

RCN

RECUMBENT CYCLIST NEWS

RCN #29

The Planet's #1 Recumbent Source

Fall 1995

The Development of Modern Recumbent Bicycles

by David Gordon Wilson

Recumbent bicycles have had many revivals. A recumbent called the Velocar disturbed the conventional bicycling world in the 1933 to 1935 period because it was used to topple most existing bicycle records, and it was ruled, "not a bicycle." The latest revival of interest in recumbents has come about because of the formation of the IHPVA. Paired recumbent bicycles currently hold most of the world HPV records. Moreover, often the same recumbent bicycles that have won the Speed Championships have also been awarded practical-vehicle prizes. The recumbent bicycle, therefore, could have very wide application.

The Evolution of Safety Bicycles and the Upright Riding Position

Karl von Drais designed the first known bicycle (circa 1817) simply as a running aid, so it is difficult to define it as having a recumbent or upright sitting position. However, the designers of the first pedaled bicycles, Kirkpatrick Macmillan in about 1839 and Pierre Lallemand in about 1865, used the recumbent position, probably because riders of what were then unusual machines wanted to start with their feet on the ground. However,

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Photo by Allen Keinert — S.J. Barao Photography

The Ryan Vanguard by Robert J. Bryant

The history of the Ryan Vanguard begins back in the early early 1970's with the Avatar series of recumbent design experiments. Many are not aware that the design actually started out as a SWB design, but when some of the problems could not be worked out, the wheelbase was extended to a LWB—the Avatar 2000. Later, the Avatar 2000 became the design inspiration for the first Ryan LWB.

Dick Ryan was originally a machinist for Avatar and had a hand in building each of the 140 Avatars before production ceased in 1983. Dick has always been committed in the LWB USS (underseat steering design)—something that is becoming more rare these days with recumbent companies offering all-in-one bikes, many models and styles. Dick's mission was to redesign and simplify the many complex Avatar systems and the production process. His new company became Ryan Recumbents.

It has now been 15 years of refining of the

design—and we can easily say that the '95 Vanguard is the best ever. The Ryan has become world famous as a first-rate touring and commuting machine—the road limo of the recumbent world. Every part of the bike tells you she is built to tour—and be ridden long distances.

The Avatar/ Ryan also inspired many, dare we say, LWB USS clones. Some in the USA and a few in Europe including the Radius and Fateba.

FRAME—LEGENDARY DURABILITY

The Ryan frame is built of 1.25 (main tube) .035 wall True-Temper 4130 CroMo tubing. USA made tubing on a USA built recumbent. The frame is expertly TIG welded with a full host of brazons. The Ryan fork is a CroMo recumbent unicrown fork. The craftsmanship on Ryan's bikes is among the best in the industry. Over the years, the bike has become known for its robust build quality and fine finish. Dick is a perfectionist

....Continued on page 5

Editorial License

By Robert J. Bryant

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Doc's new dream bike—Flux ZPro

SUMMER SEASON 1995

Wow! Here we are at the tail-end of another riding season. The sales season has netted some interesting recumbent happenings. The SWB market is hot. ATP and Rans are backlogged with SWB orders. Some dealers ordered *Rockets* and *V-Rexi* well in advance, so they are to be had without delay—if you care to do a little detective work. The 24/20 wheel combo has become the hot set-up for the V-Rex. AngleTech is the key contact for these. We are expecting announcement of a SWB tandem from a well known manufacturer as well as an all new high-end SWB dream-machine for '96. We also know of one SWB with a very uncertain future—more on this later.

There was a mid-season run on *Ryan* and *Easy Racer* models which has their deliveries delayed a bit as well. This is a true sign of their timeless designs.

The trike scene is really changing. The \$6,000 *Windcheetah* is in short supply in the USA. The *Counterpoint Triad* was taken out of production and has become all but extinct! The *Zephyr* production trikes are also in very limited supply. Rick Horwitz will now only build only custom order trikes in the \$5000 range. The *US-Trice* is available, but on a delayed delivery basis (backlog). Jim Wronski reports that he will import a new trike from the U.K. called the *Rubicon*. It's stainless steel, has hydraulic brakes and should sell for under \$4000. Rumors of a new *Euro-Trice* manufacturer could be beneficial to the US trike marketnext year.

Our *Greenspeed GTR20/20* Australian trike has just landed in the USA. Attention readers: This is the finest trike we've ever seen. Pay close attention, renew your subscriptions and read all about it in the next RCN.

16" TIRE FUTURE

Here we are in the summer of '95 and a dependable version of the Kenda 90 psi 16" x 1-3/8" tire has not arrived here yet—and now we hear they are discontinued. Now, enthusiasts can debate which of the replacement tires is the best—Kenda, Chen Shin or Golden Boy.....?

The most recent go-around of the high pressure Kenda 16" tire has proven to be a pathetic failure. Why? If you want to keep your SWB bike low, you need the 16" wheel/ tire. If you want to keep your heel from crossing the path of the front wheel, you need a 16" tire. If you want to mass-market the SWB, you could use a 16" tire. If one of the best selling SWB recumbents in the USA uses this size, why can't we get a

decent tire? What's an enthusiast to do? Well, have we got good news for you. ATP is going to have their own 90+psi tire manufactured, hopefully in time to be on '96 models. We will report more as information becomes available.

A possible trend in 16" wheeled SWB bikes is retrofitting them to 20"s. ATP has a kit which includes a 20" fork, wheel and tire. What do we think about this? The jury is still out. The positives probably outweigh the negatives—but keep in mind—it does effect the geometry and handling of your bike. Many riders like the 20" geometry better. I have made it no secret that 20" wheels and tires are absolutely superior to 16"s. They are made for BMX, abuse, jumping, riding in pools, solar racers....and recumbents. ATP reports positive feedback and great sales of the 20" upgrade kit (20" experimenters, please send us feedback).

NEVER FEAR DOC 'BENT IS HERE

Interest in recumbent bicycles is higher than ever. Recumbent sales are better than ever before. RCN is going strong and we've finally gone full-time into publishing (quitting our day job) to bring you bigger and better RCN issues!

We find it interesting at how different Euro-SWB bikes are from their North American Counterparts. The Europeans kick their seats way laid-back and raise their bottom brackets up high. This makes for an easy use of 20" (or larger) front wheels and little heel interference. Designers, what do you think?

Rider Groups— We invite any active recumbent bicycle organizations to send us contact info that we will print in an upcoming RCN.

RCN BACK ISSUES

We are running out of some RCN issues. If you want an RCN#2-#13 issue, please order them in the next 60 days (valid thru 10- 31-95). We will offer a special bargain on back issues sold direct through RCN (mailed to our PO box in Renton, WA—ONLY). Any six back issues for \$24.99 (no#14, 26-27) postpaid USA.

ONLINE RECUMBENTS

If you have a computer, modem and an internet connection or similar service such as America OnLine, join Brian Wilson's HPV-Mailing List.. To join, send a message "subscribe hpv" to: Majordomo@zippy.sonoma.edu stop by and say hello!

Viva Recumbency!

Robert J. Bryant

RCN PUBLICATION INFORMATION

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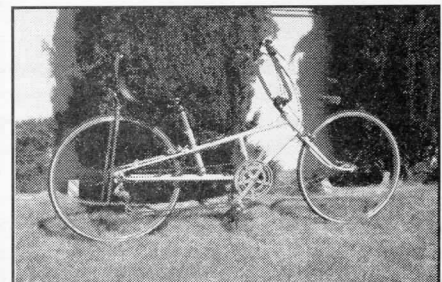
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Clay Patterson's RoadRunner
Photo by Clay

MARRIED WITH CHILDREN

Dear RCN,

Nice issue and congratulations on going solo (full time RCN publisher). If you find that town with \$50K houses let me know. By the way, is Katherine D'Amato single? :)

Name withheld

Nice try! Sorry guys, Katherine is an avid cyclist, runner, jogger, walker, has a career, two kids, some fish and a husband!

OUR RECUMBENT FUTURE

Dear Robert,

When I think back to when I was trying to find out more about recumbents and how hard it was getting started, I've got to say thanks to your publication—we've come a long way! I've also thought for years that someday the pot will melt-down the choices of styles to one or two. Will it be long, short, upright or underseat? I've now come to realize that just like the car industry, the bicycle industry can now offer an endless variety of shapes and sizes, breaking away from the grip of the diamond frame monopoly.

Going through the guide, turning page after page of consistently sized photos of endless variety of bikes and corresponding spec sheets really makes one feel that these silly machines are actually off the ground and flying—and they have no intention of going away as they have in the past, "in your face uprighters!"

Mark my words right here and now, "if we don't start getting the recumbent idea into younger minds, we're going to all go down with the ship." I would like to get one of my videos <IHPSC> into every middle school and high school library in the country, or hey even 1% of the schools would be helpful. I've tried to make this point with other HPV folk and it seems to fall on deaf ears. How many subscriptions go to school libraries? Not enough I am sure!

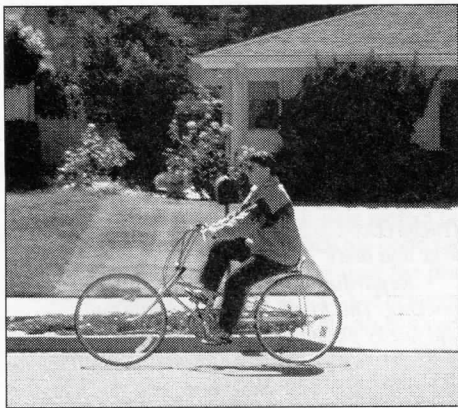
I for one would lie to see RCN grow to a ripe old age. Take care and have a good summer. As for myself, I've got to spend 45 days in Hawaii. My wife and I hope to bicycle several of the islands and camp out the whole time. It's a tough job, but somebody has to do it. Keep up the good work, Robert!

Recumbently yours,

Steve Iles

Steve, thanks for the kudos. Look for a review of your video elsewhere in this issue. We agree with you 100% on getting kids and young adults into recumbents and HPV's. Nowhere near enough is being done. RCN will offer any subscription at

.....Continued on the next page



Clay RoadRunner

—Photo by Clay Patterson

ROAD RUNNER

Dear RCN,

My name is Clay R. Patterson. I was born deaf and blind (in my right eye) in 1967. I'm a current junior college student, majoring in Office Automation in an AS degree. I attend Allan Hancock College in Santa Maria, CA since the fall of 1989. I have also worked at the Santa Maria Dept. of Recreation & Parks, as the Special Olympics volunteer. My specialization is data-entry computerization. I started my volunteer work in September 1993. I've been a recumbent bike owner since 1992.

Pictured is my Road Runner recumbent bike. This one is very easy to ride with above seat handlebar steering. I ride it around the Santa Maria city very well. I've commuted by recumbent from my home to college, work and the YMCA for three years.

My father saw an ad by the bike's former owner in a free ad paper in late 1991. However, I had rented recumbent bikes in Bend, OR and Steamboat Springs, CO before. The best rented bikes that I have ridden are the ReBikes. They are quite different from my recumbent, as they have very flimsy balance. It required me to balance more severely due to the different conditions such as steady hills.

Sincerely,

Clay R. Patterson

Deaf Recumbent Bike Owner

claypat@aol.com

Clay, thanks for writing. I have seen the Road Runner before, but I know nothing of the bike's history. If any RCN readers can tell us about the bike, please write. —Robert

1/2 price that goes to a library. This would benefit anybody in this industry, come on manufacturers and dealers, you know this is true, let's get get recumbents into the libraries and the hands of the next generation—Robert.

PEDAL-CARS

Dear RCN,

I really enjoy information regarding trikes (Trice, Windcheetah, Zephyr type). If possible, could you please tell me what hpv's are in RCN#12. They were used in the CBS environmental disaster mini-series.

Thanks,
Paul LeGrand

Dear Paul, there were several HPV's and recumbents used in "The Fire Next Time." The ones that come to mind are the Rhoades Car (pedal cars) and some pedal/ electric made by Mark Murphy of Blue Sky Design in Eugene, Oregon (sorry, we don't have a current address). Blue Sky builds the body for the AeroTrice by Eco Cycle (see RCN buyers guide). Rhoades Car builds a complete line of pedal cars. Rhoades Car, 124 Rhoades Lane, Hendersonville, TN 37075. —Robert

RCN—FOR THE ENTHUSIAST!

Dear RCN,

Enclosed is my check for renewal. I've been a cyclist for over 35 years and look forward to investing in a recumbent soon. I've been waiting for the "testing phase" to pass and reliable units to become available. They're here!

I've watched other magazines go from bike lovers' journal to consumer ad catalog—I hope you can avoid this! Your publication has the "warm fuzzies" that put the "human" back into Human Powered Vehicles.

Good luck,
John J. Bullaro, PHD

Thanks John! You won't see RCN become a consumer catalog. We are a publication by and for enthusiasts of way-cool bikes. RCN has lost a few advertisers to prove that we are 100% devoted to readers' interests.—Robert

Subj: Buyers Guide

Date: Sun, Jul 9, 1995 12:10 AM From: RPEDERSO@VM1.NODAK.EDU
Hi Robert,

Your Buyers Guide was super. I think that the recumbent dealers should pool their dollars and hire temps to do next years guide under your supervision/ consultation.

Keep up the good work.

Rodli Pederson
Rodli, I am afraid that <most> recumbent dealers and even many manufacturers don't see it your way (go figure?), but we love the readers' support and there will continue to be buyers' reference material available from RCN.

Subj: RCN #28 FEEDBACK

Date: Tue, Jul 4, 1995 9:06 AM EDT
From: Ron.Colverson@gb.swissbank.com
Dear Dr. Bob,

This is my first regular issue; my subs started

with the Buyers' Guide. The BG, by the way, is now falling apart it's so well thumbed!! RCN#28 arrived (in the UK) last week by air mail. It's way better than I was hoping for. My favorites were the EZ-1 review & interview, Zach's ride report, the Easy Racer vs. Vision reader test & the Homebuilder's Corner. There wasn't really anything I didn't like. For me, the style & the mix of articles is just right.

Here's looking forward to the next one.

Ron

COOL RANS BIKES

Dear Robert,

Please continue my subscription to your informative and enjoyable publication. When I receive an issue I immediately find a comfortable reclining device and read front to back. I am never disappointed in the contents, but only when the last page appears.

Restraint has never limited my activities when human powered vehicles are involved. I now possess a V-Rex and a Stratus. Choosing Rans was made easy by their attention to the smaller detail and the outstanding quality of their frames. Both are equipped with Sachs 3 x 7 hubs, 700/20 wheels and their very comfortable mesh seat. The Stratus has a road fairing by Zzipper mounted to handlebars made by Easy Racer.

My 13km commute to work along Victoria's waterfront is probably the best in the world. With little traffic and a 25-30 knot westerly blowing, both recumbents deliver me at work in much too short a period of time. I am finding that the fairing on the Stratus makes a very noticeable difference in downhill speeds and my ability to maintain a higher average speed on the flats. I felt the SWB V-Rex would be similar due to its lower frontal area, but it is not, both climb hills with the same amount of energy expended.

Several months ago I couldn't have described a recumbent, but now I am completely captivated by their comfort and performance. I will probably retain my UHCD2 (Uncomfortable High Coefficient of Drag Device), but it's use will gradually fade and the dust will accumulate.

Sincerely,

Mike Sheehan, Victoria Canada

STREAMLINER 101

Dear RCN,

I am interested in getting a fully faired recumbent streamliner such as the Lightning F-40, Gold Rush Replica or AeroTrice. Can you offer some advice?

Thanks, Paul

Dear Paul, The F-40 is the most advanced fully faired production two wheeler there is. It is the dream bike of many riders. The aspect that many don't understand is that this is a truly ADVANCED bike. The full body aerodynamics create a new extended learning curve. Tim Brummer will not sell one to every customer who wants to buy one. Admittedly, we have made light of the "F-40 pre-owners test" situation, but in truth, it is good that he does so. An F-40 in the hands of a novice on a windy day can turn it into an airplane without controls. Even for the most seasoned, skilled F-40 rider it is a bike to be respected. If you are committed to a fully faired bike:

A) respect the work of the designers out there
B) be prepared to spend countless hours perfecting your own design.

C) BE CAREFUL

The F-40 owners manual makes many correlations between flying and sailing (two past times that I happen to love).

As for the AeroTrice, this body is basically for rain protection. The AeroTrice body was not designed for a Trice, the Trice was redesigned to fit in it. The AeroTrice shell was designed for electrathon racing. Most who've seen it say it's difficult to use. The canted in wheels are not standard on a Trice. The body that was designed for the Trice is the fg nose cone/ soft body from Peter Ross/UK. The AeroTrice is not in the same league as other faired 'bents. There have only been a few built and there is no cooperation with the Trice designer, Peter Ross. A better example is the faired Windcheetah or Leitra, however, these bikes are big bucks—we estimated in the \$7500 range. Ken Trueba (Eco Cycles) is currently working on a new trike and body.

Regarding the Gold Rush Zzipper/ body stocking: This fairing takes very little time to learn and works great. It goes on, removes and stows easy. It is not as advanced as an F-40, as it has no aero tail section or underbody, but this makes it that much more user friendly, and admittedly, a bit slower....and probably a safer speed option.

Speed projections (IMHO): If you can ride your Gold Rush Replica/ Super Zzipper at 20 mph, you should be able to ride a GRR with body stocking at 24 or 25. With the same effort, you should be able to ride your F-40 at 28 or 29 mph.

As with driving high performance automobiles, speed on bikes is to be respected. —Robert

Subj: Car racks

Date: Mon, May 15, 1995 8:08 AM EDT
From: CPHELPS@admin.rochester.edu

Dear RCN,

From your past correspondence it seems that people haven't solved the problem of a car rack for a LWB recumbent yet, and usually turn to something like a tandem rack (expensive) or a hand made job of some sort (not available to most folks). If this is still a problem, I have some good news: I've devised a system to carry my Tour Easy that uses entirely off the shelf parts from Yakima, and it's really easier to put the bike there than to put my old road bike on a rooftop rack. The trick is to put the rear wheel on a crossbar attached to the trunk of the car (near the rear) and the front fork on a standard roof rack. Yakima's new Q Tower series does the trick 'cause it has gadgets that allow trunk mounts.

Charles Phelps

Subj: Re: High Praise/ decreased rants

Date: Fri, Jul 7, 1995 12:20 AM EDT
From: XDVN52A@prodigy.com

Dear Bob,

I just got your RCN #28. It's great!! I really like your editorial style and, like many others,

.....Continued on page 17

....Continued from the cover story, page 1

THE RYAN VANGUARD

when it comes to his bikes and it shows. The Ryan comes in a standard size that fits most riders, as well as an XL and even a custom XXL on special order (very tall riders). Paint is Imron red or black and custom colors are optional.

For 1996 models (delivered after 9/95), all Ryan Recumbents will be built by Richard Schwinn's Waterford Precision Bicycles. Waterford is quite possibly the best, most respected bike builders in the world, having built the USA hand-built Schwinn Paramount line for many years. This is very exciting news for Ryan fans and especially future recumbent purchasers.

USS—UNDERSEAT STEERING

Dick Ryan helped write the book on USS indirect steering. The Ryan set up is the best underseat steering linkage in the industry today. It is quiet, smooth and makes for near perfect remote steering geometry. Why? Dick has perfected USS/ USS LWB design geometry over the past 15 years. The steering is set at 1.25:1. Dick says many new builders try 1:1 which results in a very poor handling bike. The 1.25:1 speeds up the steering resulting in a luxurious dialed-in feel. The steering is really the key to the great Ryan ride.

The Ryan has steering adjustment increments of 1/2"—the system is not infinitely adjustable. There is also threading on either side of the steering rod that will compensate for maybe another 1/8"-1/4", so dialing in of the system may take some time to get perfect. In mentioning this, we can also say that this most recent upgrade of the steering linkage/handlebar mount/seat mount/ seat horn is the best ever on the bike. USS fans will certainly respect and covet what has been done here.

For 1995, Ryan has a new two-lever (no tools to adjust) steering seat clamp mechanism that has simplified steering adjustments considerably. Also new for 1995 are the seat take-off/ adjustment bolts. It is now possible to adjust the steering and seat independently and quickly. What was once a drawn out twenty minute affair, now takes a minute or so.

RYAN SEAT—LAID BACK KARMA

The seat is very unique and popular among seasoned recumbent riders, especially those into touring. It is made of ventilated nylon mesh that is suspended over an aluminum tube frame. The Ryan seat is again proven tough and high quality. It is used by many home-builders and even other small manufacturers. The seat has several adjustable straps that allow you to loosen or tighten the mesh in order to dial in the shape of the seat. The mesh is breathable—which is important when you're spending hours or even days on a bike.

The seat design is part of the laid-back attitude and comfort that has become the Ryan trademark. Lean back—way back! If we labeled recumbent seats as to their recline, the Ryan would be in the extreme laid-back category. There is an adjustable recline angle, but the seat base vs. back angle is....laid back. Even in it's most upright position, the seat was more reclined that I was accustomed too.

The seat horn is a fact of life on a Ryan Vanguard. Unfortunately, the horn is necessary to hold the front edge of the seat material taut in front of the seat. The problem for some riders is that the seat horn brushes a rather sensitive area of the human anatomy. Dick reports that it is only a small segment of Ryan riders that notice this. So what do you do if..... The Thermarest seat cushion option erases most evidence of the seat-horn. We have also seen riders add foam pads to the Ryan seat base.

Over the years, the seat-horn has become less pronounced, but it is still worthy of mention in this review. Our most recent Vanguard had an even less apparent seat-horn than we've experienced with past models.

If you are amongst the laid-back-karma mind set of laid back Ryan riders, you will appreciate this riding position. Comfort is the key word. Dick wasn't too concerned about scientific reports about power output, seat or bottom bracket positioning. He went for comfort—all the way.

COMPONENTS

The Ryan component package is first-rate. The derailleurs are Shimano Deore LX. Shifting is aided by a high quality Sachs freewheel and 21 speeds shifted via Grip Shifts. The retro-grouches at RCN were unanimous that the Shimano bar-end shifters with modified Advent bar-ends facing up and away from the rider were the best way to pilot the Vanguard (optional). It kind of reminds me of airplane controls and those bar-cons shift so nice. Grip Shifts with the bar-ends facing rearward are the standard fare.

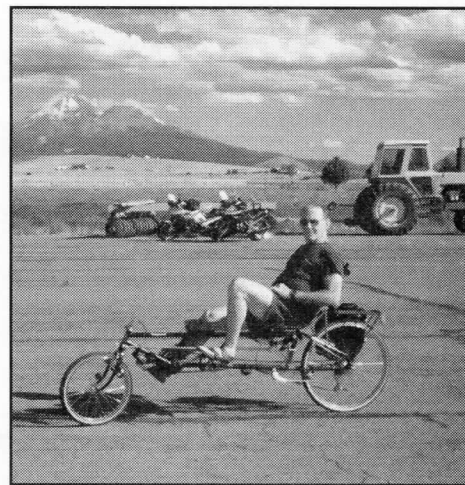
One minor problem we found was the Deore LX front derailleur was made for a microdrive style of crankset. These use chainrings of no larger than 42 (or so) teeth. The Ryan's crank had a 52-tooth outer chainring. Shifting was still good, but we did have to tweak the front derailleur a bit. There was some occasional chain slap of in the large chainring. Retrogrouch lesson: If you have old stock high-end derailleurs and components—hang on to them—they work better on bents than do some of these new fangled units.

For those of you that must have better components, a Shimano Deore XT version is also available and some Ryan dealers offer their own custom versions, some are even doing Sachs 3x7/ 63 speed versions.

STOPPING

The Ryan stops really well and with the long forgiving wheelbase, you can nail the brakes as hard as you like. For '96, braking is via Pedersen Self Energized front and rear cantilever. In the past when we have ridden Ryan recumbents the front braking has suffered, as was the case with the front brake on our test bike. It was something about that long snaking front brake cable routing that seemed to rob the power. We have always been tempted to throw on a front drum brake.

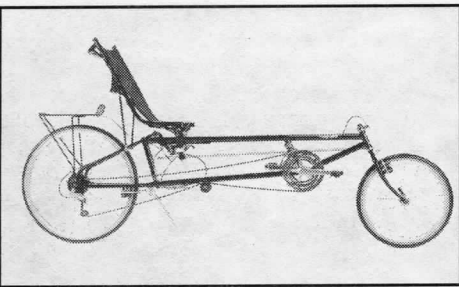
Our mid-year '95 test bike had one Pedersen on the rear and a Dia Compe FSE on the front. The FSE felt mushy and was not capable of stopping the bike on its own. We installed Kool Stop pads, which helped, but we still would have liked stronger front braking. For '96, Ryans will have



Dick Ryan in Yreka 1992-RCN

TOP TEN REASONS TO BUY A RYAN RECUMBENT

- 10) You can cruise in comfort while sipping your Latte or iced tea and holding the Ryan bar-end with one hand.
- 9) The Ryan is perfectly suited for riding with Birkenstock sandals. (Ryan Sizing: inseam, X-seam, height, Birk size.....)
- 8) You can have Dick Ryan help you locate one of those 70's leather bike helmets and some goggles to go with (but do they have the matching pocket protector?).
- 7) You won't have to worry about adding all those costly high-tech parts because Ryans are cool without them.
- 6) You can hang with the laid back Ryan riders and snicker at the racer guys speeding by at the recumbent events.
- 5) You can lay your seat back as far as possible so you can take a nap when you get tired on a long ride.
- 4) Acquire bragging rights because your vintage Ryan Vanguard was built, welded and painted in Eugene, Oregon and has a SunTour drivetrain (and you keep it in friction mode).
- 3) Acquire bragging rights because your vintage Ryan has needed no parts replaced and is as tough as the Golden Gate Bridge (this article is reminding you that it could be time for that first 15,000 mile tune-up).
- 2) You can help Dick Ryan finance his move BACK TO Eugene, Oregon, so he can get some good granola.
- 1) You can spend your riding time saying hello to all of the passers by on the bike trail and keep track of how many respond.....and how many Lycra-heads don't look at you like you're from outer-space.
- 1) (alternate) Spend your riding time checking out the babes/ hunks on the bike path because you're having so much laid-back fun and you're not in a hurry.



front and rear Pedersens. If anything, these brakes have too much stopping power—and they wind-up quick for an all-or-nothing feel. Bite my tongue, but maybe this would be a good bike to throw on a set of Magura hydraulics with their excellent modulation (but don't ask Dick for these.....).

WHEELS

The wheels are a tough combo, a 26" x 1.25" Specialized Fat Boy on a Weinman Bontrager rim on the rear and a 20" x 1.5" venerable Haro slick with a Weinman rim in front. Dick once told me of a rider who went 18,000 miles on a Haro, try that with your 16" kid's bike tire! The hubs are Sovos cartridge sealed bearing units. I know, Sovos? Who are they? Isn't this the imported stuff that Bryant is always ragging about.... Yes! Well, I decided to try them out for myself and they are pretty smooth feeling hubs. And we love the cartridge bearings. Overall, the wheels are of very good build quality and are the perfect set up for this bike and the comfortable riding it brings.

LWB USS HANDLING

In our 1990 review of the Vanguard, we wrote, "The Vanguard's handling is in a class by itself." I still think this is true now more than ever. The Vanguard is as smooth as silk and easier to control—than those SWB pitch-men would have you believe. Once mastered can be done with your palms or just two fingers on each bar-end.

The excellent handling characteristics are due to several factors:

- An extremely dialed-in geometry.
- The long (luxurious) wheelbase.
- Fingertip controls that are close to your body.
- Comfort being the ultimate design goal of the designer.

USS (underseat steering) makes for a bike that is complex and labor intensive to build—and it must be dialed-in. It is important to note that Dick Ryan has paid close attention to the proper ergonomics of the underseat style of recumbent. Some bikes we've ridden have such a long reach, you have to be spider-man to grab the bars—not so with the Vanguard. And with the customized bar-end extensions, the steering is ooh so sweet.

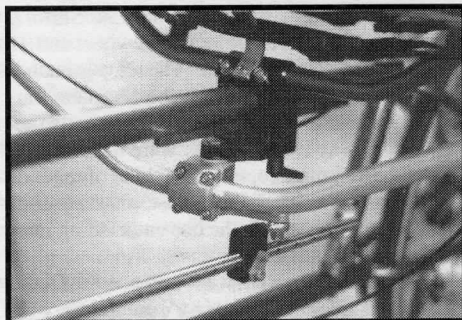
FINDINGS

The Ryan recumbent is built rock solid. There are no unsupported beams, stays or frame tubes, there is full triangulation of TIG welded CroMo tubes that make for one of the toughest recumbent bicycles available today. LWB recumbents take less of a beating than their SWB brethren by absorbing road shocks and bumps over the long

wheelbase. This makes for a much smoother ride than you'll get on virtually any SWB, or skinny tired LWB.

Compared with other LWB recumbents, the Ryan's riding position is farther back and there is more weight on the rear wheel. The Ryan seat is also mounted higher on the bike, which makes the center of gravity on the Ryan higher. The bottom bracket is also mounted fairly far back keeping your feet well out of the front wheel track.

In all fairness, we did find a few items that we'd like to see addressed. Foremost, the Ryan is a bike that needs to be purchased through a dealer. The assembly of this bike is too big of a job for most new riders. We suggest ordering your Ryan through your local recumbent dealer or bike shop—or else sweet-talk Dick into preassembling it for you and shipping it in one of those large boxes they once used. Also, we have never liked the front brake cable routing. The new seat and steering adjusters are the best improvement to the Vanguard in the bike's history, but we would like to see a return of the Eugene-Ryan era (classic) of multiple holes for seat stay adjustment.



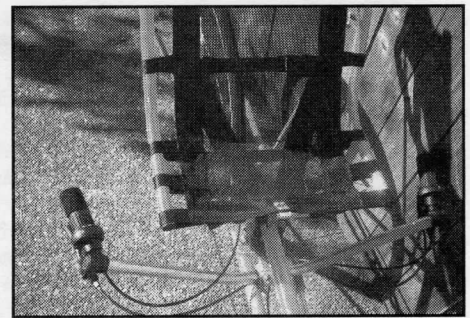
The new Ryan handlebar/ seat adjuster—Photo by Ryan Recumbents

RYAN LUXURY

The Vanguard is a thoroughbred in the recumbent world. So many riders are concerned about performance, speed and getting places in a hurry. With the Ryan I found that I was thinking differently about my ride (an altered recumbent state?). Taking in the sights, smells, surroundings—and not concentrating on going fast, beating the other guy or keeping my bike tracking in a straight line—totally enjoying the experience of this bicycle.

The bike has a wonderful natural track that most designers would envy. Unfortunately, the Ryan has a reputation amongst performance riders as being a slow bike. But even if it is, we say so what! On a recent ride from People Movers store in Orange to Huntington Beach, a Ryan led the pack most of the way, until that sneaky Rocket rider snuck by us near the end. I must admit that I did notice a lack of quick-acceleration and my hill climbing power was less than on some bikes. The reason for this is most likely the very low bottom bracket height and extremely laid-back seat angle. The Ryan probably does not have the most optimum seating position for power-output. Truly, the Ryan was built for comfort rather than high-performance riding.

Have you passed on the LWB because they



The Ryan bars & bar ends—staff photo

are not compact enough? Or you think they're too hard to maneuver? Well, a Ryan will easily fit on the rear rack on a mid-size car, mini-van etc. and will barely hang out the sides with the wheels off. As for maneuverability, Ryan riders learn this cool technique of standing, grabbing the bike on the main tube in front of the seat, lifting up and twisting the bike until it is placed in the direction of the new destination. This is tough to do on non-LWB USS recumbents.

On a recent trip to daVinci days in Corvallis, Oregon, I had the occasion to ride with a group of SWB riders. Over the course of the weekend, riding in metro Corvallis, with crowds, in an HPV parade, on the local bike trails and out in the country, I never once got into a situation where the SWB helped in maneuverability—except for trying to

RYAN SPECS

DESIGNER: Dick Ryan/ 1989
 WEIGHT: 31 pounds
 WEIGHT DISTRIBUTION: 70% rear/
 30% front
 WARRANTY: Lifetime
 WHEELBASE: 66.5"
 HEAD TUBE ANGLE: 69 degrees
 RAKE/ TRAIL: 2.25"
 REMOTE STEERING: 1.25:1
 SEAT HEIGHT: 25"
 SIZES: 5'4"-6'2"
 FRAME/FORK: CroMo/ TIG
 SEAT: 6061-T6 AL/ nylon mesh
 WHEEL SIZE: 26"/ 20"
 DERAILLEURS: Shimano Deore LX
 SHIFTERS: 21 spd. index Grip Shifts
 CRANKSET: SunTour XC Expert 32/
 42/52
 GEARING: Sachs Aris 13-32
 GEAR-INCH RANGE: 26-104:
 BRAKES : Pedersen Energizing cant.
 FINISH: Imron black, red
 SOLD THROUGH: Select dealers/
 Direct
 SIMILAR MODELS: XT upgrade,
 tandem
 ROAD TEST: RCN #4, #29
 SUGGESTED RETAIL PRICE: \$1650

get them all back inside the van to go home.

The Vanguard is a recumbent legend with a classic proven heritage and it is most definitely the most refined touring recumbent available today. For more information on this great LWB recumbent bicycle, contact Dick Ryan at Ryan Recumbents, One Chestnut St., 4th Floor, Nashua, NH 03060. Ph #603-598-1711. □



Photo by Allen Keinert — S.J. Barao Photography

RYAN AWARDS

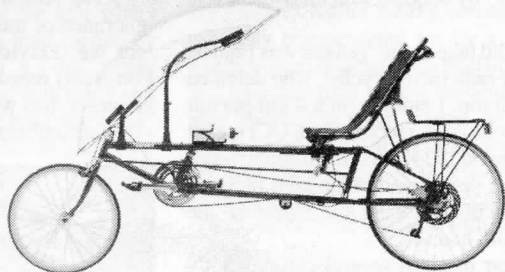
Basically, the Ryan Vanguard has won this award every year that we have ever judged bikes or offered awards.

- 1995—Editor's Choice for Best LWB USS Recumbent
- 1994—Editor's Choice for Best LWB USS Recumbent
- 1994—Best Craftsmanship on a Recumbent
- 1993—Editor's Choice for Best LWB USS Recumbent

TANDEM NOTE

Do you own a Ryan Fleetwood/ DuPlex or another commercially available recumbent tandem? We'd love to hear your story or send us a review.

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Recumbent Cyclist News Awards:

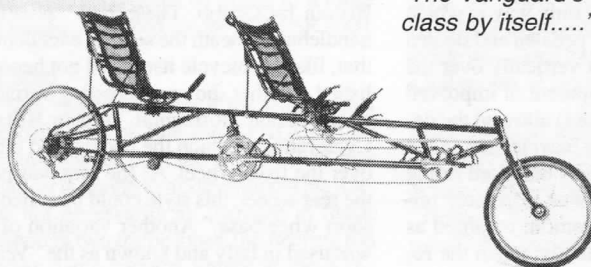
- 1993, 1994 & 1995 —Editor's Choice for Best Underseat Steering Recumbent
- 1994—Best Craftsmanship on a Recumbent

"The Vanguard's handling is in a class by itself...." —RCN 1995

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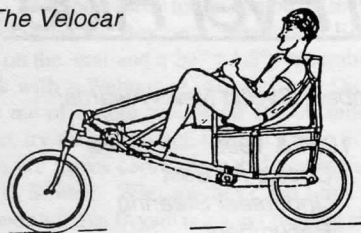
The Development of Modern Recumbent Bicycles

by David Gordon Wilson

.....Continued from the cover story, page 1

the direct coupling of the pedals to the wheels meant that the effective gear ratio was, in modern terms, superlow. Gears and chains were not developed to the point where they could be used to improve the gear ratio. Accordingly, the pedaled front wheels of the Lallement bicycles were

The Velocar



steadily increased in diameter until they were as large as could be comfortably ridden: the machine became the high-wheeler. The only way in which the high wheeler could be both pedaled and steered was for the rider to be almost vertically over the front wheel. When the development of improved chains and sprockets (circa 1884) allowed the development of the geared safety bicycle—so called because of the high, precariously balanced riding position of the high wheeler was extremely unsafe—the upright pedaling position, regarded as normal, was retained. Accordingly, when the recumbent bicycle reappeared in geared form, it was regarded as an aberration.

THE GEARED RECUMBENT'S FIRST 30 YEARS, 1895 TO 1925

The "modern" safety bicycle had evolved almost to its present configuration by soon after 1890. While we cannot similarly refer to "modern" recumbents, because there are at present many styles being made, something close to one modern style was made in Belgium around 1896. In this the rider sat rather high, directly over the rear wheel, and starting must have been difficult. Another American recumbent was that produced by Brown, in which the rider's seat was entirely forward of the rear wheel, and the front wheel was forward of the cranks, an arrangement used by several modern machines, including the AVATAR 2000.

Peugot produced a recumbent bicycle in France at an unfortunate time: 1914, the year in which World War I started. Perhaps this had the greatest potential of success of all unorthodox bicycles because Peugeot was a significant company, and because it had the greatest chance of influencing the French-dominated UCI. However, the

war ended this effort. After the war, the Swiss engineer Paul Jaray made the J-Rad recumbents in Stuttgart in 1921 with limited success.

THE VELOCAR

Later in the 1920s a class of cyclecar racing became very popular in Germany with the American-German sailboat researcher Manfred Curry taking a prominent part. In France a self-taught engineer, Charles Mochet, was making small motorized cycle cars. He also made a one-seat, four wheeled pedal car for his son, Georges, who would "amuse himself by pedaling fast and passing ordinary bicycles with ease." Charles switched his production entirely to a two-seat, four-wheeled HPV that he called a Velocar. According to A. Schmitz (Why Your Bicycle Hasn't changed in 106 Years) it had free wheels, a differential, and a three-speed gear and was fast enough to pace bicycle racers around the track. Its instability on turns gave Mochet the idea of "cutting the Velocar in half, figuratively" by building a recumbent bicycle for racing.

One who did take to the Velocar was Francis Faure, a second-rank racing cyclist, who defeated the world champion, Lemoine, in a 4 km pursuit race. He also broke track records. The UCI met in some disarray and in 1934, after much controversy, passed rules that disallowed recumbent bicycles for officially sanctioned racing and, therefore, the records that Faure had set.

The Velocar inspired several commercially produced recumbents, especially those built in Britain by Grubb. These had "Whatton" style handlebars beneath the seat, an excellent principle that, like the bicycle itself, did not become established. Neither did an interesting variation known as the Ravat Horizontal, sold in Britain as the Cycloratio, in which the pedals and cranks were over the front wheel. As the seat was partly over the rear wheel, this style could be called the "high short wheelbase." Another variation of this style was used in Italy and known as the "Velocino." A high long-wheelbase recumbent using a steering wheel, but otherwise being constructed of conventional bicycle components, was the Moller Triumph.

After the Second World War, the principal users of recumbents known to us were some in



The Cycloratio
—photo by Mats Nilsson



The Avatar 2000
photographer unknown

Britain still riding Grubbs, and Dan Henry in the US, who made a personal long-wheelbase machine for his own use. Henry used standard 27" wheels and designed very effective springing on both.

THE EVOLUTION OF THE AVATAR

The Avatar 2000 was developed largely in ignorance of the foregoing history. To some extent we (David Gordon Wilson and Richard Forrestall) repeated what had been done before. However, had we known of the existence of previous recumbents, we might well have taken the



The J-Rad—Photo by Mats Nilsson

same course, because little had been reported of either their deficiencies or their advantages.

The design evolved from many initial sketches and careful layouts on the drawing board. There was even some simple analysis. But most progress was achieved by the old-fashioned way of trial-and-error. That this was so was not through laziness or lack of rigor. Any device that interacts closely with human beings should be designed with great attention to detail, but it is virtually certain that major deficiencies will become apparent only after the device has been in use. A review of the stages we went through, and the conceptual errors we uncovered, will, we hope, help others avoid similar mistakes.

The first two recumbent bicycles in the series were made by H. Frederick Willkie II, who, inspired by a design contest, had written David Gordon Wilson (DGW) asking for a sketch of what he thought would be an advanced type of bicycle. Thus, the first (1972) of the two bicycles, called "Green Planet Special I" (GPSI) by Willkie, was later found to bear a strong resemblance to the Ravat, a high short-wheelbase machine. [The wheelbase of the GPSI is—45".]

Willkie used the GPSI around Berkeley, CA, achieving reportedly high speeds, but found the crude seat jarring to his spine. It was obvious, also,

that the handlebars and stem almost directly in front of his face could cause injuries in an accident. At Willkie's request, DGW sent a new sketch and suggestion for changes to produce a low short-wheelbase recumbent.

The result in 1973 was the Green Planet Special II (GPSII), in which Willkie lowered the cranks as far as possible and brought the steering-head tube back so that the front-wheel rim would clear the heels. This also permitted the handlebars to be under the thighs. Although he used a hard molded-plastic seat, Willkie found that this machine was far more comfortable than GPSI, partly because there was a far more "open" angle between the torso and the line connecting the hips to the crank axis, allowing better breathing, and partly because he was now sitting more on his buttocks and less on his coccyx. [The wheelbase of the GPSI is—40".]

The loading on the 16" x 1" tubular front-tire was, however, very large, and a typical tire life was less than 100 miles. When DGW bought GPWII from Willkie he brought the rear wheel about 12" forward to reduce the load carried by the front-wheel, fitted a robust 16" x 1-3/8" wheel and clincher tire, and experimented with many seat types and angles. [60-degree seat back-angle, 24" seat height and a 15" bottom-bracket height]. This much modified version of the GPSII was renamed the "Wilson-Wilkie" (WW) and many thousands of miles were covered on it in great comfort and enjoyment.

This unusual machine attracted media people, and was the subject of many newspaper articles and photographs, TV interviews, talks, two school movies and a Mobil commercial. It may have inspired a commercially produced recumbent of similar appearance but dissimilar details, known as the Hyper-Cycle.

The WW did have flaws, despite its delightful features. It was still heavy on the front-wheel, causing even the clincher heavy-duty tire to last only one or two thousand miles. Spokes in the front wheel regularly broke. Heavy braking on the front wheel would cause the rear wheel to lift, and after an emergency stop, the rider could find himself standing with the bicycle vertically behind him. On two occasions there were more dramatic stops when, in one case, the front-brake retaining nut shook itself off, the brake fell on to the tire, rotated around the rim and became entangled in the spokes. The front wheel locked, the forks bent back, and the rider, travelling at between 25 and 30 mph, went forward onto his feet and then on to his hands. Nothing more than abrasions and bruises resulted. This and the other spills confirmed the outstanding safety features of the recumbent design with below-seat handlebars.

Through the interest of a potential manufacturer in an improved version of the Wilson-Wilkie, DGW met Richard Forrestall in his search for builders willing to work on what seemed to most the somewhat strange designs he was drawing. Forrestall and his partner, Harald Maciejewski first built the AVATAR 1000 (A1K), an improved version of the WW, in 1978. In this the front wheel was moved forward about 10" from that in the WW in order to reduce further the load on the front wheel. This was done despite the potential interference between the heels and the front-wheel rim

because it was realized that this interference could occur only at speeds below about 6 mph; at higher speeds, the maximum amplitude of the front-wheel steering movements is too small for interference to take place. To retain the previously convenient and comfortable placement of the handlebars below the seat, a ball jointed steering rod was used to connect the handlebars to the fork crown. [The wheelbase of the Avatar 1000 is—36.75".]

The A1K was a considerable improvement on the WW, and gave longer front-tire and front-wheel life. The learning period needed to become used to keep the heels out of the way of the front-tire at very low speeds was short. Only in extremely heavy braking did the rear-wheel show any tendency to lift. Comfort, already impressive on the WW, was further enhanced with the reduction in front-wheel loading.

The relatively higher loading on the smaller front wheel of the A1K compared with the conventional bicycle (roadster & 10 speed) inevitably leads to higher rolling resistance, but this is probably compensated for by a lower air drag. There was no reluctance to load up the rear wheel, and interstate trips were confidently and comfortably undertaken when loaded with gear. We felt that to improve upon the A1K we should further decrease the loading on the front-wheel. The ideal front-wheel location would seem to be to have a common vertical tangent with the front of the pedalling circle.

In 1979, we solved the nose-heaviness of the short-wheelbase recumbents by going to a long-wheelbase design. We called this the AVATAR 2000.

AVATAR 2000

The sole "cost" to moving the front wheel forward appeared to be that the AVATAR 2000 (A2K) became longer than the A1K, which was almost identical in length to a conventional bicycle. There was not necessarily an increase in mass, because although two frame tubes, the steering rod and the brake cable become longer in the A1K, the frame is much simplified, stresses are greatly reduced, and two idler cogs (chain idlers) needed to route the chain over the front wheel on the A1K are no longer needed. In addition, the following advantages over the short wheelbase A1K were found, some of them unexpectedly, to be added to the already listed advantages of the recumbent bicycle over conventional bicycles.

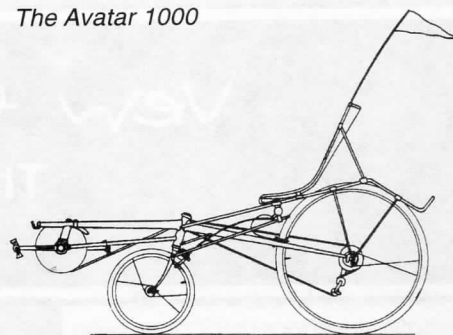
1. Tracking accuracy became very precise. While all bicycles should go where the riders steer them, the outstanding ability in this respect of the A2K extended to ice and snow conditions, in which the light loading on the front-wheel allowed it to climb over ice and snow ridges that would cause the short-wheelbase versions to skid.

2. Full braking on both wheels can be used at all times except on slippery surfaces. In normal circumstances a front-wheel skid cannot be induced.

3. The high proportion of the weight distribution on the rear wheel gives outstanding rear traction in snow and ice, and outstanding rear-wheel braking in all conditions.

4. Although the seat frame undergoes almost the same vertical accelerations as the rear wheel, the resilience of a fabric seat in the vertical direction gives the effect of springing.

The Avatar 1000



5. At speeds above two or three meters per second, the combination of rolling and air drag for the wheels alone is lower than for two large wheels, because of the low forces on the small front wheel. The rear wheel runs partly in the lee of the rider's body, reducing its air drag. The semi-recumbent position gives a lower frontal area, of course, than does a conventional bicycle because having the legs out in front more than compensates for the somewhat more "exposed" attitude of the torso and head.

6. A small but appreciated advantage of the LWB recumbent is that it can be carried around almost like a brief-case by holding the top tube just in front of the seat.

The above article was originally from the 1983 paper "The Evolution of Recumbent Bicycles and the Design of the Avatar Bluebell" by David Gordon Wilson and from the forthcoming book by Allan Abbott and Dave Wilson called HUMAN-POWERED VEHICLES. The above article was edited by the RCN staff. RCN is planning a full review of this book as soon as it is released.

David Gordon Wilson is a recently retired professor (MIT), the co-author of the book Bicycling Science, and the long-time editor of the IHPVA's "Human Power" quarterly. He is one of the world's leading experts in the field of human power.

"I loved my SWB Avatar 1000 but when I switched to the LWB Avatar 2000, I was completely converted and now find it difficult to ride the 1000. But I'd like to try a CLWB like the original Velocar, or one with sliding cranks of some sort." —David Gordon Wilson July 1995. □

FRONT WHEEL LOADING DISTRIBUTIONS

	Front wheel	Rear wheel
Three-speed Roadster	36%	64%
Ten-speed	40%	60%
GPSII (est.)	70%	30%
Wilson-Wilkie (WW)	65%	35%
Avatar 1000 (A1K)	62%	38%
Avatar 2000 (A2K)	31%	69%
From the RCN archives:		
Hypercycle (generation I)	73%	27%
ATP Vision (16" wheel)	59%	41%
Lightning P-38	55%	45%
Counterpoint Presto	54%	46%
Haluzak Horizon	54%	46%
Ryan Vanguard	30%	70%
Easy Racer Tour Easy	35%	65%
Easy Racer EZ-1	25%	75%

View From The Big Chair

The Far Side Of Tire Sizes

by BJ Strass

Cycling is a confusing sport. At least as far as measurements go. A common Road Bike will have a combination of metric and English sizes.... 9/16" pedals....5mm rack bosses....an English threaded bottom bracket in metric widths....and it goes on and on. For we 'Bent riders the dilemma of tire size comes into play. What's the big deal you may ask. After all a 16 tire is 16 inches right. WRONG! In the design of tires the creator saw fit to use their own individual measurement systems. Some measured the outside of the tire, some measured the bead seat to the bead seat, others measured....well who knows what. Thus it is always a few times a year I get a call from someone having just purchased a 16x1-3/8 tire for their bike and finding it will not go on the rim. In actuality they did get a 16x1-3/8 tire but the actual diameter is different than the 16x1-3/8 tire they require. "Did you check the E.T.R.T.O.?" I ask. "THE WHAT," I get in reply.

The E.T.R.T.O. is the universal "True Size" method of measuring a tire and rim. Most tires have this designation stamped on the sidewall such as.... "ETRTO 37x451"but admittedly, some do not. The 37 is the 37mm width or cross section of the tire. The 451 is the 451mm bead seat diameter of the tire. I have compiled the following list of tire sizes we commonly and uncommonly use. By far this list is not complete. There are many other sizes of tires out there, many of them obscure (Schwinn was notorious in the old days of using their own unique tire sizes on their bikes). I must admit I do not know the ETRTO of all the tires listed and would appreciate a knowledgeable reader to enlighten me with their ETRTO. Here's hoping this helps you in getting the right tire for your 'Bent.

Give Me A Break (Brake)

Again while we wait for the rest of the world to catch up to us in our heightened status of recumbent riders we are made to suffer in some areas due to the short supply of components designed with the 'bent rider in mind. Sure we always find what we need but it would be nice to have a better selection. Brakes has always been one of my "pet-peeves" as many brakes designed for road bikes will not work on 'bents due to cable placement, incorrect reach, etc. Many bents come with cantilevers now but still many do not and have not in the past. In your search for upgrading your brakes it is necessary to be open and creative. Trying a bit of non-convention may pay off well.

Most SWB/MWB's require that the cable for the front brake enter the brake on the left side of the bike so as to not interfere with the chain. There are only DiaCompe and Weinmann road brakes made in this manner and both are of only fair stiffness. But BMX brakes have the cable on the left side (most) and generally are quite strong for the rigors of racing. Odyssey, DiaCompe Bull Dog, and others are available from your local BMX shop. Husky dual pivot brakes such as the DiaCompe Big Dog and FSE however have right side cable routing. However, these still may be used. In some instances it is possible to mount these brakes on the back of the fork which reverses it and places the cable on the left side. Again it is important to know the "reach" so as to make sure it will work.

LWB's with caliper rear brakes often suffer in braking due to the heavily weighted rear wheel. In the past the excellent Magura Hydraulic brake could be used (at consider expense) but is no longer available in a caliper mount. The aforementioned Big Dog/FSE brake works well but the

best is the Pit Bull from Odyssey (What is it about naming BMX brakes and red beer after dogs anyway??). This brake is a roller cam design on a caliper mount. It is really strong and has it's own built in cable stop. This brake often works equally well on the rear of SWB/MWB's will not work on the front due to it's cable placement on the center of the brake.

Another item often overlooked is the 2mm brake cable. These are used on some tandems and MTB's. The thicker diameter minimizes cable stretch and works well for long runs of cable but it is required for the cable run to have minimal and gradual bends. Sharp bends only cause stiff heavy brake lever pull.

It is often thought that lubricating the cable and housing will make the action smoother and overall better. This was true in the days when cable housings were bare metal but now all are lined with nylon, Teflon or gore tex. Lubing the cable/housing will cause the lining to expand, catch and hold dirt, and in colder climes, the lube will thicken (If your bike has sluggish index shifting and you lubed the cables you now know why). The best way to lube a cable is to not lube the cable at all. If you feel you absolutely must, pull the cable across a block of paraffin wax a couple of times before installing. The wax is dry and does not cause the lining to expand.

Finally consider drum brakes. They are strong, don't grind on the rim, last nearly forever, and are generally unaffected by bad weather. They are very popular in Europe (where components tend to be less trendy and more functional) and will fit any wheel combination.

Relax and Ride.....BJ ☐

EDITORS NOTE: In the 1992 CycloPedia catalog, Gaylord Hill had a rolling resistance chart that showed a 27" tire as the basis tire at 100, the IRC Roadlite 20" was rated 128; the Moulton at 175; the ACS RL Edge 20" x 1.75 was rated at 164; the Golden Boy 16" x 1-3/8" at 225 and the 16" x 1.75 at 290. The information was compiled by the CB Institute for Cycle Research, Ann Arbor, MI.

In the 1994 catalog another rolling resistance test was done rolling a tricycle down a ramp to see how far individual tires would roll. The best was the IRC 700c x 25 at 98 feet; next was the Moulton 140 psi tire at 65 feet; The Moulton 70 psi tire at 32.6 feet; The Chen Shin 20" x 1-3/8" 65 psi at 33.6 feet; The Haro 20" x 1.5" at 27.7 feet; and the 16" x 1.75" Michelin 60 psi at 16.5 feet.

For more information, write: CycloPedia, POB 884, Adrian, MI, 49221.

SIZE	BIKE NAME/ TYPE	ETRTO
16x1.75	BikeE, Common Juvenile Tire Size	305mm
16x1	Primo Race Tire	349mm
16x1.3/8	Vision, Lightning, Etc.	349mm
16x1.3/8	Also called "400A" Euro Bents, Roulandt	340mm
17x1.1/4	Moulton, Lightning, WindCheetah	369mm
20x1.5 - 1.75	Ryan, Haluzak, Etc. Common BMX Size	406mm
20x1	Primo Race Tire	451mm
20x1.1/8 - 1.3/8	Tour Easy, V-Rex	451mm
24x1 - 1.3/8	King Cycle, V-Rex	520mm
26x1	Also called "650B", Triathlon Bikes	571mm
26x1 - 1.9	Common MTB Size, Vision, Haluzak, Etc.	559mm
700c x 18 - 38mm	Common Road Size, Tour Easy, V-Rex	622mm
27x1 - 1.1/4	Common Older Road Bike Size	630mm

“You Don’t Have to Put Your Foot Down Anymore”

(A look at three recumbent trikes: The ReTrike, Triad, and Zephyr)

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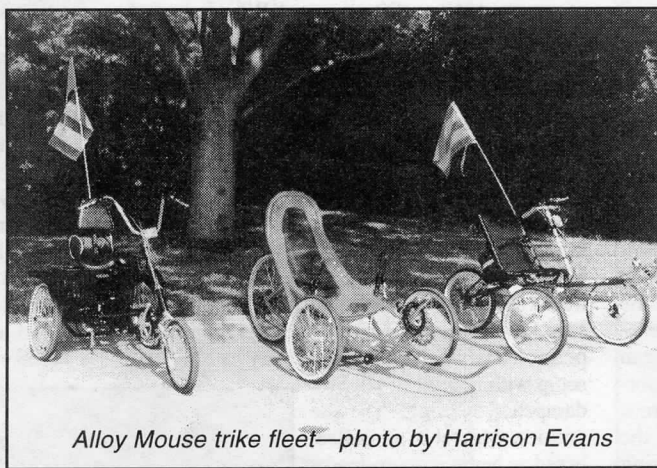
A column for recreational recumbent riders and friends.

A big difference. If you are a two-wheel rider, you probably get off your bike when you quit riding. After a long ride, recumbent tricycle riders often stay seated, not desiring to go anywhere. This, and not putting a foot down at stops, may be the obvious differences between riders of trikes and bikes.

Trike rides are adventures combined with exercise. Summer mornings early, before the ferocious heat, Mary and I often trike the seven miles west to the country town of Double Oak. We stop in the shade in front of the town hall and visit with the old-timers. Neither of us bothers to dismount and the town characters seem envious that we are the ones with comfortable ‘lawn chairs.’ Usually they entertain us by unloading their frustrations about the groups of upright cyclists that race through their streets every day. King’s Road is the town’s main (almost only) road, and it is part of a popular North Texas, bicycle training route. Groups speed along in their bright lycra ‘*Freud & Hormone*’ team jerseys, riding two-to-four across, paying no attention to the local stop signs or traffic. The anger this instills in the townspeople is remarkable. Eventually they tire of complaining and want to tell us (not ask) about our trikes. I’ve heard many suggestions for ‘improved’ trike design from tractor-driving experts in Double Oak.

Why a trike? I’m not sure what first interested me in trikes. Mary’s interest comes from hating to tip over riding a bicycle. Our early trike expectations and notions of what was right were quite wrong. I had seen the Mike Burrows’ design *Windcheetah* in Richard Ballantine and Richard Grant’s *Ultimate Bicycle Book*, 1992, (New York: Dorling Kindersley, Inc.), pp. 129-131, 137. The *Windcheetah* looked amazing but I was sure that it was not safe for street riding or practical in any other way. We again saw the *Windcheetah* and several other interesting trikes in the **RCN 1994 Buyer’s Guide**. In the same guide was an advertisement showing a **ReTrike 707-VP**. The ReTrike looked practical, safe, and affordable. The ReTrike was a classic trike design that I understood and identified with.

Mary’s first trike since the 1940’s. Mary needed a new machine, so we immediately ordered a ReTrike 707-VP from ReBike by way of our local bike store, Bluebonnet Bicycles. Bluebonnet agreed to deliver the trike to me still in its crate, unassembled. I like to build cycles up by myself, especially when they are for Mary. The ReTrike proved to be a sturdy, well-designed,



Alloy Mouse trike fleet—photo by Harrison Evans

non-performance frame with some of the worst components I had seen on any bike other than a department store Murray or Huffy. We threw most of the pieces away and began to build up a very reliable machine with Shimano LX, XT, and other high quality components. The trike is now dependable and almost maintenance free.

ReTrike design and performance. The ReTrike 707-VP is a CLWB (Compact Long Wheel Base) Semi-Recumbent Classic Two-in-Back Trike. CLWB’s are, in many ways, the perfect low-cost first recumbents for either two or three wheel machines. The ReTrike is not suitable for speed or quick maneuvers. The top speed under power is around 12 mph, and coasting over 15 mph is dangerous. Of the two rear wheels, only one provides power and braking. The rear brake locks very easily and causes bad skidding. The front wheel has standard cantilever brake mounts, and any high quality mountain bike cantilever and lever will provide good front wheel braking. The front fork has a spring operated steering damper to help compensate for extreme wheel-flop. The damper looks silly but works very well. Turning a ReTrike at speed causes it to flip over just as your childhood trike did.

ReTrike advantages. Mary likes her ReTrike a great deal. She has a little over \$1,000.00 invested including about \$400.00 in component upgrades. She has added a rear view mirror, safety flag, electric horn, and flashing lights front and rear. All this makes the trike a fine neighborhood riding machine. It makes a perfect guest trike for visitors who are not used to recumbents. The large rear basket makes it ideal for short errands. Seven speeds and very low gearing (a modification) give it enough power for hill climbing on the local bike trail. Its 64 lbs. are not a problem, if you are not in a hurry. The image is that of a machine for practical errands.

The next trike. I watched Mary riding her ReTrike for several months and decided that I had to have a trike. At intersections, I would linger behind on my Tour Easy, waiting for her to ride ahead and shout “clear,” so I wouldn’t have to unclip and put a foot down at the corner. My envy grew. I thought it was time to try a high-end performance trike. By now I had read and learned enough about trikes to realize that performance road trikes all had their two wheels in the front. Some straight line speed record trikes still use two rear wheels but they will not corner well and generally look more like a Hoover vacuum cleaner than a trike.

A Triad. For a trike to be safe on the road, it must, I was sure, raise the rider at least as high up as most two-wheeled street-recumbent riders. This notion led to my buying a **Triad**. The Triad was being built by **Jim Weaver of Counterpoint Conveyance** and assembled and sold by **Kelvin Clark of AngleTech** in Woodland Park, Colorado. I bought the Triad in a partially complete state and finished the component selection and assembly of the trike myself. The **Triad** is beautiful and comfortable to ride. Its 63 gears make hill climbing a snap and the parking brake is true luxury. Parking brakes should be mandatory on all trikes. The front drum brakes are perfectly balanced and provide predictable, even stopping. The idler assembly and drive train are quiet and smooth-operating. The handle bars and controls are easy to use and not tiring on long rides. The suspended seat is as comfortable as I’ll ever need on a recumbent. The trike feels light and responds as if it weighed far less than its true 42 pound, ready-to-ride weight. Kelvin Clark, at AngleTech, is a dealer with one of the best reputations in the country.

I was wrong. The Triad confirmed the advantages of the two-wheels-in-front SWB (short wheel base) design. That part was perfect. Still, my Triad did not qualify as a performance trike (that’s my opinion). The higher seating position made the Triad noticeably unstable and subject to wriggle and wander at speeds over 15 mph. Part of this is due to my large size and extremely long legs. The front “boom” on my Triad was specially made 4” longer than a regular production model. I am afraid of going fast on my Triad. I have considered and ruled out all possible causes of this problem and settled on the trike’s height as the cause. Possibly relevant to this is the industry rumor that Jim

...Continued on the next page

Weaver has stopped delivery on any more production Triads whatever the cause. In spite of this, I ride my Triad with confidence and take it on extended road trips. I just keep the speed down and exercise extra caution on downhill. At slower speeds, it's a no-hands, lie-back-and-relax pleasure.

A big change in trike thinking. I was learning from the Triad and becoming even more involved in a love affair with recumbent trikes (you can think up your own jokes and puns for this type of affair). I now seriously questioned the notion of rider height being necessary for safety. I began studying the reaction of motorists to our two trikes on the road. The unusual machines, wide wheelbases, and large, bright, custom-design safety flags all contributed to an increased awareness and respect from motorists. I realized that being ten or fifteen inches lower would not make much difference in how motorists saw us. On a low, recumbent trike, the additional safety requirements would fall solely on the rider and not on the motorist. This suited me just fine, and gave me far less to worry about than the high speed instability of higher-up trikes. About this time I began to look seriously at the designs for high-performance, low center-of-gravity, two-wheel-front trikes. **Ian Sims**, the Australian builder of the widely respected **Greenspeed** sport and touring trikes, has flatly stated that any high performance trike has to have a low center of gravity, both for cornering and for straight line stability. He goes on to say that once you start riding recumbent trikes, you begin to lose interest in two-wheel HPVs. The Triad, with perfect steering geometry, except for its high center-of-gravity, has convinced me that Sims is correct. He is also right about our loosing interest in two-wheelers.

The next trike, a Zephyr MK-II GT. Mary needed a lighter trike capable of road touring speed. About this time, RCN #25 had a picture of the **Zephyr MK-I**, designed and built by **Rick Horwitz**. I contacted Rick and began following the development of the new, and much lighter, **Zephyr MK-II**. It was scheduled to begin pro-

duction in the spring of 1995. Rick and Melanie Horwitz have been building HPVs and bicycle trailers since 1990. They own and operate **Practical Innovations Company** in Morgan Hill, CA. In May we ordered, and on June 15, 1995, received a Zephyr MK-II GT. We specified that the Zephyr would be complete and ready to ride except for minor assembly after unpacking. Total cost including the air freight was \$3,495. (the current price for the custom ordered/ hand built Zephyr is \$5,000.) We had not purchased a 'built up' HPV of any type in over fifteen years. What luxury. It took less than two hours to have the Zephyr unpacked, assembled, adjusted, and ready-to-ride. Rick writes the best assembly instructions I have ever seen. The pictures in this article show the Zephyr the day after we received it.

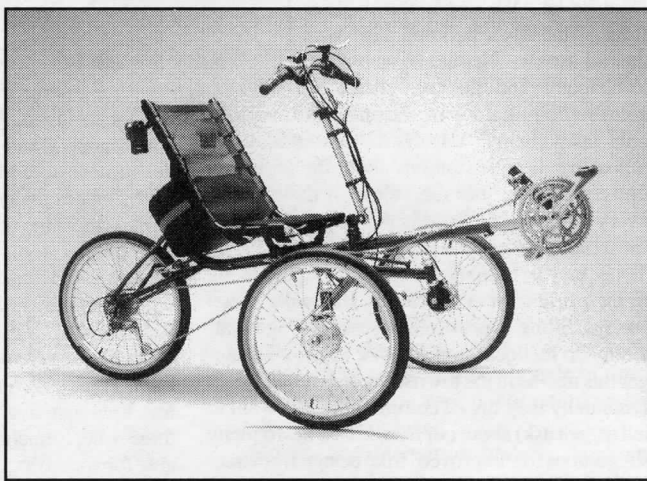
Zephyrs are amazing. Mary has so far logged about 300 miles on her new machine. It is light and very fast. My new view of her on rides is a back wheel and flag about a quarter-mile ahead. When I can get close, I am amazed that the Zephyr tracks straighter than any bike or trike I have ever seen. Rick Horwitz can tune the steering and suspension any way you want it. Mary had her trike setup with neutral-to-slightly-dampened steering. The suspension was set to very firm, based on her maximum-loaded rolling weight. She can ride hands-on or hands-off under full-power without any wavering or wander. Light, high-performance, two-in-front trikes almost universally exhibit some wriggle under power. Wriggle is created by the alternating torque load from pedaling. Wriggle is so pronounced with two-in-front, fully faired racing trikes, that the British have appropriately nicknamed them "tadpole trikes." Mary's Zephyr is a rare exception, it is straight-

line steady under any load, at any speed.

We are trying to get Mary to find time to write a future RCN column giving her impressions of the Zephyr. Given her twenty years of riding experience, standard size, and tremendous power output, she is a perfect reviewer for such a high performance trike.

I love high technology. One the road, I have taken to calling her on her cellular phone when she gets more than a half-mile ahead. This slows her down and allows me to catch up. When I do get the rare opportunity to ride beside her, I am impressed with how quiet her trike is. Most recumbents with multiple chain idlers are rather noisy. Rick makes his own 'O' ring dampened idlers and they run silently. Rick also makes the disk brakes on the Zephyr. Mary's brakes exhibit little of the usual hiss or rub associated with upright-bicycle disk brakes.

Dream On. On several occasions in recent weeks, I have walked down to our studio workshop and found one of the extended family of neighborhood kids sitting in Mary's Zephyr. The eight-to-ten year old fighter pilot is in the midst of a fantasy aerial combat, bearing down on the



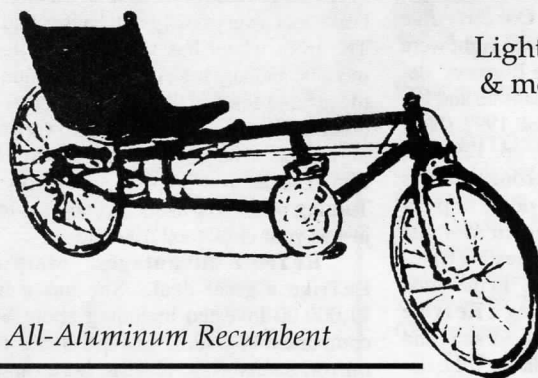
The Counterpoint Triad—photo by Harrison Evans

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enemy, Shimano 'Rapid Fire' cannons blazing. As soon as I've confirmed the hot shot's "kill," I pump up tires or perform some routine repairs on their tortured BMX, and send them on their way.

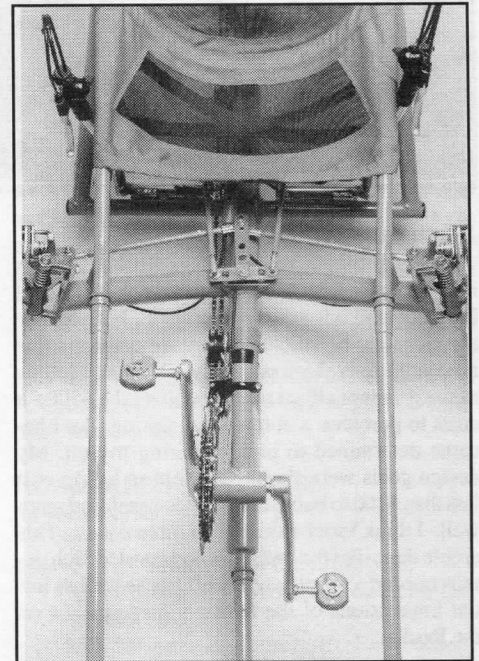
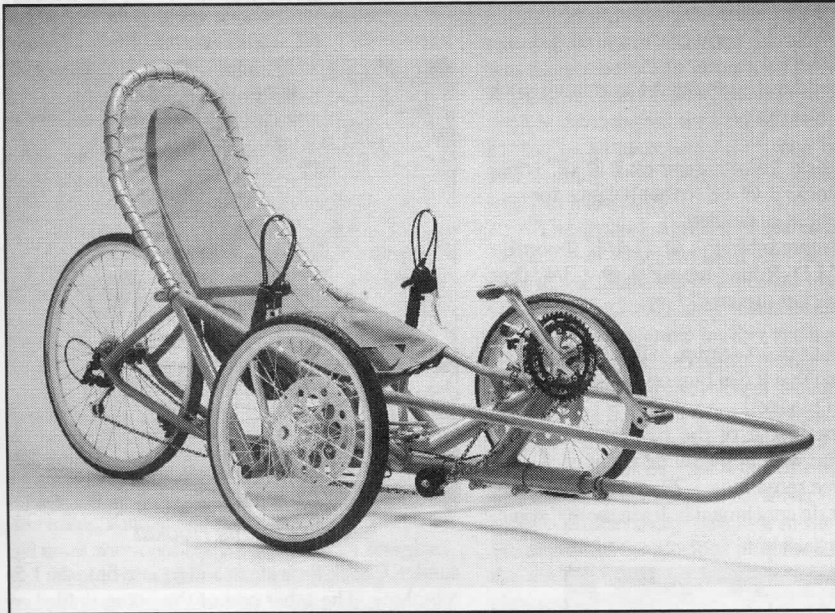
Now I have time to dream. My dream is of a custom-built Greenspeed GTR 20/20 Touring Trike made to my exact size and requirements. Due to my long legs, bad knees, and large size (including huge feet), I cannot ride most of the available two-in-front performance trikes. Out of the question for me are the Zephyr, Trice,

Windcheetah and other respected trikes. Given the excellent international reputation of Greenspeed and my respect for Ian Sims, I don't really care. Now, if I just had some money.

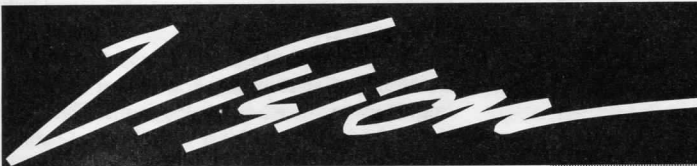
Robert Bryant, our editor and publisher, should have his new Greenspeed by now. He will be writing a review of it for the next issue.

At Last. If you have questions about trikes or need some help, send eMail to AlloyMouse on America Online, or to alloydmouse@aol.com on the Internet. If you are not wired, reach me through RCN. If I can't answer your question,

I can find someone who can. Remember there are many great trikes in this year's RCN Buyer's Guide. Also, there are many regional non-production trike builders that make amazing machines. Find them at local HPV gatherings and races. □



The Zephyr—photos by Harrison Evans



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Homebuilders Corner

A Low Cost Fairing for the Rans Rocket

Story & photo's

by Dave Krovetz

Email: dok2p@virginia.edu

INTRODUCTION

I recently purchased a Rans Rocket and it is really a joy to ride. Like many recumbent riders I have coveted a fairing for my 'bent, both for the aerodynamic benefits and creature comforts that a fairing offers. Unfortunately, like many fellow riders, I cannot afford (or rationalize) the \$500+ it costs to purchase a commercial fairing. So, I became determined to build a fairing myself. My design goals were simple: the fairing had to cost less than \$100 to build, look professional, and work well. I think I succeeded on all three counts. This article describes the materials and construction details needed to duplicate my efforts as well as initial impressions of the fairing's performance on the Rocket.

CONCEPT

The fairing consists of an aluminum frame covered by clear Lexan plastic. The frame uses a center "spine" to which perpendicular ribs are attached using pop-rivets and tack welds (the rivets act as jigs prior to welding). This spine is curved in an arc which describes the profile of the fairing. The Lexan covering is attached to each rib via bolts and rubber washers at points about one inch from the rib ends. Lexan plastic is readily available at glass shops, is easy to work with, flexible and UV-proof.

The fairing is mounted to the cycle in two places. The primary mounting point is to the front of the bottom bracket. A secondary stabilizer attaches to the front derailleur tube. The bulk of the stress and all of the weight of the fairing are directed to the bottom bracket attachment point. The entire fairing weighs 3.5 pounds. The cost of materials was approx. \$42, the cost of welding all of the joints approx. \$30. Thus, the fairing was built for a total cost of less than \$75.



FABRICATION

Begin building by cutting the aluminum stock to lengths as follows:

- 3/4" stock: 1 @ 40" (spine); 2 @ 12" (ribs)
- 1/2" stock: 3 @ 12" (ribs) balance for—bracing cut as needed.
- 3/4" square tubing: 1 @ 11-1/4" (boom).
- 1-5/8" I.D. Round tubing: 1 @ 2-3/4" (bottom bracket mount).**

**Cut out a cross-section of this tube of about 120 degrees so that it can butt up against the front of the bottom bracket.

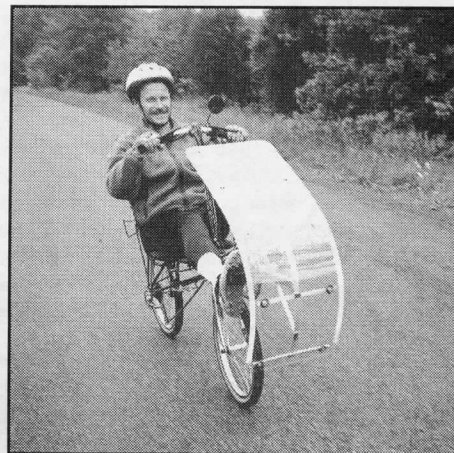
Mark the layout of the five ribs along the length of spine with a 3/4" wide rib at each end. Space the three remaining 1/2" ribs equally. Drill 1/8" diameter rib attachment holes in the 40" spine,



two holes per rib (indent the location of the holes with an awl, then drill). Using these holes as templates, mark, punch, and drill matching holes in the ribs. Each rib also receives an additional 1/8" diameter hole nominally 1" from each end for Lexan attachment.

The spine is now bent to shape. After some experimentation, I did this freehand. Bend about a 24" diameter curve into the first 20" of the spine, leaving the balance straight. This curve should describe about 120 degrees of arc. However the exact curve may vary and can be adjusted later as needed. Now pop-rivet the ribs into place.

The front boom is made next. One end is coped to match the 1-5/8" tubings curve, the other notched to mesh with the spine. A belt sander can be used to create a nice coped curve by pressing the end of the square tube against one roller of the



Dave on his Rocket

sander. Check for a clean and square fit to the 1-5/8" tubing. The other end of the boom is filed on two faces to create a notch about 1/8" deep which can then interlock with the 3/4" spine. Temporarily mount the frame to the bike to check for clearances and a pleasing curve. I suggest doing this frequently as you assemble the frame. The boom should be roughly colinear with the frame of the bike. A length of 1/2" stock is cut and riveted in place on the upper end of the spine to meet the front derailleur tube as well as a similar piece between the lower portion of the spine and the boom. A 1/2" brace is attached between the derailleur post brace and the boom, effectively holding the boom in place and strengthening the derailleur post brace. A final strengthening brace is riveted between the upper portion of the spine and the derailleur brace.

Prior to final welding, install temporary clamps and braces as you see fit. Spot welds at the ribs are sufficient, beads are required at the boom. Use sandpaper to round the corners of the Lexan to a pleasing curve. Lightly clamp the Lexan to the now welded frame and, once squarely aligned, mark locations for all ten mounting holes. Drill 1/4" diameter mounting holes through the Lexan (oversized to allow for expansion and contraction of the Lexan with temperature). Attach the Lexan with 1/8" x 3/4" bolts, sandwiching it between rubber washers with a final flat metal washer above. Attach the fairing to your bike using hose clamps; two at the bottom bracket and one at the front derailleur post. Press the strips of edging into place along the length of Lexan. You are done.

....Continued on page 22

REVIEW: 1994 EUREKA IHPSC

International Human Powered Speed Championships 19th Annual Speed Championships Video

Reviewed by the recumbent underground's BentBOBX

Recumbent enthusiast, tourist, homebuilder and videographer, Steve Iles, has been producing IHPVA racing event videos for several years now. These racing videos are truly a labor of love for him. The RCN library is lucky enough to have a complete set of Steve's videos. The 19th Annual IHPSC Eureka, California event video from the Summer of 1994 is his best work so far.

Let's face it, Eureka, California was not the most ideal place for a speed event, and racing in mall parking lots (hpv's in the mist) is not really the kind of image that we need to portray recumbent bicycles in..... Whoa, let me climb down from my high horse and say that after seeing this video, I sure wish I was there.

The first forty minutes is a visual introduction to the wide variety of recumbents, hpv's and streamliner racing recumbents. Many will recognize the close-knit USA F-40 contingency of Zach Kaplan, Jerry Pease, John Tetz, Greg DuVall and friends, Tom Traylor's front-wheel-drive fleet in action, Izzie Urieli's Grasshopper folder (featured in RCN), the Canadian Varna's some weird lean steer trikes, Kinetic Sculpture land and sea vehicles and more way-cool bikes than you can imagine.

Not to be outdone by the Lightning contingency (minus Tim Brummer), the Easy Racer folks were out in fine form with 24 Hour Race Winner, Mhyee and the Easy Racer Gold Rush America (see what it looks like to climb out of a streamline after 24 hours and 607 miles), Fast Ron Bobb on his Gold Rush Replica and Gardner Martin can be seen secretly test riding and studying Sean Costin's low racer, "Little Eddie." Steve Delaire's Rotator team was in attendance with several riders and variations of the Rotator Streamliners.

The NW rider contingency (movie extras) Nick Hein, Joe "Road Warrior" Kochanowski [world famous for designing 90 pound streamliners made from old junk bikes (free), used

innertubes (free) and cardboard (free—local appliance shop)—hey, it just goes to show you that you don't need to spend \$1000, \$2000 or \$8000 to be competitive—\$50 can go a long way—and you don't wanna mess with these NW racers—climbing the hills of the NW on 90 pound bikes is not for the faint of heart] and finally, fast John Williams riding, "Vortex," his homebuilt composite SWB, were also permanently engraved in celluloid.

We did hear some familiar voices of our own RCN Good Will Ambassador, Ron Schmid, and Oregon HPV cohort Rick Pope, but we only caught a quick glimpse of him while the cameras were panning the sea of odd bikes. Nowhere to be found was Lightning's Tim Brummer, even though the Lightning contingency has almost an eerie presence at these events with the swarm of F-40's all parked in an aero formation with beeping bells and flashing dual headlights in unison (can you tell, I'm jealous).

The second segment of the video is parking lot racing in slow, medium and fast groups. It is easy to see that the IHPVA could learn a thing or two from the Great Lakes Series races which seem to have a better grasp on hpv racing for enthusiasts. The parking lot racing footage slowly turns into a long hour of streamliner racing footage that even for the heartiest of fans, seems to get a little long (we lost one of our reviewers to zzzz-land after 90 minutes in—the whirr of streamliner turn into the snoring of my co-reviewer—name withheld to protect those sleeping in the easy chair). We also liked the glorious plug for RCN smack in the middle of this movie. Even though we did play second fiddle to the IHPVA, we are happy to be recognized—and we dare HPV News to give Steve this good of a review!

The final segment is an interesting look at what the Redwood HPV Association considers worth evaluating for a "practical vehicle" competition (a hotly debated subject—"how many jugs of pond water are strapped on that bike? And how fast are you at removing a pedal?" Correct me if I am wrong, but what's practical about hauling pond water on your bent or what is demonstrated by timed pedal removal?) and the final few moments are the water competition. This is where I, myself dove off into the wild blue....ZZZZZ.

All kidding aside, Steve Iles has developed a neat talent for bringing these events into our homes and bike clubs, and he does an excellent job. We also would like to compliment the Redwood HPV Association who put this event on—a huge undertaking that deserves mucho kudos.

Are you a recumbent information junkie? Are you a homebuilder or racer wannabe in need of inspiration? Do you want to put on an event like this? Do yourself a favor and buy this video. It's a heck of a lot of recumbent fun for \$25! Share it with your local recumbent club or shop, loan it out, but show Steve that you appreciate his hard work and continuous efforts to bring these events to film. But save your kudos for when Steve returns from this two month annual recumbent tour, this year to the Islands of Hawaii—maybe he'll do a video on that trip? Tell Steve that RCN sent you!

The two hour 19th IHPSC "Eureka" video is available in VHS or 8mm from: Steve (RCN says your video is cool) Iles, 5419 Crestlawn Dr., E. Canton, OH 44730. The cost is \$25 US post-paid, \$5 extra for overseas.

HONORABLE MENTIONS:

(as seen on this video)

- Steve's Iles ultimate MWB touring bike, "ComforTour II" (We need to do an article on this bike).
- A \$50 50 pound homebuilt Easy Racer
- Concept Z (the forerunner to the Cheetah MWB record race bike).
- A rare rolling chassis shot of a Moby Infinity (that's not really an Infinity....is it.... Don....).
- Gunnar Fehlau doing nose wheelie/ track stands on his Harig (hold that pose).
- Ernie Shimpf's "Smooth Operator" SWB and new low racer homebuilt bikes
- A Blimpo Cycle (uh huh).
- Joe Kochanowski's "TV" or Technical Vehicle (1/2 horsey bike and 1/2 bent).
- Rolling footage of an Eco AeroTrice
- Hugh Currin's SWB that comes apart and fits in a suitcase (send us pictures, Hugh!).
- Robert Como's latest Space Age Bike (I wanna ride it).
- Len Brunkalla pedalling backwards, but moving forward. ☐

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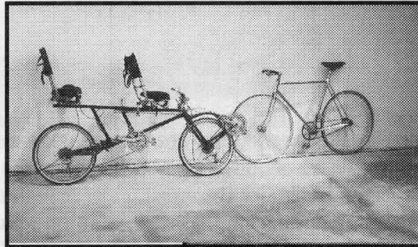
RCN's Cool Bikes of The Month!

WYMS "With Your Main Squeeze"

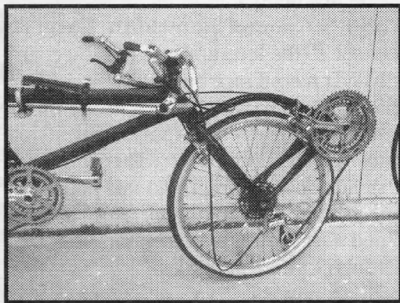
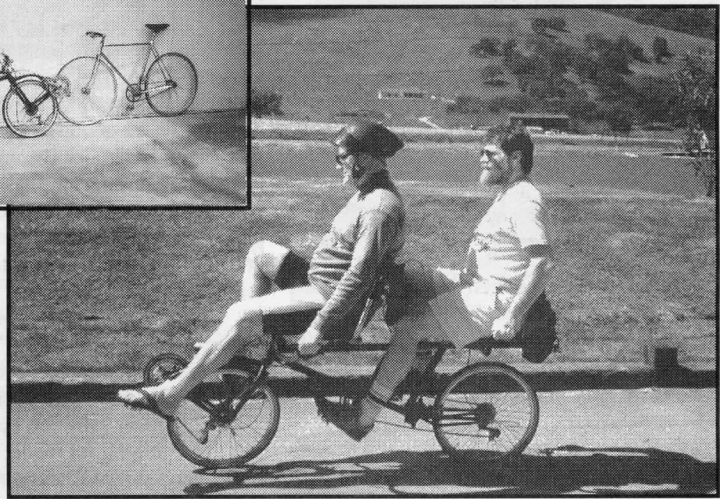
A two wheel drive tandem recumbent prototype
Story & photos by Bill Patterson

The Wyms was designed from the experiences of a couple who had been riding tandems for 14 years, and had just finished a month long unsupported tour. The process of boxing the bike for air transport and moving about France on the rail system gave insight into the magic of marrying bicycles and public transportation. The American railway system, AMTRACK places tandems on the same contraband list with drugs and explosives. A tandem to be used in the USA in the same manner as in France must be hidden as normal luggage.

As ones age increases, the time spent on a normal bike seat hanging over drop handle bars becomes increasingly onerous. The new tandem must be more comfortable as well as being smaller.



Above:
WYMS
Right: Bill
Patterson
and Cornel
Ormsby
riding
WYMS—Bill
Patterson



STEERING

Recumbents are controlled by above the seat or below the seat steering systems. Both methods have advantages. Below seat steering was chosen because of compactness.

DRIVE-SYSTEM

Front wheel drive for the captain was chosen for two reasons. First, the steering axis becomes a natural place for the folding frame. Second, it does away with the connecting chain. This may allow easier transport but does not save weight. The weight of the additional cluster offsets the saving of not having the connecting chain. Front wheel drive also allows the captain to steer and pedal with his feet for hands-free riding. The stoker has freedom to chose her cadence and can coast or pedal while the captain coasts. The two wheel drive system appears to be more enjoyable for the stoker and the captain. The system, however, requires a learning period of at least one week before it becomes second nature.

COMFORT-SUSPENSION

Two methods of achieving comfort were used on the Wyms: Suspension and the recumbent seating position. A simple unsupported chain stay with

rubber compression members was used to provide as plush a ride as possible for the stoker. The captain is provided with a suspended seat. Next generation bikes may incorporate front suspension.

RECUMBENT POSITION

The recumbent position provides more comfort to the hands, neck and the rear, if the seat is properly designed. Normally, recumbent bikes are larger and heavier than their diamond frame cousins. Care was taken to keep the Wyms as small and potentially light as possible.

COMMENTS

The Wyms could have been built without front wheel drive. The FWD option requires several days of riding to become acceptable to the captain. After a week it becomes very pleasurable and allows Uni-cadence. The stoker enjoys the full suspension and she is also much more involved in the whole riding process with full control of her own set of derailleurs. The exaggerated trail causes some flop at slow speed, but provides a safety margin at higher speeds. A missed shift or foot slipping off of the pedal could be a disaster on a front wheel drive bicycle with normal head tube angle, rake and trail. Any experienced stoker will prefer riding the Wyms over any diamond frame bike and most recumbent tandems. We spent the summer riding in California, Colorado, and Washington. Hills and traffic are no more of a problem than on the "safety bicycle." The small size is a boon for travel and keeps the potential weight down.

Riding WYMS by Zach Kaplan

Bill Patterson was visiting San Francisco and I was able to meet up with him and ride WYMS. This is a SWB 2-wheel drive tandem he built. The front rider drives the front wheel through a pivoting bottom bracket arrangement with USS, while the rear rider drives the rear wheel. Both riders have completely independent drivetrains so they can pedal at different cadences or coast independently. The seats are borrowed directly from the BikeE. The bike has a swing arm rear suspension using rubber from old car tyres as elastomers. He is working on front suspension for it. Both wheels are 20" and the bike folds up in about 20 minutes for taking on an airplane.

Bill gave me a brief ride in the back seat. I was impressed with how he was casually riding it round corners with no hands. He said it takes 3-4 days of riding the bike when suddenly you stop needing to hold the handlebars. Then he took out

SPECIFICATIONS

Wheelbase:	48"
Length:	74"
Frame material:	Mild steel box section.
Wheels:	20' X 1 1/8"
Components	Used— nothing clicks
Seats:	BikeE
Weight:	49 lbs
(thats my story and I'm sticking to it)	

Please send a picture and short article for "RCN's Cool Bike of the Month" feature to: RCN's Cool Bike, POB 58755, Renton, WA 98058. It can be a homebuilt, commercially built, personalized bike, commercial prototype or you can be a new manufacturer or an old one with something new!

a couple chunks of rubber from the suspension to lower the ride height and turned me loose on the streets of San Francisco to practice riding solo for a couple hours. I had ridden the WYMS briefly once before and found it much easier to ride than other FWD recumbents I've ridden. The steering geometry has a lot of trail, so this might help. Also the seat is fairly high which makes it easier as the other ones I rode were very low. Normally I prefer a lower seat but for this application the high seat is fine.

This was sort of a trial-by-fire for someone with little pivoting FWD experience to be riding through traffic and hills. The first few blocks were scary (no I didn't even bother practicing in the lot first). I was sort of weaving around a bit. I had a rear view mirror though and the drivers behind

me seemed understanding. I gradually started to feel more comfortable with each passing block. All the traffic sort of forced me to get good at the handling quickly. I rode over to the densely trafficked financial district. Here there was a red traffic light at every corner and busses and traffic jams all over the place. The high seating position was useful in this traffic. The people on the sidewalk were giving me lots of looks and comments, but I am used to that riding the F40.

I now felt very comfortable on the bike and started riding it along the waterfront, sprinting and blowing off bike messengers. With all the trail on the bike I found I could hold a fairly straight line sprinting. I was able to go up all my usual hills, except for one and I think I could have ridden it up that one if the bike had a lower first gear.

At the end of the ride I felt I could almost

take my hands off the bars, but not quite. Given a full day of riding it I think I could. One of the useful findings of this test was that my knees didn't hurt. My knees are prone to pain from such things as clipless pedals with inadequate float. I thought the pivoting BB would trigger off the knee pain but it didn't, so now I am more encouraged to build a bike of this configuration. Bill really has something neat going here, though he admits it would be hard to market due to the initial difficulty riding it. I'd like to build my own WYMS type bike which would be modular. The "tractor" unit could be plugged into a rear fork and wheel for riding solo, a rear seat/rear drive unit for riding tandem, or a one or two wheeled platform unit for load hauling. I think the most difficult part would be finding a "MS" (main squeeze) to ride with me! □

...Letters continued from page 4.

LETTERS...

regretted the decreased ranting in the BG. Your comments in #28 about not doing the Buyer's Guide show me that you are continuing to aggressively grow your excellent magazine. I know I'm showing my age when I say that I preferred the opinion-style of the '94 issue. More personality!!!

I'm a little uncertain about your publishing more, smaller editions as a monthly format gives a much better "presence." But on thinking more, the increased bother of more production and mail cycles per year are a real cost in money and effort level. It's close but I vote, again today, for more issues if the quality and personality factors are kept up. Heck, I would even pay more to hear from you more often.

—LFS

Subj: Re: Mike Wolfson's homebrew

Date: Wed, Jul 5, 1995 7:59 PM EDT

From: wadenelson@frontier.net

Dear Dr. Bob,

Wolfson's design is excellent. Dump the 20" rear wheel and you've got the next generation SWB, in my humble opinion. Anyone, again not designing F+R suspension into their 'bent line is now queuing up to miss the boat. The roads here are rough even in a car, much less on a bike on which you can't stand on the pedals and brace for impact.

Have you got a phone # or email for Wolfson? I've gotta get a bigger or better photo. Why don't you publish my "how to photograph" guidelines in an upcoming issue. Do you see how the wall heater behind this bike screws up seeing the detail on the rear geometry? It kinda forms an optical illusion.

Great article!

Wade Nelson

Wade, That article was great! I cannot understand why every manufacturer does not build a bike just like that—it doesn't seem that difficult of a concept. Maybe we can persuade Mr. Wolfson to oblige?

Subj: RCN Monthly

Date: Tue, Jun 27, 1995 4:00 PM EDT

From: Robolino

Dear Robert,

I'd like to see monthly (or nearly monthly) issues of RCN. I'm always waiting for the next one to arrive, and I always seem to get thru read-

ing it before I'm ready to stop! While initially you might have slimmer issues, I'll bet it wouldn't be long before they are the same size as today's issues. You'll probably want to make more use of short write-ups from subscribers ("What I did with my recumbent on my vacation"). I just really enjoy reading about what's going on and hearing from other folks that ride 'bents.

Chuck 0\—o)

V-REX COMMENTS

Dear Robert,

I now have several hundred miles on my new V-Rex XT. I would like to add a few comments to BJ Strass' excellent review.

I concur fully with BJ's comments on the new mesh seat. The new V-Rex mesh seat is simply the finest and most comfortable seat (saddle) I have ever used. My cycling experience includes untold thousands of miles on traditional uprights, and long wheel base recumbents.

The V-Rex XT is quick, and very responsive. Riders who choose the center pull brake upgrade will need to be careful that their cycling shoes do not hit the front wheel brake hoods. The builders should consider adding a few braze-ons for a tire pump and water bottle cages.

Staff members at my local bike shop were very impressed with the overall quality of the design, construction and component selection. They were especially impressed with the superb welding and metallic finish.

The Rans V-Rex is a welcome addition to the short wheelbase recumbent marketplace.

Sincerely,

Gerald P. Peterson

Subject: RANS V-Rex Report

Date: Thu, 22 Jun 95 23:27:36 -0500

From: melha001@gold.tc.umn.edu

Dear RCN,

I've been riding my new V-Rex for about a month, so I thought I would post a ride report. I built the bike up from a 37" frameset using mostly Shimano XTR and Deore XT parts. The frameset came equipped with front and rear cantilever braze-ons, a YST headset (cheapo), and a 16" chromoly fork. The rear wheel is built with a Sun 24" rim and a 125psi 1" tire, and the front is a

17" Sun rim with a Moulton tire. Both wheels have 28 spokes, and the bike weighs in at about 25-1/2 lbs. I bought almost all the parts from Zach Kaplan/ - highly recommended.

My riding background consists of 20 years worth of both tandem and single wedgie riding. Although I've been interested in recumbents for years, I have never owned one prior to this bike. I usually ride about 175 miles a week.

So, how do I like the V-Rex...well, I love it! In fact, it's the most fun I've had riding a new bike in a long time. The steering may seem a little twitchy at first, but if you have reasonable bike handling skills you'll quickly adjust to the bike's light feel - it's really responsive. The 'Rex seems stable a low speeds, high speeds (I've only had it up to 45 mph so far), and all speeds in between :-) The new Rans seat is very comfortable and highly adjustable; it took very little time to find my ideal seat-back angle and leg length setting. My seat is set to about a 120 degree angle to the horizontal plane of the bottom bracket and my fore-aft position is set exactly as on my upright racing bike. After only about 5 days of riding I was able to comfortably do a hilly 40 mile ride. Now I ride it almost every day.

How about complaints? Well, I have a few. I don't like where the water bottle Rivnuts are located (behind the seat frame), the headset is of low quality for this class of bike, and the front cantilevers are really spongy when used in conjunction with the Suntour or Tektro power hanger (use a sidepull instead). Other than that, not much to complain about.

The real problem is that I like the recumbent so much that I've slacked off my tandem riding (much to the displeasure of my wife). My interim solution was to order a new Rocket frameset for her so she can get used to the recumbent position while I work on our new recumbent tandem :-) Can't wait! A few other observations/comments/ suggestions:

- I use a Camelback 1/2 back on the seat without modification
- I love the 24/17 wheel combination - light weight and fast!
- Gripshift XRay 800s work great.
- Buy some extra zip ties for the seat.
- After trying Speedplay Frogs, I'm dumping my Time pedals.

Regards, Mark □

Recumbent News & Rumors

AIRO SERIES Airovize and Airoshield

Portland, OR—by Rick Pope and Robert Bryant.

This past Spring, Tom Piszkin of AIRO-Series Inc. sent us his new helmet visor (Airovize) and shield (Airoshield) to review.

The Airoshield is a wrap around eye shield that snaps onto the front of any helmet and extends down to nose level. It is available in two sizes and several tints, and is 99% UV blocking. It attaches to any bike helmet by the use of two adhesive backed plastic strips that have twin ridges protruding from their surfaces. Slots in the shield snap over the ridges for quick mounting and removal.

The second product is called Airovize and, as the name suggests, it is a visor that snaps onto your helmet using the same slot and plastic strip method. In fact, since the shield and visor are thin enough, you can mount both at the same time for real protection. The visor is cut away along its top surface to allow good airflow into the vent slots that most helmets have these days.

I was able to try out the Airovize during my winter commuting, using it on misty days or when I got caught in rain showers. It really helps keep the worst of the rain off your face, although it failed to keep my glasses dry at speed (no visor would). The angle of the visor is not adjustable, although it can be set when you first attach the adhesive strips in place. The strips are still holding tight thanks to Scotch high bond tape. Our adhesive strips have now been in place for six months and show no signs of release.

As for the Airoshield, the drawback for recumbent riders is that it interfered with my helmet/sunglasses mounted rear-view mirror (not a problem with the visor).

The first visor did not come down far enough for full eye coverage, but the latest model Airoshield covers almost your entire upper face and it is closer to your face due to a change in the angle of the shield. The only drawback to the new shield is that it rests just above your nose and the plastic shield is rather sharp also, so fitting both the shield and visor to your helmet is a trick. Once on, they should stay on unless you crash or bounce your helmet on the garage floor (as we do occasionally). Overall, I like the shield and recommend both products. Although, we cannot recommend sacrificing your rear-view mirror in order to use the shield.

AIRO-Series products can be ordered factory direct with prices of \$14.95 for the shield, \$11.95 for the visor, \$9.95 for replacement shields, and about \$4 shipping & handling. AIRO-Series, Inc. 1973 North Nellis Blvd., Suite 121, Las Vegas, NV 89115-3654.

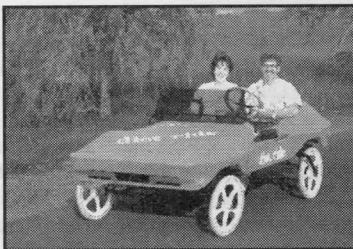
Part of this review originally appeared in the OHPV Newsletter. Rick Pope is the editor of the Oregon Human Powered Vehicles Newsletter. OHPV membership is \$10. OHPV, PO Box 614, Beaverton, OR. 97075.

ATP Notes

Seattle, WA—ATP has announced that touch-up paint is available for both of their stock colors, teal and burgundy. The paint comes in a "brush in the cap" 5 oz. bottle. Fairing braces are now available. If you are an original Vision fairing owner, there is no cost to receive the brace item, but you will be charged for shipping. Future fairings will be shipped with the brace. ATP also has a chain "quick adjuster" which allows you to set the boom length for different size riders without cutting the chain each time. The quick adjust kit bolts into the forward chain-guard mount position. This product was actually designed for dealers and rental fleets, but is available through your ATP dealer—as are all of the products listed above.

Easy Racer Plans Out of Print

Watsonville, CA—Easy Racers would like to thank the thousands of recumbent enthusiasts who have purchased our plans over the last 15 years. Demand for the plans has decreased to the point where we have had to declare them "out of print." Easy Racers may bring them back into print if sufficient demand warrants another print run.



Diet Ride Pedal-Car

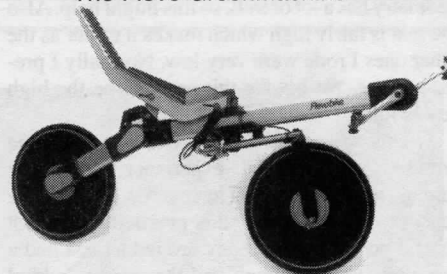
St. Louis Park, MN—A new company called Power Engineering & Mfg., Inc. has announced world-wide sales and manufacturing of the Diet Ride™ PEDAL POWER for two vehicle. The Diet Ride has a three speed transmission, adjustable bucket seats, an emergency brake and brake light. For more information, contact PEM at Ph#612-924-6178 or Fax#612-924-6177.

Greenspeed Trike & SWB

Victoria, Australia—RCN will be doing a full road test on the Greenspeed GTR 20/20, a sport touring tricycle from Australia. Our test trike has three 20" x 1.75" wheels and a Sachs 3 x 7 63 speed drivetrain. The Greenspeed is a high quality trike built from welded Reynolds 531 tubing. It is different than the Trice or Windcheetah as it has a stiffer frame and longer wheelbase. Prices for a single trike shipped to the USA should start around \$3,500 (USD) shipped to the USA.

Ian Sims of Greenspeed also builds several SWB models with or without front, rear or full suspension. Greenspeed, 69 Mountain Gate Dr., Ferntree Gully, Vicotria 3156 Australia. Ph#03 758 5541, Fax 03 752 4115. Email: greenshp@ozemail.com.au

The Flevo Greenmachine



Greenmachine to change Recumbents Image

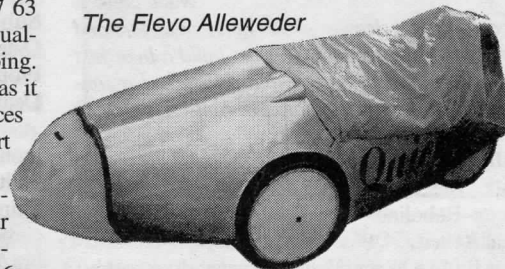
The Netherlands—The Dutch recumbent company, Flevobike is planning to introduce a new MWB recumbent bicycle called the "Greenmachine" next year. The drivetrain along with the chain will be housed through the rounded rectangular main beam, making for a very user-friendly easy to maintain HPV. The bike is constructed in a modular fashion and all sections are replaceable. Both wheels are mounted on "one-side" forks similar to the Windcheetah and other Mike Burroughs designs. The Greenmachine has front and rear suspension and the wheelbase can be adjusted by sliding the front wheel and steering unit along the frame beam. The bike can also be folded by tucking the rear wheel unit forward and under the bike. The seat shell is aluminum and designed to avoid heat and sweat build-up.

Flevobike hopes the Greenmachine will take recumbent bicycles away from the back-yard builder image and into the mainstream. The bike will be commercially available in March 1996 and sell for £850 in Europe. Flevobike has yet to sell or ship their bikes to the United States.

Flevobike is also the manufacturer of the Fiets prize winning Alleweder (all-weather) aluminum, full-bodied tricycle. The one-thousand-rivet Alleweder monocoque body is made in sections by the Fokker aircraft factory and assembled by Flevobike in Dronten.

We are not aware of Flevo shipping to the USA, or the existence of a North American distributor, however, For more information, contact: Flevobike, De Morinel 55, 8251 HT Dronten, The Netherlands.

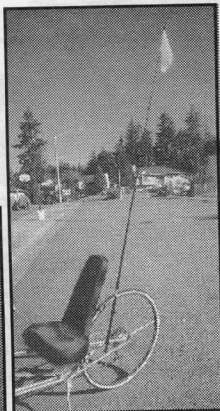
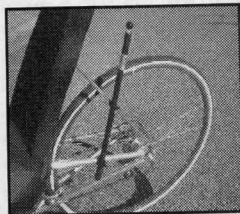
The Flevo Alleweder



....Continued on the next page

Guard-A-Life Bike Flags

Kent, WA—Bicycle safety flags do not get enough credit. Most are with their low-tech, low-quality and low-cost. Most riders think a flag is a flag. Well not so! If you want to have a deluxe safety flag to match your personalized deluxe recumbent bicycle—have I got a flag for you! Larry Dede is an entrepreneur from Santa Rosa, California who is the inventor of the Guard-A-Life telescoping safety flag. The flag will mount to any bicycle and works especially well for recumbents.



The unique telescoping pole is made of strong flexible infection molded fiberglass and extends from 18" to 78." The six pole sections are laid up separately to create a very tough, thin walled, tapered tube. Each section must be cured, re-spun and then painted. Each pole is hand assembled and finished. The flag itself is a glossy orange reflective material, much better quality than any other

flag we've come across.

We have been using a Guard-A-Life flag on an RCN test recumbent for about eight months. The test unit is durable, tough and gets comments from onlookers (imagine, a safety flag that gets noticed.....). The mounting hardware consists of two thin strips of double back foam tape (to protect your frame, seat rails, etc.). The Guard-A-Life unit straps onto the sticky-tape with two strong black zip-tie. This product is highly recommended. The Guard-A-Life flag sells for \$32 (postage paid) and is also available through many recumbent shops. If your shop does not sell it, tell them they should. Contact Guard-A-Life at 1275 4th Street #111, Santa Rosa, CA 95404; Ph/Fax#707-526-3548.

Infinity 15th Anniversary!

Mooresville, IN—Don Barry reports that there will be a new Infinity for 1996, the "15th Anniversary Grand Touring Infinity." The new bike will have two Aerospoke wheels (700c/20"), CroMo fork, and nice quality Sachs components. The finish will be a custom silver/black veined paint job. The cost for one of these limited edition bikes will be \$2100. Look for the new bike in late October.

Also look for a new seat system on this bike. The seat has an ABS Vacume formed shell with a ballistic (used in the seats of a Rolls Royce) material woven pattern weave made in Germany.

Kenda 16' 90 psi tires

Kent, WA—The Kenda 16" x 1-3/8" 90 psi tire has been discontinued, at least for the foreseeable future. In a disappointing turn of events, the once ballyhooed tire is now out of production. As you read this, the final shipment of 1500 tires *may* be approaching US shores, most of which are going to a few recumbent manufacturers, dealers and for warranty replacements.

Late note: Kelvin Clark of AngleTech dropped me a note that he stocks a 16" x 1-3/8" 65 psi Chen Shin replacement tire that sells for \$10. He also has Schraeder and Presta tubes to fit. You can reach AngleTech at Ph#719-687-7475. RCN reader/contributor Bill Volk (custom S & B SWB) writes that he has had good luck with this tire. People Movers also stocks this tire.

UPDATE: Just before press time we heard that ATP is going to have their own 16" x 1-3/8" 90+psi tire made and hopefully available for '96 model bikes.

Kingcycle K3 Trike

Guttenberg, IA—Steve Hansel of Linear Mfg. Co. called to say that his company will be importing the K3 trike into the USA. The cost will be in the neighborhood of \$5000-\$6000 with the body complete. This may seem pricey, but maybe not when considering that this is a fully faired hpv. The first K3 is being shipped from the UK to the USA very soon. Stay tuned to RCN for more info!

....Continued on page 20

Cruise in Comfort on a Linear Bicycle



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See our new SWB model
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North American Importers of: Kingcycle, k3, Windcheetah, and Brompton

....Continued from page 19

NW Home-Builders

Seattle, WA—Seattle area recumbent home-builders meet in Bellevue, WA the 3rd Saturday of every month. For more information contact Nick Hein at Ph#206-255-7560.

Nomadic Behemoth

Corvallis, OR—I'm riding through downtown Corvallis, half brain-dead from the sun and fun of the HPV parade, when who should call out my name, "Robert!" I turn around to find Steven K. "Computing Across America" Roberts pedalling through town just behind me on his high-tech, computerized, million-dollar recumbent. A technological marvel that is still as amazing today as the day I time I saw it. As it turns out Steve has been headquartered in San Diego with side trips to my neighborhood, Seattle, and nautical points north into the Puget Sound and San Juan Islands. Steve is presently working on a Nomadic Microship sailing/pedalling catamaran. Steve offers a complete list of products including his book, several technical papers, posters, T-shirts and back issues of his newsletters. You can reach Steve through Nomadic Research Labs, PO Box 92190, San Diego, CA 92190. Ph#619-534-2495 or via cyberspace/email: <wordy@ucsd.edu> Be sure to tell him DrRecumbnt/ RCN sent you!

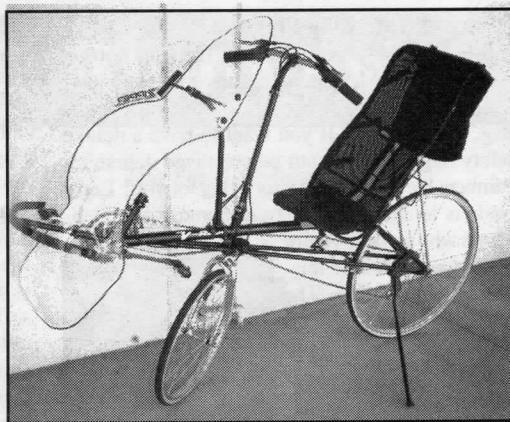
Belik Bicycle

Rosenburg, TX—Several issues ago, we published a photo of a unique SWB built by Jaroslav Belik. He reports that since then, he has built 22 different recumbents and is introducing a new line of bikes at Interbike '95 in Anaheim. Jaroslav's line includes seven models, plus a one wheeled trailer. The bikes are based on monobeam modular building technology. The designs appear to be similar to the Linear and BikeE style. For more info, you can contact this new company at 1610 Mulcahy, Rosenburg, TX, 77471.

New Hard-shell HPV Seat Now Available

San Francisco, CA—We're carrying a new fiberglass hardshell seat designed for recumbents. Designed by an avid recumbent rider in corroboration with a composite manufacturer specializing in the kit car and go kart industry.

The seat back is about 19" high and 8" wide at top and 12" wide at butt section and 8" long at the base. The seat is ergonomically designed with a 15 degree offset of seat back and seat and two reinforcing ribs on the seat back and one on the seat. Mounting pads are incorporated into reinforcing ribs for mounting brackets. The edge of the seat has flared lip design for easy mounting of seat material like Lycra using vinyl edge mounting clips. Weight is approx. 3 lbs. Back is Gel coated white. By providing you own mounting brackets, foam & clips, you can incorporate a comfortable quality seat on your next bent. The price is \$48.95 + shipping from Gaerlan Custom Cycles, 838 Grant Ave. #410, SF, CA 94108



David Whiteman's V-Rex 700/20 with new V-Rex Zipper fairing—Photo courtesy of People Movers

Rescheduled North American HPV Speed Championships

Adrian, MI—The event originally scheduled for mid September has been rescheduled for October 14-15 and moved to Columbus, OH. See the RCN calendar for more information.

Bicycling Injuries Can Cause Impotence

Los Angeles, CA—More than 200,000 American men are impotent as a result of falls onto the crossbars of bicycles, according to researchers from the Boston University School of Medicine. Such falls account for a full third of all cases of impotence resulting from injuries to the groin, the team reported in the Journal of Urology.

The team called for the development of protective devices for use during sports and the redesign of bicycles and other sporting equipment. *This article was in the July 6, LA Times Metro section.*

Zzip Designs V-Rex Fairing Now Available!

Davenport, CA—The V-Rex mount system is the same as for the Lightning P-38. There are however, two fairings bubbles to choose from, the P-38 and Ryan. Mark Colliton test rode both but prefers the Ryan Zipper. Mark has had the prototype for seven months or riding daily to work in the Washington DC area. Mark says the extra width of the Ryan bubble at the top of the fairing gives great weather protection for his hands. The Ryan is 21" wide as compared to 17" for the P-38 model.

Jill McIntire, a P-38 rider going across the USA had this to say, "I am about 1.5 weeks into

my ride and can give you some fairing impressions....one day I had constant 35 mph crosswinds and not only was the bike fine, but I had men on uprights drafting off me! I have had no control problems. I think perhaps, it's giving me an extra 1-2 mph-but that is pretty subjective.. I'm definitely warmer and drier!"

The V-Rex/ P-38 Zipper is \$500 (\$300 mount/ \$200 fairing). The mounts weigh 1.6 pounds and the fairing weighs 2.75 (either model). Contact Zzip Designs Ph#408-425-8650.

NorthEast Recumbents—Largest Recumbent Dealer in northeastern USA

Verona, NJ—The largest recumbent dealer in the NE including New York and New Jersey Metropolitan area has within one season expanded to a full-time dealer carrying seven brands of recumbents and accessories. They have recumbent models from ATP, BikeE, Easy Racers, Lightning, Linear, Rans and S & B for both test rides and rentals.

The owner, Johannes Groessbrink, is a German machine design engineer who opened the shop as the solution to the problem that he could not find any recumbent shops in the NE. He offers excellent advice and first-class service.

NorthEast Recumbents is just 15 miles from New York City and 25 minutes from Newark International Airport, which is a great location for serving the international cycling community. You can contact Johannes at Ph#201-239-8968. □

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Adventures in Presto Modification

.....and other relevant thoughts

Story & photo by Harris Reavin

The Counterpoint Presto is the most fascinating and sophisticated of recumbent bicycles. Its design is outstanding and may be the best currently available. Yet the Presto has fatal flaws which have turned off many riders who have gone on to other recumbents. Previously in RCN Mark Colliton discussed some of the problems of the Presto in comparison to the Lightning P-38. Those who are familiar with both bikes sometimes migrate to the P-38 because it seems to be a better-integrated package. I bought a Presto because of the brilliant design. I was very disappointed in its failings. Instead of trading it in for a P-38, I tried to fix the flaws. I believe that I've succeeded.

I became interested in recumbent bicycles the way most people do. riding a mountain bike was too painful and no amount of adjustment or modification could fix it. I wanted a bike that would be comfortable for hours of touring and that would provide performance equivalent to that of conventional road bikes.

I started to seek out and test ride recumbents. One of the first was a ReBike. It was easy to handle and comfortable, but too heavy and crudely built. The ReTrike is useless for anyone interested in touring. It is heavy, slow, and unstable at speed.

The search continued and I tried about ten different models. Most of the seats were uncomfortable in one way or another. That was surprising because I had expected that recumbent designers would put the emphasis on comfort. Most recumbents are one-man designs that are sold in very limited quantities. As a result, choosing one involves finding a designer who thinks the way you do and whose body is comfortable in the same position as is yours.

I eventually decided that a mesh seat was the only way to go. Foam seats are comfortable, however, I live in the Washington, DC area and Summers are hot and humid. I would quickly become soaked and feel as if I were riding on a wet diaper. Some of the mesh seats have a bottom foam cushion. This defeats the quick dry advantage of the mesh. Some other mesh seats were too short on the bottom or had other uncomfortable flaws.

LWB bikes reminded me of driving a school bus, CLWB bikes were easy to handle but seemed to have poor performance. SWB seemed best if they had front suspension. In evaluating recumbents I closely agreed with the opinions in RCN. They recommended the Presto as the SWB having the best mesh seat, suspension, and features, in addition to very good performance.

The Presto had no local dealers, but Kelvin Clark of Angletech gave me the name and number of a nearby owner who was willing to demon-

strate the bike. A two-block ride was all that was needed. Its seat was by far the most comfortable I had tested. The bike had only 179 miles on it and the owner was willing to sell due to an unrelated injury. I had wanted the 63 speed suspended version, but the price was good, the bike was there, and it could be easily upgraded.

The biggest problem with the Presto was the harsh ride without front suspension. The frame seems to be totally inflexible. The 20-inch wheels with 100 psi tires are rock hard. The seat suspension is very nice and reduces road shock to your butt and back, but the lack of front suspension made the bike murder to ride on a bumpy bike path. The ride was OK on the road, however dangers arose when an unnoticed or unavoidable bump or hole could throw me out of control. This may be a problem to some degree with all SWB recumbents without front suspension. It is a result of having a lot of your weight riding over the front wheel and not having any way to unload it as you would with a conventional bike.

Eventually I had the front suspension installed and it completely changed my opinion of the bike. Now I can ignore all but the largest road defects and feel in control, although the SWB can still give a choppy ride in certain conditions. The situation happens when you hit a bump at the front and the suspension bounces you backwards, then the seat suspension bounces you forward. Most fully suspended upright bikes suffer from this problem to varying degrees.

A front suspension with more than the 1.6 inch travel of the RST fork used on the Presto would be wonderful. Nevertheless, it is probably superior to other recumbent suspension systems. The best front suspensions are made for 26-inch wheels. The 20-inch Presto wheel permits the use of a fork made for BMX bikes. A 16- or 17-inch wheel requires a custom made suspension fork. This is why front suspension is so rare and expensive on recumbents.

As I got used to the Presto, I realized that it seemed to be very inefficient going uphill. I am not a strong rider and it was much harder to go up even small hills compared to my old mountain bike. RCN said that the solution was to gear down and spin. The 20-inch rear wheel and stock gearing gave a low gear of 27 gear-inches and this was not low enough. I tried to achieve this with smaller chain rings but the existing 38-tooth ring was the smallest that would fit the crank set and work properly with the idler. That was one of the reasons why the Presto uses the Sachs 3x7 (3 speed internally geared hub).

I was convinced and ordered the Sachs 3x7



hub which brought the low gear to 20 gear-inches. The lower gears were helpful but the bike still seemed very inefficient. Although the hub was installed for the lower gear range its main benefit is the ease of shifting—is it much more convenient than the derailleur. As a result I rarely use the derailleurs any more other than when going up steep hills.

After the hub and suspension upgrades the bike was much better but the seat was still a problem. Although the seat base is 24 inches above ground, it was impossible to hold the bike up comfortably when stopped. Even on tip-toe it seemed to be too high. I had to fall into the seat due to its excessive backward tilt. When riding it was hard to get my chin down low enough to see where I was going. That was ironic since one reason I got a recumbent was the difficulty I had in holding my head up enough to see where I was going.

I had been told that recumbent riders often pulled themselves forward when climbing steep hills—and I was doing just that. Martin Kreig stated that recumbent riders developed their abdominal muscles rather than the gluteus maximus muscles in their butts as is common in upright bike riders. Because you do not push recumbent bike pedals with your abdominals it seemed that recumbent riders were wasting energy pulling themselves forward when straining to go up hills.

Another rider claimed that some tests had shown that a 105-degree seat back to leg angle was optimal for performance. The Presto had angle of 125 degrees and the P-38 which is considered the most efficient mountain climber measured 112 degrees. Some LWB bikes that have a reputation for poor performance have a very large angle, as much as 150 degrees. Many recumbent riders tilt their seats backwards to reduce air resistance in an effort to improve performance. Sitting more upright and using a fairing may be better. The obvious solution was to tilt the seat forward.

The seat back angle on a Presto is not readily adjustable because it is part of the seat suspension. That was the reason why I did not immediately move the seat and experiment with different angles. There are at least three different versions

...Continued on the next page

...Continued from page 14

HOMEBUILDERS CORNER-A LOW COST FAIRING FOR THE RANS ROCKET

Performance Results

My first impressions of the fairing as I rode were of an increase in road noise and a noticeable lack of moving air from my feet up past my hands. My face still caught the wind. On a typical downhill, where my unfaired bike might coast to 30 mph, the faired bike achieves about 33 mph. This increase of 7-10% is fairly consistent. I also noticed a marked increase in coast-down speed/distance over the unfaired bike. This is, once the downhill run is over, the bike continues to roll at good speed on the ensuing flats. At low speeds the effect of a fairing is minimal. Handling is solid at all speeds, with the bike stable enough to ride one-handed at any time. □

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- 1—1/16" thick Lexan sheeting 14" x 42"
- 10—1/8" x 3/4" bolts with self-locking nuts
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- 20—1/8" rubber washers, wide flange
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...Continued from the previous page

of the Presto seat suspension. On my bike the seat back support tube is held up by a 5-inch bolt that has an elastomer doughnut on it. I replaced the existing bolt with a 6-inch bolt and a 1.5-inch spacer made from a 2-inch oak dowel. That moved the seat back up and forward 5 degrees. The seat bottom, which had tilted up about 5 degrees, now was parallel to the ground.

The positive effects of the change were dramatic. Now my feet easily reached the ground when stopped. I no longer felt that I had to fall into the seat when getting on. I could now see where I was going without straining my neck. Most of all the leg to seat back angle was reduced from 125 degrees to 120 degrees. This seemed to improve pedaling efficiency dramatically. I was now able to use higher gears and did not have to down shift as often. It is amazing what the 5-degree difference can make.

I met Dan Eagle Eye when he was riding his P-38 on the local bike path. He also has a Presto that he uses for touring due to its great load carrying ability, but not for most shorter day trips because of its well known problems. Dan bought the Presto because the P-38 was unstable with a touring load. After modifying my bike, I contacted him to see if the change would work for someone else. Dan was just about to leave for a bike touring vacation in Hawaii, which he had done previously on the Presto. The seat angle was reduced to 120 degrees and Dan headed to the islands.

Dan was ecstatic over the results. On three consecutive days he had easily gone up a 4000-foot volcano with a 100-pound load of camping equipment attached to special panniers on the back of the Presto. The seat angle reduction also eliminated the balancing when stopped problem, even with a huge load on the bike.

The change in seat angle proved a great success. Now for the next modification. After a WHIRL ride Dan, Mark Colliton, and I were discussing the relative merits of the Presto and the P-38 when Dan mentioned that the P-38 gives a unique feeling of oneness with the bike that makes it seem so efficient. I rode Dan's P-38 and realized that the feeling was related to the integration of the seat with the rest of the bike. The modified Presto was the same seat height and angle as the P-38 when we put them side by side. However,

there were two obvious differences. The P-38 bottom bracket is 3 inches higher than the Presto and the P-38 has a longer seat back, which supports your shoulders. You can do nothing about the high P-38 bottom bracket, which is a mixed blessing anyway—as it can cause numb feet. It does reduce the leg to seat back angle about 8 degrees to 112 degrees. This is better than the 120 degrees on the modified Presto.

I decided to make a seat back extension for the Presto. Not being a metal worker, I made the extension out of wood. I added six inches to the seat height and tilted the extension forward 30 degrees. The results were wonderful. Now I had a feeling of oneness with my Presto.

I had proved the concept and wanted a properly made metal and mesh seat extension. Kelvin Clark suggested that Stephen Delaire of Rotator might do the custom work. He is an excellent craftsman and currently builds seats for the P-38. I sent him a drawing of the design and received the finished product for just \$110. It is made of three pieces of aluminum tubing and is covered with mesh in the manner of a Lightning. I cannot imagine riding without the seat extension.

Is the modified Presto as fast as a P-38? I don't know, but I believe it is now competitive. For me the Presto is a better choice overall, with the front suspension, rear seat suspension, a folding steering column, and the ability to carry tremendous loads without degrading the handling.

Conclusions: Where do we go from here? I am now pretty much satisfied with the Presto and enjoy riding it with its current configuration, however, it could be designed more efficiently. The 120 degree seat back to leg angle is the largest that is acceptable. A seat with a range from 120 to 105 degrees would be fascinating to test.

Going to seat back angles of less than 120 degrees raises other issues. As you become less recumbent more of your weight rests directly on the muscles that are the primary source of pedal power. The possibilities of discomfort and pain are very real. Very recumbent seats (greater than 125 degrees) are comfortable because you are resting on your back and not on your butt. You have to balance efficiency with comfort. The ideal seat would be adjustable on the fly. You could be laid back for comfort on the level, then move upright for efficiency when pedaling uphill. Perhaps we can convince designers to create such a seat....□

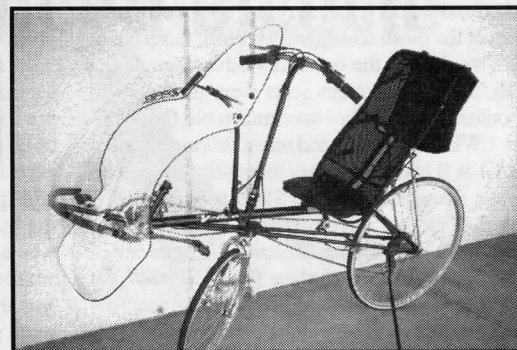
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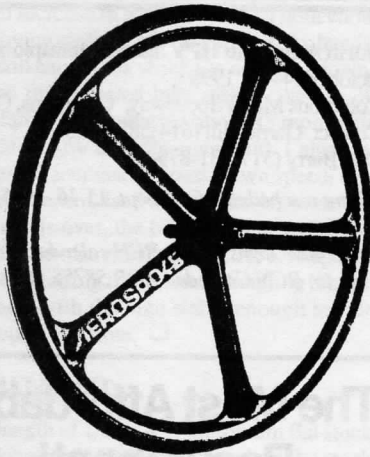
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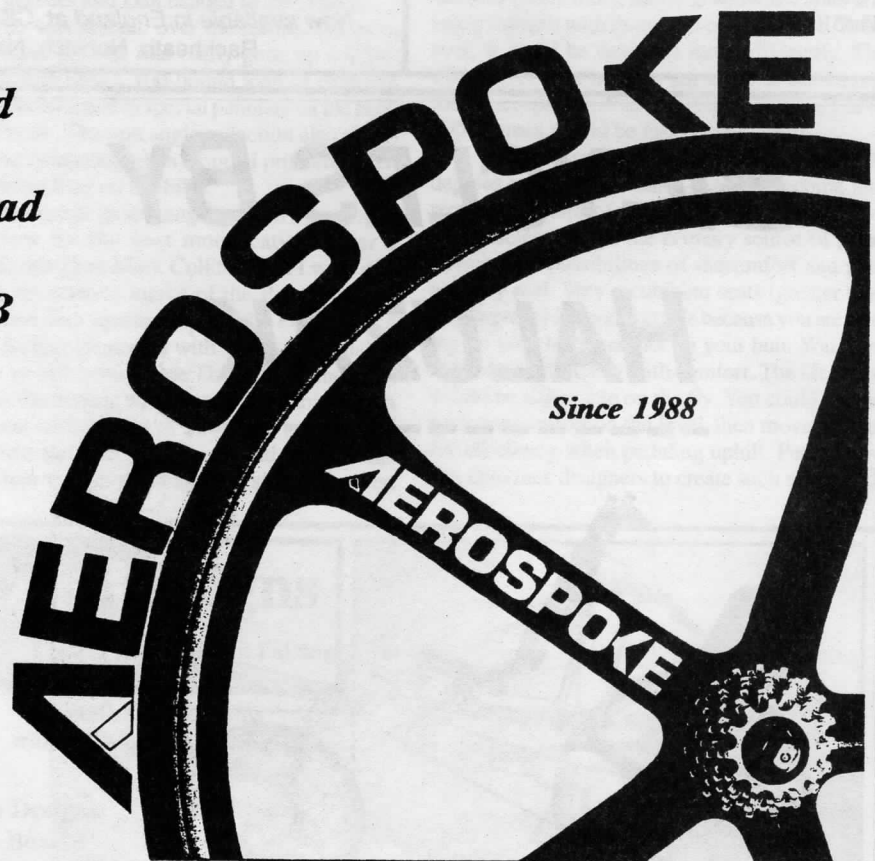
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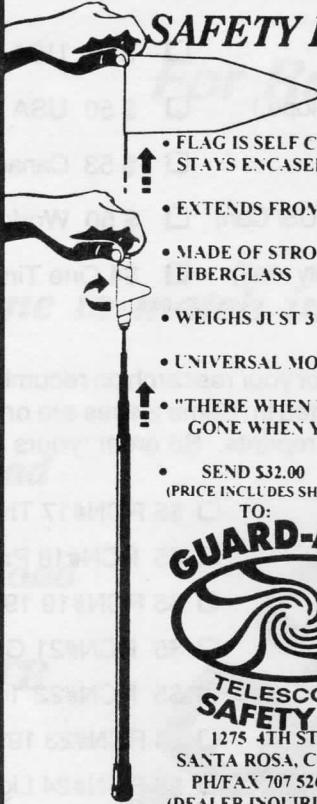
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FOR SALE: 1995 Linear, blue anodized, like new (20-30 miles), \$800 plus shipping PH#408-996-3954 (CA/29)

FOR SALE: Ryan Vanguard, 92/93 model, black, bar-end shifters, Zzipper fairing, 1200 mi., excellent condition. \$1300 Carole, Ph#607-547-8571 (NY 29)

FOR SALE: 1994 Vision Imaculate with < 500 miles, Shimano Deore LX throughout, MT twist shift; rack; seat bag; chain guard, and extras. Price: in western WA \$1195, elsewhere \$1195 + shipping (C.O.D.) Call Richard (206)463-3360 (IL/29)

FOR SALE: 1995 Greenspeed GTR 20/20 trike, 63-speed, Sachs 3 x 7, Ritchey triple crank, built strong for a 6'1" tall rider, Ultegra bar-cons, Deore LX rear der. Sachs front, 3-Tioga Mitsubishi "Comp-Pool" 20" x 1.75 90 psi semi-slick tires, bottle cage, blackburn rack, rear fender, Ride-On cables, dual rear-view mirrors, British Racing Green, excellent condition. New in August. New cost \$4300+ Interested parties only. A superb example of a beautiful recumbent tricycle- new condition. Ph/ fax#206-630-7200.

FOR SALE: 1995 Linear, 42" LWB underseat steering. New in the box. Ready to go/ shipped anywhere-48 states! \$859. Ph#206-630-7200.

FOR SALE: Easy Racer Gold Rush Replica. Large, Like new. Custom componentry (Shimano Deore XT, American Classic, Grip Shifts), full fairing. Must sell. \$1935 Ph#410-830-4138 (29)

FOR SALE: 1995 ATP Vision R-45, Deore XT, 26" rear 16" front Primo, custom ice blue paint. This bike has "0" miles. Cost \$2250 new, \$1800. Call Doug, Ph#906-789-2088 (MI/28)

FOR SALE: 1994-1/2 Haluzak Horizon-dark red, fully equipped, 28/38/48 front, ridden 100 miles, perfect condition. \$900. Call Bill@510-531-3774 (CA/30)

FOR SALE: ATP Vision R-40—100 miles includes a long and short wheelbase booms and computer mount. \$900 plus shipping. Call 904-372-5095. (29)

FOR SALE: Kowal KD4 MWB (41") frameset. Includes frame, seat, 20" CrMo fork and Vision ASS steering kit. Excellent condition. \$350 + shipping. Call 503-472-9014. McMinnville, Oregon (29)

FOR SALE: Alternative Bikesstyles CLWB (Ed Roeters). 3 speed. Experimental model. \$275. Ph#419-534-2431 (OH/29)

FOR SALE: Aerospoke wheel set: 700c and 20" both with IRC tires/ tubes, Dura Ace QR's and a Sachs 12-30 freewheel. Demo 37 mi. \$599. Ph#206-631-5728

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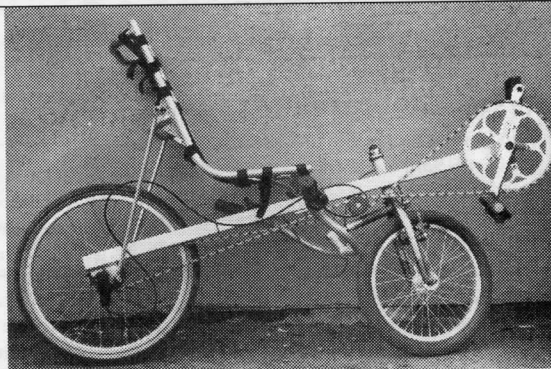
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USED RECUMBENTS

FOR SALE: Test ride bikes—Available Sept. 1. These were my test ride and/ or floor models this season: Rans tailwind 20" BMX size wheels list price \$985, sale \$775. Rans Response list \$1375, sale \$1075, V-Rex (no cantilever) 24 X 1.5 rear 16" 1 3/8 front list \$1475, sale \$1200. All are triple cranks. S&B trike, rear brake only \$600. Not available until September. **Recumbent Sea** Ph#616.454.3260. pick-up, ship or meet you 1/2 way.

FOR SALE: De Felice LWB custom, size-4, Phil hubs & BB, rack, full mesh seat, custom fork, rare. \$999.99, Linear LWB demo \$899 **AngleTech** Ph#719-687-7475

FOR SALE: USED RECUMBENTS: Silver Infinity trade in with many upgrades \$695; Maxam Prestige-uses from \$595; used S&B SWB \$470; Ryan Vanguard new display bike from \$1450; one used with a full Zzipper at \$1450; Vision R-40 demo \$795; Rans Tailwind demo \$750; Rans V-Rex with bucket seat demo \$1150; **Mt. Airy Recumbents** Ph#301-831-5151 Best reasonable offers Can Ship. Bikes are available for test ride at our shop.

CONVENTIONAL BIKES:

FOR SALE: BIKE FRIDAY, 1995, World Tourist, black, 21 speed, Shimano LX, Ultegra bar-cons, bar-ends and suitcase. Never ridden. \$895. Call after 7 pm EST Ph#301-933-1947 (MD/29)

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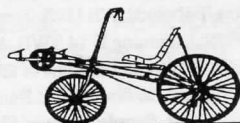
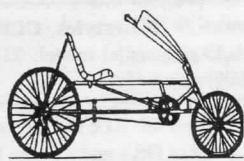
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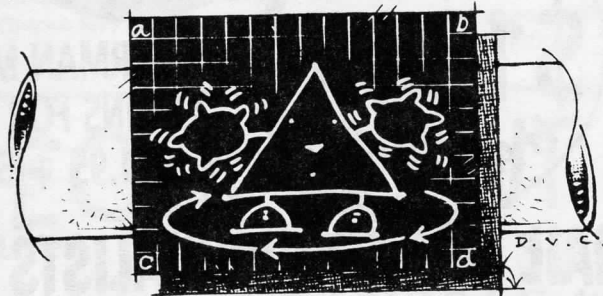
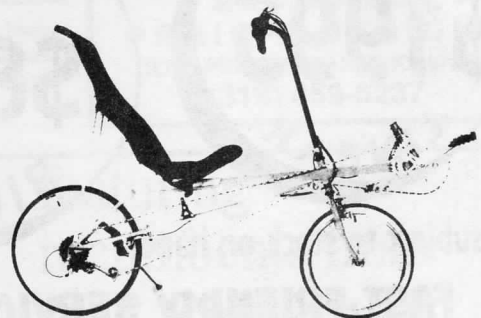
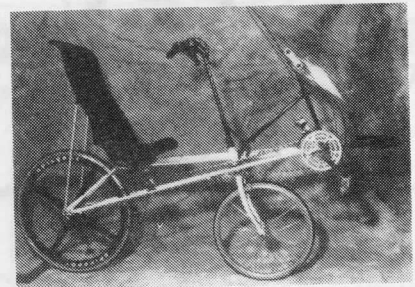
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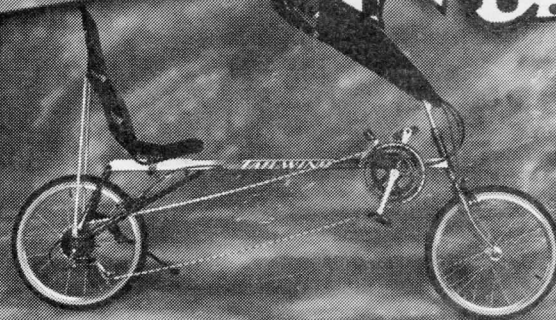
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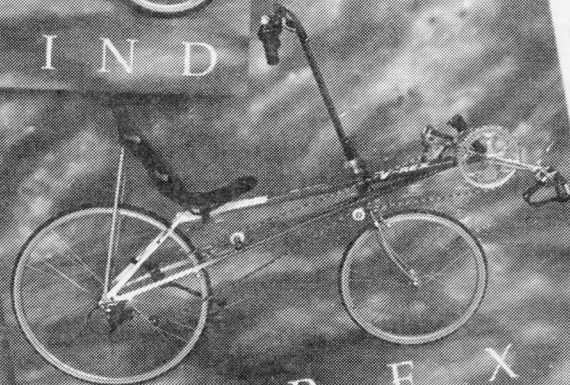
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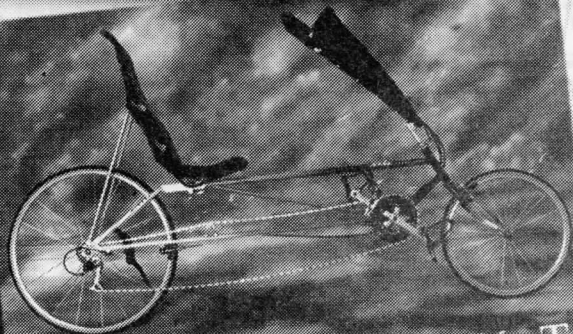
TAILWIND



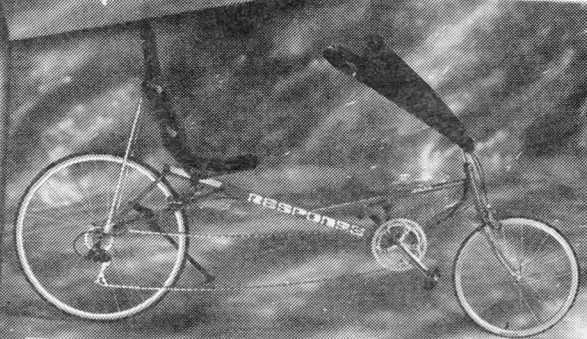
ROCKET



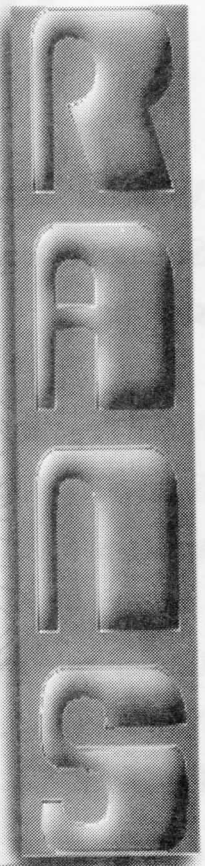
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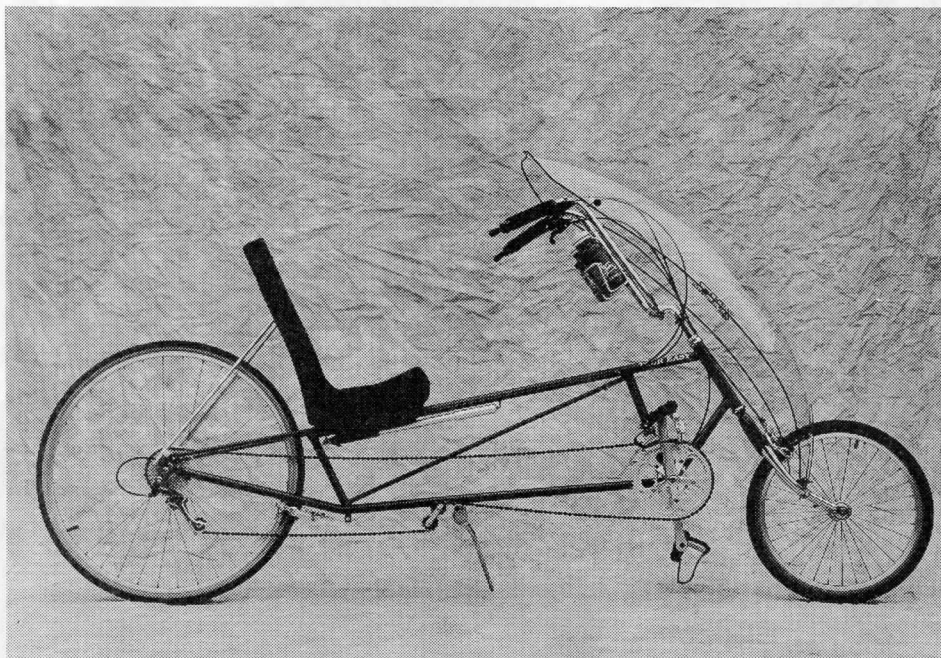
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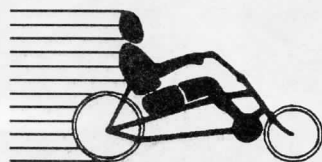
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Buyers Guide Updates

- **BikeE** Correct Phone Number is:
503-753-9747 (Corvallis, OR)
- **Recumbent Sea** Phone Number is:
616-454-3260 (Grand Rapids, MI)
- **Soho Design's** correct phone number is:
503-575-2003 or 1-800-258-SOHO. They are the builders of the Renegade, pg 19.
- **The True Wheel** has a new toll free line:
1-800-473-0047 (Hailey, ID)
- **Page 13:** The bike pictured is a Angle Tech V-Rex SS, the GL63 is not available with a Spinergy wheel.
- **Page 22:** The BikeE has a lifetime warranty on the frame.
- **Page 35:** The Zephyr by Practical Innovations, Co. has a track of 32."
- **Page 39:** The AngleTech Counterpoint Opus has a 26" rear wheel.

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RECUMBENT CYCLIST CALENDAR

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SPRING '95

Indiana HPV Fest

April 29, 1995

The first even in the 1995 Great Lakes HPV Race Series. Contact: Don Barry, Ph# 317-831-8798.

SUMMER '95

The Ninth Annual Michigan HPV Rally

June 3, 1995

Waterford Hills Raceway, Waterford, MI.

Events include a road-race, sprints, hill-climb/coast down, and the chef's surprise.

Unlimited HPV Races

June 9, 21 and July 25.

Hellyer Park, San Jose, CA

HPV Racing at the Velodrome. 40MPH speeds. Hosted by Fast Freddie Markham. For more info, call Easy Racers at Ph#408-722-9797.

Delta Challenge

June 4, 1995

Delta College, Bay City, MI.

Road course with hairpin turns. The fourth race in the Great Lakes HPV Race Series.

The Midwest Recumbent Rally

June 10-11, 1995

Amherst High School, Amherst, WI.

Ride, rally and hang'in in the parking lot. Sponsored by The Hostel Shoppe in Stevens Point, WI. Contact Rolf at Ph# 715-341-4340 or 1-800-233-4340 (WI. only).

DaVinci Days

July 14-16, 1995

The 7th annual celebration of science, art, and technology. Contact OHPV, Paul Atwood, Ph# 503-752-6410 or Festival info, at Ph# 503-757-6363.

The Wisconsin HPV Classic

July 15, 1995

State Fair Park, Milwaukee, WI.

The Milwaukee mile is a one mile oval auto race

track. Great Lakes HPV Race Series. Contact Dennis Northey, c/o POW WOW Bicycle Tours, Ph# 414-671-4560.

The Third WISIL Challenge

July 16, 1995

Parkside in Kenosha, WI.

The one mile course is perfectly square, with wide radius turns. There will be 15 and 20 mile road races, as well as the, "Cheddar Challenge," a standing-start quarter mile. Great Lakes Event. Contact: WISIL HPV'ers, Len Brunkalla, 260 S. Channing, Apt. 1, Elgin, IL 60120.

Cycle Fest 1995

August 4th-7th, 1995

University College of St. Martin, Lancaster, U.K.

A Celebration and meeting place for people and ideas. Racing, trade show, with test rides, guided local tours and cycle-art exhibition. See Moultons, Pedersons, classic lightweights, recumbents and hpv's.

For more info contact Peter Cox, 32 St. Georges Quay, Lancaster, LA1 1RD, England or call 01524 849083.

World Championships '95

August 26-Sept. 3, 1995

Eindhoven, The Netherlands.

EVENT CANCELLED (update as of 4/1/95)

FALL '95

North American HPV Speed Championships

September 16-17 (registration no later than 9/15/95)

Michigan International Speedway

Brooklyn, MI (between Adrian-Jackson)

For more info contact: Don Barry at ph#317-831-8798 or Gaylord Hill Ph#517-263-5803

Interbike Anaheim International Bicycle Expo

September 10-13, 1995

Anaheim Convention Center, Anaheim, CA.

(Trade Show) Contact: Interbike

Ph# 714-722-6975.

1995 Int'l Bicycle and Sports Show (BIO)

September 20-22, 1995

Sands Expo and Convention Center, Las Vegas,

NV.(Trade Show)

Contact: BIO, Ph# 303-444-4246.

Ohio HPV Race

October 7th or 8th, 1995

Columbus Motor Speedway, Columbus, OH. A

new race for the Great Lakes Series.

HPV Race Official Workshop

October 15, 1995

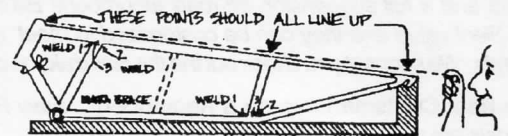
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1995 RCN Editor's Choice Awards

THE BEST RECUMBENTS BIKES

The Best SWB Recumbent of 1995 (USS): *ATP Vision. The Vision is still the best all-around recumbent. Who else gives you a SWB, LWB, ASS, USS, 16" and 20" front wheels that all fit on the same bike? This is the new recumbent enthusiasts dream!*

The Best SWB Recumbent of 1995 (ASS): *Rans V-Rex. The world's new SWB powerhouse. What can we say, Rans offers the finest SWB recumbents for the money. We like the AngleTech 24"/17" version the best, but all are excellent.*

The Best CLWB 1995: *Easy Racer EZ-1 (tie) BikeE 21 speed. The EZ-1 is the lowest priced bike EVER from that recumbent institution of Easy Racers. It rides and handles like a dream with trademark exquisite Easy Racer's road manners and frames welded by Fast Freddie. The BikeE is an excellent, compact package and they offer the fantastic Sachs 3 x 7 for 21 speed shifting. Also the price was reduced to \$895 this year, which makes it a good buy.*

The Best LWB Recumbent of 1995 (ASS): *Easy Racer Tour Easy. Still the best! Look for new upgraded spec's for '95!*

The Best LWB 1995 (USS): *Ryan Vanguard XTR. Nobody does LWB USS like Dick Ryan & company.*

The Best High Performance Recumbent 1995: *Easy Racer Gold Rush Replica with optional body stocking. This bikes fantastic and does not require a pilots license or exam.*

The Best Recumbent with a Full Fairing: *Crystal Engineering/ Ross Recumbents/ Peter Ross' and his nose cone/ soft body options for the Ross SWB and (Euro) Trice trike (priced from £400).*

The Hottest New Recumbent for 1995: *Rans Rocket. New Rans seat, V-Rex bar & stem, dual 20's, tall gearing....all from \$695....wake me up.....this is a dream, right?*

The Most Under-Rated Recumbent: *Haluzak Horizon. Bill Haluzak builds several variations of his MWB recumbent, from the standard Touring model, to the Hybrid Race and new for '95 a model for shorter riders and a full suspension off-road recumbent! Bill's bikes are an excellent value and they can be customized to meet customers demands. We suggest you check out the the Haluzak line of recumbents.*

The Best Craftsmanship on a Recumbent: *Easy Racer's (most models are now welded by Fast Freddie Markham).*

The Best Recumbent Building Plans 1995: *Easy Racers (LWB) and CycloPedia's Econ Bent (MWB).*

THE BEST COMPONENTS

The Best Recumbent Seat: *Rans-Haluzak-Lightning*

The Best Recumbent Component Group: *AngleTech V-Rex GL63*

The Best Recumbent Drivetrain: *Anything with the Sachs 3 x 7. This unique internal 3 speed hub with a 7 speed freehub allows small drive-wheel bikes fantastic wide range gearing. It also shifts at while riding or standing still. Gear heads can keep their front derailleur to get 42-72 speeds (cool!)*

The Best Recumbent Paint Job: *3 color fades for a \$65 upgrade.*

The Best 'bent Clipless Pedals-all around: *any Shimano SPD*

The Best Recumbent Crank: *Mavic, Campy or Ritchey*

The Best Recumbent Brakes (low end): *Dia Compe FSE/ Big Dog*

The Best Recumbent Brakes (high end): *Shimano Dual Pivot*

The Best Recumbent Chain(s): *Sachs*

The Best Recumbent Chain Idler: *Bill Haluzak's Horizon*

The Best Recumbent Shifters: *SRAM Grip Shift SRT600/800*

The Best Recumbent Fairing: *Zzip Design*

The Best New Recumbent Fairing: *AngleTech & V-Rex Zipper*

The Best Recumbent Fairing Deal: *Rans with optional windscreen.*

The Best New Option on a Recumbent Bike: *The ATP Vision large size seat & 20" front wheel conversion.*

The Best Recumbent Warranty: *Limited lifetime from Rans, Haluzak, Easy Racers (most models) and Linear*

The Most Under-Rated Components: *Sachs drum brakes*

THE BEST RECUMBENT FOLKS

The Best Recumbent Dealer 1995-West: *Jim Wronski, People Movers, Orange, CA.*

The Best Recumbent Dealer 1995-East: *Larry Black, Mt. Airy Recumbents, Mt. Airy, MD.*

What makes these two shops stand out is that they are places where customers can go and see very a large selections of recumbent bicycles. There are many dealers than have a few brands, but these guys go to the other extreme, they probably have too many!

The Best Recumbent Designer(s) 1995: *Randy Schlitter/ John Schlitter/ Mark Colliton-for the Rans V-Rex.*

The Best Custom Spec'ed Recumbents 1995: *Kelvin Clark, AngleTech, Colorado.*

The Best Recumbent Parts Place: *CycloPedia/ Gaylord Hill; The 1995 CycloPedia HPV parts catalog is out and it's a must for any 'bent rider.*

BEST RECUMBENT STUFF

Best Recumbent Brochure: *1995 Rans Catalog with Rocket insert. Just as we were going to press we saw new color brochures from ATP, Easy Racers and Haluzak*

Best Recumbent Manufacturer Video: *Easy Racer's new video with the EZ-1.*

Best Recumbent Video: *Steve Iles' "Eureka, CA IHPSC Video." This was a tough call, but Steve's newest video is better than all previous efforts. This is a labor of love for Steve, we suggest you order his latest video and try it out.. We also liked the EnCYCLEopedia video. See all kinds of weird bikes being ridden...cool!*

The Best Bike Publication (besides RCN): *EnCYCLEopedia/BCQ*

LAID BACK RUMORS

Please Keep in mind that these are completely unsubstantiated rumors.

Suspension 'bents I: *We know of some new suspension recumbents under development. Be prepared to pay \$2500+/- for full springs.*

Suspension 'bents II: *Just as we were going to press, Bill Haluzak called to tell us about his new fully suspended MWB for \$1995.*

A US SWB manufacturers has a tandem in the works.....

One of the big boys is again looking at the 'bent market.....this time they're looking at trikes?

RCN DUBIOUS ACHIEVEMENT AWARD:

This award goes to a select few recumbent manufacturers who actively build & sell recumbent bicycles in the USA, but DID NOT respond to our buyers' guide questionnaire or send any pictures of their models. If they had responded to our mailer(s) it would have guaranteed them listing(s) in our buyers' guide. We apologize in advance for these manufacturers' short sightedness and our not being able to bring you info on every single model available in the USA, even though we have brought you 98.4% of what is available.

RCN ReCYCLE CLASSIFIEDS

RECUMBENT DEALERS

•SAN FRANCISCO BAY AREA•

Dave's Bicycling Alternatives. Stocking dealer for Linear, Ryan, Easy Racers, and BikeE. new and used recumbents and unusual bikes available. Good test area. Located in Santa Clara County. We service the complete bay area. Call 408-996-3954 or 1-800-520-1245. (CA/26-27)

PEOPLE MOVERS: The USA's Biggest and Best Recumbent Shop! We specialize in Ryan, Linear, Rans, A.T.P. Vision, Haluzak, BikeE, Rotator, Maxam, & ReBike recumbent bicycles. Drop-ship anywhere in the USA. People Movers, 980 N. Main, Orange, CA. Phone #714-633-3663. Call us last for the **BEST** Price. Open 7 days.

RECUMBENT/ HPV PARTS:

Performance Road Wheels, 16" and 20," Deore XT Hubs, 36 hole, Sun Mistral or Arai rims with quick release axles. \$79.95 and up--plus shipping. New! 90 & 110 psi 16" tires. Call People Movers Ph#714-633-3663 (CA/24)

BIKE PARTS FOR SALE: •**Look Carbon Shoes,** used twice. US-11.5/ Euro 46 \$35 shipped; •**Campagnolo Grand-Sport** long cage rear derailleur & bar-cons (non-index). Exc. cond. (25 mi.), orig. box. \$37 shipped. •**Bruce Gordon** tubular CroMo racks, powder coated black, front low rider and rear (set only). The finest racks known--this is a steal. \$55 shipped Ph#206-630-7200.

FOR SALE: Easy Racer Sling Seat, custom made prototype that bolts directly to a Tour Easy or Gold Rush recumbent. The seat comes with all parts necessary to easily bolt on. \$249 shipped anywhere in the USA. Ph #206-630-7200, 8am-noon, 1pm-3pm, 6pm-8pm PST.

FOR SALE: 20" UNI Discs, black, non-logo, \$49 each shipped anywhere in the USA. Ph #206-630-7200.

FOR SALE: SPEEDPLAY MAGNUM--Clipless Pedals, walkable cleats, like new \$90. Sell/ trade Ph#619-452-3889

WANTED HPV PARTS:

WANTED TO BUY: Burley trailer (or similar). Call Ross Ph#501-793-2383

WANTED: Long Zipper or similar fairing and mounts to fit Vision R-40 recumbent. Contact Barry at Ph#503-363-0306 (26/27)

RCN CLASSIFIED ADS WORK! AND SOME ADS ARE FREE !

For these classifications, ads are free: Ads run for one issue and then must be renewed: Recumbents For Sale-Under \$399, Parts for Sale, Parts Wanted, Pen-Pals, Tour Partners & homebuilder networks & information. Call Ph #206-630-7200.

USED RECUMBENTS

FOR SALE: Counterpoint Presto, 1992/93 model, 20" x 1.5" tires, Front suspension, Magura brakes, Deore XT drivetrain, triple crank and custom dark green paint. Call John (mobile/voice mail) Ph#206-279-9469. (WA/26/27)

FOR SALE: 1994 Easy Racer Tour Easy, size large frame, red, Zipper fairing, rack, pump, 20" x 1.5" front tire. Less than 1000 miles. Bike is like new. \$1400+ shipping OBO. Call Darryl at: Ph#(HM) 206-933-6577 or (WK) 206-441-0295. (WA 26/27)

FOR SALE: Counterpoint Presto 1987(?), folding boom, drop bars, 12-speed, 20" x 1-1/8" wheels, Dia Compe brakes, Custom pearl paint, exc. cond. est. 500 mi., \$1250 + shipping. Call Rick, Ph#206-828-3701 (WA/26/27)

ALMOST NEW * SUPER DEAL: Vision R-40 SWB underseat steering, less than 2000 miles. Original equipment. Wife says three 'bents are too many! \$690+ shipping. Charlie Ph#805-871-9445. (CA/25-26)

FOR SALE: EASY RACER GOLD RUSH REPLICAS Alum., Cobra seat, Full Zipper, composite fender, Blackburn rack, Deore XT front der., Sachs Huret rear, 24 speed, Sachs Shifters, Shimano RX100 brakes, extras, excellent condition. \$1950. Ph#510-463-8021. (28)

FOR SALE: 1994 COUNTERPOINT PRESTO SE63 Custom fade paint, 63 speeds, XTR, DuraAce, modified suspension, very low miles. Cost over \$2800/ Sell for \$1900. Call John Ph#719-683-2713 (CO / 28)

BUILDERS GARAGE SALE--FOR SALE- Two CLWB, two-SWB home-builts. Quality equip., Frames or complete. Bargain pricing. Call Tom Ph#618-263-3557 (MI 26/27)

FOR SALE: Lightning P-38, '94 model, fits 6" rider, less than 200 miles, superb cond., wheel disc. \$1275 OBO. Call Val at Ph#1-800-526-4661 (UT/ 26-28)

FOR SALE: 1994 MAXAM Reveille \$250 Less than 50 yards. Call Val at Ph#1-800-526-4661 (UT/ 26-28)

FOR SALE: Vision Recumbent. 1995 model, short wheelbase, underseat steering, burgundy and less than 100 miles. Includes accessories . \$750. Call Steve at (206) 292-1947 (WA/ 26-27)

FOR SALE: • One 1995 Maxam Revielle Dlx. Top of the line model, new in the box. \$499. • **1995 Infinity** upgraded equipment, built from frameset in last month: Sugino cold forged triple crank, Sachs hubs, Suntour drivetrain, blue, very nice \$799. • **Turner Laid Back 2000** frameset, blue, small size, CroMo, f' glass tall seat, new in the box, a steal at \$459 • **Easy Racer EZ-1** Red, large, performance wheel upgrade, Grip Shifts, large, dual water bottle cages, road test demo-50 miles, \$100+ in options \$739 shipped • **1995 Linear SWB,** RCN road test demo-50 miles, mint cond. \$959. Robert Ph#630-7200, Fax#206-631-5728. (WA/26-27)

USED RECUMBENTS

FOR SALE: TWO RYAN RECUMBENTS. 1992 models with less than 100 miles. #1 Deore XT Gruppo, Sun Mistral hard anodized rims, hand built 36 spoke (DT) wheels, 700c rear, 21 spd., red \$1495. #2 Suntour XC Pro/ LTD, Grip Shift, sealed hubs, 26" rear wheel, 21 spd. red, \$1195. Price incl. shipping (48 states). Call eves Ph#503-543-3383. (OR 26-28)

FOR SALE: 1992-1/2 Joel Smith-ATP R-20, Deore DX components, custom idler and intermediate gear. Bike is new old stock, 200 miles. Very rare. Cambie Cycle Ph#604-874-3616 \$1200 US/ offer. (CAN/ 26)

FOR SALE: Ultimate Tour Easy. Complete or as frameset. Large, Black, with Faring. \$1,700 complete. Call James Vernon (214) 539-9063, AOL - AlloyMouse, Internet - alloymouse@aol.com. (TX/ 26-28)

FOR SALE: 1992 Linear LWB, 18 spd., underseat steering, gold 42" frame, nice cond. \$590 + shipping OBO Wally Ph#313-884-0109 (MI/26-28)

FOR SALE: Tour Easy, red, lg. frame, fits riders 5'7"-6'4", Triple crank, bar-end shifters, std. Zipper, rear rack & panniers, handlebar bag, computer, spare tires & tubes; tuition payment forces sale. Cost \$1800, asking \$900. Stephen Anderson, 602 Gornto Rd. Valdosta, GA 31602. Ph#912-242-6209.

FOR SALE: 1995 Rans V-Rex XT, custom paint, both wheel sets & forks, \$1750 Save \$\$\$ People Movers Ph#714-633-3663

FOR SALE: Two '94 Linears, one like new, the other new in the box. Call Terry, Ph#319-252-1076. (IA/27)

PUBLICATIONS

HPV NEWSLETTERS: IHPVA HPV News, 65 + various issues, 1984-1994, \$75 shipped. RCN, POB 58755, Renton, WA 98058. Ph#206-630-7200.

RCN Classified Ad Rates & Information

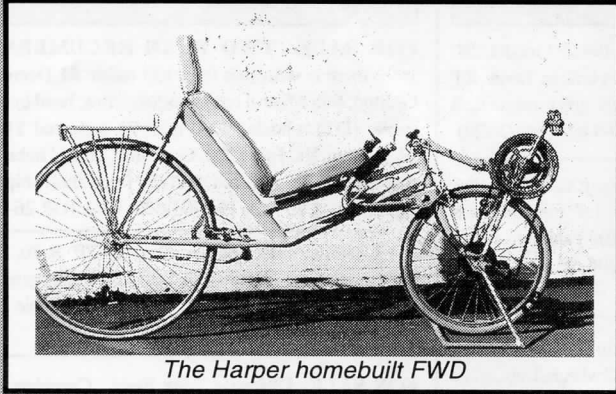
Effective with this issue, all non-commercial paid classified ads will run for "TWO" issues. If your bike sells would like to cancel your ad for the second insertion--please call us ASAP. Free ads run only once.

Classified Ads Rates:

"Parts Wanted," "Parts For Sale" & "Personal ads" all free to subscribers. "Bikes For Sale"--Each 25 words \$12.50. Non-Subscriber rates are: \$20 for each 25 words. Commercial classifieds are \$1. ea. word (40 word minimum). Name, address & phone counts as 10 words. Please phone 206-630-7200 to request a display-ad rate sheet.

RECUMBENT CYCLIST ADVERTISING WORKS--PLACE YOUR AD TODAY!

•RCN Photo Gallery•



The Harper homebuilt FWD



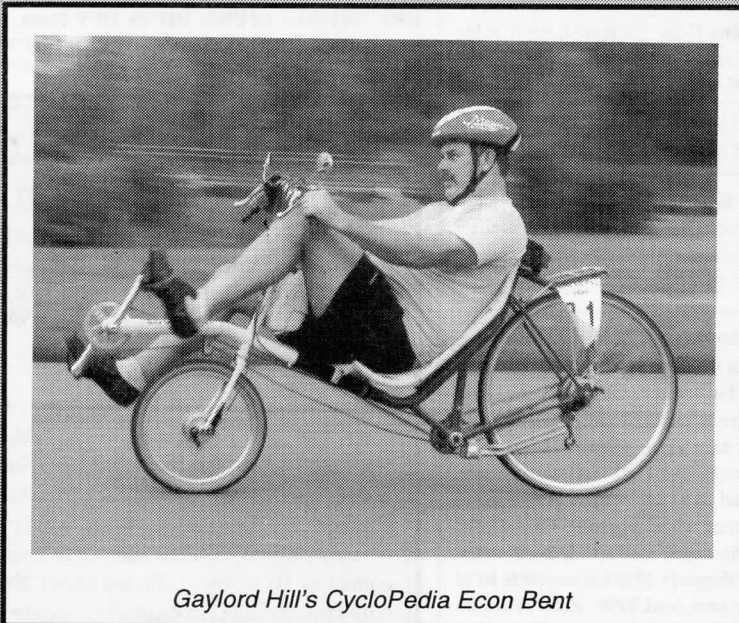
The 1995 Haluzak "Traverse" recumbent MTB



The Flevo FWD



The Lightning F-84 Composite



Gaylord Hill's CycloPedia Econ Bent

Dear readers,
We hope that you have enjoyed our publication. We would love to have you as a regular subscriber to RCN. It is your support of this magazine that makes issues like this one possible. Also, please let manufacturers know that you saw their bike in RCN. We hope to hear from you soon!
Viva Recumbency!
Robert J. Bryant, Publisher

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