

RCN

RECUMBENT CYCLIST NEWS

2000 SEASON PREVIEW

UPDATES, SPECS & PRICES

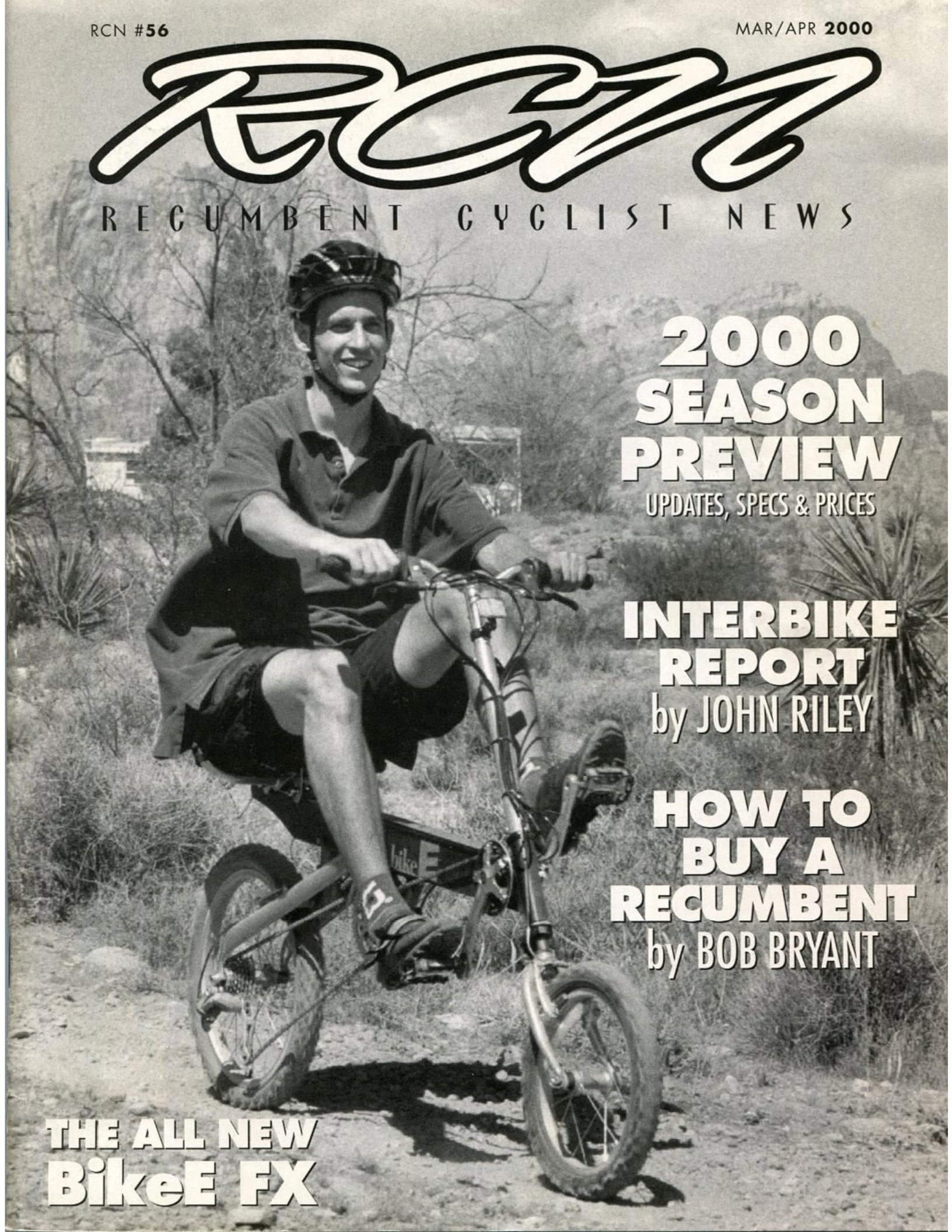
INTERBIKE REPORT

by JOHN RILEY

HOW TO BUY A RECUMBENT


by BOB BRYANT

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RCN Into the New Millennium

by Bob Bryant

When I became interested in 'bents in 1986, there was one local bike shop that sold them. Unfortunately, they didn't sell the brand that I was looking for—and I tend to be a bit on the stubborn side—so I bought one sight-unseen via mail order. That experience changed my life—and motivated me to start publishing RCN in 1990.

During the year 2000, we will celebrate our 10th year publishing and see our 60th issue. Our mission with this Season Preview issue is to help you to understand all about recumbents and become an educated customer. There is a good chance that you will be more educated about recumbent bicycles than the dealer or salesman that you buy from. Education is the key. Mistakes can be expensive.

Our mission is and always has been to be a communication for recumbent newbies, enthusiasts, manufacturers and dealers. Our goal for 2000 is to write about what is fun and exciting about recumbent bicycling—by and for recumbent enthusiasts.

For this *Season Preview* issue, the RCN crew attends the Interbike Trade Show in September and we write about what we see and hear. We also keep our ears to the wall for news from the CABDA and other shows and events. Our readers (spies) let us know what they see and hear (please don't assume we've heard it, send us an email). We attempt to track down all industry rumors.

If you are a first time RCN reader, we suggest that you use this guide in conjunction with companion issues RCN#43-46 '98 Buyers' Guides (while available). We are in the process of publishing a book about recumbents that will leave no stones unturned in the education, riding, ownership, and other topics. Unfortunately, ad sales=page count and we could not squeeze it all into this issue. Please make a note of our the manufacturers who advertise in and support our mission. Please let them know you saw them in RCN.

As of this writing, we are still the *ONLY* recumbent print publication in North America, and the *ONLY* publication that does recumbent road tests. And you don't have to advertise in RCN to get your bike reviewed or listed in our *Season Preview*. There is no underhanded or conspiratorist activities. We send an info request to all manufacturers. They know to send us info and many do not (lame).

We run a simple and honest publication with lots of opinions. We're very proactive about our review process and we'll share our findings with a manufacturer at any time, though some would rather make up excuses and elude that we have it in for them—no such luck. Our #1 goal is to offer an honest analysis for RCN readers.

We hope that you will find this issue interesting. We apologize for the lack of page count, some missing regular features, etc. Just understand that RCN#57 is done and ready to be mailed, so your next 'fix' is already on the way. RCN needs reader support now more than ever before. We have some neat plans for late 2001 and we hope you'll stick with us to see how it plays out.

Viva Recumbency,
Robert J. Bryant

■ In Our Next Issue...

Look for a test of the WizWheelz trike; a Wheels/Tires sizes article by Zach Kaplan; Miss Piggy on the Santa Fe Trail; and the Development of the Pharobike Low Fat—A Tribute to Dan Duchaine.

■ On the Cover...

BikeE's Gabriel Vest rides the FX 'Ultimate Offroad Bike' at Interbike Dirt Demo in Las Vegas, Nevada. Photo by John Riley. Cover design by Mark Colliton.

■ Misc...

We are looking for a freelance proofreader. We are considering more issues in 2001 and will be looking for more article submissions. □



RCN#56 March/April 2000

The Recumbent Enthusiast's Publication, since 1990

Inside RCN#56

- 10 **REVIEW: The BikeE FX MTB**
by Bob Bryant
- 14 **2000 Season Preview**
by John Riley
- 20 **2000 Recumbent News & Updates**
- 26 **RCN's Most Wanted Recumbents**
- 27 **How to Buy A Recumbent**
- 39 **Recumbent Manufacturer Listings**
- 40 **2000 Recumbent Prices & Specs**
- 46 **Recumbent Rider Group Listings**
- 47 **Classified Ads**
- 48 **Glossary**

Issue Note: RCN Letters and other regular features will resume with RCN#57.

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- We are as far from a corporate affair as you can possibly imagine. RCN is published by enthusiasts, for enthusiasts—because we love recumbent bicycles. We are the voice for the enthusiast recumbent world since 1990.
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- April 28-30 – So. California Bicycle Expo 2000

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Recumbent News

Do you have a new or updated recumbent model, recumbent related product or service? If so, please send press releases and photos to: RCN, POB 2048, Port Townsend, WA 98368. Text only can be emailed to: bob@recumbencyclistnews.com (most get printed).

WELCOME BACK BJ STRASS

RCN would like to welcome back BJ Strass to the recumbent industry. After a 3 year stint outside the cycling industry, BJ has joined the team at Atlantic Bicycle, in Margate Florida, as Store Manager. BJ was the owner of Introspect Cycle, a popular recumbents only shop in Sacramento California, and was active in cycling, and the promotion of recumbents and cycling in general, throughout Northern California. Some of you may also remember him as a regular contributing writer to RCN for many years. Good to have you back BJ!

Events 2000

APRIL 2000 WHEEL & SPROCKET BIG SALE

Contact Wheel & Sprocket

MAY 13TH SATURDAY MICHIGAN RECUMBENT RALLY—EAST

Willow Metropark pool shelter, 9am-3pm. www.lmb.org/wolbents, BobMich@compuserve.com or 734/387-9058.

MAY 26 - 28 HPVSO 3RD ANNUAL NIAGARA RECUMBENT RALLY

Niagara Falls, Ontario, Canada—Contact: HPVSO Web site <http://www.hpv.on.ca/> or from Roy Bird birdy@bconnex.net

JUNE 3-4 MIDWEST RECUMBENT RALLY

Stevens Point, WI Hostel Shoppe www.hostelshoppe.com

JUNE 10 WHEEL & SPROCKET/TREK RECUMBENT RALLY

At Trek, contact Wheel & Sprocket

JUNE 10TH SATURDAY MICHIGAN HPV RALLY

Waterford (n.w. Detroit). 8am-4pm www.lmb.org/mhpva, kiehler@juno.com or 313/884-0109.

JUNE 11TH SUNDAY SAGINAW VALLEY CHALLENGE

Saginaw Valley State College. 8am-3pm. www.lmb.org/mhpva, kiehler@juno.com or 313/884-0109.

JULY 8-9, 2000 3RD ANNUAL RECUMBENT ROUNDUP

Ogden, IA—Contact: 1-800-645-2981 or www.Thebikebarn.com.

JULY 8-9, 2000 RARE 2K RECUMBENT RALLYE

Rochester, New York—Contact: rarelist@rbcbbbs.win.net or call Michael Brisson at 716-461-5084 or Hank Walck at 716-217-9450.

JULY 28-31 2000 SPOKESFEST 2000 HPV FESTIVAL LEICESTER, UK

Contact: Roger Lovel +44 (0)116 278 1360 Email roger@spokesfest.free-serve.co.uk or write c/o Leicester Spokes, PO Box 30, Leicester LE1 9DG.

AUGUST 19 & 20, 2000 HPVSO TRIKEFEST 2000

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SEPTEMBER 9TH SATURDAY MICHIGAN RECUMBENT RALLY - WEST

Grand Rapids area, 9am-3pm. www.lmb.org/wolbents, BobMich@compuserve.com or 734/487-9058.

SEPTEMBER 16TH SATURDAY FALL RECUMBENT RENDEZOUS

Stony Creek Metropark Eastwood Beach shelter (north Detroit suburbs). 9am-3pm. www.lmb.org/wolbents, BobMich@compuserve.com or 734/487-9058.

SEND CALENDAR LISTINGS TO RCN, PO Box 2048, Port Townsend, WA 98368 or info@recumbencyclistnews.com



The 2000 EZ-1 SuperCruzer

J & B IMPORTS INTRODUCES NEW \$500 RECUMBENT

J&B Imports is producing an entry level recumbent designed by Easy Racers, Inc. The EZ-1 Super Cruiser features popular size tires, 20" x 1.75" rear and 16" x 1.75" front; mounted on alloy rims with quick release levers. The seat is a Koolback type similar to the upgrade seat EZR has for their Tour Easy and GRR. The brakes are Tektro-Alloy V-brakes with alloy levers. It uses conventional 21 speed mountain bike gearing with Grip Shifts. Shimano derailleur and freewheel are standard.

The EZ-1 Super Cruiser is a compact LWB with a 56" frame that will fit riders from 5' through 6'3". Seat height is about 24." It comes in red or blue, is available now priced about \$500.

The EZ-1 Super Cruiser was displayed at the major dealer shows. Dealers commented that it met a needed price point, coming in about \$200 less than the competition. Many dealers rode it and expressed the opinion that the handling was very good and extremely user friendly. They saw it as an ideal first recumbent. □

Contact: Have your dealer contact J & B Imports or Easy Racers for retail sales.

Source: Easy Racers Press Release

JOHN SCHLITZER LEAVES THE RANS COMPANY

In a surprise move, John Schlitter, brother of Rans company founder and owner Randy Schlitter has left the Rans company. It was a triple whammy for Rans as Howard Harmer, has also left the company. At the same time, Rans announced that the model updates shown at the Interbike Trade Show in Vegas were *NOT* going to be available until 2001, with some possible early introductions including a Stratus-spec'ed Velocity Squared this Spring.

John Schlitter has been the *enthusiast* voice at the Rans company for many years. Many readers have met and ridden with John and he is known as a true recumbent enthusiast. We're not sure where John is going to land, though we hope he stays with recumbent bicycles.

Our condolences go out to the Schlitter family for the loss of their father this past November. □

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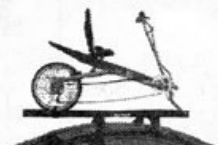
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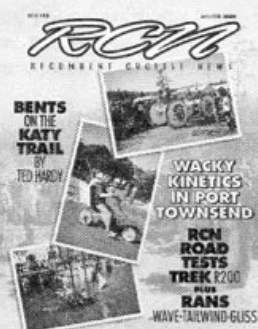
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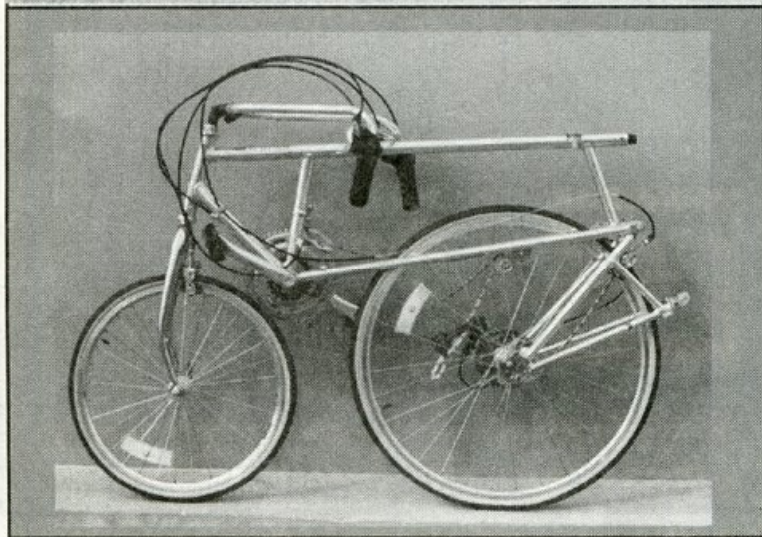
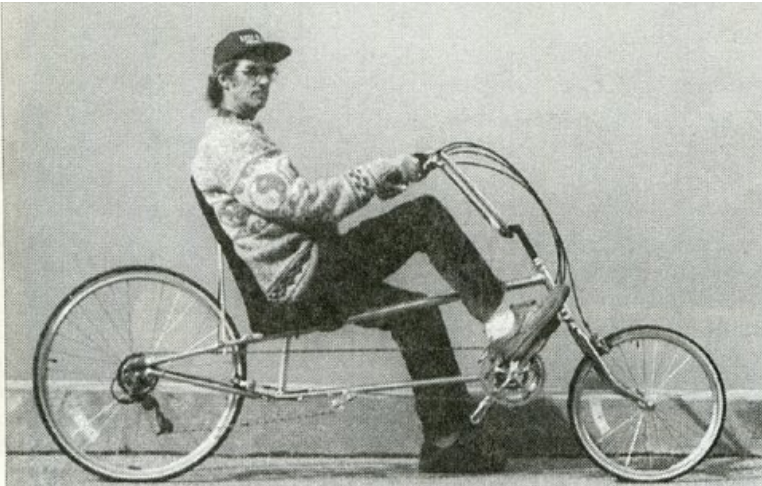
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EASY RACERS UNVEILS FOLDING/SUSPENSION GOLD RUSH

Easy Racers' Gardner Martin personally unveiled the new folding/suspension Gold Rush long wheelbase model at the Seattle Bike Expo in late February in Seattle, Washington.

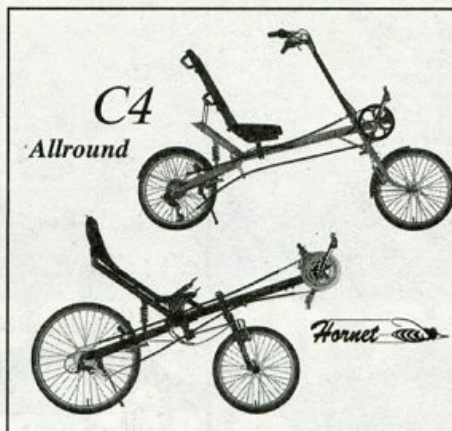
The new model has an aluminum frame and triangulated swing arm with a elastomer spring stack. The suspension stack quick releases to allow the swing arm to fold. The seat is still bolted to the bike, though it can be removed in a minute or two. The suspension has one inch of travel at the suspension (equalling two inches at the wheel). This new option will add just 1/2 pound to the weight of the frame. The folded Gold Rush will fit in a standard bicycle box, which will definitely make travel easier.

The rear suspension will be a (approx.) \$500 option. This is certain to be the smoothest riding Easy Racer to date. Source: RCN □

GREENSPEED Introduces GTO

For 2000, we are introducing a new model that will combine the best features of our GTR, GTS, and GTC trikes. The basis is our bestselling GTR touring trike. We have lowered the seat, to give even better road holding and handling. We have accomplished this by using the dropped main tube (used on the GTS). The ground clearance is still better than the GTS, due to a new low profile steering pivot.

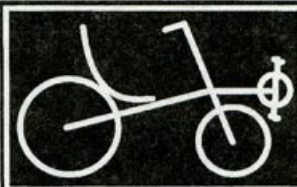
Many customers have preferred the S&S coupled GTC "Suitcase" trikes, but some have wanted the longer GTR seats, and some have not liked paying the extra \$487.50 for the three S&S couplings. The GTO will include one S&S coupling, and will cost \$162.50 more than the standard GTR, yet pack down just as small with the short seat, and almost as far with the long seat. This will make it cost effective shipping, by lowering the cost to the USA from \$455 to \$260 (US dollars). The first batch of GTOs is now under way. Source: Mfr. provided press release. □



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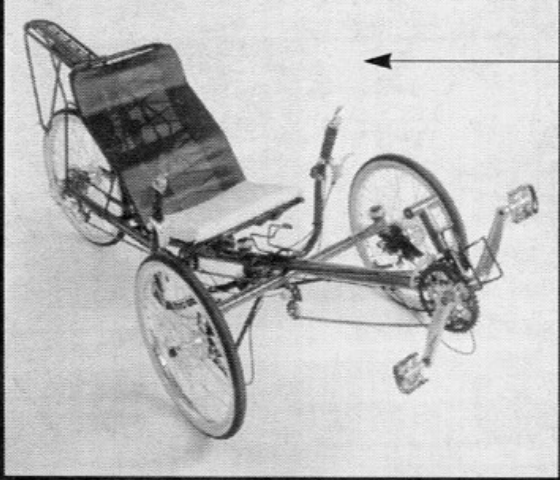
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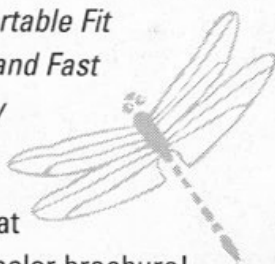
—Bob Bryant, RCN

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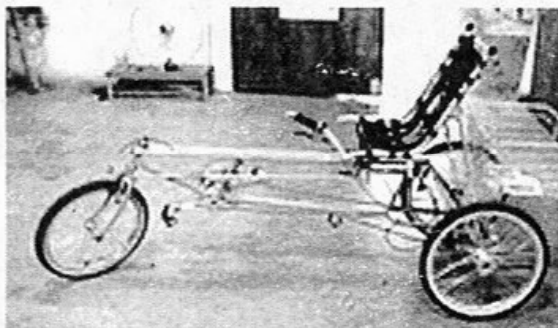


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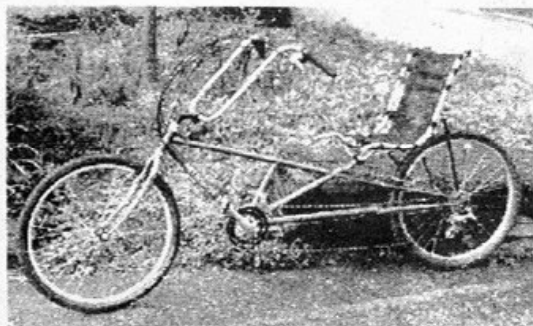
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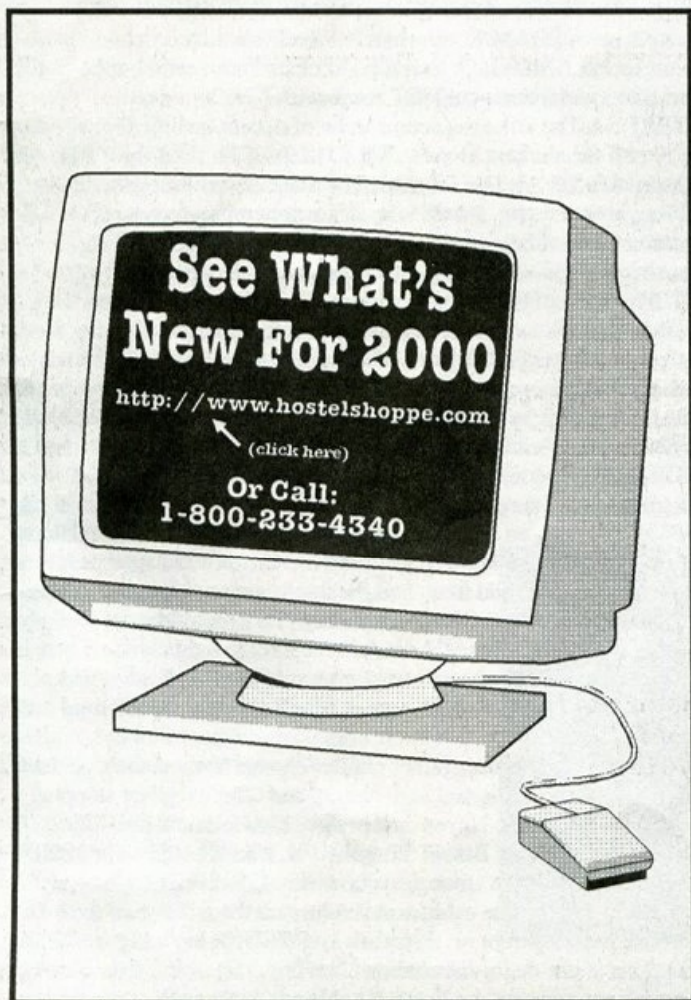
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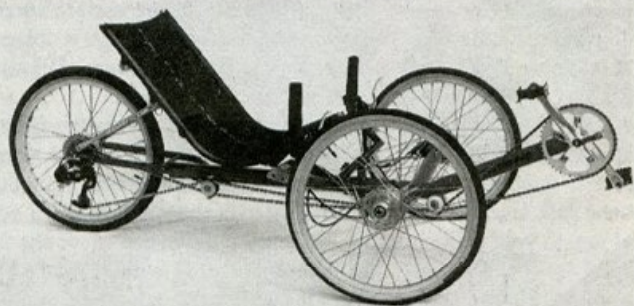
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The BikeE FX

The Coolest Compact To Ever Grace Pavement, Dirt or any other road substance you can think of

by Bob Bryant

For 2000 BikeE has introduced a new fully suspended model called the FX. This bike has been designed as the ultimate all-terrain recumbent bicycle. It utilizes a new proprietary in-the-headtube suspension system and simple mid-drive drivetrain system. The mid-drive is shifted by a front derailleur just like a typical mountain bike. It comes stock with a new off-road low-back seat (Sweet Seat optional) and hybrid tires that work great on and off-road. The FX is spec'd with a SRAM 7.0 drivetrain, new Alex rims and ESP V-brakes (the FX is also disc brake compatible). This bike will be available in anodized pewter grey or red and will retail for \$1495.

■ I. SYSTEMS

FRAME—The BikeE FX frame is built in their Corvallis, Oregon factory. They use a custom designed aluminum extrusion for a mainframe. The FX frame tail has been bobbed and contoured creating the most for the most compact BikeE frame extrusion yet. The CroMo suspension swing-arm is the same as that found on the AT and NX. The one additional part of the FX frame is an aluminum triangulated "V" section that attaches the mid-drive bottom bracket to the aluminum frame extrusion. It sounds like a potential kluge, though it is slick and nicely done. As with the rest of the build quality, the finish is very nice.

FORK—The FX has an extremely simple BikeE proprietary front suspension fork which offers 1.5" (38-40mm) of travel. They started with a standard BikeE fork attached to a hardened steel tube with corrosion resistant plating. Next is the bearing. They use a retainer inside the fork that has ball bearings to make for an extremely smooth action. This is self-adjusting and is a press fit. Next is an outer tube that slides over the inner tube and bearings. Inside this tube is a top-out bumper and at the bottom a double seal to protect against dirt and water. All of this is held together with a C-clip.

To create the shock—they use an Englund Air cartridge that has the dampening adjusted specifically for BikeE's intended use. Since most forks use two cartridges, Englund beefed up the cartridge with an additional seal. This cartridge uses air as the preload and air as the dampener, just like the Cane Creek Shock (no oil). The cartridge screws into the bottom of the fork. The scissor-like hinges are used to keep the fork stiff and in alignment. The rubber on the single hinge is designed as a top out bumper. This is a total user-serviceable fork, though BikeE suggests that owners have their dealers service the forks.

The BikeE shock fork does an excellent job suspending the front end. The 1.5" of travel is adequate, though larger riders will need to pump up the shock to keep from bottoming over the big bumps. Unfortunately, this makes the fork less useful for road riding over the small stuff (or adjust the air pressure to your riding terrain). This is the downside of air shocks. The argument for compacts and LWB recumbents is whether they even need a front shock. It certainly isn't necessary, though after dialing it in for your weight and where you ride (on or off-road), it noticeably smooths out the ride. This shock is of exceptional design and quality for a \$1500 recumbent. It is certainly better than any off-the-shelf 20" suspension fork. I have been fairly critical of these. Some of the builders selling \$4000 suspended recumbents haven't made a commitment to a proprietary head tube suspension (yet....). So in this respect, BikeE deserves much praise.

WEIGHT—Our FX weighed XL weighed in at 33 pounds (XL is < .5 pounds heavier than the standard). With the optional Sweet Seat, that increased to 36 pounds (yep, a three pound weight difference between the low-back and Sweet Seat). It is a rather heavy bike, but no more so than other LWB models.

SHIFTING—The 24-speed mid-drive drivetrain shifts better than any other mid-drive we've tried. The forward chain has no spring tension, a direct chain run and works fine. The rear chain is sprung at the rear

derailleur. An extremely cool custom matched triple mid-drive crankset/front crankset is made for the BikeE FX (designed by Paul Atwood). The crank has cold forged arms with anodized rings shaped from 7075 aluminum. To top it all off, the BikeE logo is laser-etched into each chainring. Front shifting is via a bulletproof Shimano LX front derailleur (one of the few Shimano parts on the bike). Historically, BikeE's have offered no-brainer front shifting. First with no front derailleur, then came the SRAM 3x7 and then the Schlumpf Mountain Drive. The FX has real enthusiast-type mountain bike shifting just like your Klein Mantra or Stumpjumper—and it is very low (17-94 gear inches); and not ideally suitable for road riding. The one BIG difference is that you can't see the triple crank as easily. I noticed that I was frequently looking down under the seat to see if I could see what gear I was in (though you could look at the shifter dial indicator....). With the two short drive-chains, and an 8-speed rear end, there is more chain deflection with the FX. It requires more technique compared with the no-brainer CT/AT drivetrain. BikeE's system also limits the high gear to a rather low 94 gear inches—though it is perfect for off-road cruising.

COMPONENT QUALITY—BikeE mostly does a good job spec'ing their bikes—they are usually on par with the model price point. One surprise component found on the FX was a Suntour cassette. Especially since I noticed it after I'd ridden the bike a few times—the FX shifts great. BikeE's Paul Atwood concurred that the Suntour cassette works fine. The SRAM drivetrain works great. Front Deore LX shifting was as quick and easy as found on most modern mountain bikes. We were also surprised to see a SRAM/Sachs chain on the FX which is a big plus—given our recent KMC chain test. SRAM chain is now stock spec on FX, NX and E2 models, though AT/CT come with KMC.

WHEELS—The wheelset seems to be of decent quality. Our FX came outfitted with the slickest SRAM ESP 7.0 hubs (first time we'd seen these hubs) laced to Alex AL DM 24 rims. The wheels were true and remained tight throughout our test. BikeE wheels are generally pretty good and the small diameter does help in providing added toughness.

Some have asked why wouldn't BikeE use a 20" wheel on the front of the FX? The basis of the BikeE design is the 20/16 wheel combo. They have done more than any other manufacturer to bring good quality tires in these sizes to market. A 20" front wheel would lengthen the bike and raise the pedals/BB, thus completely changing the design and rider ergonomics. And the bottom line is that the suspension fork design requires a 16" front wheel (20" wouldn't have worked).

TIRES—BikeE does not offer a full-out knobby tire for the FX. That is too bad, as I sure liked the knobs supplied on our AT off-road bike (RCN#43). The tires on the FX are Kenda Krisps. These are a 305mm/406mm x 2" wide semi-knob (65psi rear/40psi front). The road path is a herringbone (wimpy) road treat, and the knobs are on the corners of the side-wall/edge of the tire. Given that most MTB's are ridden on road, this is probably a good tire choice. I don't think it is the right choice if you plan to use it as the "ultimate all-terrain bicycle" as BikeE advertises. Though the gonzo MTB R & D guys at BikeE ride with Specialized 'Spanky' full knobs.

BRAKING—BikeE uses rather cheap Alhonga V-wannabe's on the CT and AT. They are low cost and high action, and offer excellent stopping power. The NX uses the Hayes disk brakes, high tech and possibly overkill for this supreme BikeE. With the FX, BikeE has gone with SRAM ESP V-Brakes. These are among our favorites. However, there is one minor V-brake glitch. The cable noodle/entry on the left side of the bike continuously taps my foot or the crank arm (NX/FX has a higher BB than CT/AT). This is not major interference, but it is a bit of a bother. I broke out the zip-ties to try and guide the V-cable out of the path of my foot or

the crankset to no avail. I drove me nuts for awhile, and then I realized that it wasn't hurting anything. I tried real hard to make it a big deal—though it really wasn't. However, it might take some getting used too.

■ II. COMFORT

The riding position is very erect and upright, about as much so as you will find on any recumbent bicycle. The bottom bracket is higher than the CT/AT. The ergonomics of the bike are advanced for a compact—more aggressive and less comfort based. I had the same control reach woes (long reach to the handlebars) as I did on the NX. We asked for longer cable runs and a higher rise bar to throw on, but it still wasn't enough. We'd like to have a pullback reach bar. BikeE is working on it, though I have also noted that with their Top Loader stem (and multiple bar possibilities, there is virtually no call for it.

NOTE: This reach issue will only affect a small percentage of riders, though maybe more if you are accustomed to a 90 degree SWB ASS arm bend). Other than this, the fit of the FX is as good as you can get. What sets BikeE apart from all other compact manufacturers is their ability to fit many different-sized riders. The standard frame will fit riders to 6'2". Taller riders or road tourists may want to opt for the "XL." Custom sizes as well as "XS" are also available. We opted for the "XL" sized bike and it fit perfectly. BikeE's Paul Atwood suggests the smaller frame size if you can make it work for you (riders of average proportions/height).

The new 'low back' seat is about as low a seat as you will find on a recumbent. It has the Sweet Seat base and is meant for pushing into—and leaning forward to off-road finesse this serious mountain bike recumbent. With the upright/erect position the potential for recumbent-butt does exist.

■ III. RIDE/HANDLING

STABILITY—The FX is a very stable recumbent designed to handle well in unstable, ever-changing conditions of an off-road environment.

This is a daunting task that no other manufacturers have 'officially' taken on to the level that BikeE has. The little seat allows you to move around and finesse off-road obstacles as best as you can imagine possible on a recumbent MTB. The low speed control is exceptional.

TRACKING—BikeE's don't have a laid back head tube angle, and lots of fork rake. The steering geometry is almost SWB-like—just point, click and turn. It is very neutral for a compact—even more so with the NX and FX. BikeE does not rely on a laid back head angle and some tiller-feel to allow the bike to track straight or come back to center after a turn (no automatic self-centering feel).

MANEUVERABILITY—This is the most maneuverable compact and BikeE to date. With the "NX" geometry, the head tube is more upright, BB is higher and tighter turns are easy and smooth (with the exception of that V-brake noodle glitch (see page 10).

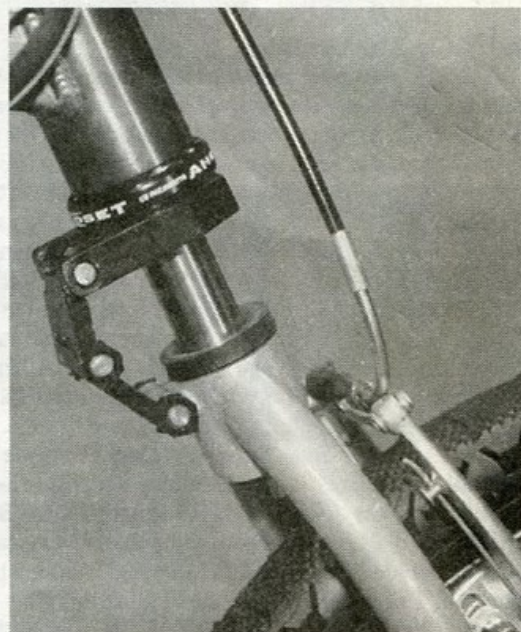
SPEED/EFFICIENCY—The FX has the least aerodynamic riding position of any BikeE. With the lower gearing, semi-knobs and upright erect low back seating, we'd expect riders to be a bit slower than on their CT/AT. Though when the terrain gets rough, the FX will scream through the mud, dirt and ruts better than ANY other recumbent. And if the bike is a bit slower, my local trek off-road cuts three miles off my ride to town and gets me there faster than ANY other recumbent in that respect. It is the only one that works truly well in the crud.

USER-FRIENDLINESS—The FX/NX have a higher bottom bracket height which definitely feels more aggressive. The controls are farther away due to the different steering geometry. This can be dialed somewhat with the optional handlebars, though it still may be an issue for some larger/taller riders. Even so, the BikeE riding position is the most user-friendly there is.

FUN TO RIDE—Fun, are you kidding? Have you ever gotten stressed out riding in between road raged commuters on frenzied highways, or even dodging bike trailers on the local trail on a Saturday morning? With the FX, just exit stage right and make your own damn trail. I found myself riding the FX fewer, though they were more fun miles exploring places I'd only previously been on a real wedge MTB.

■ IV. OWNING/PURCHASING

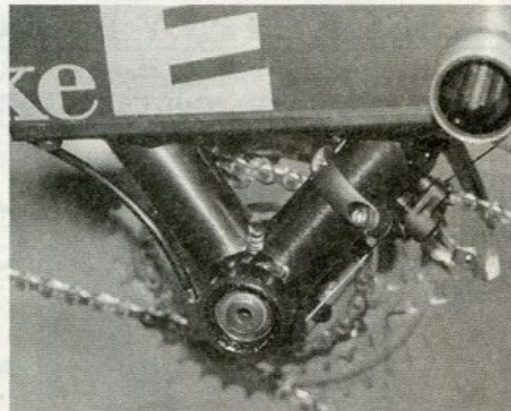
VERSATILITY—The FX is among the most versatile of all of the BikeE models. It is suitable for off-road, on-road, and touring (as long as you can handle the low gears). BikeE's aren't the fastest recumbents though the FX will go nearly anywhere.



BikeE's new suspension fork



BikeE's new mid-drive crankset



BikeE's mid-drive frame mount

We were unable to try a fender set (due to front susp.) Installing a front fender will be a trick. Most of the other BikeE options should work just fine.

SHIPPING/ASSEMBLY—BikeE's ship in a relatively small box and are easy to set up (< 30 min.). The only adjustment we had to make was to tighten the front derailleur cable in order to dial out some high gear chain noise, but that was it. Overall, we did find the FX to be a bit noisier than the other BikeE models.

TRANSPORTABILITY/STORAGE—This BikeE will travel and ship better than the others due to the low-back seat (The Sweet Seat is huge). BikeE's, especially the XL models, are not as easy to ship or haul around as you'd think. They have a high center of gravity (c.g.) and can be difficult to hang onto some car racks. I hope BikeE is thinking about a folding or compactible model for the future.

QUALITY/DURABILITY—BikeE's are pretty tough. The built-in-the-USA models (NX/FX/E2) have all of the bases covered. This should be a very trouble free recumbent.

COST/DEPRECIATION—The FX should hold its value well. Off the showroom floor, it is priced very competitively and offers better value than any other suspended recumbent. Since it is the new BikeE flagship model, it should be very hot through the season. With market and dealer saturation, CT/AT models are not holding their value as well on the used market.

■ V. RCN ANALYSIS

VALUE—No other manufacturer offers such a slick full suspension package for this price. On top of that, BikeE is one of just two manufacturers who build a design-specific suspension fork for their bike. The other manufacturer charges a lot more. The best thing about the FX is that you can get it any way you like it. We tested a stock off-road version, however, there are three different handlebars to choose from and a Sweet Seat is a no-charge option. However, the bike is truly designed for an advanced, lean forward gonzo ultimate recumbent mountain bike position.

MARKET COMPETITION—BikeE owns the compact genre. This is an exceptional bike for the money—a full suspension does everything enthusiast compact, built in the USA. The FX comes in an anodized 'pewter' color or red. RCN's Marilyn tells me this is a very trendy color for the new millennium. I sure liked it.

At the Interbike Trade Show Dirt Demo we were watching mainstream folk ride recumbents. A couple of mountain biker ladies cruised up within earshot. One was riding a high-BB skinny tire SWB. The other was riding an FX. The dialogue went something like, "I sure can't imagine why anyone would want one of these (SWB)," "though this off-road bike is sure cool, I want one." Now, I don't think this view will be representative of recumbent enthusiasts (who love SWB models). Though, according to BikeE, these things are REALLY being ridden offroad. This is no regular



The BikeE FX at Interbike Dirt Demo Las Vegas.
Photo by John Riley

BikeE with shocks, it is a true offroad recumbent. BikeE reports that the FX's are leaping out the door. We hear from BikeE that *Playboy Magazine* has an FX as well as *Mountain Bike Action*. This is certainly one of the most popular recumbents for the new year.

VERDICT—In most cases, BikeE's R & D is very good. The NX and now FX are especially good. No matter what you might think about BikeE you have to give them credit for making the most of the compact style recumbent. So the question remains, whether all of this high end glitz and glamor is necessary to make the basic BikeE design better. The answer to this is no. The best BikeE is the AT. It is the most affordable and best all around compact. Minus the front suspension and the ability to change a flat rear tire quicker (no 3x7 hub), the BikeE AT does most of what the FX will do—with a more user-friendly riding position to boot. Now, if you are a gonzo type who wants to do some serious recumbent offroading, you won't find a better bike than the FX. This is where the more advanced/lean forward c.g./higher pedal-BB position can make a difference. The FX is the most complex BikeE to date due to the shock fork and mid-drive, though it uses mostly off-the shelf parts.

The last question is whether this high end model will keep BikeE owners loyal to the marque. It is my guess that it might do a better job of it than the NX—a high performance BikeE—though not in the same league as other 'performance' SWB and LWB models.

If you are looking for an urban assault vehicle, the FX may be the ticket, though you'd better like the upright/erect riding position. The biggest gamble for BikeE is whether the recumbent-buying public is gonzo enough to actually utilize the FX's off-road expertise....or as with most mountain bikes—most will just stay on the pavement. This would be a shame, though is probably more than likely. As a road bike, the FX would need that pull back stem, the Sweet Seat and some higher gears (they have to be thinking about this). With the BikeE product refinement, a full host of accessories and laid back attitude will have them sailing smoothly into the new season. The FX is an excellent addition to an already exceptional recumbent line. It is bound to be a great seller.

■ VI. RATING/SUMMARY

- ✓ **Comfort** — C+ (low back seat)
- ✓ **Design/Style** — A
- ✓ **Drivetrain** — A
- ✓ **Chain Management** (Idlers/Noise/Vibration) — A
- ✓ **Brakes/Braking** — B (front V-brake noodle/crank arm interference)
- ✓ **Finish Quality** (welds/paint/preassembly) — A
- ✓ **BOB RATING**—A

▲ PROS

- ▲ A great value for full suspension
- ▲ The most comfortable mountain bike ever
- ▲ Cool BikeE options
- ▲ Exceptional quality & design
- ▲ Refined handling, drivetrain, and expert R & D and spec.

▼ CONS

- ▼ Front V-Brake noodle ticks right crank arm.
- ▼ Long reach to the controls for this rider (I need a pull back stem).
- ▼ Don't expect ultimate laid-back cruising comfort
- ▼ A rather low top gear.
- ▼ A Suntour cassette? (Sorry, I don't know anything about these....)

■ COMPONENTS

See spec sheets elsewhere in this issue. □

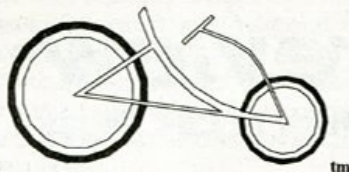
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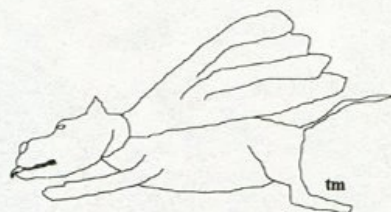
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2000 Season Preview

Industry Updates from the Interbike Trade Show in Las Vegas

by John Riley

Nestled in the mountains, the tiny community of Blue Diamond, Nevada (pop. 420) seems a million miles away from the buzz of the Las Vegas Strip. But in reality, it is only half an hour away by chartered bus. It provided a convenient location for the On Dirt Demo, the opening event of the Las Vegas International Bicycle Expo (Interbike) held September 9 - 13. The venue offered a 2.5-mile paved loop for on-road testing and five off-road loops ranging from basic rides on dirt roads to highly technical single track.

■ BIKEE 2000

Normally one would expect the recumbent demos to be strictly on the paved loop, but in one of the biggest surprises of the show, there was a recumbent out mixing it up on the trails. NOT surprisingly, it was from BikeE. BikeE's have been seen fitted with off-road tires before, but the BikeE FX (show nickname: Fat E) was designed for the job. It has full suspension, and a mid-drive that provides super-low gearing. It has a low back seat (the tall-back Sweet Seat is optional) that encourages the rider to forgo the normal recumbent laid-back position in favor of one more upright, with the rider's upper body free to move about, a definite aid in technical sections.

The new proprietary front suspension is built into the head tube/steerer assembly. There is an aircraft nose wheel-style scissors linkage. Rear suspension is the standard BikeE set-up, as is the beam frame, although the rear of the beam is shortened slightly. The mid-drive unit is mechanically fastened to the bottom of the beam and comprises a bottom bracket with four chainrings. The inner chainring takes the drive from the front. The other three chainings are shifted by a front derailleur and drive the rear wheel in the conventional manner. In place of the 3 x 7 hub found on most other BikeE's, there is an 11-30 eight-speed cassette hub. Shifting is by SRAM ESP 7.0 with twist grip shifters. The gear range is 17 - 94 inches. Price on the FX is \$1,495.

The other big surprise from BikeE was the E2 tandem. With the bottom bracket for the front rider out ahead of the front wheel, the wheelbase on this bike is the same as on the single bike. The unconventional steering on the bike has a nearly vertical head tube, with the fork raked slightly to the rear. The bike has rear suspension in the usual BikeE fashion with a Cane Creek AD-5 shock. The bottom bracket for the stoker is attached below the beam in a manner similar to the way the mid-drive is attached to the FX. Two Sweet Seats are provided. The standard size will fit riders from 4'8" to 6'3" in either the stoker or captain position. The E2 will have SRAM 7.0 components. It should be available by February at a price of \$2,195. Both the E2 and FX are disc brake compatible.

The entry level BikeE CT now comes with the high-back Sweet Seat, updated SRAM ESP components and the same Wellgo pedals as the AT. The price is \$695.

The complete line of BikeE accessories has been refined and added to. Among them is a BikeE computer that has an extra long 1.6 m wire to accommodate the distance between the hub and the top of the handlebars. Wire length is a problem for many recumbent installations, so this unit may come in handy for many other bikes besides the BikeE. This is a ten function unit.

A new 300 PSI shock pump is stronger and more durable than other shock pumps. It has an aluminum barrel and gauge. The price for the computer and the pump is \$39.95 each.

For those days when you don't want to ride outside, BikeE now has a trainer that works with 20-inch rear wheels. The BikeE trainer utilizes a patented rim driver magnetic resistance system and fits all 20" wheel bicycles. The price will be about \$249.95.

Other accessories include a protective neoprene shock boot for all rear suspension models. It will work on all Cane Creek shocks. There are

clipless pedal inserts for the Wellgo pedals on all BikeE models, and the BikeE top loader stem and assorted handlebars are available for all models.

■ VISION 2000

Also at Demo Day and looking decidedly NON fat was the new Vision VR 65 Saber. Vision has had a prototype around tantalizing people since they released photos in 1997. The bike is finally going into production. The bike has two 24-inch wheels (520) instead of the prototype's 26 inches and comes fitted with narrow, high pressure tires. With a main tube diameter of 1-1/2 inches, it maintains the skinny-tired, road bike look of the earlier version. Even with the smaller wheels, the laid back seat is just over 28 inches off the ground, so this bike is not for shorter riders.

The next day, on the show floor, Vision unveiled the titanium version of this bike, the VR 68. It weighs in at about 22 lbs. and comes mostly Campy equipped for \$4995. The CroMo VR 65 comes with Shimano Ultegra components and sells for \$3295 (Ed Note: a scant \$700+ more than the Ultegra-equipped R45...R & D and development costs you know).

Also at the Vision booth was the much modified year 2000 model VR 82-85 tandem. The frame still comes apart in the middle, but the joint has been redesigned for a more positive, self-centering connection and is no longer used as the length adjustment point for the stoker. Instead, the stoker's seat now slides on a long track. The seat mounts to the track with two quick-release pins. These pins go through curved slots on the bottom of the seat that allow for seat tilt adjustment. The seat back is now self-supporting. According to Vision's Ricky Comar, the x-seam ranges for the tandem are 30 - 40 inches for the stoker and 42.5 - 46.5 inches for the captain (an XL boom is available to fit x-seams to 52.5").

The head tube has been moved forward relative to the captain's seat so that the bike will better accommodate above-seat steering. The tandem also now has a major kickstand. It is a double leg, center stand design.

The big change with the CLWB R30 series is that the bikes now come with two 20-inch wheels, instead of the 20" rear, 16" front combination.

The Vision line is now organized with all of the R40 series of bikes being hardtail. Price for the basic VR40 remains at \$1095.

The R50/R54 are full suspension versions of the R40/R44 hardtails. The rear suspension is in the process of being completely redesigned for improved function. The Vision staffers feel that the idea behind this suspension is not well understood. Vision's Ricky Comar explained that the bike is not a mountain bike and the suspension is not intended to function like a mountain bike suspension. (Ed. Note: In late November, we were told that the system we saw is still receiving some tweaks and updated info will follow when it is available.)

The most interesting new SWB Vision accessory is Windwrap Windscreen nose fairing. This looks to be a better fit to the combination of bike and rider than other fairings, and has a mount that allows the fairing to be tilted forward to make it easier to get on the bike. Watch for some tests on this. It might provide a significant reduction in aero drag.

In the ongoing quest for maximum seat comfort, Vision will offer an optional Thermarest air cushion as a replacement for the foam in the Vision seat base.

■ LONGBIKES 2000

Longbikes is the new kid on the block, but they come to the party with one of the oldest and most refined recumbent designs, the LWB Vanguard, and its tandem form, the Duplex as well as several SWB models. While they may be new to recumbents, they have many years of experience designing and building everything from race cars to material handling equipment, according to founder Gregory Peek. From the looks of the latest versions of their bikes, they seem to be getting up to speed quickly.

The Vanguard has been joined by another long wheelbase design, the Slipstream. Compared to the Vanguard, this bike has a lower seat and a higher bottom bracket. It can be had with either the traditional Ryan Vanguard style under-seat steering, or a unique automotive style above-seat steering system that has the bars attached to a column that turns the fork through a universal joint.

The frame design of the SWB bikes has been changed from the design seen in early pictures. The look is now much sleeker.

One of the unique characteristics of the SWB bikes is their modularity. The rear triangles bolt on. A bike can be built with either a 20 (Nitro model) or a 26-inch (Eliminator model) rear wheel. The rear of the SWB can actually be removed and the front part of the frame can become the front half of the tandem. Peek said he wanted the design of the tandem to "flow through" from the design of the single and that this resulted in the tandem having bolt-together modularity too. The tandem can be had with either a 20 or 26-inch rear wheel. In addition to the existing joints, S&S couplings can be factory installed on any of the bikes. Longbikes has several sizes of travel boxes available.

The tandem has an extra long seat mount rail so it should accommodate stokers of various sizes, including children.

Steering can be either the Longbikes Tiltaway above-seat system or the 1.25:1 under-seat linkage system. The under seat steering is not mounted to the seat as has been the case with the Ryan bikes, so it adjusts independently of the seat. This change will eventually be phased in throughout the line, including on the Vanguard.

The SWB bikes also have a unique chain management system. There are three separate chains. The front chain goes from the bottom bracket to a double idler sprocket above the front wheel. An eccentric bottom bracket shell and a pivoting idler bracket are used to tension the two front chains. The double idler sprocket is two side-by-side thirteen tooth cogs machined from a single piece of aluminum. The second chain goes from the idler to the rear bottom bracket. The third chain handles all the shifting and drives the rear wheel. Because the relationship of the rear bottom bracket and rear hub is identical to that on a road bike, the shifting is identical. For bikes with a 20-inch rear wheel, the gearing is stepped up along the way so that the bike can have a normal gear range with standard size chainrings. Peek says the drivetrain is totally silent, which was one of the primary goals for the system.

Plans for the seats were not firm, but there may be three designs. There is the traditional Ryan design, a full mesh sling with a seat horn, a new full mesh seat without the seat horn, and a new seat with a self-supporting mesh back and a padded base. This seat will allow the tilt of the back to be adjusted independently of the base. The seats mount to a rail on the top of the frame with a dovetail mount.

Starting at \$1999, the price of the bikes can cause sticker shock, especially if one sees the price before actually seeing the bikes. Seeing the bikes in person, the prices don't seem so out of line. There is polished, machined aluminum everywhere and many unique features. Most of the bikes can be had in either steel or 7000 series aluminum. Peek said he does not want price to dictate design. "I want to build a Mercedes quality product and price it accordingly," he said.

■ LIGHTNING 2000

Veteran recumbent designer Tim Brummer has continued to expand and refine his line of Lightning bikes from the base \$850 Thunderbolt to the \$8500 full-fairing carbon fiber full-suspension Phantom.

The carbon steel framed Thunderbolt is now available in two versions. The base model retails for \$850. The new A-10 model has upgraded components that reduce the weight of the bike. It also has an idler instead of a chain tube above the front wheel. Price on the A-10 is \$995. The Thunderbolt has a shorter wheelbase than the Stealth and can be had in a version for shorter riders.



The new 2000 Burley LWB/SWB convertible. Photo is a prototype—Photo by Wheel & Sprocket



The 2000 Double Vision tandem.

Weight of the Stealth model has been reduced by a frame redesign and the use of an aluminum stem. The Stealth B-2 uses the same components as the P-38, including the hollow 105 crank and spindle, providing a further weight reduction. Prices are \$1350 for the base Stealth and \$1750 for the B-2.

The P-38 now has a two-piece handlebar and stem allowing the exchange of handlebars and stems for fine tuning of the fit. The P-38 also has improved, higher quality lugs, increased frame/rear brake pad clearance, and improved suspension fork response to small bumps. Narrow, high performance wheels and caliper brakes (instead of A brakes) are a no cost option. The Voyager option includes S & S couplers and an airline-legal case making the P-38 a travel bike.

Optional on all Lightning models is a new tilt and lock steering column. The rider adjusts the steering column angle to where they want it, and then locks it down with a quick release. Also optional is a quick-adjust kit that allows the boom to be adjusted without changing the chain length.

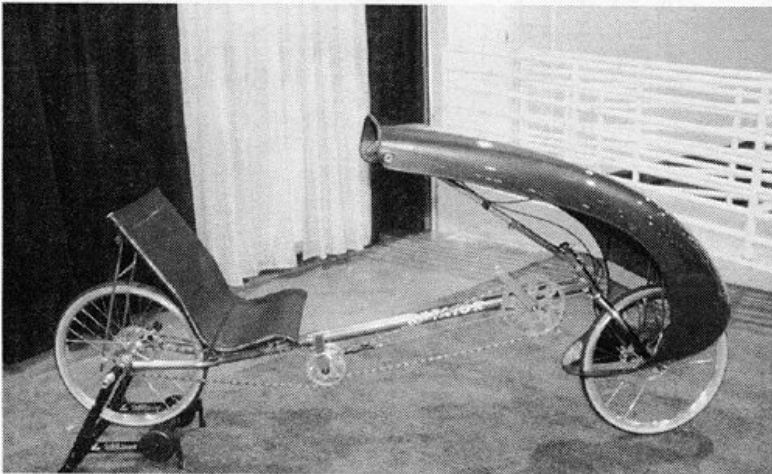
Hanging up at the back of the Lightning booth was an R-84 fresh from the 745 mile Paris-Brest-Paris endurance ride. Rider Bob Fourney completed the ride in 47 hours, finishing 20th out of 3,500 riders. Brummer says new molds and tooling should improve delivery times for the \$4,800 carbon fiber framed bike.

■ HALUZAK 2000

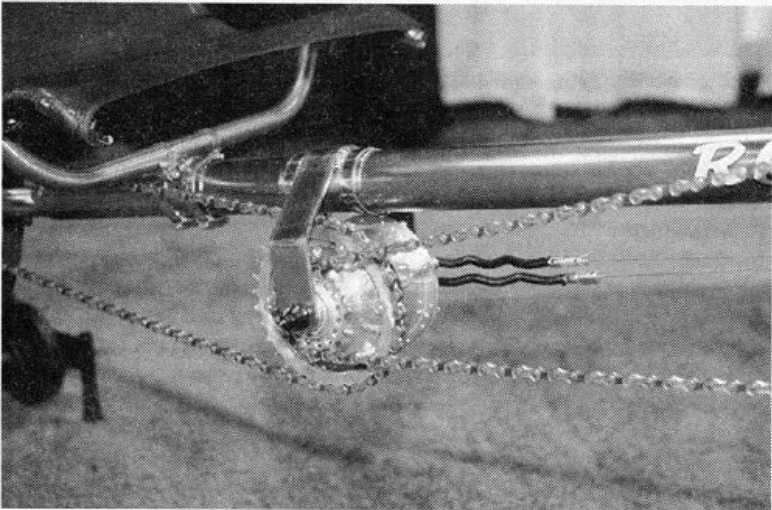
The new fully suspended Haluzak Traverse was absent from the demo day, but looks like it could have held its own in the dirt. Haluzak was forced to redesign the rear suspension when the shock they had been using was no



The 2000 Radius line. Watch for our upcoming C4 review—John Riley.



The Rotator TiPursuit with Rohloff hub—John Riley



The Rohloff hub acts as a mid-drive on the TiPursuit—John Riley

longer available. The result is an impressive four bar linkage system that would be at home on a high-end mountain bike. The tubes in the suspension are made from Ritchey Nitanium tubing, which according to Bill Haluzak is titanium enhanced CroMo. The chainstays are ovalized for lateral stiffness. The system was designed to have the chainline pass near the pivot to reduce the chances of pogoing.

The suspension unit is a multi-adjustable Fox Vanilla coil and oil unit with return damping. Haluzak also has a new seat back bag with a pouch for a water bag. (Ed. Note: For those of you who saw the new Traverse at Interbike or in this issue of RCN, the design is in the process of being changed again).

It is in the process of being simplified from a 'four link' to a 'three link' suspension design.

Just before press time, Bill Haluzak announced a new recumbent trike model, the "Tryumf." This two wheel in back trike is based upon the Haluzak/People Movers compact that never made it to market. This 35-pound 8-speed (Mega 11-34) trike has a disk rear brake, V-style front brake, alloy wheels, mesh seat back (cruiser saddle base) and will retail for \$1200-\$1500.

We are sad to report that Sales Manager Haluzak Jeremy Lewis is no longer at the company. Haluzak's top notch welder "Oren" has also defected to Rotator and is welding TiRush frames. "1999 was a tough year" according to Bill Haluzak. We wish them the best of luck.

■ J & B/SUN SUPERCRUISER 2000

Recumbent legend Gardner Martin from Easy Racers was on hand at the show at the J&B Importers booth. J&B has licensed the design of Gardner's EZ 1 CLWB bike and it is being sold as the J & B Sun Bicycles EZ-1SC Super Cruiser. They will be producing it in Taiwan and distributing it in North America. The price will probably be around \$500.

■ RADIUS 2000

The German recumbent builder Radius now has a North American distributor, Buchanan Bikeworks, located in Garfield, New Jersey. There are two styles. The CLWB rear suspended (coil oil rear shock) C4 can be had with either direct above seat steering as the Allround model, or linkage under-seat steering as the Tour model. The Allround is \$1399 and the Tour is \$1500. As is common with many European bikes, the C4 models comes complete with fenders, rack and dynamo lights. Optional equipment includes ASS (or USS), cases, a rearview mirror and special colors.

The full suspension Hornet II is a classic European SWB with an adjustable, laid back, hard shell padded seat, linkage under-seat steering and a high bottom bracket. The bike comes with Magura hydraulic brakes with recumbent specific levers. The price is \$2,020. Optional equipment includes a rack kit, light kit, fenders, mirror, computer-mount, velocase, low-rider and even a Zzipper fairing. (Ed. Note: The Radius workmanship is much improved over previous versions. We are currently reviewing a C4 with above-seat steering. Do not get this vastly superior bike confused with the Redbent).

■ GREENSPEED 2000

Australian trike builder Greenspeed had a full complement of trikes on hand both at the demo and on the floor at the show, including a super low race trike. Greenspeed offers a lot of custom options, but they are encouraging dealers to at least have a demo trike in their stores.

Due to the cost of shipping a Greenspeed from Australia to North America, the S & S coupler model is an especially good value as it folds into two cases. An S & S coupled Greenspeed tandem was shown at the S & S Machine booth. This tandem trike is almost 12' long and separates into three sections.

■ ROHLOFF 2000

The Rohloff booth was like a candy store. They had several bikes on display that used their 14-speed internally geared hub. Among them was a very clean titanium Rotator Pursuit. This bike located the hub where the Pursuit usually has a mid-drive and used it as the bike's only gear changer. The bike had a Rotator nose fairing that was finished in a color that matched the color of the unpainted titanium frame. The Rotator name was cut out in the front chainring and the bike had Magura disc brakes. Builder Stephen Delaire was on hand at the booth. Regarding the standard Pursuit, he said two forks are now available. One is designed for maximum high speed stability, which is important with the faired bikes. The other gives up some of that in favor of better low speed handling. In a test ride of a bike equipped with this fork last fall, it appeared that there was still plenty of stability for the unfaired bike on downhill runs, and that the low speed handling had improved. Ti Pursuits start at \$3700.

Displaying a level of technical sophistication never before seen in a production hpv, the amazing Crank It Mountain Quad Sport Utility Cycle™ was also on display at the Rohloff booth. This off-roader has full suspension with three inches of travel.

The front suspension units are Cannondale HeadShoks. The solid rear axle has been named NicholsLink after designer Jon Nichols. It incorporates anti-lift and anti-squat geometry so the rider won't pitch forward under hard braking or backward when accelerating. There is a bit of passive rear steering so that the cycle understeers in corners. Rockshox SIDs units hold up the rear.

A four wheel hydraulic disc braking system is provided, with separate front and rear levers. The full Ackerman steering is also torque-aligning, meaning that if you apply the brakes when one wheel has solid traction and the other doesn't, it won't pull to one side. Neither is the steering disturbed by bumps, according to company literature.

The Rohloff hub is again used as a gearbox. It drives a positive traction differential unit in the axle. Gear range is from 17 to 91 inches. An optional Schlumpf Mountain Drive II unit extends the range to 17-141.

An adjustable boom and adjustable seat position allow the riding position and center of gravity to be dialed. Riders from 5' to 6'6" are accommodated. There is a Windcheetah-like seat with a removable, washable pad and a lumbar insert.

Steering is by joy stick, which is an above the seat system that has a universal joint at its base. This allows the bars to be swung out of the way when mounting the cycle and also allows the rider to hold the bars while leaning in corners. An under-seat system is also available.

The wheels and seat quick release for travel. The frame is heat treated 6061 T6 aluminum. Estimated weight of the production cycle is 45-48 lbs. Price will be around \$7,000.

■ PEUGEOT/QUETZAL 2000

The Quetzal lives, according to the people manning the Procycle booth. It appears that there is an aluminum model priced at \$1599 and a steel model priced at \$1099. The bike is a low, under-seat steer LWB with a 16-inch wheel in front and a 20-inch in back. The bike is made by Procycle, a big bike maker in Quebec, Canada, but apparently the man behind the design is Denis Brown of a Quebec company called Sport Soleil et Neige. Also there is reportedly a Quetzal club in Quebec. (Ed. Note: Our road test (RCN#45) of this dog recumbent was the last time we ever heard from these fringe recumbent builders from Canada. They even abandoned the test bike at RCN. We finally sent it home via a Canadian dealer.)

■ VELO SCOOT

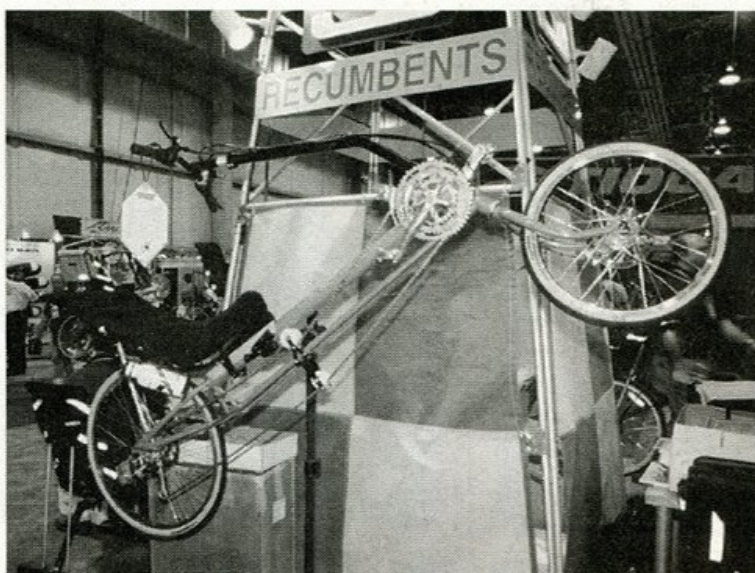
The Veloladen ScooterBike, a full suspension CLWB from Germany, has a graceful, curved frame and a hardshell cargo box behind the seat. The spec sheet says the weight is 37 lbs. The person in the booth said it was 44 lbs. In any case, it was difficult to lift this bike.

■ JOHN'S OPINIONS AND OBSERVATIONS

Normally with a recumbent, you just lay back and ride. You cover the miles in comfort, and with the right bike and rider, at good speed. If you watch people ride mountain bikes, especially young people, they don't so much ride as play. They can't hardly pass a berm or gully without trying to ride over or through. They seek out trails that challenge them and their bike. The BikeE FX can't do everything a mountain bike can do, but it can do a lot of it. The FX is arguably the first recumbent that encourages the rider to ride in the mountain bike style. As such, it could attract an entirely different sort of person to an entirely different sort of recumbent riding. It is a hybrid of a different sort, part way between a recumbent and a mountain bike. It could be a real breakthrough bike. As one person on the Internet put it, in the vernacular of one much younger than me, "it rages!"

Before the show, there were a lot of rumors about recumbents coming from big bike makers. Besides the Trek, there were none, at least not on the show floor. Some of us get excited about the prospect, thinking it means we are going mainstream, feeling like we will somehow be more legitimate than before. The dealer network of the big companies alone is probably enough to strike fear into current recumbent makers, but from the perspective of a recumbent rider, what's the big deal?

The Trek is a nice enough bike, but it is only one bike. The rumors are usually along the lines of one or two models. Is ONE bike from one of these companies going to be a match for the full lines that are now available from the recumbent-only makers? In most cases, the bikes from recumbent makers



The Rans Velocity Squared (V2) should be available now—John Riley



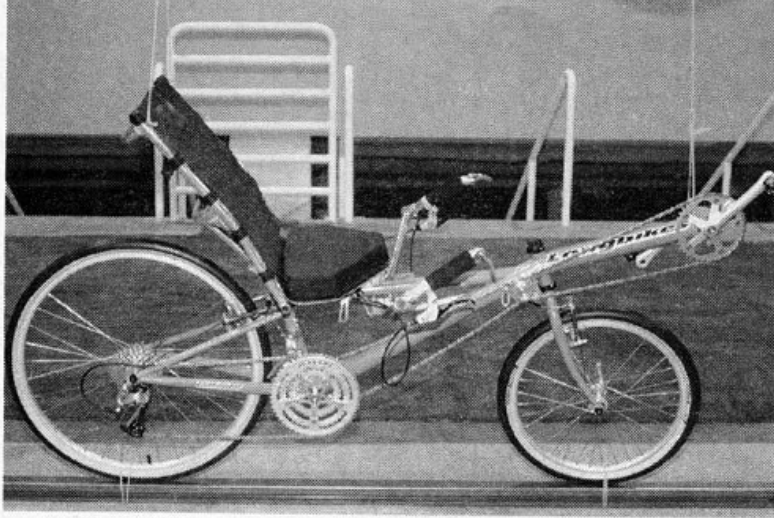
*The amazing Crank It Mountain Quad Sport Utility Cycle.™
Photo by John Riley*



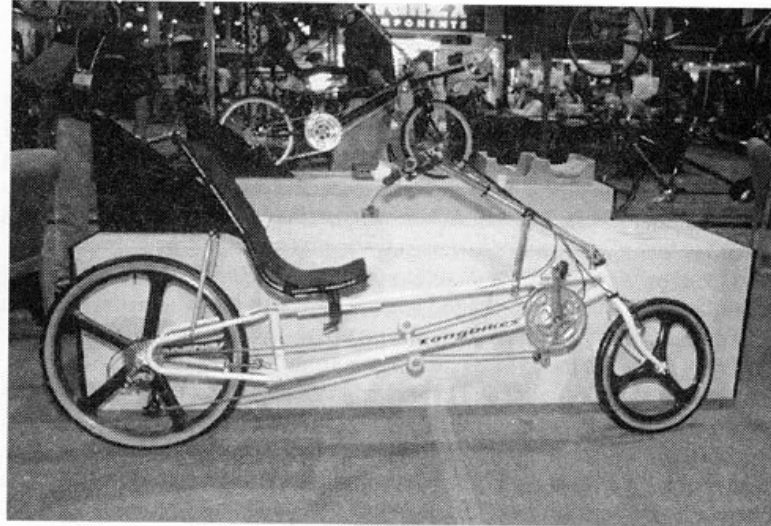
The Veloladen ScooterBike—John Riley

represent YEARS of refining, listening to customers, and refining again. Are the designs from the big companies going to be a match for that? They could try to copy, but without the feedback loop, they would quickly fall behind. They could compete on price, but they will have the same issues with low volume (compared to regular bikes) that current builders have. So far none of the big companies has indicated a willingness to lose money on this. They see no point in recumbent missionary work.

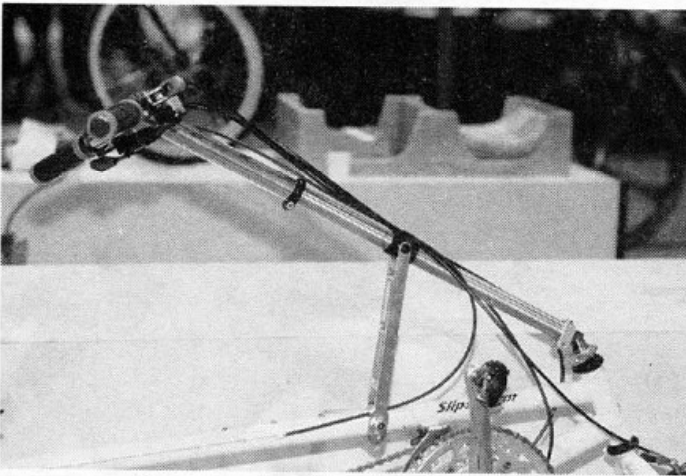
The trade publications tell bike dealers that it is no good to just have one recumbent on the floor. You have to have several and your staff has to know recumbents. Recumbents are harder to sell, they say, but they sell at



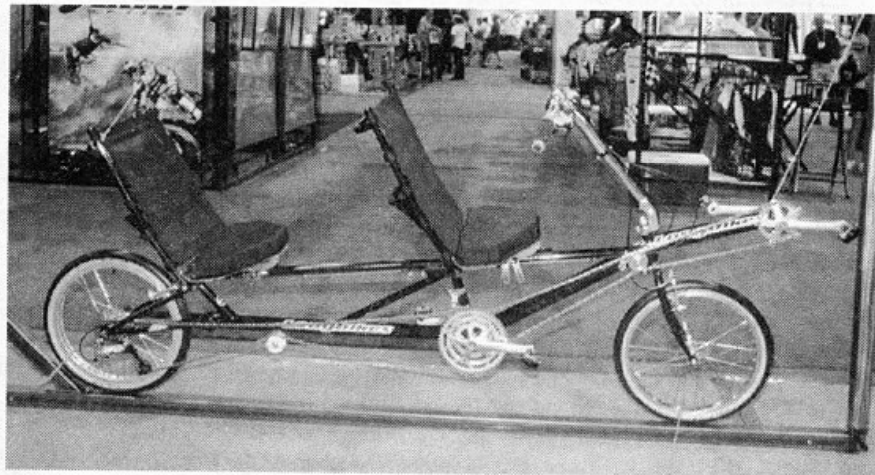
The new Longbikes Eliminator SWB USS—Photo by John Riley



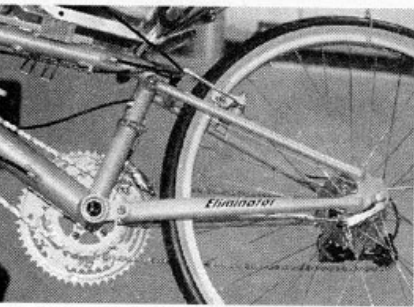
The new Longbikes Slipstream with U-joint-style above-seat steering. The bikes looks very cool, though we haven't tried it yet.—Photo by John Riley



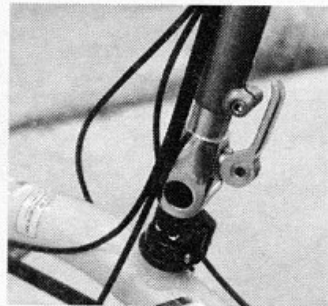
Longbikes Slipstream U-joint ASS—Photo by John Riley



The new Longbikes convertible tandem (converts to single)—Photo by John Riley



The Longbikes Eliminator SWB drivetrain.
Photos by John Riley



Lightning's very cool new fold-forward stem
Photos by John Riley

Are they going to make the commitment? Not as long as other bike markets hold up. They have no reason to. Meanwhile, we can look forward to excellent bikes built by enthusiasts, sold by enthusiasts, for people who like to ride. Check 'em out—they get better all the time. □

Ed. Note: Rans showed their bikes at Interbike, though has postponed their introduction until later this year. 2000 model specs will be the same as 1999. The Gliss, Vivo, V2 and Screamer will continue to be US built. The Velocity Squared is now available.

New Rans accessories will trickle in over the next year and include a new seat back bag in water proof, high visibility yellow fabric, carbon fiber-look abs fenders, possibly an updated seat clamp and a full line of model-specific racks, both front and rear.

There has been a rumor floating around the internet that Trek has purchased Rans. We have no idea where this rumor came from and believe it to be NOT true. Rans CEO Randy Schlitter had this to say, "No, we have not been contacted (Trek)."

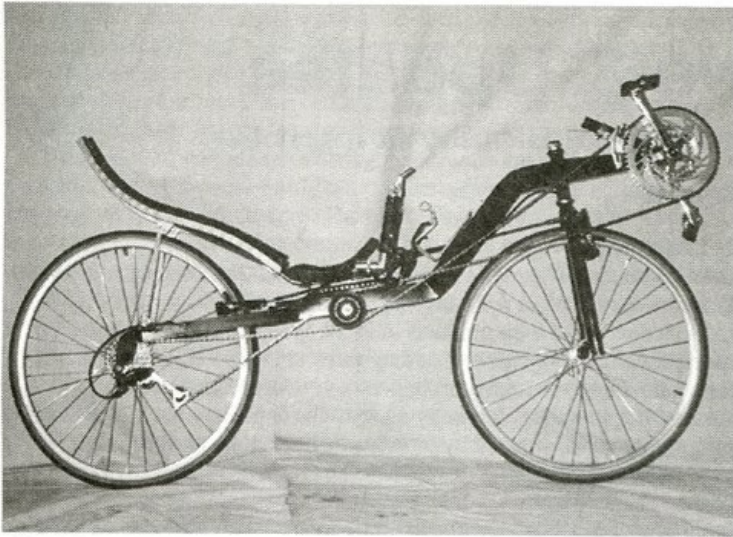
a higher price point to people that are likely to spend more money on accessories. There can be a payoff, but there has to be a commitment, they say.

Perhaps the same holds true for the big bike makers. They aren't going to get anywhere just dipping a toe in the water. And they won't be able to market recumbents the way they market other bikes. The beer and babes approach one sees at some booths isn't going to cut it. (Nothing against beer and babes, but they don't help me pick a bike.)

POSITIONS AVAILABLE

- ✓ RCN is seeking a fast working and affordable freelance proofreader/copy editor.
- ✓ Wanted Columnist. Fame, but no fortune. This is currently a non-paid position, though ad space barter or lets discuss it?
- ✓ We are also looking for reader-road testers—brave riders willing to write articles for RCN. We do not supply test bikes. We want to hear about your recumbent rides, bike-mods, thoughts and experiences. We are considering an expansion to more issues per year and we need to DOUBLE our current submissions. bob@recumbencyclistnews.com

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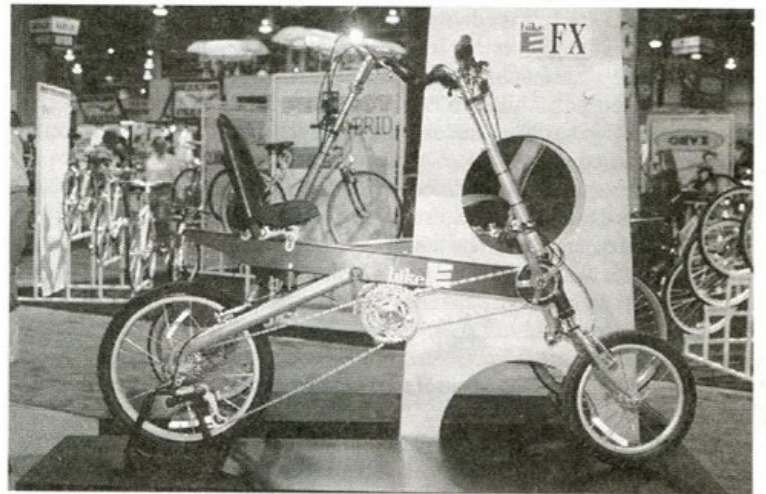
Not for the faint of heart—this is the new dual 26" wheel Reynolds Weld Lab Wishbone—Photo courtesy of George Reynolds



The 2000 Angletech Altitude SHO full suspension SWB ASS with drop bars, HED wheels and a host of hitch goodies. This is the best suspension SWB made



The new BikeE E2 Tandem. No, the fork is not backwards. You gotta have a sense of humor....and contrary to popular belief, we do—Photo by John Riley



The 2000 BikeE FX. Note the custom mid-drive crankset custom made for BikeE by an overseas motorcycle manufacturer—Photo by John Riley



The 2000 WizWheelz 2.3. sells for \$2195. See our upcoming road test in RCN#57. Photo courtesy of WizWheelz.



The German Zox FWD. See www.liegerad.com/zox or call Ed Deaton at Fools Crow in Florida.

More 2000 News & Updates

Updates from Manufacturers Who Do Not Display at Interbike

by Bob Bryant

Not everyone attends the Interbike Show to display their new models. Many smaller and direct and custom manufacturers don't go, or don't show. Here is the news from the rest of the recumbent world.

■ ANGLETECH

The coolest thing happening over at Angletech is the Rohloff 14 Speedhub (14-speed internal gear hub) equipped models. Just before press time we received our V-Rex RBT-14 and it is slick. For you recumbent addicts who have to have something new, this has got your name written all over it!

Angletech will begin delivering the Kelvin Clark/Mark Colliton (V-Rex & Barcroft co-designer)/Mark Nobilette designed high-end, high-performance recumbent. The bike has many upgraded features not found on other recumbents in its category such as: fillet brazed custom CroMo oval tubing, custom drop outs and custom investment cast sloping crown fork or titanium. The ASS riser is bead blasted and anodized grey and offers a top notch tilt mechanism. The seat has a lumbar curve, adjustable tilt angle and quick release delrin block slider and a new Angletech sling/mesh seat base that is cutaway for easy stand-over height. The MC2 comes in several variations from \$3295.

The Boulder-built Altitude SWB is upgraded for 2000 with a coil/oil rear shock which has 4" of travel. This is a lively and active suspension for the suspension connoisseur.

Angletech's other in-house models are the TriSpeeder and Quadraped trike, both having custom-built frames by Mark Nobilette, paint by Rainbow and custom in-house build.

Angletech is also a dealer for Rans, Vision, BikeE (and others) offering custom-spec and high end versions of many production recumbent models. Parts from Rohloff (new 14-speed internal hub), Phil Wood, HED, Avid, Chris King, Modolo, SRAM 3x7, Shimano and others can be found on RB-14, GL63, SHO, custom Rans Screamer tandems or other tricked out versions.

Kelvin Clark has the best reputation in the industry for building custom built and/or spec'ed recumbents to the most discerning customers. He has been dealing in recumbents for nearly 20 years and has dealt with such notable companies such as Moulton, Counterpoint and others.

Rumor—We found a KMC chain spec'ed on an Angletech Vision Ti Saber listing for \$4999 (we're sure this can be upgraded....).

■ BARCROFT

For 2000, Barcroft has added a tandem, the Barcroft Columbia, a unique compact two-seater that is short enough to be hauled on a standard rack on the back of a car, nimble enough to make U-turns on narrow streets, yet big enough to carry two tall riders on a high-speed ride. Designed by ex-racer and WHIRL rider Chris Burkhardt, who helps program the Hubble Space Telescope in real life, the Columbia rides on 20-inch wheels front and back. In order to reduce the bike's total length, the stoker sits above the rear wheel. Two-inch tires and acclaimed Rans seats provide a superior ride, while the stiff frame makes for sharp handling. Burkhardt's design is easy to build, which means Barcroft can offer this well-equipped bike for \$2995, a price well below recumbent tandems with equal performance.

Barcroft also is introducing a new version of its long, low Virginia, the GT. The new model has a 20-inch front wheel running in a compact, custom-made fork. With high-pressure Continental Grand Prix tires, the Virginia GT is a hot machine. Add a Mueller Windwrap fairing for even more performance.

The original Barcroft Virginia continues to be available with 16-inch front wheel and a full suite of high-quality components. The Barcroft Dakota is a slightly taller bike than the Virginia models, with 20-inch front wheel. The Dakota can take a suspension front fork. Both the Dakota and Virginia models have braze-ons for luggage racks.

■ BILENKY

Bilenky builds the former Counterpoint Opus (1/2 recumbent, 1/2 wedge tandem). We have not received info on their products, nor have they ever requested us to list their products in RCN. We have heard rumors of them assembling Greenspeeds or that they were a licensed US builder, but as it turns out, they have been working on their own recumbent trike.

Just before press time, John Snyder sent this to the hpv list, "Now Bilenky jumps onto the same track by introducing a recumbent trike to their product line. Catch this — it will have a reverse gear. A chatty ride report of the vehicle: <http://www.bilenky.com/rumors.html> Pictures: <http://www.bilenky.com/antigrav.html>."

■ BLACKBENT (Recumbent Barn)

Any educated RCN reader types will figure out that this is an "S & B!" Recumbent Barn's Ray Simonds made a deal with Jack Baker of S & B. Ray is said to have ordered 400 Blackbents for 1999. Recumbent Barn buys welded frames and fiberglass seat shells. We spent a few weeks this past summer with a 'Blackbent.' Our test unit came without a seat cover (raw foam) and we're not sure that there is one.

We were less than thrilled with this bike. It had a few defects, the cheapest no-name components we've ever seen on a recumbent and handling is extremely quirky (a very laid-back head tube angle makes tracking difficult; some riders like this odd trait, but not me). In early December, we were told that the bike is being redesigned and will be built by another source. Ray Simonds had this to say, "We are redoing it <the Blackbent> but I don't know when I will finish testing the prototype and have specs." Rumor has it that Recumbent Barn had the chance to buy the rights to the S & B Single/Blackbent design and passed on it, choosing to replace the design with their own new SWB design.

The S & B SWB/Blackbent is an acceptable quality SWB in the low price range. However, the design and build quality is not up to par with many of the other manufacturers. The short-lived Blackbent phenomenon has basically ruined the market for the more expensive S & B single. Jack and Smitty's mission is just to build affordable decent recumbents, and they are truly the losers in this situation.

■ BOULDER BIKES

Boulder is the co-designer and contract frame builder for Kelvin Clark's Angletech Altitude. For 2000, Boulder will offer it's own version of the Altitude. The primary differences are in the brakes. The Boulder Galaxy uses V-Brakes (instead of Magura's) and a different spec. The 2000 Boulder Serius is a Galaxy (Altitude) based full-suspension recumbent tandem.

■ BURLEY

The new Burley recumbent is a compact LWB recumbent with indirect (linkage) ASS. The seat is a mesh back, with a Corbin (motorcycle seats) base. The components are from the new Shimano Sora road triple group. The wheel combo is a 26/20 with a coil/oil rear suspension. The bike converts to SWB with no additional parts needed. At \$1299, it is a great buy from a unique company that is a welcome addition to the recumbent market. Burley has lots of dealers, so bikes should be easy to find once they are unveiled in April of 2000.

We have not yet seen the bike live or ridden it, though are hoping for a test bike sometime this year, though we haven't heard from the Burley design team in quite a while. Here is what the CABDA show Burley brochure said:

"The Burley Limbo creates a new performance standard for recumbent bicycles. The Limbo's finely tuned riding position and steering geometry combine great comfort and excellent high and low speed handling. The Limbo features an upright position for better visibility and improved pedaling efficiency. A carefully designed seat-to-pedal relationship makes

for easy start-up from a standstill and provides excellent ergonomics and power transfer. Offering a low step-over height, our large diameter 4130 CroMo boom tube is flex free and custom formed to accommodate a wide range of riders. Limbo seating is custom designed by motorcycle expert Mike Corbin, providing superior comfort and performance."

"Dual headsets and linkage steering provide natural and precise cornering without the awkward "tiller" effect or unstable handling encountered with many designs. The tiller effect is characteristic of the more common direct steering designs. When cornering, the rider must swing the handlebars through an unnatural arc—like a tiller on a sailboat. The Limbo's superior linkage steering replicates the feel and performance of a traditional upright bike."

"The Limbo is a recumbent that riders can grow with. The aft headtube permits easy conversion to a more responsive, high-performance short wheelbase recumbent. The SWB setting features an increased bottom bracket height and specific steering geometry for a more efficient power transfer and quicker handling. The conversion is done in 15 minutes requiring only 5 and 6mm hex wrenches."

"Our custom tuned RockShox™ coil-over rear suspension absorbs potholes, curb-cuts, and cattle bars with no pedal induced 'bobbing.' A full size 26" rear wheel enables a wide range of tire and gearing options. Using proven reliable materials and high quality conventional bicycle components, the 'designed and built in the U.S.A.' Burley Limbo is easily serviced at any professional bicycle shop."

The above is from Burley's promotional material.

■ CAMBIE CYCLE

Cambie is a full service bicycle and recumbent shop as well as a custom builder. They build both LWB ASS and SWB ASS rear suspension recumbents, a recumbent tandem (Easy Racer style) and recumbent trail-a-bike. Fabrication is very high quality, and with the exchange rate, the bikes are good values as well. Check out their website at www.cambiacycles.com.

■ CANNONDALE

Select Cannondale VIP's, dealers and friends (read NO MEDIA, we tried really hard....) were invited to see the future of Cannondale at the Las Vegas trade show. Rumor has it that the bike was declassified for an ever-so-brief glimpse. The recumbent is said to be a high performance full suspension SWB ASS with a Headshock salted for the under \$2000 price range. We have a Cannondale Headshock Mountain bike here at the RCN offices. If Cannondale does introduce this bike, you can bet that it will be the best front suspension ever installed on a recumbent. The Headshock is far superior to ANY Ballistic, RST or Suntour fork that the likes of recumbency has ever seen. Cannondale has subscribed to RCN for years, and has nearly every RCN in print.

■ COMFORT CYCLE

The former owners have disappeared. The contract frame builders (Cycle Creations) have been marketing an updated Chaise 3 through the Internet and a handful of dealers. Another company, Penninger Recumbents (see listing) now markets a very similar trike. They have reportedly corrected the problems with the previous versions, though have no ties with any of the previous companies.

■ EARTHCYCLES

The new "Sunset" is a 406mm 20"/305mm 16"-wheel equipped high performance SWB style lowracer. The bike has a unique monoblade front fork and split frame for rider size adjustability. Many of the systems are directly off or similar to the Dragonfly trike. The chainline is such that the chain can be run up over the idlers or free alongside the front wheel. Earth Cycles has ambitious racing plans for USCF, time-trial and HPV racing in 2000. The Sunset will sell for around \$2400.

Company news: There has been a bit of a reorganization at Earth Cycles. Shean Bjoralt is still at the helm, though his partners have left.

■ EASY RACERS, INC.

The big news is in the licensing of the EZ1 to J & B/Sun. This compact model will immediately become the lowest priced compact (with nationwide availability) at \$500. Easy Racers has also developed a new

rear suspension version of the aluminum Gold Rush Replica. Rumors persist of a EZ1-style tandem as well. Easy Racers continues the tradition of the best performing and finest handling LWB ASS bikes made—an RCN favorite for years.

■ GREENGEAR/BIKE FRIDAY

The main claim to fame for this model is its ability to fold and do so quickly. It can easily be stowed in the trunk of a car due to the tiny dual 16" wheels and ingenious Greengear folding mechanism. Refinement is the name of the game for 2000. Greengear offers several models of their SWB suitcaseable folder with dual 16" wheels starting at \$1795. Our test bike has been delayed until Spring 2000, though we are still looking forward to reviewing this bike...though our test bike is late.

■ HUMAN POWERED MACHINES (HPM)

Quite possibly the busiest man in recumbency is Jan Vander Tuin. Besides running CAT (Center for Appropriate Transport), dabbling in Cycle Oregon (publication) he builds some bikes. The really good news is that these custom built recumbents haven't had price increases. Imagine a LWB OSS dual 26" complete for \$1200. Well, we have one coming and it will see a mid-2000 RCN review. Also worthy of note is their new folding SWB based on their "Swift" folding upright. All of the SWB, LWB, trikes, workbikes and trailers are available for 2000. It is difficult to get a hold of Jan, and customers need to be diligent, but the bikes are very nice and excellent values. Look for a Roadster (dual 26" LWB ASS) soon!

■ INFINITY

The Infinity is the square aluminum tube LWB USS that has been around for years. Ace Tool of Indiana sold the rights to sell the bike to Bike Emporium in Scottsdale, AZ. Bike Emporium keeps a very low profile in the recumbent world. Of the blue, we received a one page brochure in December. It would seem that the bike is still available to mail order purchasers. The bike still has cable actuated USS, though now has bar-con shifters mounted on bar extensions. The wheel combo appears to be a 26"/406mm 20". The bike has a CroMo fork, Tektro V-brake, a roller-rear brake (BMX?) and a Shimano drivetrain. The bike comes in two sizes (63" & 67", which we presume is the wheelbase) and comes in yellow and black. The biggest surprise is what appears to be a Rans seat. The Infinity was always a pleasant and comfortable riding LWB. This appears to be the nicest Infinity ever spec'ed.

■ INSPIRED CYCLE ENGINEERING (ICE)

The folks from the UK who are at the helm of Peter Ross' former company are doing great things. There are now three trike models. The Classic is as close to the Trice we have known for years. The "XL" is the new extra low high performance model (8" seat height/ 13" bottom bracket). The "Explorer" has a higher seat and a lower bottom bracket for larger riders and for touring (12.5" seat height/15" bottom bracket height) and 3 20" wheels. We suggest that you contact US dealers The Bike Rack and Fools Crow Cycle who are specializing in Trice. Hal at the Bike Rack says that a seat update and possibly a head rest are upcoming. Specs will vary as US dealers import framesets only.

Rumor—A Trice tandem trike?

■ LINEAR

For the first time in years, Linear did not attend Interbike. We've had a difficult time getting information from Linear. According to an email from the factory to John Riley, here are the changes in the line: 2000 models will feature a higher quality anodized finish. The bikes have been made lighter (though no weights have been given) and stiffer (though no examples have been offered) throughout the range. The CLWB Mach III is reported to be available with above-seat steering (we've been hearing this for years wouldn't but count on it until we see it).

■ ORGANIC ENGINES

Dan Kavanagh is Organic Engines and is a small custom builder in Tallahassee, Florida (formerly with Fools Crow Cycle). Dan has demos of most of his models at his shop. He has a limited dealer network and a fleet of owners who are often willing to give test rides. Dan builds a SWB, trike, tandem SWB, a tandem trike and a cargo trike.

The SWB ASS Vapor is available with 26/20, 20/20 or 20/16 wheel combos. The wheelbase is 39" and the bike weighs about 30 pounds. The fork is an RST suspension and parts are Shimano 105/XT. It sells for \$825 (frameset)/\$1550 (complete bike).

The Triclops trike is equipped with a mix of Shimano LX/RX100 with a Sachs/SRAM 3X7 rear hub. Seat height is 13", wheelbase is 38" and track is 32". The TriClops sells for \$2150.

The Daisy Mayhem tandem is equipped with a Shimano Deore XT/Ultegra group. The wheelbase is 82.5" (20/20 would be about 80"). The captain's seat height is 23" and the stoker seat height is 23" (is a bit lower on a 20/20). The weight is about 45 lbs. The Daisy sells for \$1750 (framekit)/\$3200 (complete) and includes RST suspension fork.

The Troika tandem trike is equipped with a Shimano Deore XT/Ultegra group. The front brakes are Sturmey-Archer hub drum brakes. The weight is about 55 lbs. The Trioka sells for \$4000.

Dan builds a cargo trike called the Sensible Utility Vehicle. Pricing on request. All bikes are TIG welded 4130 CroMo steel, seats and accessories are 6061 aluminum. SUV backbodies are MIG welded and the pedicab and sweeper contain mild structural steel tubes. 35 and 50-gallon versions use 4130 CroMo tubing. The Tandems are now available with a custom proprietary coupling system that allows for easier transport and shipping.

■ OSELL

This company reportedly builds nice LWB touring recumbents in Minneapolis, MN, using Rans seats, Easy Racer bars, etc. We have never received any printed information on these bikes, though we hear that they are pretty nice.

■ PASHLEY

The PDQ (former Counterpoint Presto) and PDQ3 (Triad) are still available, though you must deal directly through Pashley in the UK. Any recumbent dealer can order one for you. The PDQ is a fine bike, though is not price competitive in the USA. The PDQ3 is. Hester at Absolutely Recumbents in Albuquerque, New Mexico reports excellent results with the PDQ3. They are the only Pashley dealer that we are aware of at this time. And since we like to recognize specialists, we suggest you give Hester a call.

■ PENNINGER

This is a new company building a trike similar to the old Comfort Cycle Chaise 3. Penninger has nothing to do with Comfort Cycle, or any other previous builder or marketer of this trike. Here is what company owner Charles Penninger wrote to RCN, "Just to bring you up to date on why we chose the old Comfort Cycle design to work with. First, I had bought a Comfort Cycle for my wife in December of 1998. It had shifting problems that could not be corrected because of misalignment of the BMX gear and the rear drive freewheel. Second, the steering was tricky, sloppy, jerky, loose and locked up when a steering arm was pushed or allowed to fall forward. Third, coming from a manufacturing background, the welding left a lot to be desired. Fourth, Comfort Cycle had left the planet, as I tried to contact them, phones were disconnected and Internet links were dead ends. Fifth, the research could not find any patents that would be infringed upon."

"Hal at the Bike Rack in St. Charles, IL (where I bought the trike) told us there was nothing he could do to correct the shifting and steering deficiencies. It was at that time Hal told us Comfort Cycle had gone out of business. Hal overheard my wife saying I should build her a better one. That was when Hal learned of our manufacturing capabilities. Hal was interested in buying what we could come up with and I talked with other dealers that were also interested in the design even though it had problems. In January of 1999 we began to redesign the Comfort Cycle. We finished the first production model in mid August. We corrected the misalignment in the drive train, we changed the fork angle to stabilize the steering, we applied high quality TIG welding, we redesigned the frame to simplify it and make it manufacturable, we improved the sling seat by adding a strap to hold the sling to the hoop which better distributes the load that caused the Comfort Cycle sling to tear at the corners. In general all aspects of the design were addressed to improve quality and dependability. From pictures of the two trikes, a delta trike is a delta trike and it

is difficult to see the differences, but side by side there is no comparison."

"Penninger Recumbents was born out of a market need from a parent company that has been manufacturing since 1980. We have done all the things that Comfort Cycle and Cycle Creations could not. By the time I heard that Cycle Creations had picked up the Comfort Cycle design, it was May of 1999 and I had far too much invested in the redesign to give it up.

The delta trike is not for everyone though it is a high quality smooth-shifting trike that can hold its own against most riders."

■ PETER ROSS

Peter has sold the design rights to the Trice to ICE. ICE has decided not to produce the Speed Ross SWB, Festina LowRacer or GEM (side-by-side three wheeler). The Speed Ross is about to reenter production with a new frame builder. The Gem is being readied for production as you read this. Festina production drawings are next on Peter's agenda. The aim in each case is to have these models built by a subcontract frame builder.

The Gem sociable quad's layout remains unchanged, but the transmission is quite different, with each rider having his/her own drive train, and driving his/her own rear wheel. This allows each rider to choose his/her preferred gear and cadence, and makes gear changing much easier.

There will be two models of the GEM (take-apart and rigid frame). A Performance model with 27 speeds (US \$4999), and a Cruiser with Shimano Nexus 7 and drum brakes (US \$NA). The latter is for those who live in flatter areas and do not need the extra cost of a wide range of gears and the ability to descend mountains without brake fade.

Finally, Peter hopes to design a trailer version which allows a train of up to four Gems to travel together. No photos were available by press time, though we hope to have a GEM review soon.

■ PHAROBIKE

We have received a report that Pharobike company owner and designer Dan Duchaine has passed away. We wish to offer our condolences to his family. We have an upcoming tribute article to Dan and his Pharobike (RCN#57).

■ RADIUS (attended Interbike)

This company built legendary suspension recumbents through early 1998. Nils Palm bought the rights to the Radius name and now markets Taiwanese built MWB and SWB models. Radius USA is the distributor and we have a C4 test bike. What is especially cool about this manufacturer is that we get to see Euro-spec recumbents with lights, fenders and all of the safety equipment that should be on all recumbents.

■ REBIKE

According to Huff's Bill Smith, "The ReBike is still being sold and shipped to Sears although it is only in limited markets and not available nationally. We are planning to expand our distribution with a relaunch of a new line of ReBikes at the upcoming Super Show in Atlanta but I would not expect to see those in retail distribution until Fall 2000."

■ REDBENT

The story of the bike painted red (Redbent). The following is the best that we can piece together. We go back to last year when it was announced that Radius, maker of fine recumbents in Germany, had gone out of business. The Radius trade name was purchased by Nils Palm (of Gecko fame). After Radius went under, Ray at Recumbent Barn found out that Peter Ronge, a principal of Radius, had a container-load of the EuroMWB "Red Pepper" frames sitting somewhere on a dock warehouse in Shanghai. Somehow, Ray managed to make contact with Peter and buy a container load full of 250 (rumored quantity) Radius Red Pepper frames. They are rear suspension, MWB, ASS frames that are unpainted with no components or handlebars (the bike is similar to the Radius, but nowhere near as refined). The original spec called for a 3x7 21-speed. RecBarn wanted to keep the price low, so he decided that he'd use his Taiwan grab bag of parts and build 7 and 21-speed versions to be sold for \$395/\$495 retail. The 21-speeds would require a derailleur post since the 3x7 was now out of the picture. This would be easy since the frames were unpainted. Apparently the add-a-derailleur post plan didn't work as the 40+/- pound Redbents are now sold as 8-speeds. We haven't read any glowing reports of these bikes and it seems that VERY few have been delivered. We've

heard stories of problematic ASS units and multiple returns. In early December we were asked not to print the Redbent specs in this buyers' guide. Recumbent Barn's Ray Simonds said, "I will run out <of Redbents> by June or so. I am thinking that I want to do something a little different." (Watch for our upcoming Radius C4 review.)

Radius continued to refine this bike, and the vastly superior model is the currently available C4.

■ REYNOLDS WELD LAB

Possibly the fastest unfaired SWB recumbents commercially. George now offers a tailbox kit for \$150 that is said to add 3 mph! A streamline kit with a fiberglass nose, coroplast and a body sock will be available soon. The coolest thing about Reynolds is that this stuff is affordable by comparison to everyone else doing high performance recumbents. And they are essentially custom built. George also says that any component upgrade is available as are either a 26" or 20" rear wheel or a dual set up for both.

George has been working on a neat dual 559mm 26" SWB USS with a seat height of 18" and BB of 29"—high crank, low seat. According to George, "when I have the seat laid back my sight line seems to go infinity and beyond" (Buzz Lightyear). You can't tell me that's not an extreme riding position, though as long as you understand what you are in for, George makes the coolest low and laid back bikes around.

In a late update, George reports that his dual 26" Wishbone is now on the road. He also has two new models based on the Wishbone and Nomad that will be made out of 2" .035" CroMo round tube (instead of formed CroMo), they will be much easier to make and cost \$1000.

■ S & B RECUMBENT

The bottom pretty much fell out of the S & B SWB market every since they started supplying framesets to Recumbent Barn for the Blackbent. Jack Baker told RCN in November that the S & B SWB (Blackbent) design is for sale and Recumbent Barn has first option. In December, we heard that Recumbent Barn was looking for a new frame source and Jack Baker was not sure if the S & B Single frame would still be sold as the "Blackbent" for 2000.

S & B is still happily building their three trike models (including a special needs hand-cranker), a newly upgraded tandem, a hand-crank trike and is working on a new folding "compact" recumbent that will sell for less than \$1000.

■ TERRA CYCLE

The TerraZa is a custom built dual 20-inch wheeled SWB built in Portland, Oregon. For 2000, the TerraZa now comes with an ovalized transverse tube. It looks really stylish, and people get it that it's not a bottom bracket. Check out our review of this bike in RCN#53.

■ TREK

As expected, Trek is pretty lame in the PR department. We received two CD's full of junk we didn't need only to find the same photo we ran last year. Trek is well aware of the criticisms of its design. Expect tweaks to

improve the bike's problematic systems. We've heard unconfirmed rumors of a convertible R200 Tandem "kit" as well as rumblings of a surprise low-end recumbent cruiser in the works.

■ TURNER

Milt Turner now offers a 20" front wheel option, has front and rear fairing options as well as a composite model. His recent mailer listed the fairings as well as rare UNI wheel disc wheel covers. We have heard ramblings of a Turner LWB!?! Could his be so? Look for a T-Lite test soon (no, not by Bob...).

■ WICKS AIRCRAFT

Wicks is a respected kit-aircraft parts catalog seller. They have been a homebuilt recumbent parts source for many years. Late last year, they became licensed to build and sell Greenspeed frame kits. We are not sure what happened, but Greenspeed had a falling out with Wicks and revoked their license to build trikes. They are now developing a trike/recumbent kit of their own.

■ WINDCHEETAH

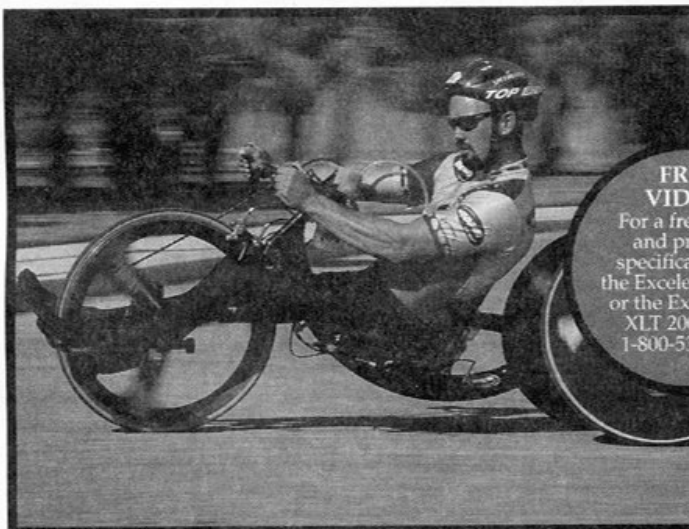
Windcheetah does not have a North American distributor at this time, though you can order a very special limited edition (about 50) Windcheetah from the Neiman Marcus catalog—a very exclusive Windcheetah, indeed. It has a special lightweight chassis made from composite tubing, and lots of Titanium parts. A special front and rear fairing package is included. The weight is about 31 pounds with fairings and the price is about \$7500.

The Windcheetah is the most exotic recumbent trike made in the world today. People who own them generally love them as they are part of a very exclusive club. The trikes are bonded aluminum, fastened with a locktite like glue and are a bit on the delicate side. The spherical steering rod-end bearings are the most petite we've ever seen on a recumbent trike. This is definitely NOT a robust touring trike, though most who've ridden it are entranced with the design.

■ WIZWHEELZ

WizWheels is a company that has struggled with growing pains (like so many other recumbent companies). Our first attempt at a trike test was a disaster—and we're not placing the blame on WizWheelz. Primarily, it was timing and communications. We have worked very hard to get a new 2000 WizWheelz 2.3 test bike and will have the review in RCN#57.

WizWheelz has made many improvements over the past year. They now offer their own mesh seat. The best improvement is the new 3 x 20" wheel design which has improved handling, weight distribution, steering and even the look of this bargain recumbent tricycle. This is the most affordable enthusiast recumbent trike in the USA and we're pretty jazzed about that. Be sure to watch for the road test, and check out WizWheelz web site to see all of the new updates. Let them know that you read about it in RCN. □



FREE VIDEO!

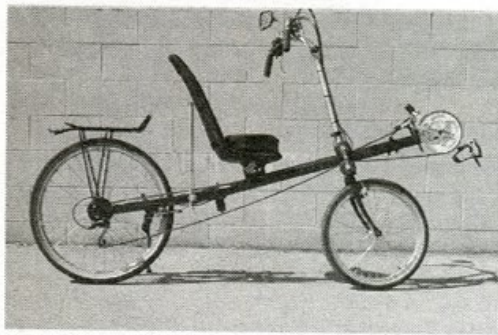
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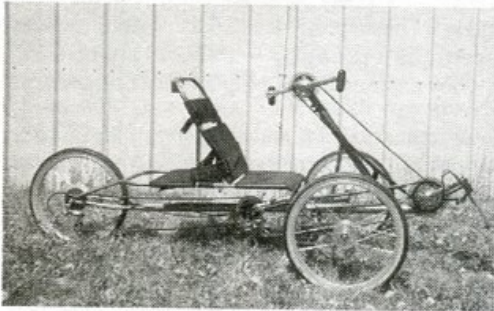
The Cambie Recambini SWB



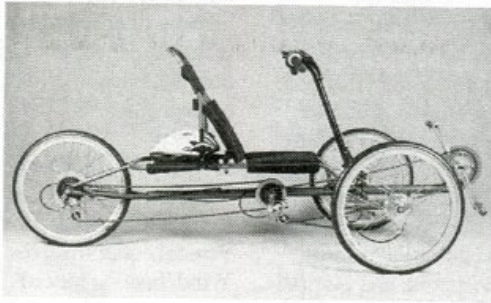
The 2000 \$1945 Rans Velocity Squared (V2)



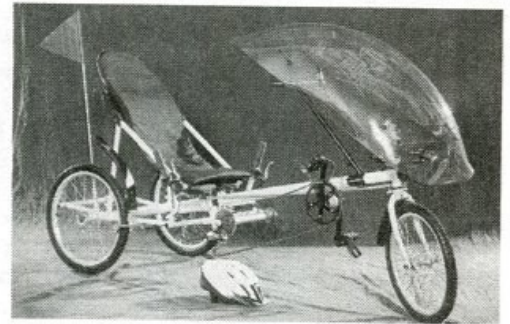
The Rans Rocket—An incredible bike for \$995!



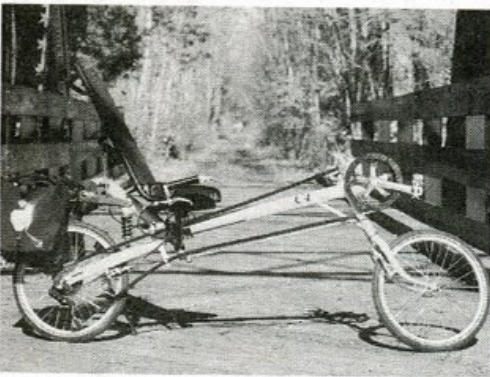
The Angletech TriSpeeder



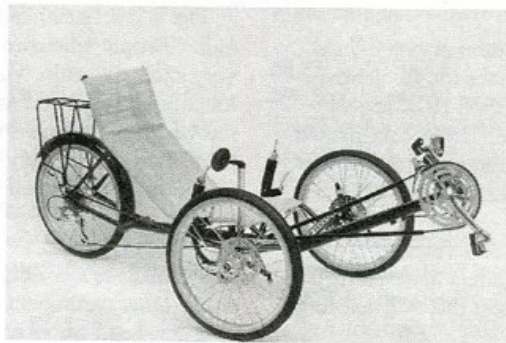
The Angletech TriSpeeder



The Penninger trike (photo is Chaise 3)



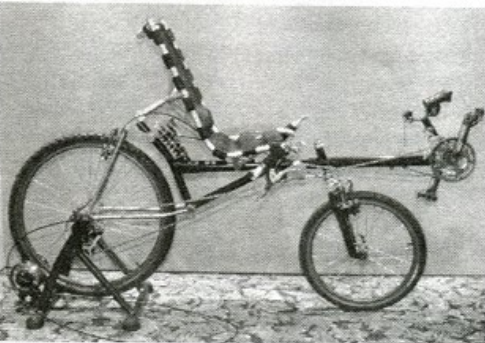
*Radius C4 MWB. Look for a road test this Spring—
RadiusUSA*



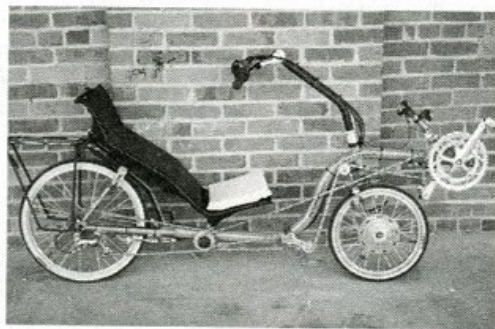
The Greenspeed GTR trike—Greenspeed



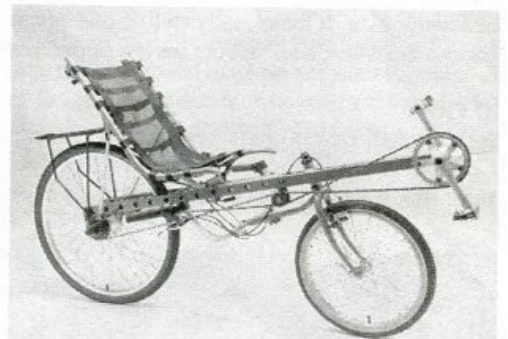
The Cambie Recamboni LWB—RCN



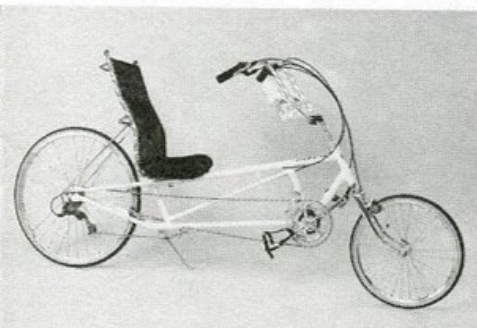
*Haluzak's new Traverse is being redesigned again
since this picture was taken. This is a 4-bar linkage.
The new version has 3 bars—Photo by John Riley*



The new Earthcycles lowracer



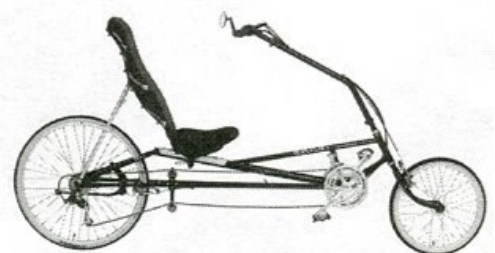
The Human Powered Machines Trick SWB—HPM



*Easy Racer White Gold (GRR) with Kool Back Seat
24 Recumbent Cyclist News*



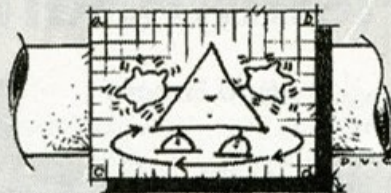
The Lightning P-38



The Rans Stratus

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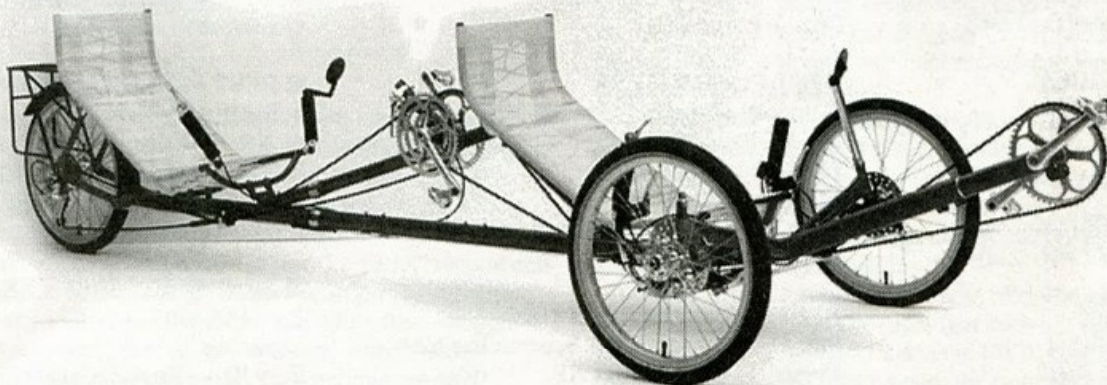
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RCN's Most Wanted

The BEST Recumbent Bicycles

by Bob Bryant

In the year 2000—Recumbent Cyclist News will celebrate its 10th birthday and see its 60th issue. As owner/editor/publisher, I have been a recumbent rider for 13 seasons and a publisher for 10 years.

It's difficult to explain my need to discuss my opinions with readers. I value this aspect of my 'job' more than any other. For a bike to achieve a good RCN review, we look for a manufacturer with an excellent design, high standards, a positive and proactive attitude. It also helps when they are trying to build the best possible recumbent in their category.

The GREAT manufacturers truly rise to the top. They care about how their bikes fare against the competition and in the eyes of the recumbent enthusiasts. Those who only care about getting a share of your hard earned cash and selling bikes by smoke and mirrors, BS and roadie cliches (lies?) choose not to participate in our process.

So, before I sign off on saying that a bike is an RCN BEST, you can bet that I've had a VERY good experience with the bike. We do take a bit of a chance offering new companies BEST awards, but hopefully, you will embrace the good ones and they will be around for a few years.

■ BOB'S TOP 10

If you select one of these models, you can be sure that you're getting one of the best recumbents made.

1. Easy Racers Gold Rush/TiRush
BEST PERFORMER LWB
2. Rans V-Rex *BEST SWB*
BEST ALL-AROUND
3. Easy Racer Tour Easy EX (refinement)
Rans Stratus (value) *BEST LWB* (Tie)
4. BikeE AT *BEST COMPACT*
5. Rans Rocket—Rans Tailwind
BEST ENTHUSIAST BARGAINS
6. Greenspeed *BEST TRIKE*
7. Angletech Altitude *BEST SUSPENSION*
8. Longbikes Vanguard/Slipstream USS
9. Haluzak Horizon USS
10. Lightning P-38 *BEST PERFORMER SWB*

■ NEW BIKES

BEST NEW COMPACT—BikeE FX (mountain recumbent)—This is the coolest compact to ever grace concrete....and dirt! From

the new colors, to the triple crank mid-drive, to the laser-etched custom crankset, to the BikeE designed front suspension fork—nobody can top BikeE's compact R & D—the FX is the ultimate recreational enthusiast recumbent for any terrain—with finish quality better than bikes costing twice as much! Now all we need is a road version with the new shock fork.

BEST NEW SWB—Angletech RBT Rohloff-equipped V-Rex (also available on Stratus, MC2 and possibly others. Look for a review soon.

BEST NEW LWB—Rans Velocity Squared. Our V² test bike arrived here in late February. Look for a road test soon.

BEST NEW TRIKE—The WizWheelz TerraTrike 2.3. Hey, it's a great trike for a lot less than the competition. Read all about it in RCN#57.

BEST NEW MANUFACTURER—Burley for the new Limbo. Burley is a neat company and a welcome addition to recumbency. We have not yet been able to ride the new Burley convertible recumbent.

■ MORE BESTS

TOURING RECUMBENTS

Compact—BikeE
LWB ASS—Rans Stratus (check out Angletech fat tire tourers)
LWB—Longbikes; Vanguard or Slipstream USS
SWB—Angletech Altitude
Trike—Greenspeed

BEST COMMUTERS

Compact—BikeE CT (cheaper)/AT (comfy)
SWB—Rans Rocket
LWB—Rans Tailwind
MWB—Radius C4
TRIKE—Earthcycle Dragonflyer (with rear suspension)

BEST NEW RIDER VALUES

Entry Level—Sun/J & B Supercruiser EZ1
Compact—BikeE CT or AT
LWB—Rans Tailwind
SWB—Rans Rocket
Trike—WizWheelz TerraTrike 2.3

BEST BIKES FOR SHORTER RIDERS

Compact—BikeE CT/AT (Extra small size)
LWB—Easy Racers Tour Easy or Rans Stratus
SWB—Lightning Thunderbolt, Stealth or P-38 (small front wheel and several frame sizes for shorter riders)
Also: Haluzak Leprechaun (still fairly tall due to seat design) or Vision SWB 16.
Trike—Greenspeed (Custom frame sizes)

■ BEST BIKES FOR TALLER RIDERS

Compact—BikeE (custom sizing available)
LWB—Longbikes (custom sizing available)
SWB—Longbikes (custom sizing available)
(If you are light & tall, check out Lightning—several frame sizes)
Trike—Greenspeed (custom sizing available)

■ BEST BIKES FOR LARGER RIDERS

Compact—BikeE CT/AT (custom sizing)
LWB—Easy Racers Tour Easy ASS & Longbikes USS
SWB—Haluzak (will build custom)
Trike—Greenspeed (will build custom)
Ask manufacturers about weight and warranty limitations.

■ BEST BIKES FOR ROADIE TYPES

Compact—BikeE NX
LWB—Easy Racers Gold Rush or TiRush
SWB—Lightning
Trike—Windcheetah

■ BEST USED BIKES

(Very tough bikes with good resale)
Rans Tailwind (1997 or newer)
Rans Rocket (any)
V-Rex (24" & 26" rear wheel models are best)
Rans Stratus (mid '90's or newer are best)
Easy Racers LWB
Ryan/Longbikes Vanguard
Greenspeed

■ BEST SELLING MAKES

1. BikeE; 2. Vision; 3. Rans; Easy Racers

■ BEST SELLING MODELS

BikeE CT/AT; Vision R40 SWB USS; Rans Rocket/Tailwind; Easy Racers Tour Easy;

■ BEST RECUMBENT SEATS

Rans ('00)
Lightning
Easy Racer Kool Back ('99.5 is best).
Note A: It is tough to judge seats without prerequisites. Not all seat types work on all designs. We like the idea of the Vision air cushion, though have not been given the opportunity to try any '00 Visions.

■ BEST RECUMBENT EVENTS

Midwest Recumbent Rally (Hostel Shoppe)
WHIRL's Big Ride (recumbents.com)
Wheel & Sprocket's Recumbent Event
Angletech's Slumgullian Colorado Tour
People Movers Rally
Anyplace recumbent riders congregate ☐

How to Buy a Recumbent Bicycle

by Bob Bryant

PART I INTRO TO RECUMBENTS

The recumbent experience is totally unique in the bicycle world. There are racers in streamliners, tourists riding across the country, average folks riding for fun or fitness and club rides and somebody's mom getting back on a bike after 20 years. The one thing they all have in common is comfort.

There is a lot to know about recumbent selection. It is a topic that can be studied as deeply as one might like, or do it the fast & easy way by wandering into your local shop and choosing one. This may actually be the easiest if you are an entry-level customer looking for a first recumbent. Think budget and compacts (CLWB). For advanced or more serious riders, you need an education. The biggest problem facing recumbent customers is the lack of information sources—that's where we fit in.

The first question I need to ask you is WHY do you want a recumbent? All recumbent bicycles are NOT created equal. They all have their pluses and minuses. There are many reasons to consider buying a recumbent, but first and foremost is comfort. When you ride a recumbent bicycle your body feels good—no pain. Your arms and wrists are totally relaxed—as they do not support your weight on a recumbent. Your neck and shoulders are relaxed—because you are looking straight ahead. Your bike seat offers full ergonomic back support—and total comfort. Your hind quarter wonders what kind of a seat this is and why there isn't pain, chafing and numbness. Another benefit of the recumbent seating position is a more open chest and diaphragm that makes for easier breathing. You will be able to ride longer with less fatigue and arrive at your destination feeling refreshed.

In an attempt to make this article easier for you to navigate, we have divided it into the following chapters:

- PART I INTRO TO RECUMBENTS**—Page 27
- PART II RECUMBENT RIDER ERGONOMICS**—Page 30
- PART III RECUMBENT DESIGN CRITERIA**—Page 31
- PART IV RECUMBENT COMPONENTS**—Page 32
- PART V RECUMBENT MFRS & DEALERS**—Page 35
- PART VI FINDING A USED BIKES**—Page 36
- RCN GLOSSARY**—Page 48

■ RECUMBENT COSTS

We can get started with the bad news first. Recumbent bikes are expensive, cost nearly double (sometimes more) than the equivalent upright bike and you get what you pay for. There are some good deals, but the prices are still up there compared to upright bikes. The more serious a rider you are, the more you may have to spend on a recumbent.

✓ **Comfort Cruiser Class About \$500**—These "compact" recumbents are perfect for occasional rides of up to 10 miles or so per outing. These models get just as many looks and offer incredible riding fun—though they can be quite a bit heavier, and use low-end steel wheels and components. These may wear out under heavy commuting/touring/enthusiast use, so our suggestion is to spend more on your initial purchase.

✓ **Entry Level \$650-\$1200**—These are the bread and butter of the recumbent industry. There is lots of value in these models that are often times the loss leaders for the manufacturers. They are perfect for light touring & commuting as well as some club rides. Some upgrades may be necessary for heavy use or long distance touring. Some items to consider upgrading are the chain, crankset and shifters. Expect a bike in the <35 pound range with 21-27 speeds, and mostly good alloy components. These are the best values in recumbent cycling. Excellent examples are available from Rans Rocket, Tailwind, Wave, Vision R40 and BikeE CT/AT.

✓ **Enthusiast \$1200-\$2200**—These models are what most tourists, club riders and enthusiasts need. The values are fair, but not as good as the entry level models. Enthusiast models have upgraded drivetrains, wheels and other components—although some may still need a few tweaks. These

models should be good for any kind of abuse the enthusiast rider can dish out. Excellent examples are available from Haluzak, Rans, Vision, Easy Racers and many others.

✓ **Advanced Enthusiast \$2200-and up**—These are the dream bikes. Full suspension, high-end componentry, hydraulic brakes, custom specs, fairings, etc. They are worth the money, some more so than others. The bikes worthy of this segment have been around for awhile, are dialed-in, refined and have the clout necessary to charge such a price tag. Look for a high level of friendly service and hand-holding. Do not settle for any low-end componentry or corners cut. This is the MOST profitable segment of the recumbent market. Customers deserve the RED CARPET treatment. Carefully consider the high-tech gizmo components that nobody knows how to work on. Tried and true can still be had on a high end bike. The high-end custom spec dealers who specialize in these bikes often have time budgeted to cater to your every recumbent whim.

■ BASIC RECUMBENT SELECTION

Recumbent bicycles come in all shapes, styles and sizes which makes selection that much more difficult. Each one of the recumbent types and styles can include subcategories of entry level, recreational, loaded touring, off-road and high performance. There are fat and skinny tire versions (often of the same model) as well as high or low-BB models in each category. Before we define the models by criteria, we will introduce the styles to you. Before we do that, here are some other basics to consider:

✓ **New Recumbent Cyclist**—If you are a non-cyclist, haven't ridden in years and just want a good place to start, we recommend the Compact recumbent. They are inexpensive (under \$1000), tough, durable and easy to ride. Don't expect club-rider speeds—these are recreational bikes.

✓ **Budget**—Choose your budget and stick to it. Understand that entry level bikes are the least expensive (\$500-\$1199). If you want a serious enthusiast bike with good parts, you need to spend more (over \$1200).

✓ **Versatility: Where and how you ride**—How will you use your bike—bike trail, touring, commuting, club road rides, off-road riding, racing, or will it fit your transit system's bus racks or your car rack or stow in your office? The most versatile recumbent depends on what is on your personal versatility list.

✓ **Bikes that you currently own/like**—Are you a performance rider (drop bar racer), mountain biker, city biker or do you like the rare and odd bikes. Your cycling preferences will most likely crossover to recumbents.

✓ **Bikes that appeal to you**—What grabs your attention? The Harley Chopper-like Easy Racers, high-tech Haluzak, technoweenie SWB ASS Lightning or friendly BikeE.

✓ **User Friendliness**—One simple rule. The higher the bottom bracket/pedals and more upright/or super laid back the seat, the more extreme the riding position. Compacts (and some LWB) own user-friendliness. SWB bikes often have heel overlap with the front wheel. LWB are long and large bikes. Under-seat steering takes more practice.

Because there are no arbitrary rules to limit the design process, recumbents come in every shape and size you can imagine. A recumbent may initially feel foreign to you: too sensitive, overly-quick or it may take you some time to get accustomed to the position. These are traits of the recumbent newbie. The word to remember is RELAX! Lean back in the seat, take a deep breath and enjoy the ride. Many of the symptoms can be traced directly to upper-body stiffness from riding your upright. Allow your body to relax and stay loose. Your next decision will be which design style to choose.

Not all recumbent styles are created equal. All have their strong and weak points. Think of each model having a check list of pluses, minuses and compromises.

Next we'll take a look at the different types of recumbent bicycles:

▲ LONG WHEELBASE (LWB)

These long and limo-like recumbent models have wheelbases of 60-70 inches. The pedals/BB are behind the front wheel and low to the ground. Steering is above or under seat. The LWB design concept dates back to the turn of the last century, though the first commercial model, the Avatar, was manufactured in the early 1980's. The design is very simple and straight-forward. The only complexities are with under-seat steering models. The design is such a no-brainer—they work great. It makes one wonder why there isn't more market competition.

Wheels—Full size drive wheel and smaller, usually 20" front wheel.

Drivetrain/Chain Management—Free running chains, excellent chain management and off-the shelf components. Idlers are mainly used taking up the slack of the long chain and/or allowing wider-range gearing.

Size/Weight—Longer and heavier than anything this side of a tandem.

Rideability/User-Friendliness—ASS models are easy to ride and handle at most speeds. USS takes some getting used to. Very user-friendly.

Fairings and USS take some getting used to. Storage and transportation can be a problem. There are no heel interference or seat height issues.

Versatility/Use—ASS models go anywhere. USS are road bikes. LWB work best for long distance road riding. We have offroaded our LWB ASS test bikes and had lots of fun. A great car replacement (keeps you from having to haul them around).

Performance—ASS can be fast with user-friendly performance, especially with a fairing. USS can be slow, possibly the worst performing recumbents next to a heavily loaded rear end on a compact with USS.

Fits—LWB fit riders from very short (low stand-over height on most) to tall. Though call the builder if you are taller than 6'. LWB for really tall riders are.....really long.

Comfort—Like the Compact, the upright and erect riding position is not always the most comfortable. Many LWB do have more advanced seats and they are overall more comfy than a Compact. The mesh seat USS versions are more comfy, though some recline you too far (with a low BB/pedals) which can suck all of the power out of your stroke.

Cost—There are really no affordable LWB models in the classic design sense (talk about a market opportunity). The closest models are the Rans Tailwind and new Burley Limbo—which are more like a compact with 20 inch front wheels. The classics are worth the price of admission.

Reason Not to—Size, weight and difficulty of storing and transporting.

Bob's Comments—LWB models vary in performance, handling and style. Generalizing is tough. These are the classic designs. Recumbent traditionalists love them, and some technoweenies despise them. I am often credited for being biased toward the LWB. My first recumbent was a LWB ASS. My most recent bike was the same (Tour Easy EX). I love this bike for its refinement, performance, versatility and durability. However, I have a love/hate relationship with LWB bikes for their sheer size and difficulty of ownership (storage and hauling). If you think I favor this design over a wonderful user-friendly compact (like our new FX test bike) or a refined moderate riding position SWB ASS (like a V-Rex)—you would be incorrect. I'm at a vulnerable state in my personal recumbent quest and open to experience new recumbents.

▲ COMPACT (CWB, CLWB or compact long-wheelbase)

Imagine a compact long wheelbase style of recumbent (hence the cool name, *Compact*). The pedals are behind the front wheel and generally low(er) to the ground, though the trend is mounting them at the head tube. The compactness is found by utilizing a smaller wheelset and raising the seat height, and moving it rearward on the bicycle (can be heavily loaded on the hind end). The majority of Compacts have above-seat steering, though one has under-seat.

The concept dates back to the turn of the century. We first saw the compact in kit/frame set form from Alternative Bikelstyles in the mid 1980's to be followed by the ReBike, BikeE, Easy Racer EZ1 and others.

Wheels—Small wheels (20" rear drive and 16" front. 305mm BikeE size works best (349mm has limited tire selection). Adding a 20" front wheel can increase performance. This changes the handling, ergonomics and moves the design into the LWB category.

Drivetrain/Chain Management—Free running chains, excellent chain management and the best ones don't even require a chain idler. The only downside is the internal geared 3x7 hubs. They work and shift great, are dependable for thousands of miles, though there is some friction loss and

changing a flat tire just downright sucks.

Size/Weight—More compact than a LWB, though can be deceptively ungainly to lift onto racks and haul around on your car. Most compacts weigh in the 29-35 pound range. Some entry level models hit the high 30's and even mid 40's (will definitely slow you down).

Rideability—ASS models are easy to ride and can be ridden anywhere. They are the easiest to learn on. Most models have a more neutral handling optimized for bike trail speeds, rather than high speed mountain descents. USS takes some getting used to.

Versatility/Use—Ride them at the beach trail one day, mountain trails the next and commute to work the next. Once described in RCN as the 'burrito' bike for its urban friendly attitude. The upright erect riding position makes it easy to function in traffic. The low BB/pedals makes stops and starts a breeze and you don't need a special outfit or hi-tech pedals. Urban, recreational riding, off-road and even loaded touring (if properly set up). Though many ride organized rides, they are not the fastest or the most comfortable way to go.

Performance—The weak-link for the compact is performance. The small wheels, hybrid tires, weight and often used 3x7 hubs take their toll. The upright riding position is less aerodynamic and fairings don't work as well. Consider a compact as the recumbent equivalent of a hybrid upright.

User-Friendliness—Very user-friendly. Fairings and USS take some getting used to, as well as storage and transportation. There are generally no heel interference or seat height issues.

Fits—CLWB bikes fit short-average height riders best. If you are near or over 6', find a builder that has an XL frame size (BikeE). My daughter Amy rode a standard BikeE when she was 9.

Comfort—The upright and erect riding position is not the most comfortable, though comfort has improved with new compact seat offerings.

Cost—Compacts offer the best values in recumbency. The low-end models are often the loss leaders of the line. A Compact is a great place for every rider to start. High-end Compacts tend to be for eternal brand fans. Before you spend \$2K be sure that you know what you are after.

Reason Not to—Weight, not quite enthusiast level performance and an entry level stigma. Though everyone can use a compact, be sure you're buying enough bike.

Bob's Comments—If you are new to bicycling or recumbents, or just don't want to spend that much money on a bike, the compact is an incredible buy. Everyone on the planet could utilize a BikeE, Wave or EZ1. This is the perfect starting point for your journey. If you are near 6' tall, steer clear of the one-size models. The Euro-style MWB are not compacts and generally have much more extreme riding positions.

▲ SHORT WHEELBASE (SWB)

These sporting recumbent models have become the favorite of the enthusiast. They offer wheelbases of 36-45 inches. The BB/pedals are mounted on a boom out in front of the front wheel slightly above or below the seat height. Steering is above or under seat. The SWB design concept dates back to the turn of the last century, though the first modern commercial model, the Hypercycle, was manufactured in the early 1980's—and was a complete disaster. It had limited a gearing range, flexible boom, a heavily loaded front wheel (very poor wt. dist.) and to top it all off—frame failures. The Hypercycle exists today as the more improved and refined (though not as refined as other SWB designs) S&B, Blackbent and Turner recumbents (former Hypercycle principals are the designers).

The SWB design is much more difficult than it looks. Balancing weight distribution, reach to controls, wheelbase, heel/front wheel strike, acceptable seat height and user friendliness remain a concern. There are many SWB design variations to suit your needs and criteria for which traits are most and least important. Do your homework as the least expensive, best selling, or easiest to find model may or may not be the best bike to suit your needs.

Wheels—SWB can be found using many different wheel combos: 26/20, 26/16, 700/20, 700/17, 20/20 and even 24/24. The most common and recommended are the 26/20 and 20/20 (though expect gearing limitations).

Drivetrain/Chain Management—SWB have among the most restrictive drivetrains. The idlers are often used to direct both lower and upper chain from the back wheel up to the head tube and out to the boom. A high quality idler and well designed chain line are essential.

Size/Weight—SWB are the lightest recumbent models and the easiest to

stow and haul on your car.

Rideability/User-Friendliness—SWB are all quick handling—very maneuverable and considered ‘twitchy’ by some. ASS models are easier to ride and handle at most speeds. USS takes some getting used to. Most have some heel/front wheel overlap which takes some getting used to. Seat heights can be too tall for some riders. BB/pedals height can be below to several inches above the seat height (performance oriented ‘extreme’ riding positions that take time and miles to get accustomed too).

Versatility/Use—SWB are generally road bikes best suited for recreational and high performance riding. SWB loaded touring requires careful bike selection and set up. Few manufacturers build a ‘true’ touring SWB.

Performance—Many SWB models can offer a very efficient rider position combined with a reasonable or even light weight. ASS models can be fast offering intermediate to very advanced performance, especially with a full body. USS models are slower, possibly in the same realm as an ASS Compact.

Fits—Your average SWB fits riders-medium height to very tall riders. Very tall riders need to steer clear of one-size frames (with XL booms). Shorter riders may require a low stand-over height (Lightning) or a SWB with a 16” front wheel or cutaway seat-base design (Vision).

Comfort—SWB models offer the best comfort available to recumbent riders. The seats often recline more, and there is a wide range of choices in BB/pedals height. Higher BB’s are more performance oriented—extreme, and cause circulation problems (for a small percentage of riders). SWB have the most advanced and comfortable seats in the business (Rans & Lightning). They are overall more comfy than a Compact or LWB as long as the pedal/BB height works for you and you don’t mind sports car-like very quick handling.

Cost—Entry level SWB models offer exceptional value. The classics such as the P-38 and V-Rex are the true enthusiast models, hold their value well and are worth the cost of admission. Beware of Hypercycle clones. We’re not saying don’t buy one, just understand what you are getting.

Reason Not to—Pedal/BB height (circulation/numbness issues), quick (often very quick and sometimes (a few models) quirky handling. Let’s face it, the SWB is the enthusiast choice these days.

Bob’s Comments—SWB’s are here to stay as the enthusiast’s choice. I do have a criticism of SWB designers. I have always been drawn to small and sporty automobiles and have been driving them all of my life. They drive, track and handle with ease and near perfection. So why are so many SWB recumbents labeled as too quick handling, or quirky?

With this in mind, and to be sure you know what you are getting, understand that choosing a SWB model takes a more advanced education than do Compacts or LWB. The makes and models vary by designer’s mission. Lastly, beware of corporate ‘designed by committee’ models with little mission other than to make money.

▲ TRIKES

Recumbent trikes cross the spectrum from a very advanced pedal powered hi-performance sports car to mobility for special needs.

Models vary greatly. Enthusiast performance trikes have two wheels in front (steered) with the drive wheel in back. Steering is mainly under-seat, with the notable exception being the Windcheetah’s joystick. Recumbent trike enthusiasts are the most loyal niche in recumbency. Many ride their trikes everywhere and will defend their supremacy, safety and usability very intently. The mobility trikes are generally two wheels in back with a higher center of gravity. They work well for special needs, folks with balance problems or enthusiasts who don’t like being so low to the ground.

Wheels—Trikes use many different wheel combos with rear wheels of 20”, 26” or 700c and front wheels of 16, 17 or 20 inches. Trikes can be hard on front tires, so we suggest a sturdy wheel/tire set.

Drivetrain/Chain Management—Trikes require a well engineered (I can’t believe I wrote that) chain management design. The chain must go from rear wheel, under the frame and seat, cross member and up and out to the pedal boom. About the best we’ve seen is the Greenspeed idler/chain tube setup. Earth Cycles uses a two-chain drive which works well.

Size/Weight—Trikes tend to be heavy and for good reason—you don’t want them to break or wear out. Buy a tough-built trike unless you are a gram-counting racer weenie (and then expect a petite light duty machine).

Rideability/User-Friendliness—In some ways, trikes are the most user-friendly as you never need to remove your feet from the pedals while in

motion or stopped for a traffic signal. Most are very maneuverable and will bring a huge smile to everyone who tries a trike. Heed our warning about BB/pedals height. Most trikes have BB/pedals’ s that are inches higher than the seat (performance oriented ‘extreme’ riding positions that take time and miles to get accustomed to or offer circulation problems in a small percentage of riders).

Versatility/Use—Trikes can be used for every aspect of cycling. Hauling them around practically requires a pickup or SUV. The most important question for a prospective trike owner to ask him/herself is whether or not they will feel safe riding a trike (low design and arguably wider in traffic). I’ve taken a fair amount of flack for my comments about not wanting to ride trikes on busy highways. Some enthusiasts have no problem with it. This is an issue that each rider must deal with individually.

Performance—There are full race trikes that are VERY fast. The average trike and trike rider performs about the same as an average SWB or LWB, though not as fast as the performance oriented designs of either type.

Fits—You can find a trike to fit nearly any size rider. Some of the manufacturers will build custom to fit varying and a very wide range of body heights and weights.

Comfort—Trikes are very comfortable, though require body english and offer the possibility for the high BB/pedals situation outlined above. Do not expect a ‘relaxed upper body’ ride like you find with a two wheeler. Body english means that you are moving your weight from side to side when riding hard (you don’t have to do this though). You’ll also need to be more fit to keep up with your two-wheeling pals (in many cases).

Cost—A good trike is expensive. Enthusiast trikes are \$3000 and up, often requiring a long delivery period. Recently, we have seen a new trike model come to market that is down in the low \$2000 range which holds great promise, though does not have a track record as of yet.

Reason Not to—BB/pedals height (circulation/numbness concerns), difficult to transport, expensive, requires more and specialized maintenance and parts.

Bob’s Comments—Trikes are about the most fun you can have on a recumbent vehicle. The allure of trikes has brought a lot of riders into recumbency (that fully faired Windcheetah dream....). My best advice is to imagine yourself riding in your locale and see if that works.

▲ MWB (medium wheelbase)

This style of recumbent is similar to both a Compact and a SWB. What differentiates the design is that the crankset is placed at the headtube. These work great for city commuting and for those riders who don’t like the idea of heel interference. The drawback is that most have high bottom brackets (less user-friendly) and most are heavy.

▲ TANDEMS

Recumbent tandems come in combinations of the above styles in USS, ASS two wheels and three. The most popular tandems, the Rans Screamer and Double Vision have SWB front ends and compact/LWB rear ends. This seems to work best for most duos. The only true LWB tandem is the Longbikes/Ryan DuPlex. Greenspeed makes a tandem trike and there is one double LWB tandem. Watch for a new entry level tandem or two.

▲ OFF-ROAD

Many recumbents will do fine on fire roads, though technical single-track is best left to the wedgie mountain bikes. The best off-road ‘bent we’ve tried is the full suspension BikeE FX. The riding position (erect/upright) works great offroad and the bike is very maneuverable. Haluzak makes a limited edition SWB USS full suspension SWB off-road recumbent. We have enjoyed riding LWB ASS models off-road as well.

▲ TRAVEL BIKES

This is a relatively new style of recumbent. These are bikes that come apart in some way for easy stowage or transport. Let’s face it, recumbents are bulky. Uprights stow and travel better. Bike Friday’s Sat R Day SWB has dual 16” wheels and folds into one suitcase (see RCN#49). The Brompton recumbent kit is made by a company in Germany and sold by the US Brompton distributor (see RCN#50). Human Powered Machines in Eugene, Oregon has a SWB folding recumbent version of their Swift folding upright. Angletech’s full size Altitude SWB has a folding seat, swinging suspension rear triangle and its own soft case.

The Linear SWB and LWB both fold. Mt. Airy Bicycles in Mt. Airy, MD, sells Linear travel cases as an option. Folding bikes in general are slick and very James Bond-like. Keep in mind that they vary by how quickly, compactly and easily they fold. I have yet to see a recumbent that folded as cleanly and compactly as a Brompton, Dahon or Birdy upright folder.

PART II RECUMBENT RIDER ERGONOMICS

■ RECUMBENT RIDER FIT & STYLE

With the wide variety of recumbent styles, it's difficult to select a "BEST" for everyone, so here are a few helpful tips:

✓ **Shorter Riders:** may want to consider models with a low seat or 16" front wheel (to keep it low). The one exception would be the CLWB style, that fit most riders. LWB models can have low seats, though expect a heavier bike. Be sure to compare the seat heights of various bikes.

✓ **Taller Riders:** over about 6'2" may not be able to ride every LWB or Compact model as they can place too much of the rider's weight on the rear wheel. An XL size frame may work. The best choice for very tall riders is probably a SWB with a wheelbase of 40"-46." Keep in mind that the shorter the wheelbase and the longer your legs—the more possibility for boom flex. Tall riders need stiff triangulated frames with short booms.

✓ **Large Riders:** should consider models with a durable reputation and/or a triangulated steel frame and a lifetime frame warranty. Fat tires, extra spokes, 26" and 406mm BMX 20" wheels work best. Forget about LWB monotubes, unsupported small diameter stays or ultra-lightweight models. Check with your manufacturer for weight limits and warranties.

Riders who have short legs, are heavy or have a "spare tire" should consider that the higher the pedals/BB, the more of your legs will come back into your gut with each pedal stroke. The low BB/pedals position may be more suitable—if not more comfortable. Larger riders can also benefit more from a fairing and ASS—and less from a wide USS.

✓ **Hammerheads:** If you are a gonzo high-performance rider, and you reef on bars, stems and frames, buy a triangulated, stiff-ASS, stiff-framed SWB or LWB known to hold up in these kinds of conditions.

✓ **User-Friendly Performance**—Many riders will find a speed benefit in a LWB ASS with a fairing or a stiff framed SWB ASS model.

✓ **Extreme Performance**—Fully faired speed demons, lowracers and ultra low and laid back trikes are extreme. The SWB variety offers very upright or very laid back seats with very high BB/pedals. It takes a skilled rider to control an extreme bike. Be sure you want to do this. Extreme positions can create neck fatigue, toe numbness and foot circulation problems for some riders.

✓ **Special Needs**—If you have a back or neck injury, carpal tunnel syndrome, prostate or tailbone problems, a recumbent may be for you. Recumbent seats fully support your back, though you will need a full understanding of all aspects of recumbent comfort and ergonomics.

✓ **Serious Touring**—Longer SWB models, and LWB recumbents are the best tourists. Forget about skinny tires, light weights, monotube frames and buy a tough bike. Cargo carrying capacity and weight distribution are important design aspects to consider. Weight does odd things to a bike's handling, so frame flex and handling stability become even more important. Performance plays into this as well, as you might be able to cross the USA on a Compact, but it might be slow going.

✓ **Ride Different**—Some people buy recumbents because they are new, different and attract lots of attention. This is cool.

✓ **Recreational Riding**—If you are a cycling enthusiast and go out for two hour rides from home with the occasional group ride—you can ride any kind of recumbent that you like.

■ BASIC ERGONOMICS

Rider ergonomics has to do with seat back recline, BB/pedal height and the imaginary lines that connect all three that determine the pedal angle (draw a line up the seat back, a second line where the seat back intersects the seat base—out to the bottom bracket/pedal axle. Measure the pedal angle. You will be amazed at how much they can vary. From a very closed pedal angle of 110 degrees possible on a Lightning SWB, to the most open riding position found on a Longbikes (Ryan) Vanguard, S & B or Vision.

Consider how the different riding positions will affect your riding style and body. Even within a recumbent design style, you will find open, moderate and closed riding positions. Here are the basic rider positions:

✓ **Open Position:** Comfort—A reclinable laid back seat and a low BB/

pedals means a passive comfortable riding position. This is not always the most efficient for acceleration, hill climbing or performance. Examples: Vision, Longbikes, S & B, Blackbent.

✓ **Moderate Position:** Adjustable seat recline angle, with low or high BB/pedals. This is acceptable to most enthusiasts in both comfort and power output. A closed position can be achieved when you want it. This is the trend in North American recumbency and can be found on any number of bikes that we like such as the Rans Rocket, V-Rex, Vivo, Altitude and others. Compact models and modern LWB (Gliss) use a semi-moderate riding position that offers near ergonomic perfection. Examples: compacts, Easy Racers, most Rans models.

✓ **Closed Position:** Performance/Racing—Upright seat and high BB/pedals makes for awesome acceleration, sprinting power and some feel aids in climbing. The upright seat back loads up your rear end and is best for athletic build riders. It is essentially an inverted drop bar road bike position. Examples: Haluzak, Lightning, Rotator, Radius, & Vision R32.

▲ ADVANCED ERGONOMICS

Recumbent comfort varies dramatically between makes, models, styles, seats and humans. With every recumbent design style comes a host of ergonomic issues relating to how your body might fit and react to any given riding position. Here are some other ideas to consider when you are in the process of buying a recumbent bicycle suited for yourself, your riding style and locale:

✓ **Seat Height**—Can you place your feet on the ground flat-footed? If you are short with a tall bike, your tiptoes will get a workout and you may eventually fall at a stop. This is especially a concern with SWB models with 20 inch front wheels. Lightning offers multiple frame sizes and increasing front wheel diameters; Rans and Vision handle it with a cut-away seat; Haluzak's feel tall even for a six-foot-tall rider due to the full sling/mesh seat base. On the other extreme with trikes and lowracers, how low can you go and still feel safe on the road? This is YOUR call.

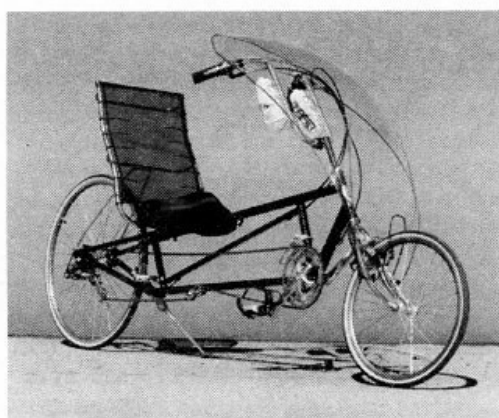
✓ **Control Reach**—If after a twenty minute test ride, you have sore arms/neck/shoulders from a long reach to the controls, you might want to reconsider your choice. This can happen with compacts and SWB USS.

We have found that the best (and most adjustable) control ergonomics can be found on SWB ASS recumbents with an adjustable steering column. The best ergonomics come from a SWB ASS that allows a 90-degree arm/forearm bend and the bars as low as you can get them (and still clear your knees). USS recumbents and trikes with side-stick controls (and with bar-con shifters/no-twist grips) are second.

✓ **BB/Pedal Height** (BB=bottom bracket)—A small percentage of riders are bothered by bottom brackets that are just below or higher than the seat base. These riders may experience circulation problems (numb toes or tingly feet). This seems to get worse the higher the BB and/or the more closed the riding position. The higher the BB/pedals the more 'extreme' or advanced the riding position is. Some do not believe this exists. This can sometimes be solved by moving the cleat rearward on your bike shows (sometimes takes a Dremel tool). More than half the recumbents sold have low BB/pedals (BB height limits market share).

✓ **Heel/Front Wheel Overlap**—Some SWB recumbents have short pedal booms and the heels of your shoes (and in extreme cases, your crank arms) can actually cross path with the front wheel during low speed turns. Expect a real shock the first time this happens. Most riders eventually get accustomed to this trait. It is *not* the most enjoyable aspect of SWB riding. Most of the modern SWB bikes have this trait (can also vary by your shoe size). The benefits of this trait are a improved weight distribution and longer wheelbase with improved c.g. SWB models of the '80's and '90's had shorter wheelbases. Lightning has always had a longer wheelbase, Rans followed suit, and now Vision is coming along. This does create problems with direct USS models, as the pushed out wheelbase moves the controls farther away from the rider and can create a 'tiller' like steering effect. (Ed. Note: We added a 2" front tire and a front fender to a Rans Vivo and found that bike had so much heel overlap that I accidentally ripped the front fender right off the bike. Think about this if you plan to add fenders.)

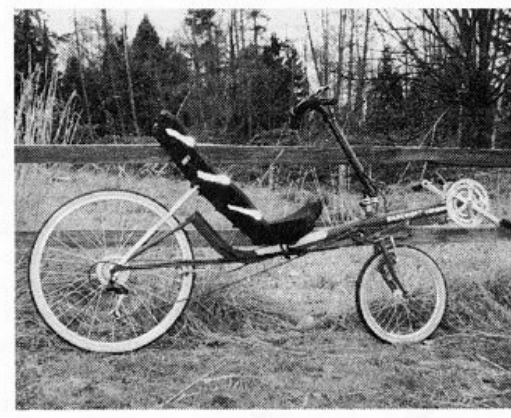
✓ **Recumbent Butt**—Some recumbent models with rather upright/erect riding positions (and/or uncomfortable seat bases) can create butt pain after an hour or two in the saddle. I've experienced it with some seats on 40 minute rides. The more upright the riding position, the better



The Easy Racers Gold Rush Black Gold photo courtesy Easy Racers



Tim Brummer on his R84 Composite—John Riley



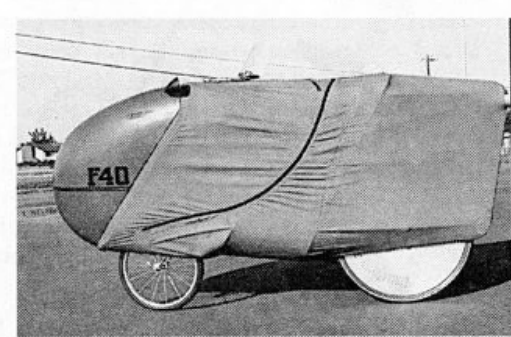
Bill Cook's Barcroft SWB—RCN archive photo



The TerraCycle TerraZa SWB



Easy Racers Club's Laurie Smith on her Tour Easy photo courtesy of Easy Racers



The Lightning F40—RCN archive photo

possibility for recumbent butt—and the more important a superior seat base design is (a contoured composite seat base with a crafted foam section and a tailored cover/though some riders prefer a sling/mesh base). In contrast, a very laid-back seat position can make a mediocre seat design feel quite comfy. The bottom line is that upright seat positions are more user friendly and work for a wider variety of riders.

✓ **Knee Pain**—It is our opinion that the higher the pedals/BB, the more the possibility exists for knee pain. If you have arthritis, knee problems or are heavy, you may not want a really high BB model. Recumbent riding can be harder on the knees, especially if you ride steep hills and push tall gears without proper training, cross-training and conditioning.

✓ **Neck Pain**—If you have neck/shoulder problems, do not consider a really laid-back seat as it may require you to use your neck muscles to hold your head downward to look straight ahead (versus the sky).

✓ **Groin Sensitivity**—If you have sensitivity in your groin area, stay away from seats with nose sections and/or seat horns (older Easy Racers, Vision, Ryan and Longbikes—all are working to alleviate this trait).

✓ **Upper Body**—Two wheel recumbents (especially USS) allow a very relaxed upper body. In contrast, trikes (ridden enthusiastically) require much body english which can be very athletic.

✓ **Carpal Tunnel/Wrist**—Many riders feel that USS takes the pressure off of their wrists. I have experienced borderline carpal tunnel symptoms and prefer a very ergonomic close reach SWB ASS.

✓ **Your Height and Weight**—Medium height/medium weight riders can ride anything. Shorter riders need to be concerned about seat height and bikes that fit short x-seams. Tall/heavy riders should forget about (most) one-size-fits-all bikes, and need triangulated and stiff frames. Throwing on a longer boom doesn't cut it.

✓ **Sizing**—Understand that manufacturers will tell many riders that they "fit" a given model. We argue some of their definitions of "fit." We don't like tall/heavy riders on one-size SWB or Compact bikes for weight distribution reasons. We don't like short riders on some 20" front wheeled recumbents (mostly SWB) for seat height reasons. We also don't like heavy riders on very light bikes with frame flex.

PART III RECUMBENT DESIGN CRITERIA

■ BASIC RECUMBENT DESIGN

After you decide what style of recumbent to look for, and what type of rider position you like, and what style of seat works best for you, you'll

need to look into how to steer the bike. Keep in mind that most manufacturers specialize in one type of steering. Here are the primary options:

✓ **Above-Seat Steering**—**ASS**—(Also known as OSS: over-seat steering; ASC-above-seat controls, etc.) This has been the standard bicycle steering method for over 100 years. It looks more 'normal' and acceptable (if that's possible). ASS can take many forms, but this type of steering is more aerodynamic and all of the serious performance machines use it. Above-seat steering offers better control, is easier to learn to ride with and control ergonomics are near perfect. You can easily mount accessories that are more difficult to mount on USS bikes.

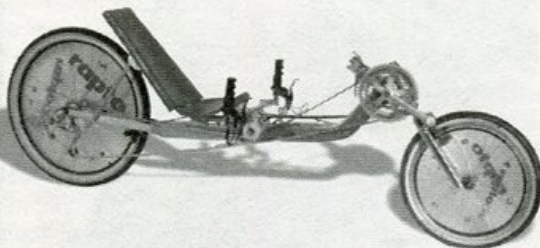
Some LWB models have a tiller-like feel to the steering. In most cases this actually makes the bikes handle better. Look for a well designed system that has been refined and you'll be okay. Riders will get accustomed to ASS quicker than to under-seat steering. The major benefit to this set up is that it needs no special parts such as steering rods, rod-bearings, and cables. SWB models with ASS offer ergonomic controls placed close to your body and the best models have strut recline adjustment. A 90-degree bend in your arm/forearm with ASS bars just clearing your knees with the bars back as far as you feel comfortable is optimum and known as the "begging hamster" position (thanks Kent Peterson). Be aware that some SWB models have roomy cockpits while others (wheelbases less than 40") may seem claustrophobic.

✓ **Under-seat Steering**—**USS**—USS has the handlebars placed underneath the recumbent seat. The handlebars are connected to the front fork with a steering rod (LWB & SWB) or directly to the fork (SWB). USS is considered better for anyone with carpal tunnel syndrome. Many riders also feel that USS is a safer option as nothing is in front of your body. When considering performance, underseat steering is usually less aerodynamic than most ASS, however, the notable exception is for trikes and lowracers. USS is generally more comfortable for long rides. Underseat steering can also be more difficult for novices to learn; though, after a short time, the balance becomes second nature. USS is a more relaxed and less aggressive way to ride (with the same trike & lowracer exceptions). USS riders have a more difficult time navigating through bike trail dividers and in rush-hour traffic mainly due to the wide handlebars.

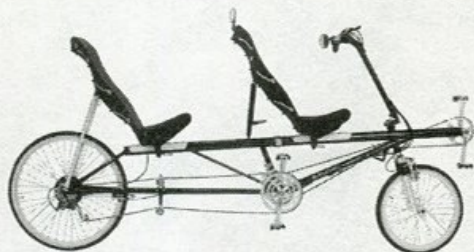
Handlebar reach can be an issue for some riders on some models. Some manufacturers have bar-end extensions which work to resolve this problem, though the bar-end extensions put controls in an odd position.



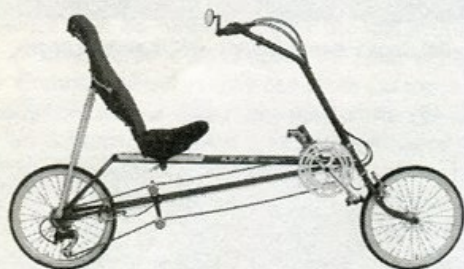
The Rans V-Rex



The Reynolds Nomad



The Rans Screamer with optional suspension fork



The Rans Tailwind



The 2000 Vision Saber with dual 24" wheels. Call Vision for info and tell them you saw it in RCN



The BikeE AT with Sweet Seat

Bar-end shifters help. Fairings can be mounted to USS models, but it's more difficult and expensive. The fairings can help make up for most performance loss that USS may create.

Which one is better? Most people adapt to ASS easier. Which one you choose will depend on you, your intended use and where you ride.

▲ ADVANCED RECUMBENT DESIGN CONCERNS

Once you get beyond the bike trail and recreational rider level, here are some other design aspects to consider:

✓ **Weight Distribution**—Weight distribution even by like styles varies quite a bit by both design and how they fit different sized riders. A Tour Easy has better weight distribution than a Stratus by design (and comes in more sizes). And a BikeE has better than a Tailwind or Wave for larger/taller riders. The Rans models have better weight distribution than a Vision, Haluzak or Trek for (taller riders) and a Lightning kicks all of their butts (multiple frame sizes and longer wheelbase). Weight distribution is important for handling, hi-performance riding, loaded touring and safety.

✓ **Heel/Front wheel overlap**—See page 30: Ergonomics Part II.

✓ **Light Weight**—Ultra light bikes are fine as long as they are tough enough, don't flex too much and are still light after you load up your sandwich, spares and a bike lock. Gram savings doesn't come for free. It adds greatly to the cost of the bike, and in some models (Vision & Haluzak) can make for a flexible frame (passive suspension!?). A stiff and light frame can be had in the Lightning P-38 with time consuming and costly space frame construction.

✓ **Wheel/Tire Size**—Wheel sizes can lock you into tire availability (or lack thereof). I have yet to find a wide enough 700c rear wheel for our Tour Easy EX; 349mm 16" & 451mm 20" wheels have one good tire available; Many manufacturers use the 406 Primo Comet and don't allow enough clearance for fatter tires and/or fenders.

✓ **Weight**—Recumbents do not need to be as light as road bikes, as most above-seat steering (and some low c.g. under-seat models) are more aerodynamic. Lightness helps, but is not the end all. Also, if you ride in the real world of rough pavement, bike thieves (a big heavy lock) and carry spares, and gear, you may want to reconsider the manufacturer hype and roadie cliches very carefully.

✓ **Frame Integrity**—If a lightweight bike is your goal, understand that some are flexible, and others are stiff. A light/stiff frame can be expensive as it involves a more complex frame design. Flexibility can also create a quirky quick-handling bike at speed. Skinny tires can add to this.

✓ **Available Options**—Some builders offer a fantastic option package, others are very limited. BikeE, Rans and Vision are a few that have good option lists. Trek has virtually none. Some fender kits are designed for the

skinny Primo Comets, which are not workable for serious year-round riders. I recently went to install a 2.1 front tire on an Easy Racer and it wouldn't fit under the fender. Shop for your builder as well as you would the style of bike that you want.

How about if you want to tow a trailer? Well it matters by manufacturer and type of trailer whether it be a cargo trailer, kid-trailer or trail-a-bike. Think about these aspects of recumbency BEFORE you buy a bike.

PART IV RECUMBENT COMPONENTS

■ SEAT COMFORT

Seat comfort is the most popular aspect of choosing a recumbent. Not all recumbent seats are created equal. All have their strong and weak points. Think of each model having a check list of pluses, minuses and compromises.

Since you cannot deweight your seat or stand on your pedals, you'll be sitting for longer periods of time. All other recumbent facts and figures aside, if you can't be completely comfortable on your recumbent seat, keep trying bikes until you are. Seat comfort is a personal issue—so try many. Seat recline can make the difference as to whether or not you will be comfortable. The more laid-back you are, the less weight will be on your hiney. We've noticed that some recumbents come from the factory with the seats fairly upright, so take the time to adjust the recline of your seat, it will make a difference. If you want the most comfortable recumbent, look for the optimum mix of seat comfort and ergonomic rider position for YOUR body. Here is our overview of seat types:

✓ **Fiberglass Shell/Foam**—These are found mainly on European high performance recumbents. Racers and a small minority like this style seat. There are no recumbents build in the USA that use this Euro style seat.

✓ **Fiberglass Shell/Foam/Cover**—These are found on S & B, Turner, Cambie, and with the Easy Racers Cobra. There are many who find these seats comfortable, however, none are state-of-the-art recumbent seats. All except the Easy Racer seat flex too much (usually in the mid-upper back, above the seat brace). Some are downright uncomfortable to some recumbent road testers. However, we do hear the occasional rant from somebody who insists that we're wrong.

✓ **Sling/Mesh**—These have CroMo or aluminum seat frames and mesh stretched across the back and base. Some are laced with rope, kevlar string, bungy cords (a good idea) zip-ties or put together with seat belt like strapping and lots of Velcro. These seats can be very comfortable, especially over the long haul for a rider who has broken their seat in and taken the time to adjust it properly (strap tension). The base comfort is not initially as good as a contoured base with foam cover, though again in the long term it can even be better. Mesh base seats seem higher off the

ground and can require even 6' tall riders to be on their tiptoes at a stop. Some sling/mesh seats have "seat horns"—a tube sticking out, up and forward away from the seat base that holds the material tight. Take the cover off and these things look downright scary (and could do some real damage), though most are covered with foam or a seat cover. If I can feel a seat horn—it ruins the seat's comfort for me. Not all riders are affected to the extent that I am in regards to this. It is just one of my pet peeves. I suggest that seat horns could (and should) be designed OUT of the seat.

✓ **Ergonomic Contoured Seat Base**—Though the full sling/mesh seat may be the previous standard, most riders would agree that the contoured composite seat base with a nice grade of foam and a Lycra cover is the most popular. An added benefit is the easier stand-over height of this design. The ergonomic mesh seat back is the hands down comfort favorite.

▲ Hill Climbing

If comfort is your number one goal, consider these design attributes that make for comfortable recumbent bicycles:

- ✓ A mesh back, contoured to fit your body that does not flex or "sag" too much.
- ✓ An adjustable seat recline to dial in YOUR optimum pedal angle.
- ✓ A contoured composite seat base with layered foam and cover. Or a mesh base that is wide enough for your rear end, that doesn't "sag" too much. These may suspend your rear more, though heavier riders can feel a "pinch" on the outside edges as they sink in.
- ✓ A low-medium pedal/BB height (a more normal riding position).

■ PERFORMANCE

Okay, it's true that recumbents hold all of the human-powered speed records. They are aerodynamically superior to conventional bicycles; less frontal area means less wind resistance. The Lightning F-40 currently holds the Race Across America speed record of five days and one hour. Gardner Martin's Easy Racers Gold Rush, ridden by Fast Freddy Markham, was the winner of the DuPont Prize for breaking 65-mph and rests in the Smithsonian.

Fairings for street use are common and optional equipment on many models. They protect you from rain, cold and wind with up to a 30% reduction in drag. So what does this do in the real world?

The general rule for speed is that an aerodynamic recumbent is about 10% faster than an upright bike. In reality, recumbents are about as fast as their equivalent road counterparts, sometimes faster, sometimes slower. It more depends on the following:

Some bikes are more aerodynamic than others—plain and simple. Skinny tires and light aero wheels are usually the fastest, though this requires a fit, lightweight rider, bike, no extra weight, spare parts and perfect pavement. Other riders might want to consider fatter tires. I find fat bald slicks to perform pretty good. Ian Sims from Greenspeed has documented this as well.

What constitutes *performance* is in the eye of the beholder. We can break them down into serious performance bikes adequate for racing, and just high end "performance" models from just about all recumbent manufacturers. For instance, Haluzak, Vision and BikeE all make high end performance bikes, though they are not considered extremely fast, nor are they known in hpv racing circles. In fact, in many cases, racing will void your warranty. The truly fast bikes are limited and rare:

- ✓ **SWB**—Lightning P-38, F-40 and R-84.
- ✓ **LWB**—Easy Racers Gold Rush, Rans Velocity and Rotator Pursuit.
- ✓ **Low Racer**—M5, Ross Festina, Earth Cycles or custom.
- ✓ **Trikes**—Greenspeed GTS or Windcheetah.

Racing recumbents should have race records and teams to back up the high performance claims. Make sure that they are acceptable records as well and that the bike in question is close to the one actually raced. The fact is that most serious high performance and aggressive riders choose one of the above bikes.

✓ **Not All Bents are Created Equal**—Just about anything else with a fairing and skinny tires (or fat?) can be called a "performance" bike. There are many great ones. Like I believe the Rans Stratus, if set up properly, can be as fast as the above LWB. V-Rex, Rockets, Angletech MC2, Barcroft and other stiff and light SWB models can perform nearly as well as a Lightning. Haluzak Hybrid Race and Vision R44/45 have light/flexible frames. They are indeed performance bikes, and only the customer can

decide whether the lightness is worth the added lack of rigidity (which also makes for a softer, smoother ride). Those who ride lowracers and low, laid back performance trikes should consider safety. Personally, I don't have the nerve to ride these ultra low machines on a state highway or busy street, though every time I mention this I get a few letters defending low bikes' safety. It is rider preference.

✓ **The Regular Guys Secret/User friendly Performance**—Maybe you are approaching middle age, don't ride as much as you'd like or are an athlete only in your mind. Maybe you are out of shape, or have an aero-belly—but still want to ride fast, here is something that may help you out: The most user-friendly performance is that of a LWB ASS machine such as an Easy Racers or Rans with a Zzipper fairing and a homebuilt toolbox and/or bodystocking.

✓ **Fairings and Bodies**—The only commercially available bodies are available from Lightning for the F-40. European trike builders Leitra and Twike offer three-wheeled commuter vehicles with bodies. Windcheetah once offered a racing body. People Movers sells the Ed Gin Coroplast Fairing Building Seminar video. This demonstrates how to turn your V-Rex into a streamliner. (Coroplast fairings, see: Ed Gin's website: www.mcs.net/~gkpsol or contact People Movers for the fairing building seminar video. Also, see RCN#44 for Kent Peterson's article on toolboxes.)

Keep in mind that riding a streamliner is the most advanced type of recumbent. Knowledge of flying, sailing, bike mechanics and an intimate relationship with your bike are important. You will crash more, but the speeds attainable are incredible.

▲ Hill Climbing

In my experience climbing with a reasonable weight SWB ASS recumbent is about as efficient as you can get. The higher BB bikes take more practice, but I suppose can be even better once you are accustomed. Climbing a LWB up a grade at very low speeds takes skill because the bike is so long. The Gold Rush climbs well because it's light for a LWB, stiff and descent/flatland average speeds work in its favor. Bikes with more open riding positions are not as good. Compacts tend to climb slower, and some not at all if you are a tall rider on a standard frame. I've ridden bikes that wheelie with each pedal stroke up steep grades (check out XL frames). Even though I like a LWB ASS for daily rides, I prefer a SWB ASS for intense climbing (Slumgullian Tour). Zach Kaplan finds he is faster on a lowracer or LWB ASS, and is a former faired SWB climber. Many high performance SWB riders would not agree. Our best advice for optimum climbing is to ride which performance oriented bike works for you and TRAIN FOR CLIMBS. Your personal fitness is the key.

■ COMPONENTS

✓ **Shifters**: Expect Twist Grips in 7, 8 or 9 speeds (x 3 gears of the triple crank for 21, 24 or 27 speeds. 21 speeds work great and are mostly found on bikes with the SRAM/Sachs 3x7 (3-spd. internal hub). 24-speeds probably work the best and 27-speeds are the latest, greatest offering cycle-dom has to offer. SRAM Grip Shift Twist Grips are the most common shifters. ESP are similar and offer quicker throws, faster shifting and require SRAM rear derailleurs. Some manufacturers offer Shimano Rapid Fire MTB shifters. Try these first. You will know if you like them. Some high end bikes have the Shimano STI drop bar brake-lever shifters. Sorry, I've never been impressed with these—especially on a recumbent. If you like the—go for it. Lastly, Shimano Bar-Con, bar-end shifters are the best shifters made and available on just a few makes/models.

✓ **Retro vs. Modern**: Retro vs. Latest Greatest. My RCN cohort Kent Peterson likes recycled parts. He prides himself on this. My RCN cohort Ron Schmid loves high-tech parts. Ron has always said, what if it breaks down in the middle of the country—what will be easier to find, old retro or new modern? Well, Kent was getting ready to head off to Paris to ride in Paris-Brest-Paris. He sent me an urgent email looking for a Suntour 7-speed freewheel (a very retro part circa 1990). I hope he found it. He was considering replacing the wheel due to his urgent problem. Had he needed a Shimano 8 or 9-speed cassette—any bike shop would have one in stock. Moral to this story: if you're gonna be retro, keep a stock of old bike parts.

✓ **Wheels**: Hand built wheels that come on \$2000 recumbents are the best. Ask who builds the wheels. Imported wheels can be okay, however, it depends on whether the dealer preps and trues them prior to delivery.

✓ **Tires**: The most common recumbent tire is a Primo Comet. They are

1-3/8" wide. They come in 26", 20", 451mm, 20" 406mm, 16" 349mm and 16" 305mm. These are nice, reasonably priced high performance tires....and they are wimpy. Fat tires like the Tioga Comp Pool are cool on recumbents and have proven to be faster by several testers (Ed Gin and Ian Sims). Skinny tires are for racers and those who ride on perfect pavement.

✓ **Brakes:** V-brakes are expected these days. ESP are our favorite, Shimano are finished real nice, but Dia Compe and Tektro seem to work better. The BikeE's Alhonga's work surprisingly well.

✓ **Maintenance & Weird Parts:** The simpler and more straightforward your system the easier it is to work on. A basic Shimano or SRAM drivetrain is probably the most trouble free. If you buy exotic boutique parts, make sure that you have a dealer who knows how to work on them (disk brakes, custom shifters/derailleurs and even 3x7 hubs). If a manufacturer skimps on parts spec—it is usually in places that are not usually or easily checked.

✓ **Mid-Drives:** Mid-drives shifted by a rear derailleur with an amidships cassette require more maintenance, attention and don't shift as well as rear derailleurs. They require proprietary parts, have more friction (pedal backwards), and throw the chain more often. Cross-overs, jackshafts and crankset mid-drives shifted via a front derailleur are more dependable, though less user-friendly than most regular recumbent drivetrains as you cannot see the triple crankset. The BikeE style mid-drive seems to be trouble free, shifts better, has less friction and appears to be more dependable than an amidships derailleur mid-drive.

✓ **Longevity:** Generally, the better the parts, the longer they last. However, racing parts are not always the toughest. Keep in mind the LX Factor: Shimano LX/105 is where durability/dependability and value all meet. This could be said for ESP 7.0. Cheaply built wheels and no-name cranks and hubs will not last as long as the high quality stuff. This is okay if you are an occasional rider, but if you are a serious commuter/tourist—buy some decent stuff. Lastly, the cheap no-name knock-off components often create shifting problems.

✓ **A Word on Recumbent Shifting:** The long recumbent chain actually makes shifting easier as you do not have to worry about the chain angle (big to big or small to small) between the crankset and cassette gears. With two chain drives, this can be a concern, primarily because it makes the bike more difficult to use.

✓ **A Word on Recumbent Gearing:** Recumbent riders need lower gears than their upright counterparts. The reason is that you spin at lower RPM's on a recumbent, and you need to spin more or you may hurt your knees (build those muscles). An out of shape rider who buys a high performance bike with tall gearing is usually making a mistake. At the very minimum, customize your gearing. You need low lows (low 20 gear inches), low(er) medium range gears and high(er) highs for flatland performance. Most stock recumbent gearing is adequate for flatland use. If you climb a lot of hills, carefully look over your gearing. Unfortunately, everyBODY is different, so I cannot really offer a definitive answer. Just be cautious—out of shape riders should not buy a high performance bike and push tall gears. Knee replacement can be costly.

For myself, living and riding in the hilly NW, I prefer a low gear about 20 gear inches. I prefer a high gear of 120+.

■ BUILD QUALITY

The majority of recumbents we see have pretty decent build quality and frame materials. The majority of recumbents are either aluminum or steel, preferably aircraft CroMo steel (CroMo). The forks are also CroMo or beefy aluminum suspension models. Most recumbents are TIG welded. BikeE's aluminum frame has some aircraft-like bolt-on features. Lightning's and Rotators are fillet brazed (left natural, not filed). Some are made in the USA, and some are made overseas [BikeE AT/CT, Rans Wave, Tailwind, Rocket, V-Rex & Stratus and Radius]. However, we find that Taiwan production quality to be excellent, and in some cases better than models where the manufacturer uses 'made in the USA' with little red, white and blue flags on their decals.

There is some debate over the design use of unsupported (no triangulation) rear frame stays (connect frame to the rear wheels). Some manufacturers have had excellent luck with this design, though this does cause the rear stays to flex with each bump in the road. My aerospace contacts tell that they will eventually fatigue. However, we are not aware of any such problems at this time. A fully welded or brazed triangulated frame is time

proven and tested way of building frames. Large diameter booms do not flex much, so it is of little concern.

Warranty length varies all over the map. Some offer lifetime, so the question remains whose lifetime. Also, you don't get a free frame if you wear it out. Veteran manufacturers with short warranties tend to be pretty good about handling problems. Any warranty is only as good as the manufacturer who will be honoring it. We are more concerned about company track record and how they treat customers.

▲ RIDER ADJUSTMENTS

There are basically three ways to adjust a recumbent seat to suit a rider.

A. Sliding QR Seat—BikeE and Rans use this method extremely successfully. However, some very strong riders have been known to break the quick release loose in some situations.

B. Sliding Bolt-On Seat—Easy Racers, WizWheelz and others use this seat adjustment method. It anchors the seat down better than any other method (aside from a fixed seat).

C. Sliding Boom—Vision, Lightning, Haluzak and others use the bolted telescoping boom for rider adjustments. Sliding booms are often problematic. The main problem is bolt fatigue from constant adjustment. Some builders even recommend replacement after so many adjustment cycles (we had a boom bolt break on a road test after 5 cycles). Boom adjustments are time consuming and difficult to align perfectly. Boom bolts bend, break and they are difficult to adjust and replace. Chains need to be carefully sized to a new rider. The widely used KMC chain's quick-links are only good once. Most manufacturers do not have sight align marks on the frame/boom to center the boom in the frame. Adjusting your bike (with a sliding boom) to fit all of your friends and family is a myth. So, carefully set your seat. Carry an extra boom bolt—and then LEAVE IT BE.

Keep in mind that some bikes dial-in much easier than others. Those with sliding seats and adjustable recline seats without lace or velcro dial in 10 minutes. If you have to adjust booms, chain lengths, seat recline, seat tension straps, etc., it can be a long process to achieve perfection.

■ SUSPENSION

Suspension adds complexity, maintenance and cost to your recumbent—though can offer the silkiest of rides. LWB and compacts can benefit from a rear suspension, though the need for front suspension is arguable on the lighter loaded front wheel. Full suspension is primarily for SWB recumbents—where it offers the most benefit. Many will argue the need for it. Once you ride with suspension—you will most likely be spoiled for life. Once you make the decision to go for suspension on a SWB, most manufacturers offer front suspension as an option first, and then rear suspension as an additional option. The new Trek R200 is rear suspension only—which is one of the bike's only shortcomings (the original prototype had dual suspension. The front was deleted to lower the bike). The reason quoted to us was something about the smooth country roads in Wisconsin.

✓ **Front Suspension**—on a recumbent is a pretty narrow subject. LWB don't need it as much as a SWB. Compacts don't really need it either, though once you've ridden with it, it's tough to go back to a hardtail. SWB riders will argue as to whether they need it. Many feel that it helps keep the front wheel on the ground, offering better traction and for this reason is a safety feature. SWB are inherently quick handling—some more so than others. There is a difference between a Vision, V-Rex and Vivo.

The current suspension fork of choice is mediocre at best. The Ballistic fork is designed for light duty use and has just over 1.25" of travel. After you sit on it—it has less. Fat tires are another alternative. In our Vivo test, our suspension fork was ready for an overhaul after 18 months.

We are fans of the proprietary BikeE (FX and hopefully other models) and Lightning suspension forks. They both have a relatively small amount of travel. Our hat is off to Lightning and BikeE for being the only manufacturers who build a fork to their own design.

The on-again, off-again 20" AMP fork seems to be off again. The Ostraad LWB fork is extremely cool, though you have to buy the bike. Angletech is the only dealer in the USA.

Steer clear of the "Top Gun" or any forks designed for kids BMX. Haluzak uses a Suntour fork that is very similar in performance, though even lower line than the Ballistic. Lastly, these forks jack up the front end of the recumbent and can change your steering geometry. Ask your dealer/

manufacturer if they custom tune the forks (elastomers) or if the model in question is optimized for the suspension or non-suspension front end.

✓ **Rear Suspension**—The majority of recumbent rear suspensions utilize the Cane Creek AD5 air shock. These seem to work very well. The design of the suspension bike itself is ultimately more important. We have had very good luck with the Rans, Angletech and BikeE rear suspensions. Cambie Cycle and Earth Cycles use a heavy duty elastomer, a simpler alternative that works very well. Elastomers can also be tuned to your body weight (XL Riders: be sure to tell your mfr/dealer your weight). Unlike suspension fork elastomers, these are external. The best recumbent rear suspension is the Angletech Altitude designed and built by Boulder Bicycles—a veteran in the mountain and road suspension world. This suspension also has the most travel.

PART V RECUMBENT MANUFACTURERS & DEALERS

■ SELECTING RECUMBENT MANUFACTURER

✓ **Choosing Manufacturer**—The easiest way to do this is go ride a bunch of bikes and buy the one that feels the best. Bikes are fairly simple vehicles, and even the worst recumbent isn't that bad. A more intense or enthusiast method would be to get educated, learn about the different manufacturers, talk to enthusiasts call the manufacturer and see how you are treated. Ask around for referrals, read RCN road tests (lack of manufacturer road tests in RCN means that they don't offer us test bikes).

Keep in mind that different manufacturers specialize in different recumbent designs. Some manufacturers offer both USS and ASS, LWB and SWB, though this is primarily a marketing ploy. In most cases, each company's passion is in one design style which they do BEST. This is not that difficult to figure out, just look at where they started and where their emphasis is placed. Here are some other items to check out:

- ✓ Are the bikes sought after or soft on the market?
- ✓ Are the bikes known to hold up well?
- ✓ How is resale? (Do the bikes go on closeout sale every fall?)
- ✓ Is the product known to be refined or is it a new model?
- ✓ Does the company have a history in recumbents?
- ✓ Is the warranty any good? Is it transferable?
- ✓ Are your inquiries and questions treated patiently & respectfully?
- ✓ Do you get acceptable answers or sales hype or smoke and mirrors?
- ✓ How are you treated on the phone after the fifth call?
- ✓ Are they proactive or difficult with an attitude?
- ✓ Do they build and sell to enthusiasts or just sell bikes to dealers?
- ✓ Can you relate to the builder/designer?
- ✓ Do you like the way the bike looks, feels and how you look on it?
- ✓ Is their philosophy about components, quality, where the bike is built and especially design philosophy a good match for your own?
- ✓ Does the company have an *enthusiast* presence at races, tours, events and in RCN?

▲ Manufacturer Rant

Okay, so most of these guys are small, don't have enough manpower, can't keep up with deliveries and orders, can't seem to keep track of promised delivery dates, but why is it that I feel like some of these guys don't want to talk to customers? There is a mentality in the bike business that has customers pushed off on dealers. Well, in a world as small as recumbent cycling—this sucks! If you are treated rudely by a dealer or manufacturer—go elsewhere, write them a letter and tell them why you are spending your money on another brand.

Here is a list of design attributes that are red flags to look elsewhere or understand that you may have problems down the road. If you decide to buy a bike with one of these attributes it's fine with me, just take responsibility for your decision.

✓ **Bad Seat Adjustment Systems** (hose clamp seat mounts)—We love hose-clamps...on homebuilt bikes. In some applications, they work fine. We've seen them connecting Rohloff hub cable hardware, and connecting the rear seat supports. Where we object is when they are the sole method of adjustment for a sliding seat (they wear out). And especially when they are used to hold the seat in its horizontal plane. They can slip, twist and they do have a short lifespan (if not left alone).

✓ **Fiberglass Seat Shells**—Composite is stronger. FG may not be tuff-enuff. Most FG seat shells lack body contour, foam and comfort.

✓ **Lack of an Infinitely Adjustable Seat Slider**—Notches or holes

every inch is *NOT* infinite. This can be, but is not always a concern.

- ✓ **Unproven Models**—Just about any new model fits this bill.
- ✓ **New Manufacturers**—No track record or staff recumbent experts.
- ✓ **Bad Component Specs**—No-name brands and vague answers.
- ✓ **Very Low Prices**—This is generally short term to 'buy' their way into the market. The deals (or bikes) are usually short lived.
- ✓ **Poorly Behaved Manufacturers**—Hey, it happens. Some are willing to send us poor test bikes (we've received worn demo prototypes, as well as crooked, misaligned 'shop' bikes).

There are many manufacturers who consistently get good RCN reviews, are proactive and offer us test bike loaners. The good ones are easy to spot and have been around for a long while. We have a fair amount of problems with test bikes. Several manufacturers have pulled their ads and ceased offering us test bikes because of our criticisms. Our point is that if they give us such a difficult time, how will they will treat should you have a problem? One area where recumbent manufacturers are truly lacking is R & D. Most new products just don't get tested enough in varying conditions with many different rider types and sizes. The key to a successful recumbent design is years of refinement by recumbent experts. Look for models that are beloved by enthusiasts.

■ SELECTING RECUMBENT DEALER

Your first step is to read RCN. Truly connected dealers will have listings in RCN. If you are connected to the Internet, go to BikeE, Vision and Rans websites. Each has a by state listing of recumbent dealers. I suggest that you call first to see what is in stock before you drive very far. BikeE has the most dealers, Vision second and Rans third. If you are not connected to the internet, go to your local library and have the librarian show you how to do it, or call the manufacturer for a recommendation.

✓ **Selecting A Dealer**—Just because you find a dealer listing on the internet does not mean the company knows anything about recumbents (though we hope they do).

These dealers may have little or no recumbent experience, have not heard of RCN and don't know the other manufacturers (other than the big-3). They may sell only one or two makes or models and often may not even stock recumbents. This type of dealer is only good for one thing—closeout specials!

✓ **Selecting An "Enthusiast" Dealer**—There are several different types of dealers. From those who will do anything to customize a bike for a you to supermarket style that have a pained look on their face when you ask for a component change. These represent the low end and high end of the market. Custom spec is a pricey way to go, though these dealers can be a good place to buy a factory bike as they have the highest 'build' standards.

Most dealers have biases and want to sell you what they sell—and sometimes what they have in stock. YOU need to make the ultimate decision.

✓ **When There Are No Dealers**—Custom spec dealers and many RCN advertising dealers and even some manufacturers will ship a recumbent directly to your door. Be sure to ask about the level of preassembly necessary to get you on the road. We prefer not to buy a recumbent mail order unless it is coming from a custom spec dealer or direct selling manufacturer who has built up and bench-tested it PRIOR to shipping, or the manufacturer offers to help you through the process. A good deal is another reason, though be sure to ask about packing and shipping costs, as well as to factor in assembly costs.

✓ **Mailorder/Saving A Few Bucks**—We suggest that unless your needs are very specialized or you have custom-spec aspirations—deal with your local dealer. If you buy mailorder, taking your new bike in to the local dealer for service will be an embarrassing experience. If you are considering this, discuss your concerns with the custom-spec dealer as well as your local dealer.

✓ **Final Dealer Rant**—Exceptional bicycle and recumbent dealers are rare (recumbent dealers are rare, period). It is my opinion that most dealers could improve—especially in the hospitality department. I'd like to feel that my business is important to them. When I was in Las Vegas for the Interbike trade show, I had a day to kill, so I went out in search of the Harley Davidson dealer. Harley Davidson owners are the most brand loyal customers on the face of the earth, and a Harley shop is a fun place to hang out. Dealers keep the coffee brewing all day. Customers are often known

by name. Customers meet at dealerships. Customers hang out at dealerships. Saturday rides start at dealerships. And these customers spend LOTS OF MONEY on their fancy motorcycles.

In contrast, when I go into a bike shop, I am usually made to feel like I should buy whatever I came for and leave ASAP and generally get the bum's rush. How many dealers in the USA have coffee brewing? How many have a couch for me and my recumbent pals to sit on or even want me around? How many have a good selection of recumbent-specific parts and accessories for me to spend my allowance on? If you run a shop like this, let us know—we plan to showcase friendly and knowledgeable recumbent shops in future editions of RCN.

PART VI USED BIKES

■ FINDING A USED BIKE

If you are looking for a specific make and model, maybe a rare Rans Vivo or Easy Racers Gold Rush—start by calling the manufacturer and asking for a referral for an in stock bike. Most of these companies will know where the rare bikes have gone. Your second best resource is RCN. The serious enthusiast dealers advertise. Call them. Lastly, use the Internet recumbent dealer listings.

Some recumbents are always rare. The high end Easy Racer and Rans models have terminal waiting lists. They are great bikes, but be prepared to wait. Other bikes may be great, but are less specialized, lower priced, built in Taiwan and are readily available. These bikes don't hold their value as well, and often times will have price reductions making for big customer losses should they resell a year later. Examples of this are as follows: Vision quit building the R42, and made the new R40 better than the old R42 (\$400 price difference). R42 owners bikes won't hold their value to well. BikeE lowered the CT price from \$925 to \$650 (though the lower priced versions are made in Taiwan). Rans lowered the price of Rockets to \$995 and added the Flip It stem, previously a pricey option. These are all great bikes—though my point is that bikes in the mainstream may be affected by price changes more often than the higher end bikes. Very expensive custom spec bikes, unpopular low-end bikes, regional brands and dealer market saturated brands also depreciate faster.

Here are some ideas on where to look for a used recumbent:
✓ **Internet**—Check out the hpv-forsale list (www.ihpva.org), www.bikeroute.com, www.recumbents.com. Hostel Shoppe's site and several others all have used recumbent sections.

✓ **RCN Classifieds**—Be the first to call, the good deals go quickly! Many dealers sale bikes, used bikes, demos, closeouts and sales.

✓ **Club Members**—Ask the local riders if they know of any bikes for sale. Put the word out. A lot of bikes change hands in our small group.

✓ **Local Newspaper**—These are rare, and the deals are either too good to be true or completely ridiculous.

✓ **Build Your Own**—See RCN#47, our Homebuilder's Special Edition (we have a few copies left).

■ FINAL WORDS

Keep in mind that everyone in this business has an agenda so be sure to filter what you read, hear and see to reach your own understanding of recumbent bikes. Stick to the ones that you are drawn to and can identify with: riders who have similar likes, dislikes and values to your own. It's not that people are right or wrong, it is more that owners and riders have differing standards as to what is acceptable or what works for them. Like car or boat owners, recumbent riders can be very brand or design loyal.

While you are in the process of becoming recumbent-educated go out and ride some bikes, surf the Internet hpv lists, ride more bikes, meet your local rider group or go to a rally or event and then ride more bikes. This will give you exposure to lots of opinions and ideas. Narrow your list down to just a few models and then go ride them. Once you complete this task—go ride the ones you like again. Ride the bikes on the final cut for longer test rides to be sure the bike will work for your present needs.

Don't get too caught up in equipment selection. Remember, that it is more about the freedom and physical activity you can experience by pedaling your recumbent on a sunny afternoon. Make your mission *about the ride*. Our only mission in this is that we hope that you find the perfect bike for YOU!

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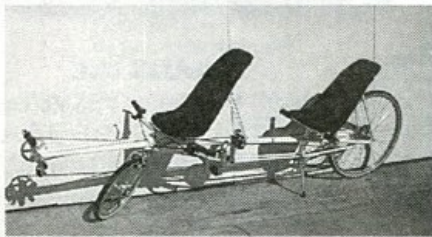
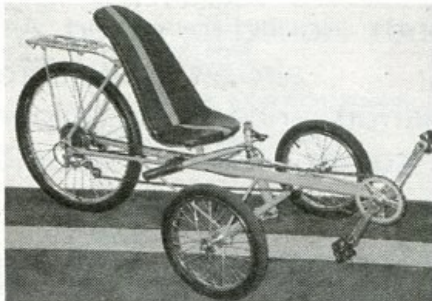
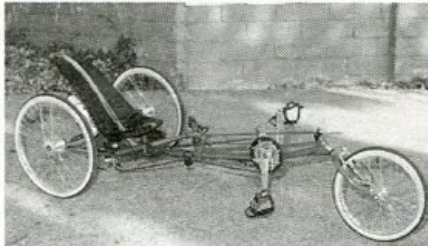
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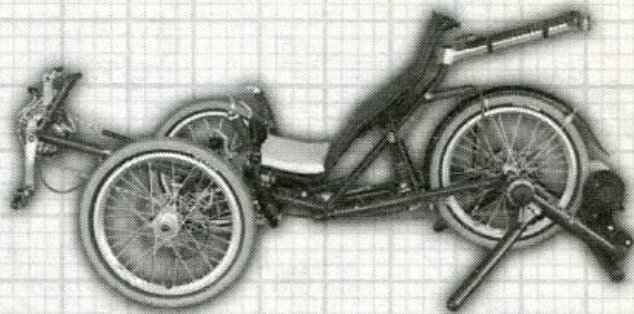
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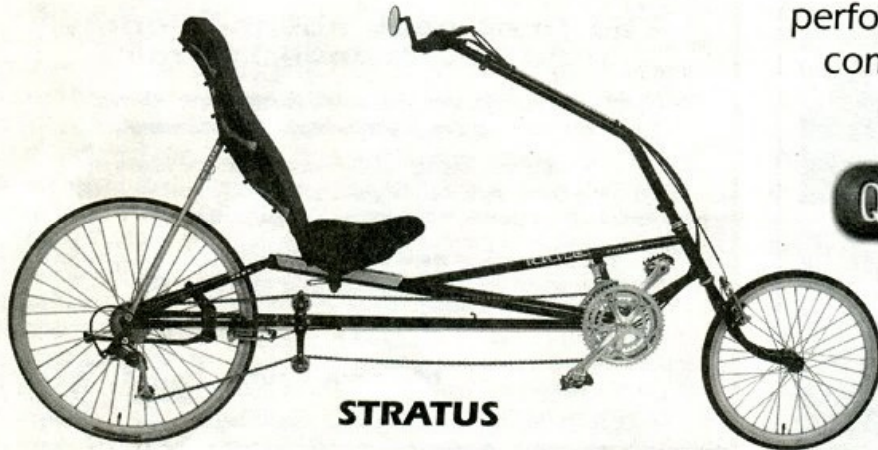
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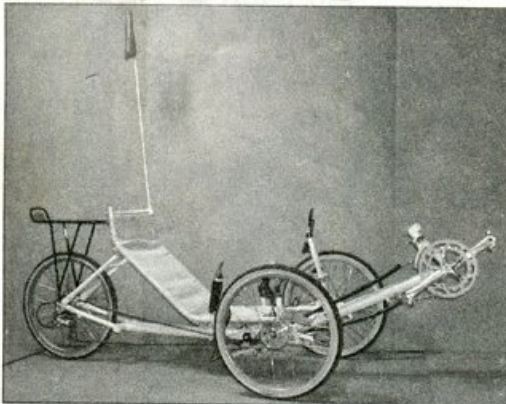
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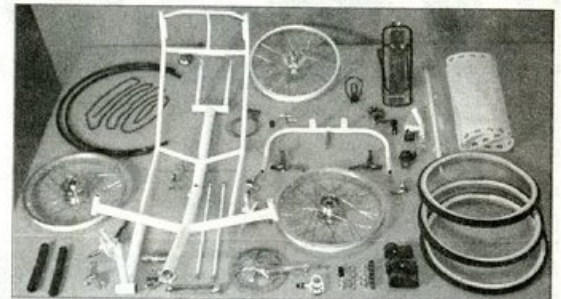
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www.bromptonbike.com
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www.cycling.uk.com/bikeshop/trice.htm.

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NOTES:

DNR—Did not respond to our info request.
☆—Manufacturer supports RCN's mission and
proactively participates in RCN road tests; can
accept criticism and supports this publication

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ross.htm
Ed Gin's Festina site: http://
www.mcs.net/~gkpsol/festina.html.

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2000 Recumbent Listings

Long Wheelbase, Compact and Medium Wheelbase

Price-Make-Model	Type-Data	Seat	Frame-Fork-Suspension	Drivetrain-Brakes-Specs
\$499-\$549 Sun SuperCruiser EZ1 <i>Fits XS 35"-46" Compact</i>	ASS WB-56" WT-#34 SH-24" BB-14.5"	Steel frame, mesh back, padded foam base	TIG HiTen steel frame HiTen w/CroMo blades; Color: red or blue	GROUP—Shimano/SRAM; SHIFT—MRX twist; DER—Acera; CRK—Dotek 30/42/52; GEARS—11-28; RANGE—21-95; BRK—Tektro V; WHLS—406mm 20"/305mm 16"; TRS—NA
\$699 BikeE CT Compact <i>Fits 4'8"-6'3"+; 2 sizes</i>	ASS WB-56" (XL avail.) WT-#30 SH-25" BB-17"	Sweet Seat—tall back Sling Mesh back Foam base with cover	Alum extruded frame; CroMo fork & stays Colors: red or black	GROUP—SRAM ESP 3.0; SHIFT: twist 21-spd; DER—3.0/3x7 CRK—Dotek alloy; GEARS—11-28; RANGE—23-108; CHN—KMC; BRK—V; WHLS—406mm 20"/305mm 16"; TRS—V Mon
\$799 Rans Wave Compact <i>Fits XS 36"-50.75"</i>	ASS WB-61" WT-#30 SH-23" BB-NA	Rans Medium mesh back Foam covered ABS base with cover	TIG OS CroMo frame CroMo fork Colors: NA	GROUP—SRAM ESP 5.0; SHIFT—twist 24-spd.; CRK—Dotek alloy; GEARS—NA; RANGE—NA; CHN—KMC; BRK—ESP V; WHLS—406mm 20"/305mm 16"; TRS—Primo V-Monster
\$995 Rans Tailwind LWB <i>Fits XS 36-50.75"</i>	ASS WB-61" WT-#30 SH-23" BB-19"	Rans Medium mesh back Foam covered ABS base with cover	TIG OS CroMo frame CroMo fork Colors: Ice Red	GROUP—SRAM ESP 7.0; SHIFT—ESP twist; CRK—Dotek alloy; GEARS—11-28; RANGE—NA; HS—Ritchey; CHN—KMC; BRK—ESP V; WHLS—dual 406mm 20"; TRS—Comets
\$1095 BikeE AT Compact <i>Fits 4'8"-6'3"+; 2 sizes</i>	ASS WB-56" (XL avail.) WT-#30; SH-25" BB-17"	Sweet Seat—tall back Sling Mesh back Foam base with cover	Alum extruded frame; CroMo fork & stays; Susp.—Cane Creek AD5 Colors: pewter or blue	GROUP—SRAM ESP 5.0; SHIFT—twist 21-spd; DER—5.0/3x7; CRK—Dotek alloy; GEARS—11-28; RANGE—23-108; HS- Aheadset; CHN—KMC; BRK—V; WHLS—406mm 20"/305mm 20"; TRS—Primo V Monster
\$1099 Linear Compact <i>Fits to 6'2"; 3 sizes</i>	ASS or USS WB-52/55/58 WT-NA SH-23"	Alum. frame, low mesh back; Foam covered alum. base with cover	FM-TIG Alum. extrusion. FK-CroMo Colors: smoke, black & red	GROUP—SRAM/3x7; SHIFT—twist 21-spd; DER—NA/3x7; CRK—Sugino XG; RANGE—21-104; BRK—Dia Compe FSE sidepull; WHLS—406mm 20"/305mm 20"; TRS—Primo Comet
\$1200 HPM Roadster LWB <i>Fits 2 sizes</i>	ASS WB-61" WT-#32 SH-NA BB-NA	Alum. frame mesh back & base	TIG CroMo frame & fork Color: custom	GROUP—Shimano/SRAM 3x7; DER—Shimano/3x7; CRK—Sugino; BRK—V; WHLS—dual 559mm 26"; TRS—Continental
\$1270 Vision R40 LWB	USS (ASS opt.) WT-#34 WB-60+ SH-23" BB-20-21"	Alum. frame, mesh back; Thermarest pad base	TIG OS CroMo frame & fork Colors-red & blue	GROUP—Shimano Tiagra; SHIFT—Rapid Fire 27-spd; GEARS—11-32; RANGE—23-117; HS—HP-MC30; BB—N52; CHN—KMC; BRK—Avid V; WHLS—26"/20" or 16"
\$1295 Burley Limbo Compact <i>Fits 5'-6'4"</i>	ASS WB-58.75" WT-#37 SH-24-26" BB-23.5"	Mesh back; Foam covered Corbin base with Leather cover; adjustable recline	TIG CroMo frame & fork; Susp.—RockShox coil/oil rear Colors: blue/black	GROUP—Shimano Sora/SRAM; SHIFT—SRAM ESP 24-spd; CRK/BB—Sora 30/42/52/UN40; RANGE—23-123; HS—Cane Creek; BRK—M420 V; WHLS—559mm 26"/406mm 20"; TRS—Comet
\$1295 Vision R32 MWB <i>Fits XS 35"-48"</i>	ASS WB-54" WT-#35/37.5 (susp). SH-24" BB-26.5"	Aluminum frame, mesh back, Thermarest seat base pad	TIG OS CroMo frame & fork; Susp.—Coil/Oil; Opt. Ballistic susp. front fork; Colors: red & blue	GROUP—SRAM/3x7; SHIFT—twist 21-spd; DER—SRAM/3x7; CRK/BB—Sugino Impel 50-T/UN52; RANGE—24-103; HS-YST; CHN—KMC; BRK—STX RC V; WHLS—dual 406mm 20"; TRS—Primo Comet
\$1350 Linear LWB <i>Fits 5'3"-6'3"; 4 sizes</i>	USS WB-62 WT-#32 SH-25" BB-19"	Alum. frame, high mesh back; Foam covered alum. base with cover	TIG Alum. extrusion CroMo fork Colors: gold, black & alum.	GROUP—SRAM/3x7; SHIFT—twist 21-spd; DER—NA/3x7; CRK—Sugino XG; RANGE—21-104; BRK—Dia Compe FSE sidepull; WHLS—559mm 26" 406mm 20"; TRS—NA
\$1399-\$1499 Radius C4 MWB <i>All Around & Tour</i>	ASS or USS WB-NA WT-#38 SH-23" BB-24"	Mesh back foam base	TIG CroMo frame; fork-NA Susp.—hydraulic rear Colors-Blue, red, yellow, black	GROUP—SRAM/3x7; SHIFT—twist 21-spd; DER—ESP/3x7; CRK—alum alloy 52-T; GEARS—12-28; BRK—Alhonga V; WHLS—559mm 26"/406mm 20"; TRS—Vredstein
\$1500-\$4600 Rotator Pursuit LWB	ASS WB-65" WT-#30 SH-15"	CroMo frame; mesh back & base; hoseclamp mount	TIG CroMo frame & fork (opt. titanium frame)	GROUP—SRAM/NA; SHIFT—twist; DER—2 rear/mid-drive; CRK—alloy; BRK—NA; WHLS—dual 406mm 20"
\$1495 BikeE FX MTB Compact <i>Fits 4'8"-6'3"+; 2 sizes Full suspension</i>	ASS WB-52" (XL avail.) WT-#30 SH-28.5" BB-20.5"	Low back offroad Sling Mesh back Foam base with cover	Alum frame; Susp.—Full Air Tech. Cane Creek AD5 & BikeE front susp; Color: pewter or red	GROUP SRAM ESP 7.0; SHIFT—ESP 7.0 twist 24-spd; DER—ESP; CRK—BikeE custom with matching mid-drive; GEARS—11-30; RANGE—17-94; HS—Aheadset; CHN—KMC; BRK—ESP V; WHLS—406mm 20"/305mm 16"; TRS—Kenda Krisp
\$1599 Rans Stratus LWB <i>Fits XS 35-52.5 2 sizes</i>	ASS WB-66-70.25" WT-#32 SH-21" BB-14"	Rans Medium mesh back Foam covered ABS base with cover	TIG CroMo frame & fork Colors: electric Blue	GROUP—SRAM 7.0; SHIFT—twist 27-spd; CRK—Shimano 105; GEARS—11-32; HS—Ritchey; CHN—KMC; BRK—ESP 7.0 V; WHLS—559mm 26"/406mm 20"; TRS—Primo Comet
\$1795 Easy Racer Tour Easy SS LWB <i>Fits XS 36"-46"; 4 sizes</i>	ASS WB-66-69" WT-#30 (med.) SH-22" BB-13"	Cobra: composite base; layered Foam; Lycra cover or optional Kool Back mesh	Seamless TIG CroMo frame & custom Spinner CroMo chromed fork Colors—black, red & blue	GROUP—Shimano/SRAM mix; SHIFT—Centera twist 21-spd (Rapid Fire 24-spd. opt.); DER—XT/105; CRK—Easy Racers (Sugino) 26/42/52; BB—LX; HS—YST roller; GEARS—11-32; RANGE—23-125 (opt. 19-125); CHN—SRAM; BRK—Canti/dual pivot; WHLS—700cx28/ 451mm 20"
\$1795 Easy Racer Tour Easy EX LWB <i>Fits XS 36"-46"; 4 sizes</i>	ASS WB-66-69" WT-#30.75 (med.) SH-22" BB-13"	Cobra: composite base; layered Foam; Lycra cover or optional Kool Back mesh	Seamless TIG CroMo frame & custom Spinner CroMo chromed fork Colors—black, red & blue	GROUP—Shimano/SRAM mix; SHIFT—Centera twist 21-spd (Rapid Fire 24-spd. opt.); DER—XT/105; CRK—Easy Racers (Sugino) 26/36/52; BB—LX; HS—YST roller; GEARS—11-32; RANGE—23-113 (opt. 19-113); CHN—SRAM; BRK—ESP 9.0 V; WHLS—700cx35/ 406mm 20"
\$1795 (\$1945 w/fairing) Rans Velocity Squared LWB <i>Fits XS 37-52"; 2 sizes</i>	ASS WB-66-70.25" WT-NA SH-21" BB-22.25"	Rans Medium mesh back Foam covered ABS base with cover	CroMo frame & fork Colors: silver	GROUP—SRAM 7.0; SHIFT—twist 27-spd; CRK—Shimano 105; GEARS—11-32; RANGE—NA; HS—Ritchey; CHN—KMC; BRK—ESP 7.0 V; WHLS—559mm 26"/406mm 20"; TRS—Primo Comets
\$1850 Reynolds Nomad Compact/LWB	USS WT-#25 WB-56"-70" SH-11-13" BB-20"	Alum/fiberglass mesh back, foam covered fiberglass base	TIG Nickel plated CroMo and custom CroMo fork	GROUP—Shimano LX mix; SHIFT—bar-con; CRK—Sugino 34/56 or 26/36/54; BRK—brake mounts for either wheelset; WHLS—26" or 20"/406mm 20"; TRS—Avocet
\$1995 BikeE NX Compact <i>Fits 4'8"-6'3"+; 2 sizes</i>	ASS WB-52" (XL avail.) WT-#30 SH-28.5" BB-20.5"	Sweet Seat—tall back Sling Mesh back Foam base with cover	Alum frame; CroMo fork; Susp.—Cane Creek AD5 Colors: green	GROUP—SRAM ESP/Schlumpf; SHIFT—twist 16-spd; DER—ESP/Schlumpf MD; CRK—Dotek alloy; GEARS—11-30; RANGE—26-112; HS—Aheadset; CHN—KMC; BRK—Hayes Disk; WHLS—451mm 20"/349mm 16"; TRS—Comets

Price-Make-Model	Type-Data	Seat	Frame-Fork-Suspension	Drivetrain-Brakes-Specs
\$1995 Rans Gliss LWB Fits XS 36"-50.75"	ASS WB-66" WT-#31 SH-23" BB-18.75"	Rans Medium mesh back Foam covered ABS base with cover	TIG CroMo frame & fork Susp.: Cane Creek rear Colors: lazer jade black	GROUP—SRAM ESP 9.0; SHIFT—twist 27-spd; DER—ESP/105; CRK—Shimano 105; GEARS—11-32; RANGE—NA; HS—Ritchey; CHN—KMC; BRK—ESP 9 V; WHLS—dual 406mm 20"
\$2195-\$3300 (\$Can) Cambie Recamboni LWB	ASS WB-70" WT-#33; SH-21" BB-14.5"	Cordura foam on alloy frame	TIG 4130 CroMo Color: custom powdercoat	GROUP—Shimano STX/RX100; SHIFT—Rapid Fire 24-spd; CRK/BB—RX100 30/42/52; GEARS—11-28; RANGE—NA; BRK—Canti/sidepull; WHLS—559mm 26"/406mm 20"
\$2399 Longbikes Vanguard LWB Standard, XL & custom	ASS WB-67-71" SH-25" BB-15.5"	CroMo frame mesh back and base	TIG CroMo Colors: red or black	GROUP—Shimano XT/105; SHIFT—bar-con 27-spd; DER—XT/105; CRK/BB—105 30/42/52; GEARS—11-32; RANGE—NA; HS—LX; CHN—Shimano HG; BRK—Avid V; WHLS—559mm 26"/406mm 20"; TRS—Avocet Fasgrip
\$2399 Longbikes Slipstream LWB Standard, XL & custom	ASS WB-67" SH-24" BB-17.5"	CroMo frame mesh back and base	TIG CroMo Colors: red or black	Same on both models/many upgrades available
\$2995 Easy Racer GoldRush SS LWB Rear suspension (opt.) Fits XS 36-46"; 4 sizes	ASS WB-66-69" WT-#27 (med.) SH-22" BB-13"	Cobra: composite base; layered Foam; Lycra cover or optional Kool Back mesh	TIG heat treated Alum. & custom Spinner chromed CroMo fork (opt. rear suspension) Colors: black, white, or polished aluminum	GROUP—Shimano/SRAM mix; SHIFT—Centera twist 24-spd (Rapid Fire 27-spd opt); DER—XT; CRK/BB—Ultegra 26/42/52; GEARS—11-30/34; RANGE—23-125; HS—Ultegra; CHN—SRAM; BRK—Shimano Dual Pivot; WHLS—700c x28/451mm 20"; HUBS—LX
\$2995 Easy Racer Gold Rush EX LWB Rear suspension (opt.) Fits XS 36-46"; 4 sizes	ASS WB-66-69" WT-#27.75 (med.) SH-22" BB-13"	Cobra: composite base; layered Foam; lycra cover or optional Kool Back mesh	Same as above	GROUP—Shimano/SRAM mix; SHIFT—Centera twist 24-spd (Rapid Fire 27-spd opt); DER—XT; CRK/BB—Ultegra 26/42/52; GEARS—11-30/34; RANGE—19-125; HS—Ultegra; CHN—SRAM; BRK—SRAM ESP 9.0 V; WHLS—700c x35/406mm 20"; RIMS—Sun(ft)/Ritchey
\$5195 Easy Racer TiRush LWB Fits XS 36-46"; 4 sizes	ASS WB-66-69" WT-#26-7/8 (med.) SH-22" BB-13"	Cobra: composite base; layered Foam; lycra cover or optional Kool Back mesh	Purged TIG 3Al/2.5V Titanium with custom Spinner chromed CroMo fork (titanium fork optional) Colors: polished titanium	GROUP—Shimano/SRAM mix; SHIFT—SRAM Rocket twist or Rapid Fire 27-spd; DER—XTR; CRK/BB—Ultegra 26/36/56; GEARS—XTR 11-32; RANGE—21.5-125; HS—Ultegra; CHN— SRAM; BRK—Ultegra dual pivot; WHLS—700c x 25/451mm 20" HUBS—Dura Ace; RIMS—Sun (ft)/Ritchey

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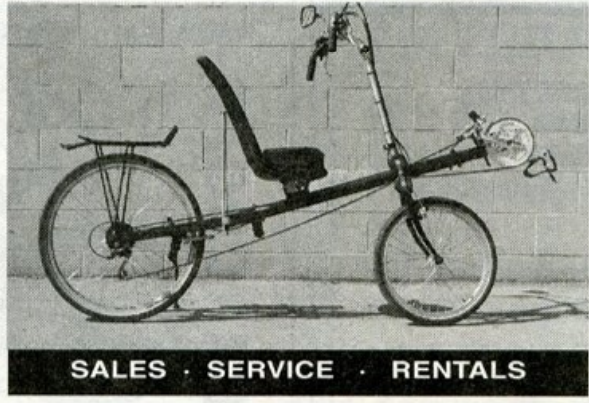
Price-Make-Model	Type-Data	Seat	Frame-Fork-Suspension	Drivetrain-Brakes-Specs
\$850-\$1150 S & B Single	USS (ASS opt.) WB-NA WT-#23-29 SH-17" BB-NA	Fiberglass shell; foam; very limited recline adjustment	TIG CroMo frame & fork Colors-Assorted	GROUP—Shimano/SRAM mix; SHIFT—twist; DER—7,8,14 or 24 speed; CRK—NA; GEARS—NA; HS—NA; CHN—KMC; BRK—V; WHLS—26"/16"; TRS—NA
\$850-\$1195 Lightning Thunderbolt	ASS WB-40-43" WT-#29-30.5 SH-21-23" BB-NA	Clamped Aluminum frame; mesh; foam base pad	HiTen steel frame CroMo fork Colors-blue, purple, yellow	GROUP—Mix; SHIFT—SRAM MRX twist 21-speed; DER—Acera/Epoch; CRK—Cyclone 28/38/48; BRK—Tektro V; WHLS—559mm 26"/406mm 20" or 349mm 16"; TRS—Comets
\$850-\$900 HPM Trick <i>Fits to 6'5"; 2 sizes</i>	USS (ASS opt.) WB-33.5-39.5" WT-#26-29	Alum. frame mesh back & base	TIG 6160 Alum. rectangular tubing Colors: powdercoat	GROUP—Sachs 3x7 or Nexus; SHIFT—twist 21-speed or 7-spd.; WHLS—559mm 26"/406mm 20" (long) or 20"/16" (short)
\$995 Rans Rocket <i>Fits XS 41.25-56"</i>	ASS WB-41" WT-#27 SH-23" BB-25"	Rans Medium mesh back Foam covered ABS base with cover	TIG CroMo frame & fork Flip It Stem Colors-ice Red	GROUP—SRAM ESP 7.0; SHIFT—ESP twist; CRK—Dotek alloy; GEARS—11-28; RANGE—NA; HS—Ritchey; CHN—KMC; BRK—ESP V; WHLS—dual 406mm 20"; TRS—Comets
\$1100 HPM Phaser folding	NA	NA	NA	GROUP—Sachs 3x7 or Nexus; SHIFT—twist 21-spd. or 7-spd.; BRK—V; WHLS—NA
\$1095-\$1345 Vision R40 <i>Fits XS 41-49.5"</i>	USS (ASS opt.) WT-#30.5-33.5 WB-40" SH-24" BB-24"	Alum. frame, mesh back; Thermarest pad base	TIG OS CroMo frame & fork Colors-red & blue	GROUP—Shimano Tiagra; SHIFT—Rapid Fire 27-spd; GEARS—11-32; RANGE—23-117; HS—HP-MC30; BB—N52; CHN—KMC; BRK—Avid V; WHLS—559mm 26"/406mm 20" or 349mm 16"; TRS—Primo Comets
\$1250-\$2195 Turner T-Lite	USS WB-NA WT-#28 SH-22" BB-NA	Fiberglass shell (composite opt.) pad; ventilated cover; limited recline adjustment	TIG CroMo frame & fork Colors-NA	GROUP—SRAM/Shimano; SHIFT—21-spd; BRK—Odyssey A V (front) / sidepull (rear); WHLS—24",26", 700c/406mm 20" or 349mm 16"; TRS—NA
\$1299 Burley Limbo SWB <i>Fits 5'-6'4";</i>	ASS WB-46" WT-#37 SH-24-26" BB-23.5"	Mesh back; Foam covered Corbin base with Leather cover	TIG CroMo frame & fork.; Susp.-RockShox coil/oil rear Colors-blue/black	GROUP—Shimano Sora/SRAM; SHIFT—SRAM ESP 24-spd; CRK/BB—Sora 30/42/52/UN40; RANGE—23-123; HS—Cane Creek; BRK—M420 V; WHLS—559mm 26"/406mm 20"; TRS—Comet
\$1350 Linear SWB <i>Fits to 6'3"</i>	USS WB-38" WT-#29 SH-25" BB-NA	Alum. frame, low mesh back; Foam covered alum. base with cover; fixed seat back	TIG Alum. extrusion CroMo fork Colors-black	GROUP—SRAM; SHIFT—twist 21-spd; DER—ESP/3x7; CRK—Sugino XG; RANGE—21-104; BRK—Dia Compe FSE sidepull; WHLS—406mm 20"/305mm 20"; TRS—Primo Comet
\$1350-\$2050 Lightning Stealth <i>Fits 5'-6'6"; 2 sizes</i>	ASS WB-41-45" WT-#27-29 SH-19-22" BB-NA	TIG Aluminum frame; mesh; foam base pad	Brazed 4130 CroMo CroMo fork; Susp. opt. Colors: blue, red, black	GROUP—Shimano/SRAM Centera 24-spd; DER—RX100/Alivio; CRK—Cyclone 28/38/48; GEARS—11-30; RANGE—25-120; HS—Dia Tech; BB—RSX; CHN—KMC; BRK—Tektro V; WHLS—559mm 26"/406mm 20" or 349mm 16"
\$1500 Rotator Tiger	ASS WB-41" WT-NA SH-18"	CroMo frame; mesh back & base	TIG CroMo frame & fork Colors-NA	GROUP—SRAM; SHIFT—twist; DER—2 rear/mid-drive; CRK—alloy; BRK—NA; WHLS—dual 406mm 20"
\$1650 Trek R200	ASS WB-43.75" WT-#32 SH-26.5" BB-23.5"	Rans Medium mesh back Foam covered ABS base with cover	3" dia TIG Aluminum frame & CroMo fork; Cane Creek AD5 rear susp. Colors-red	GROUP—SRAM/Mix; SHIFT—twist 40-spd; DER—ESP 7.0/mid-drive; CRK—Cyclone 39-T; RANGE—24-122; HS—Dia Compe; BB—NA; CHN—NA; BRK—Nexave V; WHLS—dual 406mm 20"
\$1695 Rans V-Rex <i>Fits 38.5-53.25"</i>	ASS WB-42.75" WT-#28 SH-23.5" BB-25.5"	Rans Medium mesh back Foam covered ABS base with cover	TIG OS CroMo frame & fork Flip It Stem Colors-electric Blue	GROUP—SRAM 7.0; SHIFT—twist 27-spd; CRK—Shimano 105; GEARS—11-32; RANGE—NA; HS—Ritchey; CHN—KMC; BRK—ESP 7.0 V; WHLS—559mm 26"/406mm 20"; TRS—Primo
\$1695-\$3045 Vision R50/54/55 <i>Full Suspension (Subject to change)</i>	USS (ASS opt.) WT-#32-33 WB-41" SH-27" BB-24/26"	Alum. frame, mesh back; Thermarest pad base	Alum. frame, mesh back full suspension Colors-Several	GROUP—Shimano Tiagra, 105 or Ultegra; SHIFT—Rapid Fire 27-spd; GEARS—11-32; RANGE—23-117; HS—HP-MC30; BB—N52; CHN—KMC; BRK—Avid V or Magura; WHLS—559mm 26"/406mm 20" or 349mm 16"; TRS—Primo Comet
\$1695-\$2745 Vision R44/45 <i>Fits XS 41-49.5"</i>	USS (ASS opt.) WT-#26.5-27 WB-40" SH-24" BB-24"	Alum. frame, mesh back; Thermarest pad base	TIG CroMo frame Ballistic suspension fork Colors-red & blue	GROUP—Shimano 105/Ultegra; SHIFT—Rapid Fire 27-spd; DER—XT/105; GEARS—11-32; RANGE—23-115; HS—HP MC30; CHN—KMC; BRK—Avid Arch V or Magura; WHLS—559mm 26"/406mm 20"; TRS—Primo Comet
\$1695 Haluzak Horizon <i>Fits 5'3"-6'7"; 3 sizes</i>	USS (ASS opt.) WT-#29 WB-40.5" SH-23" BB-24"	2-piece alum. frame, mesh back & base	TIG CroMo frame & fork Suntour susp. fork opt. Colors-blue, green or red	GROUP—Shimano 105; SHIFT—bar-con 27-spd; DER—LX/105; GEARS—11-32; RANGE—NA; HS—Tange Levin; CHN—KMC; BRK—LXV; WHLS—559mm 26"/406mm 20"; TRS—Schwalbe
\$1795-\$2595 Greengear Sat R Day <i>Stock & custom</i>	USS or ASS WT-#29.5 WB-40" SH-25.5" BB-23.5"	Mesh back, temperfoam base	CroMo frame & fork Seat suspension Folding frame	GROUP—Shimano Revo, 105 or Ultegra; SHIFT—twist, Rapid Fire or STI; BRK—Tektro V; WHLS—dual 16" x 1-3/8"
\$1850 Reynolds Wishbone <i>Fits: custom to rider</i>	USS (ASS opt.) WT-#25 WB-48-52" SH-14-16" BB-25"	Alum/fiberglass mesh back, foam covered fiberglass base	TIG Nickel plated CroMo and custom CroMo fork	GROUP—Shimano LX mix; SHIFT—bar-con; CRK—Sugino 34/56 or 26/36/54; BRK—Dual brake mounts for either wheel size; WHLS—26" or 20"/406mm 20"; TRS—Avocet
\$1995 Rans Vivo <i>Fits XS 41.25-56"</i>	ASS WB-45.75" WT-#31 SH-23.75" BB-25.5"	Rans Medium mesh back Foam covered ABS base with cover	TIG CroMo frame Ballistic susp. fork; Cane Crk AD5 Flip It Stem Colors-Lazer Jade Black	GROUP—SRAM ESP 9.0; SHIFT—twist 27-spd; DER—ESP/105; CRK—Shimano 105; GEARS—11-32; HS—Ritchey; CHN—KMC; BRK—ESP 9 V; WHLS—dual 406mm 20"; TRS—Primo Comets
\$1995 Barcroft Dakota & Virginia	ASS WB-47" WT-#31 SH-19.5" BB-23.5"	Rans Medium mesh back Foam covered ABS base with 2	4130 CroMo frame and fork Colors: NA	GROUP—Shimano 105; SHIFT—SRAM twist 27-spd; DER—XT/105; GEARS—11-34; RANGE—22-118; HS—Ritchey; CHN—NA; BRK—XT V; WHLS—559mm 26"/406mm 20"; TRS—Primo Comets
\$1995 Haluzak Hybrid Race <i>Fits 5'3"-6'7"; 3 sizes</i>	USS (ASS opt.) WT-25.5 WB-40.5" SH-23" BB-24"	2-piece alum. frame, mesh back & base	TIG CroMo frame & fork Suntour susp. fork opt. Colors-blue, green or red	GROUP—Shimano Ultegra; SHIFT—bar-con 27-spd; DER—LX; GEARS—11-32; RANGE—22-118; HS—Ritchey; CHN—NA; BRK—Avid V (front)/Ultegra (rear); WHLS—700c/406mm 20"; TRS—NA

\$2020-\$2500 Radius Hornet/Pro Fits 5'2"-6'4"	USS (ASS opt.) WT-#36 WB-NA SH-24" BB-29"	Composite euro-shell-type	TIG CroMo frame & elastomer susp. fork & rear Colors-blue, red, yellow, blk.	GROUP—Shimano XT/LX; SHIFT—bar-end ; DER—XT/LX; CRK—alloy 32/42/52; GEARS—11-32; RANGE—NA; BRK—V/Hydraulic; WHLS—559mm 26"/406mm 20"
\$2195+ (Scan) Cambie Recambini	ASS WT-#33 WB-48" SH-23" BB-27"	Cordura foam on alloy frame	TIG CroMo 2" frame & fork Colors-custom powdercoat	GROUP—Shimano STX; SHIFT—Rapid Fire 24-spd; DER—Alivio/RX100; CRK—Shimano 32/42/52; BRK—Canti/ sidepull; WHLS—559mm 26"/406mm 20"; TRS—NA
\$2400 Earth Cycle Sunset Fits XS 35-48" or cust.	USS WT-#27 WB-37-48" WH-12" BB-18"	CroMo frame; mesh back & base; Hemp covered foam pad	TIG CroMo frame Monoblade fork	GROUP—105/XT; SHIFT—Grip Shift Plasma 27-spd; DER—105/mid step up; CHN—NA; BRK—Sturmey Archer drums; WHLS—406mm 20"/305mm 16"; TRS—Primo Comet
\$2400-\$4395 Lightning P-38 Fits 4'9"-6'8"; 4 sizes	ASS WT-#22-26.5 WB-41-45.5" SH-18-20" BB-NA	TIG Aluminum frame; mesh; foam base pad	Brazed 4130 CroMo S-1 CroMo fork; Susp. opt. Colors: red, blk, yell, tl.ch., blu.	GROUP—Shimano 105; SHIFT—Shimano bar-con 27-spd; DER—Deore/105; GEARS—11-32; RANGE—NA; BRK—Odyssey A V; WHLS—700c/20" or 16"
\$2495 Haluzak Traverse Full suspension	USS (ASS opt.) WT-#33.5 WB-40.5" SH-23" BB-24"	2-piece alum. frame, mesh back & base	TIG CroMo frame SR 7500 susp. fork Nitanium swing arm Fox Vanilla shock	GROUP—Shimano LX; SHIFT—bar-con 27-spd; BRK—V; CHN—KMC; WHS—559mm 26"/406mm 20"
\$2495 TerraCycle TerraZa Custom	ASS WT-#32 WB-42.5" SH-22.75"-24.25" BB-23.75"	Rans Medium mesh back Foam covered ABS base with cover	TIG CroMo frame & custom fork	GROUP—Shimano 105/SRAM; SHIFT—SRAM Plasma 24-spd; DER—105/3x8; GEARS—11-32; RANGE—23-115; HS—Chris King; BB—105; CHN—NA; BRK—XT V; WHLS—dual 406mm 20"; TRS—Primo Comet
\$2499-\$3999+ Longbks Eliminator 3 sizes & custom	USS (ASS opt.) WB-43" SH-24/23" BB-26/24"	Strutless, mesh back, padded base	TIG CroMo frame & fork Colors: NA	GROUP—Shimano 105; SHIFT—bar-con 27-spd; DER— Shimano XT/105; CRK/BB—105 30/42/52; GEARS—11-32; RANGE—24-123; HS—LX; CHN—Shimano HG; BRK—Avid 10 V; WHLS—559mm 26"/406mm 20"; TRS—Avocet Fasgrip
\$2499-\$3999+ Longbikes Nitro 3 sizes & custom	USS (ASS opt.) WB-43" SH-24/23" BB-26/24"	Strutless, mesh back, padded base	TIG CroMo frame & fork Colors: NA	GROUP—Shimano 105; SHIFT—bar-con 27-spd; DER— Shimano XT/105; CRK/BB—105 38/52/62; GEARS—11-32; RANGE—24-123; HS—LX; CHN—Shimano HG; BRK—Avid 10 V; WHLS—dual 406mm 20"; TRS—Avocet Fasgrip
\$3249.99 Angletech V-Rex RBT14	ASS WB-42.75" WT-#30.5 SH-23.5" BB-25.5"	Rans Medium mesh back Foam covered ABS base with cover	TIG OS CroMo frame & fork Flip It Stem Colors-Custom	GROUP—Rohloff (14-spd. internal hub); SHIFT—twist 14-spd; CRK—Ritchey Logic; GEARS—11-32; RANGE—22-116; HS- Ritchey; CHN—SRAM; BRK—Magura; WHLS—559mm 26"/ 406mm 20"; HUBS—Phil/Rohloff; TRS—Vredstein
\$3295-\$4995 (Ti) Vision R65 Saber Fits XS 38.5-45"	ASS WT-#26 WB-39.5" SH-28.5" BB-28.5"	Alum. frame, mesh back; Thermarest pad base	TIG CroMo frame & custom fork or 3Al-2.5V Titanium	GROUP—Shimano Ultegra or Campy Record (Titanium model); SHIFT—STI 27-spd; DER—XT/Ultegra; GEARS—11-23; RANGE—29-108; CHN—KMC; BRK—Ultegra V; WHLS—dual 24 x 1-1/8"; TRS—Tioga
\$3699 Boulder Galaxy Full suspension	ASS WT-#31-33 WB-41" SH-23" BB-26"	Rans Medium mesh back Foam covered ABS base with cover	TIG Alum frame & Ballistic susp. fork; oil/coil rear susp. Colors: custom	GROUP—SRAM 9.0; SHIFT—Plasma 3x7 21 or 9/27 spd; DER—9.0/Ultegra; CRK—Sugino XD; RANGE—18-140; HS—Chris King; BB—XT; BRK—9.0 V-Brakes & levers; CHAIN— SRAM; WHS—dual 406mm 20"; TRS—Conti Top Touring
\$3999.99 AngleTech Altitude GL63 Full suspension	ASS WT-#31 WB-41" SH-23" BB-25.5"	Rans Medium mesh back Foam covered ABS base with cover	TIG Alum frame & Ballistic susp. fork; oil/coil rear susp. Colors: custom	GROUP—ESP 9.0 SL; SHIFT—twist 27-speed; CRK—Ritchey Logic; BB—Phil; HS—Chris King; RANGE—18-145; CHN—SRAM BRK—Magura hydraulic; WHLS—dual 406mm 20"
\$4699.99 AT Altitude SHO Full suspension	ASS WT-#31 WB-42" SH-23" BB-NA	Rans Medium mesh back Foam covered ABS base with cover	TIG Alum frame & Ballistic susp. fork; oil/coil rear susp. Vision tilt/adjust w/STI bar	GROUP—Shimano Ultegra; SHIFT—STI; DER—Ultegra/Plasma; GEARS—30/50/62; RANGE—22-110; BRK—Avid V; HUBS—Phil; RIMS—Hed Carbon; TRS—Conti GP
\$4699.99 Angletech MC2 TS-27	ASS WT-#27 WB-42" SH-22.5" BB-23"	Angletech mesh back and sling/ mesh base	Nobillette built billet brazed 4130 CroMo oval main tube, invest cast fork/ Ti option	GROUP—Shimano Ultegra; SHIFT—Modolo 27-spd; DER—Ultegra/Plasma; RANGE—22-116; HS—Ritchey; BRK—Avid Arch Rival 4.0; WHS—559mm 26"/206mm 20"
\$4700+ Lightning F40 Fits 5'2"-6'6"; 3 sizes	ASS WT-#32-34 WB-42-45.5" SH-18-20" BB-NA	Aluminum frame; mesh; foam base pad	Brazed 4130 CroMo S-1 suspension fork (1.5"-T) Colors: red, yell,blue, wht.	GROUP—Shimano Mix; SHIFT—Dura Ace bar-end 27-spd; DER—Deore/RX100; CRK—XC Comp 28-46-56; RANGE—23- 140; BRK—Hayes/105; WHLS—700c/17" Moulton
\$4800-\$6000+ Lightning R84 Fits 5'2"-6'8"; 3 sizes Full suspension	ASS WT-#20-22 WB-42-47" SH-18" BB-NA	Aluminum frame; mesh; foam base pad	Molded Carbon Fiber Unibox S-2 suspension fork (1.5"-T) Color: coated natural carbon	GROUP—Campagnolo Athena/XT; SHIFT—bar-end 27-spd; DER—Deore/RX100; GEARS—11-32; RANGE—26-123; WHLS—700c/20"



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2000 Recumbent Tandems

Price-Make-Model	Type-Data	Seat	Frame-Fork-Suspension	Drivetrain-Brakes-Specs
\$2195 BikeE E2 Fits 4'8"-6'3"	ASS WB-NA WT-# NA SH-NA BB-NA	(2) Sweet Seat—tall back Sling Mesh back Foam base with cover	Alum extruded frame; CroMo fork & stays; Susp.- Cane Creek AD5 Colors: Ano. blue or red	GROUP—SRAM ESP; SHIFT—twist 21-spd; DER—ESP/3x7; CRK—Dotek; CHN—KMC; BRK—V; WHLS—406mm 20"/305mm 16"; TIRES—Maxxis
\$2800 S & B DBL Panther	USS WB-72" WT-#41 SH-19"	(2) Fiberglass shell + cover; limited seat recline adjust.	TIG CroMo frame & fork Color: NA	GROUP—Shimano/SRAM; SHIFT—twist 21-spd; CRK—Sugino; BRK—Hayes Disc; WHLS—559mm 26"/349mm 16"
\$3800-\$4850 Double Vision R82/85 Captn XS 42.5-46.5" Stoker XS 30-40"	USS or ASS; WB-70" +/-; WT-#52-53 (KS) SH-23.5" BB-26"(C)/24"	(2) Alum. frame, mesh back; Thermarest pad; sliding stoker seat and captain sliding boom	TIG CroMo Color: orange, green or purple or custom (85)	GROUP—Shimano Deore/105 or XTR/Ultegra; SHIFT—Rapid Fire 27-spd; DER—Deore/105; CRK—ATP IPS; CHN—KMC; BRK—Avid Arc Rival V or Hydraulic; WHLS—559mm 26"/406mm 20"; XT hubs; IRC Metro Duro rear tire/Panaracer front
\$3995-\$4995 (Traveller) Rans Screamer Captn XS 39.5-51.5" Stoker XS 37-49"	AS WB-74.5" WT-#45 SH-23.5" BB-25.5"(C)/23.5"	(2) Rans Medium mesh back Foam covered ABS base with cover	TIG CroMo Opt. susp. fork Opt. S & S Couplers Flip It Stem Color: black or red	GROUP—SRAM ESP 9.0; SHIFT—twist 27-spd; DER—ESP/105; CRK—Ritchey Logic Tandem; CHN—KMC; BRK—Magura hydraulic; WHLS—559mm 26"/406mm 20"; TRS—Ritchey Tom Slick/Peregrine Special
\$4349 Angletech/Rans Screamer GL27 Same as above	AS WB-74.5" WT-#44.5 SH-23.5" BB-25.5"(C)/23.5"	(2) Rans Medium mesh back Foam covered ABS base with cover	TIG CroMo with Nobilette CroMo fork (Opt. susp. fork) Flip It Stem Colors: red or yellow	GROUP—SRAM ESP 9.0; SHIFT—twist 27+ -spd; DER—ESP 9.0SL/XT; CRK—Ritchey Logic Tandem 26/38/54; GEARS—18- 120; CHN—SRAM; BRK—Magura hydraulic; WHLS—559mm 26"/ 406mm 20"; Hubs—Phil; TRS—Ritchey Tom Slick/Tioga ST Cmp.
\$3799 & up Longbikes DuPlex	ASS or USS; WB-103" WT-#53 (KS) SH-25" BB-15"	(2) Alum. frame; mesh	TIG CroMo Reinforced fork Color: NA	GROUP—Shimano XT/105; SHIFT—bar-con 27-spd; DER—Shimano XT/105; CRK/BB—105 30/42/52; GEARS—11- 32; RANGE—NA; HS—LX; CHN—Shimano HG; BRK—Avid V; WHLS—559mm 26"/406mm 20"; TRS—Avocet Fasgrip
\$5499 Boulder Serious Full suspension	ASS; WB-74"; WT- #44-46; SH-23.25" BB-26"/12.5" stoker	(2) Rans seats	TIG Easton 7005 Alum.; full suspension; Ballistic suspension fork	GROUP—SRAM 9.0; SHIFT—Plasma 3x7 21 or 9/27 spd; DER—9.0/Ultegra; RANGE—18-140 or 21-104; HS—Chris King; BB—XT; BRK—9.0 V-Brakes & levers; CHAIN—SRAM; WHS—dual 406mm 20"; TRS—Conti Top Touring
\$5670 Greenspeed Tandem Trike Fits XS 30-50.5"	USS; WB-90" WT-#66 SH 11" BB-15"	CroMo frame; full mesh, elastic lacing (integral part of frame); no recline adjustment	MIG 4130 CroMo Optional S & S Centerpoint steering Colors: several	GROUP—Shimano RX100/STX RC; SHIFT—Ultegra bar-con 72-spd; DER—Shimano/3x7; CRK—NA; GEARS—30/42/52 3x8x3; RANGE—14-126; CHN—NA; BRK—Sachs drums or Hayes discs; WHLS—406mm 20" x 1.75



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Price-Make-Model	Type-Data	Seat	Frame-Fork-Suspension	Drivetrain-Brakes-Specs
\$990 S & B Malibu <i>Fits NA</i>	2-front/1-back; USS WB-NA SH-20.5" BB- 17" WT-#35	Fiberglass shell + cover; limited adjustment	TIG CroMo Color: custom	GROUP—Shimano/SRAM; SHIFT—twist 6- 21-spd; BRK—rear hub; WHLS—24"/305mm 16" front (2)
\$1900 HPM Tritan <i>Fits: custom</i>	2-back/1-front; USS WB-73" SH-NA BB-NA WT-#39	Alum. frame mesh back & base	TIG 4130 CroMo Color: custom	GROUP—Shimano; SHIFT—bar-con; DER—Shimano; BRK—Sachs Hydraulic disk/V; WHLS— 406mm 20" (3)
\$2195 WizWheelzTerraTrike <i>Fits XS 39"-48"</i>	2-front/1-back; USS WB-40" SH-11" BB- 14" WT-#35	WizWheelz heat treated T6 Alum. frame; mesh back & base	TIG CroMo Color: red & yellow	GROUP—SRAM 7.0; SHIFT—SRAM Power Grip 3x7 21-spd; DER— SRAM 7.0; CRK—Sugino XD 46-T; GEARS—12-28; RANGE—22-94; CHN—SRAM; BRK—Sturmey Archer drums; WHLS—406mm 20" (3); TRS-Primo Comet
\$2495 Penninger Traveler <i>Fits XS 36-52"</i>	2-front/1-back; USS WB-61.5" SH-14" BB-16.5" WT-#53	CroMo frame; mesh "hammock" type	TIG CroMo Colors: red, blue, yellow	GROUP—Shimano Deore LX/SRAM/Phil; SHIFT—SRAM; DER-LX/RX100; BB-Shimano UN52; BRK—Avid V/DiaCompe caliper; WHLS—406mm 20" (3)
\$2595 Pashley PDQ3	2-front/1-back; ASS NA	Aluminum frame; mesh back & base; no recline adjust.	TIG CroMo Color: red	GROUP—SRAM 3x7; SHIFT—twist 21-spd; DER— SRAM CRK—V; WHLS—406mm 20" (3); TRS—Nokian City Run.
\$2800 S & B Speedster	1-front/2-back; USS WT-#34	Fiberglass shell + cover; limited recline adjustment	TIG CroMo	GROUP—Shimano/SRAM; BRK—Sachs drum (rear); WHLS—406mm 20"/349mm 16" (front); TRS—NA
\$3500-\$3700 ICE Trice Classic <i>Fits XS 32-42"</i>	2-front/1-back; USS WB-39" SH-12" BB- 17" WT-#39	ICE Alum. frame; mesh cover	Fillet brazed CroMo Color: red, yell., blue, blk., grn, wht., silver	GROUP—Shimano Ultegra/XT Mix; SHIFT—Dura Ace bar-con; GEARS—11-34; RANGE—4 options; BRK—Sturmey Archer drums; WHLS—559mm 26"/406mm 20" (front)
\$3285 Greenspeed Travel Trike <i>Fits XS 40.5-46"</i>	2-front/1-back; USS WB-39.6" SH-12" BB- 16" WT-#39	CroMo frame; full mesh, elastic lacing (integral part of frame); no recline adjustment	MIG 4130 CroMo S & S Couplers Centerpoint steering Colors: same as below	GROUP—Shimano RX100/STX RC; SHIFT—Ultegra bar-con 72- spd; DER—Shimano/3x7; CRK—NA; GEARS—30/42/52 3x8x3; RANGE—14-126; CHN—NA; BRK—Sachs drums or Hayes discs; WHLS—406mm 20" (3); TRS-Comp Pool
\$3315 Greenspeed GTR Touring <i>Fits: XS 36-50"; 5 sz</i>	2-front/1-back; USS WB-39.6" SH-12" BB- 16" WT-#39	CroMo frame; full mesh, elastic lacing (integral part of frame); no recline adjustment	MIG 4130 CroMo Centerpoint steering Colors: green, red, blue and orange	GROUP—Shimano RX100/STX RC; SHIFT—Ultegra bar-con 72- spd; DER—Shimano/3x7; CRK—NA; GEARS—30/42/52 3x8x3; RANGE—14-126; CHN—NA; BRK—Sachs drums or Hayes discs; WHLS—406mm 20" (3); TRS-Comp Pool
\$3395 Earth Cycle Dragonflyer <i>Fits XS 37-48 or cust.</i>	2-front/1-back; USS SH-11.5" BB- 16.5" WT-#41	CroMo frame; mesh back & base; Hemp covered foam pad	TIG CroMo Elastomer rear susp. Colors: blue, grn, red, yellow, purple & custom	GROUP—Shimano 105/LX; SHIFT—bar-con 24/27-spd; DER— Shimano 105/mid step up; CRK—Shimano LX; GEARS— NA; RANGE—18-117 or 15-95; CHN—NA; BRK—Sturmey Archer drums; WHLS—406mm 20" (3); TRS—Comet
\$3599 Angletech TriSpeeder <i>Fits NA</i>	2-front/1-back; ASS SH-11" BB HT- 16" WT-#39	CroMo frame; mesh; no recline adjustment	TIG CroMo Color: custom	GROUP—SRAM ESP 7.0; SHIFT—twist; DER— Shimano 105/ mid-drive; CRK—Sugino XD 36-tooth; BB—Phil; GEARS—11-30/ 11-28; RANGE—17-141; CHN—SRAM; BRK—Sachs VT drums + drag; WHLS—406mm 20" (3);
\$3835 Greenspeed GTS Sports Tourer <i>Fits XS 40.5-48.5"</i>	2-front/1-back; USS WB-42.3" SH-10" BB- 16" WT-#35.2	CroMo frame; full mesh, elastic lacing (integral part of frame); no recline adjustment	MIG 4130 CroMo Centerpoint steering Colors: green, red, blue and orange	GROUP—Shimano XT/105; SHIFT—bar-con 54-spd; DER—XT; CRK—105; GEARS—30/52/52 3x9x2; RANGE—15-120; CHN—NA; BRK—Sachs drums or Hayes discs; WHLS—406mm 20" x 1.125" (3); TRS-Comp Pool
\$3999 Angletech Quadraped <i>Fits NA</i>	2-front/1-back; ASS SH-20.5" BB- 13" WT- #44-47	CroMo frame; mesh; no recline adjustment	TIG CroMo Color: custom	GROUP—Shimano RSX Mix; SHIFT—RSX DT; DER— Shimano 105/mid-drive; CRK—Sugino FUSE; BB—Phil; GEARS—NA; RANGE—17-141; CHN—SRAM; BRK—Sachs VT drums + drag; WHLS—406mm 20" (3)
\$4290 Greenspeed GLR Race Trike <i>Fits XS custom</i>	2-front/1-back; USS WB-46.5" SH-7.5" BB- 14" WT-#30.8	CroMo frame; full mesh, elastic lacing (integral part of frame); no recline adjustment	MIG 4130 CroMo/Al. Centerpoint steering Colors: green, red, blue and orange	GROUP—Shimano Ultegra/XT; SHIFT—bar-con 18-spd; DER—XT; CRK—Ultegra; GEARS—53/67 9x2; RANGE—15-120; CHN—NA; BRK—Sachs drums or Hayes discs; WHLS—406mm 20" x 1.125" /16" x 1-3/8"
£4200-\$7500 Windcheetah <i>Fits NA</i>	2-front/1-back; Joystic ASS; SH-7.5" BB-13.5" WT-#31	Carbon/kevlar seat shell; foam & cover; no recline adjustment	6000 Series Alum./ bonded with Loctite 638; cast lugs	GROUP—NA; DER—NA; CRK—NA; GEARS—NA; RANGE—NA; CHN—NA; BRK—Sturmey Archer drums; WHLS—559mm 26"/ 406mm 20" (front); TRS-NA



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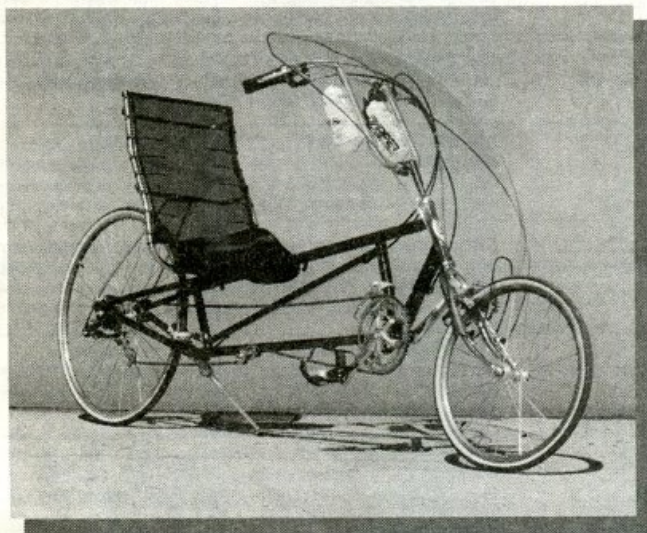




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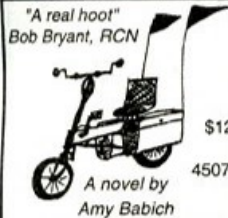
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RCN Glossary

Words Used By Educated Recumbenteurs

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

AIR SHOCK: Recumbent rear suspension shock made by Cane Creek that requires a special pump and generally a psi of your body weight + 10%. Air shocks require this pressure to dial-out the 'pogo' effect (pedal induced suspension movement).

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

AHEADSET: A desirable and popular brand of threadless headset found on some recumbents.

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

BAR-CON: Shimano bar-end shifters—the best and toughest shifters ever made. These are also made by Campagnolo.

BB: Bottom-bracket or boom bracket (pedal axle).

BENT: Slang for recumbent.

BODY STOCKING: A soft full fairing, usually made of Lycra or other stretchable fabric and used in conjunction with a front fairing and/or tailbox.

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

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

CARBON-FIBER: A high tech, high strength composite material.

CASSETTE: The modern freewheel cluster derailleur-shifted gears of 7, 8, 9, or 10 gears on the back wheel of a bicycle derailleur drivetrain.

CENTER-OF-GRAVITY (C.G.): recumbents strive for (back to front) 50/50, 60/40 or even 65/35 (on a good LWB). Anything less than this will affect the handling dynamics of a recumbent bicycle in a negative fashion. Case in point would be a tall rider on a one-size compact (heavily loaded back) or SWB (heavily loaded front).

CHAIN-IDLER/CHAIN TENSIONER: Directs the chain through the frame (indirect chain path) when necessary. Usually made from a modified skateboard or rollerblade wheel, derailleur pulley or custom-made wheel that carries the chain slack on SWB and some LWB models. Beware of some that *DO NOT* have bearings and are very noisy.

CHAIN MANAGEMENT: How the chain is idled/managed, via idlers/tensioners. Routing the chain through cables, USS handlebars is especially difficult on SWB & trikes.

COIL-OIL SHOCK: A high-end mountain bike rear suspension shock found on just a few recumbent bicycles. For suspension lovers who dislike pogo, but like an active suspension, this is for you.

COMPACT: CLWB or MWB recumbent

COROPLAST: Plasticized cardboard that works great for homebuilt recumbent fairings. See RCN#44 for our article on tail box building—and stay tuned for an update. Ed Gin's website is another good reference for this. People Movers has a good fairing building video.

CLWB: Compact Long Wheelbase 47"-60."

CroMo: Chrome-moly steel.

DELTA: Trike with two wheels in the rear.

DERAILLEUR: Shifts the 5,6,7,8, 9 or 10 derailleur gears over the cassette cluster (or freewheel) cogs.

D.O.M.: Drawn-over-mandrel. This is a type of higher quality HiTen steel.

DROPOUTS: The frame piece (or fork tip) that holds the axle quick releases. Some manufacturers make their own, others use name brand forged versions. Cheap recumbents use stamped thin mild steel that can bend too easily.

ENTHUSIAST: Having enthusiasm for recumbent bikes (and to subscribe to this 'enthusiast' publication).

FAIRING: An aerodynamic windscreen designed specifically for recumbent bicycles. Sometimes called by a brand name of "Zipper."

FLIP IT RISER/FOLD FORWARD: Rans term for their SWB above-seat steering riser that has an adjustable recline angle and folds forward for easy entry and exit. NOTE: Some, such as the Rans, are designed NOT to be locked down.

FWD: Front Wheel Drive

GEAR INCH RANGE: Recumbent riders require a wide range of gears. Low gears for climbing (high teens to low-mid 20's) a wide mid-range, to highs of 100-130 gear inches. This depends on your level of performance and what the bike is designed for. Formula: Take the front chainring tooth count divided by the number of rear cog teeth multiplied by the actual measured drive wheel diameter. (high: large front to small rear/low: small front to large rear).

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

HEAD-TUBE: Vertical angled tube that holds the headset, that holds the fork in place and allows a two wheeled recumbent to steer.

HAYES DISK BRAKES: The disk brake of choice for high-end recumbents. Be sure to go for the full hydraulic version. We have heard complaints of inadequate power about the cable actuated mode.

HEAD-SET: The bearings that hold the fork in the headtube.

HEEL INTERFERENCE: When your heel crosses the path of the front wheel of a recumbent bicycle (generally happens in low speed turns; varies by make/model)

HI-TENSILE: Mild steel used in entry level bikes.

HPV: Human Powered Vehicle.

HPVA/HPVA: International version of the above.

IHPVA: International Human Powered Vehicle Assoc.

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

JACKSHAFT: A non-shifting mid-drive cross-over used on some two-chain recumbent drivetrains.

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

LEG SUCK: When your feet slip off recumbent pedals and 'suck' back under the seat and bike. This is an easy way to break a leg. This is more common on higher bottom bracket designs when riders do not use clipless pedals, or can happen in off-road conditions when the rider takes his/her feet off the pedals.

LWB: Long wheelbase 60"-71"+ (crankset low and behind front wheel). **LOW-RACER:** A SWB recumbent built as low as possible for HPV racing (may exceed our wheelbase range for a SWB).

MAGURA: German hydraulic caliper brake.

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

MTB: A dated abbreviation for mountain bike.

MWB: Similar to a Compact with BB at headtube.

Formerly used to describe longer SWB bikes.

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

OSS: Over-seat-steering: Acronym for the politically correct who don't like ASS.

PEDAL ANGLE: The degree of angle as measured with two intersecting lines. The first being from the corner of the seat back and base out to the bottom bracket spindle axle. The second being from the base of the first point (seat back and base junction) upward following the seat back angle. A 'pedal angle' can be closed-performance; open-touring; or moderate.

PEDAL STEER: Pedal-induced steering input that makes the bike more difficult to track straight. This generally happens on SWB models with wheelbases of

less than 39" or a very laid back head tube angle.

PEDAL BOOM/MAST: The frame piece that protrudes outward and forward from the headtube on a SWB recumbent that holds the bottom bracket/pedals/crank. These are often telescope adjustable.

POGO EFFECT: Unwanted pedal-induced suspension movement. This is generally found on entry level (affordable) or improperly designed suspension systems. If you don't climb hills, and you like an active suspension, this may be okay.

RAPID FIRE: Shimano two bottom under-bar shifting system. Definitely a step up from twist grips, though an acquired feel. They seem to hold their adjustment better than twists, but not as good as bar-cons.

RECLINE ANGLE: The recline angle of the recumbent seat back.

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

RWS: Rear-Wheel Steering. Generally, a bad idea.

STI: Shimano Total Integration—drop bar brake-lever shifters. This system was designed for road racers who never want to take their hands off the 'drop' position. Some roadie-cliche ridden recumbent manufacturers think that recumbent riders will like this. The problem is that the side-to-side motion required to shift can actually change the direction in which you are travelling if you aren't careful.

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

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

SACHS 3 X 7: This is the Sachs Internally geared three speed with 7-spd. freewheel (21 speed total). Gear #1 is a reduction underdrive, gear #2 is a 1:1 lockup and gear #3 is an overdrive.

SINGLE TRACK: A narrow mountain bike trail and technique.

SWING ARM: On a suspended recumbent—the rear frame section that is suspended. These need to be strong to resist torsional flex.

SCHLUMPF MOUNTAIN DRIVE: A two speed internally geared bottom bracket that allows a very wide range of gears. Shifting is done via a button in place of the dust-cap on the bottom bracket. These are relatively rare and pricey.

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

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

STEM-RISER: The steering piece that holds the handlebars to the stem/headtube.

TADPOLE: Trike with two wheels in front.

TILLER: A long distance between the head tube and controls can create a feel much like the feel of a tiller of a boat. This effect can be found on LWB & SWB.

TAILBOX FAIRING: An aerodynamic tail section often used for storage, mostly homemade of coroplast (plastic cardboard used for political yard signs). Fairings are mounted on a rear rack, cut to shape and stitched together using zip-ties, etc.

UNDER-SEAT STEERING (USS): Steering via handlebars beneath the seat.

V-BRAKE: A new and strong style of cantilever brake the has high arms in a "V" formation. These were designed for mountain bikes, though have become the standard for touring, commuting and recreational bikes—even hybrids. Anything less is just not up to par these days. V-brakes require fat tires.

X-SEAM: A recumbent fit measurement that simulates the distance between the seat back/base out to the farthest reach of the pedal stroke. Sit with your back against a wall and measure from the wall to the bottom of your foot.□

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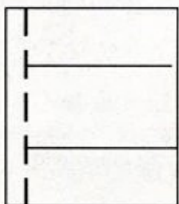


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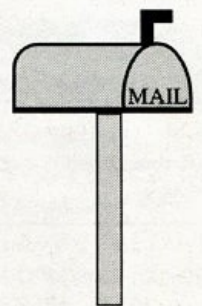


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- RCN#53** Road tests of the Rans Stratus, Haluzak Horizon and Barcroft Virginia. USS: Steering for Laid-Back Riders, Route 66 Tour, Charles Mochet II
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Cheers and thanks,
John Higley
New England



Laurie Smith on her Tour Easy. Laurie was not an avid cyclist until she bought a Tour Easy in June of 1999. By September, 1999, she had blown the doors off the long standing Vancouver (Washington) Bike Club Women's Recumbent 10 Mile Time Trial Record. Previous record 30:57.

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