

RCM

RECUMBENT CYCLIST NEWS

Issue # 63
May/June
2001



A Vision Pace Line

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Web: www.recumbencyclistnews.com

Schedule

Expect RCN to arrive every other month, (odd months) within the first two weeks of the first calendar month of the issue.

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■ **On the Cover...**

Vision Pace Line—photo courtesy of ATP.

■ **In Our Last Issue...**

RCN#62 March/April 2001—our 2001 Season Preview issue. This issue was mailed March 1. If you did not receive this issue (and should have), please email us.

■ **Our next issue...**

RCN#54 will be out in two months—by early May. It will feature a BikeE FX & HPM TriHauler road tests as well as cool trike, FWD and touring articles.

Editorial License

by Bob Bryant
drrecumbnt@aol.com

Welcome Recumbent Riders

To the 63rd edition of Recumbent Cyclist News.

Not Enough Buzz, Hype & Jolt in RCN!?

I received a call the other day from a subscriber who works at a bike shop that sells recumbents. He made the comment that the last few RCN covers (59-60-61) were not that great. I asked why. Well, he had heard comments from a reader and a few industry reps that our format and covers just do not do enough to sell and promote recumbent bicycles.

Since the covers photos are mostly of RCN readers, and all had something to do with the content of the issue in question, I am still dumbfounded. And then it struck me. We don't have *buzz, hype & jolt* cover lead ins, and endless "newbie" commentary that might excite somebody who just happens by the magazine rack.

The fact that just 12% of RCN's make it to the newstand is another aspect we did not address in our conversation. 70% of RCN readers receive RCN by subscription. The other 18% order them as back issues or pick up a freebie/sample somewhere.

RCN is different from the other more commercial mainstream magazines. The most apparent way we are different is that articles are generally enthusiast written. We publish **WHAT IS SUBMITTED**.

RCN is an enthusiast oriented publication. All of our changes have been made with long term sustainability in mind and our attempt at a move to publish more issues. What this will require from you is some participation. If you don't like RCN's content, please submit an article or write a letter offering some constructive criticism and share your ideas.

At \$30-\$40 per year to subscribe, our readership is above the newbie recumbent titillation to get you to "go recumbent." Chances are, if you've subscribed to RCN, you are already sold on recumbents.

As we found in our readers survey, over 40% of you will buy a recumbent in 2001. That is a healthy market for our advertisers. So, even though we do not tailor our editorial and writings to whip you into a recumbent buying frenzy and convince you to buy a (or another) recumbent, the honest reports from real-world users seem to do this anyway. So we end up with an honest enthusiast publication without the *buzz, hype & jolt* of the mainstream press. I'm thinking that you, as RCN readers, like it this way. If you don't, please let me know.

Newbies do receive plenty of information to get up to speed once a year in our annual Season Preview issue (RCN#62) and we are working on RCN article reprints.

Ryan/Longbikes Saga

Some of you may have misunderstood Dick Ryan's article in RCN#62. When Dick talks about "the company" he is speaking of Ryan Recumbents, not Longbikes. Longbikes was listed in our manufacturer Seen & Noted section and in John Riley's Interbike report.

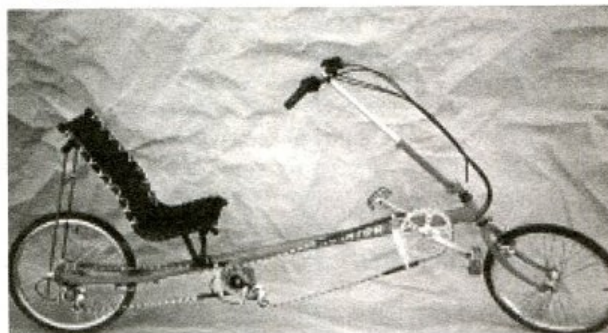
Longbikes is still in business, though we don't know what bikes are being built. They are in some form of reorganization. We have not received product information since the Fall of 1999. Longbikes, nor Mr. Peek subscribe to RCN. We did email Mr. Peek the pertinent text to Dick Ryan's article, though we have yet to receive an update from Longbikes about the article.

Viva Recumbency!
Bob Bryant ♦

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Recumbent News



3rd Annual Recumbent Retreat August 18 & 19, 2001 Fort Stevens State Park (Warrenton, Oregon)

Join other recumbent owners for two days of riding (all levels), night time bike lighting contest and parade, rides to Seaside for lunch & Main Street Recumbent Parade to the Lewis & Clark turn around. Dine at nearby restaurants for dinner and breakfast or join in potluck meals in camp. Families welcome! Come for a ride, come for a day or stay for the weekend!

For more information, contact: Jeff Wills—jwills@pacifier.com or Tel. 360-254-3736 or Connie McAyeal—ohyesbent@hotmail.com or Tel. 503-647-2438

NOTE: If you want to attend this event, make reservations ASAP.

Cycle Vision

Cycle Vision 2001 is a recumbent event you should definitely visit on June 9th and 10th, 2001. Recumbent bikers from all over Europe travel to Lelystad to meet. Lelystad features an outstanding racetrack (RDW; near the airport). There you can experience high-speed races, timetrails, an exhibition-show (with all commercial recumbents, secondhands, prototypes and much more) and a try-out track (for children also). There is a camp-site and a hotel to stay the night. Contact: www.ligfiets.net

IMPORTANT NOTICE:

Snowbird/Season Address Changers

Your RCN issues may NOT be forwarded. We end up paying 60 cents to get a message from the USPS that you are, "Temporarily Away" or each time you move—plus the costs of re-mailing issues (over \$2 each). If you move seasonally and place a forward order with the USPS, please notify us. We now have the ability to keep two addresses on file and can do manual season address changes for you. Please send us email or mail us your seasonal address information ASAP.

Do You Have Stuff For Recumbent News?

*A Product Review? Product News? An Event?
Club News? Have you bought a really cool new bike?
Do you have news from your recumbent shop or factory?
If so, please send info to: RCN, POB 1825
Poulsbo, WA 98370. Text only can be emailed to:
bob@recumbentcyclistnews.com*

New Out Your Backdoor Issue Available

"Out Your Backdoor" is an occasional "bookazine" put out by Jeff Potter. The latest issue is subtitled "A Personal Anthology of Homegrown Adventure." It covers just about every aspect of life from the point of view of the do-it-yourselfer, as Potter has experienced it. He says it's about "modern folkways," how real people create meaning in a commercialized world. It's about taking life back from the image-makers. He includes a bunch of stories and artwork on HPVs and bikes. But he applies the same "biky" attitude to articles on XC skiing, canoeing, duct-tape, classic books, and roadtrips. It's kind of a mag, but he says it's meant to stand on its own, like a book. It also appears to be a bit of a catalog, as Potter gives excerpts from his line of 23 very unique books. 72 packed pages in a nice layout. \$5 for the latest, to 4686 Meridian Rd., Williamston MI 48895; outyourbackdoor.com. Source: OYB



Trans Canada Recumbent Record

Pierre Dore rode his recumbent bicycle trans-Canada, 5,021 miles in three months Victoria, British Columbia to St. John, New Foundland. This was a new record for the Guinness Book of Records.

Pierre's trip was sponsored by Hostelling International and Emu Oil (www.emu.ca). Pierre is selling his autographed post cards for \$5 each. He is currently planning his next trip and looking for a new sponsor/charitable organization.

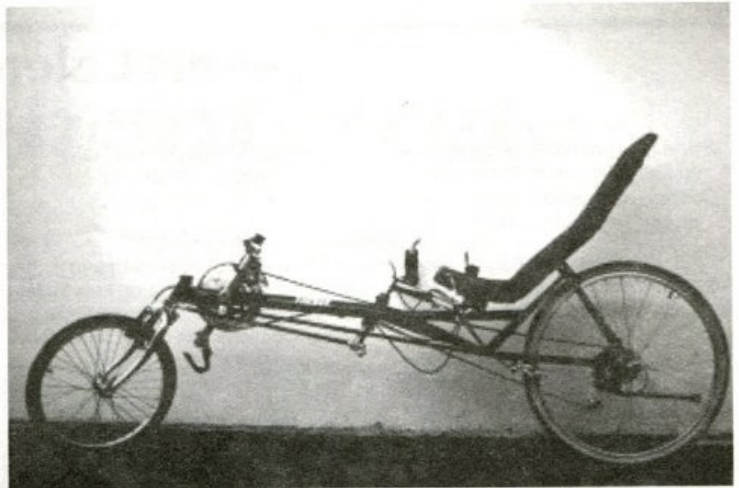
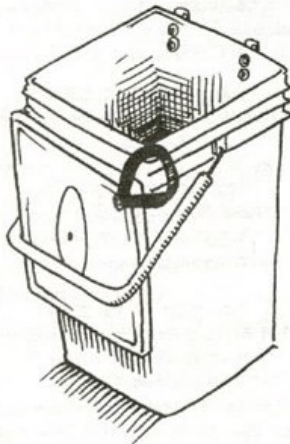
Contact: Pierre Dore, 11-1529 Comox St., Vancouver, BC, Canada IL4 V3P

Cobbworks Oyster Buckets

Plastic bucket panniers!/? Yep, that is what they are. Imagine rigid 4-gallon high-density polyethylene buckets made for the food industry. They carry 1000 cubic inches of just about anything. They are 9-inches square on top tapering to 8.25 inches on the bottom. They are 13-inches tall. They weigh two pounds each. They come with a cool hand-made look logo as well as 3M Scotchlite reflective tape on each bucket.

The "buckets" are waterproof with sealable tops. They have large handles for carrying (independently) and straps and clips to secure them to your bicycle. The design is simple and they work great. They are inexpensive at \$55 per pair. There is a deluxe model available as well as custom options.

Contact: 611 Capitol Way S. #205, Olympia, WA 98501-1277. Tel. 360-352-7168. Check them out at www.cobbworks.com.



New Turner LWB USS

This is a photo of Milton Turner's new LWB USS recumbent.

RCN #62 Mistakes, Omissions & Corrections

ATP Vision—We listed some outdated contact information. here is the updated info: Email: info@visionbikes.com, phone 425-673-2448 or toll-free 1-877-433-4273 (USA only) spells out 1-VR RIDE HARD!

Easy Racers Gold Rush Replica—Yes, we did accidentally omit this bike from our spec list. The GRR is one of our favorite bikes and listed in "Bob Bryant's Top Picks for 2001" as "Best Performance LWB." Our apologies to Easy Racers, Inc. and all of the GRR fans and owners.

Haluzak—Haluzak did not send 2001 product information, but did acknowledge that they do not wish to participate with RCN. Bill Haluzak did not like being #9 on Bob Bryant's RCN#56 "Top 10 Best Recumbents list" (this is the top 10 of EVERY recumbent model).

Longbikes—They are still in business. See editorial.

Lowracer Comments—I don't happen to think that ultra laid back seats (neck and shoulder pain) and ultra high bottom brackets are that comfortable. And COMFORT is my #1 goal in riding recumbents. I respect that others may have differing opinions. If this is you—you are welcomed to write about it for RCN. When all else fails, I just state the my opinion as I believe it to be. This is a qualified opinion based on riding and sitting on several bikes and talking to dealers for over 11 years. If you have a differing opinion, please write an article for RCN.

WizWheelz—We messed up their phone number. The correct number is: Tel. 616-940-1909. Wayne at WizWheelz also brought it to my attention that they are not a "small trike manufacturer," but in fact they are the largest in the USA.

Note: RCN#62 is a huge project, and with all of the details, it is the most difficult thing we do all year. Unfortunately, mistakes are inevitable. To hedge your bets for next year, make phone contact with us to go over each detail as it relates to your company.

For those details that we messed up on, please accept our apologies.

RCN Info

Contact

RCN is run by a one man editorial department—ME...Bob Bryant. Please accept our apologies that we don't have time to yack on the phone with everyone (wish we did). The best way to get our attention is by sending email. We respond to most emails. We take action but often do not respond to call in inquiries.

RCN is a business—and we are available on a consulting basis for \$30 per half hour for any type of bike selection or industry consulting that you may need.

Back Issues

We have the following issues in stock: RCN#62, 61, 59, 58, 52, 51, 48 (limited quantities). Issues are \$8 each or \$20 for three or \$30 for six. We will also reprint certain articles on request (email for availability & costs).

When to Renew

To continue receiving your RCN subscription without interruption, please consider renewing two issues prior to your expiration date/issue. The reason for this is that while you are reading this issue, the next issue and database information are at the printers.

On most RCN issues and renewal forms, you will have the following text on the top line of your label, "61 LAST ISSUE." This means that RCN#61 is your last issue. We will send you one renewal notice when it is time to renew.

Change of Address

If you move, don't forget to send in your new address! We actually need 60 days notice so you don't miss an issue. We have to pay the post office up to \$1 for your new address as well as the re-mailing of issues—which contributes directly to subscription costs.

Missed Issues

You should be receiving RCN every two months. If not, email us ASAP DO NOT wait six months to let us know there is a problem. RCN is published six times per year. You should received your issue by the first day of the second calendar month of the issue. Check your address on your mailing label from previous issues to see if there is a problem. If not, assume that it is a US Postal Service error and drop us an email or send us a card and we'll send a replacement.

Thank you for your support.

Events Calendar 2001

April 5-8, 2001

Wheel & Sprocket Bike Expo/Sale
WI Fair Park (south Exhibit hall)
Contact: www.wheelsprocket.com
or, call 1-800-362-4537 (Harry)

April 7, 2001

POWOW/Wheel & Sprocket Race
Wisconsin Fair Park
Milwaukee Mile
Contact: www.wheelsprocket.com
or, call 1-800-362-4537 (Harry)

April 27-29, 2001

HPB Race at Barrie Outdoor Show
Barrie, Ontario, Canada
www.humanpoweredboats.com

April, 28th & 29th, 2001
Indy HPRA Racing action

Indianapolis, IN
Major Taylor velodrome/Pioneer Pk.
www.wisil.recumbents.com/wisil/racing2001/indiana2001-brouchure.htm

May 5-6, 2001 (tentative)

BJ's Touring Primer,
Withlacochee trail, Florida
BJ Strass, bentbj@earthlink.net

May 12, 2001

Michigan Recumbent Rally—East

Willow Metropark pool shelter
www.lmb.org/wolbents, 734/487-9058 or bobmich@compuserve.com

May 12-13, 2001

HPRA Racing
Minneapolis, MN.

Dave Krafft dkrafft@bitstream.net

May 26-28, 2001

HPV/Electrathon Race

Portland, Oregon, PIR Raceway
<http://home.pacifier.com/~jwills/pir2001/2001race.htm>. Jeff Wills Tel. 360-254-3736 or jwills@pacifier.com

May 26-28, 2001

Great Western Bike Rally
Paso Robles, CA

Jim Rudolph bentcyclier@aol.com or 760-941-0367 or Richard r2parks@earthlink.net

June 2-3, 2001

Midwest Recumbent Rally
Stevens Point, WI
www.hostelshoppe.com

June 15-20, 2001

Wolf Creek Tour

Durango, CO through San Luis Valley
visiting hot springs and deluxe accommodations (pre Slum. tour) Kelly tel. 970-625-5025 or kiniguez@sopris.net

June 23-24, 2001

Michigan HPV Rally/HPRA

Waterford, Michigan (northern Detroit area)
www.lmb.org/mhpva, 313-884-0109 or wkiehler@aol.com or www.lmb.org/mhpva

June 23-24, 2001

4th Annual Recumbent Roundup

Ogden, Iowa (The Bike Barn)
www.thebikebarn.com or 800-645-2981

June 23-24, 2001

A Return To Freedom

Easy Riders Recumbent Club
www.geocities.com/toureyeasylover or toureyeasylover@hotmail.com

July, 2001

The Tucker 100 HPRA Races

Northbrook, IL velodrome, and Cheddar cheese challenge at the Kenosha, WI velodrome.
Sean Costin seancostin@aol.com

July 14-15, 2001

RARE 2001

Rochester, NY 75 mile ride/campout
Mike Brisson 716-461-5084 (eve), mbrisson@rochester.rr.com or Hank Walck 716-217-9450 or cwalck@frontiernet.net

July 28-29, 2001

Steve Shutt Memorial HydroBowl

Elkhart, Indiana
Jake Free JFreeEnt@AOL.com

July 28-29, 2001

World HPB Champs (Boat)

Leicester, England
roger@spokesfest.freereserve.co.uk

July 28-30, 2001

Sequim Ride 2001/EERC

Sequim, WA
John Larson elaron@olypen.com or tel. 360-681-6370

July 30, 2001

Steve Shutt Memorial HydrBowl

Elkhart, IN
Contact: JFreeEnt@aol.com

August 3, 2001

HPB racing

Buffalo, NY
www.humanpoweredboats.com

August 4, 2001

Waterfest HPB

Buffalo, NY
ron@humanpoweredboats.com

August 2-5, 2001

The International Human Powered

Speed Championships

Brighton, England.
www.bhpc.org.uk/

August 5, 2001

Calhoun Cycle Anniv. Ride & Party

www.calhouncycle.com ("events") or call 612-827-8000 Free t-shirt to the first 100 riders who pre-register.

August 12-19, 2001

POWOW/Wheel & Sprocket Rally/

HPRA Sparta, WI

www.wisconsinbicycle.tours.com, Tel. 414-671-4560. Or www.wheelsprocket.com, 1-800-362-4537 (Harry) ron@humanpoweredboats.com

August 18-19, 2001

3rd Annual Recumbent Retreat

Fort Stevens State Park
Warrenton, Oregon
Jeff Wills—jwills@pacifier.com or Tel. 360-254-3736 or Connie McAyeal—ohyesbent@hotmail.com or Tel. 503-647-2438

August 25th, 2001

BAS Ride

Milwaukee, WI
<http://storeyfoundation.org/HPV>

September 7, 2001

WISIL HydroBowl (Boat)

Rockford, IL
Contact: bikeguybob@aol.com

September 8, 2001

Michigan Recumbent Rally—West

Western Michigan University (Kalamazoo). www.lmb.org/wolbents, 616/353-0125 or Paul.Pancella@WMich.edu

September 15, 2001

Fall Recumbent Rendezvous

www.lmb.org/wolbents, 734-487-9058 or bobmich@compuserve.com

Other Events/Contacts:

Seattle Area Homebuilders

Now called SeaWheels. Nick Hein is starting up the group again. Get on their mailing list at www.bikelist.org/mailman/listinfo/seawheels or give Nick a call at 425-255-7560.

HPRA Race Events:

www.recumbents.com/hpra

IHPVA (HPVA) Race Events:

www.ihpva.org

HPB (boat) events:

www.humanpoweredboats.com

Planning an Event? If you are planning a recumbent ride or event, please send the information to: bob@recumbentcyclistnews.com Allow 3-4 months advance notice

Rider Group Listings:

If you run a recumbent rider group, please check your RCN#62 listing and email us with updates ASAP.

Recumbent Tours in New Orleans

Kayak on a Bayou...Try the road less traveled. Paddle with us on Bayou St. John, a beautiful national historic waterway. Laid Back Tours offers guided recumbent bicycle tours of New Orleans, LA. For more information, check out www.laidbacktours.com or call 800-786-1274.



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Cool bike magazines are becoming a rare breed. One of our favorites is Adventure Cycling. They have published for many years with the unique concentration on touring bikes, bike tours, maps, routes and touring equipment. Go check out their website at www.adventurecycling.org or email info@adventurecycling.org or call 800-755-2453.

Calling All Homebuilders & Customizers

We found this very cool website that deals with chopper, cruiser and even recumbent homebuilt bikes. It is an online magazine called *Bike Rod & Custom*. We found the interview with the Robert Q. Riley quite fascinating. Riley is the plan seller of the X-2 composite recumbent (www.rqriley.com). Check them out at www.bikerodnkustom.homestead.com/cover2.html.

If you have built a Riley recumbent, please write us about it—RCN.

So You Want To Read About Your Own Company in RCN?

Well, take the time to write us, send us your brochure, a photo and a description of what you do, and we'll try to list it.

Contact:

RCN, PO Box 1825, Poulsbo, WA 98370 or email bob@recumbentcyclistnews.com



Recumbent Mail

If you have something to say, a differing viewpoint or experience—we want to hear from you! **Please limit letters to 300 words.** No charity ride sponsorship request letters. RCN reserves the right to edit submissions for clarity, content and space limitations. bob@recumbencyclistnews.com or RCN, PO Box 2048, Port Townsend, WA 98368

HPM Roadster

I'm a long time RCN reader and subscriber and your reviews have always impressed me as being well informed and informative. The review of the "Roadster" was not up to your usual high standard. I guess calling it a "cruiser" got my goat. Although its motorcycle-like good looks exude attitude, it is no more made to cruise sidewalks and boardwalks than a Harley is made to cruise main street.

The Roadster I'm currently riding is less than three years old and has over 10,000 western Oregon back roads miles on it, 3000 in the first six months! I bought my first one 19 years ago, and I think it is the ultimate long distance touring bike. It can carry a complete set of panniers, pull a BOB trailer full of gear, and look great doing it. Now that's performance! In '94 my Roadster and I spent 2 weeks touring and camping in the San Juan islands. Since then I've discovered credit card camping. Packing only 10 or 20 lbs of clothes, tools, tubes, Ibuprofen and credit cards, a reasonably fit geezer like myself (I'm 50 something) can ride a Roadster a hundred miles a day, (more or less) day after day in comfort and style.

Speaking of comfort, I find the seat cool, light and the most comfortable of all the recumbent seats I've tried, and I try them all. My wife likes the little "horns" that curve out and pamper the backs of her thighs, but my seat doesn't have them. Of course no one style of seat will suit all fannies any more than one style of shoe will please all feet. And the "ape hanger" handle bars are supposed to flex a little as one hangs one's ape-like arms from them; that absorbs vibration and makes them more comfortable. I do like the idea of adding a cross member. It would be a good place to mount headlights, speedometers and the like.

Although the Roadster always generates a lot of interest wherever it is seen, no one to date has marketed it aggressively. Without going into too much historical detail, let me point out that the first Roadsters (called "Runners") were designed by local legend Gary Hale in the early '80s and part of his genius in designing them was to use (except for the frame, seat and handlebars) all standard, "off the shelf" road bike components. In the early '80s Co-motion, the Eugene tandem manufacturers, were making them to fill custom orders, and suggested that I finance a prototype with full suspension. At my counter suggestion, they switched to making them with mountain bike components and wheels with relatively fat high pressure pavement tires. I ride my Roadsters with clipless mountain bike shoes and pedals, and recommend them for most recumbent bikes and riders.

Recumbently Yours

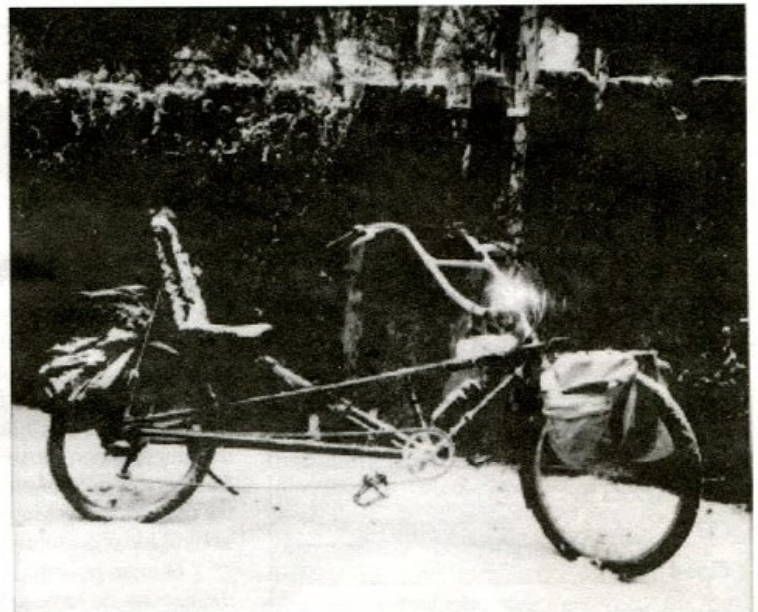
Jimmy Siemens jsiemens@efn.org

Editor Comments: Thanks for writing. We had correspondence with three owners in this review and Jan and I discussed your enthusiasm for this bike. Keep in mind that this is my opinion. I have 15 years experience of LWB ASS riding. I highly respect readers opinions and will print this letter. I do believe that we will have a positive impact on the Roadster as Jan has already made changes to the bike based on our input. I hope you will write about your bike for RCN.

Roadster Raves

Just wanted to share with you all my experiences with my new Recumbent "Roadster" I got from Human Powered Machines. I had wanted to get a recumbent that served as an in town commuter as well as an open road cruiser. A difficult combination to be sure, but I think I have found a bike that fits both bills very well. With a long wheelbase and the two large 26" wheels it is just superb out on the open road at high speeds. It is very stable descending hills, and not too bad climbing them. I'm thinking it is going to be wonderful for touring this summer.

For my in town commute I have found that my visibility is better



RCN Reader Pippa Garner bought our test Roadster last year. She has adapted an Easy Racers Cobra seat to the bike and uses it for transportation in Santa Fe, New Mexico

than it was with the more compact recumbents I have used in the past. Actually it goes beyond visibility and borders on notoriety. This bike causes a stir wherever I go. People want to know about it.

The big secret I have found with this bike over some of the smaller wheeled recumbents I had owned in the past is that it actually performs better carrying a load. I almost always am carrying quite a bit so this is quite a benefit for me. I have a standard front rack on mine and carry fully loaded Ortleib panniers. (This helps quite a bit to balance the weight displacement.) I also have a Vaude waterproof backpack that I sling over the back of the hammock style seat. With this combo I am often carrying over 50 pounds with no problem. The hammock style seat, by the way, is just great in our wet climate. No worries about wet foam here. I just bat the water off the nylon mesh with the back of my hand and we are ready to go.

With full fenders, waterproof bags, and 26" wheels I feel pretty good about battling the pot holes, slippery shoulders, rain, car splash, and other elements we all have to deal with in this wonderful Northwest. The standard sizing of this bike makes it easier to add accessories as well. I have been able to put a double kick stand on it so it stands completely upright, even heavily loaded. Very handy.

It is a big bike, to be sure. But it is fast, and comfortable. It is stable, and versatile. As long as we are burning calories here, and not fossil fuels, I don't feel too badly about pushing around a couple of extra pounds. Especially since the versatility of the bike has me out using it more often, and the car staying at home more.

John Bittner, JOHNJBitt@aol.com

Ryan/Longbikes Clarification

I'd like to clear up what may be some confusion about the status of Ryan Recumbents and Longbikes resulting from my article in RCN#62. Longbikes is alive and well, the reference to the company name being signed back to us meant OUR name (Ryan Recumbents). The model names, Vanguard and Duplex are ours. The model name "Slipstream" belongs to Longbikes. Greg Peek is doing an excellent job of building the bikes and has come up with some innovative new designs.

Dick Ryan, Ryan Recumbents

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This is a renewal

Subscription rates:

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- \$70 Two-year subscription
- \$90 Three-year subscription
- \$110 Supporter-5
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Proper Bike Builder Response

WizWheelz compels me to buy from them even though I have no plans to own a trike. In the last issue of RCN their announcement reads: "In response to the review in RCN issue #57, we have developed and are now offering the TerraTrike version 3.0 which includes the following improvements over the version 2.3." Now that's the attitude to take! Instead of pulling their ads or slamming RCN for letting readers know about the shortcomings of their trike, they specifically made it better in the areas that, according to RCN, needed improvement. Hey ATP, Lightning, and Linear, don't you think that this is a better way to go? RCN is the voice of bent riders. Ignore us at your peril.

Dick Alexander, allerdoc@lisco.com

Velorution

I had to respond to Amy Babich's guest editorial, Velorution because of her well intentioned but totally impractical idea of changing transportation in this country. "Human powered trains," "bikes that carry barrels of beer?" Our country and the rest of the world is firmly entrenched at the level of technology that includes the extensive use of the internal combustion engine that uses fossil fuels as a source of energy. In another 25 years we may be using Mag-Lev vehicles or any of several ideas currently being tested.

Human powered vehicles (bicycles) in all their forms do have a niche and a purpose. I think more effort must be made to make this mode of transportation attractive to those people who can fit it into their life-style as a choice. Let's face it, HPV's suffer the same disadvantage as motorcycles.... no weather protection when it rains. But at the same time I agree it is almost criminal and certainly environmentally irresponsible to drive a gas guzzling 2-ton SUV on a short trip to K-mart!

Glenn Garrett

High BB Pain

I have been riding my Lightning P38 for about four years. During this time it has provided me with great enjoyment accompanied with a recurrent pain in the soles of my feet. I questioned Tim Brummer about it and he suggested I change my clipless pedals to a model that has a wider platform than my Shimano SPD's. I tried changing pedals but unfortunately not to a wider platform model as the expense is hard to justify if this is not the true source of the problem. It occurred to me that cleat position might have some bearing on my discomfort and I have arrived at a position that relieves some of the pain. I have also inserted Spenco foot gel pads, but even so, still occasionally experience the original problem pain. The best solution so far is to stop and get off the bike for a few minutes for every hour on the bike.

Someone suggested this problem is related to the height of the pedaling position in relation to the seating position. On my P38 there is no adjustment I can make, other than to insert padding, and lose the aerodynamic advantage to a small degree. The pain is now so intermittent that I most likely will just choose to suffer in silence. What I'm curious about is whether other recumbent SWB riders

experience similar pain in the soles of their feet while underway?

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Editor Comments: *It is our opinion that most manufacturers of high BB bikes don't want to acknowledge that some riders just do not acclimate to high BB's. We have run articles on this in the past. It is my theory that 5%-10% of recumbent riders don't adapt and have foot numbness, tingly toes or other problems with their feet. While riding a high BB SWB on a tour, my big toe went numb and stayed numb for nearly 6 months. I can ride for an hour with no discomfort, and then I start feeling tingly in my toe. I've experimented with shoes, cleat positions, no clipless; it doesn't matter, I still have the problem. I would recommend trying some different solutions before giving up on your beloved bike. Just understand that high BB bikes are still a relatively small minority in biking and even recumbent biking. An article of interest on this subject came out in RCN#58 on page 44: Numb Feet Recumbents & Homo Erectus.*

SWB Blues

Chris Foss' analysis of controlling a recumbent is excellent (RCN#60). It's too bad he learned it after the accident.

I used to be a glider flight instructor and taught students about PIO, pilot induced oscillation. It's severe porpoising the pilot causes by responding too big and too late reinforcing rather than stopping a small problem. Trainer gliders respond a bit sluggishly to controls, so it's harder for a student to get behind or to over control. High performance gliders respond quickly and need only hints of control movement. Does that make a high performance glider dangerous? In the hands of a pilot not ready for it, yes, but that's the pilot's fault, not the machine's.

My SWB responds quickly with minimal control input, but I had ridden a gentle LWB for 7 years before buying it and took my time learning the new feel... Actually trying to throw myself to learn how to respond. I usually did that on grass for safety. While I've learned to stay leaning back, my "seat" is sensitive enough now to detect the bike's position and I can lean forward with little risk. If a problem should develop, my trained response is to lean back immediately to maximize control. That alone might have saved Chris; it instantly lowers the shimmy rate.

How do you stop a shimmy? Freeze the controls. It makes little difference where your wheel is pointed. Once the shimmy is stopped, just correct whatever lean you have and enjoy the rest of the ride. It's just like gliding.

In an emergency, is it safer to stay with the bike or not? I don't know, but my bike is built to handle speeds higher than my body is. I think I'd try to stay using the skills I've developed to control it. Without them, it's a toss up. I'd get hurt either way.

I hope Chris has many happy years riding... maybe on recumbents... and that his experience teaches others to train themselves to control whatever bike and components they choose.

John Kaplan
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Blackbent Black Eye

I have a story that I think others should hear before they get stuck with the same troubles that I have.

In the spring of 1999 I purchased a new recumbent bicycle online from the Recumbent Barn in Redondo Beach California (mail order). It was their top of the line in house brand Blackbent. I was excited when the bike first arrived. Although I had been riding recumbents for 10 years already, this was a major step up in quality for me, or so I thought. The first thing I had to do was replace the USS handlebar because the reach to the original handlebar was too far for my (what everybody tells me are) long arms. This was no big deal, after all it was mail order so I figured a little tinkering would be required. When I got it on the road, it was fun to ride but the rear derailleur wouldn't shift worth a damn. At first I thought it was just me being an idiot and having the thing adjusted all wrong. However after much fiddling I came to the conclusion that it must be the crappy twist shift stuff that I had never used before.

Then alas, I had to hang up riding for about 10 months because the commute got too long (1 hr, 15 min. each way) on top of 14 hour work days, so I kind of forgot about the problem. When my working life and commuting distance became more reasonable again I started riding again and the problem became an issue again. At first I contacted Gripshift because by this time my one year parts warranty through the Recumbent Barn was expired. I received no response.

Then, one of the rear seat stays broke on the Blackbent. I contacted Recumbent Barn, in mid July 2000, and told them about it and also happened to mention the shifting problem. The seat stay was a bolt-in component and they sent an improved version right away (I was happy), and as it turns out the shifting problem was related to the geometry of the rear derailleur hanger being off on some of the early Blackbents so I would need a new frame. We talked about what I was looking for, as by this time the Blackbent had undergone two revisions to become the Blackbent 3. At the time I figured that I would really like an original frame because it was light, it was a shorter wheelbase than the new one and I knew that by swapping over my already slightly customized components that I would have a bike that fit me with no further modifications required. A month went by and nothing.

After a couple of more weeks I broke one of the tubes of the main frame, a fatigue failure. I contacted the Recumbent Barn again to inform them of the new development and to discuss my new concerns. There was a new contact name so I described my history with them and my concerns. After much conversation we decided that I would send the old bike back and they would swap the parts over to one of the new Blackbent 3 frames and send me back a rideable bike. I decided on the new frame because, reasonably, I figured that a frame of the original design would fail in approximately the same amount of riding time as the first frame (less than 200 hrs). As I awaited them to send me shipping instructions (another week

and a half) a bike frame showed up at my house. It was of the original design, exactly what we had decided that I didn't want.

I called them a couple of times to say "What Gives Here" but only got an answering machine so I emailed them instead saying what would you like me to do? No response. Finally I decided that I would swap the parts over (yes I have a headset press and everything) and just have to deal with another broken frame again in about 10 months. That's about how long it will take me to put on a couple hundred hours of riding, after taking off five months due to snow where I must ride a mountain bike instead of the recumbent.

I had almost all of the parts swapped over when I went to mount the seat and discovered that the old seat would not fit the new frame unless I did some custom drilling and possibly weakened the structure of the seat. I don't think I should have to go there. Once again I have phoned them only to get an answering machine and emailed them. I have still not received a response. Snow is on the ground and I have missed the recumbent season.

In conclusion, I recommend that all people considering a Blackbent consider other alternatives. Their design is too new and unproven, as evidenced by their ongoing radical redesigns. The customer service that I have received is unparalleled in how poor it has been. I thought that the Blackbent was a real deal when I first ordered it but how good of a deal is something when it is broken most of the time.

Wayne Field

Tricky Steering in Recumbency

In his letter to the editor in issue 60 Chris Foss wrote about his unfortunate experience with a recumbent. While I have problems with some of his conclusions about recumbent bicycles I will agree with him on one point. Recumbent steering is "quick." That's being polite about it in my opinion. I don't care what type of machine you buy, the new rider is going to find goosy handling that takes a lot of getting used to. And once you are used to it you have to stay pretty focused on the handling during any ride at any experience level. In my opinion recumbents are simply more unstable, handling wise, than an upright. You can "get used to it" but it's always there. It's too bad in that the


damn bikes are so much more comfortable than uprights. You know the only company I know of that attempted to address this problem was ReBike. They put a tight spring at the bottom of the fork and attached it to the frame to keep the bike running in a straight line. This indeed helped the situation! Not an elegant solution I'll grant you and it didn't really cure the problem completely but at least it was something. I have a Rotator Pursuit that is a sweet looking machine. I enjoy riding it. I didn't have much fun for the first 3 months on it but with time I got the hang of riding a bike that terribly wants to fall over or swerve into the shoulder. It's a handful. Other people get on the bike and get right back off. They aren't going to sell a lot of Rotators. But they don't want to either. However it seems that this magazine promotes the recumbent bicycle and would like to see its wide spread use. Me too. But it isn't gonna happen unless the manufacturers address the problem and somehow make the bikes easier to handle in general. Chris Foss tried one, it darn near killed him and he's done with recumbents. It's really too bad.

Larry Ripp rippx001.tc.umn.edu

Editor Comments: Back in the early days of recumbency, SWB recumbents either had heel interference with the front wheel (and your heel) or wheelbases that were three feet long (and shorter) with heavy loads on the front wheels. The heel interference could be a real shocker the first time your heel struck the front tire. On some short, short SWB models, it was easy to lift the rear wheel off the ground while braking. Even today, many SWB rear wheels lock up too quickly making for tricky braking. To top it all off, with the use of the 20-inch front wheels and mesh base seats, even 6-footers were on their tiptoes at stops.

Because of these concerns, many in the industry never expected the SWB to become so popular. As compared to a CLWB or LWB ASS recumbent, they are difficult to learn to ride and handle in traffic. Granted, for any recumbent enthusiast who is fully knowledgeable about SWB recumbents, their strong and weak points and the other options available in bike selection, this is no big deal.

Unfortunately, the problem is just as difficult as ever. Some designers have such little regard for the heel interference issue that it is not possible to install front fenders. And if you do,



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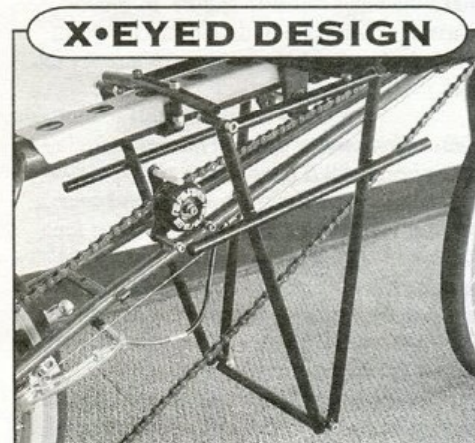
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it is possible to rip them clean off the bike in low speed maneuvering (I've done this). With the rampant disinformation brought forth by the Internet and manufacturers who would rather keep customers in the dark and just sell them a bike—we still have these problems.

By the reactions of some manufacturers to this publication, it is a wonder that there is any recumbent market at all.

Squirrely SWB

I ride a Haluzak Horizon and have for about 4 years. Now the Haluzak is considered to be a SWB USS but not as short as most. Chris says the all SWB bikes may be unsafe and that I'm sure is true. I've tried a couple of them and they were squirrely as hell. However in defense of Haluzak the steering is neutral, that means the steering doesn't want to flop one way or the other. I've had mine up to 47 mph



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John Schlitter

Mark Colliton



but not on purpose, and it was very stable wanting to go only the way you want. I would suspect that Chris should have spent more time practicing. Getting on a recumbent for the first time is like learning to ride a bike all over again. At least it was for me. Now about his balance. I ride both a recumbent and a Trek regular bike and enjoy both. I have thought about balance quite a bit. And there certainly is a difference. The only way I can compare is to stand in one place then lean over forward then lean over backward as far as you can and decide which position you feel that you have the most control. I can go down hill in tight turns and always go faster on my Trek because I feel more confident than on my recumbent. And as far as height is concerned I think Chris is 180 degrees off, the higher you are the less stable and particularly on recumbents. Don't get me wrong I love recumbents. I just finished a 1000 mile ride down the coast of Oregon & California on my recumbent pulling a BOB trailer (That took some serious modifications) and if I were to do it again I'd do it on my recumbent with a BOB trailer. By the way Haluzak says don't pull a BOB trailer unless you want to die and they're right unless you are willing to do my modifications.

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Homebuilder

For the past 18 or so years I have been building and riding recumbent bikes. The first were three editions of Easy Racer (the last of which Gardner told me was the nicest built customer one he had seen), a Don Harse lowrider in two editions (the first of which I rode through Port Townsend about June 5th of 1989 on the northern tier route to Bar Harbor, along with 11 other much younger riders. I was 66 at the time. The second edition of the same lowrider was built after returning home and subsequently was expanded to include a passenger-powered detachable sidecar. The last bike I have built in the past two years, modeled after the Vision (by the time I had made necessary changes for handling I call mine the ReVision—20-inch wheels & midship free-wheeling freewheel for gearing up.

At age 77 I still put on 10-15 miles a day in lieu of driving a car around Redmond, Oregon.

Reid L. Seastrand, SeastrandRM@cs.com

I'm Back

I thought that the Net would suffice for all my info-bents included and I allowed my subscription to lapse. No way! There is just something about the anticipation of receiving the next issue and getting lost in other peoples' input and enjoyment of my favorite past-time, recumbent cycling. I've loved cycling for almost fifty years now. The freedom of suddenly being able to cover four times the territory in the same span and with less effort was emblazoned into my preteen mind and NO motive experience (car, train, boat or plane) has come close to duplicating that still sublime epiphany. I adore the simplicity of the conventional bicycle, however, my body began to suffer from this affection about ten years ago and I was relegated to short trips. A fellow cyclist suggested that I should look into recumbents. I did some searching and came

across an ad in a cycling magazine about Easy Racers. I sent for more info and looked into everything I could find out about bents. I always take a good long look before I make any significant purchase, so over the next two years I kept on researching and came into contact with your magazine, RCN, and subscribed. I had liked the looks of the Tour Easy and after reading your article on the bike, decided to order one. Your report on the bike was spot on and I have been enjoying my TE since 1992. I still firmly believe that it is the best all-round long wheelbase bent made. Gardener Martin is a genius. I have called Easy Racers a dozen times over the years for info and stuff and Gardener himself answered the phone ten of those times and he always seemed to have nothing in the world better to do than to help me locate some more Sun Tour retro gear. Gardener is a good and great fellow and I only hope "going big time and flying the coop" does not change him. Being curious by nature, I started wondering about short wheel-based bents. After reading your impressions of the Vision R-40 and Bill Dowling's article in RCN, I ordered one. I have now concluded that a person needs a minimum of two bents. One long and one short. I have the 23rd R-40 made and have thought about trading it in for a new R-40 but the bike rides so sweetly. For me, it is not twitchy. I'm 6'2" and 180 and I can ride that neutral handling dude in a straight line at two mph! I could never understand your rant about the seat horn. Later, I got a CLWB BikeE. But soon after sold it to my brother-in-law. The BikeE is fun but, in my opinion it is a better first bike where as the TE and R-40 are first and last machines. I have successfully raced and sport toured on the TE and have done serious self-contained distance touring on the R-40. They both are my favorites. Just like my children. I appreciated the quick response in you getting me the back issues—and particularly the one that was already out of print and you photocopied and hand stapled one for me when most outfits would not have gone to the trouble now THAT is service. The only other photo copied mags I have are from the IHPVA—another dedicated group. I am planning to retire in 16 months and bike tour most of the US. I hope to also visit Easy Racers, ATP, and maybe even RCN. All three of you put out first class products.

Roger Fuller
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Sat R Day Comments

I hate writing this letter. I hate writing to say, in essence, "ditto." I would much rather be saying, "Bob, who paid you to write that hatchet job?" Or "Who paid you to write that fluff piece?" It's just not fun to say that I agree with almost everything you wrote about the Bike Friday Sat R Day. So, while I can't disagree with you substantially in your review, I can nitpick. I don't know what problems you had with the quick-fold, since I can fold it almost as fast as I can type this sentence. And, your Bike Friday-supplied description of quick-folding is out-of-date: the seat no longer folds and swivels on its front mount. And that's it. Sure, I may quibble over the "geeky

looking" comment, but I will have to say it looks better in person than it does in pictures. While the bike isn't as fast as my Wishbone, it's far from being a lead sled. I know that I surprised quite a few people, including myself, with the performance I was able to get from it on TOSRV and GRAB-AAWR last year. It's a fun bike, and there are very few compromises. If I had to have just one recumbent, the Bike Friday Sat R Day would definitely be in the running.

Larry Varney, lvarney@one.net

Cool RCN

What a cool new issue of RCN! (#61) You can't ask for a better HPV mag. Shari's Slumgullion Tour report was captivating. Same with Bill Conklin's canyon cruising report for off-road BikeE's. Really neat racing pics, too. Something for everyone. I bet you couldn't find a richer resource. Talk about dense! Meaty, nifty stories cover to cover.

Now, I liked the review of the Trice trike. However, it clashed somewhat with my experiences and with Rob Wood's report at the WISIL website. Rob finds that tadpoles wander too much with pedal input for his taste. Me too. I've only ridden one, however. Way too much speed scrub in bumps, too. Well, I guess I'd have to lurk awhile in the trikes list to really find out. I really like the trike concept, especially for Velomobile potential. I think it's neat that Rob is developing a lean-steer delta trike with a view to fully faired highspeed work. We'll see how it compares to tadpoles. And what will happen to it in the slippery stuff? (It seems like you'll have to ride with lean-mode locked-out in bad weather.) It's good to always stay at the drawing board!

DG Wilson's piece on HPV Innovation was fascinating. Great to keep getting his input! I found it interesting that he suggests that recumbents offer a wider range of performance per vehicle than uprights. He suggests there are 3 basic types of rider—racer, cruiser, commuter—and that it's possible to do all three with a sport recumbent, yet he says the upright market uses distinct bikes to cover these uses. I partially agree. The "one bike does it all" niche is also wonderfully served by uprights.

My upright road bike is simply great for all 3 of those functions. With it I can enter all types of racing events...even HPV events! It's fine for tours and day-rides. It's perfect on uphill and for any type of handling. It's fine on dirt roads. It's light, strong and proven. It's wonderful around cars, stoplights, potholes and sidewalks. It's a pocket-rocket and a cruiser. It carries panniers, saddlebag, and handlebar bag just fine. I can easily hop on it with a shoulder bag or backpack. I've stripped it down and made a track bike out of it for the velodrome or fixie riding. And if we consider a partially-suspended hybrid upright, we get all these things plus mtb-bike riding and racing. In one bike. (Soreness does get to me over 30 miles, but I usually don't ride farther than that.)

I have a garage full of well-worn bikes, including two 'bents. I find that for everyday riding that I grab a different one depending on need and whim. Yet perhaps my road bike

does the most.

It seems like the recumbent hops to it most lively for a certain kind of niche: gentle, smooth, wide roads without too many stop lights, and mid-range distances. Though this is a very common niche.

Jeff Potter, jp@glpbooks.com

More Recumbent Barn Woes

My experience with Recumbent Barn has been a mixture of good service with very bad. Unfortunately the current result has left me with a broken bicycle.

The only explicit guarantee they make is a 30 day money back trial period, which has expired. I notified them within this period that I intended to return the bike; however, they extended the trial period and worked with me on various problems. We got to a point where most of the problems had been fixed and I notified them that I intended to keep the bike. About three weeks later the frame broke. The company is no longer responding to phone or email.

bill@shira.net

Casualties of RCN

I just received my issue #62. You've got so much meat in that thing that it can't be read in one sitting. Good Show !!

I liked the letter from the fellow that sold his Visionor a BikeE. The letter served very well to illustrate some of the contrasts that exist in the world of recumbent bicycles.

The Ryan article showed the tenacious character of this recumbent pioneer. Unlike a lot of what we hear today, for Dick Ryan, the Vanguard was more than about the money.

The lack of references to Haluzak caught my attention. Did I miss something or are they one of the casualties?

Mark Eichenberger

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Editor Comments: Bicycles by Haluzak pulled out of RCN when Bill Haluzak made it clear that he did not like being #9 on our RCN#56 Top 10 list (top 10 of all recumbent models). We have not received any product info for more than a year and they did not attend Interbike where we could get information.

Comfort Bikes

I am enjoying the current issue of RCN while tucked into my house while sleet falls outside and read your question on whether "comfort" bikes should be covered in RCN. This is a great idea. Comfort wedgies occasionally reviewed by people who also love riding recumbent recognizes that some of us also continue to ride conventional bikes.

Earlier this winter I purchased a comfort bike (an aluminum Specialized Expedition Sport with Shimano Rapid-Fire Alivio gearing, front shock and seat post shock) to ride during the winter when roads are covered with snow, slush or a corrosive soup of ice-melting chemicals. Not wanting to subject my expensive Rans Stratus to such conditions, I decided to try a less expensive upright.

It would have been great to have had some pointers from other recumbenters to guide me in finding a conventional, albeit comfort, bike.

So far I am loving the new bike, even more than I anticipated. It is more stable in sloppy conditions, nimble, quick shifting and much more comfortable than my last upright. Now it doesn't compare to the Stratus, but it doesn't have to—I am outside riding, having fun and staying fit. When I get home, I clean the bike by dumping a 2 gallon bucket of hot water on it, wipe it down and after it dries, relube as necessary. I have added fenders, a rack and a pair of Specialized Nimbus EX 1.5's (a favorite of urban couriers). These tires are faster, offer a smooth ride and still have acceptable traction.

Interestingly, when I was shopping bikes, most bike shop owners did not want to sell me a comfort bike when they learned that I rode 2500-3000 miles annually on my road bike (the Stratus). They steered me to more expensive mountain bikes, contending that I would not be happy with the comfort bike and would soon be trading it in for a real mountain bike. They tried to sell me on off-road riding which unfortunately requires putting the bike on a rack and driving to place that offers bike trails. But I prefer to be able to ride right out of my garage especially during the short days of winter when I can sometimes squeeze in a quick ride after work before dark.

So, I vote yes for one or more articles on comfort bikes.

Dick Hubeny ♦

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Reader Road Test

2001 Vision R54

Article & photos by Mark Eichenberger
markeichenberger@yahoo.com

Purchasing a recumbent bicycle presents the buyer with a mind blistering array of choices. It is an exercise in balancing wheel base, seat type, bottom bracket height, suspension and so on with needs, wants, perceptions and budgets. For those attracted to the convenience of a short wheel base, easily obtained drive line parts and comfort of full suspension, the Vision line of full suspension recumbents may just fit the bill. The R54 is the middle model of this product line.

Vision completely redesigned their full suspension series of bicycles for 2000. The most significant change is the triangulated rear swing arm. This design change stiffens the rear end of the bike and reduces the pogo effect of previous designs. A new seat sling conveniently provides a greater range of adjustments for increased comfort.

SYSTEMS

Frame/Suspension

The R54 uses a mono-tube frame constructed from TIG-welded 1.75" CroMo steel. The rear wheel swing arm is mounted to the frame through sealed industrial bearings. An adjustable boom is used for rider leg length adjustment. Seat position is fixed with adjustable recline. All these assemblies are manufactured and nicely finished in Vision's Seattle, Washington area plant.

The frame is painted with metallic powder coat while the seat is done in flat black. Although it does not gleam like a custom wet spray, the smoothly applied metallic coating has a rich low gloss sheen that looks very much nicer than the dull flat powder coats found on other recumbents. Decals are stuck on the surface and not sealed. Care must be taken not to rub them off. My hand displaced parts of the main "Vision" decal while I mounted the bike on an automobile rack.

A Ballistic 600 elastomer suspension fork provides the front suspension. This fork provides adequate travel for most pavement problems. The rear suspension uses a Cane Creek AD-5 air shock. This shock is readily available, serviceable and low maintenance during regular use. Both shocks exhibited more stiction than I would like but otherwise kept the wheels damped nicely in control.

The flailing forked rear end of models past is gone. It is replaced by a triangulated assembly with a geometry designed to prevent the pogo effect, when properly set up, at a lower shock pressure than before and over a wider range of rider weight.

The reviewed bike is equipped with under-seat steering. Vision directly couples the handlebar to the front fork. The hand grips are located directly to the rider's side, oriented front to back and parallel to the ground. The bike may be configured with either over-seat or under-seat steering. If a steering configuration change is desired, rather than buying another bike, a conversion kit is available. The change should be left to a mechanic familiar with bicycle set up and adjustment since it does require making cable, drive train and brake adjustments.

Weight

Vision publishes the weight of the R54 at 33 pounds without pedals. The tested bike weighed 34 pounds with pedals before the addition of heavier tires and accessories. For most riders the weight factor is greatly overstated. However, the bike should be light enough that one person may conveniently handle it during transportation and storage. The R54 is reasonably easy to load into a car, truck or lift up onto garage hangers.

Drivetrain/Shifting

The drive train of the R54 uses Shimano 105 in the front and XT in the rear. The shifters and brake levers are Shimano LX. The XT rear derailleur comes equipped with an Avid Rollamajig. Rear shifts are smooth and positive, up and down the cassette. Front shifts are quick

and deliberate going down into smaller chain rings. Going up into the largest chain ring requires a solid, extended puuuuuush from the thumb, which is annoying.

The R54 does not use idlers on the chain's drive side. This results in a very smooth, quiet and silky drive, a real treat after buzzing idlers. Chain length is a function of the rider's leg length due to the adjustable boom. I found that correct chain length was noticeably beneficial to overall drive train performance. The take up side of the chain uses two idlers with internal bearings. They worked quietly and uneventfully, as they should. A small chain guard, with laser cut company initials, prevents the chain from jumping beneath the idlers on bumps, as does happen on some recumbent designs. On hard bumps the chain would slap against the handlebar.

Single-sided SPD pedals came on the bike from the factory. Though these are not the fanciest pedals they nevertheless are a good starting point and will save the purchaser some money up front.

Component Quality

The R54 is a classic case of LX/105 factor, where performance and cost provide best value. I test rode an R50 with Shimano Tiagra components, though serviceable the LX/105/XT of the R54 have a more refined feel and smoother operation.

Wheels/Tires

The wheels are built by Vision owned Winkle Wheel. Rims are Sun CR18 and the hubs Shimano 105. Vision recumbents use an asymmetrical rear frame geometry that permits centering the wheel, hub and frame with very little dish. This results in a more evenly tensioned and durable wheel. So far, the rims have remained true in the face of the load they are carrying and the additional subjected stresses for this review. This unique geometry needs to be considered when purchasing equipment specifically designed to work with conventional geometry, such as Bontrager ASYM rims or Rohloff 14 speed hubs.

The R54 comes stock with a 1 3/8 100psi Primo tire on the front and a 1 inch 100 psi Primo on the rear. I had these changed out to a 1.75 65 psi Primo V-Monster on the front and a 1.5 75 psi Michellin Wildgripper City on the rear. They are relatively heavy, but sturdy and care free.

Braking

The brakes are Avid Arch Rivals. The Arch Rival replaces the models 40 and 50. In early 2001 Avid is expected to change the cartridge pad from their proprietary Rim Wrangler to more economical and available Shimano compatible pads. The braking performance of the Arch Rival with the Rim Wrangler pads is excellent. During routine stops they easily, intuitively and controllably bring the bike to a sure stop. During hard and emergency stops the suspension aggravates the tendency for the bike to dive, reducing the load to the rear wheel, making it easier to lock up. Learning rear brake modulation to avoid rear wheel lock up is essential with this bike. I found that learning to modulate the rear brake was easily mastered. The brake levers have three leverage adjustments. This is useful if you like a little more grab and less quickness to your brakes.

COMFORT/ERGONOMIC/FIT

The R54 has a +1 inch seat to bottom bracket height. Seat height measures 26" with the bottom bracket at 25". Many popular SWB recumbents range from -1 to -4 inches. Does it make a difference? For this rider it has helped enormously. The foot discomfort I experienced for thousands of miles on my -3 recumbent is gone. The riding position feels more relaxed yet efficient at the same time. Much of riding position comfort is how your body works. Many riders find high bottom brackets just great, others find low bottom brackets just great. What I

the bottom bracket a bit below the seat. This was one of the major reasons I bought it.

The R54, like other Vision bicycles, has a fixed seat with an adjustable boom. Though this method does not permit easy adjustment to other riders it is solid, simple and inexpensive. The two pinch bolts that secure the boom bend into a bit of a "frown" when tightened. Vision recommends generously greasing the bolts and changing them every 10 adjustments to prevent them from shearing off. This is sage advise, considering that it may take several adjustments to find the "sweet spot" for you and breaking a bolt could be a genuine disaster.

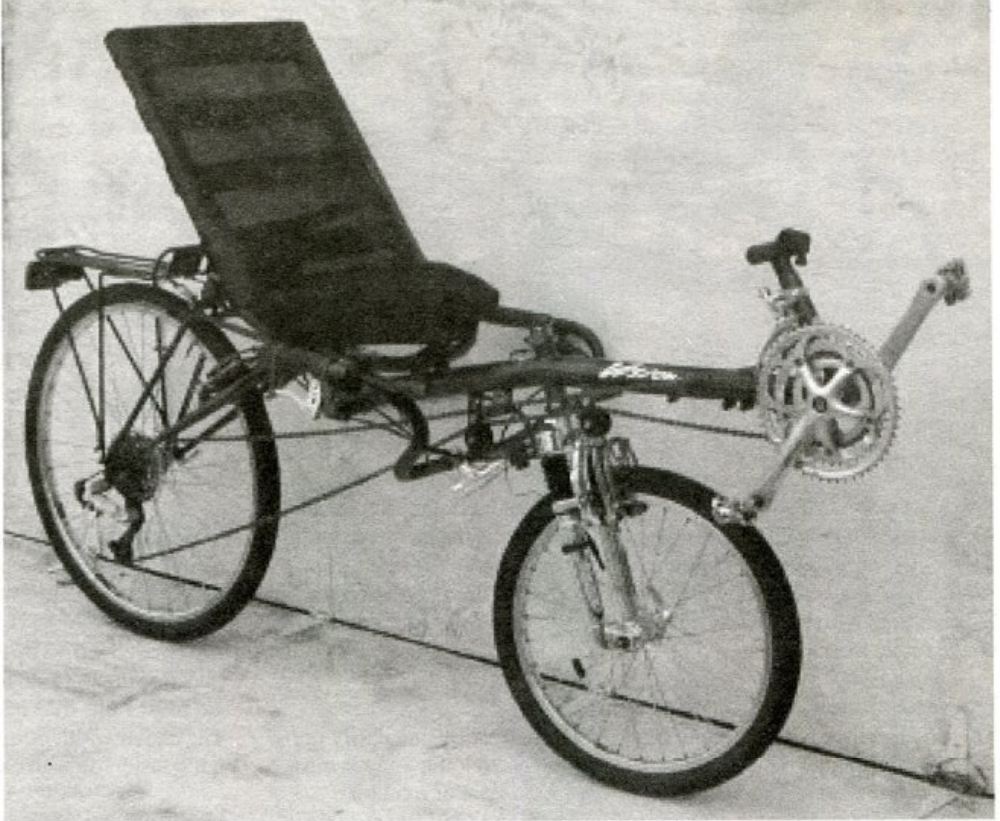
The under-seat handle bar adjustment is limited to tilt and about one inch front to back (up to 3" possible by using a different Vision handlebar). The bike is easily mounted with the bar grips not in the way. Though the bars swing under the seat, U-turns in a double car driveway are easily negotiated without the bar being out of touch with both hands. The position of the bar and the front to back orientation of the hands make for an exceptionally comfortable and relaxed riding position. The hands just rest lightly on the grips, shift controls and brake levers right at the fingers. There is not much vertical adjustment so it is important to make certain that the hands rest comfortably on the grips. Riding by the finger tips is uncomfortable and not safe.

Vision makes the surprisingly light and rigid full sling seat with mesh back and foam pad in their factory. The improved sling allows adjustments at several places along the back to provide support where it is needed. A front seat horn may be noticeable to some riders. Proper seat adjustment will reduce this. The rider sits IN rather than ON the seat, nestled in a pocket which is very comfortable, solid and secure. On hard pedaling you are secure and not bouncing around on the seat back. Quick releases attach the seat to the main frame tube, making the seat easily adjustable and removable. The front quick release uses a custom flat plate bolt. This specially fabricated part is necessary to provide adequate chain clearance. Keeping a spare handy is a good idea. Though the seat height measures a rather high 26", the "V" shape to the front of the seat allows the legs to easily drop to the ground. It does not seem as high as it is. I have a reasonably short 29" inseam and find no difficulty whatsoever comfortably putting my feet flat on the ground. The seat cushion is thin and low density but did not seem to cause problems.

RIDE/HANDLING

Stability

The R54 has a 42" wheel base, which is a bit longer than other short wheel base recumbents. The bike is very stable at slow speeds, making starting and stopping almost effortless. I found myself more than once nearly stopped and in the pedals. The fastest I've had the bike is 35 MPH heading down hill. The bike was smooth and stable, the speed was almost unnoticeable. At the bottom of the hill the road turns sharply left and then right with very uneven, rutted and poorly patched pavement. The bike just rode through the turns and over the rough pavement



The 2001 Vision R54

without a hint of the instability. This is where suspension pays off in ways other than comfort. The under-seat steering and steering geometry made this experience even more fun. I just let my hands rest on the bars, leaned into the turns and sailed on through. Small steering inputs to induce instability were corrected quickly and deliberately.

Tracking

The bike tracks surprisingly straight. Pulling a straight line off from a start is delightfully easy. The bike almost makes you think you could ride it without hands, but don't try it. Riding with one hand is easily learned. I had to do it stomping up a hill, right hand behind me feeling the shock for pogo. The bike just slipped straight ahead.

Maneuverability

The R54 has short wheel base maneuverability tempered by a slightly longer wheel base. Riding along busy bike paths, making sharp turns and U-turns in the street are almost automatic. The wide under-seat steering handlebar makes running narrow openings in brick dividers a little more challenging. The fun of SWB format is preserved but without the excessive quickness that SWB bikes are reputed to have or the graceful sweeping turns of a LWB. The steering input travel is limited as compared to some bikes. This makes spinning the bike around in the garage a bit more of an effort than the 90 degree inputs allowed in above-seat steering recumbents.

Speed/Efficiency

The under-seat steering and slightly higher seat height to bottom bracket create more drag than above-seat steering designs. The suspension, though well controlled does take up some

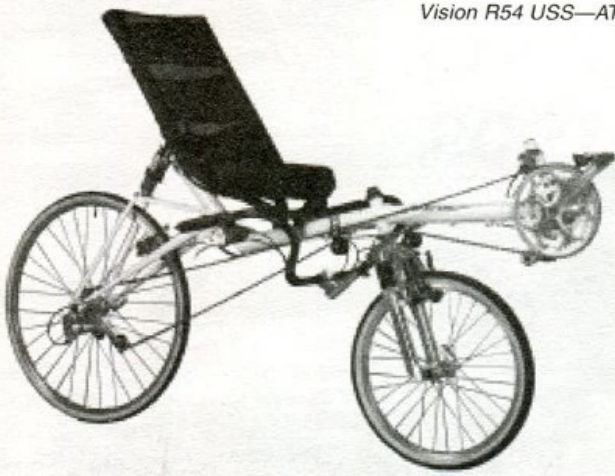
energy and the bike is 34 pounds. These factors together do not make the R54 a speed machine as one equates in a Lightning P38, Easy Racers Gold Rush Replica or Rans Velocity Squared. For reference, repeated 20 and 30 mile rides more comfortably averaged 0.6 to 0.8 miles per hour faster than on my Rans Rocket. The R54 delivers full suspension comfort while retaining a fairly efficient ride. The bike was not tested with optional fairings.

Suspension Behavior

Now for the big question, "What about suspension pogo!?" The instructions suggest starting out with the shock pumped up to your body weight and then sit on the bike. The shock is not supposed to compress, but just be on the verge of it. If you bounce a bit then the shock should compress. If it does not, or is too soft, the pressure should be adjusted down or up a bit to achieve the desired effect. For me, this was 150 lbs, 90 pounds below body weight. When set up as recommended, the suspension performed very well. It does not provide a plush "active" ride, but rather a firm controlled ride. For purposes of this report I tried a few things that I would routinely not do. Testing for pogo was done by selecting a nice steep hill and stomp pedaling, rather than spinning, up in the lowest gear. A bike mechanic friend of mine, with a keen eye, watched the shock as I chugged up the hill. He noticed no shock movement. I reached around and placed my hand on the shock while stomping and felt only pulses that corresponded to pedal motions.

The next test was barnstorming irregular railroad tracks. Lump-didy-lump, not bam-didy-bam without bottoming out. Where's a speed bump? The bike took the speed bump in stride with the expected pitch in the back. On

Vision R54 USS—ATP Vision



Vision R50 ASS—ATP Vision



level pavement slight shock movements correspond to pavement irregularities. The front suspension tends to float a bit, but is controlled. On sharp diving turns the rear end felt stable, confident and true, though not as tight as my 20x20 hard tail. As well as it works the ride lacks suppleness. Pavement cracks are more noticeable than I would like. Summing up with an automobile analogy, the bike rides like a sports coupe rather than a sedan.

User Friendliness

The R54 is a user friendly recumbent. The seat quickly and easily pops on and off. Recline adjustments are as simple as undoing and resetting a quick release. Drive line parts are standard mountain or road bike Shimano. The suspension components are bike industry standard that may be ordered by most local bike shops. The bike also walks well. You can steer it by rocking the seat in the direction you wish to go. It fits in between the filing cabinets at work and on elevators. On the down side, the ability to quickly adjust between riders is inconvenient. The bike does not have water bottle mounts.

Fun to ride?

What is it like to ride the R54. The Vision slogan of "Comfort Without Compromise" is a bit misleading, the bike really is "Comfort Through Careful Compromise." This is a compliment to the bike's designers. Though the R54 may not do everything perfectly, it does most everything very well and balanced—not drawing attention to itself. The result is a bike that cradles the rider with the arms hanging naturally to the side and the legs quietly pedaling naturally forward. The bike's geometry permits an intuitive feel that allows sailing around turns with controlled body lean that comes naturally. Shifting gears is just a finger click or thumb push. If you do encounter that heavy bump or rough pavement you ride comfortably and securely over it. You arrive at your destination feeling healthy, not beat up. Riding the R54 is not about the bike, its about enjoying the ride.

OWNING/PURCHASING

Versatility

The R54's ability to be either an above-seat or under-seat steering bicycle makes it a very versatile machine. For this rider, under-seat steering is best appreciated on paved surfaced, smooth or rough and secure gravel. Off-road and soft dirt trails would be better negotiated with the above-seat steering. Soft sand and high bottom brackets don't mix well regardless of who makes the bike. The mounts for a rear rack worked flawlessly. I was given a used Blackburn Mountain rack and it fit right, fully secured, the first time without any foolishness.

Shipping/Assembly

The under-seat steering necessitates handlebar, chain and cabling to all share a fairly small space. Vision publishes detailed dealer instructions that emphasize these critical assembly details. When they are followed, the bike really works well. For the \$2195 that this bike lists for, the set up should be right. If you have any questions that cannot be satisfactorily answered by the shop where you bought the bike, Vision will help. I have asked them a lot of questions, perhaps being very trying at times.

to my confidence in them as the manufacturer and in their product.

Transportability/Storage

The short wheel base permits the bike to be carried on conventional bike racks without expensive tandem adapters. The overall length lets it rest conveniently in the back of a mid-sized station wagon without having to take wheels off. The easily removed seat keeps it clean and dry when transporting outside the car or truck and reduces the height, which may aid in storing. The bike stores conveniently from the roof of the garage. The added width of under-seat steering may be a bit of an issue. I would not consider this an easy to transport bike for air travel.

Quality/Durability

This bicycle is hand built in the Seattle area. Tube cutting, welding, painting and initial assembly are performed at the factory. Vision has made an effort through fundamental frame design and component selection to build an efficient yet tough bike that is serviceable. There was one serious factory assembly error. The bike came with the rear brake pads reversed. This is a potential safety issue since the pads could be forced out of the brake cartridges. Vision was made aware of this issue.

Cost/Depreciation

The R54 at \$2195 is a serious investment without much competition to drive it down. Trying to find one selling for less is very difficult. I found more than one dealer listing the bike for over retail. Looking through the sale advertisements for Vision and Rans recumbents I noticed, for bikes three years old or less, that Visions sell for about 70% of list while Rans bikes sell for 80% of list. However, Vision has noticeably dropped the price of their bikes over this time while substantially improving their quality, so these numbers may be a bit skewed.

MY ANALYSIS

Value

Full suspension comes at a premium price regardless of the manufacturer. In this component group about \$500. Full suspension performance recumbents start at \$1700. This is where the buyer has some choices with the Vision series. All three bikes share the same frame set, which sells for \$1550. The entry level R50 with Tiagra level components sells for \$1695. For \$145 more than the frame set the buyer gets a completed bicycle. For many riders who are interested in limited recreational riding or wear it out and upgrade this a bargain. The R54 upgrades to the 105 level components for an additional \$500. Is it worth it? Considering that you cannot buy the frame set and dress it with new parts of comparable group, the nice smooth operation of the bike, it is a fair value. In the case of the R55, which sells for an additional \$800. above the R54 and \$1300 about the R50 is a different story. The frame set and components can be purchased for \$200.00 less than the completed bike. One custom recumbent bike builder sells an R55 type bike with upgraded parts from stock for the same price as stock.

Market Competition

The R50 series does not have a great deal of direct competition. If the

Veloteknik from Europe. Price wise the R50 with the Ballistic 600 fork at \$1695 is a better buy than the HP Veloteknik with a Ballistic 450 fork at \$1795. When considering the color availability, "Made in USA" construction, materials, workmanship and component level the R54 is priced within the market. Ordering the bike took about three weeks for delivery. Vision is currently claiming an 8 day factory turn around.

Additional Notes

The R54 has a number of adjustments that the rider should dial in. The boom length is the major one, however many others are important. These include seat recline and adjustments to the handlebar and control positions. I found the time to get them right really paid off. A real sweet spot can be found that makes this bike a friend to ride with.

From the factory, options are limited to your choice of eight paint colors, two stock ones at no additional charge. Vision offers a range of accessories to make your recumbent more useful. These include a day bag with integral bladder, a T-bar for mounting lights, computers, and GPS receivers to the front derailleur tube, fairings and a center stand.

Verdict

If you are looking for a speed machine—this is not the bike. If you looking for the stately grandeur and prestige of a long wheel base—this is not the bike.

Do you like to ride, to enjoy the ride? Are looking for the fun and convenience of an efficient SWB bent that comfortably tames road anomalies? Are looking for a well made, serviceable and engineered bike that draws little attention to itself as the miles comfortably roll by? If so—then the R54 is an excellent choice.

RATING/SUMMARY

Mark's Rating

Comfort: B+

(seat horn may be a problem for some)

Design/Style: B+

(efficient and stable but lacks suppleness)

Drive train: B (difficult front shifting)

Chain Management (idlers/noise/vibration):

A- (Very smooth and quiet, but slaps handlebars on large bumps)

Brakes/Braking: A

Finish Quality: A- (Decals can rub off)

Mark's overall R54 Rating: B+

Pros

- ✓ Firm yet comfortable, stable, intuitive ride in a convenient short wheel base format
- ✓ Bottom bracket slightly lower than seat
- ✓ Full suspension with minimum pogo that uses standard components
- ✓ Available with ASS/OSS or USS
- ✓ 26x20 wheels allow standard parts and gearing
- ✓ Reduced dish rear wheel
- ✓ Built in USA with a variety of factory colors

Cons

- ✓ Relatively expensive
- ✓ Added complexity of full suspension
- ✓ Cumbersome front shifting
- ✓ Bottom bracket may be too high for some
- ✓ Seat may be too high for some riders
- ✓ Non-standard Reduced dish rear wheel
- ✓ Somewhat heavy
- ✓ No water bottle holder

Access

Advanced Transportation Products, Inc.
Toll Free: 877-433-4273
Phone: 425-673-2448
Fax: 425-673-4668
email: Info@visionbikes.com
Web: www.visionbikes.com

INFO

2001 Vision R54 SWB USS

Price: \$2195

Wheelbase—42" measured

Seat height—26" measured

BB height—25" measured

Weight—34 pounds measured with pedals

Frame—TIG CroMo

Fork—Ballistic 600 suspension

Components

Crank—Shimano 105 170mm stock (165mm test bike); BB—Shimano 105; Headset—Shimano STX; Derailleurs—Shimano 105 (front)/Shimano XT (rear); Gears—9/27-spd.; Chain—KMC; Gear Inch Range—23-115.8 stock (21.6-106.2 test bike); Pedals—single sided SPD; Wheels—559mm 26" (rear)/406mm 20" (front); Rims—Sun CR18; Tires—1.35 Primo (front)/1.0 Primo (rear) 100 psi (1.75 Primo V-Monster (front) 65 psi/1.5 Michelin Wildgripper City (rear) 75 psi test bike); Hubs—Shimano 105; Brakes—Avid Arch Rival cartridge with Shimano LX levers; Warranty—Lifetime on frame; 1 year on components; Colors—Midnight Purple and Jewel Green. Blaze Red, Mystic Blue, Sedona Orange, Gloss Black, Classic Silver and Glacier White are available as options.

About the Author

Mark Eichenberger resides in Richardson, Texas. He is an electrical engineer. He works in the telecommunications industry and commutes to work via recumbent bicycle. His stable includes a Rans Rocket, Vision R54 and Sun Cycle EZ-1. He averages 2500 miles a year on the bents, is married with three children and enjoys serving in his church. He is member of the Recumbent Enthusiasts of North Texas (RBENT), www.rbent.org.

Disclaimer/disclosure

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ABOVE/BELOW: Author Mark Eichenberger on his R54 USS with optional front suspension fork



Vision's new triangulated swing arm and air shock location. This design is said to require significantly less shock pressure than previous designs.

Read about recumbents online

www.recumbents.com

www.bikeroute.com

www.ihpva.org (hpv mailing lists)

www.bentrideronline.com (eZine)

[alt.rec.bicycle.recumbent newsgroup](mailto:alt.rec.bicycle.recumbent@news.grouper.com)

The Twike Challenge

by Victor Muñoz

There is a vast gap between a 30 lb. bicycle and a 3,000+ lb. car. And balancing on two wheels at automotive speeds is a bit too much of a thrill for many non-motorcyclists. The Twike was developed precisely to help fill this void of options.

It was designed by engineers and architects concerned to combine some of the extreme energy efficiency of a bicycle with many of the comforts, performance and safety characteristics of a car. The Twike has the latter's all-weather protection, the relative safety of a recumbent seating position, and the power to flow with traffic even on steep hills. It can carry two adults plus a hundred pounds of cargo. Yet both driver (or "pilot," as Twikers are called) and passenger can each contribute as much human power as they wish to the motive energy of the vehicle. It is light enough that the human input—while not practically sufficient by itself—can be a significant boost to its range. Certainly, the human power purist may object to the fact that the vehicle is 80 to 90 per cent motorized, but then the Twike was not designed to replace the bicycle. (Why would we want to do that?) It is the conventional automobile—one and a half ton battering ram that it is—that requires replacing wherever possible. The typical car driver needs some of his or her excuses taken away. Incorporating many of a car's useful urban virtues but without its inherent wastefulness is the Twike's mission and challenge. Apart from that, it also takes all the fun out of driving a car!

14 Years in the Making

One of the first Twike prototypes, a purely human powered version, was presented at the 1986 Vancouver Expo by its Swiss designers, who were then students at the Federal Institute of Technology (ETH) in Zurich. The student project won an international award for innovative design in alternative energy vehicles at the Expo. Since, it has been through many stages of development and refinement. (The name, by the way, was derived from "twin bike.")

There are now about 500 Twikes in Europe, mostly in Switzerland and Germany, and a handful in the US. Until recently there were two incarnations of the company, S-LEM and Twike A.G., but in the fall of 1999 they merged into SwissLEM A.G. (LEM stands for Light Electric Mobile.) The company's initial marketing strategy centered on distribution through a network of small locally owned Twike Service Centers/Dealers. Ralph Schnyder, who was part of the original design team is still among the company's leaders. His team's dedication over the years to the challenge of introducing such a radically new idea in transportation is truly remarkable. In the next few years, the company hopes to make a significant entry into the US market, again by working through small local Twike Centers. There are already a handful of Twike pioneers in Washington, Oregon, Indiana, Vermont and Connecticut. EVsNW Inc. in Seattle, which specializes in electric power-assist bikes ("ebikes"), is currently the licensed US distributor.

As part of the EVsNW Coop, I had the chance to visit the original Twike center in Gelterkinden, Switzerland in the spring of 1998. I was there to take an assembly course from Ralph and to learn as much as I could about the Twike in my brief six day visit. Nestled in a narrow valley in the foothills of the Alps, the village of Gelterkinden reassured me as I approached it for the first time that any vehicle produced thereabouts could not avoid contending with steep grades. (This had been a problem with some early flatland-made electric vehicles I had previously owned.) Ralph and his family lived in a beautifully restored 500 year old stone barn. A trained architect, part of the impetus for his involvement with the Twike was the need to reduce acid rain, which apart from its other ill effects, is fast defacing ancient buildings throughout Europe. Being an avid three-wheeled recumbent biker and designer, of course, offered another reason to pursue the idea.

Efficiency

Let's face it, most of us are never going to enjoy pedaling up a steep hill,

let alone in rain, wind and snow, with impatient traffic tailing you or whizzing by. The Twike was engineered around the notion that one should be able to pedal a vehicle, use city streets, keep up with city traffic, carry a passenger and luggage, without having to brave the elements or forgo the most basic comforts of a car—but do so at least 20 times more efficiently than any conventional internal combustion vehicle. At 80 watt-hours per mile (without pedaling), the Twike gets the equivalent of 300+ miles from the energy stored in one gallon of gasoline, converted to electricity. Any pedaling you do is icing on the cake.

Equipment

The vehicle comes with either a Plexiglass or a laminated safety glass windshield, windshield wipers, the standard array of automotive lighting, defrosters, horn, 3-point seat belts, an aluminum ultra light aircraft frame and roll cage, and a removable Cabrio top (Twikes are fun in nice weather too!). The single front wheel is steered by a tiller controlled with the pilot's right hand and arm. The pedals are mechanically connected to the rear axle, but freewheel when the axle is turning faster than the pedals. Both pilot and passenger, neither, or either of the two can pedal with or without the motor. With a curb weight of almost 600 lbs. However, it is not practically possible to go more than a few miles an hour, even on the flat, exclusively on human power.

The highly ergonomic seats with excellent lumbar support are fully adjustable to accommodate a range of different leg lengths and preferred reclining angles. Both seats tilt forward to access the luggage area behind which is wide enough for about five full bags of groceries. Most driving functions are controlled by the pilot with a single joystick-like tiller including—besides steering—acceleration, braking, signaling and cruise control.

A shifter on the center console permits three driving modes: 1) forward with motor and pedal input, 2) forward with motor only, and 3) reverse with motor only. A five speed gear shifter on the pilot's left allows the pedal drive different ratios. The pedal drive is geared to provide useful input at speeds up to 25-30 mph. Beyond 30 mph the vehicle would be operating almost entirely on electric power. Although capable of 52 mph—and with amazing car-like acceleration—the Twike's efficiency was designed to peak out at about 25-35 mph, exactly those speeds most suitable for urban cruising.

The accelerator button, controlling motor power, is just above the regenerative braking button on the joystick. It has two user programmable performance stages and cruise control. A typical driving pattern is to hold down the accelerator button until your desired speed is achieved, then tapping the regen button once lightly will maintain the current speed for easy cruising, allowing you to concentrate on pedaling and watching the road. Any subsequent brake action or further accelerator button pressure cancels the cruise control, returning complete manual control to the pilot. No, piloting a Twike is not quite like riding a bike or driving a car...but like something entirely different, yet still very intuitive!

With three independent braking systems, the Twike is not short on stopping power. Rear hydraulic brake drums are activated by the pilot's back pedal action. Front mechanical disk brakes are controlled by a lever on the left control handle. Both trigger stop lights. But in addition to these conventional braking systems, regenerative motor braking is also available on demand at the light touch of the regen button on the steering joystick. In typical operation, the regen brake is the most often used brake, especially for planned stops. Even without the other brakes applied, it can bring the vehicle to an almost complete stop at two different levels of intensity, selectable by increasing pressure on the regen button, while at the same time recovering electrical energy for the batteries that would otherwise be wasted as heat on brake pads. Moreover, it can easily be locked at a user selectable level with the built

in cruise control, an invaluable feature for extended down hill cruising in steep or mountainous terrain. (Remember, the Twike hails from Switzerland.)

Getting into the Twike requires tilting the entire canopy forward—jet fighter-like. Admittedly, this can be a bit awkward at first—I compare it to getting into and out of a bathtub. But every aspect of the Twike was designed with functional efficiency in mind, aiming for strength and safety but without succumbing to the usual automotive temptation to pile on mass. The outer skin is a single piece of molded Luran S plastic supported by an aluminum cage. The load bearing part of the frame consists of a continuous, undrilled, U-shaped, 3 inch diameter aluminum tube, to which all other structural members and components are clamped with cast aluminum brackets. Keeping this tube undrilled or unwelded enhances its strength. The one piece motor/transmission unit and two battery modules sit very low to the ground at rear axle level. 75% of the weight of the vehicle is resting on this axle, the rest, on the front wheel, thus keeping this independently suspended vehicle stable.

Power on Demand

Though the original prototype of the Twike was pure HPV, obviously to successfully flow with traffic the Twike had to have a motor. The designers chose a 336 Volt AC Synchronous propulsion system, powered by two (or, optionally, three) battery modules, each consisting of 280 C-size NiCad cells. Each module is further broken down into seven sections and each of these has its own battery monitoring electronics, sensing voltage, current in and out, temperature, and state of charge. A central processing unit collects information from each section of each module, and software processes the information for display to the pilot and for controlling performance and charging characteristics. An inverter takes the 336 Volts of stored DC power and converts it to AC for the motor. AC motors easily lend themselves to regenerative braking. The high voltage of the system enhances efficiency.

The software permits—among other things and as previously mentioned—the user to set different parameters governing the performance of the joystick buttons, making it easy to customize acceleration and braking performance, thus balancing efficiency to individual taste. The vehicle can charge on either 220 Volts AC or 110 Volts AC (the latter with a small step-up transformer).

One of the outstanding features of the Twike, a product of its lightness and energy miserliness, is that—unlike many electric vehicles of the past and even many yet to come—it can recharge on ordinary house current at a very fast rate: 1 hour on 220 Volts, 2 hours on 110 Volts. Larger EVs require either a very expensive, uncommon, extremely high voltage and/or current electrical service,—or can take all night to charge on conventional household circuits. The three battery module version of the Twike can travel up to 45 miles on a single charge. But because of its fast and universally available charging capability, the vehicle can achieve 150 to 200 miles a day with repeated charging stops. The record is over 350 miles in a day in Europe, where, of course, 220 V is much easier to come by.

In the scheme of things, human input can account for, at best, about 10% of the motive power necessary to move the Twike. Nevertheless, that's a vastly greater proportion than would be the case if we tried to move even a small gas car partly with sweat.

The '98 Challenge

Although providing an alternative to the car for common urban commutes and errands was the original idea behind the Twike, there is a growing enthusiasm for its touring potential. It so happens that an enjoyable cross country trek would only be pleasantly punctuated with stops every 40 or so miles. Twike clubs have been formed in Switzerland that sponsor village to village tours, rating restaurants in part by the friendliness of their charging facilities.

To date, the ultimate Twike tour, however, was the Twike 98 Challenge. In the summer of that year it made EV history. Over the course of 11 weeks, six Twikes accomplished a 7,000 mile journey, starting in Bern, Switzerland, traversing Germany, Czechoslovakia, Poland, Russia, the Baltics, and Finland on their way to Nordkap, the northernmost point of Europe, 200 miles north of the Arctic Circle, then back through Scandinavia, Belgium, and Germany to where they began. Comparable to going from Seattle to Boston, and then back again and then on to L. A., the trip consumed for each Twike 550 kWh or about



\$44 in electricity costs (at .08 cents/kWh)(Ed. note: Rates have undoubtedly gone up since this writing). Proving their ruggedness, the little vehicles survived the untamed roads of the former Eastern Bloc with no more than occasional flat tires. In the world history of EVs there is probably no other instance of an EV (let alone six of them) covering such a distance in that block of time. The six Twikes were averaging nearly a hundred miles a day. The high voltage in Europe certainly helped. But even half that distance in a day is still far more than most Americans travel.

There is a marvelous photo documentary on the Internet at <http://www.twike.ch/challenge98/fotos.htm>. American documentary film maker, Michael Patterson also went along for the first 1,000 miles or so and produced an engaging video of this first leg of the Challenge. There is something really amazingly cinematic in the night scene of Twike after Twike passing in review before the camera and a crowd of spectators... A copy of the film can be obtained from Michael by contacting him at mpatt@hotmail.com.

Safe?

One issue that immediately occurs to car drivers, looking at the Twike for the first time, is safety. (Cyclists are apt to look at it in a very different way.) With such a thin skin not much stiffer than the plastic of a gallon milk jug and so light an aluminum frame, what chance has a Twike in a collision with an SUV? In the case of a side impact, there is

undeniably very little between a Twike occupant and the bumper of a heavier vehicle, although front and rear collisions are buffered by fore and aft crumple zones. The vehicle has been crash tested in Germany and is considered the safest motor-cycle—as it is usually registered in most states and countries—on the road. That's not saying much, of course, to someone accustomed to travelling wrapped in a ton or more of steel.

But there is another dimension to the concept of safety that may be, however fitfully, beginning to take hold as part of a more thoughtful general notion of what urban transportation should be. The idea that, in deciding what vehicle is deemed "safe," we should only be concerned about the safety of the occupant is self-defeating. By that logic, the vehicle you are driving should always be bigger than what everyone else is driving—the hell with pedestrians and cyclists. They don't deserve to live.

Few vehicles need to be as big as they are to perform their function in an urban setting and there is quite often in that setting other human flesh involved in accidents besides that of an occupant in a vehicle. The Twike was designed to be kind to what it may hit. There is no comparing the damage done to the human frame and flesh by the soft, pliant nose of a Twike and the steel cage of even a "safe" car like a Volvo, backed by six times as much mass... Walking shoes and bicycles are "safer" than Twikes, but not much else is.

Is it Worth it?

The Twike is one of the most unique and ambitious vehicles in the world. While I was visiting the Twike facility in Gelterkinden in March of 1998, I witnessed the rollout of a specially painted edition headed for Japan, to Honda R & D. (Who knows what they had planned for it?) As the world's most energy efficient two passenger motorized vehicle, it represents the extreme expression of an idea.

Customer satisfaction is high and used Twikes are still quite rare and fetch high prices. New Twike prices can range from about \$16,000 to \$20,000, depending on options. Not a HPV, nor quite a car, many find it difficult to assess. My experience has been that the chance to ride or pilot a Twike noticeably changes the tune of some price skeptics from "That's a lot of money for something with pedals" to "How can I afford one?" Both expressions acknowledge the price, but the second begins asking the right question.

Walter Breitingner of Valparaiso, Indiana and Ron Manganiello of Burlington, Vermont are two intrepid North American Twike pioneers. Walter is now pushing 20,000 km on his Twike, which he dubbed Verde, through the subzero winters and 100+ degree summers of Indiana, day in, day out. Ron, an energy efficiency expert and ardent cyclist, got tired of pedaling a bike in New England blizzards, but felt there had to be some better alternative than a car. So after experiencing our Twike, during a visit to Seattle, he and his wife, Ellen, packed

off to Switzerland and actually participated in the assembly of their own 1999 model.

The company is committed to unstinting quality and engineering and to innovation (the next generation of Twikes will probably sport Nickel Hydride batteries), but it is also concerned to use as much recycled and recyclable material as possible. There is a conscious effort to avoid components manufactured in countries where labor is exploited. Much of the electronics are made in Germany, Japan and the US. (T. B. Woods of Pennsylvania makes the inverter, the heart of the electrical system.) These factors coupled with the still limited, hand-assembled, production help explain the cost. All the same, it's common to see a lot more money wasted on vehicles with a lot less vision.

References

The complete operator's manual in English is available online at <http://twike.cjb.net>

The original Twike site is at <http://www.twike.ch/english/international.htm>

Also visit EVsNW at <http://www.electricvehiclesnw.com>

Read more about Ron Manganiello's Twike adventure at <http://www.burlingtonelectric.com/specialtopics/EV/Twikeart.htm>

Twike Specs

Length x Width x Height: 2650 x 1200 x 1200 mm
Unloaded Weight: 220-250 kg, including battery (depending on equip.)

Payload: 2 persons plus luggage

Maximum speed: 85 km/hr

Starting Gradeability: >20%

Energy Consumption: 4-6 kwh per 100 km

Suspension: 3 wheels, independent struts

Brakes: rear hydraulic drums, front mechanical disks (CH), front mechanical drums (D), rear parking brake, electrical brake (regen.)

Steering: control tiller with adjustable damping

Turning circle radius: 3.5m

Chassis: alum. frame (space frame with roll bar)

Body: Thermoplastic Luran(r)

Pedal Drive: 5-speed gearing

Electric Drive: AC synchronous motor, rated 5 kWh

Battery: Ni-Cd, 2 kWh

Battery Charger: 2 kW (charge time 2 hours)

Range: 40-80 km

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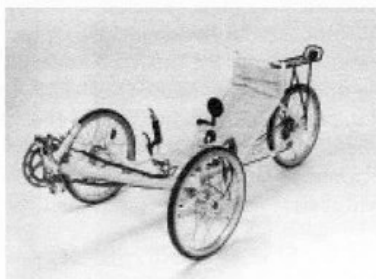
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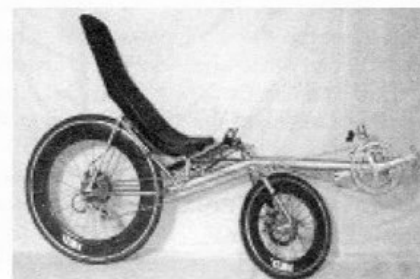
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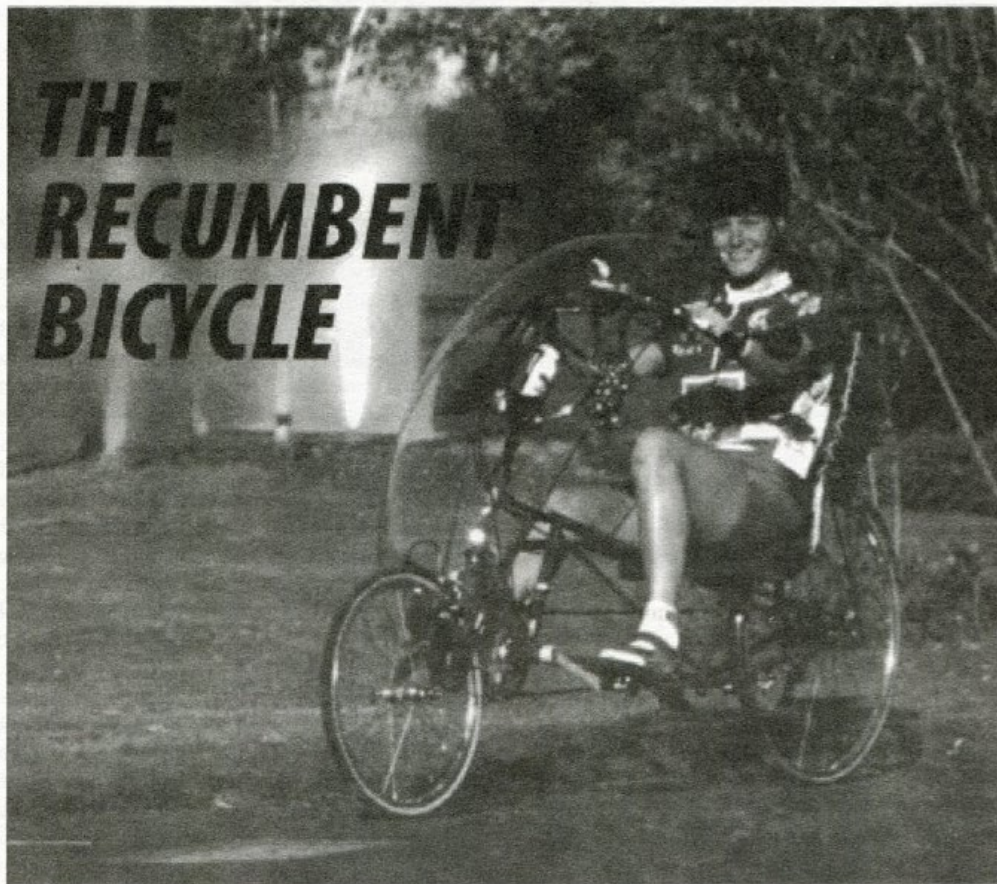
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In Pursuit

By Bob McClure, Jr.
robertmclure@earthlink.net

I've been riding a recumbent for six years. My first (and only, up until now) 'bent was an Infinity (LWB USS). It's been a fun machine what with adding a full fairing and such, but it's somewhat heavy and (like all bikes) has its share of little niggling problems that I can't easily solve. So I have been studying the 'bent scene for some time, window shopping, as it were. My short list of "The Next 'Bent" has included, in no particular order, a Tour Easy, Lightning P-38, Rans V-Rex, or either the Rotator Tiger or Pursuit. For most of the bikes on the list, I figured I would have to find a used one to keep from busting the goodie budget. Well, I encountered a deal on a virtually new Rotator Pursuit that I couldn't pass up, so I now have The Next 'Bent. This article documents some of my experiences fitting this machine into the 'bent part of my life.

One of the initial concerns was whether or not I would fit the frame. It is a "large" frame and I am 5'9" with an x-seam of 42". Everyone said it would fit, so I bought it.

The bike arrived and I started tearing boxes apart and purging packing paper. I installed the rear wheel and the seat. With a few minor adjustments—the bike was ready to roll.

The next order of business was fitting the bike to me. I moved the seat up just shy of the mid-drive bracket, but found my legs to be still a bit short. Studying the arrangement, it looked like I could move the seat mount forward to where the two clamps (yes, those hose clamps that RCN's Bob Bryant disparages) straddled the mid-drive bracket. I could, and I fit. Later, I decided I would really like to have the seat just about a half an inch further forward, but the next increment was about two inches to get the seat mount past the mid-drive mount and the aft bottle-cage mount. I tried it for one trip to work and back and decided it was definitely not good. I returned the seat mount back to straddling the mid-drive bracket.

A word about the clamps: hose clamps are one of those simple, ubiquitous, and very effective devices that, as long as they do their job, you just can't improve on them. These are of stainless steel, so they're not going to rust, and for the last six months of my ownership and about 750 miles, they have done their duty. I suppose, if the look really bothers you, the appearance might be improved by cutting off the excess "tail" of the band that sticks out of the worm screw housing. I understand that Rotator tried some spiffier looking clamps, but found that they stripped out because the worm screw didn't bite far enough into the strap. The previous owner had replaced all of the hose-clamps prior to shipping the bike to me—as several had failed. RCN/Bob Bryant's point about hose clamps on a \$1700 bike is well taken, though the replacement clamps on this bike have worked just fine.

While adjusting the replaced rear derailleur adjuster barrel and running through all of the rear cogs, I dropped the rear chain off the driver cog on the mid-drive. After I put it back in place and resumed shift adjustment testing, it fell off again. It was time to investigate. It looked like the chain tube that leads the chain onto the top of the driver cog was off just enough to cause the problem. Some careful bending of the aluminum bracket that holds the top and bottom chain tubes cured the problem. Needless to say, I rode the seven miles to work the next day. What a delightful machine!

About the Drivetrain

I guess I'd preferred a bike with a "normal" sized drive wheel (26" or 700c) so that I could easily find replacement drivetrain components for it. The trade-off for that is that I have to carry two spare tubes with me. The Rotator machines intrigued me because of the use of a mid-drive instead of triple chainring in front, which, it seemed would get past the need for giant chainrings or internally-gear hubs to deal with small drive wheels. The mid-drive is a rear cassette with one gear missing and another that drives the chain to the back wheel.

To put it in terms of chainrings, it is as if there is a quint-chainring set.

Two of the nice things about this setup are that both gear-sets shift as easily as rear derailleurs, because, well, they are. And there are no such things as unusable combinations because of cross-chain (big-cog/big-chain-ring or small-cog/small-chainring) problems.

This is my first experience with Shimano Hyperglide and I am delighted with the smoothness of shifting. This is compared to the Sachs on my Infinity and whatever came on it originally—Suntour, perhaps.

The left shifter is just a right shifter, turned upside-down, so the gear indicator numbers are upside-down. After I determined which gear indicator number correlated to which gear of the mid-drive, I took a piece of Post-It correction tape and made new numbers and stuck it over the original numbers, right-side-up, of course. Then I put clear tape over the new tape to postpone deterioration until I could come up with a more elegant solution. Also, like most shifters, the right (rear) shifter rotates forward to upshift, and the left (mid-drive) shifter rotates top-forward to downshift.

How do you deal with all of these gears? Well, my practice has been to start out in 2-1 (2nd on the mid-drive; 1st on the rear), and do straight and level cruising in mid-drive 4th, selecting the most comfortable rear gear for the desired load and cadence. I usually save mid-drive 1st for serious hill climbing and mid-drive 5th for serious descents and tail-wind situations. My typical shifting pattern from a dead stop has been to go from 2nd to 3rd to 4th on the mid-drive before working the rear shifter, because I can more easily use the large jumps in gears in the early acceleration.

The Seat

The seat is mesh fabric suspended from a CroMo frame. The seat back is laced on with 1/8" braided nylon or Dacron cord. With the lumbar curve in the frame, it makes a stout base from which to put the muscle to the pedals. The seat bottom is laced on with maybe 1/4" shock cord making for a cushy place to sit. At first, I thought the frame was very springy, and though it is a little springy, most of what I was experiencing was in the seat bottom. So, given the fat tires, slightly springy frame, and the springy seat bottom, I found I could just power over bumps, holes, and tracks that used to jar my teeth. My only complaint is that my butt tends to slide forward, and I find I have to occasionally push myself back in the seat with my legs. If the way your body mates with the bike's geometry is such that you can lean the seat back, and it can be leaned back a lot, the butt positioning probably won't be a problem.

The Steering

This is my first bike with above-seat steering. I was aware, from previous reviews, of the tiller effect of the steerer, and I wondered how much of a problem it would be. I found getting used to it was not hard at all, but it does require a short period of adjustment. Now, I don't have a second thought about it and can start out with little wobble.

Some of the tiller effect is mitigated by a pretty laid-back head-tube angle, but that, in turn, causes a fair amount of fork flop. But, again, I didn't find it much of a problem as it is countered by a generous amount of fork rake to make for about 2 to 3 inches of trail. I find it plenty stable at slow or high speed—once you are rolling and clipped in. The biggest obstacle to slow-speed maneuvering is the tiller effect, but once you get used to that, a 180° turn in a two lane road is as easy as any other LWB.

My Carps

I don't care what anyone says; this bike needs fenders, at least on the front. Ride over damp pavement, and you are guaranteed to get spots on your glasses. I found a couple of recumbent shops (Calhoun Cycles, Fools Crow and Angletech, among probably several others) that carry German ESGE fenders. The fenders and mounting kit are sold separately, so you can do your own custom mounting. Besides, I'm an engineer—I can probably figure it out myself. If you hire your shop to

mount the fenders, be sure they have your bike in stock for a model.

The is the first bike I have had that is not freestanding, that is, it doesn't have a kickstand. What's worse, I can't find a place to mount any of the available ones. My Infinity had a plate welded in the front part of the chain-stays on which one could mount a conventional kickstand. My LBS tried to fit the kickstand they put on the ATP Vision, but it clamps to the chain-stay and the seat-back brace, and my seat brace was too vertical to fit. It's just a real pain in the neck to always have to find a place to lean the bike against. Far be it from me to lay the bike on the ground. Well, only if I absolutely have to. I later talked to the folks at Rotator and they procured for me the kickstand used by Lightning. It works pretty well, but I haven't managed to tighten down the mounts enough to prevent serious assaults from rotating it around the chain-stay. I may shim it with some plastic tape.

And as mentioned earlier, there is no good place to mount most bike headlights. Surely the bends in the handlebars could be place further out from the center, so that there is some straight-ahead mounting space for the light. It wouldn't hurt to make the bars just a couple inches wider, too, because I would have wanted to mount my computer, light and Air Zound II on the bar. As it turns out, I discovered that my Cateye light has a mount that allows a small amount of horizontal rotation. Perhaps other lights do, too, but my old Vetta didn't. I elected to mount my computer and horn on the handlebar and the light on an accessory post made for mounting computers on aero bars, which I mounted on the riser.

Some Serious Riding

After two commutes to work, I felt ready to take on the next rally, which happened to be "Hammer the Hills of Duncanville, a suburb southwest of Dallas," put on by the Greater Dallas Bicyclists. I signed up for the 40-mile course. Being a little late for the pre-start queue, I settled in near the back of the pack. At the first part of the course it was still too crowded to really open her up, but I finally found a beautiful downhill with lots of clearance and I cranked her up through the gears, all the way to high gear, and found myself rolling along at 47 mph. What a blast! I let that momentum carry me up the next rise and around a corner and up another hill.

I passed a number of wedgie bikes as I downshifted while momentum bled off, and I heard one rider remark, "... and he's not even in low gear!" Made my day.

I found getting up the hills only a little less pleasurable once I was out of momentum. What with the lumbar curve in the seat, the light weight, and the flexibility and easy shifting of the gears, I quit dreading hills. On one hill that wasn't enough to drop me to Grandma Low, I was doing an aerobic cruise up the hill, when I saw in my rearview mirror a couple of DF riders standing on the pedals and gaining on me. Deciding we'd have none of that, I put the meat to the pedals and accelerated up the hill, and the next time I looked in the mirror, I couldn't make them out. However,



Author Bob McClure Jr and his Rotator



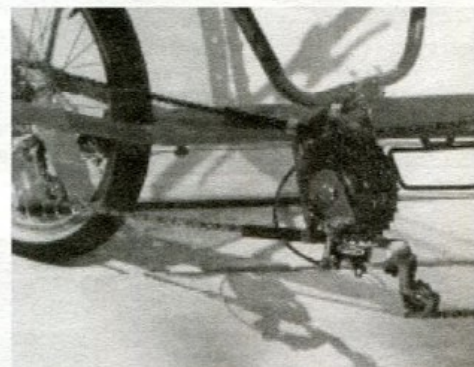
Author Bob McClure Jr rides his Rotator

they may have slowed to chat with some sweet young things I had passed earlier. Yeah, that must have been it. But it was still fun. Well, the bike is Fire-Engine Red; it goes like a scalded cat, uphill and down; I think it's a "Hot Rod."

Further Adventures

I can't leave well enough alone, so fairings were next on the list. Mine is modeled after the very sleek Rotator Interceptor. I figured I would get more "bang" from a front fairing, but I wasn't sure how to engineer one for an above-seat-steered LWB, and I really needed the storage space afforded by a tail box. At some point, I got a bright idea for the framework of a tail box. With my Blackburn rear rack as a base, I formed the structure with the angle-plastic. I then took a single piece of Coroplast as long as needed from front to back and front, again, and as wide as I wanted to make the box tall,

I have had a delightful time with the Pursuit. It is solid, very comfortable to ride,



Rotator's dual rear derailleur mid-drivetrain

and remember: it is the base for the Interceptor. I think it's a keeper. ♦

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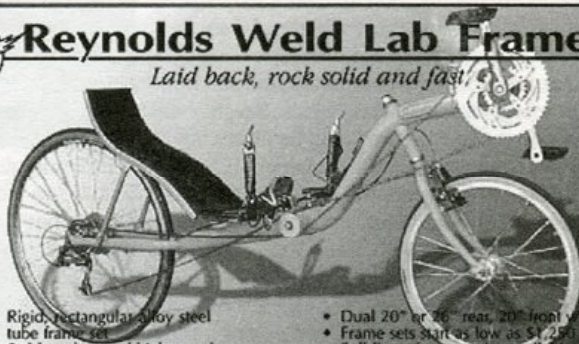
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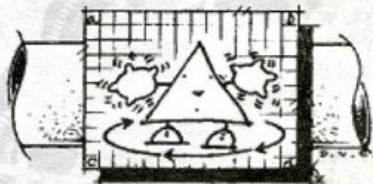
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Two Years Riding a Fully-Faired Vision R-40 Practical Vehicle

Story & photos by David M. Eggleston
dmeengr@nwol.net

It's been more than two years now since I finished my Ed Gin white Coroplast full fairing for my ATP Vision R-40, making it into an R-40FF. I got the bike in Sept. '95 and had ridden it as LWB USS and SWB USS. I liked both configurations, but the short wheelbase made it lighter and much easier to carry and park. Being also a member of the HPVA I finally decided to convert it to SWB ASS so I could wrap a full fairing around it and experience the resulting aerodynamic advantages. After many modifications for creature comfort, communications, and safety, it has become a substitute for a car for around-town errands. I use my car so rarely now that I only fill it with gas every month or two. It keeps getting festooned with cobwebs. The R-40FF has been such fun that I ride it whenever I get a chance. I like the fact that it provides basic transportation based on renewable energy. I use less gasoline than just about anybody.

What good is a heavy, fully-faired SWB recumbent anyway? Well, it's really good. It's fast, and most people who build one find themselves going 10 to 25% faster than without the fairing for the same power input. That difference depends upon how much power the rider puts out. At any speed above 15 mph the difference between it and an unfaired bike in ease of pedaling is noticeable. Riding unfaired bikes becomes discouraging.

It has a windshield, an open cockpit, and an open bottom so I can get my "landing gear" down quickly for stops. I have fallen over in it 3 times, all at almost zero speed. No damage to me, hardly any damage to the fairing, but hard on the ego. You look and feel so silly.

It is quite cozy on cold winter mornings. My feet in the nose are protected from wind chill, as is all the rest of me except for my head, so I can get by with one less layer of clothing. The open cockpit gives adequate ventilation in the summer. The only problem is that in the praying hamster position my elbows get sweaty and rub against the inside panels, leaving dirty streaks. The perspiration tends to deform the Coroplast inward. It's not much of a problem, but my next fairing will have a wider position for the elbows.

The windshield and fairing, along with mudguards, protect the rider in mild sprinkles. I have a bicycle rain cape for serious rain. By putting it on before getting in, the cape hangs between me and the fairing. The cape edges can't blow in the wind. I am not yet comfortable putting the front of the cape over the handlebars, as not being able to see the front wheel and handlebars is disconcerting. I need more practice with the cape, but we've had hardly any rain lately. I would like windshield wipers for my glasses, however!

I have dual beam NiteSun headlights on the front and four LED flashing taillights and a big reflector on the rear of the fairing, augmented with a white strobe that lights up the whole back end for high visibility during night riding. Rotating wheel and DOT yellow side reflectors augment the side visibility of the white fairing, which is pretty good even without reflectors. With another Eclipse 7-LED flashing light on the back of my helmet, at night I look like a moving party. I ride a lot in the early morning during our hot summers. I treasure the very light early morning traffic, the cool air, and the usually lighter morning winds. No sunblock is needed at this time of the morning.

The electrical system is based on a 3.3 lb lead-acid 12 V rechargeable motorcycle battery, with redundant backup gel cells for longer night rides. I use the 10 watt bulb for most purposes and go to the 45 watt combination for tricky traffic situations. Neither of these bulbs has ever burned out, despite violent pounding from potholes, with 100 psi in the tires, and on an unsuspended front end. Ed's fairing suspension system does provide cushioning for the bulbs.

The white body attracts lots of attention. "You got a motor in there?" Is a standard question. Kids call out "cool bike," and people drive alongside and roll down their windows to ask questions. They pull

up beside you at intersections to talk. It's great that they notice it, as drivers tend not to see anything smaller than another car. I carry an instantly accessible business card holder filled with cards with recumbent website names and my name and email address. This becomes almost a necessity as so many curious people try to stop me to talk. This is a good vehicle for a people-person.

I think that the white Coroplast body makes the bike look bigger and heavier than it is, and motorists tend to treat it as if it were a weird motorcycle. It is quite a bit more visible than a wedgie both day and night, and they seem to treat it with more caution and respect. This translates into improved safety in traffic.

As a LAB Effective Cycling® Instructor I stop at all stop signs and follow the vehicle rules of the road, pretty much as I would in a car. I get into the left turn lanes to turn left. The local drivers are used to seeing me on the road, and don't hassle me. I feel that I am doing local bicyclists a service in riding so often and training the local motorists to accommodate bicycles on the roads. My predictability, signaling of turns, and abiding by traffic laws help build respect for bicyclists among the motorists.

From a practical point of view the body serves many purposes. It looks so inscrutable that I have little worry about anybody stealing the bike, which is great since I hardly ever carry a lock anymore. The bike weighs 60 lb. with all the accessories, and is too ungainly for any one person to carry, which makes it hard to steal. Nobody can see the actual shiny bike inside the fairing, which is a good form of protection in itself.

The body makes the vehicle more sensitive to side winds and gusts. In a strong side wind you ride leaning into the wind 5 to 10 degrees. When going downhill at very high speeds a big side gust can lift the bike off the ground, or suddenly shove it sideways. Handling it then is like flying a high performance aircraft. It is very controllable, but you have to get the hang of it gradually. You need to be very conscious of when a gust might hit you, as when you have a left crosswind and a big vehicle goes by in the other direction at high speed. Even coming out from behind hills or buildings can be tricky. You are pretty safe from gusts if you stay below 25 mph, even with the bike unloaded.

The heavy total bike weight is a necessity in strong winds. Best of all is riding it fully loaded with groceries, water, and batteries. The extra weight makes it more stable and controllable. That's why it should be great for self-contained touring.

Not everyone will like the feeling of the cockpit. Some may find it claustrophobic. You can't just hop off it as on an unfaired bike. You have to open the door, balance gingerly, and step out. I rode an unfaired recumbent for three years before trying a faired one. One could learn to ride it in less time, but it does take more concentration and skill than an unfaired recumbent. For this or other reasons, it just isn't an attractive target for thieves.

I have a glove compartment behind my head for carrying stuff that needs quick access, and a larger trunk area behind the seat with a rack and panniers for carrying heavy or bulky stuff. It can haul a fair load of groceries, and bulky packages cannot fall out, as the bottom is closed in.

The handlebars are right in front of me and hold my ham radio transceiver and cyclecomputer/heart monitor. I tell the curious that the heart rate monitor is like the tachometer on a sports car. A dual band antenna protrudes above the tail section for good communications up to about 25 miles from the nearest repeater. The radio makes for easy reception of NWS temperature and wind speed and direction reports, which is really helpful as we have very strong winds around here much of the year. The ham radio eases feelings of isolation on long solo rides. It is also useful for emergency communications, although I now carry a

cell phone too. A watt instrument light illuminates both the cyclecomputer and transceiver liquid crystal readout panels for night riding. A powerful gas-driven horn mounted on the front of the steering column is easily accessible and can be heard one mile away. This makes a small vehicle sound like an 18-wheeler. I use it only rarely, but it's really handy and effective when needed.

The fairing reduces wind drag so much it is like a built-in peloton when I have headwinds, and the airfoil-like plan form of the fairing means that it sails in crosswinds. This makes it much less worrisome to deal with winds that would make most bike riders stay home. The bike gets really difficult to control when the winds get above 25 mph with higher gusts, but up to that point I can ride under decent control even in traffic. The sailing capability means that I can ride 21 mph in a 21 mph beam crosswind, although maintaining a straight line is a challenge in those conditions. This feels good to an old sailor. On an unfaired bike in such winds I would be slowed to a crawl. I have a yaw string on my windshield to show the relative wind, just as I did when I used to fly sailplanes. I find this very useful. I can move my head out of the windstream in crosswinds, which noticeably reduces drag and adds 1 mph or so.

I always carry one CamelBak for easy water access. The low position hanging on the back of my reclined seat enables me to keep the gulp valve continuously in my mouth on hot days. Riding this bike I am better hydrated than in any other situation. On very long rides I mount an additional CamelBak filled with sports drink. Water over the right shoulder, sports drink over the left. My longest ride so far was a 13.2 hour, 183 mile charity ride. This is a great long-distance cruising machine for the Midland-Odessa area of West Texas, with its almost flat terrain. This heavy machine goes uphill slower than a lightweight wedgie.

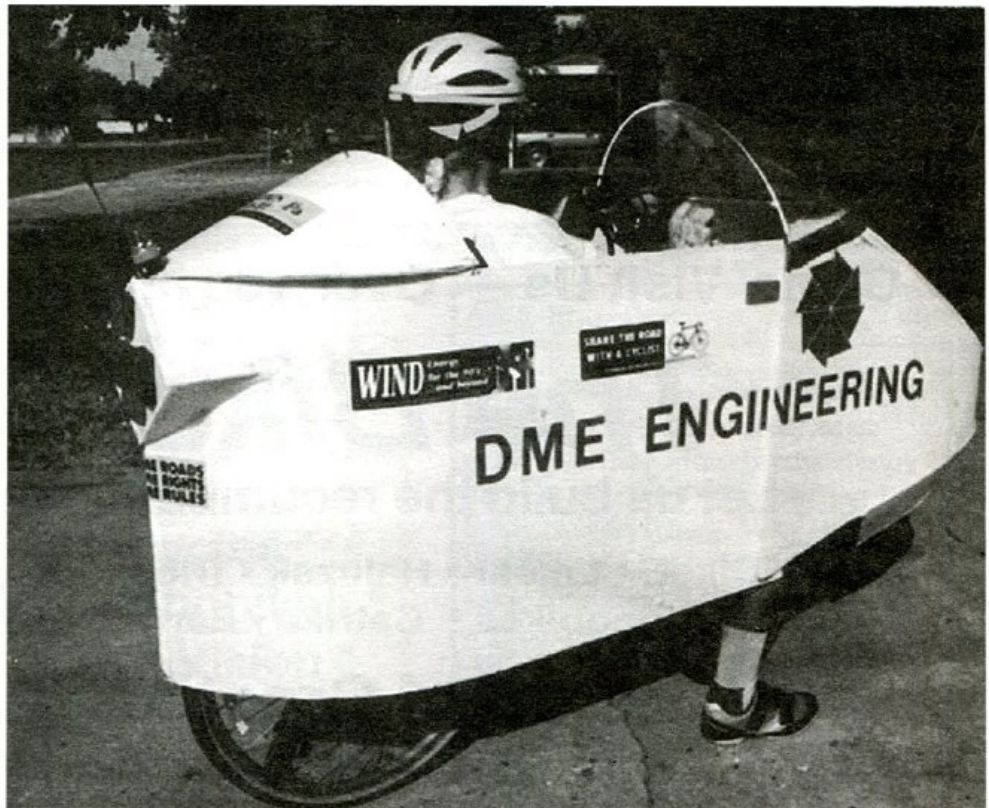
One problem with our area is the very long distances between towns, and hardly any cover for pee breaks. The fairing is a godsend in this case. I just stop by the side of the road, and nobody can see what's going on inside there anyway. This is the fastest relief stop known to mankind. And with the drought, the grass needs all the water it can get.

My Cycleaware helmet-mounted mirror is a principal safety device. The erect recumbent riding position (I don't need to recline the seat, as wind drag would hardly be affected) gives excellent visibility and allows me to monitor it almost continuously in traffic, and even on rural highways. A number of local riders have been killed over the years by drivers that didn't see them and simply ran over them. I pay close attention to the traffic behind me. The mirror is plastic and easily scratched though, and needs very careful cleaning with alcohol and a cotton swab after rinsing with water. I always carry a replacement mirror, as I do not feel safe riding without it.

The fairing does very little to hamper changing a tire. I just lay the bike down on its right side and remove the wheels. I use a Primo Comet front tire and an Avocet Fat Boy rear, with slime-filled tubes. Tire reliability is very



UPPER/LOWER: author David Eggleston on his bike



important on a practical bike, and this combination has worked quite well for me. The slime prevents much air loss even with small punctures. It takes a major cut or blowout to force me to change a tube, and I haven't had that happen to this machine on the road yet. I have had very good luck with the Primo Comet, and don't understand why it seems to have a reputation as lacking durability. I replace it only when the tread gets thin. It seems as durable as any of the other tires I have used.

The Vision R-40 is rugged and pretty indestructible, which is an advantage for a daily-use, practical, car-substitute bike. I remove the fairing every few months for bike maintenance. Removal takes just a few minutes.

Some people worry about their vulnerability to dogs when riding a recumbent. The fairing makes it almost impossible for dogs to get at you, or even see your legs, so the only real worry is running over the canine, which would be painful to both bike and dog. If you do fall,

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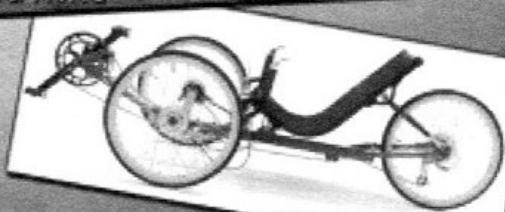
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the road will scrape your fairing up, but your body will be protected inside. No road rash, thank you.

Riding this bike in a peloton with wedgie riders works pretty well, although it is not much use to try to draft behind as it has hardly any draft, and the wind shadow is too low. Other recumbents can get some benefit of drafting behind it. It does provide some shielding for wedgies in strong crosswinds. I have thought of rigging up a water fog sprayer to cool wedgie riders behind me on long, hot, summer rides. Extra weight doesn't slow me much on flat terrain, as aerodynamic forces dominate at my usual speeds. My legs, inside the nose, are mostly shielded from the sun, which saves on sunblock. White Coroplast reflects a lot of the heat.

At age 65 I can keep up with most wedgie riders on flat terrain up to about 25 mph. Above that, the extra rolling friction of a 60-lb. bike eats up too much power, and I have to either draft or fall back. Of course the machine screams downhill, much like a tandem.

After two years the Coroplast fairing has a few dings but looks and works about as good as new. This Coroplast material is amazing.

For any of you that would like to build a fairing for a SWB recumbent, People Movers (www.recumbent.com) markets a neat video showing such a fairing being built during a one-day seminar. The materials cost me less than \$100. I thank Ed Gin for the design and convenience of this really neat fairing. You can access his web page at www.mcs.net/~gkpsol. This fairing has made my entry-level R-40 into a fun to ride, remarkable all-purpose car substitute, given me a lot of regular exercise, and saved me a lot of money. The only thing wrong is that I feel safer and less vulnerable to winds on this bike; consequently, my other bikes, except for the tandem, have mostly gathered dust. ♦

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An Editorial

As legends go, Flyin' Joe is pretty lame. This dog supposedly used gravity to fling himself into infamy and the psyche of unsuspecting bentists everywhere. Why couldn't I just fall off a ladder and expect the same treatment. I liked Joe. He was a good dog. But I don't understand the obsession with keeping his image alive. Evidently, he had a good publicist.—d. doty



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RAGBRAI—A Bicycle Festival

by Carl Smith
SmithFoto@aol.com



For the uninitiated, RAGBRAI is a week long, moving bicycle fest of about 10,000 folks cycling across Iowa from the Missouri to the Mississippi. The word is an acronym for the Register's Annual Great Bicycle Ride Across Iowa. The Des Moines Register is Iowa's major newspaper. The genesis of RAGBRAI was a casual ride across the state by friends from the newspaper. Last year was the 28th version of what the Register bills as the "longest, largest, and oldest bicycle touring event in the world." Indeed, it is an institution—the sights, sounds, friends, food, and hospitality of Iowa folks.

Iowa flat? If you believe that you'd believe the sign some youngster was holding up en route. It proclaimed, "Last hill ahead." This year the route started in Council Bluffs at an elevation of about 1200 feet and ended 490 miles later in Burlington at about 600 feet. But those numbers don't tell the story. The easy day was 54 miles and had a total elevation gain, and loss, of 1400 feet. The 71 mile hard day had a total gain of 4300 feet. It was rollers all day. I quickly appreciated the 26-tooth chain ring and the 28-tooth rear cog on my recumbent.

As a recumbent rider I quickly noticed other recumbents. The majority were Visions: usually USS/SWB ones, although there was an occasional one with above-seat steering. Rode and chatted with a delightful lady from one of our evening stops—the town of Ankeny. Her Vision was a LWB/USS with a small front wheel. She kept getting ahead of her husband—a big guy on another Vision. I saw her later in Newton after it had been raining. She had one knee and a foam seat cushion on the ground and with the other knee and hands was wringing out water. (Newton is home to a Maytag appliance facility; we met Maytag's "lonely repair man.")

I saw only one Haluzak recumbent. This surprised me for they are common here in Albuquerque. Other "single" sightings were a Burley and a Trek. I didn't get to talk to their proprietors. I saw about four or five Easy Racers; two of them were Gold Rush Replicas. Linears—I only remember seeing one.

There were a half a dozen BikeEs. I passed one group of them quickly almost every morning. They were riding in circus mode with foam animals on their helmets and blaring radios. If you think that a BikeE would be a poor choice to ride 490 miles in a week, you would miss the point of RAGBRAI. Some folks rode mountain bikes—with knobbies—the whole week.

Rans bikes were plentiful. Of the group from Albuquerque two of us rode Rans. Steve, the organizer of our group, rode a new Velocity Squared and I, a V-Rex. Having ridden RAGBRAI four times before Steve had enough of the sore butt and creaky body from riding an upright bike. He is a big strong rider and the V2 suited him well. (On one of our training rides, he reached 52 MPH descending the local "test piece"—Heartbreak Hill). I saw half a dozen old and new Stratuses, a couple of Tailwinds and Waves, two Vivos, and a couple of Rockets. One was the upgraded Saturn with its hydraulic brakes. I saw only one other blue V-Rex, but saw an older 20/26 V-Rex with that poor front brake that Rans used.



End of the ride—dipping the wheels in the Mississippi

Tandem recumbents were also present—a couple of Double Visions and two Screammers. One of the latter had a great paint job. There was even a half 'n half, bent/upright tandem. It was a modern version of the old Counterpoint bicycle. The stoker sits in the front in a recumbent position, the captain is close behind sitting upright; thus the arrangement allows a compact tandem. Rode and talked for a bit with these folks. The couple had received the bike recently but had quickly adapted to it. It's made in Germany, but I didn't catch the name. They were hammering right along!

Early in the week I saw a tadpole trike but didn't get close enough to see what it was. Later I saw a parked Greenspeed sans rider. Too bad for I would have liked to talk with the rider. (I think it would be a real kick to ride a trike across Iowa—one would need a big "ding-dong" bell to "salute" the folks along the way.)

Perhaps the mix of recumbent types reflects what the dealers stock and sell in Iowa and the adjoining states.

Every time I saw a recumbent I'd exclaim, "There's another." My initial impression was that there were a lot of bents on RAGBRAI; then I realized that there were lots of bikes present and that a certain percentage would be recumbents. This, of course, led to the question, "What is the percentage?" Four crude surveys gave numbers

on the order of 4 percent. In our charter/service group of 300 people there were four recumbents. On the bus ride back to the start point there were two bents among 50 cyclists. One day at a rest stop I started counting upright bikes after seeing one recumbent. I reached 27 before it was time to ride again. The final crude number comes from a survey a couple of us did while lying on the grass in a town square one evening. We could see three bents—and that may have triggered the topic—and fifteen uprights. Tiny sample sizes, of course, but a rough indication of bents to uprights.

Modifications to recumbents were interesting. On the first day we chatted with a guy on a Stratus (see photo next page). He had a clever plastic piece under his chain rings. It was shaped like a Frisbee and served to keep road crud thrown by the front wheel off his chain rings. On the back of the Stratus was a very nicely made, Kent Peterson-style (RCN#44), tailbox. The delightful item was the canopy over his head. With tubing he had extended the seat back up and over the seat. A fabric stretched between the tubing.

Ramon of Arizona was riding his modified long wheelbase, above-seat steering Vision. His obvious modifications were a 700c wheel on the rear and a 24 inch one on the front. None of the often ballyhooed fat slicks for him. Great guy to ride and talk with but it was obvious who would win if you tried the "competitive number" with him.

My cohort Steve says that next year he will modify his V2 to include fenders. We get eight inches of rain a year here in Albuquerque so we don't know about fenders. On this year's RAGBRAI we had heavy rains on two days: the most Steve had seen in his five years of riding RAGBRAI. At any speed above 12 mph the front wheel of the V2 would pitch water and road dirt into his eyes. The rear wheel was throwing water onto the back of the seat and the water ran down into his clothes. The front wheel of my V-Rex loaded the underside of the seat with



V-2, V-Rex and modified Stratus



Shade and grass—great camping in Washington, Iowa

water and dirt, but not onto me. For the rear I had stuck a gallon size plastic bag containing a piece of cardboard in the lower portion of the Rans seat. My only problem was that the wet dirt clogged the “rolly” gadget on the front side of the derailleur, which caused late downshifts. A squirt of WD40 in camp cured that.

A typical ride day for our group began at 4:45. Up and pack the tent in the dark. Load stuff on the baggage truck and be on the road by 5:15 to 5:30. We’d follow the blinking red bicycle taillights of the other early birds. On clear mornings we’d watch the sun rise. After 10 to 20 miles we’d stop at a town for breakfast; usually cooked by a local church group. In riding the miles we’d watch for the red arrows marking the route. Cookies and coffee made a nice stop in the towns. A great 9 am lunch was Tender Tom’s Turkey tenderloins. On reaching the town where we would stay for the evening we followed the arrows to our charter service baggage trucks and camping area. Then a shower, lounge about in the afternoon, walk into town for a big supper, and see the sights of the thousands of other bicyclists. With darkness—hit the sack. This was the scheme of our group of four. Steve, our experienced RAGBRAI rider, likes this approach. It gets one ahead of the hoard of riders and beats the heat of the day. The previous year’s ride had been very hot. In addition, one gets a hot shower; the later you arrive, the cooler the shower! Other riders have a different approach. After supper one evening I talked with a gal on a Vision who had just arrived in town. She had left the previous evenings stop about 8 am, stopped about an hour later for a massage and was so relaxed that she napped for a while. Then she visited in the subsequent towns en route.

One morning I was delayed by a flat tire and saw another side of RAGBRAI. It was the circus aspect—a guy towing a canoe on a two-wheel dolly behind his bike. Also I rode in and out of clots of cyclists. In the close groups one had to be real careful. Also notable was the range of cyclists. There were the hot roadies in matching jerseys hammering along in a pace line. I thought they would finish the 50 to 80 miles quickly but later realized that they were taking long breaks. At the other end of the spectrum I saw two 12 or 13 year old boys riding an ancient Schwinn tandem. In their rear baskets were a six pack of Gatorade and a food bag. Notable also was the number of 40 to 50 year-olds who seemed interested in a steady paced, enjoyable ride. (There is a rumor that some of these folks ride for a month before RAGBRAI, ride the tour, and then, don’t ride until a month before the next RAGBRAI!)

RAGBRAI is traditionally scheduled late in July. Sign up is in March. It involves a drawing for admission since the number of

applicants exceeds the 10,000 limit of the organizers. Details can be found on their web site, www.ragbrai.org.

“Ride hard, Eat lard” was our group motto. Indeed, with all the pork producers in Iowa many meals include pork. And lard is the ingredient that make the homemade pie crust taste great. The rhubarb/strawberry and gooseberry pies were scrumptious. ♦

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Recumbent Speed

by Chet Rideout

Recumbents have always been known for their speed advantage. This was highlighted in 1932, when a Velocar designed by Charles Mochet won several races against cyclists using the traditional diamond frame bicycle. After the decisions to ban recumbents from racing competition, the recumbent went into decline, since it was not possible to design one for racing. It again made great strides with the founding of the International Human Powered Vehicle Association by Chester Kyle and Jack Lambie, however, who held their first race in 1975 in southern California. It is exciting to see how far these competitions have brought recumbency in just 25 years.

Gardner Martin designed the Gold Rush streamliner in the 1980's, and Freddy Markham rode it to a 65.48 mph record in 1986, a record that seemed at the time insurmountable. I was lucky enough to be on hand with the next major step in speed, where the Cheetah, designed by Kevin Frantz and James Osborne, made a serious attempt at the record. The Cheetah, made largely of carbon fiber and covered with a fairing designed by computer, was piloted by Chris Huber to a speed of 68.73 mph in September of 1992 (RCN, Nov.-Dec. 1992) on the high plains of Colorado near Alamosa. This meant that Chris covered the 200m distance in the time trap in less than seven seconds!

One year later I again was in attendance when a variety of recumbents were pedaled on the Colorado course to try to better the Cheetah's record. It was fantastic to meet Gardner Martin and Freddy Markham, and a bike designer from the old world, George Georgiev. The bike he built around Sam Whittingham, a Varna bike, seemed impossibly low and small, and both Sam and Freddie sported runs in the 60 mph range (Bicycling, Jan. '94). Matt Weaver was also on hand, although I did not see him race. The weather seemed to be a constant problem that year, with winds thwarting the racers' efforts at almost every time of day.

The IHPVA mailing list (www.ihpva.org) on the Internet alerted me to a huge step forward this year in Nevada, and I noted that several of the same names were still involved. The 68.73 record had been broken, even the 70 mph barrier! I devoured as much information as I could on various websites, and it seemed that the deeper I delved the more amazing the exploits proved to be! After contacting Matt Weaver and Jeffrey Caswell, I decided to write another article about these magnificent men and their high speed machines.

These races were held between October 8th and 15th near Battle Mountain, Nevada. Matt Weaver found this strip of tarmac four years ago, which is much longer and smoother than the course near Alamosa. As always, there were problems with road closure, since many people (in particular a trucking company) wanted access to this route during the races.

On October 9th Sam Whittingham set the fastest official mark at 72.41 mph in the Varna Mephisto. This bike, like all of those used by Sam, was designed by George Georgiev, as was the Varna bike (earlier raced by Sam), used by Andrea Blaseckie. She set a new women's speed record of 54.04 mph. Both of these bikes, though they are extremely low and streamlined, have windshields—amazingly, they were the only bikes with top speeds that did!

Matt Weaver had two bikes at the competition, but he only rode one of them. They are the Kyle Edge, a black torpedo that he rode, and the Virtual Edge, a green one that he did not—apparently it was not quite ready for prime time due to some alignment problems. Sean Costin's Coslinger Special was also entered. All three of these bikes lacked windshields, instead depending on a battery powered video camera/video screen combination. Sean's setup involved a 4" color screen, with the camera mounted on the front point of the bike.

On Tuesday and Wednesday, October 10th and 11th, Sam managed a run at 71.93 mph. Matt Weaver hit 64.28 mph, whereas Sean Costin reached 61.88 mph. Andrea reached 51.42, and Matt and Andrea reached within 5% of their best runs in a second run, a new requirement of record races.

Finally, on Friday, October 13th, Sam did a faster run of 72.74 mph, which is now the world record time. It was a pity that George Georgiev, designer of the Varna bikes, had a stroke earlier this year and was unable to attend the event. Sean Cosner upped his mark to 62.83, and Paul Buttemer came in fourth at 61.79 mph.

Matt did raise his time on Saturday, hitting 69.46 mph, also faster than the Cheetah world record time. I also heard some rumors about Matt hitting faster speeds, so I asked him some questions.

Q: What is the altitude of your new course in Nevada, and the earlier one near Alamosa?

Matt: The Nevada course is at 4,600 feet, and that of Alamosa at 7,600 feet. Higher altitudes (up to about 14,000 feet) are certainly faster. Alamosa is faster, but since it is shorter it is more limited in top speeds. Also, Alamosa's surface has deteriorated and was never as uniform, and buffalo wander onto the course and the shoulder is more rugged. The Nevada course is near Interstate 80, and is a "benchmark" site of sorts which is suitable for lots of future vehicles, even vehicles that may someday surpass 100 mph.

Q: In Colorado the run leading to the time trap used by the Cheetah and the race the next year was 3 1/2 miles, whereas the Nevada course's length was 5 1/2 miles. Why the extra distance; was it necessary?

Matt: The extra distance is for anticipation of higher speeds. A long "aerobic" acceleration preceding an anaerobic sprint is desired. The faster one can go, the slower the net acceleration, yet average distance covered per unit time increases. Desired course length increases with more than the square of projected top speed. The Nevada course is actually longer than necessary this time around, but the road surface finish and uniformity is superb, and shoulder very safe. The distance goes quickly. My last "modest" runs were at and under 6 minutes from a standing start, and 4 minutes after the first mile.

Q: What is the gearing possible with your bike, the Kyle Edge?

Matt: I have a 90-tooth front gear, with a 21x9 cogset, giving 114 to 265 gear inches.

Q: What is the total weight of your bike and fairing?

Matt: It weighs in at about 55 lbs. It is heavy, but very crashworthy.

Q: Have you ever had a crash at speed, in this or other events, and if so, what damage was sustained by you and your bike?

Matt: I've never crashed any video bike at speed. I have tipped the Virtual Edge over at very slow speeds (< 5 mph) with the landing gear retracted when coming in to a stop with catchers. Also, after my very first test, I began climbing out of the bike before bringing it to a stop; the video seems to detach the mind from reality of going down the road. At high speeds (60 mph or faster) the video doesn't give a good sensation of the speed. Only by sensing the forces and noises, and noting how fast the yellow road markers and various other markers zip by do I begin to sense how fast I am going.

Q: What size wheels are used?

Matt: I have a 700c rear, and a 17" Moulton front tire. This front tire is one of the original GM Sunrayer slick special Moulton tires.

Q: Since Sam Whittingham had such a high speed with a windshield, do you think your TV system is indispensable?

Matt: Direct vision is preferable, but the video works very well, perhaps better than "shallow-angle" windshields. Video gives flexibility and ability to better approximate laminar-flow bodies. This is a primary focus of the Kyle Edge and Virtual Edge bikes.

Q: What is the TV system you use, and how was this developed?

Matt: I use dual flat LCD displays, measuring 3 x 5 1/2 inches, a dual high-res color CMOS, an electronic shutter, and wide angle 480 line cameras, which measure 1" x .6" x .6". The idea for using a TV camera crossed my mind while videotaping HPV's from a moving car in 1991. Formal testing of the system on the Cutting Edge frame met with immediate success, and the first implementation was used on the Virtual Edge in 1995.

Q: Matt, I see you used a jet-fighter style breathing tube. Where does it vent to the outside?

Matt: Air enters on the trailing edge of the HPV and vents one-way into the cabin and exits out the rear wheel hole. Otherwise the cabin is sealed for aerodynamic reasons. No other cooling air flow was used for sprint runs, and we actually had cool conditions when we rode in September.

Q: The women's record was established at 54 mph. Is it likely that this record will ever exceed 60 mph?

Matt: Certainly. Of course the effort to do so is still no small feat!

Q: What predictions would you make about the upper limit of HPV speed?

Matt: I would predict 100 mph will be exceeded on muscle power alone.

Q: It is rumored that your speed exceeded 80 mph on one run, although this is not an official speed. How did you determine this speed?

Matt: I have only one speedometer that accurately reads to 99 mph, but it is not backlit, and it was not installed. Normally I position it to be illuminated by the glow of the LCD display. I instead gauged speed by pedal cadence. I know certain cadences very well. It was my first time to fully accelerated the Kyle Edge, and I was pedaling 110 RPM and went to shift to the next gear as usual, but there was no next gear—to my surprise I was in my top gear! At the moment I realized I was running at over 80 mph. Later calculations, as well as observations from a pursuit car indicated I was going about 85 mph.

Q: The Internet article said a lot about "laminar flow." Could you expound on this, Matt?

Matt: For identical teardrop shapes, where the airflow is "attached," net drag can vary by as much as 300% due to the state of the 1/16" or so blanket of air (the "boundary layer") directly touching the body surface. Shape, surface finish, surface uniformity, vibrations, and other factors critically influence the state of the boundary layer, and demand exacting design and craftsmanship. The boundary layer is like an invisible thin ocean blanket covering the surface. Initially it is in a smooth state with swells, but eventually it is more like white water after ocean waves have been irreversibly broken. The local skin friction or rubbing action of the outer airstream racing by is often 10 times greater in the whitewater (turbulent boundary layer) region as in the smooth swells (laminar boundary layer) region. There are limits to its application, but much can be done to delay the transition from laminar to turbulent (the waves breaking) and dramatically reduce overall drag, even though the body looks the same to the untrained eye.

Q: Is any thought being given to competing in Peru at 20,000 feet using bottled oxygen? Or on the moon, where streamlining won't be necessary? (Maybe I'm getting a little carried away here...)

Matt: If a long-enough course existed, it would be a fast one. Perhaps you could have a suspended course running from one mountain top to another, thereby improving both air and rolling resistance! Ha, ha! It crossed my



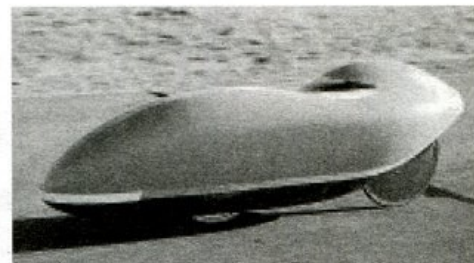
Starting Line—The racers prepare their bikes at the start— Photo by Jeffrey James Caswell



Virtual Ride—Matt Weaver takes the half open Virtual Edge for a ride —Photo by Paul Gracey



Virtual Side—Sam Whittingham and Paul Buttemer of the Varna Team examine the Virtual Edge— Photo by Paul Gracey



Sam Whittingham rides the Varna bike —Photo by Chet Rideout 1993



mind, but I would rather work on vehicle design! ♦

For further information on the World's Fastest Bicycle Competition 2000, check out the following websites:

www.wisil.recumbents.com/wisil/speedruns2000/worlds-fastest-bicycle-2000.htm

www.wisil.recumbents.com/wisil/coslinger_special.htm

RIGHT: Cheetah—Chris Huber prepares to race the Cheetah in Colorado in 1992—Photo by Chet Rideout



THE TRITAN

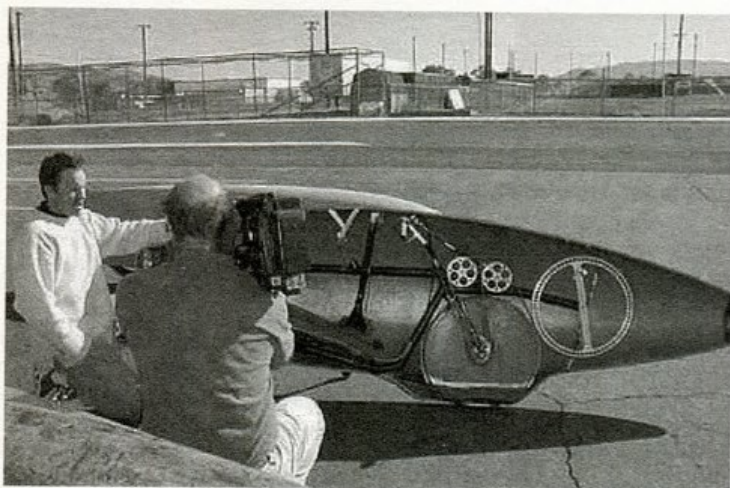
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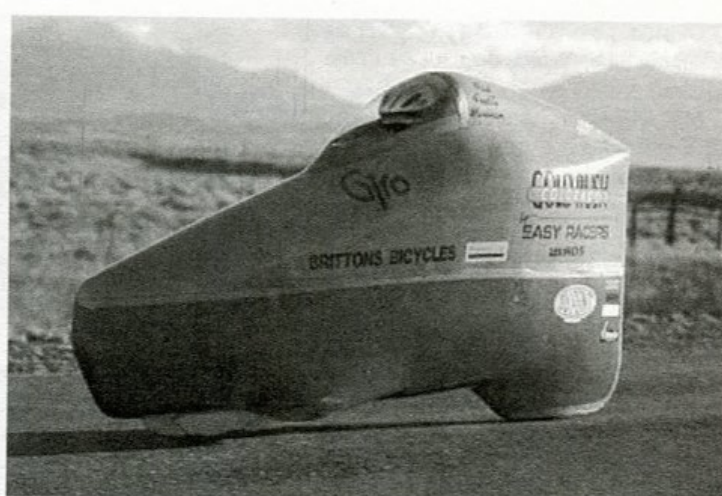
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Pointer—Matt gives an interview on the Virtual Edge—Photo by Paul Gracey



Gold Rush—The Gold Rush in Colorado—Photo by Chet Rideout, 1993



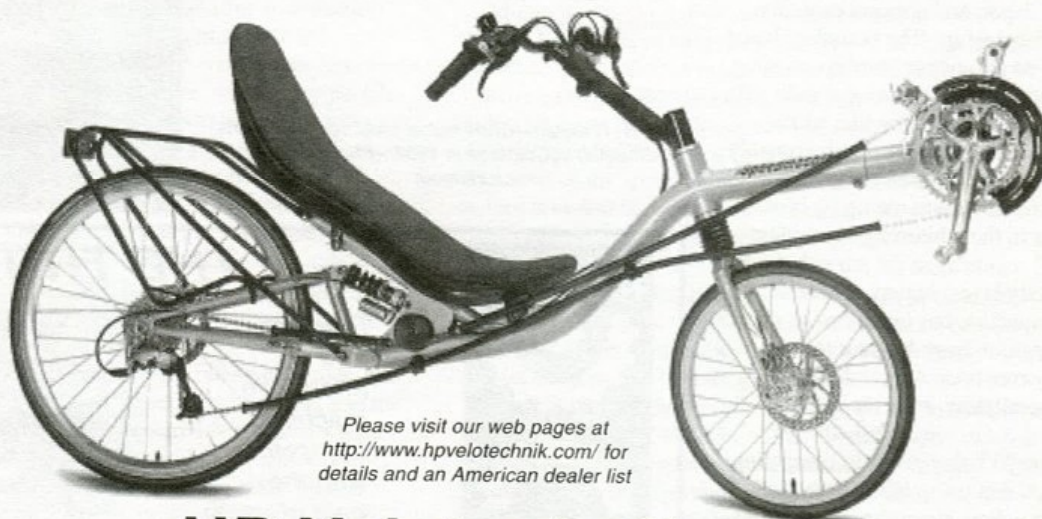
Three Bikes—Sean Costner, Sam Whittingham, and Matt Weaver pose with their bikes—Photo by Jeffrey James Caswell



Kyle Edge—Matt Weaver shows off the Kyle Edge—Photo by Jeffrey James Caswell

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RCN Reader Road Test: The Lightning P-38

Article & photos by Chung Kay Lam
mlam10@hotmail.com

In response to RCN's long-suffering desire to have a road test report on the Lightning P-38 (RCN hasn't had a test loaner P-38 since 1991), I have decided to take up the pen and fulfill his wish.

When people who've been in the recumbent scene talk about fast bikes and HPV racing, the names of a handful of production bikes often get mentioned. Names like Gold Rush Replica, Lightning P-38, Rotator, Windcheetah, etc. These bikes get attention and admiration because they have been tried and true in HPV racing much like car designs in auto racing.

The Lightning P-38 has long been known as a high performance SWB recumbent bike which has won countless HPV races in a fully faired version called the F-40. It was this impressive track record and the accolades of owners of this bike that first attracted me. I had seen the video that Lightning sent me but it seems outdated and the picture and sound quality leave much to be desired.

As a recumbent newbie (I've been riding recumbents for about a year), my first recumbent bike was the 1999 Rans Rocket which I thought was a pretty fast bike...until I bought the Lightning P-38. The Rans Rocket is a very nice bike and the price is beginner friendly but I wanted a bike designed specifically for racing. Someone once quoted to me that the Rocket is a poor man's Lightning. Nevertheless, this was the bike I had for comparison.

I have always liked riding fast and continually searched for the ultimate speed machine (although I'm not a diehard speedfreak). I had researched and read all the letters, opinions, the brochures from various manufacturers. I surfed the Internet diligently looking for information and scoured past issues of RCN (although I didn't read the P-38 road test issue #24). Finally, I decided on the Lightning P-38 because it was light (about 25 lbs.) and its size (about the same length as an upright bike) made it practical to transport on my trunk rack. Also, I had become used to the high bottom bracket position on the Rocket and believe the position allows for greater leverage for going up hills. In addition, the Lightning was touted as an excellent hill-climbing recumbent bike.

It was reported that the early Lightnings had quality control problems and occasional frame failures. The parts specs weren't up to par considering the premium price one had to pay. All those problems have been addressed more or less. The 2000 bikes are offered with a much improved selection of parts (Campagnolo or Shimano Ultegra) and the frames have been modified to make them more durable. Lightning warrants their frames and seats for 5 years.

SYSTEMS

Frame—My bike was built from a 1999 frameset and the parts were carefully chosen for weight and high performance. The P-38 has a 4130 CroMo steel space frame which is wonderfully TIG welded from no less than four different diameter tubes. The frame is made in the USA for those who think this is important (personally, I don't care where they make it as long as it lowers the price without sacrificing quality). The complexity of the frame is the reason it takes so many hours to build. This construction makes the frame very light yet strong thus preventing frame flex. The welds are beautifully fillet brazed with no spaces or gaps. The two-stage electrostatic baked-on urethane paint job is smooth and impeccable which is a major improvement over early models. It is truly a work of art!

The fork is a unicrown style which works quite well. A suspended fork is also offered (similar to Cannondale's HeadShock) but it would add another pound to the weight. The suspension fork gives about an inch or so of travel which helps smooth out the small bumps and irregularities of everyday travel.

Weight—Since the P38 was designed as a racing bike, it is quite light

in relation to its size. My bike is a large size frame which weighs 25.5 lbs. (bare bike weighed on an accurate medical scale). The smaller size frames weigh about 23 pounds—far lighter than most production SWB. Close examination reveals that even the components and parts were designed for gossamer weight. The drop handlebar, stem and seat frame are made of aluminum. Moreover, the sealed bearing delrin idlers are much lighter than the high density skateboard wheel-derived idlers of the Rocket.

Seat—I have found the sling mesh seat of the Lightning to be very comfortable, cradling the rider's bottom quite nicely. I did not slide forward like I did on the Rans seat nor did I experience butt pinching as reported by some people on sling mesh seats. The position is fairly closed (meaning the rider is sitting more upright rather than leaning back) which may give some riders the recumbent butt syndrome (a pain in the buttocks caused by rider's weight in one area rather than dispersed over the back and buttocks.)

The seat frame is curved to provide lumbar support. There is a thin open-cell foam bottom pad which fits into a sleeved seat cover sewn into the mesh. I think the seat foam and cover could be velcroed instead of sewn in to facilitate easier removal for washing.

The aluminum frame and mesh seat and back make it much, much lighter than the Rans seat which has a plastic base, thick foam bottom and CroMo steel frame. I have also found that the side seat horns of the Lightning seat support my legs if I decide to let them hang down.

One gripe I have is that I think the bottom seat cross support (where it attaches the seat to the frame) should be positioned more forward to give better balance and weight support (on occasions the seat would creak and the front part of the seat frame would rub on the bike frame). Also, the shock cord used to tie the mesh to the seat frame eventually wears out the silver paint on the frame leaving unsightly welts. Moreover, the cord stretches over time and may require tightening the mesh seat.

The Lightning seat is bolted to the frame and does not slide for adjustment as on the Rans seat. The seat stays are welded to the frame at a fixed angle and thus limit the amount of seat recline (there is some room for slight adjustment). This arrangement makes it difficult to adjust for different leg lengths (a sliding bottom bracket boom is used instead) but it preserves the ideal weight distribution at 45% on the front and 55% on the rear of the bike.

Handlebar/stem—The bike comes with a standard aluminum drop bar shaped like an upside down "U." In its OEM form, it can only be adjusted for height but not for distance to the rider's body. I have been fortunate that this configuration works for me. For those who want more adjustment on the horizontal plane, Lightning offers a tilt and lock steering mechanism. This clever device will allow you to adjust the handlebars closer to your body and secure them in the set position.

There is minimal rake of the stem thus eliminating the tiller effect often seen in steeply angled barstems (eg. Rotator Pursuit).

The drop bars provide for several hand positions and are quite comfortable. The handlebars are taped with standard cork handlebar tape. There is also a V-shaped handlebar available which is shared with the Lightning Stealth.

Shifting/Components—I use the Shimano Dura Ace bar end controls (barcons) which may be retro but work excellently on this bike. Lightning also offers twist shifters. I initially had reservations about it since I was used to the SRAM Gripshifts of the Rocket. The barcons shifted smoothly and were just as fast or faster than the Gripshifts. The front derailleur is friction shifted while the rear is indexed shifted. My gripe here is that on slow maneuvers when I need to make major turns, the shifters sometimes strike my knees which can knock them out of gear. Since experiencing this a few times, I've learned to swivel my knees out of the way to avoid this. I have a Shimano Ultegra triple

Hollowtech Crank 52/42/30 with matching front derailleur. The rear derailleur is a Shimano XTR with Shimano XT 11-32 cassette giving me an adequate low gear to go up nearly every hill I've encountered (24.4-125 gear inches). The chain is a Sachs PC59 narrow for 9 speeds. These components are top shelf and very lightweight with proven performance and dependability, accept no substitutes!

Rims/tires—I use Continental Grand Prix tires which are excellent for riding fast. Rear: 700c X 25, Front: 20 X 1 1/8. There are some concerns about pinch flats and its durability on rough roads but (knock on rubber), I've never had a problem and I've ridden on the tough streets of New York city (note: I did have some cloth threads come off the side walls). With these tires I felt approximately 5% faster than the Primo Comets (this is a general impression, not a scientifically accurate assessment). I might try fatter tires in the future for comparisons.

The rims are Velocity Aerohead 6016 aluminum alloy laced to Shimano Ultegra hubs. Supposedly, these rims are very strong and can support the bike in case of a tire blow-out or flat.

Braking—I have found the Odyssey A brake in the front to be more than adequate in providing full stopping power where you need it. The Odyssey brake enables one to route the brake cable to either side to avoid rubbing against the chain or other moving parts. The rear is a Shimano RX 100 caliper brake which provides stopping power without the weight. The brake levers are Ritchey Logic which are bent to match the down curve of the drop bars.

Comfort/Ergonomics/Fit

I have found the Lightning P-38 to be very comfortable due to the cupped feeling of the sling mesh seat. I didn't experience recumbent butt even though the seat was fairly upright. As a strong rider, I tend to push against the seat back quite forcefully and have noticed some buckling of the mesh in the lower portions of the seat (the mesh is slightly stretched, not broken).

There is some oversteer which is common on SWB bikes with small front wheels but one becomes accustomed to the handling in time. The drop bars work wonderfully and can adjust for height but do not move forward/backward. Lightning offers a tilt and lock mechanism (\$100) that would allow you to flip the handlebars closer to your body. Unlike the Rans Flip-it riser, the Lightning device locks in position so you don't accidentally flip forward in a panic stop.

The bottom bracket is about four inches above the level of the seat (seat height about 20 inches) which is not such an extreme position unlike some European 'bents. I haven't had any numbness or tingling of my feet from being in this position (although some people may experience hot feet due to their unique physiology).

American 'bents are notorious for leaving the chain exposed waiting to gouge the rider's calf or at the very least, leave a long, dark oily streak on the skin or clothes. I have solved



Chung Kay Lam and his P-38

this problem by using a BikeE chain tube (or any plastic tube will do) and velcroed it to the frame. This arrangement preserves my tender flesh and causes only a minimal clacking noise as the chain runs through (it's a compromise I can live with).

The P-38 comes in four sizes: small, medium, large and extra large. These sizes can accommodate heights from 4'9" to 6'8". My bike is a large frame which fits me fairly well: I'm 6'1" - 200 lbs. My X-seam is 45-inches. I opted for the lightweight aluminum sliding boom (saves about 150 grams) which replaces the standard CroMo piece. One major gripe I have is with sliding booms for adjusting leg lengths. I HATE them. They are a pain in the A** to adjust. It took me almost 1/2 hour of frustrating tinkering to finally get it right. There are no tic marks on the tube to mark length and you have to add or subtract chain links to get the optimal fit.

RIDE/HANDLING

Speed/stability—The light weight of the Lightning P-38 makes it a very fast and responsive bike. After riding the Rocket, this bike feels so much quicker. I would guesstimate that I'm 10-15% faster on the Lightning. It is very stable at high speeds. So far, I've gone 42.5 mph coasting downhill and about 27 mph on the flats (without spinning out the bike). Low speed handling is not a major problem other than possible heel rub. I can almost do trackstands on this bike.

Hill climbing—My verdict after riding this bike on very hilly terrain is that it CAN climb hills much easier than the Rocket primarily due to its light weight. Of course, proper gearing and rider fitness are also

important. The frame is very stiff and thus energy is not wasted on frame flex.

Ride Quality—The unsuspended bike can have a harsh ride due to its narrow tires although the seat frame does flex giving some passive suspension. If a cushy ride is what you want, then go for the front suspension fork. Lightning offers a rear suspension unit called the Shockster which bolts on to the frame but adds 3-pounds of additional weight. I have opted not to use suspension to keep the bike weight down.

OWNING/PURCHASING

Shipping/assembly—Lightning recommends buying the bike from a local recumbent dealer who can set the bike up properly. If there are no dealers within your area, then Lightning can ship the bike to any bike shop or to your home. The bike is shipped in two boxes: one holds the frame and accessories and the other contains the seat. The bike comes with a manual for proper setup.

Transportation/storage—The P-38 is about the size of an upright bike so I can transport it on a standard trunk car rack. It doesn't take up much floor space either which is important if you live in a small apartment. The light weight makes it easy to carry it over the token turnstiles in the New York city subway system. In summary, this bike is as easy to carry around and manipulate as a upright bike.

Cost/depreciation—The initial cost may seem high but the bike holds its value fairly well. It is a well sought after bike which preserves its resale value quite nicely. The bike is an excellent value for the money, new or used!

Options—Lightning offers a host of

optional equipment to customize the bike to your needs. They offer a seat bag with a sleeve that slides over the back of the seat. The bag has a carrying handle and a horizontal reflective stripe. It is large enough (700 cubic inches) to carry most items for a day trip. I carry a Platypus water bladder in it. There are also low drag panniers (2000 cubic inches) and rear rack for extended touring. A small front handlebar bag can be used to store keys, spare tubes and other loose items. A modified Mirrycle mirror is available and mounts onto the brake handles (the mount has a tendency to loosen, so I use thread lock).

There are bosses on the frame under the seat to attach two waterbottle cages. The horizontal position of the cages increases the likelihood of your waterbottle bouncing out of the holder when you go over a bump (I've already lost my favorite polar waterbottle this way).

The partial Zipper Lexan fairing (small size) is available. It covers the handlebars and rider's chest only. A few people have reported that it doesn't improve speed all that much and a better investment would be a full size fairing. The F-40 fairing is also available to retrofit the P-38 (adds 5 pounds).

As mentioned previously, a lock down tilt steering device is available for easier adjustment of the handlebar stem. A RAAM-tested quick size kit is offered which is a device that takes up excess chain thereby allowing for adjustment of the sliding bottom bracket boom without changing chain lengths.

Market competition—There are a few bikes that can be compared to the Lightning P-38. The Rans V-Rex is a venerable bike which is also quite fast but is heavier. The Vision VR45 is also a high quality bike but there is a lot of flex in the monotube frame (intentional) which may dampen power transmission. Others in contention are the Barcroft Virginia (low and laid back), Angletech Altitude (more expensive) or MC2, Rotator Tiger, and Longbikes Eliminator.

Final Thoughts/Verdict

The Lightning P-38 is the finest, short-wheel base production bike that you can buy for the money in my opinion. The bike is an excellent value for the money. It is well made, fast and light. When I first rode the bike, it felt like the Hand of God pushing me forward. This bike ROCKS! Overall, I'd say I'm about 10-15% faster on the Lightning than on the Rocket. The SWB configuration may require more advanced riding skills but after a few hours of riding, you'll be a pro. Others who have ridden my bike come back smiling ear to ear remarking how fast and responsive it is. If the Gold Rush Replica is the ultimate long wheel base recumbent, then the Lightning P-38 is the short wheel base equivalent!

About the Author

Chung Kay Lam lives in Fort Lee, New Jersey near the George Washington Bridge in the New York city Metropolitan area. He is a board-certified physician in Internal Medicine specializing in Geriatrics with an office in Fort Lee. He lives with his wife and a five month old baby daughter. His other interests include



The classic P-38 SWB is also the basis for the faired F-40

collecting insects, marine biology, exotic sports cars and drawing (pen and ink, pencils). He is a member of the Metropolitan Area Recumbent Society (MARS): www.recumbents.com/mars which consists of members from CT, NJ, NY, and PA.

RATING/SUMMARY

Chung's Rating

Comfort: A

Design/style: A

Chain management: B+

Brakes/Braking: A-

Finish Quality: A-

Overall Rating: A-

Pros

- ✓ Great value for speed/performance
- ✓ Lightweight
- ✓ Comfortable seat
- ✓ Many options (bags, panniers, fenders)
- ✓ Practical and convenient size

Cons

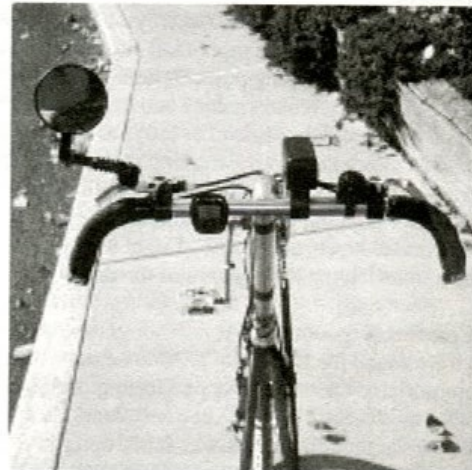
- ✓ Pricey
- ✓ High bottom bracket configuration
- ✓ Closed riding position
- ✓ Unremarkable standard specs
- ✓ Sliding bottom bracket

Access

Lightning Cycle Dynamics, Inc.
Tel. (805) 736-0700
Website: www.lightningbikes.com

Info

Lightning P-38 SWB OSS
Price—\$2500-\$3100 (depending on specs)
Wheelbase—45" **Seat height:** 20"
BB height—24" **Weight:** 25.5 lbs
Frame—TIG 4130 CroMo
Fork: unicrown CroMo

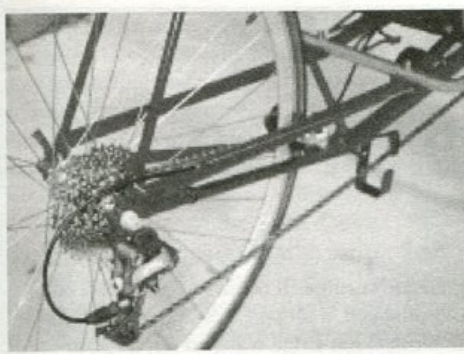


Components

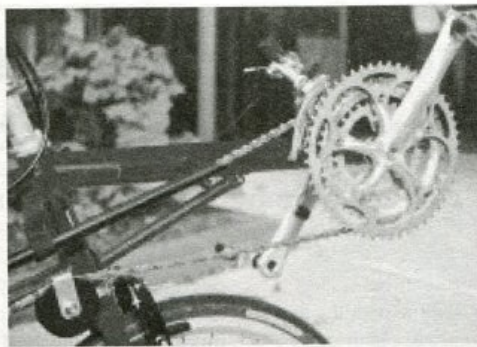
Crank—Shimano Ultegra Hollow Triple (52/42/30) 175 mm; **BB**—Shimano Ultegra;
Headset: Shimano 600; **Derailleurs**—Shimano Ultegra (front), Shimano XTR 9 speed (rear) **Gears:** Shimano XT cassette 11-32, 9/27 speeds **Gear inches**—24.4-125;
Chain—Sachs PC59; **Pedals**—Dimension (Taiwan); **Brake Levers:** Ritchey Logic
Wheels—700c (rear)/ 20" (front); **Rims:** Velocity Aerohead (36 spokes); **Tires**—Conti Grand Prix 700c X 25 120 psi (rear), 20 X 1 1/8 (28-406)120 psi (front); **Hubs**—Ultegra;
Brakes: Odyssey A (front), Shimano RX 100 caliper (rear); **Warranty**—5 years on frame and seat; **Colors:** Red, Blue, Yellow, Black

Disclaimer/disclosure

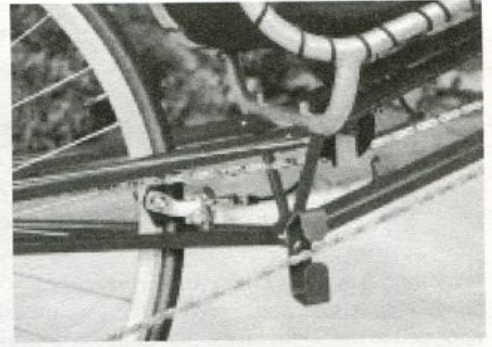
The opinions of this article are solely those of the author and do not represent the views of this publication or of the editor. Any mistakes or omissions are solely those of the author. The author has not received any monetary compensation nor benefitted in any way from the aforementioned manufacturers/organizations. ♦



Note frame triangulation



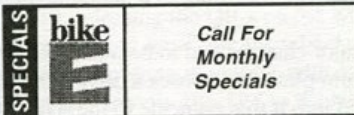
Lightning space frame/triangulated boom and large diameter chain idler



Lightning space frame and rear triangulation. Chain runs through "V" in frame. Note lower chain guide



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Quest for Power

Adventures in Power Assisted Cycling

Article & photos by Tom Beuligmann
bikeman@wworld.com

Over the years, I have browsed the pages of many publications concerning human powered vehicles, carefully studying the articles that appealed to me. Until lately, that didn't necessarily include electrically assisted bikes and trikes. I thought power assisted bicycles were either too cumbersome or too polluting to be considered a transportation alternative. They just didn't seem to be "pure" bicycles, and I didn't need help cycling. I was fit enough.

Then my father began inquiring about an assist for his BikeE Air-Tech. At first I just disregarded it, but dad persisted, and I began to take him seriously. We eventually started looking on the Internet for some type of motor for his bike. Of course, the first decision was what type of energy source would be used. Dad thought electric assist would be under powered and too heavy, so we decided to try a gas engine first. After some searching, we settled on the Dimension-Edge two-cycle engine www.bikemotor.com that drives the rear wheel with a urethane roller. The cost for the BikeE kit is about \$600, and even includes a how-to video to make the installation easier. The mounting hardware was listed to fit the BikeE A/T specifically. We placed the order and the kit arrived in just a few days. This system places the engine on a channel shaped aluminum plate just above and to the left of the rear wheel, and has flat brackets that extend forward to the BikeE's swing arm. As the engine and brackets came out of the box, we noticed that the hardware had a "home shop" look about it. The brackets looked to be made of aluminum plate, cut into the needed shapes. Not that they were improperly made, but just not as finished as you might see from a high production shop.

The design is a combination of bolted plates secured with star washers or nylon washers at the pivot and adjustment points. Some of the brackets appeared to have been changed from the ones we saw in the video, but after a while, we reasoned where each went, and adjusted until all clearances were correct (we thought). We were then instructed to saw a wedge out of the left side of the bike's frame tail to allow for engine clearance with the suspension compressed.

With the motor securely in place, we proceeded to place the throttle and roller engagement cables. The throttle control is a simple friction type thumb shifter that looks at home on the handlebar. The control that lets the drive roller down onto the tire is a crank like arrangement with a cylindrical handle attached to a five-inch lever. It is used to overcome the heavy-duty spring that holds the roller tight against the tire.

With all the controls in place, we dash out for gas and two-cycle oil. My brother Jim, who helped with the installation, takes the first ride. He cranks the "E" up to about 12mph, and engages the drive. With a little hesitation, the motor starts and he's away. A quick trip up the street, and he returns. There is a distinct odor of burning rubber. Jim says he felt the roller slip, and returned right away. When we look under the engine housing, we can see that the roller is already melted and one third gone! Not a good start. Back to the rack for more adjustment. We increased the tension on the roller and tried again. Now full power is getting to the ground. My test ride is pretty thrilling. I can get nearly 30 mph with medium pedaling! The BikeE is pretty nervous at that pace and so am I. This is just an assist motor?! Oh well, mission accomplished.

I send the bike home with dad, but I have some reservations about the user friendliness of this system. Since the lever that activates the drive roller is on the handlebar stem, it's difficult to separate the steering and engagement motions completely while pedaling the bike above 12 mph. The power of the motor will push the bike over 20 mph without pedaling, and letting your speed drop below 10 mph will kill the motor. Engaging the engine in traffic is just plain scary. Imagine the need to slow for a larger vehicle and all you need to do is stop pedaling, close the throttle, throw the lever to disengage the drive while steering one-handed, and apply the brakes while downshifting. Why wouldn't you just apply the brakes hard, you ask? First, the brakes are far less effective with the motor buzzing away. Secondly, if you brake enough to kill the engine, you will chug to a shaky stop, unable to pedal hard enough to

overcome the bogging engine and resume. It occurs to me at this point, that had we wanted this kind of speed, a moped would have been much more easily controlled. The Dimension-Edge was just not a viable "assist" for dad, and we proceeded to plan "B."

Back to the Internet. Armed with a better knowledge of the features we wanted, we renewed our search for a better assist for dad's Air-Tech. I thought it would be better if we could find a hub driven electric unit because of our bad luck with tire drive. To be fair, it could have been our poor adjustment, or the overly powerful engine caused the roller to melt. However, we hadn't even tried the unit in wet conditions that encourage slippage. Also, since the power available with an electric unit is a fraction of the gas engine's power, we thought the efficiency loss of a tire roller might be too high compared to hub drive.

There are very few hub drive kits available, especially in kit form that is adaptable to recumbent use. There are increasing numbers of electric bikes out there, but most are fitted with a motor system which is not separately available, or that would not lend itself to retrofit. We finally decided on the US Pro-Drive, a kit sold by Currie Technologies (www.currietech.com). They have a complete line of products including cruisers, mountain bikes, a police bike, a scooter and a trike. Our kit retails for about \$599, and is intended for fitting to a diamond frame bike.

For our application, some major changes had to be made. First of all, the motor mounts to an aluminum plate that houses a drive hub, which has criss-crossed slots machined into it that coincide to the spoke pattern around the hub flange. Therein lies the first snag. The Sachs 3x7 hub flange is too large in diameter to fit inside the motor hub. The 3x7 had to be swapped for a standard cassette hub. This may seem like a huge compromise, but for my 75-year-old father, it worked fine. He rarely, if ever, used the high gear range in the hub, and we guessed that the motor would preclude the need for the low range. I substituted the new hub and began to install the motor on the left side of the wheel. The second and third snags now became apparent. The kickstand mounting plate that extends inward from the rear dropout must be removed to make room for the motor plate, and the rear swing arm must be spread as well. A longer axle and spacers had to be added on this early model A/T, and the wheel re-dished for proper centering. I also fashioned a sturdy bracket to relocate the kickstand to the outside of the dropout. Whew! The hardest part is done.

To maintain stability and weight distribution, I decided to hang the battery under the belly of the BikeE. I accomplished this by riveting an aluminum bar to the frame, perpendicular, just ahead of the swing arm pivot, pointing straight down. The battery case has a slot in it that fits snugly over the bar. A bolt through the bar serves as a stop to hold the battery case. I am able to use the hardware provided for the front battery mount, with slight modification, and I riveted it directly to the frame. It has a one-quarter turn fastener that uses a key to release so that the battery can be removed in seconds. I then placed the thumb operated throttle control on the handlebar and connected the wires. Some recumbents will require a throttle extension wire, which Currie can provide at a small cost. The long-winded, design-as-you-go installation is finally complete. It's time for the rubber to meet the road. This trial run is far less complicated than the gas powered job. There is no fuel to mix and no awkward controls to mess with. You just pedal away and press the thumb lever. The Pro-Drive has a nice variable control that is smooth to operate, unlike some other Ev's I have driven, which engage like an on-off switch. The surprisingly powerful motor, coupled with the BikeE's twenty-inch wheel will easily pull my 215 pound weight up to the top speed of about 12.5 mph. Unlike tire drive assists, the Pro-Drive's top speed is regulated by wheel diameter. A 26" wheel should get you up to about 18 mph. That is much faster than my father would ride under normal conditions. He was never interested in using the motor as a primary power source, so the 20" wheel was perfect for help over

the bigger hills, especially with a load of groceries. As a bonus, the lower gearing is great for getting dad across a busy street, or dropping his riding partner (me), in a stoplight race. Currie does not recommend using the motor from a dead stop, but dad figures the 20" wheel bogs the motor far less than the 26" wheel it was designed for, so he does it anyway, usually helping out with pedal power.

The Pro-Drive is a dream to ride. The power is adequate, smooth, and relatively quiet. When not in use, the unit simply freewheels quietly, almost imperceptible. The friction of the extra chain is almost nonexistent too. The battery is advertised to carry the rider about twenty miles on level roads. While we have had no reason to test the unit wide open, there is little doubt that the reserve is ample for many miles of assistance.

You may be wondering about handling a bike with the extra weight of the battery and motor. When loading the bike onto a carrier, the battery can be removed by unplugging the power cable and twisting the keyed fastener on the case. It's off in a few seconds. The motor weighs about 7-8 pounds, and is fairly easy to handle on the bike. Fixing a flat on the bike is a little cumbersome, but requires no tools if your bike is already equipped with quick release wheels. This is best done by flipping the bike upside-down, releasing the QR's on the wheel and motor plate, and removing the wheel as normal while supporting the motor with one hand. Since the motor is attached to the hub, it removes as one assembly.

Dad has been using his BikeE-E now for several months, almost daily during decent weather. He often carries groceries or other loads on the under-seat bags. The fact that the motor hangs from the rear hub and travels with the suspension is a testament to the durability of the BikeE and the Pro-Drive.

The only maintenance required has been adjusting the slack on the motor chain. Since installing dad's unit, I have done a second installation for a customer, and assisted on a third. The response has been extremely positive. Dad jokingly commented recently that when his time comes, he wants to be buried with his BikeE! Anyone who takes even a passing interest in his unusual bike had better be prepared to hear all the details about his son, the bike shop owner who installed the motor for him, and how you have to be 75-years old to qualify for owning one. He is rightfully proud of the latter fact. While the first comment some people make about the bike is "that's cheating," for dad it's just the icing on the cake, allowing him to ride farther and more often, despite some health concerns that might keep a less determined man down.

The positive experience I have had with the Pro-Drive has lead me to look for a more affordable recumbent that lends itself more easily to electric assist than the BikeE. With the reintroduction of the Easy Racers designed EZ-1, Gardner Martin has answered my prayers. The open frame has enough room to mount the battery easily, and the standard rear hub allows the motor plate to be readily added. The motor could be installed on most recumbents, but finding a good place to put the battery is a



Robert Beuligmann on his BikeE



The S & B Supercruiser EZ1 with US Pro Drive kit installed

challenge. I prefer to keep the battery's weight as low as possible. It can be mounted on a rear rack, but it can make the bike awkward to handle, and may be more than the kickstand can stabilize at that height. I think the US Pro-Drive and the EZ-1 is the perfect marriage. The total package is under \$1200, and since many potential electric buyers may not be "serious cyclists," the EZ-1 presents a ride that doesn't intimidate them.

It amazes me how my mind has been opened to the possibilities of assisted cycling. Where once I would have reserved it for the elderly or physically challenged, I now can see endless uses. How about sweat free commuting to work, or a quick trip to rent a movie, even when you have just showered for the day.

Consider adding a trailer for hauling loads you would have previously used the car for, or building that dream trike with an enclosed body and enough room for heavy cargo. Once, you may have plugged along on a busy city street with cars zooming by. Now, you can at least approach their speed, lessening the chance that a motorist might lose patience and try to squeeze by too closely.

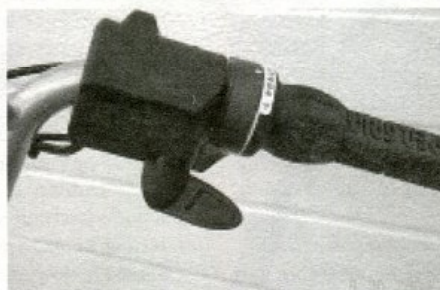
Recently, the idea of assisted cycling took on another dimension for me. This summer, I was found to have a necrotic knee that cannot be helped by surgery. I am faced with the possibility of total knee replacement soon (at 40!). Cycling may be the only form of exercise available to me right now, and the electric assist motor may be the savior that allows me



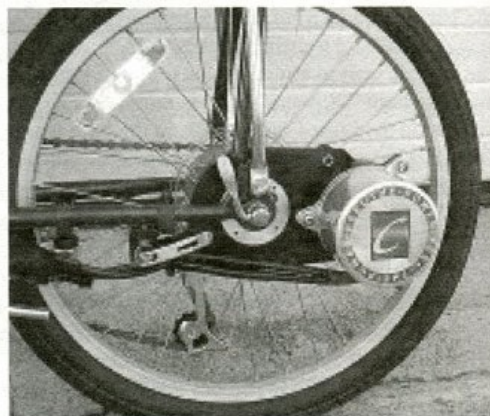
Sue Lindquist on USPro-Drive equipped BikeE

to ride any terrain I want, and possibly postpone the need for surgery.

Tom Beuligmann runs Tom's Bike Annex, a recumbent Specialty shop in Mt. Carmel, Illinois. Tom sells BikeE, Easy Racers, Rans, and other recumbents and does USPro-Drive Electric conversions to recumbent bicycles. You can reach Tom at Tel. 618-262-4088 or www.BikeRoute.com/BikeAnnex.



ABOVE—USPro-Drive twist grip
RIGHT—Motor, chain drive and chain cover
UPPER RIGHT—USPro-Drive on EZ1



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USPro-Drive Project Update:

Paul Arends (RCN copy editor) has sent me a lengthy email showing much interest in electric assist for his Gold Rush. Apparently, he has already gone the same route that my father and I did with the gas engine on his Tour Easy and had some of the same problems that we did. In his list of questions regarding the Pro-Drive, he wanted to know, like everyone else, how long does the battery last, flat out? Well, the way my dad has used the motor, we have never found out. I am too tall to hop on an EZ1, run the battery dead, and try to pedal home.

So today, I devised a test. I mounted the EZ1 on my BikeE mag-trainer, and set the resistance to the highest level. With the battery fully charged, I turned on the power and tied down the throttle. Keep in mind that the motor alone will haul my 215 pound weight at 12.5 mph on flat ground. It was just under 60 degrees in my shop when I started the test. I calibrated my Cateye computer and began the test, the motor alone spinning away at 12.9-13.0 mph. As you see, this is just slightly faster than what it would carry me without pedaling. If you allow for the wind that my body would catch, you could estimate the load on the motor as fairly close to street riding. I let the motor buzz away while I did other chores, but I kept a close eye on the speed and time. In a few minutes, the motor had warmed a little, and was running over 13 mph. This tapered slowly back down to 12.5 or so, and stayed there for over 45 minutes! At 50 minutes, I left the room with the dude still running over 12 mph. I returned 10 minutes later, and the battery had finally begun to wind down. The battery pack is sealed lead-acid, but it performed much like a ni-cad, in that it ran an even power level until it was spent, and then it fell off fast. At the one hour mark it was audibly coasting down to a stall. I shut it off at 1:02 run time and a speed below 9mph, fading fast. The total distance with no pedal input: 12.8 miles.

Needless to say, it performed well beyond my expectations. It should have great range used intermittently.

Tom Beuligmann ♦

Bicycles & Airplanes

by Sandra Martin



Tanya Markham (14), daughter of the legendary Fast Freddie Markham, and Mackie Martin (13), nephew of the equally famous Gardner Martin

Very early in the morning on May 31, 2000, a couple of teenagers climb into a tandem, streamlined, recumbent, getting ready to try for a record. The event was the 36th Annual Watsonville Fly-In and Air Show. Why a recumbent record attempt at an Air Show? Why not? The grade is within limits and the runways are smooth. More importantly bicycles and airplanes have maintained a long-standing relationship since a couple of bike mechanics did some testing at Kitty Hawk in 1903.

Dr. Chester Kyle acknowledged that relationship in 1975 when his senior engineering class took a known wing design, turned it 90°, and slipped it over a wedge. They made the startling discovery that air resistance limits bicycle speed much, much, much more than rolling resistance does. Dr. Kyle then organized the first Human Powered Race and the International Human Powered Vehicle Association was born.

Dr. Paul McCready, a past president of the IHPVA added spark to the relationship when he used a streamlined recumbent bicycle with wings called the Gossamer Condor to capture the long-standing Kremer prize for human powered flight. Another McCready flying bicycle, the Gossamer Albatross, flew across the English Channel.

It's also amazing how many recumbent riders are pilots (in the normal sense). We don't have any hard data on this, but I bet if RCN or somebody conducted a poll, over 15% of recumbent riders would also be pilots. Given all of the above, and given the fact that Easy Racers' factory is actually on airport property, it seemed a real natural to try for a record at the Air Show. The Air Show promoters thought so, too.

The record in question is the HPRA, Human Powered Race America, Junior Class Record. The junior class is 16 and under. Garrie Hill, founder of the HPRA, flew out from Ohio himself to be official observer for the attempt. Garrie's son, Theron, set the record at 33.47 mph. HPRA is headquartered in Ohio and sponsors a series of events throughout the Midwest. The HPRA is grass roots racing at its best with recumbent riders racing one another in several clearly defined classes.

So, it's before 8:00 AM, and Tanya Markham (14), daughter of the legendary Fast Freddie Markham, and Mackie Martin (13), nephew of the equally famous Gardner Martin, suit up in the Double Gold for a try at the record. The announcer calls in all the planes in the air and repeatedly announces that the taxiways are closed. The run actually takes place on a taxiway. They broadcast over both the loudspeakers and the airport radio frequency. Spectators line the fence that separates crowd area from taxiway.

The kids pedal off, and despite everything a small plane pulls out in front of them. Mackie who sits backwards, stokes, and does the shifting, yells at Tanya that he's shifting. She yells back not to shift because there

is an airplane in their path. She aborts the run, brakes, and slows knowing they will fall over because there is no one to catch them. Still, it's better than running into propellers. Officials get the airplane off the race course. He apologizes. It seems he has no radio and the roar of his engine prevented his hearing the loudspeaker.

The handlers get the kids out of the bike. They are unhurt and ready to go again. Despite the near miss both Tanya and Mackie remain pumped and focused. It may have even helped, as both of them seem to get past their initial jitters. All goes well and they turn in a new 200-meter Juniors Record at 43.56 mph. It's over 10 mph better than the previous record. The crowd roars and then rushes to the Easy Racers pavilion to meet the kids and get a closer look at the strange bike. Most of the people at the Fly-In have never heard of a recumbent bike, much less seen one. We set one up on an old wind trainer so they can try it. Thousands get their first seat on a recumbent bicycle and become enlightened. A good time is had by all.

As an added attraction, Fast Freddy Markham agrees to drag race a Piper J-3 Cub in the Gold Rush. Gardner is holding Fred up ready to push him off, the Piper is cranked; propellers are spinning and ready to go. They're off. Freddy is way down the course and the Piper still seems to be struggling to get off the line. Markham beats him by a mile it's actually embarrassing.

We think the pilot was startled by Freddy's fast start and took some time to recover. All of the pilots are startled by Freddy's win. The betting was heavily against him. "Bicycles can't go that fast," they told one another. Most of them took the race as some kind of joke (the pilot even put on a clown headdress) until they saw Freddy flying (couldn't resist this one) down the course.

The Piper demands a rematch and the whole thing is repeated on the last day of the Fly-In. This time the pilot is not asleep at the wheel, he already has his tail wheel off the ground before the flag is thrown, and the smoke from the engine shows he is running nitrous for an added boost. The J-3 beats Freddy by about a foot. The crowd surges to the Easy Racer pavilion again to shake Fred's hand and look inside the bicycle that beat the airplane (at least once).

Editor Notes: There are many ties between airplanes and bicycles—and recumbents. Tim Brummer of Lightning is a aerospace engineer and many of his bikes are named after airplanes. Randy Schlitter of Rans builds and sells experimental airplane kits as well as recumbent bicycles. They have taken their bikes to Fly-Ins around the country for years.

'Benting Around the Big Island

by Steven Zrucky
stovitzrucky@yahoo.com

In May, my life partner, Robby, and I spent eight wonderful days of recumbent riding around the big island of Hawaii. In total, we logged more than 260 miles (plus several miles more when my computer stopped working in the rain!) in a very memorable experience we would like to share with our fellow RCN readers and bent enthusiasts.

A few days before flying from home in Los Angeles to Kona, Hawaii we packed up Robby's BikeE and my Rans Vivo and shipped them by UPS to our first motel there. Uncle Billy's (billing itself as the only Hawaiian-owned hotel on the island) was very accommodating in agreeing to accept our bikes in advance of our arrival and to store the boxes until our return eight days later.

Day One consisted of five hours of flying, arriving at the airport mid-afternoon, taking a cab to the hotel, assembling the bents, and taking a short ride to explore that very small town. Flying into Kona, on the west coast of the island, gives the impression you are arriving on a different planet. The huge and fairly recent lava flows give the western half of the island a "moonscape" look, barren of much vegetation.

The next morning we were up and ready to go. Our first destination, Captain Cook, was only a few easy miles away, or so we thought. We decided on a leisurely cup of coffee and a nice long walk on the beach to start the day. By mid-morning we were on the road.

The ride south to Captain Cook had many more rolling hills than we expected, and many more miles of rather steep up hills than anticipated! While we are both in fairly good general physical shape, neither of us is in what one would call real bicycling condition. We both found the first day's ride to be quite strenuous. Luckily, we had replaced the BikeE's cassette with a Mega-range which allowed Robby to climb every hill on the island that we faced. The lowest gear on the Vivo was adequate but after several miles I was wishing for lower gears. After more than twenty miles, we arrived at our first stop, the historic Managa Hotel, built in the early 1900's and now run by the grandson of the founder.

The next morning, awakening a bit stiff in the legs, we headed out toward Naalehu, in the southern part of the island. While we anticipated the 48 miles, we again underestimated the hills, and the water which we would consume pedaling up those hills! While the temperature was less than 80 degrees, the humidity was high and we drank and drank. The Manuka State Park was very pretty, but it had no potable water. After sharing a bottle of iced tea that Robby had hidden away, we were thinking we might have to flag down a motorist who might have some water. Luckily, the little settlement of Ocean View was just a few flat miles down the road. This whole area is starkly beautiful with the large lava flows of

different hues of black from the different time periods. The last several miles into Naalehu were downhill and what a thrill with the sweeping curves and tight hairpins! (I was scared to grab the biggest gears!) Shirakawa's Hotel was a very welcome site for our tired legs. After a bit of a rest, we walked around in this pretty little town.

On Day 4, we headed out to the north knowing we had a long climb in front of us up to Volcano National Park. The ride started with a few miles of fun downhill through the town of Punaluu, then a couple miles of roller coaster before it settled into 24 miles of steady ascent, climbing to more than 4,000 feet elevation. This part of the island seemed more interesting to us as the vegetation was more varied and the miles (although we are slow on the hills) melted away and we finally reached the summit and then a couple of miles downhill to the Park entrance and Volcano House, the beautiful old lodge in the park where we would stay for the next two nights.

The following day we hiked the 5 mile Kilauea Iki trail down into the crater of the Kilauea volcano, then 'bented around the 11 mile Crater Rim Drive, stopping at the various overlooks, steam vents and short guided trails. Of course, wherever we stopped, people would ask if these bikes really were as comfortable as they looked. And, of course, being the bent enthusiasts that we both are, we sang the praises of riding a bent! Later we walked a few additional miles into the lava tubes and down the famous Desolation Trail.

Day Six started in a drizzle, but we were ready for the rain (which may have accounted for just a couple of hours of light mist) (I'd like to plug our very comfortable, extremely lightweight, breathable rainsuits called Frogtoys). The twenty-five miles of steady downhill to Hilo, on the east coast, for me was a very welcome change from the prior days' hills. (Although Robby actually prefers the acents!) Pedaling almost to the other side of town, we found our motel, the Wild Ginger Inn. It has a wonderful, open-air veranda with wicker chairs and a hammock, surrounded by large leafed greenery of the rainforest, reminding me of Central America. Hilo has a population of about 25,000 so it allowed us a great afternoon of cycling exploring different neighborhoods. Much to my chagrin, Robby always found the steepest hills!

The northern coast of the big island, very lush green, was our route the following morning. The dozen or more bridges span beautiful gorges, some very spectacular, both in size and waterfalls sending the water crashing to the ocean below. The bridges all narrowed to one car lane in each direction. Fortunately, each also had a sidewalk (or bent lane) with curb-cuts on both ends making cycling over them very convenient. And we could stop in the middle to enjoy the scenery in

safety separated from the cars. Luckily, this bent lane was almost always on our side of the road, making us glad we circled the island in a counterclockwise direction. To divert for just a minute, the road, a 2-lane highway, around the entire island is in very good condition, and has, except for a very few miles, a shoulder ranging from two to three feet and often five or more feet wide! And this with relatively light traffic! A 'benter's paradise, especially when one comes from riding in downtown L.A.!

After a stop at the beautiful, private but non-profit botanical gardens (but closed early in the morning when we got there), a four-mile very scenic route detour (rainforested canopy on the road) and many sight-seeing delays on the bridges, we were ready for lunch. Down below and off into the distance was Laupahoehoe Point Beach Park, with the surf crashing into the lava boulders, a perfect place to do lunch. Another rush of steep downhill hairpins and we were there. What a paradise setting!

After lunch, we were on the road again, slowly climbing back to the highway and more miles of gentle rolling hills and more great scenery. After more than 35 miles, we arrived at Paauilo, home of that night's stop, a B&B called Sud's Acres.

When I had made the reservation with "Suds" Suderman and told him we'd be on our 'bents, he said his place was more than 2.2 miles up the hill from Paauilo and that we should call him from the little convenience store and he would bring his pickup down to haul us up the hill.

We got to the store, the shopkeeper pointed the way to Sud's but suggested we call Suds for a ride. We thought, "How hard can this be?" And after an ice cream bar, we started out. It was steep!! And steeper and continually steep! We could barely go fast enough to maintain our balance. Thank goodness for low gears! After an hour and twenty minutes, we arrived—what a welcome site!

"Suds" and his wife gave us a warm welcome and showed us our accommodations—the whole first floor of their beautiful home, complete with a cold-water, no-chemical indoor swimming pool. We noticed two giant koi and a variety of smaller fish in the pool. Suds, looking to be about 80 years old, told us that almost every day he swims with the fish and invited us to do so if we chose. The water was a little too cold for us! In the 15 years that Suds had been operating his B&B, we were only the second and third persons to pedal up to his place. After we rested, we went for a leisurely walk in the woods, accompanied by Suds' friendly dogs.

Early the next morning we were on the road again toward our next destination, Waimea, also known as Kamuela. We detoured through Honokaa, a pleasant little town. Heading back toward the highway, we encountered Plumeria Street, a name that we



Robby relaxing at a scenic overlook near Kona, Hawaii



Steve on his Vivo after 25 miles up hill

will remember for a long time. Like the road to Suds' place, Plumeria Street was very steep, and very long. (Well, perhaps only 2 miles but it seemed at the time much, much longer!) After reaching the highway again the terrain turned to gentle rolling hills and beautiful scenery. We cycled past the famous Parker Ranch, the largest ranch in the U.S. at 225,000 acres! Just as the huge dark clouds rolled in and a little drizzle started, we reached our motel in Waimea and checked in.

On our last day of riding back to Kona (about 38 miles) I was looking forward to the downhill again. The first 25 miles were gentle rolling hills and spectacular view points overlooking vast lava flows and the ocean. There was a field of cactus! In Hawaii? Another interesting scene was a small forest that at first look appeared like trees in winter in our northern states. Here, however, the trees were dead from the lava flow that had occurred 80 years ago! And instead of snow, a chocolate-brown crust covered the ground.

The last several downhill miles were very thrilling for me. (Robby likes the climbs much more than the descents). Although the shoulder narrowed, the traffic remained light and courteous. With few sharp curves, I could grab the biggest gears on the Vivo and, Yahoo!!

We returned to Uncle Billy's where our bike boxes remained under

the open-air patio near the registration desk. After packing up the bents, we again went for a long walk on the boardwalk and beach soaking up the beauty of the island. The next morning a taxi-van picked our bents and us up and hauled us to the airport. Away we flew with such pleasant memories 'benting the big island. ♦

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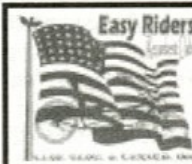
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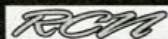
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RCN Classified Ads

Recumbents For Sale

FOR SALE: 1998 Angletech Altitude SWB ASS, less than 1000 miles. Lots of extras included. This is a really fine bike (see RCN#59 RCN test). Original cost \$4000 plus accessories. Call John at 641-581-5756. Or e-mail at morrisjr99@earthlink.net (IA/64)

FOR SALE: RANS Tailwind 1999. \$850. Excellent condition, ridden less than 100 miles. Loved the recumbent so much I upgraded! Great bike for the new rider—think Spring. Call (208) 321-8141 or email: info@allthingsaquatic.com (64)

FOR SALE: 1998 Trice, yellow, excellent condition, only 100 miles! 3-wheel recumbent, electric assist; 24 speeds; setup by Fools Crow; sweet deal at \$1700, pics available; contact Ray at rholan@cronosys.com or tel. 440-446-0003 (64)

FOR SALE 1997 R82 Double Vision \$3000 Red. Less than 500 miles. Upgraded with bar end shifters. USS. 21 speed. Independent Pedaling System so riders do not have to pedal in sync. Pictures at <http://www.donsdonuts.com/bike/bikeindex.html> Tel. 415-897-1960 (64)

FOR SALE: VISION R40 SWB USS, green, 26" R, 16" F with conversion kit for LWB. Lombard seat cushion, Cyclometer, water bottle cage, pump, seat bag, extra tires, 700 miles. \$800 + shipping. Tel. 631-727-2907 (64)

FOR SALE: Easy Racer Gold Rush Small frame, pristine condition, < 500 miles. Limited edition Black frame, twisted cranks, Rans seat & luggage trunk, Zipper fairing, dual mirrors, carbon front render & rear, 4 bottle cages, kickstand, Sram 9.0 shifters, brake levers, hubs, wheels plus upgrades. \$2,400 + shipping. 505-526-3228 or kkalk@iopener.net (64)

FOR SALE: 1999 Rans V-Rex. Excellent condition, very low miles. Electric blue. This is a very FUN bike. I've taken care of it! Extras to be included: Kickstand, T-bar light mount, (2) Mirrycle mirrors. I'm changing to LWB to better suit my needs. Asking \$1200. or B/O. Shipping included in USA. Dann Doremus (603) 672-1263 or dannny@earthlink.net (64)

FOR SALE: '95 Counterpoint Presto SWB, ASS, red 63-speed, suspension fork, new front wheel, thumb-shifters, good condition, \$895. Can meet on RAGBRAI. Randy 712-277-2095 (IA/64)

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FOR SALE: DH5000 (1991), 60", ASS, 21-spd., LWB \$575. Free delivery within 325 miles of Dallas. JCB @ 214-827-8800 or birdshaw@flash.net (TX/63)

FOR SALE: 2000 VISION R-44, above-seat steering, 27-speed, Rapidfire shifters, front brake booster. Includes seatbag, fenders, Platypus water bag. \$1400 + shipping. Tel. 541-343-7785 or email jporter@epud.net (OR/63)

FOR SALE: 1998 Rans Gliss, 3x7 hub, Angletech fenders, Magura brakes, kickstand, computer, Vredestien tires, approx. 1000 miles; exc. cond. green color. \$1900. Call Will Tel. 707-441-8809 (days) 707-445-4229 (eve), or wild@reninet.com. (63)

Publications

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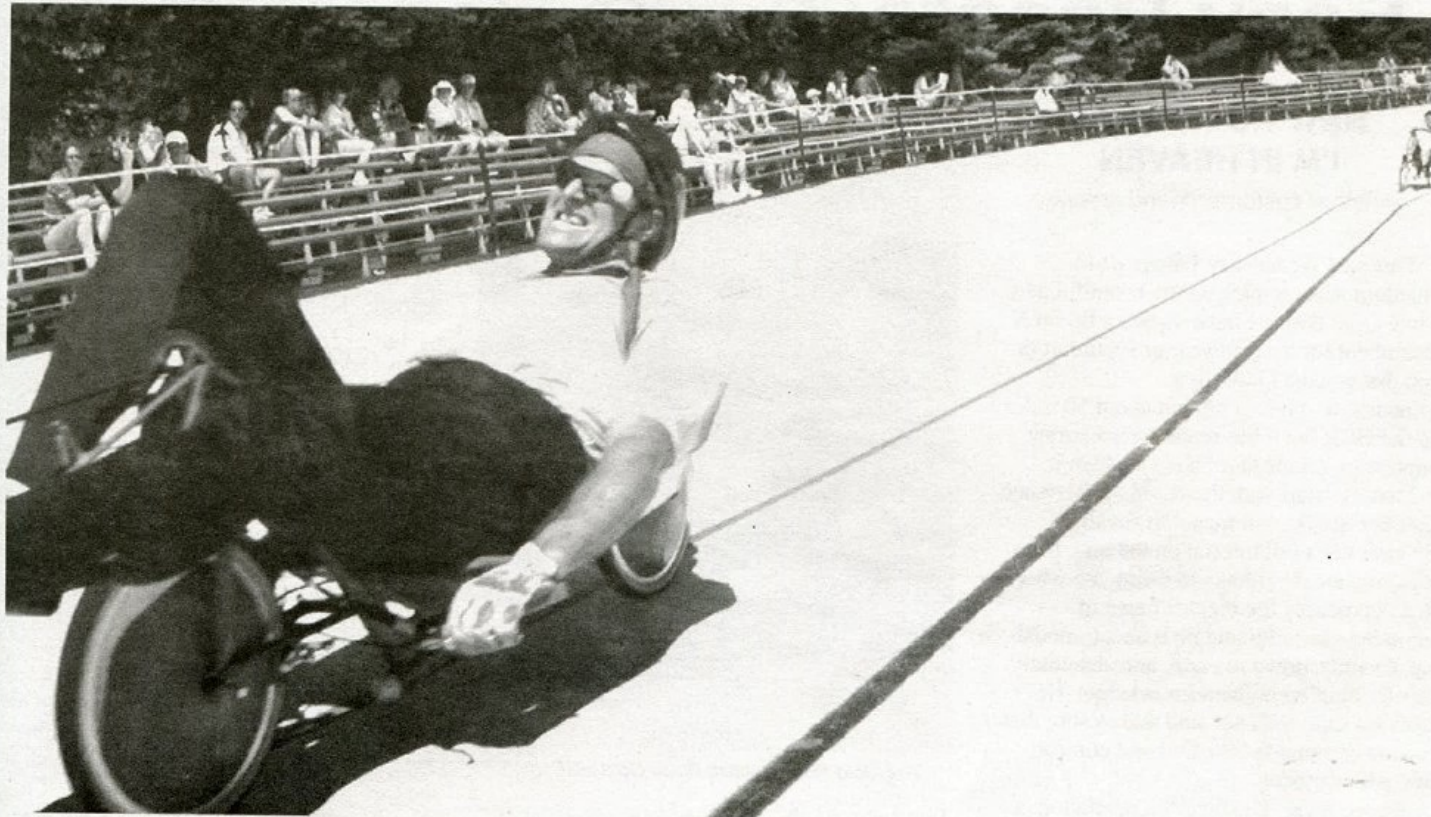
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Easy Racers: Our Customers Speak

NEW GOLD RUSH I'M IN HEAVEN

(Another customer/friend speaks)

This past Wednesday I drove down to Freedom, CA., to pick up my beautiful new white Gold Rush. I have owned a Brand X recumbent for the past year or so, unfair or not, that is what I have as a comparison. I have only put about 50 miles on the GRR but it has made such a strong impression on me that I have to share it.

I have to start with the buying experience. Gardner Martin will treat you royally. He gave me a full tutorial on the bike from adjusting the derailleurs to truing the wheels. Here's probably the biggest name in recumbent bicycles and he is accommodating, friendly, down to earth, and absolutely chock full of recumbent knowledge. He takes his time with you and makes sure that you are completely satisfied and comfortable with the bike.

Ah, the bike. The bike is a revelation, a marvel, one of life's gifts. I knew that it felt good from my test rides but now that I have ridden it on my familiar bike paths I have a much better feel for it. Is it faster than my Brand X recumbent? Whoa baby, this thing kicks ass! It feels like the hand of God has come down and given me a push. There is an overpass near my house with a gentle descent. Brand X recumbent—29.5 mph, GRR 33.4 mph without fairing.

This morning I put on the fairing.



The Gold Rush Replica Black Gold—RCN#45

I then took a ten mile ride on a very familiar loop where there is a three mile stretch that is flat and straight. I normally ride it at 20-22 mph pushing pretty hard. I spun up to 20 mph on the GRR and was astounded at how easy it was. I pushed a little harder, looked down at the speedo and I was cruising comfortably at 25 mph.

At that point I must have broken the world's record for recumbent grins. I pushed a bit more and was sailing along at 27 mph. Now I

am beside myself and even though I knew the Gold Rush was good I had no idea it was this good. I backed off a little to enjoy the ride and when I got home my average was 20.2 mph. This included a few stops and one small climb and as we all know the computer average is not the cruising average so I am ecstatic. It has been a goal of mine to average 20 and even though this was a short ride I feel good about it.

I am also very pleased by the ride quality of the GRR. It is one smooth bike. I was curious if I would notice more road shock being used to my suspended bike but the long wheelbase soaks up the bumps wonderfully. I have also had no problems with maneuverability zipping around posts and going around sharp corners. The bike handles beautifully.

One final note is how well the GRR climbs. There is one very steep hill that I climb often. It is only 2/10 of a mile but it must be about a 12% grade. I go up it fine except for the part about being near death at the top. The first time up it on the GRR was shocking. I just spun right up and not even in the lowest gear. I was breathing hard at the top but not gasping like I usually am.

A 47 year old stable family man probably shouldn't have such passionate feelings about an inanimate object but if anyone will understand, you guys will.

Posted to alt.rec.bicycles.recumbent

by Michael Cvetich.



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