲ **ARIZONA—Phoenix/Scottsdale:** Laid Back Society: 2nd & 4th Sat. 8am. loaners available. Contact: Ken Culver, Bike Emporium, 1-800-DrBike1.

▲ **CALIFORNIA—Watsonville:** 3rd Sat./ month @ 9:30am Easy Racers Tel. 408/722-9797.

▲ **CALIFORNIA—LA area:** 3rd Sun., 10 am@Burton W. Chace Park, Mindanao Way, Marina Del Rey, CA. Chris Broome, Tel. 310/823-2464, cbroome@usa.net

▲ **CALIFORNIA—Orange County:** 2nd Sat./month ride to the beach. Meets at People Movers Call Jim Tel. 714/633-3663.

▲ **CALIFORNIA—Palo Alto:** Call Alvin Chin Tel.650/571-5147 or chin\_alvin@hotmail.com.

▲ **CALIFORNIA—S.F. BARC** (Bay Area R'bent Cyclists) 1st Sat./month, 10am@ Mill Valley Plaza Zach Kaplan Tel. 415/381-5723 or zakaplan@earthlink.net.

▲ **CALIFORNIA—Monterey/Santa Cruz:** 4th Sat.10:30am@ Seabright Brewery/Java Junction Coffee House, 519 Seabright Ave. in Santa Cruz, Martin Krieg, Tel. 408/426-8830, cycleam@BikeRoute.com. <http://www.bikeroute.com/RecumbentRides.htm>

▲ **CALIFORNIA—San Diego:** Last Sat./month from the Mission Bay Vis. Ctr. Bill Volk Tel. 619/824-8323, bill\_volk@lightspan.com

▲ **CALIFORNIA—Sacramento:** Recumbent Riders of Dave @ 916/483-4435 or SacBent@aol.com

▲ **CALIFORNIA—Sacramento S.A.R.C.:** (Sacramento Area R'bent Cyclists) Gary @ 916/600-8312 or cookie13@pacbell.net

▲ **CALIFORNIA—San Dimas:** EZRiders (~30 mi. E of LA) Most Sat. 20-50 mi. (workouts) Sun. 10 - 20 mi. (social) odonnell@ xsis.xerox.com or & lscheetz@cyberg8t.com

▲ **CONNECTICUT:** Recumbent Yankee Pedalers meet 2nd Sun.@ 9am. Dave Tipping Tel. 203/484-2937 or nz1j@juno.com

▲ **FLORIDA—FOOLS CROW CYCLES, LASERR,** (Tallahassee): Call Ed Deaton@ 904/224-4767, edde@freenet.th.fl.us

▲ **IDAHO—HAILEY** (Sun Valley area): Bob or Reggie Tel. 208/788-5433.

▲ **ILLINOIS—Chicago:** WISIL Len Brunkala, 260 S. Channing, Apt.#1, Elgin, IL, 60120-6619 or Ed Gin Tel.773/237-6624.

▲ **ILLINOIS—Champaign/Bloomington:** CIRC (Central Illinios Recumbent Club) meets monthly for rides. Tom Smith Tel. 217/351-7305 or tsmith4@students.uiuc.edu, www.mtco.com/~webstwl/circ1.htm

▲ **INDIANA—Fort Wayne:** Wendell Brane Tel. 219/749-5610, or WBrane@Compuserve.com.

▲ **KENTUCKY—**'Bent group forming. Mike Reilly Tel. 502/491-0328, mfreilly@bellsouth.net

▲ **MASSACHUSETTS—North Shore:** Riders wanted! Contact: Bob Hicks Tel. 508/774-0906.

▲ **MICHIGAN:** Michigan HPV Michael Eliasohn Tel. 616/982-4058.

▲ **MICHIGAN—SE:** Wolver-bents meet Sat@ Metropark Pool shelter, Mar.-Nov. 9am. Bob Krzewinski, Tel. 313/487-9058, BobMich@compuserve.com. <http://www.Recumbents.com/Wolverbents/>

▲ **MINNESOTA—Minneapolis:** MnHPV Meets 2nd Wed. 7pm Lk. Nokomis Com. Ctr. Ride 6pm - Mar.-Oct. Mark Stonich Tel. 612/824-2372.

▲ **NEBRASKA—Omaha:** County Cruisers Meet 2nd Sat., 6-30 mi. Armand Gibbons Tell. 402/553-4472, <http://www.nfinity.com/~armandg.html>

▲ **NEW MEXICO—Albuquerque:** Ride one Sunday morning per month. Contact Hester at Absolutely Recumbent Tel. 505/345-7736.

▲ **NEW JERSEY—Metro Area Recumbent Society** (MARS) 3rd Sun. from the Geo. WA. bridge (NJ side) John Tetz, Tel. 973/584-6481; E-Mail jgtetz@aol.com.

▲ **NEW YORK—Rochester:** RARE (Rochester Are R'bent Enthusiasts) Hank Walck Tel.716/265-4287; Michael Brisson Tel. 716/461-5084; Dave Larson Tel.716/235-4116.

▲ **OREGON HPV ASSOC.:** Ride contact: Jeff Wills Tel. 360/254-3736, jwills@pacifier.com OHPV, PO Box 614, Beaverton, OR 97075

▲ **PENNSYLVANIA—Philadelphia:** PARC (Philadelphia Area Recumbent Cyclists) John Hunka Tel. 609/662-5180 or hunka@astro.ocis.temple.edu

▲ **TN/NW GA/N.AL—Chattanooga:** Easy Chair Rec. Bikes Tel. 423/886-1499, easychairbikes@att.net

▲ **TEXAS—N. Texas R-BENT:** 4th Sat./month. Tel. 972/329-1225, <http://web2.airmail.net/imbent2/bentride.html>

▲ **TEXAS—Houston:** Ride 2nd Sun.@ Katy HS. Contact Pat @ 281-347-3627 for start time.

▲ **UTAH—Riverdale:** Comfortable Crotch Club Brett Rodgers Tel. 801/399-2447.

▲ **WASHINGTON—North King/Snoho Co. AARC:** (All Recumbent Riders Club) 3rd Saturday, 20 miles from Monroe to Duvall, Social pace, 20-miles. bradrick@serv.net, Tel. 206/632-6955

▲ **WASHINGTON—Seattle/Bellevue/Renton:** NW Low Down & Laid Back 'Bent Riders: Up to three rides per week, email for calendar. Bob Tel. 253/631-5728, DrRecumbnt@aol.com, www.halcyon.com/peterson/bentkent.html

▲ **WASHINGTON—Spokane:** Meet 2nd Sat. 9:30am @ SIRT parking lot east of Fairfield Inn, Jeremiah & Karen E/Z RIDER Cycles Tel. 509/725-4249 jmgangini@famrc.org

▲ **WASHINGTON—Vancouver:** Meet on the 3rd Sat., 9am from the Old Holland Bakery. Gale Simpson Tel. 360/891-1947.

▲ **WASHINGTON—SE:** WRTW2\* Two Wheeled, R'bent Riding Trombone Teachers of Walla Walla. VonBruno@bmi.net

▲ **WASHINGTON DC AREA:** W.H.I.R.L. Every Sat., 8am (9am-winter) @ Viers Mill Rec Center. <http://www.recumbents.com/whirl>

▲ **WISCONSIN—Madison:** Recumbent Brigade. Last Sat. 9am@State St. corner of the Capitol. May-Sept. mfox@lss.wisc.edu

▲ **DO YOU WANT TO START A GROUP?** Send us a listing similar to those you see here, keep us updated and on your mailing list.

▲ **VOLUNTEER:** Keep in mind that these are volunteer-run groups with little or no budget. Be thoughtful and courteous with your requests. Volunteer to lead a ride or help out with the group. Get involved! Support your local r'bent rider group.



# • 1998 RECUMBENT EVENTS CALENDAR •

## ■ 5th ANNUAL 'BENT EVENT

August 29-30, 1998  
Mt. Airy, MD  
Mt. Airy Recumbents Tel. 301/831-5151.  
Email: Abikie@aol.com

## ■ hpr® HPV RACE SERIES-ELKO

August 8-9, 1998  
Elko, MN (Truck Driver Training Facility)

## ■ hpr® HPV RACE SERIES-KENOSHA

August 29, 1998  
Kenosha, WI (Kenosha Velodrome Night Racing)

## ■ hpr® HPV RACE SERIES-ELKO

August 30, 1998  
Burlington, WI (Auto Test Facility)

## ■ HPV Development Series

Sept. 12, 1998  
San Diego, CA (SD Velodrome)  
Bill Volk Tel. 619/824-8323, bvolk@inetworld.net

## ■ PEOPLE MOVERS 'BENT BASH

September 5th, 1998  
Orange, California  
People Movers Tel. 714/633-3663

## ■ CENTRAL ILLINOIS BIKE RIDE

September 5 & 6, 1998  
Contact: McLean County Wheelman, Box 947,  
Bloomington, Illinois 61702 or Jerbal1@aol.com

## ■ INTERBIKE DEALER TRADE SHOW

September 11-14, 1998

Sands Convention Center, Las Vegas, NV  
Tel. 714/376-6161

## ■ hpr® HPV RACE SERIES-OHIO

October 1998  
Columbus, Ohio

## ■ hpr® HPV RACE SERIES-FLORIDA

November 1998  
Tallahassee, FL

## ■ RACE CONTACTS:

—hpr® HPV RACE Contact Info: Gary Hill, 220  
Vill-Edge Dr., Granville, OH, 43023.  
garriehill@nextek.com. www.recumbents.com

—San Diego Velodrome Series: Bill Volk Tel.  
619/824-8323, bvolk@inetworld.net

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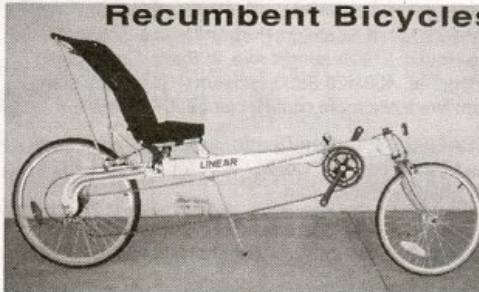
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**FOR SALE: RANS V-REX: 24/20, Sachs 3x7,** Magura, brakes, lights, computer, metallic green, fenders, high-back seat, Frog Speedplay pedals, excellent condition, \$1400 firm Tel. 250/384-4545 (CAN/46)

**FOR SALE: EASY RACER GOLD RUSH REPLICA,** 1997 model, full Zzipper fairing, low miles, mint condition \$2200. Tel. 440/526-8301 (46)

**FOR SALE: 1995 HALUZAK HORIZON;** less than 300 miles; green with rear bulldog brake. Excellent condition. \$1000/obo Call Dave: 702-882-1271 or [FluittDav@AOL.com](mailto:FluittDav@AOL.com) (NV/46)

**FOR SALE: 1997 ATP DOUBLE VISION TANDEM** recumbent, IPS (independent pedaling system) under 500 miles. Excellent condition \$3,000 + shipping. Scott Henry Tel. 920/868-3309 or [oldtimeportraits@dewis.com](mailto:oldtimeportraits@dewis.com) (46)

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**FOR SALE: V-REX 24 GL63 (24/20)—narrow tire format,** UNI disc, custom color, '96 Angletech demo, 2nd owner, computer, lots of extras. Asking \$1500. Call for info 907/789-4347. Leave message (AK/47)

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**1996 WHPVSC VIDEOTAPES:** Las Vegas HPV racing-190 min. 2-VHS tapes \$30 postpaid. Gregory Du Vall, 2930 Colorado Ave. #D-12, Santa Monica, CA 90404-3647 or ph#310/829-5662.

**HPV CD-ROM:** electronic archive about recumbent bikes, waterbikes, railbikes and human powered aircraft - thousands of pictures, texts, video clips and homepages for PC/Mac/etc. USS\$30 - call People Movers (714)-633-3663. <http://www.liegerad.com>

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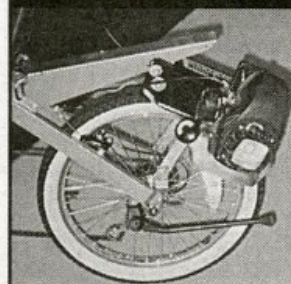
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## USED 'BENTS

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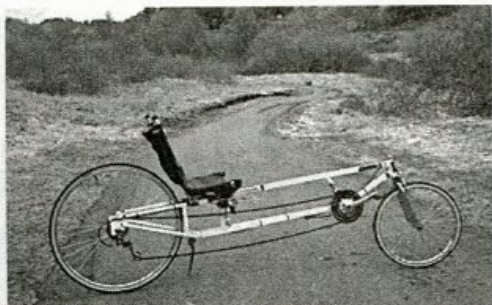


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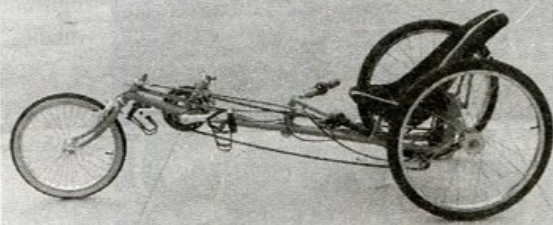
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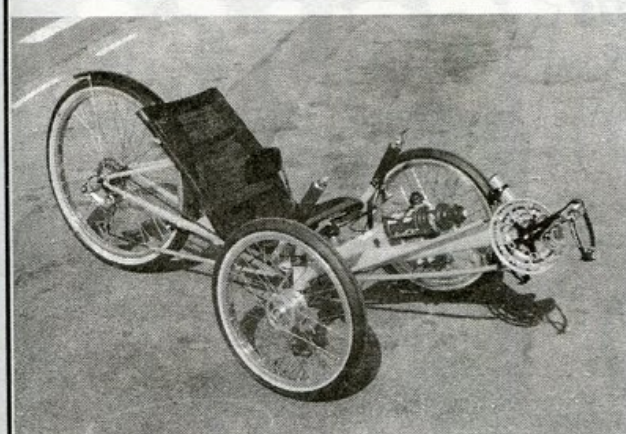
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
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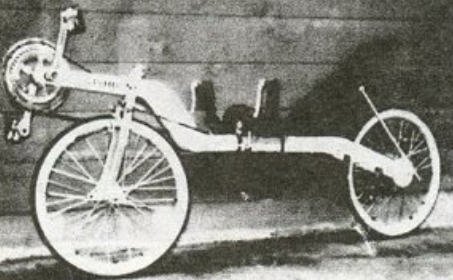
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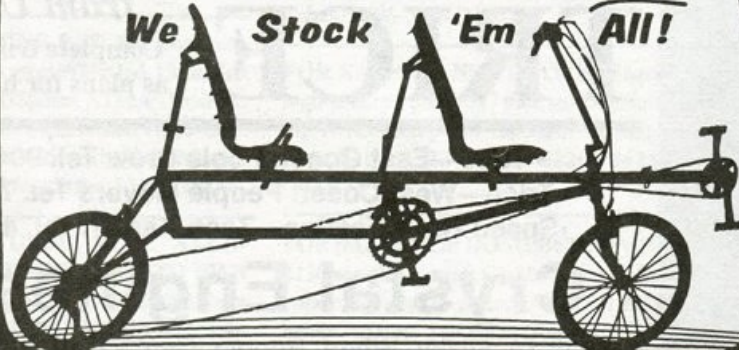
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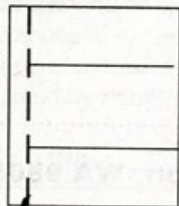


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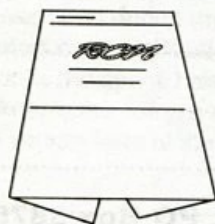
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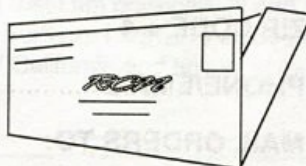


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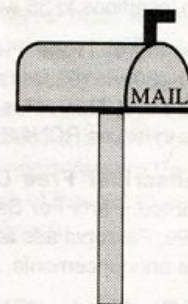


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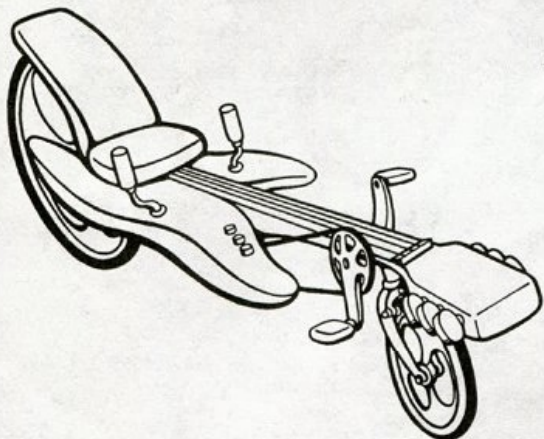
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ADDRESS: \_\_\_\_\_

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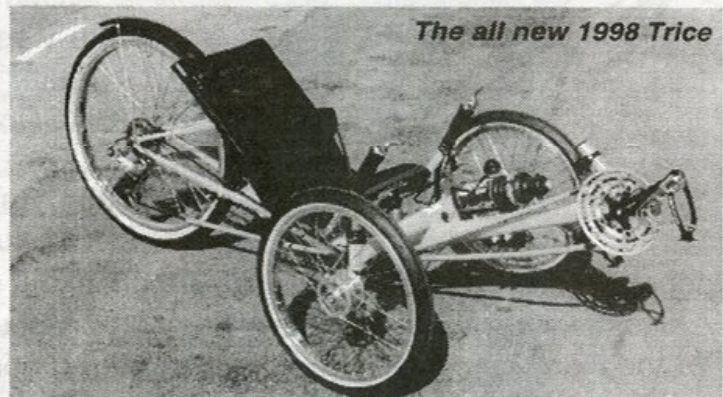
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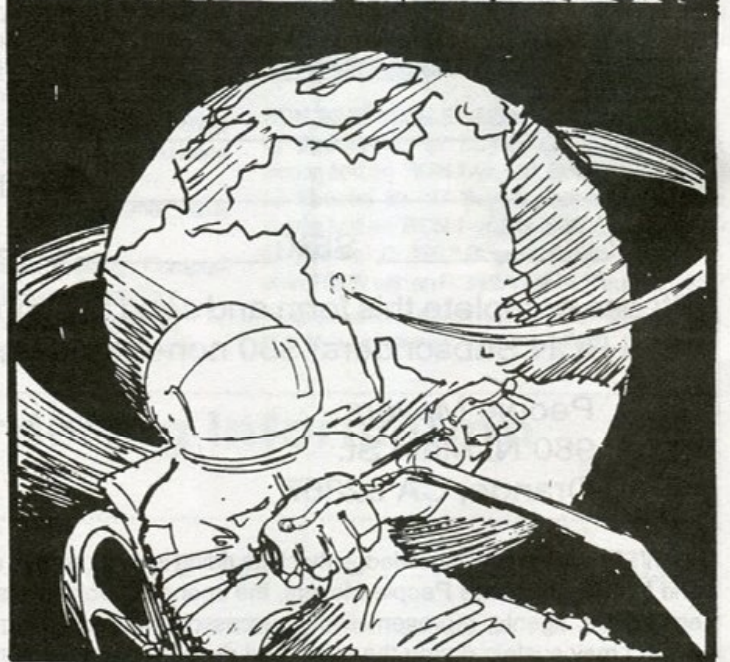
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c.	0.008	0.004	0.003	0.003
d.	15	25	10	10
e.	75	75	75	75
f.	90	100	85	85

a. Frontal Area (sq.m)      d. Bicycle Mass [ave] (Kg)  
 b. Drag Coefficient (Cd)      e. Rider Mass (Kg)  
 c. Rolling Resistance (Cr)      f. Total Mass (Kg)

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