

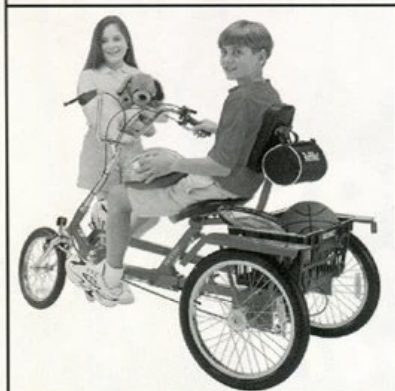
RCN

RECUMBENT CYCLIST NEWS

**1998
SWB
Buyers'
Guide**



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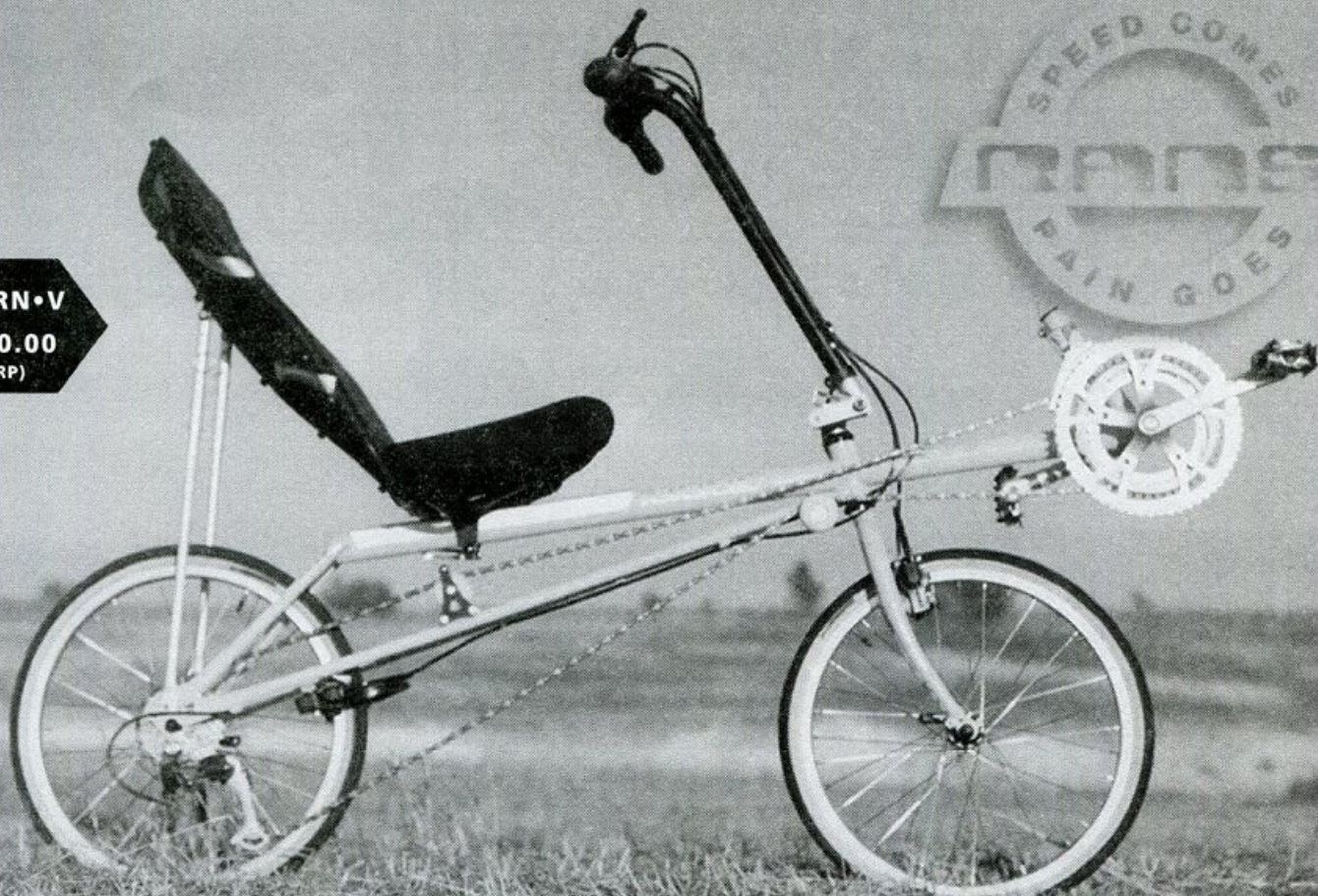
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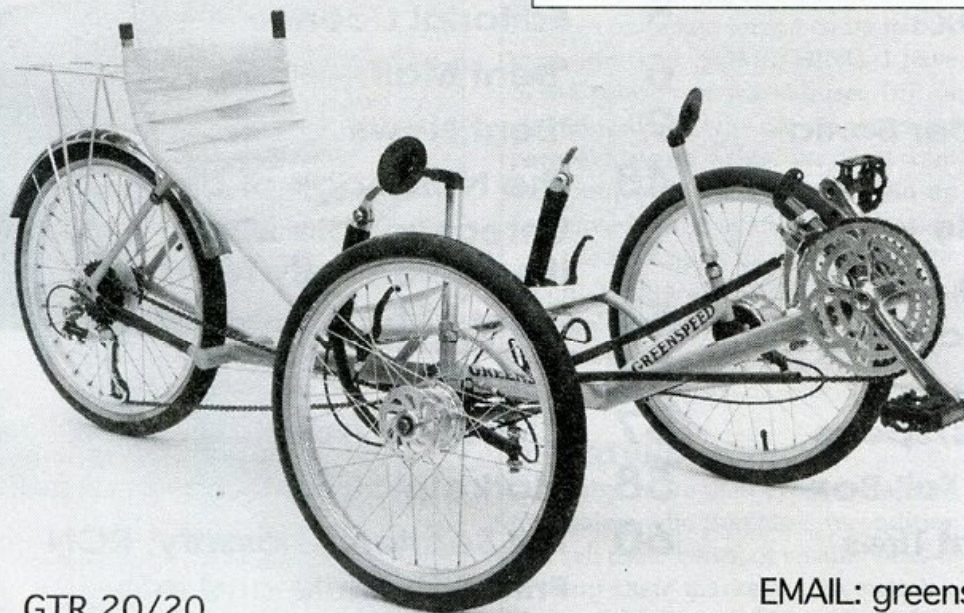


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GREENSPEED RECUMBENTS

RECUMBENT CYCLIST NEWS



Joel Smith rides the 1998 Vision R-45 with HED wheel option

Features

- 14** The 1998 Rans V-Rex
- 20** The Rans SWB Trio
- 22** A World Touring Super Sonic Linear
- 26** Altitude and Attitude—
Recumbent Touring
- 34** SuperGuide: All About Short
Wheelbase 'Bents
- 42** SuperGuide Ratings/specs
- 48** How To: A Tale of a Tail Box
- 52** Why 'Bents Need Fat Tires

RCN#44 Cover

The '98 Haluzak
Horizon with standard
V-brakes and optional
front suspension fork

Departments

- 5** Editorial License
- 6** 'Bent Mail
- 9** 'Bent News
- 48** The Notebook of an
Unreasonable Man:
It's All Perfectly Normal
- 54** 'Bent Rider Group Listing
- 55** 'Bent Events
- 57** Classified Ads
- 58** Marketplace
- 60** Tail Section: Glossary, RCN
Print Schedule and info

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RCN

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March/April 1998

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Editorial License



The Wacky World Of Wrecumbents

Feast or famine in the Land of the Laid Back...

I've just about heard every excuse in the book why recumbents are in such short supply these days (or have long shipping delays). Yeah, — there is a serious 'bent shortage this year. We're finally having some market success—and some freaking models are already sold out for '98. Hello! Isn't this March! There was no off season this year. Take note....order your bike now.

If it's not a painter shortage in Hays, Kansas, or a welder shortage in Seattle, Washington, it could be the Sachs 3x7 hub shortage in Iowa or quite possibly the lack of Sachs chain due to the SRAM purchase of Sachs. If it's not that, it may be that the lords at Shimano are sitting around deciding who is worthy of buying direct—all the while recumbents are hard to get. It's time for some ACTION.

We finally have a market for these, the best and most comfortable bikes on earth, so let's find a way to get them built! Go to Taiwan, find a frame-building subcontractor, form a co-op to buy parts direct or SOMETHING. I have heard rumors of warehouses full of unsold wedgies, why not strip them for parts to hang on 'bents? We don't want our glimmer of success to be held up by deliveries and availability woes.

We apologize in advance for the recent media attention and critical acclaim that we brought to some models this year—which has made availability even worse.

OPPORTUNITY KNOCKS!

Now more than ever I see a need for dealers who purchase, recondition and sell used 'bents, or smaller ones to revamp their marketing to snatch a share of this boom. C'mon guys, let's get creative. There would be opportunity for dealers who would like to consign/broker bike components to manufacturers, or even used recumbents to RCN readers. I got this idea when I paid

nearly \$200 for a used disc drive for an antique Mac Powerbook (5 years old). And it was ridiculously difficult to find.

Calling all wheeler-dealers! I have been privy to some internet recumbent sales over the HPV list and seen recumbents sell in an hour, and heard stories of bikes selling in minutes. Two Tour Easy's sold locally for less than \$500. One over the internet to a local rider, the other was my original recumbent advertised in the local bike club paper. Has the time for a used 'bent sales specialist come? At the very least, dealers should be running ads that list their used 'bents, bikes in stock and specials.

I can tell you that the value of your used 'bent depends on where you are selling it. If you place an ad in your local paper, you'll lose big time. You'll do a bit better selling to a 'bent rider group buddy. If you market via RCN or over the internet, you should get top dollar. No worries, People Movers can act as an escrow service for your transaction for a small fee.

PENILE NUMBNESS RIDES AGAIN

We love *Bicycling Magazine*. They do an excellent job of covering the total bicycling scene. Sometimes recumbent riders may not feel that they get enough coverage, but that's why we're here. We're glad that *Bicycling* recognizes this fact as well and plugs RCN a lot (Thanks to *Bicycling's* Ed Pavelka, Geoff Drake & Jim Langley). We hear the *Bicycling* guys are riding 'bents, cool! Geoff Drake has a Vision R45!

I recently read an editorial in *Bicycling* about how it's okay to take shorter rides. I chuckled at the possibility that this could be a thinly disguised wedgie response to last seasons penile numbness press and a possible rationalization to continue riding a wedgie... if just for a few miles. Hey, I like all kinds of bikes, but I can barely climb on a band-aid-seat wedgie these days. Just the thought of it makes my hiney ache. 'Bent seat—Ahhh!

Viva Recumbency Bob Bryant.



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

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

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

RANS: RIDE LONG & PROSPER

Thanks big time for the recognition our little bike company received in issue #43. Our hard working staff is reveling in the limelight of what we feel are very meaningful awards. Here is to hoping that RANS can always grab a ray of limelight!

I would like to voice my concerns on off-road recumbents. Our back 40 contains some pretty good dips and dives, and we've taken quite a few hops through this terrain on many of our models. As long as we stayed on the ground, things worked out. It's when the bike starts to get air, the problem enters...landing lumbar!

Speaking from experience, being a person who started adult life 1/2" taller than currently measured, I feel qualified to comment on the subject. Do 'bents make good flying machines? Umm...no, but a simple "no" here will not suffice. The dynamics at play are beyond what current designs can handle. Could a safe suspension 'bent be designed for the off-road use? Sure, with enough time and money, but would the cost justify the potentially mediocre outcome? Uprights have it all over the 'bents in terms of body English induced moves. As long as you are sitting down, you can only dance so much!

If off-road 'bent riding becomes popular, damage induced to the spine through compression failure of the vertebrae will effectively reduce the number of 'bent riders. But expect to see increased sales of adjustable beds and recliners.

This is not our mission at RANS, we want to ride long and prosper. We'll do that by listening to the 'bent rider and being real about the laws of physics. And most of all by being patient. We know that recumbents

'BENT MAIL

WE WANT TO HEAR FROM YOU



We couldn't resist...a BikeE Air Tech with a Rans seat (Tour Easy model) and 4-BikeE accessory mounts. Though completely experimental (at your own risk)—it worked great—RCN

are here to say, and will grow into a common sight. Going for air is only a sign of identity crisis. Be patient, we will get there without the gimmicks.

So maybe instead of trumpeting a "new sport" that can only harvest job security to already busy back doctors, lets keep our 'bents safely grounded and enjoy the long ride into our own '90's.

Ride our bikes and ride them hard. But please folks, don't go ballistic. We claim our designs are not intended for such use, and I doubt that after a few hard "lumbar landings" anyone else will!

Yours Truly

Randy Schlitter, RANS, Inc.

GREAT NEW LOOK

The latest RCN arrived today. WOW!! The new layout is excellent. Its magazine feature style requires more pages in the book (at greater expense to you), but from a reader's viewpoint, the cleaner look is much more inviting. It should inspire more thorough reading, though, because it's easier to follow. Which, in turn, should evoke more enthusiasm for your editorial and your advertising. Speaking as an ad agency owner, your new format has potential to be a win/win/win for you, your readers and your advertisers. Congratulations.

Bob Meierhans

NEWBIE 'BENT PRIMER

Congratulations on issue 43 - I think it is the best yet. I especially like "How to buy a recumbent bicycle" article on pages 32-36. It should be mandatory reading, before a buyer sits on his/her first test bike.

Chris Broome

CBROOME@mail.arco.com

LA Recumbent Riders

COLORADO CYCLING ADVENTURE

I read your article about your ride (Slumgullian Tour) last summer in Colorado in the last RCN. While reading the story, I seemed to pause on each word and feel myself on the trip. That was one of the best recreation articles I've ever read. Oh how I wanted to be there.

After two back surgeries, I'm looking at a Rans Stratus. I visited The Bicycle Spokesman in Toronto to see what it was like. I liked it. Joe says hi to you. He mentioned he wrote you and told you how he liked your article about the Colorado ride. I'm 55 now and hope to get in condition to go cross country when I retire (soon, I hope). I'm reading Donna Ikenberry's book *Bicycling: Coast to Coast* and have ordered others. Thanks for a great story and great magazine.

Ed Haley

eghaley@dreamscape.com

MORE TURNER FEEDBACK

As the new kid on the block (got a 'bent but ain't learned to ride it yet due to recovering from neck surgery) I LAUGHED OUT LOUD when I saw Turner's response in RCN#42. You'd think someone of HIS AGE would have progressed BEYOND "If I can't have it MY WAY I'm just gonna pick up my bat and ball and GO HOME!!" Turner seems intent on SHOOTING HIMSELF IN THE FOOT from EVERY POSSIBLE ANGLE!! How's he gonna sell his bikes? TELEPATHY?? And now, onto a much happier subject: I LOVE THE MAGAZINE! As a VERY veteran rider/climber/etc., it's INCREDIBLY REFRESHING to see a publication 100% free of ATTITUDE!!

Paul Larson

rinkedinkus@earthlink.net

Paul, we'll work on keeping the 'bent attitude under control. We feel sorry for Milt (Turner), but he failed all of our tests with the problematic T-Lite. We were told by a dealer recently that he's still pedaling his bikes—Bob.

RCN COMPLAINTS

I'm addressing this formal complaint to you as the editor of RCN, specifically in reference to RCN #43 which I recently received.

#1) Is it possible that this issue (#43) is even bigger than RCN #42? I have found that no matter how big you make RCN, I seem to read the whole thing faster and faster. I've only had my issue for about 10 days and I just started reading it for the third time. I have to mention that this is not the only material that I'm currently reading. I believe that you and your publication are responsible for this problem and I require an explanation.

#2) This complaint is even more serious than the previous one. I'm the proud owner of a 1998 Rans V Rex. I really, really like this bike. But after reading RCN #43 I'm feeling strange, almost primal urges. I just have to have a suspended BikeE or at least a Rans Tailwind or I'll go mad. Don't get me wrong, I'm keeping the V Rex, but I just can't be happy anymore with only one type of Recumbent. What will it be next? A Gold Rush Replica? A Festina Low Racer? A Greenspeed Trike? I ask you, no, I beg you to stop this nonsense. I hold you responsible for my sanity, my marriage and the state of my finances.

#3) I was going to write a request to cancel my subscription so as to prevent any

further evil from occurring to me. But NO! I can't make my fingers do it! Knowing that RCN will be giving away a BikeE Air Tech ...I'm no longer responsible for my actions.

Frank Gonzalez

P.S.: This is in no way a cheap attempt to get my e-mail published in RCN...

Dear Frank, You are definitely addicted. Should I be glad that I play a part in this sickness? I've had this same thing since 1986 and it doesn't go away. Just enjoy "the ride" more than the quest for bikes and you'll be okay—Bob.

RANS SEAT ON BIKEE

I read your article in RCN #43 regarding the bike seat. Were you able to put the Rans seat on? It's something I would consider if you felt it was a plus. I have a 1995 BikeE. Thanks in advance for your advice.

Laura J. Giambrone

lg21spd@snet.net

Laura, I have successfully mounted the Rans seat on the BikeE. I used a Rans "Tour Easy" model seat and four BikeE accessory mounts, 3 under the seat (overkill) and one for the sprint



Have you received your RCN#43 yet?

All active subscriber issues should have arrived by this time. If yours has not —give us a call today. The postal service occasionally misplaces a bulk mail issue or two. Call 253/631-5728 if you've had a problem. Now would be the perfect time to upgrade to a deluxe first class mail subscription. Send your deluxe renewal + \$1 per outstanding issue to RCN.

Readers, if you have information that may be of interest to others please share it by sending it to RCN, Did You Know, POB 58755, Renton, WA 98058. Please give us the source for you info.

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◆ **RCN #43 UPDATES (Goofs)**

Jim the Recumbent King called to say that the BikeE RoadE has a 451mm rear wheel and he likes the 305mm front wheel way better than a 349mm on the BikeE.

◆ **KENT PETERSON**

Kent wrote to say that his family has been spelling their last name Peterson with an —SON for years. Sorry, Kent.

◆ **RCN SCHLUMPF GOOF**

Reader Juerg Hoelzle wrote to tell us that we misspelled Florian Schlumpf's name in RCN#42. Schlumpf produces the 2-speed bottom bracket called the Mountain Drive. Check out their website at <http://www.schlumpf.ch>. Greenspeed trikes offers the Mountain Drive as an option.

■ 'Bent Bits

◆ Angletch can cut 1/2 LB off your 'Bent!

Kelvin Clark called to say that he now has Reynolds 853 20" forks for SWB recumbents. This fork has the potential to cut 1/2 pound off your bike. The cost is \$250. Tel. 719/687-7475.

◆ Vision Updates the Metro!

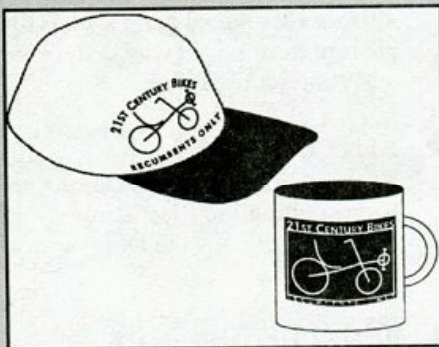
In a late note, Vision Metro's will now be shipping with an upgraded cassette and gear casing eliminating the hard-to-adjust drivetrains. Metro brakes will now be delivered with Kool-Stop brake pads. An upgraded Metro designated R-32 is in the works.

◆ Zach Kaplan Cycles

Zach is the US distributor for The Crystal Speed Ross SWB and Festina Low Racer (RCN#43). Zach manufactures custom drive train parts, super-long cage derailleur, etc. He now sells custom length chain tubes. He can often do away with your SWB idler with these tubes.

◆ Cool 'Bent Hats & Cups

21st Century Bikes sells these cool coffee cups for \$6.99 + \$2 S/H. The hat sells for \$12.99 + \$2 S/H. Send a check/M.O. to: PO Box 367, Hull, MA 02045



■ 'Bent Tip

◆ Stay in touch with RCN Advertisers for the most up-to-date Recumbents Parts, Tires and accessories for your 'bent. If you don't have a 'bent dealer in your town—mail order for parts.

■ 'BENT MAIL....

braces on the Rans seat. The only real modification was to shorten the sprint braces and drill two new mounting holes. The seat works great, but not as good as on a Rans model. The seat is higher than the BikeE seat. BikeE is doing something, so I wouldn't run out and spend the \$320 or so it would take to buy all of these parts for your conversion—Bob, RCN.

FAIRING POSITION

I have had my Lightning for 2 years and have been competing in the "stock" class in the Midwest HPV Racing Series. I've been finishing in the middle of the class. Last month I decided to take the next step and purchase a front fairing. I just installed a Treklite Super Zzipper and have been out with it a few times. The claimed performance increase of 10% seems to be true. The fairing has added about 4 pounds in weight to the bike. It seems that all the pictures that I see of the Zzipper fairings show the top of the Lexan below the eye level of the rider. Wouldn't the bike be faster if the fairing were high enough to direct the air flow "over" the rider's head?

Wally Kiehler, Kiehler@juno.com

Wally, You are supposed to look just over the top of the Zzipper fairing. Looking through would distort vision. With the curvature of the fairing, the airflow should brush your hair. Some manufacturers are not setting up their fairings with this correct setting in mind—Bob, RCN

CLIPLESS QUESTION

I have been interested in getting a recumbent since I started with neck and shoulder pains when I ride any of my conventional stable of bikes. I visited People Movers and tried a host of bikes. Even though I thought I couldn't get used to USS, I felt the most comfortable on a Linear (USS). I've had it for 10 days and it takes some getting use to. I am 73 years old and ride 30-50 miles a week with a group of fellow seniors, mostly through our park system and some quiet city streets. How do you feel about SPuD clipless pedals rather than toe clips for 'bent riders?

Thanks,

Bernard Barron, buddyb@aye.net

Bernard, My opinion is that toe clips are borderline dangerous on recumbents with high bottom brackets. I have ridden with SPuDs for years. I also have some TIME ATACS that I like a lot. I suggest you take the toe clips or at least the straps off and then get some clipless

pedals, though wait until you feel comfortable with the bike. You exert a certain amount of energy just hanging your feet out front, so clipless make it easier. With the Linear you need to be careful that your feet don't slip off the pedals as they can fall back under the bike and cause you to move forward out of the seat—Bob, RCN.

HAULING RECURBENTS

Do recumbents fit on regular bike racks? How do you carry one like a Vision model on a car? Thanks!

Barclay

Barclay, Many recumbents will fit on the racks that hang off the rear ends of cars. I have carried a Metro, Tour Easy, Rocket, BikeE and V-Rex on the back of a Mazda Miata with a factory optional Thule rack. LWB bikes take more care, but it's possible. Roof racks like a Yakima with a fork clamp (front) and a wheel tray (back) work well. If you have a LWB, you need a long-roofed vehicle (stretch the rack out) or an optional long wheel tray. The best rack is the Draftmaster receiver hitch rack. They now offer recumbent-specific mounts—Bob, RCN.

HOSTILE WEDGIES

Perhaps all wedgie riders are not as hostile as they appear. This past summer I was stopped at a street crossing on a Cape Cod rail trail with my Tour Easy. Two young wedgie riders in their 20s came up in back of me. One asked what my handicap was. I replied "about a 6." I guess they also played golf and after a second or two the other rider started laughing so hard he almost fell off his bike.

When he stopped laughing he asked if he could try the Tour Easy just for the hell of it. After a few wiggly attempts he started to get the hang of it and wanted to take a run down the trail with it.

After thirty minutes he returned with a big smile on his face (I thought I lost the bike forever). He wanted to know where he could buy one RIGHT NOW. After explaining it may take a month or two to get a new one he wanted to buy mine. The premium he offered was not enough to convince me that I should wait a month or so for another, although I did tell him how to reach Easy Racers. If you can use a little humor against what seems to be hostility, sometimes good things happen. Thanks again for the great mag!

Carl Bredberg

bredberg@ma.ultranet.com □

'Bent News

What's Happening in the 'Bent World

■ Touring Stuff

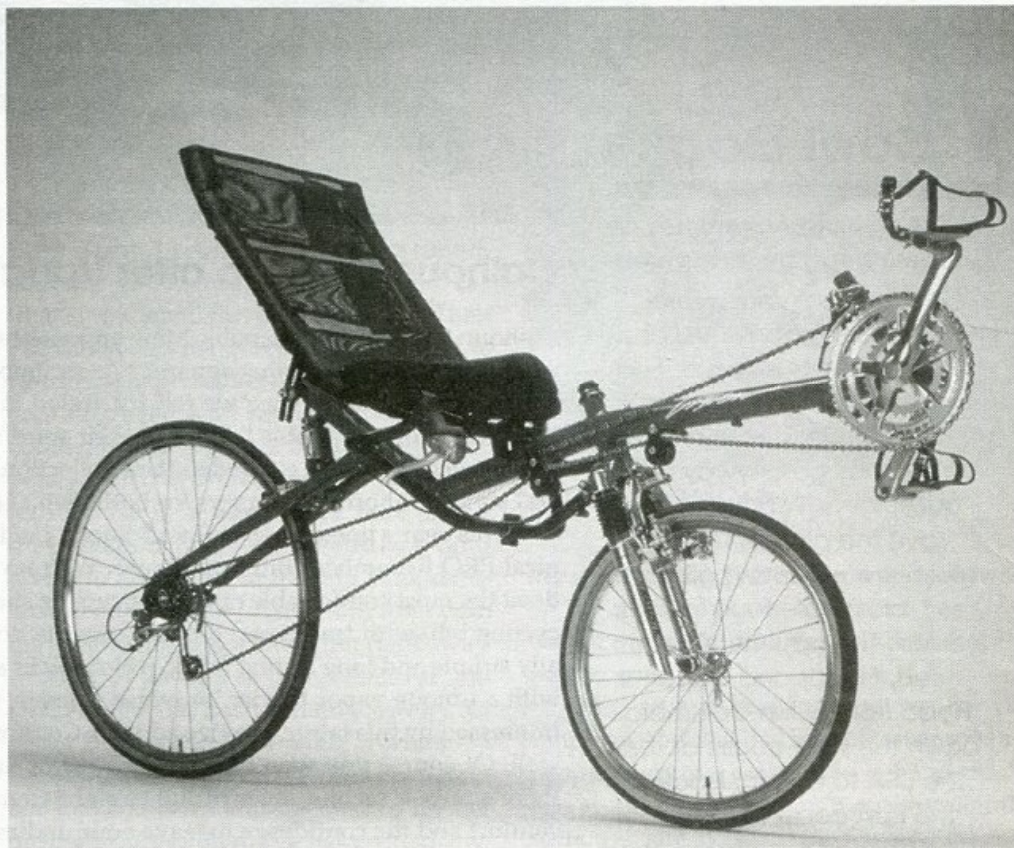
Are you heading out onto the road this summer for a 'bent tour? If you are, there are some great sources that you should be aware of that will help you plan your dream trip.

◆ **Bicycling Coast to Coast** by Donna Lynn Ikenberry

Grab your helmet, check your tire pressure, and prepare for the ride of your life! Author and veteran cyclist Donna Lynn Ikenberry pedaled across the USA, and now she's giving you the inside scoop on how to get the most out of your trip! Donna takes you through 10 states: Virginia, Kentucky, Illinois, Missouri, Kansas, Colorado, Wyoming, Montana, Idaho, and Oregon. Based on Adventure Cycling Association's popular "Trans America Bicycle Route," the tour is broken into 77 day trips, which can either be enjoyed on their own or linked for a coast-to-coast run.

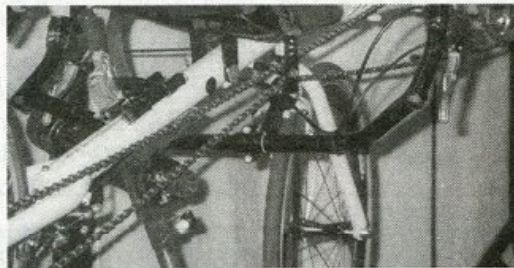
Another great source is Adventure Cycling Association, their magazine and Cyclosource catalogs of books, maps and bicycle touring supplies.

1-800-721-8719.✂



Vision Set to Unveil NPT "No Pogo Technology" Bikes

The "Engineering Minds" at Vision have been feverishly working on the '98 bikes. While happy with the front end and suspension geometry, the design team decided to upgrade the elastomer suspension on the R40/42 models to the Cane Creek AD5 air shock as used on the R44/45 models. "The best handling Vision we've ever built" claims Vision designer, Grant Bower. "On the SWB design the Cane Creek was clearly superior to the elastomer." "We transferred the R45 NPT (No Pogo Technology) to the R40/42 frames. It's costing us more, but the performance is fantastic. The NPT suspension geometry provides the efficiency of a rigid frame with the comfort of suspension." R44/45 suspended bikes are available now, the R40/42's will be available around April 1st. Hard-tails are currently shipping.



The Vision R45 will have new low profile narrow handlebars and come outfitted with a full Shimano Ultegra 27-speed drivetrain with STI Road style shifters, the beautiful Ultegra crank, hollow bottom bracket and the special Shimano 9-speed chain. There is even a HED wheel equipped R45. Other Vision SWB models will be outfitted with Shimano Rapid Fire shifters for 1998.

■ 'Cool Books

◆ The Cycling Adventures of Coconut Head by Ted Schred

This is not your average bicycle touring book. Ted and crew have no business out on the road on these garage-sale bikes and virtually no money—

but they go anyway on a quest for adventure and to save the planet. This book gives us a refreshing glimpse of bicycle touring at its oddest. The adventure leads

Ted, friends and Coconut Head from British Columbia, down the west coast, across the USA to Florida, back up the East coast to New York and west to Ottawa. The pages of the book include

goofy cartoons that accent the story. Another unique point of "Coconut Head" is

Schredd's need to take pictures of himself and companions naked. This is one hilarious read. ☺



Calhoun Cycle to offer Updated 'Bent Riding Shorts

Calhoun Cycle of Minneapolis, MN, announces the expansion of their exclusive line of technical recumbent cycling apparel. "As recumbent cyclists ourselves," says Luke Breen, owner of Calhoun Cycle, "we felt frustrated at the lack of high-quality, chamois-less, technical shorts available." Now in their third season of recumbent apparel, Calhoun Cycle has refined and expanded their collection of fine recumbent wear to include several styles of shorts and jerseys for both men and women.

This year's line-up has many additions and improvements. Most exciting is the technical PRO Recumbent Bib from Bouré. With no elastic binding your waist, bibs are indeed the most comfortable option for cycling shorts. These are truly a high performance cycling bib, with traditional 8-panel construction made of Comfortex™, an exceptionally supple and long lasting fabric which wicks away moisture in warm conditions, and with a unique vapor barrier, provides warmth in cool weather. Calhoun Cycle was so impressed by this fabric, they've added a Comfortex™ 8-panel PRO short to their line as well. Of course you won't find a chamois or any unnecessary padding here. Instead, there's only a second layer of lightweight Comfortex™ in the crotch which provides comfort and the confidence to leave your undies at home.

Calhoun Cycle also worked with Mt. Borah to improve their best selling short of 1997. The loose-cut Supplex® shell of the Sawtooth double-short still has a clever leg strap which cinches down to prevent ballooning, but this year the rear pocket has been eliminated and Velcro® closures have been added to the front pockets.

In addition to the exceptionally high-quality shorts from Bouré and Mt. Borah, Calhoun Cycle has also added an entry short from Atak. Still a performance 8-panel construction and chamois-less, at \$34.97 these cotton/lycra shorts are great for casual riders. Calhoun Cycle ships their apparel free of charge in the U.S. and guarantees your satisfaction. To receive a catalog, call them at (612) 827-8231 or e-mail: bent4good@aol.com

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'Bent Kokopeli Jewelry Now Available

Albuquerque, NM—I had been corresponding via email with Peg Francisco, a potential recumbent customer in Tucson, AZ. She told me that she was a short person with just a 27" inseam. I told her about the shiny red Haluzak Leprechaun we had on the floor and how I was fairly sure it would fit her. Peg got excited and said she would drive to Albuquerque to try it out. She added that she made jewelry and would bring some to show me. Peg arrived on our private sale day in a small white Mazda sports car. She was thrilled with the Leprechaun. Lew, my husband and cohort, actually got it into the back of her car (that's how small this recumbent is!). Then Peg showed us her jewelry. She made these teardrop-shaped silver earrings and a pendant engraved with Kokopeli riding a recumbent. Kokopeli is a Native American petroglyph that symbolizes happiness and fertility. He is a hump-back flute player that wears a feathered headdress (and seems to always be in the laid back semi-recumbent position). We fell in love with the jewelry and placed an order right away.

Peg's jewelry is both beautiful and fanciful. She has been creating jewelry for about 24 years. In 1974 while working on the Navajo Nation, Peg watched her neighbor make jewelry and decided to try her hand at it. Since then, Peg has created jewelry based on whatever her particular passion has been at the time. She used to be a spelunker and then a kayaker. She created bat earrings and cave scene jewelry. She made pendants with a person paddling a sea kayak. Luckily, two years ago she discovered recumbents. Peg was on a 525 mile ride from the Grand Canyon to Mexico on



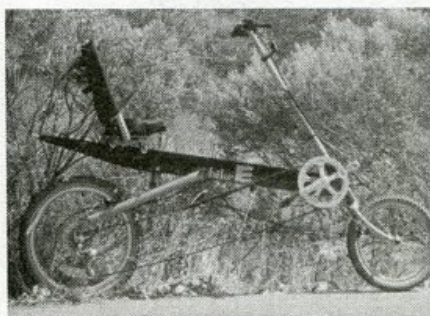
This jewelry is beautiful—we've tested it—Bob, RCN

her wedgie bike. Two recumbent riders were on the trip and easily convinced Peg (who was in dire pain) that a recumbent was the way to go.

Peg enjoys making jewelry for the simple reason that it brings pleasure to other people. Because each piece is hand-made, one-at-a-time, the designs may vary slightly. Although she likes making jewelry, she confesses that riding her Leprechaun takes precedence. This is why customers will need to be a little patient after placing an order. Peg tells us that she will be designing a bolo tie, key chain, bracelets and belt buckles. Orders may be placed through Absolutely Recumbent, 4924 4th St. NW, Albuquerque, NM, 87107. Tel. 505/345-7736—Hester Balsam

■ A Free 'Bent

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Bent News

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Open Road, publishers of Bike Culture Quarterly and annual Encyclopedia, have a new North American agent to handle subscription and contact inquiries: Len Frazier, Open Road USA, PO Box 720174, McAllen, Texas 78504. Voice: (956) 454-1161, Fax: (956) 686-7175, email: lenf@earthlink.net

VISION FENDERS NOW AVAILABLE

Vision Recumbents is now offering recumbent fendersets. They mixed size sets are black heavy gauge plastic, and come with stainless steel hardware. Both the front and rear fenders are double strut style for a shake-free fit. The 65mm wide fenders are available in 20" front—26" rear sets, perfect for 20/26 wheel tandems. 55mm wide fenders are available for single recumbents and come in 20/20 and 20/26 sets. Vision says that the 20" size works just fine on 16" wheels. The fenders retail for \$39 per set and are available from your Vision dealer.

VISION SOLVES 'BENT WORKSTAND PROBLEM

Vision has solved the problem of how to hold your 'bent in the common bicycle workstand. Most recumbent main frame tubes are incompatible with the jaw size of the common bicycle workstand. Mechanics will no longer have to hang their bikes from the rafters, or prop them up on a chair. The Vision StandClamp solves all of these problems. Infinitely adjustable from 1" through 3", the StandClamp easily attaches to the bike, providing a spot for the shop's workstand to grab. StandClamps retail for \$100 and are available from your Vision dealer.

BIKE FRIDAY FOLDING 'BENT & OTHER RUMORS

We've heard the rumor again. Will Bike Friday produce a folding recumbent bike? We've heard that the 'Bent Friday is in the 3rd prototype. It will be custom built to fit the rider, it will go into a travel case and be a very "compact" recumbent. This will most likely be a '99 model. In other speculation, when prompted by an HPV list member, Trek did not deny rumors of a '99 'bent model.

VISION TO OFFER BALLISTIC SUSPENSION FORK OPTION

The folks at Vision have been working very closely with Ballistic (suspension fork manufacturers). New for '98 are a 20" fork for single recumbents, a 16" front fork for single recumbents and a "High Rate" suspension fork for tandems. The 16" wheeled Vision models have been redesigned to take advantage of this new fork. The entire bike has been redesigned to better fit the smaller rider.



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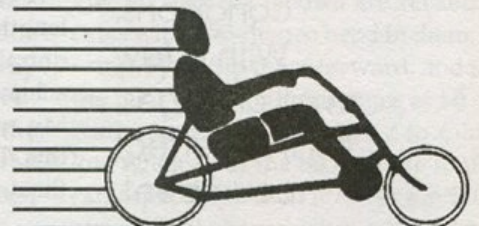
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**By Richard
D r d u l**

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The V-Rex is both nimble and stable, if that makes sense. I can do very tight U-turns and weave my way through a slalom course no problem. Yet at high speeds and on rough roads, I have complete control of the bike. I can lean over pretty far in a corner, and I don't worry about losing it. It's a bike I feel safe riding in even the cruddiest conditions. ... With a few small changes, it's the perfect recumbent.

For 1998, Rans has updated the V-Rex. If you liked the V-Rex 24 — as I did — then you'll love this V-Rex. I've been riding my new V-Rex for three months now, and after making a few small changes, am pleased as punch with it. Whether you're looking for a fast recumbent to dust wedgie riders on club rides, or a bike for touring, the V-Rex would be an excellent choice.

▲ What's New?

The new V-Rex features several changes for 1998, all of which have improved the bike. These changes include:

→**Common wheel sizes**-The rear wheel is a 26" MTB size, for which there are many choices of road tires available. One of the biggest drawbacks of the V-Rex 24 was that neither of the two 24" wheel sizes (507mm and 520mm) offered much of a tire selection, and only the 507mm size barely met my "can you buy a replacement tire at Wal-Mart?" Test. The front tire on the new V-Rex is a 20" BMX size, for which there is also a good selection of road tires available, as well as replacement tires at Wal-Mart.

→**V-Brakes**-Until this year, it was not possible to use V-Brakes on the rear of the V-Rex and some of the other Rans models (the cantilever posts were too far apart). On all its hardtail models, Rans now bends the chainstays together so that it is possible to use V-Brakes. Of course, Magura brakes can still be used if you prefer them.

→**A longer wheelbase**-The bike has been lengthened 2.5" (6.5 cm) for 1998. To my untrained eye, it appears that this has been achieved by moving the head tube forward. My well-trained tape measure confirms this. The upside is a more stable ride, and the downside is more heel interference.

→**A lower seat height**-Not by much, but the seat is about 1.25" (3 cm) lower than on my V-Rex 24. Not bad, considering the 26" rear wheel raises the rear axle an inch or so. The bottom bracket has also been lowered a similar amount, so the net effect is the same riding position.

→**Greater seat recline adjustment**-Where there used to be five positions for seat back recline, there are now ten, which provides a greater range of adjustment in smaller increments.

→**More eyelets**-The standard rigid fork now comes with two eyelets on each dropout — one on top of the dropout, and one on the bottom. The fork on my old V-Rex only had one eyelet on each dropout, which made it a pain to attach fenders. I like my front fender to extend fairly far forward, so as to keep spray off the cranks and my feet. This means that I need a fender stay on the forward half of the fender as well as on the back half. That second eyelet on top of the dropout makes it *much* easier to attach the fender stays. A nice touch.

▲ Buying a V-Rex

In order to meet the overwhelming demand for their bikes, Rans has greatly simplified the selection process. The V-Rex is now available in any color you want, as long as it's blue. Fortunately, it's quite a nice blue. There are a few choices involved in ordering a V-Rex. Two important choices are seat height and height of the Flip-It handlebars. Both choices depend on whether you're taller or shorter than about 5' 4". Riders over 5' 4" should consider the tall seat (which is \$50 extra). I'm 6', and I find the regular seat uncomfortable — the top of the seat digs in under my shoulder blades. I should point out, though, that many riders taller than me



The '98 Rans V-Rex with 26/20 wheel combo and longer 42" wheelbase. This bike is gorgeous!

use the short seat and like it just fine. If you're not sure, get the tall seat — everyone finds it comfortable, so you won't regret it.

Riders 5' 4" and under should consider the short Flip-It handlebars, as otherwise the bars may be a bit too high for comfort. Component choices are limited to two upgrades. A suspension fork can be added for \$150. I plan to put one on my V-Rex. Despite the extra 1.8 pounds, I feel the improvement in comfort and control on rough roads will be worth it. I was pleased to find that the suspension fork will not change the geometry of the bike. The stock rigid fork is about the same height as the suspension fork, and has a similar rake, so the head tube angle and the resulting trail should remain pretty much the same.

The other available upgrade is Continental Gran Prix tires for \$78. Why anyone would want to do this, I can't imagine. The stock tires are already a bit too thin for my liking, and the Gran Prix's are even thinner. Instead, I switched to fatter tires.

The suggested retail price of the V-Rex is \$1,645, or \$1,695 with the tall seat. If you don't like the components, you can always buy a frameset (which includes the seat, Flip-It handlebars and other V-Rex-specific parts) for \$1,195 (with the short seat).

▲ The Frame

The V-Rex is constructed of 4130 CroMo steel, and is TIG welded. Everything about the frame is well-done — clean joints, nice welds, sturdy rear dropouts and the Rans "R" laser cut into the dropouts.

Essentially, the V-Rex frame is a triangle, which makes for a reasonably stiff structure at a reasonably light weight. The main frame tube is 1.5" in diameter, and the chainstays and seatstays are 3/4" in diameter. The chainstays now join the main tube at the bottom bracket (rather than midway between the head tube and bottom bracket), which provides more lateral stiffness at the bottom bracket. The head tube pierces the main tube, and is also supported by each chainstay.

▲ Other Stuff That Rans Makes

Much has been said about the comfort of the Rans seat. The one on the 1998 V-Rex is even more comfortable than on my V-Rex 24, so I tore the seat apart to find out why. It turns out Rans is using a very firm open-cell foam, which provides better support. The 2" (5 cm) thick foam is plenty thick for my weight (155 pounds, 70 kg), so I expect that even heavier riders will find the seat comfortable.

The Flip-It bars are fantastic! I would never ride a bike without tilting handlebars again, and Rans' design is the best I've seen. The Flip-It bars can be adjusted as close to or as far from my body as I want them — I've got mine set fairly close and low, so that my elbows are tucked at my sides with a 90-degree bend in them. When I stop, I just flip them forward, and step off the bike with no interference at all. And I really appreciate the ability to fold them low when I put the bike on the roof of my car, especially when it saves me \$20 in an over-height charge driving onto the ferry.

▲ The Wheels

The most important components on a bike — next to the frame — are the wheels. And I was pleasantly surprised to find that the V-Rex comes with decent wheels, because this is an area where many bicycle manufacturers cheap out.

The hubs are Shimano LX, and the rims are Sun CR-18. Nothing fancy here, but a good reliable combination. And the nice thing is that the rims are wide enough to support fat tires. I checked both wheels for trueness after a couple hundred kilometers, and they were both perfectly centered, and needed only very small adjustments to be perfectly true. Both wheels have 36 spokes. This is more than necessary, especially on the front, so the result is a pair of strong wheels that can handle even the heaviest rider with a full touring load. The reason for 36 spokes is that this is pretty much the only way to get quality 20" rims.

▲ Tires

My V-Rex came with a Primo Comet 20" x 1.35 (ISO 38-406) tire on the front, and a Ritchey Tom Slick 26" x 1" (ISO 25-559) tire on the rear. Now, one thing that drives me crazy about the bike world is that tires are often much narrower than labelled. Case in point — the width of the Primo tire is rated as 37mm, but it measures only 31mm in width. I was pleasantly surprised, however, to find that the Ritchey tire matches its rating, measuring a full 25 mm in width.

As I described in RCN #40, I've come to prefer fatter tires for greater comfort, lower rolling resistance (in many cases), and better control in the event of a tire blow-out. So I eventually changed the tires on the V-Rex for fatter tires.

On the front, there is no limit to how fat a tire can be fitted. I chose an Avocet Fasgrip Freestyle slick, which is labelled 20" x 1.75" (ISO 47-406), but measures an actual 39mm in width.

On the rear, the fattest tire that can be fitted is one that measures 45mm in actual width. I tested a tire labelled as 26" x 1.9", which was 45mm in width, and it fits with about 1/8" clearance all around. I settled on a slightly narrower Ritchey Tom Slick 26" x 1.4" (ISO 35-559), which actually measures 37mm in width to provide adequate fender clearance.

▲ Stopping

The V-Rex is equipped with Shimano LX V-Brakes, and Gripshift ESP 7.0 brake levers. I really like the V-Brakes — they provide plenty of stopping power with excel-

lent modulation. The ESP brake levers work fine, even though they don't offer the variable leverage feature of other V-Brake-compatible levers.

If you want to save weight, you could leave the rear brakes off and wouldn't notice much difference! While slowing for a stop sign and signalling a left turn (which meant I wasn't using my front brakes — just my back brakes), I almost sailed through an intersection. This led to a few isolated tests of braking effectiveness, which proved beyond a scientific doubt that the rear brakes are pretty much useless. Now, this is not a happy situation. I like to know that I can stop with either my front brakes or my rear brakes. So I did some further rigorous scientific testing, and discovered that the small-diameter chainstays flex way too much with the V-Brakes. When I squeezed the brake lever, I could see each canti post flex outwards almost 2mm!

Fortunately, there's an easy and relatively inexpensive cure for this problem — a brake booster. This is a horseshoe-shaped brace that prevents the brakes from flexing outwards. What a difference it made on the V-Rex! Now I can truly stop with just the rear brakes, in almost as short a distance as with just the front brakes.

▲ Shifting

SRAM's Gripshift ESP 7.0 rear derailleur shifted well — as well as an XT rear derailleur. However, I didn't notice that the much-hyped "1:1 actuation ratio" provided any better shifting than Shimano's derailleurs. SRAM uses a fixed jockey (top) pulley, which makes for crisp shifts, but it also means that indexing adjustments are more finicky. Shimano, on the other hand, uses a floating jockey pulley, which means that the rear derailleur can tolerate a bit more misalignment of the indexing before shifting is affected.

One awkward thing about the ESP 7.0 rear derailleur is that the design makes rear wheel changes more difficult. This is because SRAM has positioned the jockey pulley on the same axis as the cage rotates, which is about 2" (50mm) forward of the derailleur hanger. In comparison, on a Shimano LX derailleur the jockey pulley is about 5/8" (15mm) further to the rear. What this does is make it more difficult to get the cassette past the jockey pulley on the ESP derailleur when replacing the wheel, especially with fat tires that prevent you from sliding the wheel forward much in the frame.

▲ Gearing

Up front, the V-Rex comes with a cold-forged Campagnolo Mirage triple crankset, set up with 52, 42 and 32-tooth chainrings. At the rear end, it's equipped with an 8-speed Shimano LX Hyperglide cassette, with an 11-tooth through 28-tooth range. I like the 42T and 52T chainrings — they're the right size for cruising in rolling terrain and bombing downhill, respectively. With a high gear of 113", I top out at about 40 mph (65 km/h) on the big downhill on my test loop. I don't need a higher gear than that, as I'd rather just coast down the really steep hills.

The gearing doesn't go low enough, though. I could handle the short hills on my test loop, but just about blew my knees to smithereens on the big uphill. The 32/28 chainring/cog combination produces a "low" gear of 27". That may be low enough for the plains of Kansas where Rans is located, but it just doesn't cut it on the mountains where I live.

Fortunately, there is plenty of room to go lower with the Shimano 105 front derailleur — as low as a 24T chainring, which is the smallest size that will fit on the cranks. This produces a nice low gear of 20". Changing to a cassette with a 32T cog would drop that to a really low 18" — good enough for most any hill. I'm going to stay with the stock 11-28 cassette, though, as the 20" low gear is low enough for me, and I like to keep the gears as close together as possible on the cassette — I prefer the wider range on the front.

When switching to the 24T granny, I decided to use a stainless steel chainring, for minimum wear and long life. This presented a problem. A stainless steel chainring is only 2mm thick, as opposed to 3mm for an aluminum chainring. That meant that I would need to put 1mm spacers between the chainring and the crank so that the teeth would be in the same position, the same distance from the middle chainring. Fortunately, after rummaging through the bowels of my local hardware store, I found some stainless steel cir-clips used to hold wheels and other things onto round shafts. These clips are the perfect diameter, and cost just \$1 for five.

Now I encountered one other problem. The 28-tooth spread on the front plus the 17-tooth spread on the rear adds up to a total spread of 45 teeth. That's seven teeth more than the rear derailleur is rated to handle, so chain wrap becomes a problem when on the granny and the smaller cogs. My cheap and simple solution was to

remove two or four links from the chain, and never use the smallest three cogs with the granny chainring, nor the biggest three cogs with the big chainring. Of course, if you do this, you have to be careful not to shift into the big-big cog-chainring combinations, as you can damage your drivetrain, frame, derailleur or worse, cause a crash.

I like to be able to use every gear combination, however. As an old retro-grouch, I would never do this on a wedgie, but for some reason when I ride a recumbent I often forget and accidentally shift into the small/small or big/big combinations. So I plan to eventually add one of Zach Kaplan's third pulley extensions to the rear derailleur cage. Another choice would be to switch to Shimano's new Nexave rear derailleur, which is rated for a spread of 43 teeth. Of course, that would require new shifters, because the ESP shifters pull a different amount of cable. Either way, it would cost close to \$100 to get the use of all 24 gear combinations with a 24T granny chainring.

Fortunately, all the effort was worth it on my V-Rex. The front shifting works beautifully! Shifts from the 24T granny to the 42T middle chainring are snappy — as good as with the 32T chainring. And I am pleased to report that the 20" low gear is

even lower than I need on my test loop. That's a good thing, because there are plenty of mountains out there with steeper grades than the big hill on my test loop.

▲ The Cheap Headset—Rans Listens

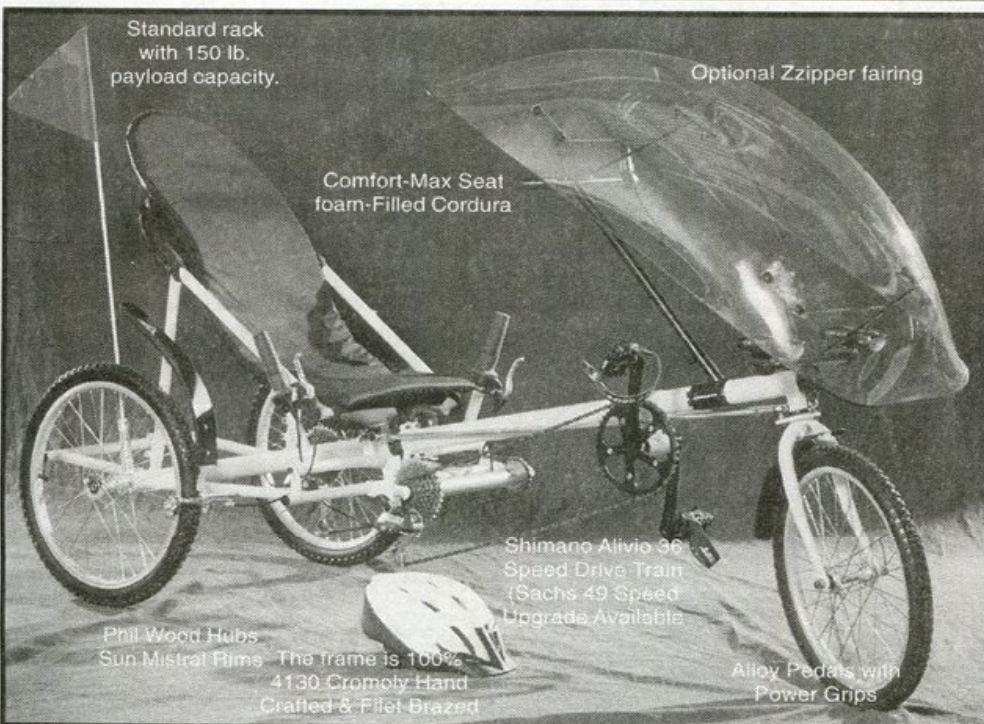
The YST headset was the only real let down on an otherwise excellent bike. When I lifted the front wheel off the ground and turned the handlebars, I could feel the bearings grinding. Not a happy sound. So I replaced the headset with a quality sealed bearing headset, and in the course of making this change, discovered that the YST headset is a JIS size, not the standard English size. What this meant was that the head tube had to be reamed slightly larger to fit the new headset.

It was disappointing to find such a low-end component on a bike of this quality, especially such an important component. A crappy headset that doesn't turn smoothly means crappy steering. It also means the possibility of a headset failure at the wrong time. Fortunately, I'm not the first person who's pointed this out to Rans, and as a result, Rans is in the process of switching over to a Ritchey Logic headset—a higher-quality English size headset.

▲ The Ride

Of course, the real test of any bike is the ride. And the V-Rex is no disappointment. In fact, it's a blast! I rode a V-Rex 24 for two years, so I'm used to a good ride. Spoiled might be a good word, too. But the new V-Rex did offer noticeably less "twitchiness" in the steering, and slightly better stability.

I attribute the improvements to the slightly longer wheelbase. Not only does this improve stability by increasing the distance between the wheels, but it also creates a bit more of a "tiller" effect in the steering because the front wheel is further forward. The "tiller" effect is the sensation that the bars are sliding sideways in a turn. It's most pronounced on LWB bikes, where some people don't like it. On the V-Rex, it's barely noticeable, but what "tiller" there is seems to improve the steering. I suspect that this is because moving the handlebars one inch to the side results in less rotation of the front wheel than if there was less tiller. This means that it's easier to make smaller steering corrections, reducing the feeling of "twitchiness." Of course, I'm only speculating as to why the bike seems less "twitchy," but the point is that it is noticeably less.



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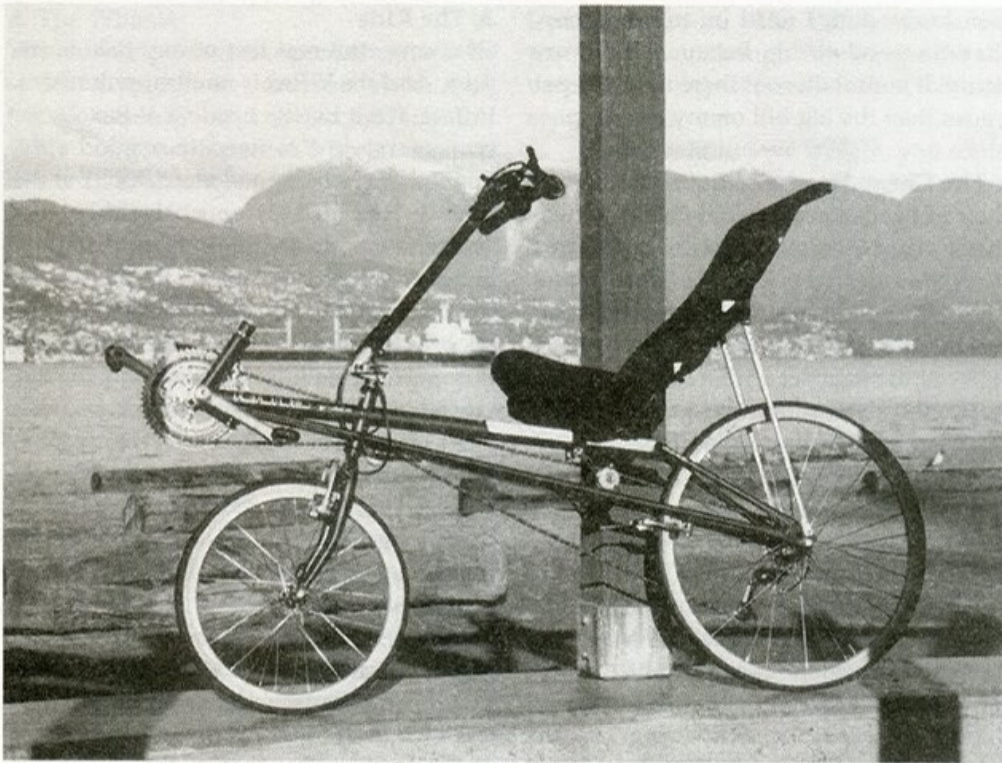
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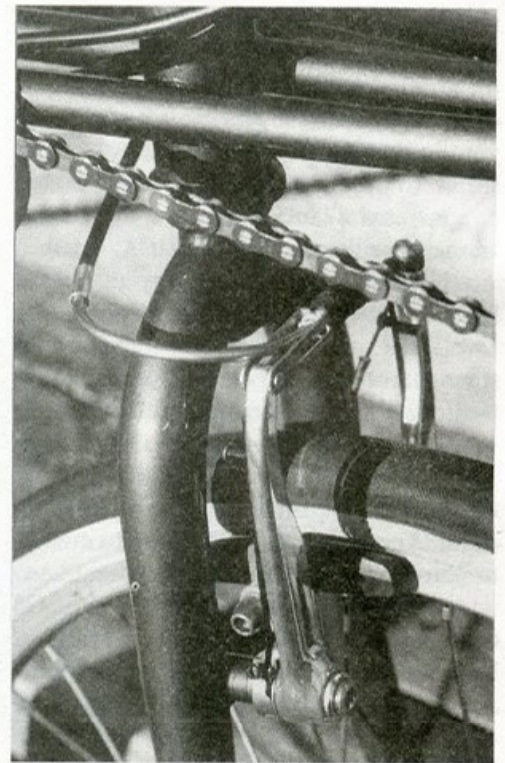
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Richard's V-Rex on the waterfront in Vancouver BC, Canada—Richard Drdul



'98 V-Rex LX V-brakes, brake noodle forward frame triangulation and Primo Comet front tire—Drdul

▲ Twitchy

The V-Rex is both nimble and stable, if that makes sense. I can do very tight U-turns and weave my way through a slalom course no problem. Yet at high speeds and on rough roads, I have complete control of the bike. I can lean over pretty far in a corner, and I don't worry about losing it. It's a bike I feel safe riding in even the cruddiest conditions.

The V-Rex is pretty good over the bumps. The foam base and the mesh back of the Rans seat absorb most of the impact, and take the edge off the bumps. You still feel them, but they're not uncomfortable.

Is the increased heel interference a problem? Not for me, but then I'm used to that characteristic of the V-Rex (and many other SWB's). It's really only an issue with low speed turns, and I've learned to keep my cranks level through the turn, with the inside crank pointing forward.

▲ The Bottom Line

Would I buy a V-Rex again? You bet. As far as I'm concerned, it's the best SWB recumbent out there. It meets all my criteria for a bike – comfortable, fast, stable, standardized (as much as is possible) and reasonably priced. With a few small changes, it's the perfect recumbent.

If I were to buy another V-Rex, I'd buy a frameset and add the parts I wanted. I'm a bit picky when it comes to components, and building a bike up from a frameset would give me exactly what I want.

Surprisingly, building a custom bike wouldn't cost too much more. The frameset is \$450 less than the complete bike. A quick check of parts prices in a couple of mail order catalogs indicates that for about \$700, I could set up a V-Rex with a mix of Shimano XT and 105 SC components, plus aero rims and other parts of XT-level quality. I haven't included pedals in this cost,

as the pedals that come with the stock V-Rex aren't clipless and would need to be replaced anyway. I also haven't included a cost for labor, as I'd do the work myself.

When you order the V-Rex:

- If you're over 5' 8" (173 cm), get the tall seat (\$50 more).
- If you're 5' 8" (173 cm) or less, get the short Flip-It handlebars (no additional cost).
- If you can spare \$150, go for the suspension fork option.

If you order the complete bike, ask your dealer to make the following changes:

- Put a brake booster on the rear V-Brake.
- Switch the 32T chainring to a 26T or 24T.
- Take two or four links out of the chain (or switch to a Nexave rear derailleur and new shifters).
- Put a decent headset on the bike – Ritchey Logic or something.

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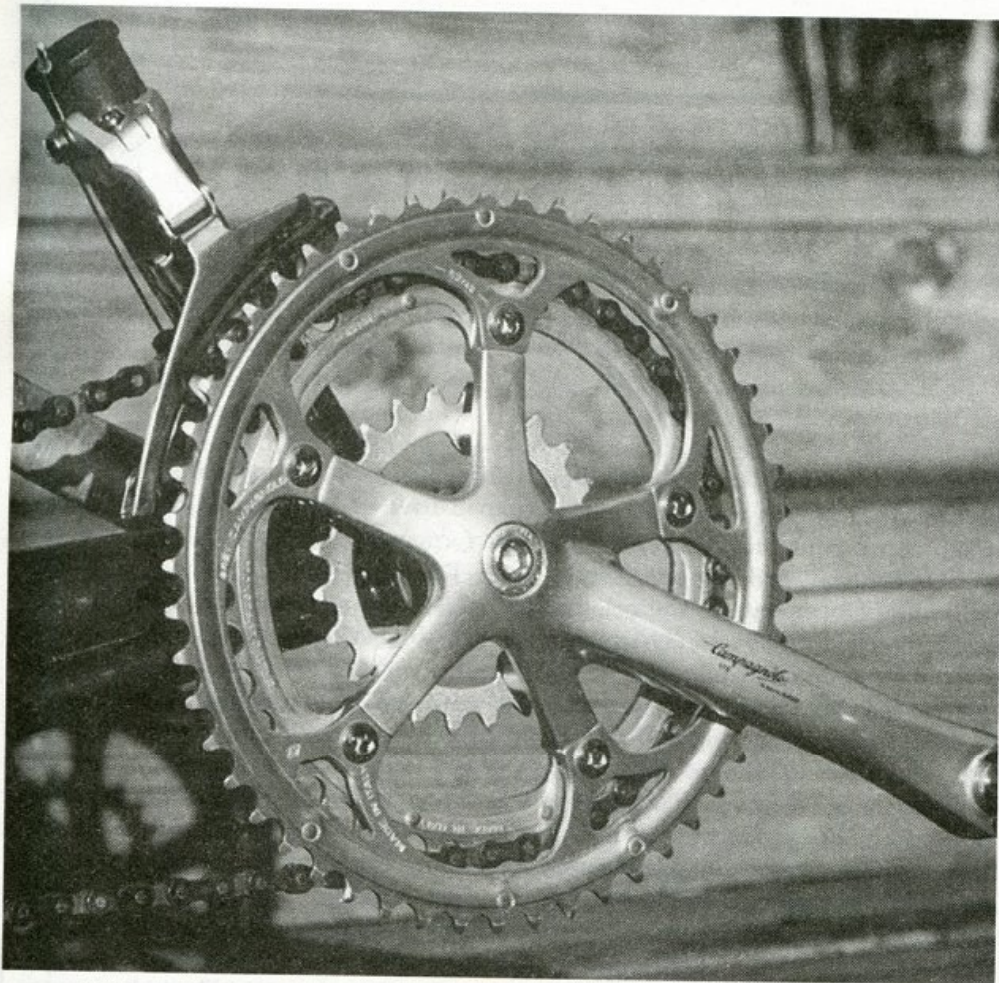
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Where else do you get a Campy crank at this price? This bike is a fantastic value—Richard Drdul

→Add clipless pedals – I recommend Speedplay Frogs or BeBops.

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Either way, whether you get a stock bike and make a few changes, or build up a "dream bike" from a frameset, you can't go wrong. The V-Rex is a great bike.

▲ Gearing

The 26 x 1" (25-559) rear tire on the V-Rex is actually only 24" (61 cm) in diameter. Gear inches are calculated on this basis. Gear inches for a 24-tooth inner chainring are included to illustrate the reduction in gearing which can be achieved. □

V-Rex Specs

Model: V-Rex SWB, ASS

Price: \$1,645

Weight: 28.6 lbs (13.0 kg)

Wheelbase: 42.5" (108 cm)

BB height: 25.5" (64.5 cm)

Seat height: 23.5" (59.5 cm)

V-Rex Options

- Seat Back: Regular, or tall (\$50 more)
- Flip-It Riser: Regular or short (2", 50 mm shorter)
- Suspension fork, \$150
- Continental Gran Prix tires, \$78

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By **Robert J. Bryant**

The underlying benefit of the Rans SWB bikes that sets them apart from the rest is:

- Excellent build quality to aircraft standards—Rans builds planes!
- Best seat.
- Very adjustable riding position.
- Great component specs—ESP 24 speed, V-brakes or Maguras brakes.
- Triangulated SWB frame.
 - Shorter boom/pedal tube.
- Longer SWB Wheelbase (40"-46").
- Excellent warranty-lifetime on the frame.

In just a few short years, Rans has become the leader in high performance SWB recumbent bicycles. The SWB Rocket, Saturn V, and Vivo are all variations and advancements of the original V-Rex designed in 1994 by Randy Schlitter, John Schlitter and Mark Colliton.

It has been my pleasure to test out all of the Rans SWB bikes during 1997 and the first few months of 1998 (somebody's gotta do it). Even though it appears like Rans has overdosed on SWB models (or models in general), each one has a suitable purpose and a slightly different personality. Model strong points and benefits are as follows:

• **'98 ROCKET:** This bike is the jack-of-all-'bents, and does-everything-well—offering the best SWB 'bent performance for the buck. The seat is lower than the other Rans SWB bikes and the wheelbase is shorter—40." The bike works better for mid-5' tall riders up to just over 6', but not much over.

After riding and testing the '98 V-Rex, Vivo and Rocket, I ordered a new yellow Saturn V for myself. I loved our original stock '96 and '97 test Rockets. Both were purchased locally and their owners love them. Many of the miles are trash-'em-up NW rain miles too. My '97 test bike is now ridden by RCN columnist, Kent Peterson, and the total mileage is getting close to 5,000. Matt Ewing rides a former '96 model square tube test bike. The only component changes have been the stiff shifting SRT400 Grip Shift on the front derailleur which Kent changed out with a retro thumbshifter. Kent also replaced the 58-T. chainring with a 62-T. See the picture in Kent's column in this issue where he builds a Tail Box.

There is something very special about the Rocket. It's that dual 20 thing. Kelvin Clark said, "It has a mischievous attitude," and I wholeheartedly agree. Some people get it—others don't. If you liked the Presto's—you'll love the Rocket. If you like the full size rear wheel, a more neutral han-

dling bike, or have any misgivings about small drive wheels, you like the out and out performance—the V-Rex will be your steed.

Rocket Downside? The riding position is more advanced than other Rans bikes—higher BB vs. seat. The high gear is limited with the 20" drive wheel, or so they say. It takes 30 +/- MPH to spin a Rocket out. All Rans SWB bikes with 20" drive wheels come from the factory with a 3x7 braze-on.

Lastly, the 40" wheelbase gives the best handling of all the Rans SWB bikes. The Rocket feels like a road bike—but light years ahead in comfort. The drawback of this relatively short SWB comes if you are over 6' tall or close and like to have your seat laid way back. If you climb REALLY steep hills, it may be possible to bunny hop the front wheel at low speeds. As I said, I am 6' tall and had this happen a few times in 1997. Once was while riding Chilly Hilly somewhere on Bainbridge Island, and the other times while climbing straight up James Hill in Kent. I never had this happen to me on the 43" WB V-Rex or 46" WB Vivo.

• **SATURN V:** Okay, it's overkill—and a Rocket-connoisseur's dream. The frame is TIG welded (vs. MIG), has bright Saturn Yellow paint (wet spray + clearcoat vs. powdercoat), ESP 9.0/900 drivetrain with the lightest, quickest, shortest-throw indexing known to man (and yes it's better than the 5.0/7.0), a Ritchey crank with tall chainrings, Flip-It stem, and those slick oil-in-the-tube brakes—Magura's! For torturous commuters who ride on crappy roads, rain, mud, rocks, opt for the stock Rocket. If you are a sunny day rider, like an upgraded machine—S5. A definite sweet spot in SWB 'bent cycling.

Saturn V Downside? Availability on this model isn't good. Call the big dealers and search early. Tourists in search of a wider gear range may want to consider adding a Sachs 3x7 hub.

•**'98 V-REX:** V-Rex co-designer Mark Colliton's original mission was to design a Lightning-killer that utilized a 20" front wheel (instead of the 16" or 17"), with a simpler triangulated frame based on his old Stratus tube set. In the old days, the V-Rex was a real deal at just over \$1000. For 1998, the 24-speed V-Rex 26/20 is \$1645—and still a bargain. The V-Rex has met and exceeded all expectations. The design evolution brought forth a 24/20 wheel configuration for the past few seasons. For 1998, the wheelbase has been lengthened to 43", and the seat lowered—resulting in the use of a 26/20 wheel combo while retaining the preferred 24/20 steering geometry.

The V-Rex is an excellent bike for big, strong, tall riders who need durability, yet a fast bike. The 26" rear wheel matched with the 20" 406mm (BMX sized) front wheel, and the longer 43" wheelbase offer perfect weight distribution for nearly anyone. The frame is nearly fully triangulated out to the bottom bracket (BB). You can ride with the fat 1.75" wide tires or skinny 1-3/8" tires on the same rim to suit your terrain or the season.

Being from the dual 20" (Rocket) camp, I see the biggest benefit of the V-Rex is for those who want the added gearing range of the 26" drive-wheel, the longer wheelbase (for a taller/XL-sized rider) or you just want a 'Rex.

• **V-Rex Downside:** The gorgeous Campy crankset is a plus, though the bike desperately needs lower gears. Have your dealer add a smaller inner chainring to take care of this. The V-Rex offers a saner, less mischievous, more down to business handling. The added wheelbase has improved stability, however, if you lay back your Flip-It stem, you now have to lay it back even farther—thus creating possibly more tiller effect. This was no big deal, unless I made a quick correction. I then had a tendency to overcorrect.

• **VIVA VIVO:** This bike has been the dream 'bent of many for years and it is here now and available (I know of a few available). The Vivo suspension is near perfection. The Cane Creek AD5 is completely adjustable, and even the Ballistic fork has a dial for adjustment. The drivetrain is similar to the Saturn V.

The noticeable difference with the Vivo is the added wheelbase—46" WB, the longest of the Rans SWB machines. The Vivo, with its dual 20's, has handled the wheelbase extension better than the V-Rex. Our test Vivo is #1. I brought it home from

Interbike and the bike is the most perfect test bike we've had here this year. It has needed absolutely nothing!

If the Rocket is the does-everything-bargain, fun machine and the V-Rex is the serious performance, big-wheel SWB 'bent, the Vivo is a combination of them both, while offering the sweetest ride possible on a SWB 'bent. Yes, the Vivo has the smoothest ride we've ever encountered while on a SWB recumbent bicycle. If comfort is your thing, the Vivo is your bike. Match a tall Rans seat, knocked back a ways, and set your Cane Creek shock a bit lighter and you have the 100% pure 'bent cush—even with the skinny Primo tires!

The Vivo is the heaviest of the Rans SWB bikes at about 32 pounds. It can feel sluggish after climbing off an S5 Rocket, but my test loop times did not show a slow bike, nor did my initial test at the People Movers 'Bent Bash ride, or I mean race to the beach. The Vivo had slightly better times than the Altitude, and the same as the V-Rex and Rocket (no difference here...) on our test run to Black Diamond and back. Average speeds were 17-18 mph.

On the 'Bent Bash ride, the Vivo's strength was full powering up and down the bridge ramps on the aqueduct river trail. Whereas Bill Volk (trick S & B) and Mark Colliton ('98 V-Rex) were slowing for these bumps, I was full-power on. Anywhere rough roads are, the Vivo will stretch them out and smooth them over.

The Vivo doesn't completely offer the mischievous handling finesse of the Rocket/S5, but has its own steadier, more predictable, in-for-the-long-haul, serious commuter/tourist handling. This recumbent would be my first choice for a long distance touring SWB.

Vivo Downside? Availability will be extremely tough. There are very few Vivo's at this time. Call the big dealers and search early. Tourists may want to consider a 3x7. A similar, though more expensive bike with even better availability will be the Angletech Altitude.

Suspension: I love riding suspension recumbents. I am concerned about the potential performance loss from the rear suspension in serious steep climbing situations a la the Slumgullian Tour in Colorado. I do plan to do some steep climbing tests with the Rans Vivo and our promised Vision full suspension model. I am intrigued with how they'll handle climbing in mid-range gears.

• **RANS NIT PICKS:** In the old days, Rans

built all of their own forks. Nowadays, they buy the J & B CroMo recumbent fork, as do Vision, Haluzak and others (not on all models). It would be nice to see a design-specific fork. The Rans paint has been soft in the past, though recently has improved. The DuPont Chromabase/clearcoat is not as tough as powdercoat, though it's the most attractive finish in the recumbent industry.

In a late breaking update, the lackluster YST headset is in the process of being replaced with a much nicer Ritchey Logic headset, though the transition will take several months due to a fork transition.

We have found the ESP to shift great, especially when the bike is new, but it is more difficult to adjust (or I haven't mastered the ESP skills yet).

Randy Schlitter (Rans Owner), John Schlitter, (Rans Bike Division President) Mark Colliton and anyone contributing feedback on the V-Rex should be proud. The Rans SWB bikes have become the best, most popular and most sought after SWB 'bents in North America today.

• RANS SWB PERFORMANCE

An RCN reader wrote to me and said that he had an Angletech/Rans V-Rex GL63 with a front shock and that he was thinking about buying a Lightning P-38, "to experience the performance side of SWB." I thought about this and told him that after testing all of the Rans SWB and other SWB ASS models varying in weight by 10 pounds, I just didn't find much difference in performance unless you went to underseat steering (slower) or a light flexible frame, or low-pressure tires. I told this reader that I estimated that the lighter, skinny-tire Lightning may go 5% faster over his V-Rex, but I can't imagine much more of a difference. I asked Gardner Martin of Easy Racers, he agreed with the 5% figure. The reader called Zach Kaplan who sells both Lightning's and Rans. Zach said he agreed with the 5% figure, and added that it would only be for very smooth pavement, V-Rex suspension and fat tires would offer better performance on anything else.

My advice to this reader was that he should add a Super Zzipper fairing and build a tail box, which Kent Peterson says is worth up to 1.5 mph in performance.

The 5% figure is probably a pretty good guesstimate as to what underseat steering or a too flexible frame may cost you in performance as well. The bottom line is that these bikes are pretty close in performance. Aerodynamics is important, and of course the condition of the engine. □

RCN

T o u r i n g

A World Touring Super Sonic Linear

**By Paul K.
Nolan, M.D.**

The Super Sonic demonstrated remarkable stability and handling prowess. The extremely low gearing allowed loaded climbing up steep grades at speeds as slow as two miles per hour without instability. High speed descents could be done fairly comfortably.

This story began over a year ago when I had the pleasure of hosting a world touring bicyclist, Jon Holmes, on one of his trips across the United States. Jon spent a couple of days at my central Texas ranch while we refurbished his custom made Italian touring bike he had been using since 1988. Jon took a spin on my Ryan Vanguard long wheelbase (LWB) under-seat steering (USS) recumbent and found immediate relief from maladies that were progressively niggling him as he toured on his conventional upright bike. When Jon crossed back through Texas this year he spent more time at our ranch and on our recumbents, the Vanguard plus an E-Z 1 by Easy Racers. Jon was hooked. As Jon was needing to earn a grub stake for the next leg of his world tour, Alaska to Argentina, he spent two and a half months helping with the horses, cattle and trails on the ranch. Jon originally being a Nebraska farm boy fit right in. Additionally, Jon's well traveled conventional touring bike had finally succumbed to 9 years and 60,000 miles, his frame had cracked. In need of a new bike, Jon tried many different recumbent models during his breaks from work.

Jon settled on the Linear Sonic because the short wheelbase and foldability would lend itself to easy packability for traveling by air; also, the USS was more comfortable for him than above-seat-steering (ASS). Jon found some shortcomings with the Sonic that I felt with a little bit of 'Bent' engineering could be overcome and make the Sonic a worthy world class tourer.

Jon liked the Vanguard's seat recline adjustability. I custom machined adjustable seat stays which also allowed easy mounting of a tire pump holder to one of the seat stays. Linear now offers optional adjustable recline seat stays on all models.

▲ CUSTOM SONIC SEAT

The foam based seat had open pore foam

which allowed absorption of water and was too soft allowing bottoming out of the seat on rough sections of road. This was swapped out with closed-cell foam Ensolite which provided a more firm yet anatomy conforming seat base that stayed comfortable on all day long rides without absorbing moisture.

The fiberglass cross seat stay tensioning rod at the top back of the seat was not stout enough to handle hard pedaling; with levering of the rider's back into the seat, the rod would pop out under hard efforts. This fiberglass rod was removed and an aluminum brace was fabricated from the 5/8" diameter aluminum tubing using part of the narrower seat back tubing that had been cut out from the stays as one inch spacers to allow the cross tubing brace to be lowered from the seat to allow room for the fabric seat back to flex fore and aft to absorb road shock. The brace was bolted to the top of each seat tube with-inch diameter two inch long stainless steel bolts with nylon lock nuts, placing a one inch long piece of the narrower scrap seat back brace tubing inside each end of the cross tubing to reinforce it and prevent crushing when bolted down. The cross brace was padded with closed cell foam pipe insulation to provide further protection to the spine in case of extreme rough riding. This stouter seat brace also allowed hanging a CamelBak bag on the back of the seat, further increasing the liquid carrying capacity of the bike and allowing the rider to sip and ride at the same time.

The seat fabric was reinforced with black poly-cotton iron on and sewn down knee patches wherever the fabric was punctured for bolts. The sides of the seat were padded with the foam pipe insulation to allow a comfortable place for the elbows to rest. To provide adjustable lumbar support, a two inch nylon webbing strap was placed around the lower back portion of the seat



Custom Linear seat



John Holmes and his tricked out Sonic—ready to hit the road—Paul Nolan

with a quick release buckle on the rear (these were secured through Campmore catalog). The latter two modifications I had already done on my Vanguard.

▲ CUSTOM SPEC

My Ryan Vanguard has USS with bar end grips and bar-con shifters which allows a more anatomical and comfortable positioning of the hands. Dick Ryan of Ryan Recumbents provided a set of bar-ends for the Sonic. The original Sonic handlebars were 28 inches wide, I cut these down to 22 inches wide before mounting the bar ends. This allowed a more comfortable positioning of the hands along side of the body while still allowing ample room for steering. There was some up and down seesaw play in the handle bars that could not be eliminated by any degree of tightening the mounting bolt. This was eliminated by placing a thin brass spacing washer between the top of the steering mounting bolt and the roller bearing washers of the steering assembly. The mounting bolt was secured with red Loctite 270 (high strength). Shimano Ultegra 8 speed bar con shifters were plugged into the bar ends with the Dia Compe SS4 brake levers mounted at the base, facing forward. This allowed finger tip control of braking, shifting and steering with great comfort. All the original brake and shifting cables were replaced with Gore-Tex Ride-On cables.

One disadvantage from this type of

shifting set up I discovered on my Vanguard, is the front derailleur as well as the bar-con shifters lack any cable adjustment. To provide for front shifter cable adjustment, I mounted a down tube cable adjuster for the front derailleur to the left hand side of the frame just forward of the seat after I filed the concave mounting base flat on the adjuster. This allowed easy cable adjustment from the seat. As the rear derailleur had an adjustment barrel, it was not necessary to mount an additional adjuster for it.

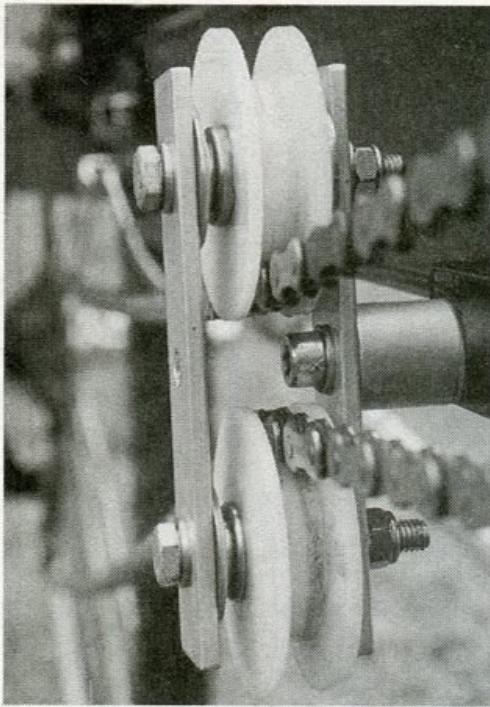
Because of Jon's shorter leg length and riding style, the steering assembly and seat had to be brought more forward than what the adjustable assemblies allowed. This required shortening the steering connecting rod approximately three inches and redrilling after it was shortened.

The Sonic was sans any water bottle mounts. Four mounts for bottle cages were thus placed: on the underside of the I-beam frame on the most forward section, one on the top of the frame in front of the seat behind the front derailleur tube and on both sides of the lower back of the seat tubes. The seat tube and top beam mount were accessible to the rider while in the seat.

The Sonic lacked any convenient place to mount a headlight and speedometer. This was quickly remedied by removing the plastic tube plug on the front derailleur tube and inserting an Ahead Set Star Fangled Nut and head tube cap (1-1/8 inch diameter). A 4 inch long 7/8 inch diam-

eter piece of 6061 T6 aluminum tubing was then drilled and mounted crosswise over the head tube cap and bolted into place using the Ahead Set bolt. Prior to mounting the tube, a groove was filed into the plastic cap with a half round file to allow the tube to seat without spinning around. A small cork was placed in the top mounting bolt access hole to keep water out. The tube ends were capped with bar end caps. The speedometer and the head light were then mounted to the tube.

The front derailleur was a Shimano Exage standard size and was retained. The rear derailleur was a low-end Shimano Altus and was replaced with a Shimano long cage LX with Bull's Eye jockey pulleys substituted for the Shimano pulleys. The no-name head set rattled and caused less than precise steering no matter what degree of adjustment. This was replaced with a Shimano LX sealed bearing head set with a dramatic improvement in the steering and no further rattling. The front crank was an upper end but now extinct standard drive SunTour XC Comp but it would not allow for an Avid Micro-Adapter that would provide a super-low granny gear. This crank was swapped out with a Shimano Deore DX standard drive crank with 20/36/50 chainring combination. A low-end no-name conventional bottom bracket was replaced with an high-end Shimano sealed bearing bottom bracket UN 72. The low-end Sovos hubs and Araya



Custom made chain idler



The Super Sonic specially outfitted for long distance touring—Paul Nolan

rims were replaced with 36 spoke Phil Wood Field Serviceable Axle hubs with sealed bearings. The front being laced to a Sun Rhino BMX rim; the rear 8 speed cassette hub to a Mavic 217 ceramic rim. A Shimano XTR 12-32 eight speed cassette was placed allowing ample low to high gear range. The rear Dia Compe Big Dog brake was retained. The front brake had to be replaced as it did not reach the smaller diameter BMX rim. An ACS 860 side-pull long-reach brake with Mathausser pads was substituted. One of the objectives that may well be apparent with these parts changes was to outfit the bike with durable, low maintenance parts, using sealed bearings where ever they could be utilized. The original KMC chain was replaced with a Sachs MC90.

The black plastic tube chain guard, though it protected the legs from chain tattoos, was not durable enough. The ends of

the tube were being worn through by the chain rubbing on it. These were replaced with custom made chain guides made from two Delrin roller bearing pulley that spun on one inch diameter axles.

I made a custom chain idler with floating delrin idler wheels. This worked great—after the third try. Linear now offers an optional chain idler.

The shifting set up with the Ride-On cables, the Sachs chain, the Shimano shifters, cassette and derailleurs with the Bull's Eye jockey pulleys and the roller bearing, floating chain idler has been by far the smoothest, swiftest shifting I have ever experienced on any bike, recumbent or upright, and I have ridden and tinkered on many a bike.

▲ CARGO CAPACITY

To handle the loaded pannier bags, a Blackburn Expedition touring rack was

mounted to the rear with a modified bracket made out of inch wide 1/8 inch thick angle 6062 aluminum taking the load on the fore portion of the rack anchoring this to the seat stay mounting bolts. The front Blackburn low rider rack was modified to fit the smaller forks without interfering with the feet while pedaling. The front 'U' brace was mounted horizontal along the top of the racks and the protruding 'U' portion was angled downward about 20 degrees to avoid foot interference while pedaling. The front pannier bags mounts were repositioned on the long axis to allow the bags to be mounted horizontal which enabled tight cornering without dragging the base of the bags. I had torn out the bottoms of a previous set of front panniers on my Vanguard that had been mounted conventionally.

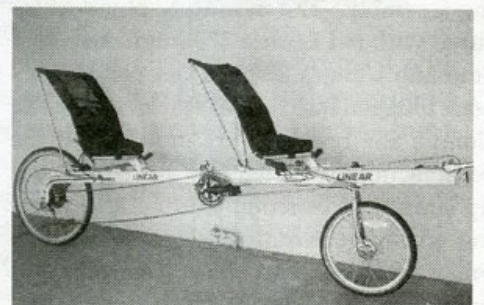
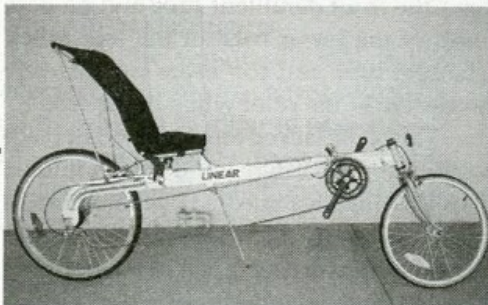
A Primo V-Monster 20 x 1 inch 60 psi tire was mounted on the front and a Spe-

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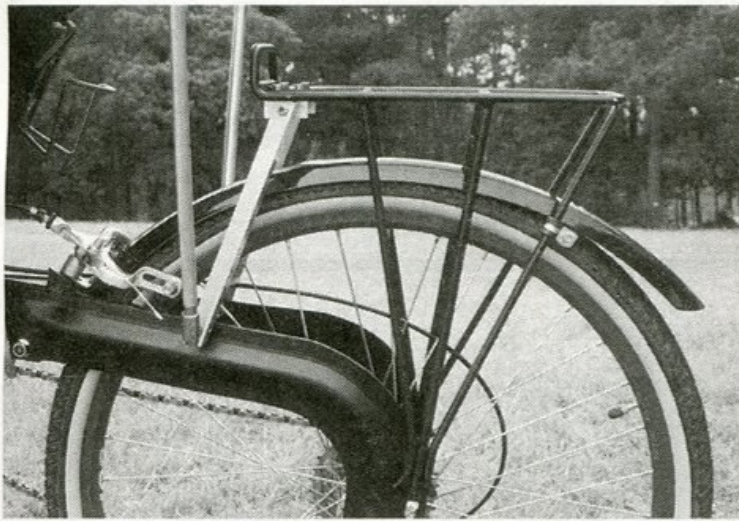
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Note the very clever accessory mounting on this one-of-a-kind Linear Sonic SWB—Paul Nolan

cialized Nimbus 26 x 1.5 inch 80 psi tire was mounted to the rear. A 1.7 inch wide diameter tire was tried in the rear but there was insufficient clearance. For wet weather riding an Easy Racer carbon fiber front fender was added and a modified 700c Zefal front fender was mounted to the rear by moving the brake mounting bracket to the most forward portion of the fender and then mounting the brake bracket to the rear brake bolt. The rear of the fender was then anchored to the touring rack using some mounting clamps anchored to the mounts for the fender stays. This provided a rigid mount that did not rattle.

As many a long distance bicycle tourist can attest, the benefits of a kick stand out weigh any weight penalty that the stand may incur. Jon wanted a kick stand but the Sonic did not lend itself to any conventional kick stand. This was overcome by mounting a conventional Greenfield kick stand to the rear base of the I-beam frame, three inches from the end by making an extension out of inch diameter 6061 T6 1/16 inch thick aluminum tubing with an inner sleeve

of 5/8 inch diameter 6061 T6 aluminum tubing. The inner sleeve was 14 inches long and slid up onto the end of the stand about seven inches and then the 21 inch long outer sleeve that had a vertical cut one inch long made with a hack saw blade on the end that slid over the stand was then slid over the inner sleeve and stand. This was clamped in place with a stainless steel hose clamp over the slit end of the tubing. This degree of reinforcement was necessary as a previous single tubing extension stand bent under the weight of the loaded bike.

▲ A WORLD CLASS TOURIST

Once all these modifications had been completed the Sonic demonstrated remarkable stability and handling prowess. The extremely low gearing allowed loaded climbing up steep grades at speeds as slow as two miles per hour without instability. High speed descents could be done fairly comfortably, but when compared to a LWB recumbent like the Ryan Vanguard, it is apparent that the LWB's are more confidence inspiring at the higher speeds certainly due

to their slower (i.e. not as quick) steering response. However, the LWB is a disadvantage for the granny gear crawls, and the SWB Sonic with its quick steering was far easier to balance at slow speeds. The slowest I can comfortably go on my Ryan is around four miles per hour.

One of the other quirks of the Linear folding design is that it can creak when under hard pedaling. This was overcome by greasing the contact points of the frame and folding rear section and by securing the frame quick releases tight.

Jon is off touring now, pedaling and working his way down the western hemisphere on his custom Linear "Super Sonic" world touring recumbent bicycle. Jon will be sending me periodic updates to let me know how he and the Super Sonic are doing. I will collate and edit these and update the readers from time to time.

Jon is interested in anyone joining him for all or part of his journey. If you are interested drop a line to: Jon Holmes c/o Bluff Creek Ranch, P.O. Box 110, Warda, TX 76960. □

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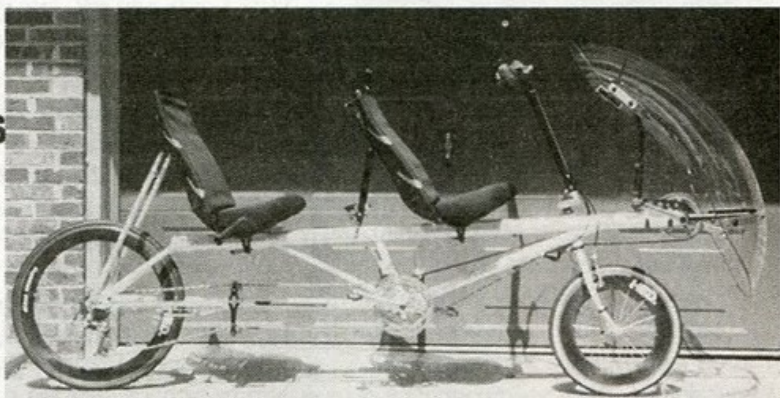


Photo courtesy of Roy Ryal

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By Bill Bruce

billbyke@psnw.com



■ Bill Bruce at
Deadman Summit

When I was first approached to join in with three other riders on a 600 mile tour through the California Sequoia and Sierra mountain ranges it was easy to say "Yes" when the departure date was six months away. But as weeks progressed and plans were being formalized I realized this was for real, and I had better get with the program and do some serious training.

A bit of background....I am retired, 64 years old, riding "enthusiastically" for about 15 years. I began my recumbent riding in 1989 (Linear/ Infinity, LWB - USS) but for lack of recumbent riding partners, after a couple of years, I sold both bikes and reverted back to (arghhhh) riding my wedgies! Longing for those comfortable rides I fondly remembered, I purchased a used Tour Easy in the spring of 1996, and the love affair started all over again. I haven't ridden a wedgie since, but have expanded my "fleet" to include a BikeE and a Rotator, and completed building a "Bentech".

But, back to the present. While this tour was scheduled to be a credit-card tour (sleeping in motels and eating in restaurants) it was going to be mountainous and training was a definite factor. Carrying over a good base from last year, I began spending more riding time in the hills around Fresno (California) and had approximately 2500 miles logged in by our departure date which was June 17th, 1997. Two full centuries, one double century, and many metric centuries gave me a good foundation for spending time in the saddle. (Actually, I shouldn't refer to it as a saddle, as on a TE, it is more like riding a "Serta Perfect Sleeper.")

Because I would be accompanying 3 riders on conventional road bikes (2 Schwinn Paramounts, and 1 Schwinn Tempo) I was determined to prove the performance and reliability of the Tour Easy

(and to disprove the "recumbents can't climb" curse). The bike was in top shape, and I was counting on my body to see me through this undertaking. (Undertaking, not undertaker!!)

ABOUT THE BIKE: Tour Easy, size medium, with the following specs....175 crank, with 28/38/54 chainrings, and a 13-30 rear cassette. SPD type pedals. IRC 1 1/8th high pressure front tire, and a Vittoria high pressure 1-1/4" rear. Half Zipper fairing, and a Uni rear wheel disc cover. Rear rack with expandable trunk bag (with about 8 pounds of contents) 3 waterbottles (large). Carried spare 20" front tire, and basic tools and pump. Total bike weight, loaded, approx. 47 pounds.

ABOUT THE GEAR: In addition to the bib-shorts and jersey I wore, which I washed out every night, I carried spare socks, tee shirt and nylon "work out" type pants (for formal evening wear) a swim suit, jacket, arm and leg warmers, plastic trash bags (for use as poncho) and personal toiletries. (Being one of that high percentage of recumbent riders with a beard, I saved weight by not bringing a razor.) Credit card and cash rounded out my gear.

ABOUT MY RIDING PARTNERS: A couple, aged 60 and 59, and a single man aged 45. The retired couple had accumulated lots of training miles, and while the "youngster" among us still works, and lacked the training opportunities, he was so psyched up mentally it compensated for his lack of training miles.

ABOUT THE ROUTE: From Fresno our route took us south and east crossing over the Sequoia's, to the eastern side of the mountain range, north through the high desert areas through the ski resort areas of Mammoth and eventually up Tioga Pass through the Sierra's and into Yosemite Valley, westerly out of Yosemite and eventually back to Fresno. Tioga Pass (elevation 9940') is closed during the win-



ter, and was open for vehicle traffic about a week before we arrived.

If you have access to a California map and follow the route you can see our general directions from Fresno — south, then east, then north, then west, and lo and behold we got back home.

CLIMBING is what this tour was all about. The second day was by far the hardest with over 6500' of climbing in 25 miles, with some monster switchbacks and very HOT. It took us about six hours to reach the summit which was about 30 miles into the ride, and left us another 30 miles and 1500' of climbing to our lodging. We were about 15 miles short of our initial destination for the night, but found a great cabin at a little resort right on the Kern River so took advantage of the owner's hospitality. He even drove us over and back to a restaurant about 4 miles down the road.

Our third day was very difficult again because of the heat and our scarcity of water. It seems we were always on the verge of running out, and even insulated bottles don't keep that last half of your last bottle cool! While Walker Pass had only half as much climbing as our second day, most of the 4000' came in the last 15 miles

over the top. We had a screaming descent into InyoKern.....I was braking at 50 mph. When we checked into our motel it was 104 degrees.

Working our way north up Highway 395 we continued to deal with lots of climbing, but also had a couple of days of high winds. (In your 30/28 and going 5 or 6 mph on the flats...TROUBLE!!)

TIOGA PASS is one of highest passes in California through the Sierra's at 9940' and as the day got nearer to climb this pass it weighed heavily on our minds. However, once we started the climb it didn't seem to have the degree of difficulty that we faced on our second day out. We had about 3100 feet of climbing in eleven miles. Commencing the climb at LeVining, at an altitude of 6800' I was already running on a lean mixture of oxygen, and my biggest challenge of the tour came once I passed the 8500' elevation.

Up until this point of my tour I had not found it necessary to get off the bike (other than for taking rest breaks) but I must admit on this climb the thin air got to me. I found myself almost hyper-ventilating and unable to get into a comfortable rhythm of breathing so I would get off the

bike and walk a bit until my breathing returned to normal, then get back on and ride some more. This procedure got me the final couple of miles to the top, and once we got going down the other side, when we hit 8000' the air tasted as thick as Karo syrup!

After that first descent we still had another 3000' of climbing into Yosemite Valley with a total of 80 miles! But, I must say, it was one of our most scenic days!

YOSEMITE VALLEY of course was breathtaking, and even with all the tourists (us included) there were enough beautiful sights to go around for everyone! The severe flood that took its toll early in 1997 left some reminders, but all in all the Park has healed, and looked better than ever.

PROBLEMS AND CLOSE CALLS were at a minimum. NO flats, or mechanical problems for any of us. Narrow roads and motor homes were an ever present danger (especially if they forget to put their steps back up). Many days the heat was so overpowering we didn't know whether to drink our water or pour it over us!

On the severe switchbacks there was ALWAYS oncoming traffic which never allowed you to get on the high side of the



road and kept you down in the "hole" which probably increased the grade another 3-4 %!

We were off our bikes taking a break on a long climb, and a wayward truck almost wiped us out coming up the shoulder on a narrow two lane road trying to allow a car to pass. Saw two rattle snakes, both dead! (We thought that truck was

going to allow us to join them.)

Bug bites, chapped lips, and heat rash were minor annoyances. After a few days on the road, the wedgie riders were constantly doing a lot of readjustments of their saddle posture (as I sat comfortably in my recliner and smiled).

GOOD THINGS were happening to us all the time! Pulling into remote little

spots throughout the mountains, and especially in the parks, the bikes always drew attention. Once the recumbent was spotted it drew even bigger reactions! We all enjoyed the good wishes and I never short changed anyone who asked of me, "How much did that cost?" "Did you make that?" "Those things can't climb, can they?" etc. We met some young hikers who were coming up the Pacific Crest trail from Mexico.

An ice cream truck going between towns stopped and the driver gave us an ice cream bar. Travellers stopped along the highway at scenic overlooks gave us water. Everyone seemed to enjoy seeing us on the road, except for a very small number of drivers who gave us the usual "salute" and honks.

CONCLUSION: Having done multi-day tours in the past on wedgies, I found that touring on my recumbent was far superior. This tour by far was my most demanding, and even after some gruelling days, once our destination was reached, and I cleaned up I felt great! Credit card touring was fun, and I didn't miss sleeping in a tent and sleeping bag! By splitting the motel costs with the other single fellow, this tour cost me less than \$600 which was a bargain for value received. (All four of us by the way are still friends!)

This tour has reinforced my belief that the Tour Easy is one of the finest recumbents available for touring, comfort, climbing, and speed. Whether climbing at 5 mph or descending at 50 mph I always felt in control. On a rating of 1 to 10, my comfort factor was a 10! (The hot weather did cause my feet to burn a bit, and when I could afford it, I watered them down also!)

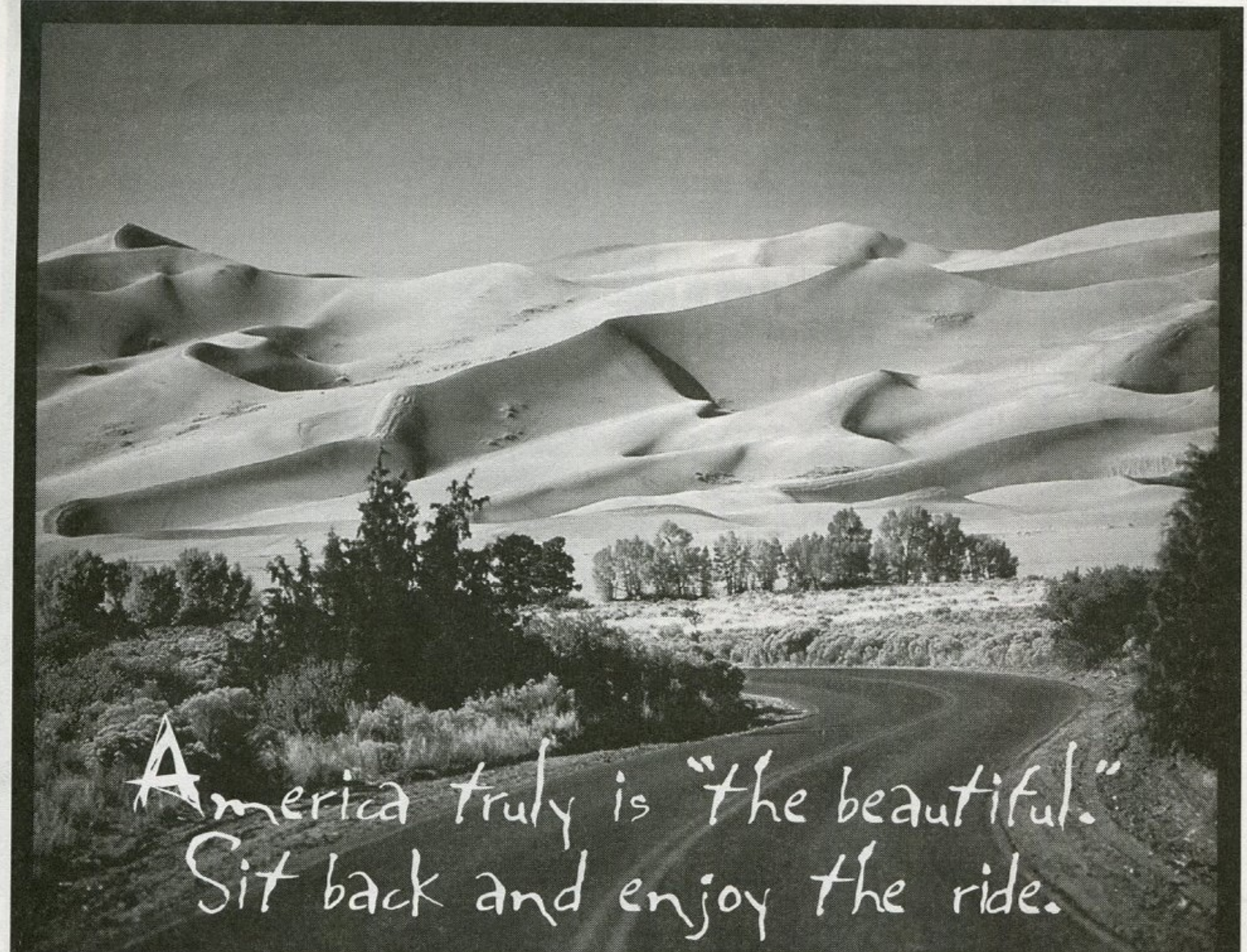
Take advantage of any opportunity to take a tour through the mountains just to show yourself and all you meet that with the right **ATTITUDE, ALTITUDE** is not a problem. Yes, Virginia, there is a Santa Claus, **AND** recumbents **CAN** climb!! ☐

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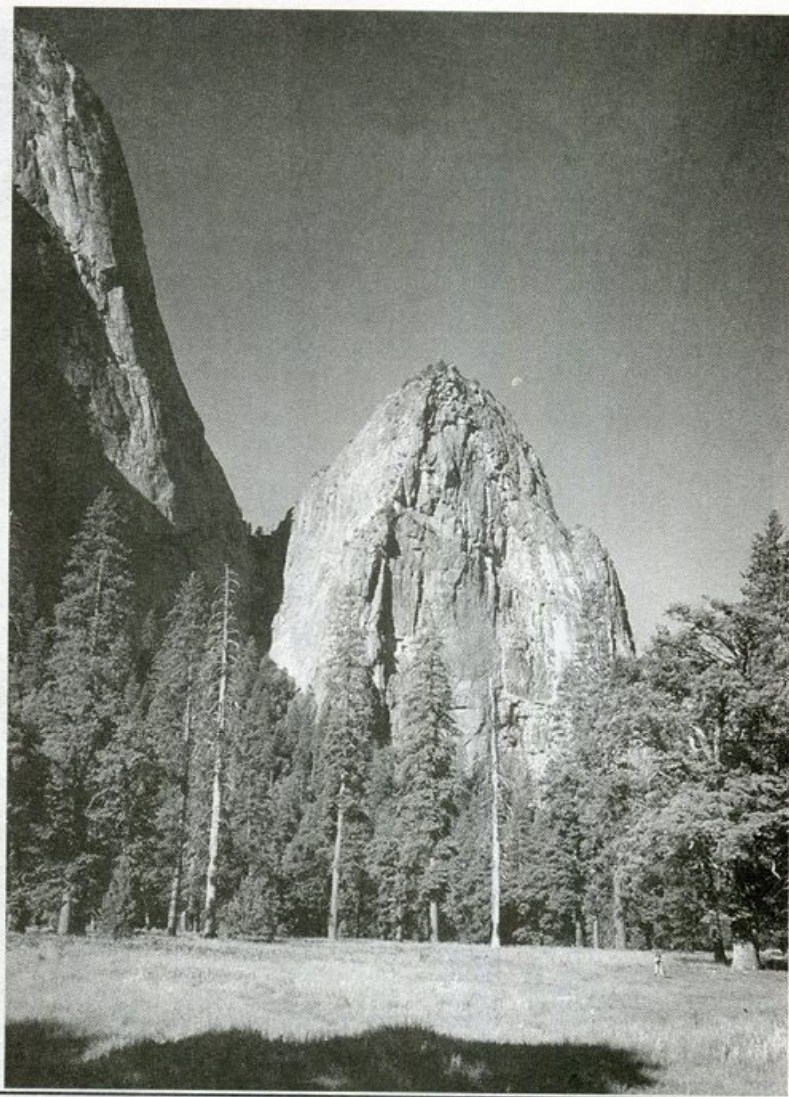
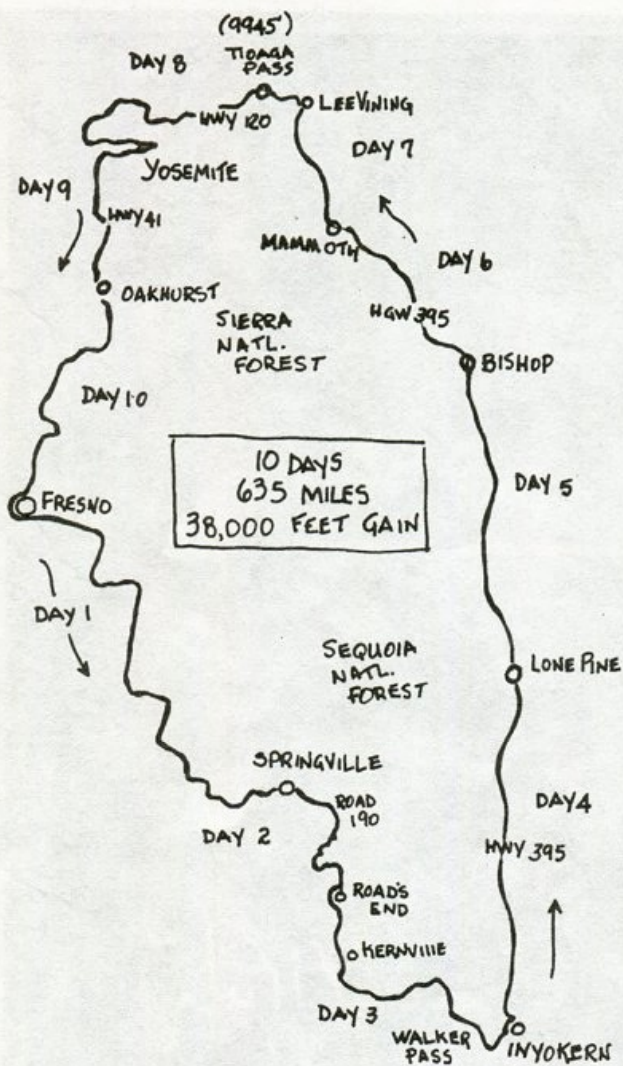
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WORDS TO LIVE BY AND LESSONS LEARNED

1. Always carry a roll of fruit flavored Life-savers with you, as they greatly relieve a dry mouth when low on water.
2. Never trust "locals" on their description of the route remaining, especially if they are on a motorcycle.

3. Don't ever eat meatloaf sandwiches in a strange restaurant, but instead order a hamburger well done and dry.
4. Choose a banana and a powerbar for breakfast over any greasy combo breakfast from a chain restaurant.
5. When you need an energy fix, a frozen burrito in a mini mart does wonders.
6. You know you are hurting when you hate

downhills knowing there is still another 1000' of climbing left before your destination.

7. Always carry a small bottle of White Lightning with you wherever you may go!
8. Don't use Uni style disc covers on a tour. (Speed advantage not worth the cross wind problem) ☐

PERSONAL DAILY/TOTAL STATISTICS

DAY /DESTINATION	MILES	GAIN	HIGHEST	AVG/MAX
1 Springville	100	1170'	1032'	13.4/23
2 Roads End	60	8030'	7210'	07.3/38
3 InyoKern	70	4010'	5310'	11.2/50
4 Lone Pine	74	2620'	4270'	12.0/35
5 Bishop	60	1370'	4640'	13.0/24
6 Mammoth	44	5870'	8000'	07.4/30
7 Lee Vining	39	1900'	8350'	10.8/41
8 Yosemite	79	6120'	9940'	08.8/38
9 Oakhurst	50	3800'	6100'	09.5/35
10 Fresno	57	2600'	4020'	12.2/40

TOTAL MILES: 633

TOTAL GAIN: 38000*

*Rounded off to allow for altimeter recordings which withholds first 10' of gain after any descent

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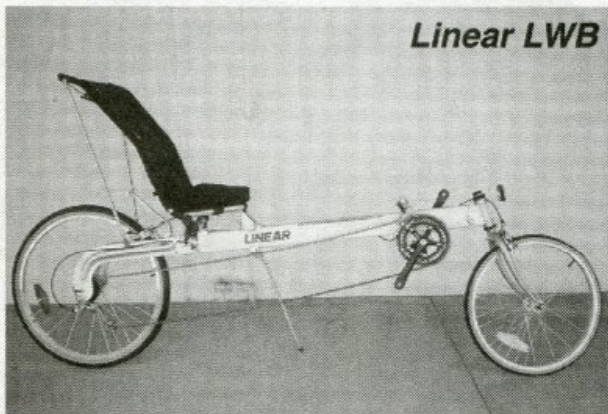
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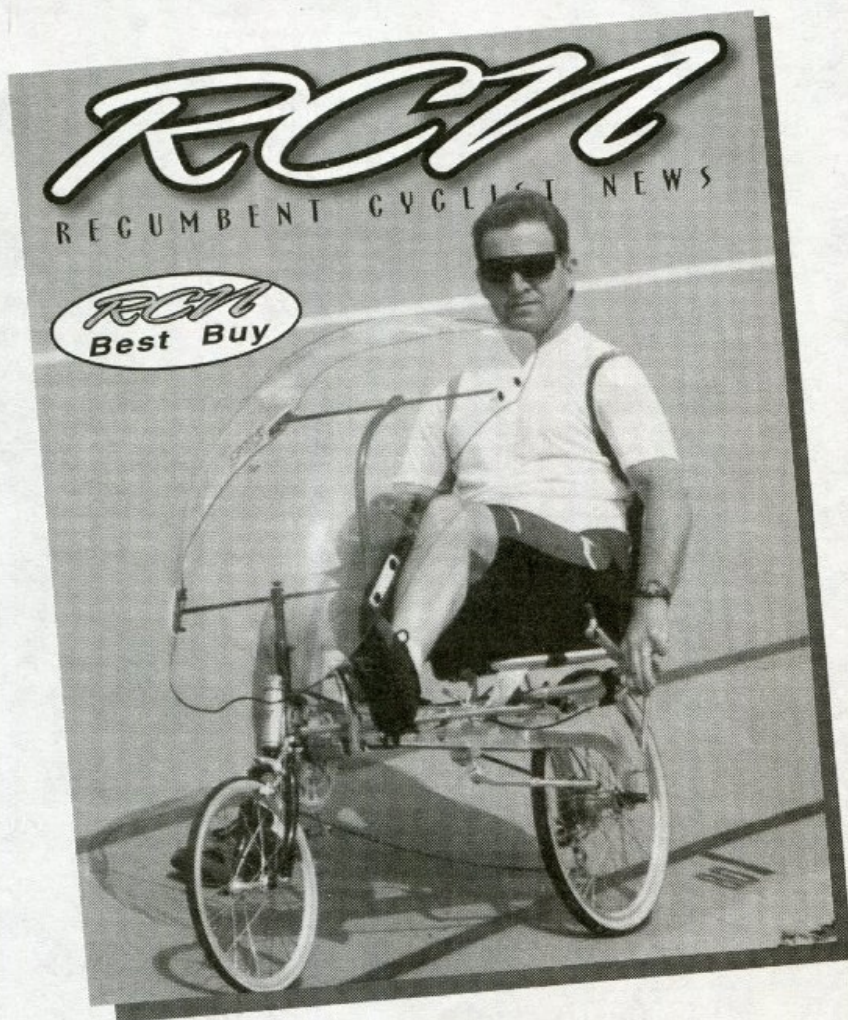
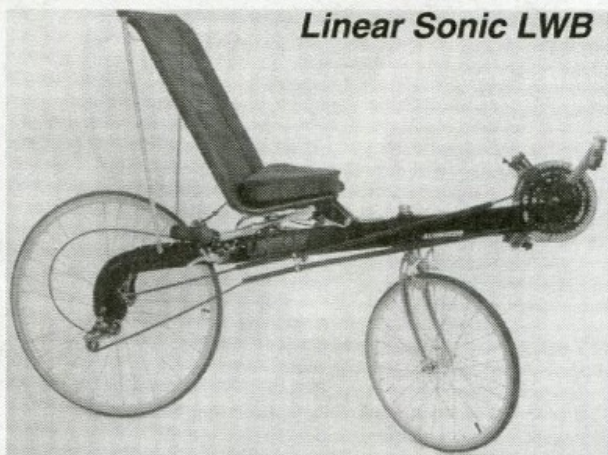
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These bikes are agile, quick-handling, quick-accelerating, extremely responsive and some models can even be described as twitchy—like a drop bar racer. They are also thought of as being the best climbers. Be forewarned that all SWB models are not created equal—wheelbases vary from 36"-46"! They are lighter than their LWB counterparts with some of the ultra-light models weighing in the low-20 pound range.

The SWB is currently the most popular design amongst recumbent enthusiasts, home-builders and racers. These bikes are agile, quick-handling, quick-accelerating, extremely responsive and some models can even be described as twitchy—like a drop bar racer. They are also thought of as being the best climbers. Be forewarned that all SWB models are not created equal—wheelbases vary from 36"-46"! They are lighter than their LWB counterparts with some of the ultra-light models weighing in the low-20 pound range. They fit on car racks, in elevators, and apartments better and they are the easiest to store and haul on a car rack.

Short Wheel Base: (SWB: 33"- 47"):

These recumbents have their crank in front of the head tube and the front wheel tucked underneath or just ahead of the rider's knees. Longer (wheelbase) SWB models can have varying degrees of heel interference where the heel of your foot can cross the path of the front wheel during very low speed sharp turns. While this is initially unnerving, the benefits are improved weight distribution, less "pedal-steer" and improved high performance/high-speed stability. The heel interference can vary by model, front wheel size and your height (adjustable booms). Seasoned enthusiasts don't even notice it after awhile and the weight distribution and handling benefits far outweigh the initial concern.

Choose your steering style wisely. Stick with what builders specialize in. The shorter the wheelbase, the closer the head tube is to your body and with above-seat-steering (ASS) and possibly intruding high stems, this may be a concern.

Bike height can also be an issue for shorter riders. There are published seat heights from 17" (S & B) on up. The higher the seat, the harder it becomes to sit flat-footed at a stop, which is an important consideration. 20" front wheels are preferred,

unless you want to "get low" for added performance or for a shorter rider. Even the seat design can effect how easy it is to hold a bike up at a stop. Sling/mesh seats with side-rails will aggravate this situation.

The best SWB handling comes from designs that have the shortest booms/ longer wheelbases (40"-45"). This places the rider farther rearward on the bike with some distance between the rider and the handlebars (ASS), and provides improved weight distribution. Direct ASS (no linkage) models offer a very positive and direct connection to the road.

Indirect USS linkage steering initially slows the handling down (new riders at low-medium range speeds), but seems touchy when going fast down a steep hill.

Direct USS requires the delicate mix of a shorter SWB and a cab-forward design to keep the rider close to the handlebars, without too much tiller from a long stem, while retaining an acceptable weight distribution (difficult for XL-sized riders).

The design theories between USS and ASS in the SWB design styles are very dramatic. It's best to make your steering choice early on and go to a company that specializes in one steering type or the other.

Be aware that the higher the BB/pedals, the more possibility for toe numbness/circulation problems. This can be an issue for some riders.

SWB Performance: If you want performance, buy a performance bike. The more aggressive designs are generally ASS models. USS bikes are more passive, and less aerodynamic. A fairing can help compensate for the increased USS frontal area.

SWB fairings are more expensive on SWB 'bents than for their LWB counterparts. They offer about a 10% speed benefit. The fully faired SWB Lightning F-40 is quite possibly the fastest recumbent available for sale in North America, though requires advanced skills. For those on a

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- ▲ Great recreational choice
- ▲ Quick Handling

- ▼ Very quick handling
- ▼ Requires more attention (initially)
- ▼ May be rough riding
- ▼ Heel interference (not all)
- ▼ High bottom bracket (pedals)
- ▼ High c.g. on 20" models
- ▼ 16" wheels=even quicker handling



The new Earth Cycle Greenway with suspended fork, fairing and MTB options

budget, a coroplast tail box can possibly add 1.5 mph, which could be as much as a front fairing. Super Zzipper front fairings are available for most SWB models.

Really skinny tires are not the end-all for performance. They are best for light riders who ride on smooth pavement (Does anybody actually do this?). Be sure to consider both your weight and where you ride before you go with skinny/high pressure tires. Skinny tires are essentially a performance marketing ploy and are not really useful in real world recumbent applications. Fat tires rule and can perform equally well with a proper tire choice. They will also improve rider comfort and safety.

SWB Drivetrains: SWB 'bents have more idlers, and steeper chain angles. A quiet, smooth running high quality idler with cartridge sealed bearings is preferred. A well thought-out chain line is also necessary, though can be compensated for with a good chain idler. SWB chain idlers can also limit wide range gearing potential. Zach Kaplan has successfully experimented with chain tubes that replace or accent SWB idlers with good success.

Wheels: SWB models are equipped with 16" and 20" front wheels. 20" is the standard, offering better handling, durability, tire choice and stability. 16" front wheels work best for shorter riders. You can expect quicker handling and reduced tire life.

Frames: A fully triangulated frame is the best, second would be a frame with an excellent warranty. Fully triangulated SWB frames are rare, the closest is the Rans V-Rex. Monotube frames are acceptable, however, the thinner the tubing diameter, tubing wall thickness, or the longer the boom, the more the frame will flex. A flexible frame will rob power more than a few

pounds—especially on a steep climb. Heavy and/or strong riders should steer clear of ultra-light frames. A stiff frame will be a godsend while climbing a mountain pass. The new monostay rear ends do flex some though seem to be pretty durable. Only time and many miles will tell for sure how they will hold up.

Seats: Most of the popular SWB seats are pretty darn good. Rans, is of course, the much touted RCN and enthusiast choice for the best currently produced seat. The ergonomic mesh back with a near perfect base/foam just cannot be beat for long term comfort with virtually no performance loss (frequented by some mesh back seats) The Haluzak sling/mesh is very nice as well. Vision's seat is comfortable, though be aware of the seat horn (can put unwanted pressure on the groin area) covered by a mediocre grade of foam. Lightning, Linear and Rotator have very nice seats as well. Unfortunately, we have yet to try a shell/foam seat on a SWB that was comfortable for more than a few miles.

The one drawback to the mesh base is what can best be described as "squeezed cheeks." When our rear end sinks into the mesh hammock—it pinches your cheeks.

SWB USE: SWB recumbents can be used for fitness, light touring, commuting and recreational riding. They often take more attention to the road and offer a firmer ride, though this depends on the model. SWB models do not handle as well when fully-loaded. Tourists may want to consider a B.O.B. or similar trailer to tow. Check with your manufacturer/dealer for recommended cargo carrying methods.

Be sure to ride many SWB models, then go back and ride the first few bikes over again when you feel more confident.

SWB ASS or USS?

UNDERSEAT STEERING—The handlebars are placed underneath the seat and are connected to the front fork with a steering rod or directly to the fork. When considering performance, underseat steering is less aerodynamic than most ASS, but can be more comfortable for long rides. Underseat steering can also be harder for novices to learn; however, after a short time, the balance becomes second nature. In saying this, I've never felt as direct a connection with my USS bike as I do with ASS. This equates to my performance as well. I am more aggressive with ASS, and less so with USS. USS riders have a more difficult time navigating through bike trail dividers and in traffic due to the bar width.

Handlebar reach can be an issue for some riders on some models. A few manufacturers have bar-end extensions which work to resolve this problem. Bar-end shifters help. The best way to determine if you are an underseat rider is to determine whether you are a passive (touring) or aggressive (high performance) cyclist.

ABOVE SEAT STEERING—This is the standard bicycle steering method for over 100 years. It looks more 'normal' and acceptable (if that's possible). ASS 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.

Riders will get accustomed to ASS quicker than to underseat 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 and the bars back as far as you feel comfortable ("begging Hamster" position). Be aware that some SWB models have roomy cockpits while others (wheelbases less than 40") may seem claustrophobic and tight.



The Organic Engines Vapor SWB from Fools Crow Cycle

SWB MACHINES

There are some great SWB recumbents available this year...and some not so great. The Rans SWB line is exceptional across the board, especially if you like SWB ASS and suspension. The Angletech line are the dream machines. Zach Kaplan does custom spec as well. The Rans Rocket is still the best machine for the bucks—and maybe the best machine period. Haluzak SWB models are the sleepers and great buy at \$1395. Haluzak offers a more stable handling indirect steering SWB. Lightnings are still the high-performance machines—though at a price. The Vision is the SWB that can do everything: SWB, LWB, ASS, USS, 16" and 20" front wheels, front suspension, dual suspension and no suspension, they do it all. We're excited to try the new Vision NPT (No Pogo Technology) suspension machines. Here are the bikes:

■ Angletech

Angletech, known for custom spec recumbents now manufactures the full suspension "Altitude." The ultra-deluxe Altitude frame is manufactured for Angletech by Boulder Bicycles of full-suspension MTB fame.

The bike has been dialed and fine-tuned over the past six months since we tested the bike in RCN#41. The Altitude's Rans seat folds and the bike compacts better than any other SWB. A bike travel bag is an option. The standard frame is now aluminum (Ti is opt.) and the drivetrain has been simplified dramatically to one idler and a short chain tube. The riding position

is V-Rex like, though very adjustable. This is one sweet ride. If you're looking for the best of the best in a totally custom machine, look no further than the Altitude.

Delivery Time—Call.

◆ **Road Tests:** RCN#41 Altitude

■ Crystal Speed Ross

Peter Ross has been building and selling recumbents in the UK for years. His Speed Ross SWB and Trice trikes are very popular in the UK. The Speed Ross SWB has never had much of a North American presence, but that may be about to change. It's light, fast and has a few different fairing options. A tent-type body, fiberglass nosecone and fiberglass tailbox trunk suitable for hauling groceries are available. Zach Kaplan is importing the Festina SWB Low Racer and spec'ing them stateside. He is also the exclusive distributor for the Speed Ross SWB model.

■ Earth Cycles

The most interesting aspect of the new Earth Cycles "Greenway" recumbent is the Hemp seat. The bike has an optional mountain bike kit, fairings and comes with your choice of 16" or 20" front wheels varying by rider height. Earth Cycles are available direct or through Calhoun Cycles (Mnpls.).

■ Haluzak

Bill Haluzak quietly builds an excellent line of SWB recumbents in his Santa Rosa, California shop. Our experiences with Haluzak Bicycles over the past year have been exceptional. No other single recumbent manufacturer will work with the customer

as carefully to provide a perfect recumbent. The craftsmanship is exceptional, the seat frame is aluminum and quickly removes from the frame. The seat mesh is sewn by Sew What and is a great full-support 100% sling/mesh seat. To top it all off, you won't have to wait three months for a Haluzak—try 3 weeks.

Haluzak builds bikes specifically to a customer's height and weight. They have different frame main-tube as well as seat tube thicknesses for different rider weights. They can build any model in a Leprechaun (26/16) version, or for tall performance riders, a 700c/451mm 20" Hybrid Race. For '98 Haluzak now offers V-brakes as standard on the Horizon. The Hybrid Race has a V-brake front (mounted on the back of the fork) and a dual pivot rear brake. They can do dual V-brakes or dual, dual pivots at the request of the customer. Haluzak still specs Shimano Ultegra bar-con, bar-end shifters. For '98, the brake levers will be moved to the bar-end extensions, with the bar-cons on the tips of the extensions. This is by far the most ergonomic steering position there is. Customers have a choice between three steering types: Underseat-direct (bars connect to back of fork); Underseat-linkage (stock) and above-seat steering. I was also told about a special lightweight direct-steered (no linkage) one-piece bar/stem USS option.

In my summer test, I also took a jab at the reverse brake mounting (behind the fork). This has become more acceptable as manufacturers have become better at dialing-in their systems. It's also been a learning curve for me. I still don't like the difficulty of cantilever setup, though V-brakes are getting much easier to set up and adjust. I've been dutifully impressed by the Tektro models on the Horizon.

Haluzak has a whole lot of little details that they will do to customize the bike for the individual customer. The bikes are actually built up after you order them—this is the closest thing to a traditional custom builder that we have in the 'bent world. Kudo's to Haluzak—Best SWB USS Recumbent 1998. The '98 Horizon lists for just \$1395! Ultegra bar-cons, V-brakes and all! **Delivery Time**—3 weeks.

◆ **Road Tests:** RCN#22 (Horizon); RCN#41 (Hybrid Race).

■ Human Powered Machines

Jan Vander Tuin's HPM is a associated with Eugene Bicycle Works (EBW) and the Center for Appropriate Transportation (CAT), which is HPM's retail outlet.



This is the Ballistic SWB Recumbent. It is very similar to German designs that we have seen. Note the high wheel interference-proof bottom bracket, dual 20" wheels, custom suspension fork and integral rack. Ballistic is primarily a suspension fork manufacturer, though they are looking for a US distributor for this, apparently mass produced-overseas, SWB recumbent.

The HPM Trick SWB comes in a standard and small size, a decision brought about by the needs of women and youth. EBW's experience with many recumbent lines and seeing how they hold up to rental usage has been a key guide for all of HPM's designs.

The Trick has a quickly adjustable seat. The USS is adjustable fore and aft. New for '98 are suspension and ASS options. Zipper fairings fit perfectly with a sturdy single-point mount.

HPM reports that even though most Tricks are set up for commuters and day trippers, the origin of the design (Kingcycle) has a reputation for speed.

■ Linear

Linear recumbent bicycles are very similar in spec/build, whether it be SWB, Compact or LWB. The Sonic has reasonable spec, with a 26/20 wheel combo, a Sachs 3x7 21 speed and the high back seat with optional lumbar bend and adjustable seat stays. My time on this bike is very limited. My reserve for this model comes in the rather upright head tube angle and seemingly quirky handling which I criticized in RCN#40. Since then I have had questions from owners wondering whether I had ridden the same bike as they own. As you can see from Dr. Paul K. Nolan's article (this issue), the Sonic

is a bike that has a lot of potential. Linear builds very nice bikes at affordable prices. Our dealings with Linear have always been excellent and Linear's Steve Hansel is one of the nicest guys in the business.

Delivery Time—2-3 weeks.

◆ **Road Tests:** RCN#44 (this issue), RCN#5 & 24 Linear LWB; RCN#40 Compact.

■ Lightning

Lightning has long been the performance leader in SWB recumbents. The P-38 is the most acknowledged performance SWB design in the world. Unfortunately, Lightning will not supply us with loaner test bikes. We must rely on feedback from own-

ers and dealers for feedback on the bikes.

For the most part, owners love Lightnings. If there is one reason for not liking the bike, it would be in the rather advanced "closed" (upright seat back/high BB) pedal angle. This riding position is more suited toward an aggressive athlete than a recreational or sport touring rider. The biggest benefit to the Lightning design is the low seat height.

Our feedback from dealers is that Lightnings have the occasional quality control glitch. Owners may or may not be aware of these situations as dealers handle them prior to delivery. A great dealer can be a valuable asset for a potential customer. Our dealings with Lightning have been lacking on all counts, though we keep hoping for some cooperation in a road test.

The Lightning frame is a work of art with its mix of small tubes, large tubes, custom castings and a custom built and designed fork. There is also a custom suspension fork designed specifically for the bike. The P-38 is a time-consuming bike to build and it's a thoroughbred. The bike is built to be lightweight and we seem to hear more of the occasional frame failure and the warranty is shorter than most.

The basic Lightning specs can be pretty lackluster, though upgraded components are available on nearly every model (XT and Campy models are available). There are also custom spec Lightnings available from Zach Kaplan Cycles and Kelvin Clark of Angletech. The Angletech Lightning's utilize a 20" front wheel and a Rans Flip-It fold forward stem.

The Stealth frames are built by Rotator Bicycles with many of the same attributes of the Rotator Pursuit, but in a Tim Brummer design. There are some updates, though some of the same rough edges we previously criticized are still present.

SWB DESIGN AND BOOM LENGTH

Boom length is one aspect of SWB design that is often overlooked. It is a direct derivative of wheelbase and heel/front wheel interference, though the equation often brings surprising information to light. Some manufacturers go for a minimal heel interference with a 36"-39" wheelbase, others are not concerned with heel interference and offer wheelbases of 40"-46."

Riders over about 5'8" +/- tall can benefit from a 40"+ wheelbase. SWB design wheelbase and head tube geometry directly relate to boom length which effects boom flex, ride and handling. Compare these boom length numbers (measured from the top head tube/main tube connection out to the bottom bracket shell) for fun:

The Vision has a long boom, due to the need to keep the direct USS close to the rider. This design that places the rider farther forward than most. The Haluzak's boom is shorter than the Vision, though still quite long

given the wheelbase. This is due to the forward seat position as well as the laid back head tube angle. The Rocket has no more heel interference than the Haluzak, yet the boom is shorter and stiffer.

"Pedal steer" is steering input that makes the bike harder to track in a straight line. This generally happens on SWB recumbents with wheelbases of less than 39" or a laid back head tube angle. Short, stiff booms dispel pedal steer which in turn provides easier more predictable tracking and high speed stability. The Rans SWB models have no pedal steer. We have noticed this to varying degrees with the Haluzak and Vision models.

BIKE	Whlbs.	Boom length
Vision R45 Susp.	41"	23.75" (6' rdr.)
Haluzak Traverse	40.5"	20.5"
Rans Rocket	39.75"	14.75"

Delivery Time—4-5 wks., 2-wks. Stealth.

◆ **Road Tests:** RCN#7 (P-38); RCN#15 (Design theory); RCN#24 (F-40); RCN#34 (Lightning Stealth); RCN#36 (Fessler) P-38

■ Organic Engines

Organic Engines is the manufacturing wing of Fool's Crow Cycle. Ed and Dan have built custom trikes, tandems and now the "Vapor" SWB. I haven't seen or ridden the Vapor, but I like the low seat height and complete Shimano 105 component package.

■ Pashley

Pashley of England now builds the PDQ SWB. Pashley, builders of the Moulton APB/Land Rover, purchased Counterpoint, lock, stock and barrel (former Presto recumbent). The Presto was a well regarded milestone SWB ASS recumbent that was indeed, ahead of its time. When Counterpoint ceased production in 1995, the primary Presto marketer, Angletech, moved their 'bent building expertise on to other models. Pashley has taken the design and merged it into production alongside the Moulton APB/Land Rover. The finish quality is not as fine as what we had come to expect from Counterpoint or Rans, but it is very nice. Unfortunately, this British import is overpriced in the '98 market.

The PDQ has a similar mesh seat with the plastic-pipe seat-suspension, a T-bar, though not the same as what Angletech built. The PDQ has a CroMo frame, a boom (without a derailleur post), along with a chrome HiTen fork, which, according to one source, has not been complementary to the handling of the bike. The Moulton APB Land Rover Sachs Centera 3x7 drivetrain works well and the bike now has V-brakes.

Buying a PDQ will be an exercise in futility. The distributor is slow to respond and does not sell direct (we never did get info. You must order through a PDQ dealer—which seem to be very limited. This

means you may have to order without ever riding the bike. If you have longed for a Presto, the PDQ is a familiar friend now back in the USA, now with a British flair.

Delivery Time—N.A.

◆ **Road Tests:** RCN#11 (Presto).

■ Rans

Rocket—affordable SWB performance, and the BEST SWB handling; V-Rex—the performance SWB machine for the rest of us; Vivo—the ultimate SWB, a full suspension touring/commuting bike, heaven on 'bent earth. Rans has presold its entire '98 model year run of bikes. If you like SWB ASS 'bents—these are by far, the BEST. Rans makes the best seat, and offers excellent component choices across the board. Rans is one of the grand-daddies of the 'bent world. The original Stratus was designed in 1974 and marketed from 1978. The V-Rex was designed in 1994 and has since captured the SWB industry and become Rans best seller. The Rocket and especially the Vivo are the icing on the cake.

The bikes are so well revered by enthusiasts, that demand has far outweighed availability. Why this hasn't inspired other builders I haven't a clue. Rans is feverishly working to ramp up production. For now, call Rans dealers.

Delivery Time—14+ weeks, call dealers.

◆ **Road Tests:** RCN#12 (Stratus); RCN#23 (V-Rex); RCN#25 (V-Rex); RCN#39 (Stratus); RCN#37 (Rocket); RCN#42 (V-Rex Slumgullian & Rans Tailwind).

■ Rotator

Steve Delaire of Rotator Bicycles fabricates the Lightning Stealth frames alongside his LWB Pursuit and new Tiger SWB. The Tiger is unique with its mid-drive, ultra low seat and Euro-style "U" ASS bars. Delaire lives by his own design rules and builds North America's most original bikes. Delaire once told RCN that he believes that

most SWB models have too short a wheelbase and too high a center of gravity—The Tiger is his answer to SWB fans.

The Tiger has an original and exotic look. At \$1500, its quite a deal. Heck, Easy Racers' Gardner Martin said the Tiger is the best handling SWB he's ridden. The Tiger has the Rotator mid-drive and bears other resemblance to the Pursuit and Stealth.

Delivery Time—We have requested a '98 Tiger and Pursuit test bikes.

◆ **Road Tests:** RCN#34 (Lightning Stealth); RCN#37 (Pursuit).

■ S & B

S & B builds SWB recumbents in their most traditional form. A low SWB USS with a 26" rear wheel and a 16" front wheel. The bikes resemble the original Hyper Cycle in which "Smitty" (the "S" of S & B) was a co-designer and principal along with Milton Turner (Turner Enterprises). S & B SWB bikes have a longer wheelbase than their predecessors. Customers have a choice of drivetrains, speeds and even component levels. There are two seat-back height choices of the S & B fiberglass seat. S & B builds USS only in the form of a sweeping "V" bar which, when combined with the USS brings the bars back under the seat. The head tube angle is extremely laid back

RCN AWARDS SWB

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

▲ **BEST SWB 'Bent—1998** (best in class): *The Rans Vivo full suspension SWB. This bike is a dream. It's fast, smooth and the most stable and comfortable SWB ride we've tried.*

▲ **BEST SWB USS 'Bent—1998:** *The Haluzak Horizon-A.*

▲ **BEST SWB ASS 'Bent—1998:** *The Rans Rocket Saturn V, though any Rocket will do.*

▲ **BEST SWB Suspended 'Bent—1998:** *The Rans Vivo dual suspension.*

▲ **BEST Touring SWB 'Bent—1998:** *The Angletech Rans Vivo. We have high hopes for the Altitude, but haven't seen the latest.*

▲ **BEST High-Performance SWB 'Bent—1998:** *The Rans V-Rex. Rocket S5 is a close second and would be our first choice if gear-range was equal. Lightning P-38's are probably faster and owners love them, though our experiences with Lightning over the years have truly been lacking at all levels. We invite Lightning to send us a test bike for 1998.*

▲ **BEST 'Bent Hill Climbers—1998:** *Rans V-Rex and the Easy Racer Gold Rush Replica.*

▲ **BEST 'Bent Handling—1998:** *The Rans Rocket/Saturn V and the Easy Racer GRR.*

▲ **BEST 'Bent Seat—1998:** *Hands down the Rans seat wins out!*

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The HPM "Trick" SWB

which, according to Jack Baker, improves handling. S & B offers affordable prices as well as custom features. You're not going to get the best 'bent in the world, but hey, they don't cost \$2,000 either. Some riders love these bikes. Though even S & B fan "Wild Bill" Volk has a Rans seat on his custom S & B. S & B specialize in SWB singles, trikes and tandems.

Delivery Time—3 weeks.

◆ **Road Tests:** RCN#25 (Volk S & B SWB); RCN#40 (T-Lite & S & B Beach Cruiser).

■ Turner Enterprises

Milt Turner did not respond to our BG info request. Why? We had a bunch of problems with his bikes and he wouldn't take care of the problems, nor would he offer acceptable solutions. With this in mind, these are not bikes that we can recommend. In the interest of being fair, we invite Turner to send us another test bike.

◆ **Road Tests:** RCN#10 (Laid Back E & Hyper Cycle); RCN#40 (T-Lite).

■ Vision

The "Engineering Minds" at Vision have big plans for '98. They have nearly doubled the size of their line with suspension models of the R40, 42, 44 and 45.

Vision seems to introduce new models six months before they are actually available. The Vision line is extensive and with all of the new suspenders, it just got larger. To simplify this complex line, just keep in mind the following rules:

1) All Visions are available with full suspension, Vision specific Ballistic/or front-suspension forks (in 16", 20" or tandem) or no suspension (hard tails).

2) All Visions are available with USS

or ASS, though their USS works the best, the ASS has been redesigned for '98. Visions have a shorter wheelbase/more cab forward design than most SWB, so the ASS is rather close to your body.

3) R40/42 have the 2" HiTen main-frame and are available as LWB or SWB. These are available with Cane Creek rear and/or Ballistic front suspension.

4.) R44/45 models have the lightweight 1.75 CroMo main-frame and come in hard-tail (no-suspension) or rear suspension with a Cane Creek AD8 air shock, and/or Ballistic front suspension. The R45 has a new narrow, low profile, USS bar and comes with Ultegra STI (road bike brake handle shifters). HED wheels are optional.

The R44/45 suspension models are now coming off the line and we do not have sufficient time onboard to rate them. An RCN designated test bike is being built as you read this. The most interesting fact about this new model is that the additional 3" of wheelbase is mostly out the back of the bike (I still cannot see the headtube while seated on the bike).

Vision traditionally builds SWB models with shorter wheelbases and the rider position very close to the head tube. This seems to be a design requirement to achieve the correct and "direct" USS reach. Ricky Comar of Vision says that the actual weight distribution is better than the hard tail. We plan full suspension review with different sized riders very soon

For '98, Vision has revamped their spec to mostly Shimano, utilizing STI, Rapidfire and more consistent Shimano component groups. Vision has modified their production line so that bikes will be built as ordered which should result in fast

delivery times on hard tails.*Delivery of the '98 suspension line has been slow. R44/45 suspension models are now in production. Production for R40/42 suspension models will be start about April 1. Hard-tails are available now.

Delivery Time—2-4 weeks.

◆ **Road Tests:** RCN#9 (R-20); RCN#21 (R-40); RCN#45 (R-45); RCN#34 (tandem); RCN#43 (Metro).

■ Custom Spec

Angletech builds custom spec SWB recumbents from many brands. Zach Kaplan builds custom spec Rans and Lightning models as well. Most RCN advertising dealers are capable of putting together a custom-spec package, though Angletech, People Movers, Zach Kaplan are the ones who have custom options printed. In these days where component incompatibility reigns supreme, custom spec is not that easy. A lot of times you don't know what will work until you build a bike. All these shops are capable, however, Angletech still reigns supreme in this category with a catalog of upper echelon models.

■ General 'Bent Info

For more general information see the '97 RCN Buyers' Guide and RCN#43 the first in a series of '98 Guides.

The specs and information included in this buyers' guide are correct to the best of our knowledge. We/RCN sent out BG Questionnaires to known recumbent manufacturers last fall for completion, in order that they be included in our '98 guides.

■ Disclaimer

There are a few recumbent manufacturers in North America, who for whatever reason, do not read, subscribe to or advertise in RCN. They will not supply us with loaner test bikes. Some of these manufacturers we have had problems with their test bikes in the past, others just seem to have an attitude. Our ratings of such models will be based upon the last loaner test unit made available to RCN until a new model is submitted for testing.

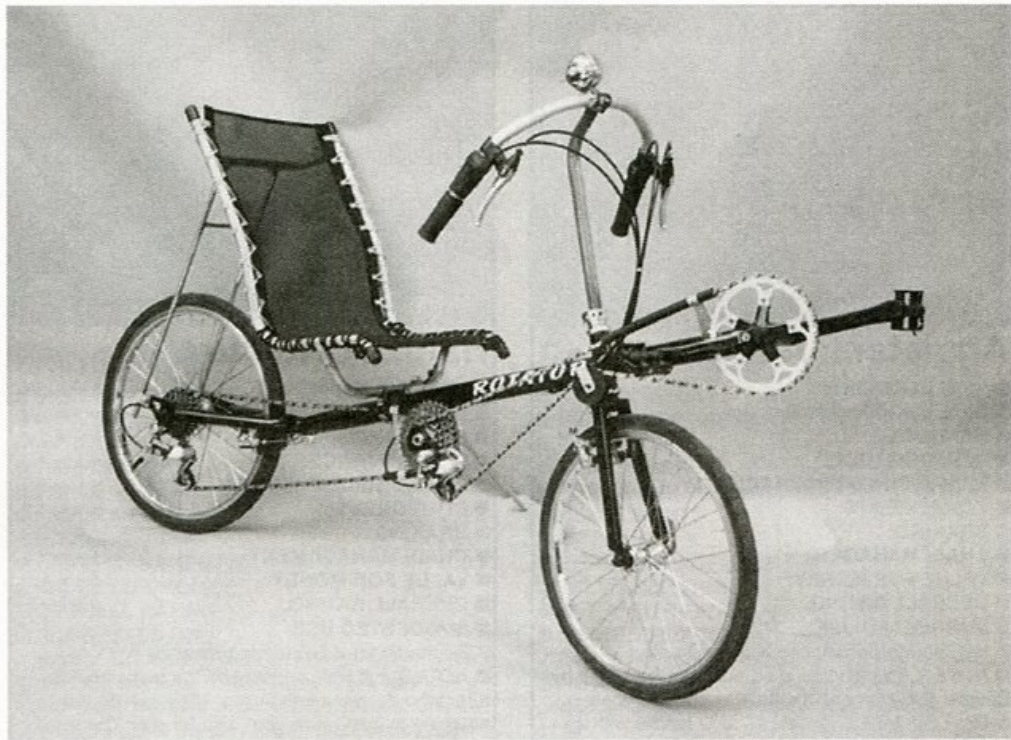
For these manufacturers we reserve the right to deny a listing of their products, or company contact information. We apologize to the readers for having to make this distinction. In most cases, there are reputable dealers who sell these products and we suggest that you deal with them.

■ RCN Ratings

RCN offers the only Recumbent Bicycle



The Haluzak Traverse—a true offroad suspension recumbent



*ABOVE: The low Rotator Tiger SWB—we want to test this bike!
BELOW: The '98 Angletech/Rans V-Rex GL63*

Buyers' Guide in the world today. RCN also *RATES* the bikes—which is unlike almost any other buyers' guide on the planet! You won't find reformatted brochure material in RCN—we tell it like it is. Bicycles are built up, ridden, rated, and critiqued by our staff. We can only conclude that manufacturers who do not submit test bikes are afraid to compete with the best in recumbency. We use a potential five star system with the following *SuperGuide* ratings: ★ Poor/needs work; ★★ Fair edging toward Good; ★★★ Good and better median; ★★★★ Very good—superior; ★★★★★ Excellent—the best. Overall Rating is not an average. Ratings can vary by design, price range and how everything works together. For performance ratings: ★ or ★★ - City/cruiser; ★★★ -Recreational or tourer; ★★★★-Fast sport touring; ★★★★★ -Hi-performance/Racer.

Watch for RCN#45, the LWB *SuperGuide*— May/June '98. □



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Angletech Altitude

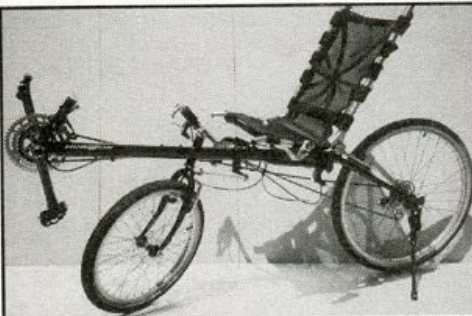
- SEAT COMFORT: ★★★★★1/2
- RIDE SMOOTHNESS: ★★★★★1/2
- HANDLING: ★★★★★
- PERFORMANCE: ★★★★★1/2
- FRAME/BUILD-FINISH QUALITY: ★★★★★
- COMPONENTS: ★★★★★
- BRAKING: ★★★★★
- CHAIN MANAGEMENT: ★★★★★
- VALUE FOR MONEY: ★★★★★
- OVERALL RATING: ★★★★★1/2
- SUGGESTED USE:

✓ HD Touring/Commuting ✓ Sport Touring

■ NOTES: The Altitude is co-designed and built by Boulder Bicycles and the build quality is impeccable. Look for an upscale Altitude for '98 with an aluminum frame and former optional parts are now standard. The Altitude is more compact than other SWB machines and a travel bag is optional. The Altitude comes in GL63 and SHO models.

■ TEST BIKE PROBLEMS: We had chain line, idler and the rear wheel went out of true. The chain line has been refined and the upper idler replaced by a short chain tube. This is a dialed top-of-the-line custom machine for the recumbent connoisseur.

■ M.S.R.P. \$3999.99 (GL63); \$4499 (SHO)



Haluzak Horizon

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

✓ Recreational ✓ HD touring/commut.

■ NOTES: Bill Haluzak may be the last manufacturer who does custom builds. They can do most anything to customize your bike for you. The build quality is excellent and much improved over the years. The Horizon is an incredible value at \$1395.

■ TEST BIKE PROBLEMS: We received a '98 Haluzak Horizon (formerly Horizon A) with V-brakes front and rear, and a front suspension fork. The bike came out of the box perfect. There were no glitches and so far the bike has had no problems. Haluzak ships FEDEX, which is preferred. Assembly was easy and Haluzak preassembly is exceptional.

■ M.S.R.P. \$1395 + S/H



Haluzak Hybrid Race

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

✓ Recr. ✓ LT touring/commuting ✓ High Perf.

■ NOTES: The Hybrid Race is the performance sleeper. Bill and crew will do anything you like to customize your dream bike. The newest options are direct USS and a one-piece bar/stem combo. Ask about brake options—dual pivots or V-brakes and Ultegra bar-cons, exceptional, dependable spec.

■ TEST BIKE PROBLEMS: Haluzak ships with the boom tucked into the frame and ours had scratches. The rear wheel had two loose spokes. The frame flexes pretty good, though Haluzak reports that our excessive test bike frame flex was primarily from the seat frame (a thicker tube option now exists).

■ M.S.R.P. \$1795



Lightning P-38

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

✓ Sport Touring ✓ High Performance

■ NOTES: Lightning produces world-famous performance bikes. Unfortunately, Lightning pays little attention to RCN. They did send us their '98 brochure. We consistently hear about quality control glitches and have experienced the indifferent attitude ourselves. Our advice is to buy from a Lightning specializing dealer such as Angletech, Zach Kaplan, People Movers or others.

■ TEST BIKE PROBLEMS: The last P-38 we had here was in 1992 and we had to buy it. It had paint problems, component incompatibilities, etc.. We would jump at the chance to test another P-38.

■ M.S.R.P. \$2045-\$2700



Lightning Stealth

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

✓ Recr. ✓ LT touring/commuting ✓ Sport touring

■ NOTES: The Stealth frame is built by Rotator, the ASS, seat, etc. by Lightning. The bike is a great bargain as Lightnings go and a durable bike. The 16" front wheel allows for a low seat height. We recommend going to a Lightning specialist dealer.

■ TEST BIKE PROBLEMS: Our test bike was a well worn shop demo with outdated spec. The bike didn't get a very good review (see RCN#34). We had the bike for a few weeks in the winter. Lightning called us unexpectedly to return it with the promise of new test bike. When the test bike was returned ridden (dirty), future test bikes were canceled.

■ M.S.R.P. \$1195-\$1520



Pashley PDQ

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

✓ Recr. ✓ Sport Touring ✓ LT touring/commut.

■ NOTES: The PDQ is the former Counterpoint Presto now built in England by Pashley who builds the Moulton APB and Land Rover bikes. The spec is similar to the APB. This is a fine bike, though not at the same custom level as the Angletech version. This import is overpriced in the USA market. The USA distributor does not sell retail, so you will have to find a stocking dealer—which may be difficult.

■ TEST BIKE PROBLEMS: I was able to ride the PDQ for 20 minutes at Interbike this past summer. We may get the chance for a longer test soon.

■ M.S.R.P. \$1800-\$2100 (price varies by dealer)



Rans Rocket/ Saturn V

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

✓ Recr. ✓ LT touring ✓ HD commut. ✓ High Perf.
NOTES: This may be the best all-around SWB made. The dual 20" wheels give it near perfect balance. Some riders can do track stands on it. In theory the 20" drive wheel should make the bike a bit slower, though we have yet to prove this in real world use. The Rocket has the lowest Rans seat height. The Saturn V spec is the icing on the cake.
TEST BIKE PROBLEMS: We've had 5 test Rockets since '96 (3 are still local). Our '97 bike has nearly 5,000 trouble free miles. The SRT 400 shifters were removed, chain and tires replaced. This Rocket has proven nearly indestructible.
 ■ M.S.R.P. \$1150 (Rocket)/\$1750 (Saturn V)



Rans Vivo

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

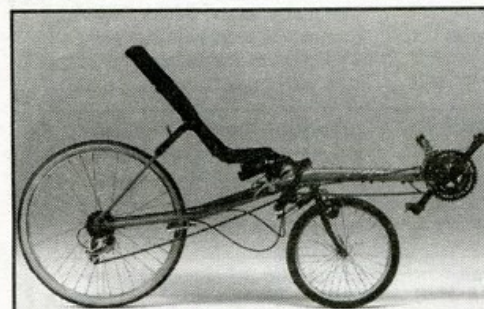
✓ Recr. ✓ HD touring/Touring. ✓ HighPerformance
NOTES: We were able to test the first two Vivo's at Interbike. The Vivo prototype is still here. The 46" wheelbase offers the smoothest, most stable SWB handling available anywhere. The longer wheelbase compliments the rear suspension which works flawlessly and does not require additional psi to limit the pogo effect. The Vivo is a sport/touring bike. It doesn't offer as spirited handling of the Rocket/V-Rex as it has a superior ride all its own.
TEST BIKE PROBLEMS: In 6 months of riding this bike has needed nothing—another close to perfect Rans test bike (and its the prototypel!).
 ■ M.S.R.P. \$2050



Rans V-Rex

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

✓ Recr. ✓ HD touring/Touring. ✓ HighPerformance
NOTES: The V-Rex is the best all around performance recumbent that money can buy. At \$1645, it is a bargain. The refinement level of the '98 model is beyond reproach. Rans mated the '97's 24/20 geometry to a 26/20 wheel combo by extending the wheelbase out to 43" and compacting/ lowering the frame (vertically) which has also improved the look of the bike. The fully triangulated SWB frame is bullet-proof, and proven very durable.
TEST BIKE PROBLEMS: This is yet another in a long line of near perfect Rans test bikes. The current test bike has had no problems.
 ■ M.S.R.P. \$1645



Vision R40

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

✓ Cruiser ✓ Recreational ✓ LT touring/ commut.
NOTES: (Rating for hard-tail only.) The R40 can be a SWB, LWB, ASS and USS, and 16" or 20" front wheel. The 20" is preferred unless you are a shorter rider. The Vision is a fine entry level bike, though a lackluster performer. The R40 has been around for several years and is the best example of a SWB direct USS design.
TEST BIKE PROBLEMS: We have not had good luck with Vision test bikes in the recent past. There have been flaws, set-up glitches, component problems and incompatibilities. We have high hopes that these problems are now in the past.
 ■ M.S.R.P. \$1099/\$1399



Vision R42

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

✓ Recreational ✓ Sport Touring ✓ LT touring/ commut.
NOTES: (Rating for hard-tail only.) The Vision R42 has the same durable frame as the R40. This model is available with or without suspension with USS, redesigned ASS, 16" or 20" front wheels. The R40 has a stiffer, less flexible frame (than the more petite R44/45) and is very durable. Vision wheelbases are shorter than other manufacturers due to the wide, direct USS and maintaining proper reach to the bars. Vision seats are very reclined and the bike enjoys a very open riding position. This model converts to LWB.
TEST BIKE PROBLEMS: N.A.
 ■ M.S.R.P. \$1495-1995



Vision 44/45

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

✓ Sport Touring ✓ LT touring/ commut. ✓ Performance
NOTES: (Rating for hard-tail only.) The R45 has the lighter, more petite CroMo frame (shared with the lower priced R44). The lightweight frame flexes more, but handles well. This model is best for medium build riders under 6'. The bike feels small for my 6' XL body. The R44/45 hard-tail is our favorite Vision, add fat tires (better handling), std. USS bars, stock wheels and a fairing. Like all Visions, it's pretty quick handling. Our R45 suspension model test loaner was pre-empted and went to *Bicycling Magazine*. Vision R45 test bike #2 has been promised and should be here any day.
 ■ M.S.R.P. \$2025-\$2855

RCN**SWB 'Bent Listings**

SWB 'BENT LISTINGS	TYPE & DIMENSION	FRAME & SEAT	COMPONENTS
Angletech Altitude GL63 Tel. 719/687-7475 Anglezoom@aol.com http://angletechcycles.com \$3999.99	SWB ASS WB-41.5" SH-22" BBHT- 2-posi. WT-31-32.5 WT DIST- 50%/50% Colors: Custom deep powdercoat Gear Inches: 17-140	Frame: Aluminum or opt. Ti main-frame, Ballistic susp. fork, 100% alum. Rans Flip-It fold-forward stem/T-bar Seat: Rans mesh back, comp. base, nylon covered foam seat Sizes: One-size/sliding boom & seat	Drivetrain: GripShift ESP 9.0 SL, Sachs 3x7 63-spd., Ritchey Logic 38/50/61 triple, Chris King. HS, Phil BB, Sachs PC41 chain, Magura HS24 brakes, Mavic/Sachs/Bont. 20" x 1.25, Schwalbe City Marathon
Angletech Altitude SS Tel. 719/687-7475 Anglezoom@aol.com http://angletechcycles.com \$4499.99	SWB ASS WB-41.5" SH-22" BBHT- 2-posi. WT-28-30 WT DIST- 50%/50% Colors: Custom deep powdercoat Gear Inches: 26-107	Same as above	Drivetrain: GripShift ESP 9.0 SL, Ultegra 38/50/61, Chris King HS, Ultegra Hollow BB, Sachs PC91 drilled chain, Control Tech V-brakes, Phil/Hed Primo Comet 20" x 1.25."
Crystal Engineering Speed Ross Tel./Fax. (011 44) 1326-378848 tricehpv@globalnet.co.uk \$1400 (Nexave) + shipping Available through Zach Kaplan Cycles	SWB ASS or USS WB-40.2" SH-17" BBHT- 25" WT-25 WT DIST- 50%/50% Colors: red, blk., wht., yell., gm., blue, bm. Gear Inches: 21-113 or 27-103	Frame: Mannesmann steel, Columbus chainstays, Alum. pedal tube, CroMo fork, alum. T-bar/stem. Seat: Alum. frame/ nylon (sling) mesh Sizes: One-size-fits all/ 5" of range	Drivetrain: Shimano Nexave or LX, Ult. bar cons or Rapidfire, Shimano BB, 105 HS, Sachs Sedis chain, cantilever brakes (opt. LX V-brakes), 700c/20" 451 or 559/20" 406.
Festina Low Racer-Zach Kaplan Tel.415/381-5723 Zakaplan@earthlink.net www.BikeRoute.com/ ZachKaplanCycles.htm \$2500	SWB ASS Low Racer WB-41" SH-7.5" BBHT- 15.5" WT-26 WT. DIST- 50%/50% Colors: Powdercoat custom color Gear Inches: 23-124 (19.5" DW)	Frame: 1.75" .035 CroMo with Columbus chainstays. alum. BB/slider, narrow CroMo fork Seat: Alum. frame, sling/mesh Sizes: One size fits most	Drivetrain: Sachs Powergrip/3x7, Specialized Strong Arm 48-T., Chain tubes, Shimano sealed BB, HS-Am. Classic, Shimano IG90 chain, XT V-brakes ,XT levers, Ultegra/Veloccity dual 406mm 20".
Earth Cycles Greenway Tel. 612/335-5048 e-cycles@spacestar.net www.spacestar.net/users/e-cycles \$1649.99	SWB ASS or USS WB-40.5" SH-22"/18" BBHT- 23.5" /19.5" WT-30 WT DIST- N.A. Colors: Powdercoat Gear Inches: N.A.	Frame: CroMo/Stainless frame, Opt. susp. fork Seat: Adjust. recline Sling/Hemp mesh Sizes: Two sizes: small 16" FW to 5'9", Large 20" FW 5'9" and taller.	Drivetrain: Shimano RX100/STX, RX100 triple, Sachs chain, STX V-brakes & levers, 26" RW/20" FW
Greenspeed GBR20/26 Tel.(011) 61 3 9758 5541 greenshp@ozemail.com.au http://www.ihpva.org/com/Greenspeed \$2990 (Aus.)	SWB USS WB-39" SH-21.5" BBHT- 26" WT-24 WT DIST- 55% (bk.)/45% Colors: Powdercoat green , red, blue,yell. Gear Inches: 26-113	Frame: Reynolds 531 CroMo mainframe/MIG, CroMo fork Seat: Reynolds 531 CroMo frame/ Nylex (sling) mesh Sizes: One-size-fits-most.	Drivetrain: Sachs or Shim. 24-spd., Ultegra bar-cons, Sachs 32/42/52, Primax HS, Sachs Sedis, Sachs VT500 drum brakes/hubs 26"/20" x 1.75 with Tioga Comp Pool tires.
Haluzak Horizon 98 Tel.707/544-6243 Sidwindr@pacbell.net http://www.bikeroute.com/haluzak \$1395	SWB USS (ASS opt.) WB-40.5" SH-23" BBHT- 24" WT-29 WT DIST- 46%(BK)/54% Colors: Powdercoat red, blue, green, Gear Inches: 26-118	Frame: 1.75 .049, CroMo frame, Cromo fork Seat: Alum. frame/Nylon (sling) mesh Sizes: One-size-fits 29"-34" inseam, custom sizes available.	Drivetrain: Shimano 24-spd., Ultegra bar-cons, Shim. 28/38/48 w/ Specialized rings, Tange Levin HS, Shimano sealed BB, V-brakes & levers, Shim./Bon. 26"/20" x 1.5"
People Movers/Haluzak Horizon "Super Tour" Tel.714/633-3663 peplmvr@primenet.com http://www.recumbent.com \$1995	SWB USS (ASS opt.) WB-40.5" SH-23" BBHT- 24" WT-N.A. WT DIST- 46%(BK)/54% Colors: Powdercoat red, blue, green Gear Inches: N.A.	Frame: 1.75 .049, CroMo frame, Susp. fork Seat: Alum. frame/ Sew What Nylon (sling) mesh Sizes: One-size-fits 29"-34" inseam, custom sizes available.	Drivetrain: Shimano LX/Sachs Neos 63-spd., Ultegra bar-cons, Shim. Exage 26/36/46, Tange Levin HS, Shimano sealed BB, KMC chain, Avid V-brakes, 26"/20" x 1.5" Top Tour, fenders, Susp. fork & rear rack
People Movers/Haluzak Horizon "Grand Prix" Tel.714/633-3663 peplmvr@primenet.com \$2295	SWB USS (ASS opt.) WB-40.5" SH-23" BBHT- 24" WT-N.A. WT DIST- 46%(BK)/54% Colors: Powdercoat red, blue, green Gear Inches: 26-133	Frame: 1.75 .049, CroMo frame, Cromo fork Seat: Alum. frame/ Nylon (sling) mesh Sizes: One-size-fits 29"-34" inseam, custom sizes available.	Drivetrain: Shimano 105/XT, Ultegra -24 spd., Shim. 105 30/40/52 , Tange Levin HS, Shim. sealed BB, KMC chain, Avid V-brakes, Spinergy 26"/20" x 1.5" Conti GP tires
People Movers/Haluzak Horizon "Rallye" Tel.714/633-3663 peplmvr@primenet.com http://www.recumbent.com \$1650	SWB USS (ASS opt.) WB-40.5" SH-23" BBHT- 24" WT-N.A. WT DIST- 46%(BK)/54% Colors: Powdercoat red, blue, green Gear Inches: 23-133	Frame: 1.75 .049, CroMo frame, Cromo fork Seat: Alum. frame/ Sew What Nylon (sling) mesh Sizes: One-size-fits 29"-34" inseam, custom sizes available.	Drivetrain: Shimano Nexave Mega/ 105 24-spd.,Ultegra bar-cons, Shim. 105 30/40/52 , Tange Levin HS, Shim. sealed BB, Sachs chain, Avid V-brakes, Sachs 26"/20" x 1.5" Ritchey/Schwalbe
Haluzak Leprechaun 98 Tel.707/544-6243 Sidwindr@pacbell.net http://www.bikeroute.com/haluzak \$1395	SWB USS (ASS opt.) WB-40.5" SH-21" BBHT- 21" WT-27.5 WT DIST- 46%(BK)/54% Colors: Powdercoat red, blue, green Gear Inches: 26-118	Frame: 1.75 .049, CroMo frame, Cromo fork Seat: Alum. frame/ Sew What Nylon (sling) mesh Sizes: 27"-31" inseam + custom sizes	Drivetrain: Shimano 24-spd., Ultegra bar-cons, Shim. 28/38/48 w/ Specialized rings, Tange Levin HS, Shimano sealed BB, V-brakes & levers, Shim./Bon. 26"/16"
Haluzak Hybrid Race Tel.707/544-6243 Sidwindr@pacbell.net http://www.bikeroute.com/haluzak \$1795	SWB USS (ASS opt.) WB-40.5" SH-23" BBHT- 24" WT-25.5 WT DIST- 46%(BK)/54% Colors: Powdercoat red, blue, green Gear Inches: 27-123	Frame: 1.75 .035, CroMo frame, Cromo fork Seat: Alum. frame/ Sew What Nylon (sling) mesh Sizes: One-size-fits most + custom	Drivetrain: Shim. XT/600 24-spd., Ultegra bar-cons, Shim. 28/40/52 w/ Tange Levin HS, Shimano sealed BB, XT canti (front) brake, Ultegra (rear), Shim.600/Sun 700c/20 (451)

SWB 'BENT LISTINGS	TYPE & DIMENSION	FRAME & SEAT	COMPONENTS
Haluzak Traverse Tel.707/544-6243 Sidwindr@pacbell.net http://www.bikeroute.com/haluzak \$2195	SWB USS (ASS opt.) Offroad WB-40.5" SH-23" BBHT- 24" WT-33 WT DIST- 46%(BK)/54% Colors: Powdercoat red, blue, green Gear Inches: N.A.	Frame: 1.75 .049, CroMo frame, Box aluminum susp. swing arm/Fox shock, Cromo fork (Opt. susp. fork) Seat: Alum. frame/ Sew What Nylon mesh Sizes: One-size-fits most/custom avail.	Drivetrain: Shim. 24-spd., Ultegra bar-cons, Shim. LX triple crank, Tange Levin HS, Shim. sealed BB, V-brakes/levers, Shim./Bon. 26"/20" x 2" with Ritchey Z-Max Knobbies.
Human Powered Machines Trick Tel. 541/343-5568 cat@efn.org http://www.efn.org/~cat \$800/\$925 (Sachs 3x7)	SWB ASS or USS (direct or indirect) WB-33"/39" SH-18.5"/22" BBHT- 21/26" WT-28/31 WT DIST- N.A. Colors: Powdercoat Gear Inches: N.A.	Frame: Rectangular alum., Cromo fork Seat: Alum. frame/ Nylon (sling) mesh Sizes: Sml. 4'8"-5'10" & Lg. 5'6"-6'4"	Drivetrain: Sachs 7-spd. internal hub (Opt. 3x7), Shim. crankset, Shim. sealed HS/BB, canti. front and Sachs drum rear brake (Opt. Canti rear), 20"/16" (sml.) 26"/20" (lg.).
Lightning Cycle Dynamics Stealth Tel.805/736-0700 Lightning@utech.net \$1195 (LX); \$1520 (LX)	SWB ASS WB-45" SH-19" BBHT- 22" WT-30 WT DIST- 55%(BK)/45% Colors: Powdercoat black or red Gear Inches: 22-118	Frame: 4130 CroMo, CroMo fork, alum. brazed ASS bar/stem, Seat: ErgoFit TIG alum. frame nylon sling/mesh Sizes: 2-frame sizes fits 4'10"-6'8"	Drivetrain: Shimano STX/Grip Shift SRT 400 21-spd., Cyclone 28/38/48 triple crankset, Alivio HS/BB, STX Cantilever brakes/26" RW/16" or 20" FW
Zach Kaplan/Lightning Stealth Tour Tel.415/381-5723 Zakaplan@earthlink.net www.BikeRoute.com/ZachKaplanCycles.htm \$2200	SWB ASS WB-42"/45" SH-19" BBHT- 22" WT-30 WT DIST- 55%(BK)/45% Colors: Powdercoat black or red, blue or custom Gear Inches: 18-118	Frame: 4130 CroMo, Ballistic or SR susp. fork, alum. brazed ASS bar/stem, opt. 1-1/8" threadless steer tube Seat: ErgoFit TIG alum. frame nylon sling/mesh Sizes: 2-frame sizes fits 4'10"-6'8"	Drivetrain: Shimano Nexave/105, Sachs Powergrip 24-spd., Shimano LX 24/40/50 triple (Aviator rings), Tange Extrude lube inject HS, WTB Greasguard BB, Shim. IG-51 chain, XT V-brakes, Shimano 105 Lube inject hubs/Velocitey 26"/20" fat tires
Lightning Cycle Dynamics P-38 Tel.805/736-0700 Lightning@utech.net \$2045 (LX); \$2600 (XT); \$2800 (Campy)	SWB ASS with optional front susp. WB-44" SH-20" BBHT- 24" WT-25 WT DIST- 55%(BK)/45% Colors: Powdercoat blue, red or custom Gear Inches: 22-123	Frame: 4130 CroMo, CroMo fork brazed, alum. ASS bar/stem, Seat: ErgoFit TIG alum. frame nylon sling/mesh Sizes: 4-frame sizes: 4'10"-6'8"	Drivetrain: Shim. Deore LX/RX100/ Ultegra 21-spd., Suntour/Shim. Exage crank, Suntour HS, cartridge BB, KMC chain, dual pivot caliper brakes, 700c RW, 20" or 16" FW
Zach Kaplan/Lightning P-38 Sport Tel.415/381-5723 Zakaplan@earthlink.net www.BikeRoute.com/ZachKaplanCycles.htm \$3000.	SWB ASS with optional front susp. WB-42"/43"/44"/45" SH-20" BBHT- 24" WT-24 WT DIST- 55%(BK)/45% Colors: Powdercoat blue, red or custom Gear Inches: 25-113	Frame: 4130 CroMo, CroMo fork, opt. Ballistic, brazed, alum. ASS bar/stem, Seat: ErgoFit TIG alum. frame nylon sling/mesh Sizes: Fits riders 4'9"-6'8"	Drivetrain: Shimano Ultegra, Dura Ace 27-spd., Ultegra 24/42/52 triple crank, Ultegra HS/ BB, Shim. HG-92 chain, XTR V-brakes, Ultegra/Sun 26" 559 RW, 20" 406 FW, Conti GP
Angletech/Lightning P-38 GL63 Tel. 719/687-7475 http://angletechcycles.com \$3050 (GL63); \$3799 (SHO)	SWB ASS with Rans Flip-It stem WB-44" SH-20" BBHT- 24" WT-25 WT DIST- 55%(BK)/45% Colors: Powdercoat blue, red or custom Gear Inches: 17-140	Frame: 4130 CroMo, CroMo fork brazed, alum. Rans Flip It stem Seat: ErgoFit TIG alum. frame nylon sling/mesh Sizes: Fits riders 4'9"-6'8"	Drivetrain: See equivalent Angletech Rans V-Rex GL63, SHO and Nultegra components. Shimano LX V-brakes (XTR on SHO); 700c/ 20" combo.
Angletech/Lightning P-38 Nultegra Tel. 719/687-7475 http://angletechcycles.com \$2999	SWB ASS with Rans Flip-It stem WB-44" SH-20" BBHT- 24" WT-25 WT DIST- 55%(BK)/45% Colors: Powdercoat blue, red or custom Gear Inches: 24-128	Same as above	Drivetrain: Shim. Nexave/Ultegra 24-spd., Ultegra 30/42/52, Nexave Mega range 11-34 cass., Ultegra BB, YST HS, Sachs chain, Shim./Bont. 26"/20" x 1.25, Schwalbe City Mar.
Lightning Cycle Dynamics F-40 Tel.805/736-0700 Lightning@utech.net \$4360	SWB ASS with full fairing/front susp. WB-44" SH-20" BBHT- 24" WT-33 WT DIST- 55%(BK)/45% Colors: Powdercoat blue, red or custom Gear Inches: 24-140	Frame: 4130 CroMo, S-1 susp. fork, brazed, alum. ASS bar/stem, fiberglass nose cone, alum. fairing frame, soft body. Seat: ErgoFit TIG alum. Sizes: Fits riders 5'2"-6'6"	Drivetrain: Shimano LX/RX100/Ult. bar-cons, S.T. XC Comp 28/50/54 triple, Ult. BB, XC Pro BB, KMC chain, Shimano V-brakes, 700c RW, HED Jet 17" AM FW
Lightning Cycle Dynamics R-84 Tel.805/736-0700 Lightning@utech.net \$3850 (LX); \$4500 (Campy); \$5500	SWB ASS full suspension WB-44" SH-18" BBHT- N.A. WT-19 WT DIST- 55%(BK)/45% Colors: red, black, white, yellow, natural Gear Inches: 22-128	Frame: Moulded carbon fiber Unibox, oversize aluminum BB, Lightning S-2 susp. fork Seat: ErgoFit TIG alum. frame nylon sling/mesh	Drivetrain: Shimano XTR/RX100/ Ult. bar-cons, Top Line 24/40/52, Ritchey HS, Boone Ti BB, Regina or Sachs chain, Scott Super Brakes, 700c RW, 20" FW w/Conti GP tires
Linear Sonic Tel. 319/252-1637 http://www.Bikeroute.com/Linear/Linear.html \$1350.00	SWB USS WB-38" SH-25" BBHT- 28" WT-29 WT DIST- 50%(BK)/50% Colors: Anodized blue, silver, gold, black Gear Inches: 21-104	Frame: Sq. Alum. mainframe extrusion, CroMo fork, alum. USS/bars, Seat: alum. frame, mesh back, nylon covered foam base Sizes: N.A.	Drivetrain: Sachs Twist Grip, Sachs/ Shimano crank, Sachs 3 x 7 21-spd., Dia Compe Bull Dog rear brake, Dia Compe 730 sidepull front brake, 26" RW, 20" FW.
Organic Engines Vapor Tel. 850/224-4767 Kavanagh@ifn.net \$1545 (Shimano 105) \$1945 (Shimano Ultegra 27-spd.)	SWB ASS WB-39" SH-19" BBHT- 22" WT-27-28 WT DIST- 45%(BK)/55% Colors: Blue, red, yellow, black Gear Inches: N.A.	Frame: CroMo frame& fork Seat: 6061 Alum. frame/Kevlar mesh back/base Sizes: 42" one-size-fits-most.	Drivetrain: Shimano 105/STI, Shimano 105 road triple, Sachs chain, Shimano 105SC dual pivot brakes, Shimano 105 BB/HS, 105/ Sun 26" RW, 20" FW w/Conti GP

SWB 'BENT LISTINGS	TYPE & DIMENSION	FRAME & SEAT	COMPONENTS
Pashley PDQ Tel. 425/641-9639 (Dekker Svc.) mdekker@eskimo.com http://www.eskimo.com/~m.dekker \$1800-2100 (price varies)	SWB ASS WB-37.5" SH-22.5" BBHT- 25.5" WT-28 WT DIST-N.A. Colors: Powdercoat aquamarine. Gear Inches: 24-102	Frame: Seamless CroMo/HiTen mainframe, HiTen fork, T-bar/stem. Seat: Alum. frame/mesh back Sizes: One-size-fits leg lengths 29"-38"	Drivetrain: Sachs Centera/ Powergrip twist, Sachs 3x7 21-spd. Ge Force roller HS, V-Brakes, 20" x 1.5" whls. with Nokian tires and VP-131 clipless/platform pedals.
Rans Rocket Tel. 913/624-6346 bikes@Rans.com \$1150.00	SWB ASS WB-39-5/8" SH-22" BBHT- 25" WT-30 WT DIST- varies (slide seat) Colors: Hot Red powdercoat. Gear Inches: 25-103	Frame: MIG CroMo mainframe, CroMo fork, alum. V-bar/riser. Seat: Rans ventilated mesh back, comp. base, nylon covered foam seat Sizes: 42" one-size-fits-most.	Drivetrain: GripShift ESP 5.0/7.0 24-spd., S.T. X-1 36/46/58, Sachs chain, YST HS, Shim. CS21 BB, Dia Compe VC-747 Linear Pull & levers, 20" x 1.35" whls. w/Primo Comets.
Angletech/Rans Rocket GL63 Tel. 719/687-7475 Anglezoom@aol.com http://angletechcycles.com \$1399.99	SWB ASS WB-39-5/8" SH-22" BBHT- 25" WT-30 WT DIST- varies (slide seat) Colors: Hot Red powdercoat. Gear Inches: 19.4-140	Frame: CroMo mainframe, CroMo fork, alum. V-bar/riser. Seat: Rans ventilated mesh back, comp. base, nylon covered foam seat Sizes: 42" one-size-fits-most.	Drivetrain: Sachs 3x7 63-spd., Ritchey Logic 38/53/62 crank, YST HS, Shim. sealed BB, Sachs chain, Magura HS11, Shim./Sun 20" x 1.25" w/ Primo Comets.
Rans Rocket Saturn V Tel. 913/624-6346 bikes@Rans.com \$1750.00	SWB ASS WB-39-5/8" SH-22" BBHT- 25" WT-30 WT DIST- varies (slide seat) Colors: Saturn Yellow Gear Inches: 28-104	Frame: TIG CroMo mainframe, CroMo fork, alum. Flip-It riser. Seat: Rans ventilated mesh back, comp. base, nylon covered foam seat Sizes: 42" one-size-fits-most.	Drivetrain: GripShift ESP9.0, ESP 900 24-spd., Shimano 105 ft. der., Ritchey Logic 42/53/62, Sachs chain, YST HS, Magura HS 11 brakes & levers, Shimano/Sun 20" x 1.25" with Primo Comets.
Rans V-Rex Tel. 913/624-6346 bikes@Rans.com \$1645.00	SWB ASS WB-42-3/4" SH-24" BBHT- 25.5" WT-30 WT DIST- varies (slide seat) Colors: Monarch Blue Gear Inches: 30-123	Frame: CroMo mainframe, CroMo fork, alum. Flip-It riser Seat: Rans ventilated mesh back, comp. base, nylon covered foam seat Sizes: 42" one-size-fits-most.	Drivetrain: GripShift ESP7.0, ESP 700 24-spd., Shimano 105 ft. der., Campagnolo Veloce 32/42/52, Sachs chain, YST HS, Shimano Deore LX V-brakes, ESP levers, levers, 26" Ritchey Tom Slick, 20" Primo Comet.
Angletech/Rans V-Rex GL63 Tel. 719/687-7475 Anglezoom@aol.com http://angletechcycles.com \$2399.00	SWB ASS WB-42-3/4" SH-24" BBHT- 25.5" WT-28.5 WT DIST- varies (slide seat) Colors: Monarch Blue Gear Inches: 18-147	Frame: CroMo mainframe, CroMo fork, alum. Flip-It riser Seat: Rans ventilated mesh back, comp. base, nylon covered foam seat Sizes: 42" one-size-fits-most.	Drivetrain: GripShift ESP 9.0 SL, Sachs 3x7 63-spd., Ritchey Logic triple crank, ST XC Pro G.G. HS, Phil BB, Sachs chain, Magura HS24, 26" x 1.75 Schwalbe City Mar. Kev. RT, Schwalbe City Mar. 115 psi FT.
Angletech/Rans V-Rex SHO Tel. 719/687-7475 Anglezoom@aol.com http://angletechcycles.com \$3099.99	SWB ASS WB-42-3/4" SH-24" BBHT- 25.5" WT-28.5 WT DIST- varies (slide seat) Colors: Monarch Blue Gear Inches: 22-121	Same as above	Drivetrain: GripShift ESP 9.0 SL, Ult. 30/42/54, Chris King HS, Ultegra BB, Sachs PC91 drilled chain, Control Tech V-brakes, Phil/Rolf/Hed Whls. 550c Conti GP RT, Conti GP.
Angletech/Rans V-Rex Nultegra Tel. 719/687-7475 Anglezoom@aol.com http://angletechcycles.com \$2199.99	SWB ASS WB-42-3/4" SH-24" BBHT- 25.5" WT-28.5 WT DIST- varies (slide seat) Colors: Monarch Blue Gear Inches: 22-116	Same as above	Drivetrain: Shim. Nexave/Ultegra 24-spd., Ultegra 30/42/52, Nexave Mega range 11-34 cass., Ultegra BB, YST HS, Sachs chain, Shim./Bont. 26"/20" x 1.25, Schwalbe City Mar.
Rans Vivo Tel. 913/624-6346 bikes@Rans.com \$2050.00	SWB ASS with dual suspension WB-46" SH-23.5" BBHT- 25.5" WT-32 WT DIST- varies (slide seat) Colors: Marshmallow (metallic white) Gear Inches: 28-104	Frame: TIG CroMo mainframe, CroMo swing arm, Cane Creek AD5 shock,, Ballistic Alum. susp. fork, alum. Flip-It riser Seat: Rans ventilated mesh back, comp. base, nylon covered foam seat Sizes: 36" one-size-fits-most.	Drivetrain: GripShift ESP9.0, ESP 900 24-spd., Shimano 105 ft. der., Ritchey Logic 42/53/62, Sachs chain, YST HS, Magura HS 11 brakes & levers, Shimano/Sun 20" x 1.25" with Primo Comets.
Angletech/Rans Vivo GL63 Tel. 719/687-7475 Anglezoom@aol.com http://angletechcycles.com \$2599.99	SWB ASS with dual suspension WB-46" SH-23.5" BBHT- 25.5" WT-33 WT DIST- varies (slide seat) Colors: Marshmallow (metallic white) Gear Inches: 19-140	Same as above	Drivetrain: GripShift ESP9.0 SL, ESP 900, Sachs 3x7 63-spd., Shimano 105 ft. der., Ritchey 38/48/58, Sachs chain, S.T. XC Pro G.G. Shim. UN 52 sealed BB, Magura HS 24 brakes & levers, Shim./Sun 20" x 1.25" with Primo Comets.
Rotator Tiger Tel. 707/539-4203 rotator@neteze.com http://www.hpva.org \$1500	SWB ASS WB-41" SH-18" BBHT- 25" WT-N.A. WT DIST- varies (slide seat) Colors: Powdercoat red Gear Inches: (est) 25-150	Frame: CroMo/Hiten brazed mainframe, CroMo fork Seat: CroMo frame, vented nylon mesh Sizes: N.A.	Drivetrain: Sachs/Sachs twist shift 35-spd. with mid-drive, Sachs cantilever brakes, 20" wheels.

SWB 'BENT LISTINGS	TYPE & DIMENSION	FRAME & SEAT	COMPONENTS
S & B Recumbents Single Tel. 310/608-0008 or 762-2243 s_brecumbent@hotmail.com http://www.bikeroute.com/S-B \$795(7-spd), \$895 (14), \$975 (21).	SWB ASS WB-39" SH-17" BBHT- 18" WT-N.A. WT. DIST- N.A. Colors: Powdercoat Gear Inches: N.A.	Frame: Hiten or CroMo (opt.) TIG mainframe, HiTen or CroMo (opt.) fork Seat: Fiberglass shell with foam pad/cover. Sizes: Fits riders 4'6" to 7'	Drivetrain: Shimano 7/14/21-spd., KMC chain, Tioga BB, Shimano sealed BB, Brakes-N.A., 26" x 1.5 RW, 16" x 1.375" FW with Primo Comet.
Vision VR40 Tel. 206/467--0231 ATPVision@aol.com http://www.cyclery.com/vision \$1050-\$1350	SWB USS (ASS, LWB, Susp. optional) WB-38" (rigid)/41" (susp.) SH-23"-26.5" ¹ BBHT- 23"-26.6" ¹ WT-29.5-34.25 Colors: Powdercoat teal & red Gear Inches: 26-114 ¹ Depends on 16", 20", fork, Susp., or rigid frame	Frame: 2" DOM steel TIG mainframe (Opt. Cane Creek Air rear susp.) CroMo fork (Opt. suspension fork) Seat: Alum. frame, nylon mesh, foam pad Sizes: Fits riders 4'8" to 6'4"	Drivetrain: Shimano RSX/STX Rapidfire 21-spd., Shimano Exage 28/38/48, Shimano BB, HS-YST St., KMC chain, Dia Compe VC-2 canti. brakes, RSX/alloy 26" RW/16" (349) or 20" (406) FW, Vision Primo Comets.
Vision VR42 Tel. 206/467--0231 ATPVision@aol.com http://www.cyclery.com/vision \$1495-1945	SWB USS (ASS, LWB, Susp. optional) WB-38" (rigid)/41" (susp.) SH-23"-26.5" ¹ BBHT- 23"-26.6" ¹ WT-27-32.25 Colors: Powdercoat teal & red Gear Inches: 28-123 ¹ Depends on 16", 20", fork, Susp., or rigid frame	Frame: 2" DOM steel TIG mainframe (Opt. Cane Creek Air rear susp.) CroMo fork (Opt. suspension fork) Seat: Alum. frame, nylon mesh, foam pad Sizes: Fits riders 4'8" to 6'4"	Drivetrain: Shimano RX100/STX Rapidfire 24-spd., Shimano RX100 30/42/52, Shimano BB, HS-YST alloy, KMC SS90 chain, Dia Compe VC-70 canti. brakes, RX100/Sun 26" RW/16" (349) or 20" (406) FW.
Vision VR44 Tel. 206/467--0231 ATPVision@aol.com http://www.cyclery.com/vision \$1825-\$2700	SWB USS (ASS, LWB, Susp. optional) WB-38" (rigid)/41" (susp.) SH-23"-26.5" ¹ BBHT- 23"-26.6" ¹ WT-25-30.25 Colors: Misty purple, yellow, red Gear Inches: 28-123 ¹ Depends on 16", 20", fork, Susp., or rigid frame	Frame: 1.75" CroMo TIG mainframe (Opt. Cane Creek Air rear susp.) , CroMo fork (Opt. Ballistic susp. fork), alloy boom. Seat: Alum. frame, nylon mesh, foam pad Sizes: Fits riders 4'8" to 6'4"	Drivetrain: Shimano RX100/STX Rapidfire 24-spd., Shimano RX100 30/42/52, Shimano BB, HS-YST, Dia Compe VC-7 canti. brakes, 26" RW, 16" (349) or 20" (406) FW, Vision Primo Comet 1.375" tires
Vision VR45 Tel. 206/467--0231 ATPVision@aol.com http://www.cyclery.com/vision \$2025-\$2855	SWB USS (ASS, LWB, Susp. optional) WB-38" (rigid)/41" (susp.) SH-23"-26.5" ¹ BBHT- 23"-26.6" ¹ WT-23-27.25 Colors: Any color Gear Inches: 28-123 ¹ Depends on 16", 20", fork, Susp., or rigid frame	Frame: 1.75" CroMo TIG mainframe (Opt. Cane Creek Air rear susp.) (Opt. Cane Creek rear susp.), CroMo fork (Opt. Ballistic susp. fork), alloy boom. Seat: Alum. frame, nylon mesh, foam pad Sizes: Fits riders 4'8" to 6'4"	Drivetrain: Shimano Ultegra/Rapidfire STI ¹ 27-spd., Shimano Ultegra 30/42/52, Ultegra-BB, Ultegra-HS, Ultegra brakes, Ultegra/Sun 26" RW, 16" (349) or 20" (406) FW, Primo Comets. ¹ drop-bar brake lever shifters

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The Notebook of an Unreasonable Man

By Kent Peterson

peterson@halcyon.com

Kent's Mission

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

"The reasonable man adapts himself to the world. The unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man."
— George Bernard Shaw

A Tale of a Tail-Box

I've been riding recumbent bicycles long enough to be used to comments like this, but today the comments weren't coming from curious strangers and they weren't

"That is so cool!"

"Wow, that looks great!"

"So, how much did that cost?"

directed at my bike. These were the exclamations from my regular recumbent riding buddies and the object of conversation was my new coroplast tailbox. The same guys who will dismiss a Black Gold with a quick "nice bike" were absolutely fascinated by my latest homebrew project.

A tailbox is a really handy thing to have and building one is surprisingly simple. I spent an hour and a half and less than 20 dollars to go from concept to completion of the basic tailbox. In this article I'll describe the basic steps I went through and hopefully give you enough information and inspiration to build a tailbox of your own.

I first began thinking about tailboxes when I saw Bill Volk talking (well, typing actually!) about them on the internet. Bill has a web page at <http://ihpva.org/Builders/WVolk/> where he has pictures of various coroplast fairings he's built along with pictures of his tailbox. It's worth noting that Bill made four different front fairings and finally bought himself a Zzipper but it only took him one try to build a workable tailbox. Inspired by Bill's success, I set to work.

I wanted the tailbox to do a few things. First, I wanted it to add enough carrying capacity to my Rans Rocket so that I could haul my usual commuting stuff and still have some room left over for groceries. Second, I wanted the tailbox to be aerodynamically slippery. I didn't really care if it im-

proved my speed, but I didn't want it slowing me down either. Finally, it had to look cool.

First, I needed to get some coroplast. Coroplast is wonderful stuff, right up there with the wheel, peanut butter and duct tape on my list of mankind's great inventions. Coroplast is a substance that looks a lot like corrugated cardboard but it is made from plastic instead of wood fibers. It is light, strong and weatherproof. It's also easy to work with and relatively inexpensive. If you want big sheets of coroplast your best bet is to try an industrial plastics company but smaller sheets can be bought at custom sign stores or craft shops.

Coroplast has ribs or flutes that give it strength and lightness. Cutting or folding along these flutes is easier than cutting across them, so when you begin a project, it's best to take the "grain" of the coroplast into account. Another thing you should decide early on is the size of the coroplast you will use. Coroplast is measured by how thick the fluted sheets are. The most common size of coroplast that I've seen is 4 millimeter but the 2 millimeter size is lighter and easier to cut and fold. I wanted my tailbox to be strong, so I chose the 4 mm size for this project. I bought three 20" by 30" sheets of red 4 mm coroplast from the pricey but convenient Ben Franklin craft store. The sheets were five dollars each. If I'd shopped around or used old campaign signs, I could've spent a lot less.

I've worked with coroplast before. In fact, the front fairing for my BikeE was a pretty big coroplast project (see RCN #40 for details). On that project I'd learned that a good way to join coroplast is to use nylon zip-ties. My local Target store sells packs of one hundred 7" long zip-ties for

64 cents, which is one of the best bargains I've seen anywhere.

Coroplast can be cut with a knife or shears and it can be folded if you first score it along one face. I run the tip of a Philips screwdriver along the edge of a ruler to score the folds. A small, sharp flat-blade screwdriver works well for punching the holes for the zip-ties to pass through.

My basic plan was to enclose the space behind the seat with coroplast panels. I considered prototyping the design in cardboard but everything was so straightforward that I decided this was just unnecessary caution. I held two of the sheets up behind the seat, took a couple of measurements, made a couple of marks and set to work.

I decided early on that I could either be very careful, make precise measurements and laboriously work to construct a water-tight container or I could assume that I wouldn't succeed in making a water-tight box, be reasonably sloppy and happy and construct a mostly water-resistant box. I wisely opted for the second strategy.

I decided that my tailbox wouldn't actually have a front, it would just butt up against the Rans mesh seat back. When I'm riding the bike, my body blocks the wind and rain from the front of the tailbox and things stay quite dry. Anything that I want to make certain stays dry, I wrap in plastic bags. Another good solution (although a bit more expensive) is to use the coated nylon bags made for kayak touring. These bags are completely waterproof and their triangular shape fits perfectly into a tailbox.

I'd ridden the Rocket enough to have settled into a seat position that I was happy with. Since I was constructing the tailbox to be integrated with the seat, it was important that I had stabilized on one seat position. One drawback of my tailbox design is that it makes adjusting the seat a bit more complicated so it's best to have settled on one seat position before doing any construction.

Viewed from the top the tailbox looks like a triangle and viewed from the side it looks like a rectangle with one sloping edge that follows the angle of the seat back. I began building the box by taking two of the coroplast sheets and cutting two inches off the long edge so I had two identical pieces that were 30 inches by 18 inches. Next, I scored a line two inches up from the long edge and folded the coroplast up at 90 degrees. I did this with both pieces so I now had pieces with that were 30 inches by 16 inches with a 2 inch wide lip. The lip was



Kent Peterson's Rocket with Tail Box. Does this bike look familiar? This is Bob Bryant's former test Rocket ('97 model)/Slumgullian trainer now used as Kent's commuter. Kent says the Tail Box is good for 1.5 mph.—RCN.

along the lower edge of what was becoming the tailbox.

Now I measured the slope of the seat and determined that for the box to sit basically level, I should cut things so I had a top edge of 19 inches, a tail edge of 16 inches, a bottom edge of 29 inches and a seat edge of 19 inches. Of course, your bike and measurements will vary. I loosely joined the tail edges of the two side pieces with zip-ties.

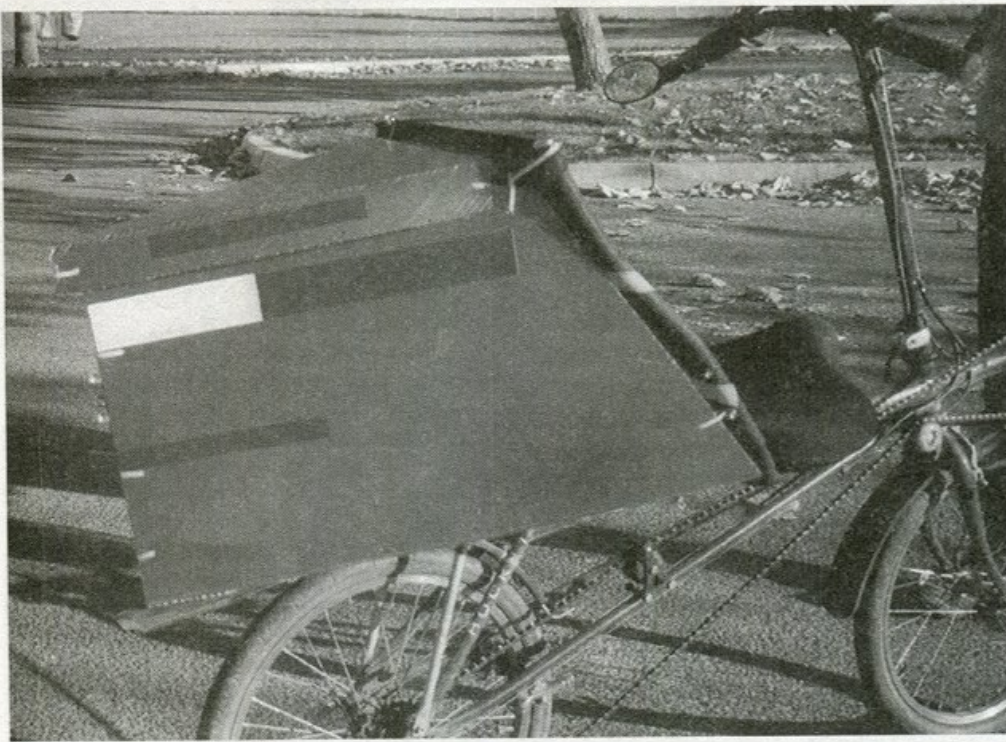
One important thing to note is that if you keep track of what you are doing with the zip-ties, you can make certain that all the zip-tie clasps will be on the interior of your tailbox. This makes things look neater and keeps things aerodynamically slippery.

The tailbox attaches to the Rocket at the seat back uprights, the seat back crossbeam, and the seat supports. I used zip-ties to

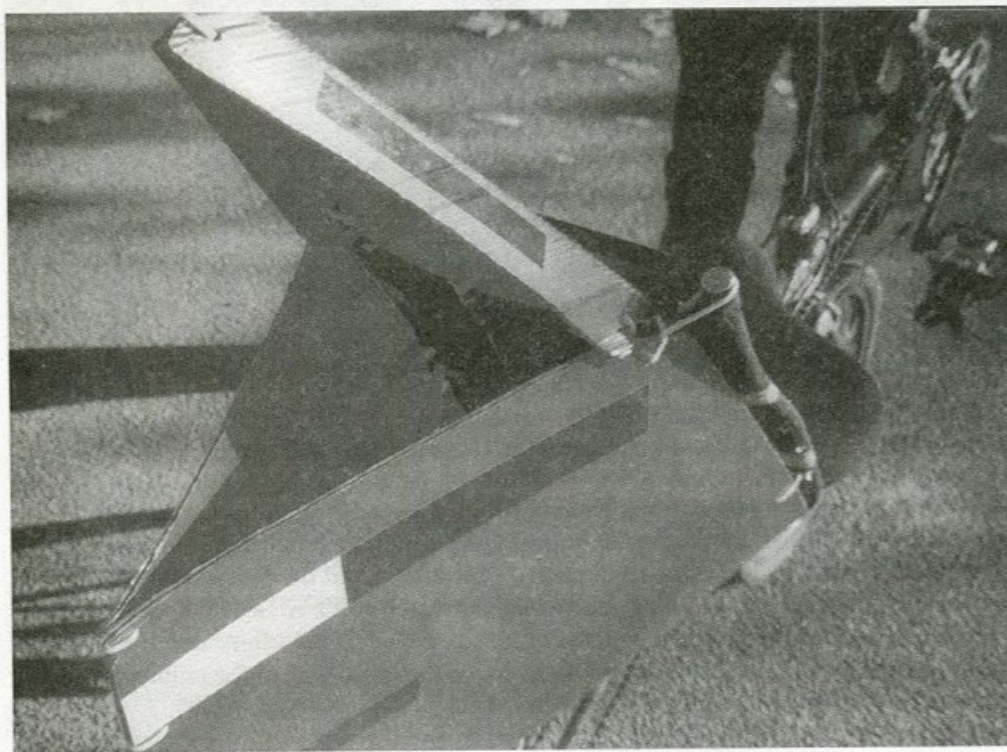
build a small nylon bridge across the seat supports which helps support the base of the tailbox and the rear fender. The Rocket has water-bottle bosses in the seat back and I used oversize washers and zip-ties to attach the front edge of the tailbox to the seat back.

But it wasn't quite a tailbox yet. It was really just a couple of side pieces loosely held together with zip-ties. Those two inch wide lips on the bottom needed to be trimmed to let the box come together in the basic triangular shape. I also had to punch some holes in the lips to let me lay in the bottom of the box.

The bottom was basically triangular but it had to fit around the seat supports, so I made it in a couple of sections, layered it in and secured it with zip-ties and a bit of duct tape. The tape was on the inside, so



The trick to Kent's E-Z Coroplast tailbox is building it right onto the seat, rather than building it off the bike and trying to fit it on after the fact (like I did).



Note the creative zip-tie attachments and zip-tie hinges.

from the outside the tailbox still looks cool. I made the bottom from the scraps I'd cut from the two side sheets. As I got all the pieces in place, I was able to tighten the zip-ties and the basic tailbox took shape.

Now I had to make the tailbox lid. For this I took my third piece of coroplast and made a triangle with one edge about 12 inches wide and the other two edges 19 inches long. I also made sure that each edge

had a lip a couple of inches wide. I joined the edges of the trailing lips to each other with zip-ties and I attached the lip of the short edge to the seat back crossbeam. This gave me a lid with a zip-tie hinge that pivots at the crossbeam. At first, I counted on friction to hold the lid shut, but a few test rides convinced me I needed something more. I made a latch from a small piece of inner tube rubber and it works fine.

I was basically done. I wound up adding some reflective tape to the tailbox and after a bit of thought, I decided to add a custom flasher as well. The flasher was very easy to make and only added another \$10 to the total project cost.

I went to my local Radio Shack and bought one red flasher LED-L4403. This little item (part number 276-036) is a light-emitting diode with a flasher circuit and limiting resistor built in. I also picked up two 5000MCD jumbo LEDs (part number 276-086) and a 4 A battery holder. I wired these things together in series, added a bit of wire and a switch from my junk box and I had myself a flasher. I attached the LEDs to the back of the tailbox and put the batteries into a plastic soap box that I tucked into the back corner of the tailbox.

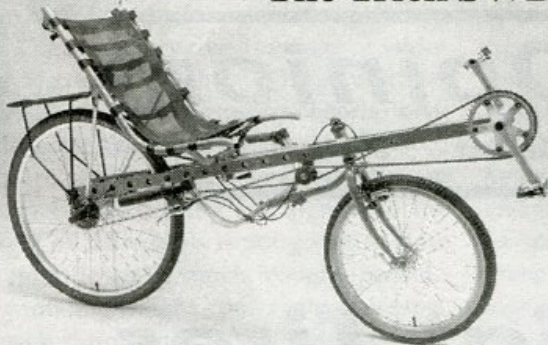
The flasher works great. The flasher LED makes the other two brighter LEDs flash in sync with it about once per second. I've been commuting with this setup (along with a NiteRider, helmet light and flasher) for about a month now and I have yet to change the batteries in my homebrew flasher.

The tailbox is very handy. The cargo capacity is wonderful. I can have my usual commuting load and still pick up a gallon of milk and a loaf of bread on my way home. And my friends reactions tell me that I've succeeded in my goal of making the tailbox look cool. Which leaves only the speed question.

I commute 7.5 miles each way every day to work. It's suburban, stop-and-go riding and it's a bit more uphill going to work than it is coming home. And I keep track of my time and speed each day so I have the data to compare my pre-tailbox speed with my post-tailbox speed. And the answer is, I'm faster with the tailbox. My average morning speed went from 13.6 to 14.9 mph and my evening speed went from 16.5 to 17.4 mph. I'm faster, I'm hauling more stuff and the bike still handles great. My engineering friends tell me that a tailbox doesn't do nearly as much for your speed as a front fairing does. I'm sure that they're right but I've built front fairings and now I've built a tailbox. Tailboxes are a lot easier to build and they are practical and fast. It looks like a winner to me. □

Check out Kent's cool web site at: <http://www.halcyon.com/peterson/bentkent.html>. See the Joetator, Raincloud HPV and a spy photo of 'Bent Bob riding a Comfort Cycle on two wheels. This is also the unofficial web site for the NW Low Down and Laid Back Recumbent Riders.

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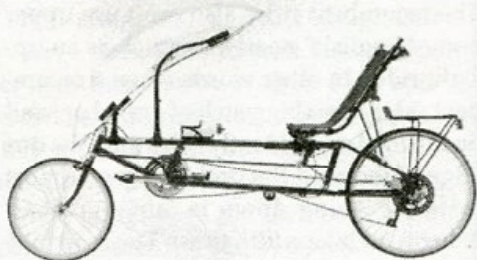
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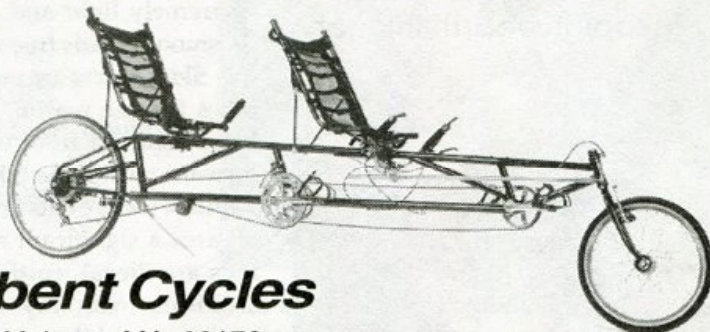
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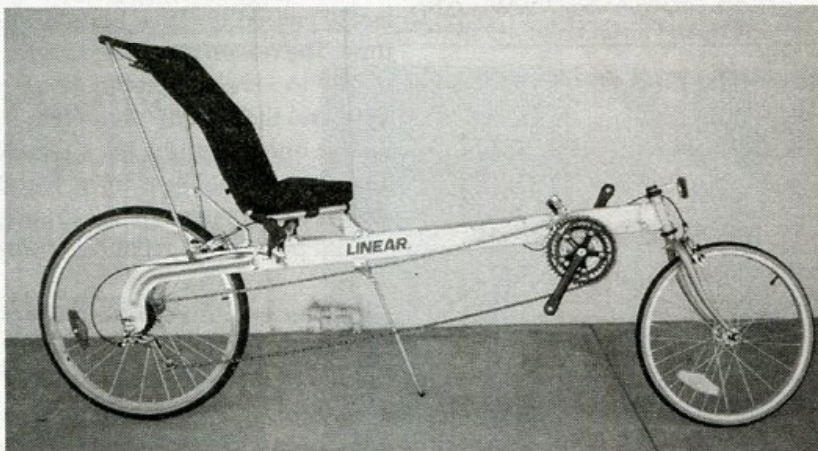
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Bent Fat Tires

By Zach Kaplan

zakaplan@earthlink.net



Zach's previous "skinny tire" life

It is really foolish to use road bike width tires on a recumbent unless you are extremely light and riding on perfectly smooth roads free of grit and potholes.

It is really foolish to use road bike width tires on a recumbent unless you are extremely light and riding on perfectly smooth roads free of grit and potholes.

Skinny tires are used on UCI time trial bikes for one reason, aerodynamics. The large diameter front wheel is the farthest forward part of the bike and reducing the width of the tire cuts down the overall frontal area a significant amount. When fairings are illegal, cutting down on frontal area is the main way to go faster. The type of time trial bikes which set records are doing it on smooth velodromes so there is no reason to use a wider tire for handling or safety reasons. Some track tubulars are so thin they are only used for a few rides. Operating costs are no object for an hour record attempt time trial bike.

Over the road time trials tend to use somewhat wider tires for added comfort, protection, and control, though still relatively narrow as aerodynamics is still highly important, generally far more significant than rolling resistance which wider tires are known to reduce.

When I first got into recumbents I rode narrow 28mm cross section tires (actually considered wide by road bike standards). I used these because they were the narrowest 20" wired on tires I could find at the time. The reason for going narrow was primarily to save weight but also because of a general thought of "If its right for a road bike it must be right for a recumbent." I also figured being a light weight rider myself I didn't need the fat tire seen on the typical pot bellied recumbent rider of the time.

After extensive recumbent riding on tires from 19mm to 54mm width I have come to a fairly clear conclusion. For the average rider on average roads a recumbent needs wider tires than an upright road bike. The primary reason is because the

recumbent rider can't deweight the bike for going over bumps and other road hazards. The recumbent rider also can't use upper body "English" nearly so much as an upright rider. In other words when a recumbent rider hits a big patch of gravel or sand on the road or accidentally rides onto the dirt edge of the road the probability of almost instantly going down is fairly great (if using road bike width tires). The road bike rider on the other hand has both more reaction time due to higher center of gravity and can move upper body side to side and for and aft in relation to the bike to a much greater degree and stands a much greater chance of averting this type of accident even though the tires may be only 20mm wide. Another reason wider tires are more important on a recumbent than an upright is generally the recumbent rider has less of a view of the road directly in front of the bike, thus it is more difficult to avoid running over road hazards. This is even more so on faired recumbents both due to forward vision obstruction of the fairing and the generally higher speeds faired recumbents operate at. Recumbents tend to have smaller diameter front wheels which go deeper into potholes, another reason to put wider tires on them, particularly if they are heavily loaded front wheels on SWBs which experience far higher impact loading than the full size front wheel of a road bike.

The primary disadvantage of wider tires, aerodynamic drag, is less of a factor on recumbents. This is because the front recumbent wheel is generally significantly smaller in diameter than the front wheel on a road bike. Additionally SWB recumbents have the front wheel set back from the front of the bike in an already turbulent zone behind the rotating pedals. With a reasonably low seat much of the rear wheel of a recumbent is drafting the

rider. On a fully faired recumbent 50% or more of both wheels are fully enclosed and contribute little to the overall frontal area.

The secondary disadvantage of wider tires is greater weight. On bikes used for solo riding (the way most transportation cyclists use their bikes) the importance of light weight is greatly over rated. Even on a hilly course adding a kilogram to the weight of the wheels is not going to slow the rider down by much. Weight, particularly rotating weight, comes into play more in pack riding such as criterium or road racing when the riders are trying to follow each other very closely for aerodynamic reasons and thus need to make frequent adjustments to their speeds to maintain the correct following distance.

My findings on real roads (rough and hilly) have been I am overall faster with wider tires than narrower tires. I am able to descend significantly faster on an appropriately inflated wide tire because of the greater flotation it offers on rough sections and when going over the inevitable road debris. The wider tire can be operated at a lower pressure without risking pinch punctures or rim damage. Doing so while slightly increasing the rolling resistance actually increases overall average speed on

typical roads because high frequency vibrations are filtered out reducing fatigue on the rider. A less fatigued rider is a more efficient rider. In addition the lower pressures reduce the amount the bike is accelerated vertically going over bumps which saves energy. While the tire sidewalls have some hysteresis they are overall fairly efficient and absorb relatively little energy. The need to operate tires at maximum pressure for maximum efficiency is another myth (on anything other than smooth velodromes).

As one continues to look at the true meaning of average speed additional time savings of wider tires become evident through a reduction in time spent by the side of the road repairing punctures and reduced time spent in hospital emergency rooms. There are considerable financial advantages to ranging from less frequent tire replacements (both from normal wear and road hazard damage), reduced rim replacements from roadside hazards, and reduced ambulance and hospital costs. □

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• BENT RIDER GROUPS •

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

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

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

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

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

▲ **CALIFORNIA—Palo Alto:** Call Alvin Chin Tel.650/571-5147.

▲ **CALIFORNIA—San Francisco BARC** (Bay Area Recumbent Cyclists) 1st Sat./month, 10am@ Larkspur Landing fountain off of Sir Francis Drake. Any weather. Zach Kaplan Tel. 415/381-5723 or zakaplan@earthlink.net.

▲ **CALIFORNIA —Monterey/Santa Cruz:** 4th Sat./month. 10:30am. 15-30 miles casual sightseeing. Meet @ Seabright Brewery/Java Junction Coffee House complex, 519 Seabright Ave. in Santa Cruz, Martin Krieg, Tel. 408/426-8830, cycleam@BikeRoute.com. <http://www.bikeroute.com/RecumbentRides.htm>

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

▲ **CALIFORNIA—Sacramento: Recumbent Riders of Sacramento.** Rides along the Am. River Pkwy. Gary Tel. 916/947-1498, Dave @ 916/483-4435 Recumers@aol.com

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

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

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

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

▲ **ILLINOIS—Chicago: WISIL** Len Brunkala, 260 S. Channing, Apt.#1, Elgin, IL, 60120-6619.

▲ **ILLINOIS—Chicago:** Fast Eddie Gin Tel.773/237-6624.

▲ **ILLINOIS—Champaign/Bloomington:** Tom Smith Tel. 217/351-7305, tsmith@s.psych.uiuc.edu for info.

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

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

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

▲ **MICHIGAN: Wolver-bents** (S.E. area): Meets 2nd Sat. @ Willow Metropark, Mar-Nov. Bob Krzewinski, 706 Dwight St., Ypsilanti, MI 48198, Tel. 313/487-9058, BobMich@compuserve.com.

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

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

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

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

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

▲ **TN/NW GA/N.AL—Chattanooga:** Recumbent riding friends are available to ride at most any time. Easy Chair Rec. Bikes Tel. 423/886-1499, easychairbikes@att.net

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

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

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

▲ **WASHINGTON—Seattle/King County: NW Low Down & Laid Back 'Bent Riders :** Weekly rides, email for calendar update. Bob Tel. 253/631-5728, DrRecumbnt@aol.com

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

▲ **WASHINGTON—SE: WRW²** Two Wheeled, Recumbent Riders of Walla Walla., VonBruno@bmi.net

▲ **WASHINGTON DC AREA: W.H.I.R.L.** Every Sat, 8am (9am-winter) @Viers Mill Rec Center. MD, N. end of Bch. Dr., weather permitting, Vic Sussman Tel. 301/565-3050, whirl.cycling.org

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

■ **DON'T HAVE ANYONE TO RIDE WITH?** Form a local rider group today! Just pick a name, choose a date, commit to showing up for a few rides and send us contact info in the above format. Are you planning a 'bent event this season? Let us know so we can place it in the RCN calendar. This concept works and has changed the face of recumbency!

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• 1998 RECUMBENT EVENTS CALENDAR •

■ OHPV Rites of Spring Bicycle Ride

March 21st 1998, 9am
Explore eastern Portland and Troutdale by bikepath. 9am @ TriMet Gateway Park, Jeff Wills Tel.360-254-3736 or jwills@ pacifier.com

■ 1998 LaGrange Benders 'Bent Ride

April 3,4, and 5
LaGrange, Georgia
Scenic rides back roads of West GA, AJ Nelson @ 706-883-8449, captaj@mindspring.com or Keith Bams @ 706-882-5609-kbams@mindspring.com

■ CENTRAL VALLEY RECUMBENT RALLY

Saturday, April 18
Fresno, California
35/65/85 mile routes SAG/Food/Wildflowers/Patch/Tee-Shirt/HILLS, Info: bilbyke@psnw.com Bill Bruce, 923 W Santa Ana, Fresno, Ca. 93705.

■ MICHIGAN RECUMBENT RALLY - EAST

May 9, 1998
Willow Metropark, MI
Recumbent demos and ride Bob Krzewinski, 706 Dwight Street, Ypsilanti, MI 48198, Tel. 313/487-9058, BobMich@compuserve.com.

■ WHIRL BIG RIDE

May 16, 1998
Rock Creek Park, Washington D.C.
24 mile ride with more recumbents in one place than you've ever seen! Mark Matarella Tel. 703/314-3044 <http://Recumbents.com/WHIRL>

■ MIDWEST 'BENT ROUND-UP

May 23, 1998
Hales Corner, WI
Wheel & Sprocket Tel.414/529-6600

■ MIDWEST RECUMBENT RALLY

May 30-31, 1998
Stevens Point, WI
Hostel Shoppe Tel. 715/341-BIKE

■ CRATERS OF THE MOON 'BENT TOUR

June 6-7, 1998
Sun Valley, Idaho
Bob Cummins@True Wheel 208/788-5433 Call to reserve a spot. 120 mi., great food, scenery & friends.

■ EASTERN CANADA RECUMBENT RIDE

June 21, 1998
Wolfville Nova Scotia, Canada.
Kevin & Denise Baker, 120 Capri Dr. Porters Lake NS, Canada. scooter.baker@ns.sympatico.ca

■ SLUMGULLIAN TOUR

June 26-29, 1998
Angletech Tel.719/687-7475

■ WORLD SPEED CHAMPIONSHIPS

June 24-27
Indianapolis, Indiana
Gary Hill, 220 Vill-Edge Dr., Granville, OH, 43023. garriehill@nextek.com. www.recumbents.com

■ BIKE CULTURE WEEK

July 18-25, 1998
York, England
Dylan MacDonald Tel. 213/468-1080. Fax: 213/462-4359 Email: Dylan@bikeculture.com

■ CYCLEFEST '98

July 29-Aug.3
Lancaster, England
John Bradshaw Tel.010 441524 32878. Fax 010 44 1524 847472.
Email J.Bradshaw@UCSM.ac.uk

■ 5th ANNUAL 'BENT EVENT

August '98 date to be announced
Mt.Airy, MD
Mt. Airy Recumbents Tel. 301/831-5151.
Email: Abikie@aol.com

■ PEOPLE MOVERS 'BENT BASH

Saturday, Sept. 5, 1998 (tentative)
Orange, California
People Movers tel. 714/633-3663

■ CENTRAL ILLINOIS BIKE RIDE

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

■ INTERBIKE TRADE SHOW

September 11-14, 1998
Sands Convention Center, Las Vegas, NV
Tel. 714/376-6161

• RECUMBENT RIDE INFO •

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"Every year this event gets bigger and better as recumbents gain in popularity," says Rolf Garthus, organizer and Rally founder. The 1998 MRR is scheduled for May 30th and 31st.

Saturday will feature free test rides, two tours, an evening meal, a recumbent bike swap and the ever popular hangin' in the park where we all look over each others' bikes and talk about accessories and the latest scoop from RCN. Saturday's activities will be held at the Pffnner Park Lodge near our shop.



Rans riders having fun at the MWR

Sunday will be devoted exclusively to touring and socializing. Amherst, WI, a small community 15 miles east of Stevens Point, has about the best touring anywhere.

On Sunday everyone will meet in the International Bank of Amherst parking lot near the one and only four way stop in downtown Amherst. The Amherst Coffee Company, across the street from the bank, will be offering a special lunch to riders and will be the headquarters for the ride. Everyone who is interested in the Saturday evening barbecue or the Sunday meal at the Coffee Company should register in advance to help us make the necessary plans.

Now about that Sunday tour. Three loops of about 20 miles each will be laid out on well marked routes in a Cloverleaf design so each loop will start and end at the Coffee Company. The roads have very little automobile traffic, are well paved and wind through some of the most scenic areas in Wisconsin. We've made every effort to identify the wrinkles in past Rallies and smooth them out for '98.

Please see our web site at www.hostelshoppe.com or call the Hostel Shoppe at 715-341-BIKE(2453) for further information and updates on the Rally. □

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Indianapolis, Indiana June 24-27, 1998

Indianapolis Raceway Park June 24

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.125 mile drag race - NHRA track

Indianapolis 500 Speedway June 25

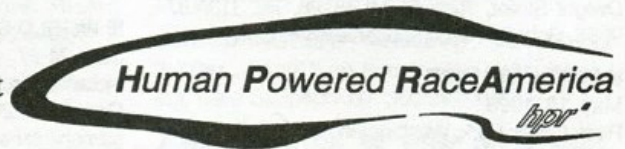
.deciMach 200 Meter Sprints
WSC 200 Meter Sprints
.deciMach 200 Meter Sprints

Indianapolis Speedrome June 26

200 Meter Sprints
1000 Meter Pursuits
Last Man Out Races

Indianapolis Waterfront Plaza June 27

100 Meter Water Sprints
1,000 Meter Water Circuit
Bollard Pull



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Further Information:

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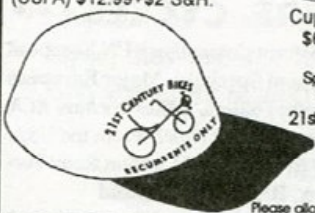
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FOR SALE: 1997 DOUBLE VISION ICS TANDEM demo with 15 miles, dk. blue, Magura's, ICS Available today! \$3900. Dale, Angle Lake Cyclery 206/878-7457 (WA/43)

FOR SALE: '97 V-Rex 24/20 GL63 demo; '97 V-Rex GL63 24/20, susp. fork, hi-back seat, trade-in; Lightning Stealth, Zach grease-guard pkg., XT except crank; Rocket Saturn V with GL63 upgrades, susp. fork; Ryan DuPlex Tandem, Phil hubs, XT bits, S & S Couplers; Counterpoint Presto, full Campy Chorus, Phil hubs. ANGLETECH tel. 719/687-7475.

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FOR SALE: 1995 ATP VISION SWB VR40A SWB, Teal, LWB conversion, 16" and 20" front wheels and forks, underseat steering, seat bag, lightly used. Owner 6' tall 75-years old switching to EZ1. \$825 Bill Myers Tel. 518/873-7376 (45)

FOR SALE: 1997 RANS STRATUS LWB, custom metallic red paint, 3x7 63-speed, upgraded chain, crank, Avid cantilevers, Angletech trunk, upgraded bottom bracket, 37" frame, <400 miles, Exc. Cond \$1499 + S/H Tel. (days) 303/866-5038; eves 303/756-1217 (45).

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FOR SALE: '96 RYAN VANGUARD, black, 24/42/52 crankset. Lovely machine, but need a SWB. Perfect condition. Will deliver within 700 miles \$1100. Tel 435/649-9613. PO Box 161, Park City, UT 84060 (UT/46)

PARTS

FOR SALE: BOX OF PARTS—P-38 fork, 17" Moulton wheel with tires, brakes, shifters, stem and more. Bought new bike instead of building. All never used. \$100. Call Jim for info tel. 561/691-1180. (44)

RECUMBENT FAIRINGS, full and partial, fiberglass and Kelvar. Reg Rodaro, 4001 Santa Barbara Blvd., #238, Naples, FL 34104-8808 (FL/44)

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

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

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For 1998, we *WILL NOT* have a traditional buyers' guide as in years past, but instead a new **RECUMBENT SUPERGUIDE!** With the idea of bringing more current up-to-date coverage, larger, more attractive regular RCN issues and in favor of subscription growth, we have opted out of the *yearly* buyers'

guide format. Instead, we will have part of the buyers' guide in each RCN issue that we publish throughout the year. Along with the SuperGuide, there will be all of your favorite regular features in each and every newly expanded RCN issue.

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- ✓ RCN #43 Jan/Feb '98 Compact (CLWB) Buyers' Guide/ '98 Editors Choice Awards and How To Buy A Recumbent Bicycle
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- ✓ RCN #46 July/Aug '98 Tandem/Trike Buyers' Guide/Accessory Guide
- ✓ RCN #47 Sept/Oct '98 Homebuilder Special/SuperGuide Update
- ✓ RCN #48 Nov/Dec '98 1999 Season Preview

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GLOSSARY

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

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

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

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

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

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

C.G.: Center-of-gravity

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

COMPACT: CLWB or MWB recumbent

COROPLAST: Plasticized cardboard that works great for homebuilt recumbent fairings

CLWB: Compact Long Wheelbase 47"-60."

CroMo: Chrome-moly steel.

DELTA: Two-wheels in the rear trike design.

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

FWD: Front Wheel Drive

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

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

HiTen Steel: High tension or mild steel.

HPV: Human Powered Vehicle.

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

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

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

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

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

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

MTB: A dated abbreviation for mountain bike.

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

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

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

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

RWS: Rear-Wheel Steering.

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

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

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

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

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

TADPOLE: Two-wheel in the front trike design.

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

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

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

ZZIPPER: A Lexan fairing by Zzip Design.



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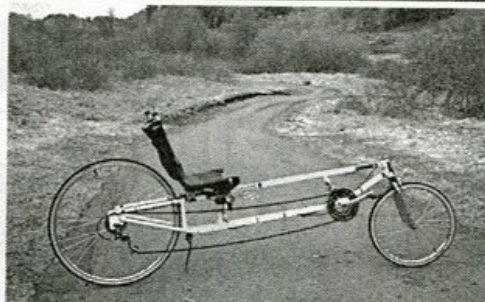
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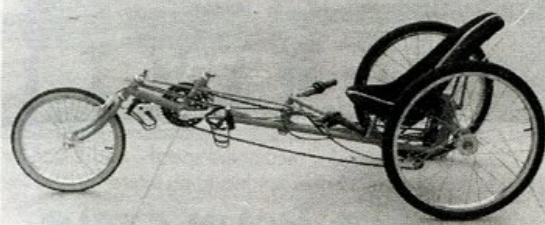


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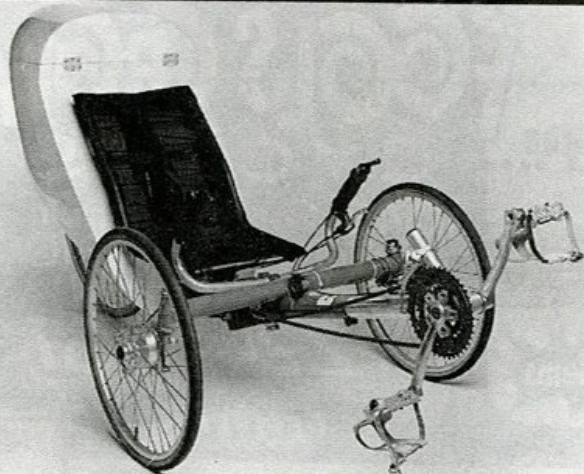
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
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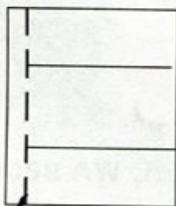


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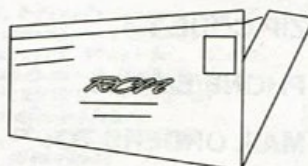


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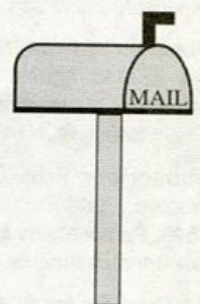


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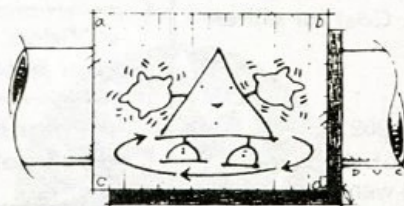
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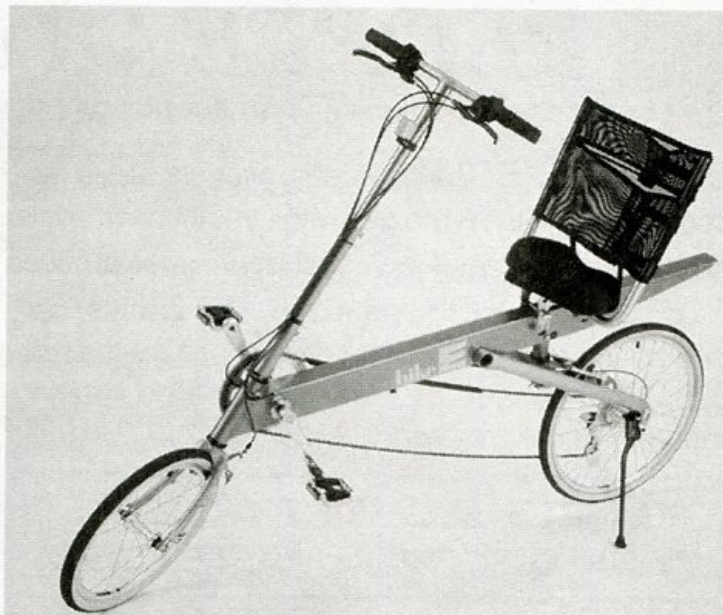
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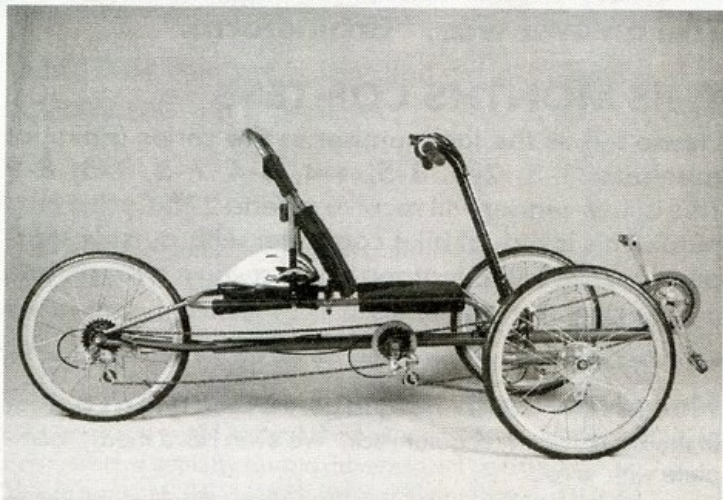
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"ANGLETECH SPEC" THE REAL THING, no caffeine: Ultimate value is not necessarily the cheapest price for a bike with an LX derailleur! We offer quality components **throughout** your bike, right down to the invisible things like cables, brake shoes, chain and build. ANGLETECH SPEC delivers the real value.

THE '98 "ALTITUDE"



PEOPLE MOVERS NEWS

.....peplmvr@primenet.com.....http://www.recumbent.com.....

LINEAR SPECIAL: People Movers has a limited quantity of LWB models with straight back seats and water bottle braze-ons. Call for our special price.

FOR SALE: P-38 Large, red, TNT cranks, carbon-spoke rear wheel, XTR derailleur, Ultegra rear hub, 105 headset, F40 front boom tube (fairing mount). Excellent condition.....\$1995.

**PEOPLE MOVERS ACCEPTS:
VISA • DISCOVER • MASTERCARD**

Last issues puzzle winner is Pat Wilson of Pt. Ludlow, WA. Pat receives an Airzound II horn. Congratulations Pat! The answer was, "Brainstorm."

THIS MONTHS CONTEST

Please tell us the last number in the series (pairs) of numbers: 1-3, 2-3, 3-5, 4-4, 5-4, 6-3, 7-5, 8-? This issues winner will receive a Vetta 225 Cycle computer. This is a dual bike computer with outside temperature (\$49.95). Runnerup will receive a Kryptonite Pocket Lock (\$9.95).

Neat New Stuff—We just got the Load Llama's in. They fit the BikeE, or any regular rack. We even have them complete with a rack.

NEW BAGS FOR BikeE/Tour Easy!

Now available are the new frame bag for the BikeE and handlebar bag for the Tour Easy. The frame bag fastens to the main beam on the BikeE and hangs underneath it and out of the way. It's about 20" long and comes in red, black or blue. The Tour Easy handlebar bag fits neatly between the handlebars. It comes in red and black. Cost for either of these bags is just \$34.95

SIX STOLEN BIKES STILL MISSING

A blue Lightning P-38 #733, a blue BikeE #196272, a red BikeE (#19680), a purple BikeE (19646), a Black BikeE (19601) and a red EZ-1 (#189) were in the six bikes stolen from People Movers in May 1996

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- EASY RACER TOUR EASY & GRR
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- ✓ Kryptonite Pocket Lock. Weighs just 3 oz., 3.75' retractable cable, lifetime warranty. \$9.95 each, 2 for \$17.99 or 2 for \$15.99 for RCN subscribers
- ✓ Power Bar Energy Pack-A 21 oz. water bottle with 3 Power Bars and Power Gel only \$6.99
- ✓ White Lightning 9.5 oz just \$10.79
- ✓ Xenon (VERY BRIGHT) strobe flashing tail lights for \$23.95
- ✓ Air Zound II refillable air horns (use your tire pump) only \$24.95
- ✓ Glow Wheels (ultra bright wheel reflectors) just \$5.99
- ✓ Pepper spray (limited supply) \$10.89
- ✓ Spinnies (attractive whirly things for your flag pole, \$3.99-7.99
- ✓ Video on how to build a coroplast fairing for your bike \$16.95
- ✓ Polar Heart Rate Monitors from \$99 including free book and bike mount.

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At last — a way to ride in comfort...

Recent advancements in technology make recumbents the most comfortable bike on the market. The seat carries 100% of the rider's weight, relieving the rider's back and shoulders. The relationship of seat to handlebars creates a natural, comfortable ride, free from neck strain, saddle sores, and wrist pain.

...and in safety...

Recumbent riders sit up, able to focus on the world around them. A study done in California found that the unusual shape of recumbents actually caused drivers to notice them more quickly than regular bicycles. On a recumbent, the rider's head is at about the same height as a standard car driver's, making for easy eye contact—and safe cycling.

...and like the wind.

Recumbent design has a fundamental advantage in aerodynamics over the traditional bicycle frame. Because recumbent riders lie back with their legs horizontal, wind resistance is greatly reduced. The addition of a wind fairing can make the recumbent lightning fast. **All bicycling speed records are held by recumbents.** For any cyclist who demands performance and comfort, a recumbent is for you.

The numbers tell the story

Recumbents have the advantage in efficiency as well as comfort and safety. With a smaller frontal area (a) they have a better drag coefficient (b) than any other bike on the road. With better weight distribution, and efficient wheels and tires, recumbents have the low rolling resistance (c) of road racing bikes. They weigh in (on average) with road racing bikes as well (d).

	Hybrid	Touring	Racing	Recumbent
a.	0.5	0.6	0.3	0.2
b.	1.2	1.4	0.9	0.5
c.	0.008	0.004	0.003	0.003
d.	15	25	10	10
e.	75	75	75	75
f.	90	100	85	85

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

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