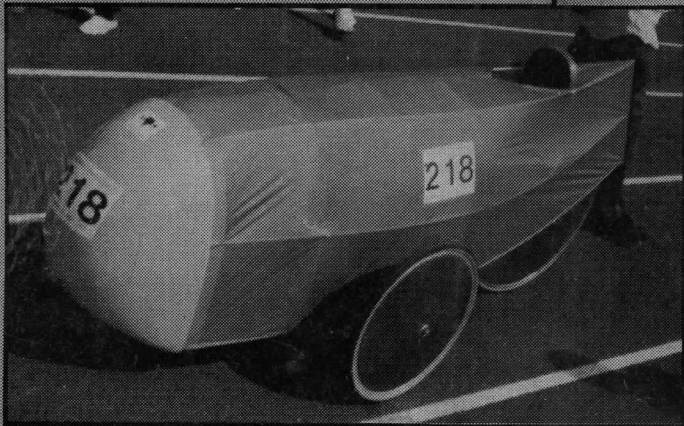
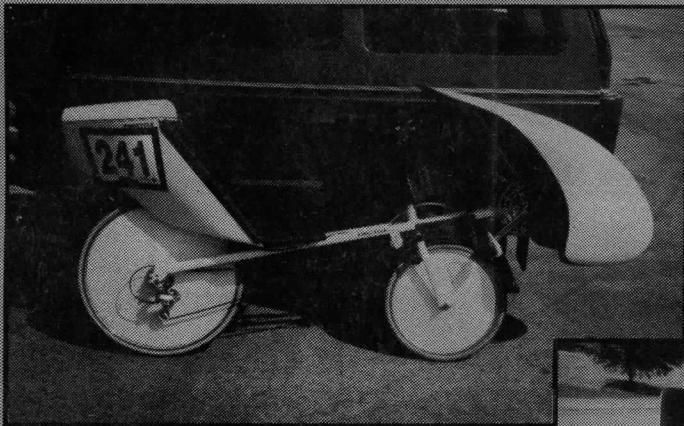


THE RECUMBENT CYCLIST

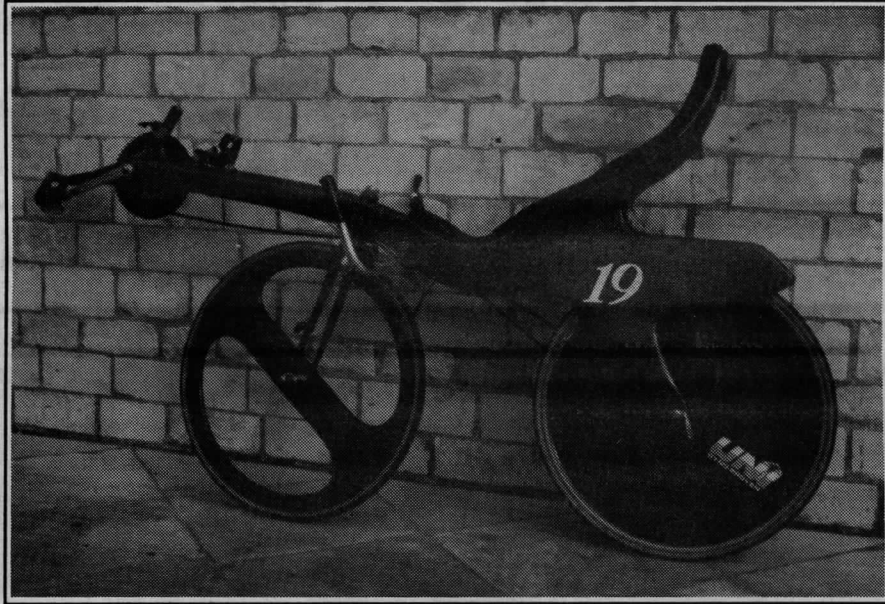
Oct-Nov-Dec 1991

The Official Magazine of the
Recumbent Bicycle Club of America

Vol. 2 No. 8 \$3.00



The 1992 Recumbent Bicycle Buyer's Guide



"M5 Composite with 2 700L wheels"
(Photo by Bram Moens)



"M5 with suspension with a 28" rear wheel
and your choice of 24", 26", or 28" front wheels"
(Photo by Bram Moens)

USCF RELAXES BICYCLE RACING RESTRICTIONS

Even though our readership and recumbent sales figures favor the LWB design, changes in the future of bicycle racing may dictate otherwise. This note was taken from page 15 of the June '91 Cycling Science, "The UCI and USCF have relaxed the restrictions. The USCF is the most liberal. They have eliminated most of the previous specifications. Gone are the rules governing wheel size, tubing size and the position of the saddle, etc. They still restrict bicycle dimensions to an overall length of 2 meters and a width of 75 cm. and they prohibit protective shields or fairings that have the effect of reducing air resistance (except spoke covers are permitted). In other words, the USCF apparently would allow a recumbent bicycle with any wheel size to be used in USCF races. Any type of frame type including monocoque would be legal."

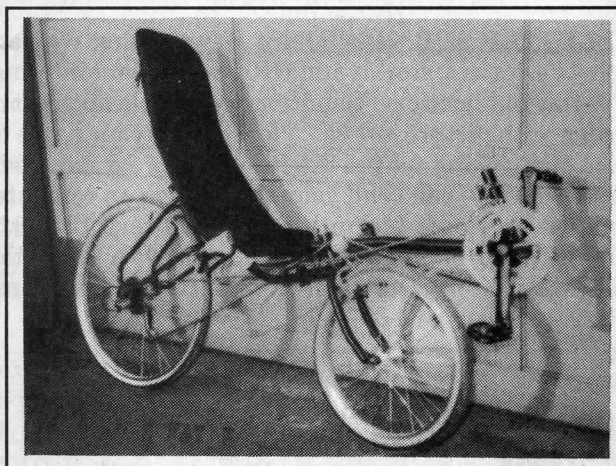
This is big news to recumbent racers. At a local Streamliner Racing Association Event, a USCF official said that he would not disallow a recumbent that was longer than 2 meters. My thought is that if and when recumbents start to win, will the rules be enforced?

We have heard of several bikes in the post production stages or on the designers table that will meet the new standards. Many already do, the Counterpoint Presto and Lightning P-38. Others in the works are:

NEW 1992 SWB/MWB RECUMBENTS

THE INFINITY BULLDOG: a medium wheelbase scheduled for early '92 unveiling, estimated price is between \$500-\$800. (See the Infinity listing in the Buyers Guide).

THE A.T.P. R-20: This new suspended (seat) monotube SWB with 20" wheels front and rear and also utilizes the CycloPedia Hyperdrive drivetrain. This recumbent was designed by Seattle area Engineer, Joel Smith. This bike will be available by the time you read this and is priced at \$1350. (See the A.T.P. Listing in the Buyers Guide).



"The 1992 Sports Cycle"

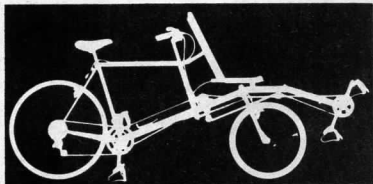
THE SPORTS CYCLE: This is a new design SWB with a wheelbase of approx. 37," uses a 20" front wheel and a 26" rear wheel. The prototype weighs in at just under 27 lbs.

The frame and fork are True Temper 4130 chromoly. The bike has been designed by a reputable and noted west coast frame builder that knows recumbents. The bike rides comfortably and is responsive but not twitchy. The seat height should be in the area of 21.5" Ready to ride bikes that will ship in one UPS'able box will be priced at under \$999. For more information send S.A.S.E. to: Sport Cycle c/o RBCA/ RCM, 17650-B6-140 Ave. SE Ste. 341, Renton, WA 98058. The RBCA/ RCM has no interest whatsoever in this project. Our only objective is to provide readers with the fastest possible way to get information on this new company.

ROTATOR PROJECT X: A brand new MWB recumbent designed and built by Stephen Delaire of Rotator Racing. This high performance racer will have Rotator trademark 20" wheels front and rear, a (approx.) 44" wheelbase, upright handlebar steering and a simple frame design. Target price range is under \$1000. Rotator is also working on a new model of "Super-7" that will also come in under the 2-meter USCF rule. (See the Rotator listing in the Buyers Guide.)

NOTE: For more information see our Buyers Guide section of this issue.

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RCM INFORMATION

The Recumbent Cyclist Magazine is dedicated to promoting recumbent bicycles and providing and encouraging communications between HPV enthusiasts, dealers and commercial manufacturers of recumbent bicycles.

The Recumbent Cyclist is the official newsletter of the Recumbent Bicycle Club of America. To subscribe to the Recumbent Cyclist, please send \$20 Annual dues and \$30 worldwide & Canada (USA FUNDS). The club patch is also available from the RBCA office for \$4.00 each shipped. Extra copies of RCM#8 are available from the below address for \$5.95 each postpaid.

NEWSLETTER SUBMISSIONS: Hey readers: We want your photo's, letters, stories and HPV/recumbent information for this publication. Send a story/ article about your bike along with picture or two. Please print your name on the back of anything sent to the RC office so we can credit the source. If you can send your submission on computer disc, we use an Apple Macintosh that will read IBM 3.5" discs in ASCII format only. If you don't have a computer, we will take it in a letter form or whatever. Please send submissions to our new office at:

NEW ADDRESS:

RBCA/ The Recumbent Cyclist Magazine
Robert J. Bryant, Editor and Publisher
17650-B6-140th Ave. SE Suite #341
Renton, WA 98058 USA

PLEASE SEND ALL CLUB AND MAGAZINE CORRESPONDENCE TO THE ABOVE ADDRESS, THE NEW HAMPSHIRE RBCA OFFICE IS IN THE PROCESS OF BEING CLOSED.

CHANGES FOR '92: We are growing rapidly and it is both fun and amazing to open the large amount of mail the club/ RCM receives. Currently the RCM is a one-man-band, I do most everything. We eventually plan to publish six issues per year, but for '91 only five will be produced, this actually was the original plan. In January of '91 we went from quarterly to five times per year. Thanks for all of your encouragement and support. Please keep on telling people about the Recumbent Cyclist.

THE CLUB ROSTER is changing so fast with our rapid growth that it becomes outdated on a monthly basis. As of January 1, 1992 the RBCA/ RCM membership roster will be available to members for non-commercial uses. For now, It will be available in two formats "by type of bike" or "by state"—please specify, these are \$4 per list or \$7 for both. At some point in the future, we will supply the list to all members at no charge.

DATABASE UPDATE: If you have purchased a bike in the last year and would like it listed in the roster or you would like your home phone number listed, please drop us a note ASAP.

"WANTED" DEPARTMENT: Huffy once built a recumbent. We want info on this! Please send your pictures & stories. Nashbar was also briefly in the recumbent business. Any info out there? We are especially interested in your experience with the following bikes for our future road test files: Presto, Laid Back, Rans and Trice.

RUMOR MILL: This one is too weird to put anywhere else, somebody in the Ohio area is said to be developing a kit to convert a full suspension Alex Moulton Bicycle to a recumbent.....

DEVOTED PRODUCTION STAFF: Editor & Publisher: Robert J. Bryant, Business Manager: Marilyn J. McKee-Bryant, Production Assistant: Jeanene Smith, Graphic Services & Printing courtesy of DeskTop Publishing & Printing in beautiful downtown Renton, Washington.



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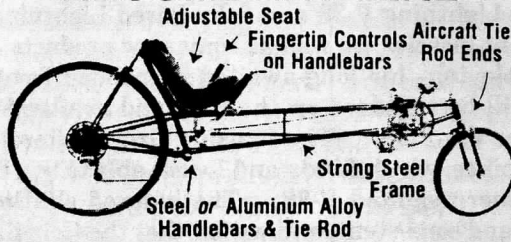
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COVER: The Kingcycle: photo by Mike Eliasohn, The fully faired Trice, photo by Mats Nilsson of Umea Sweden and the DH5000.

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RBCA CALENDAR

SUNDAY DEC. 1, 1991: NOON- 2 PM

PASADENA DOO DAH PARADE We will be riding our machines more or less in formation along the 1-1/2 mile, four lane parade route, in large circles, figure-eights and impromptu drag races. From time to time, we'll stop an dismount in order to abuse **SACRAFICIAL UPRIGHT "SAFETY BICYCLE"**, being dragged down the street, (complete with blazing saddle!). A \$15 entry fee will be charged to participants. For more info, call Gregory DuVall (310)829-5662.

FEBRUARY 28 & 29, 1992

THE SEATTLE BICYCLE EXPO: We have secured a booth for the show. See you there. Seattle Center Flag Plaze Pavilion. A small fleet of Recumbent Cycles will be present.

MAY 16 & 17, 1992

RUN, BIKE, HIKE AND ROLL SHOW: Santa Clara Convention Center, Santa Clara, CA. The promoters of this event would like to have a recumbent display? Call:(408)354-0700.

MARCH 12 & 13, 1992

PORTLAND BICYCLE SHOW: Portland Coliseum, Portland Oregon. We are tentatively planning to do this event, if you are interested please call our Hotline (206)255-9479.

INTERBIKE '91

The Interbike '91 Trade show is certainly overwhelming! This was our first time there at this Anaheim, California event and as the day wore on, it became obvious that at least two days were needed to even have a chance of seeing everything, and alas, we had only time enough for one. We will not make this mistake next year! Carbon fiber/composite construction seemed to be the rage this year. The materials could be found everywhere in bikes, wheels and even components. Nuke Proof Industries were showing hubs with aluminum cores wrapped in braided carbon fiber. Everyone seemed to have at least one composite bike on display (and folks, we mean every bike maker you can think of, and then some). Most of the frame designs were

quite exotic and defy verbal description, except to say that the term 'diamond frame' would certainly not apply. Specialized showed some composite 'concept bikes' including a tandem with the drive components completely enclosed in the fuselage-like frame.

Nearly all of the high-end mountain bikes had front and rear suspension, and many of these MTB's were so built-up and gnarly-looking that we nicknamed them 'Robobikes.' Seeing the huge variety of upright frame designs made us wonder why so many bike makers suffer from supinaphobia (fear of recumbents).

Campagnolo showed a complete line of off-road components, including even bar-mounted thumb-shifters, as well as twist-grip shifters. They also had brake lever/ shifter combos that looked suspiciously like Shimano's STI. Sachs had a new shifter which they call the Aris Twist Ring, as part of their '92 line of Aris off-road components. We were impressed with this new shifter, which is shifted with the thumb and includes a gear-number display. This indexed shifter has definite possibilities for recumbent bicycles.

Two of the most unusual upright bikes that we saw were from Legacy Bicycle, Inc. and Dynamic Bicycle Manufacturing. The Legacy bike is two-wheel drive-the-rear hub having a bevel-gear arrangement that transmits power through a flexible shaft to an identical bevel-gear unit on the front hub. Legacy claims 40% more traction with this system, which is intended primarily for off-road use.

The Dynamic bike is chainless, using a shaft-drive system. The solid steel shaft is hidden in the right-hand "chainstay" and has bevel gears at each end to transmit power from the bottom bracket to the rear hub. The bike has only a single speed.

A few manufacturers, including Paramount, were showing recumbent fitness trainers. All of these machines seemed to be extremely well-built, with sophisticated computerized performance displays. And, speaking of recumbents...

The IHPVA (International Human-Powered Vehicle Association) was in attendance with their annual booth, displaying a Laid-Back Bicycle and a Tour Easy. Linear was there showing their aluminum folding recumbents, and Tim Brummer, of Lightning Cycle Dynamics, was showing both his Lightning P-38 and fully-faired Lightning F-40 recumbent bicycles, as well as some new products. Tim was displaying his long-awaited suspended front fork, which will be standard on the F-40 and available as an option for the P-38. Tim is using Grip Shifters on his current bikes, which Linda and I were able to try, thanks to a trainer-mounted P-38. The indexed shifting was positive and consistent, and we felt that the Grip Shifters helped to make the Lightning recumbent bicycle more rider-friendly.

Not to be out-done, Gardner Martin, of Easy Racers, Inc., was there with... "Fast Freddy" Markham, the former Olympic cyclist, who pedaled Martin's famous Gold Rush fully-faired recumbent to the record speed of 65.4 mph. Though not having a booth, the two were there to keep up on the 'latest and greatest,' and we ran into the pair on three separate occasions during the course of the day.

I guess we Harley chopper-type recumbent riders have to stick together!

Mark and Linda Stone, Sherman Oaks, CA

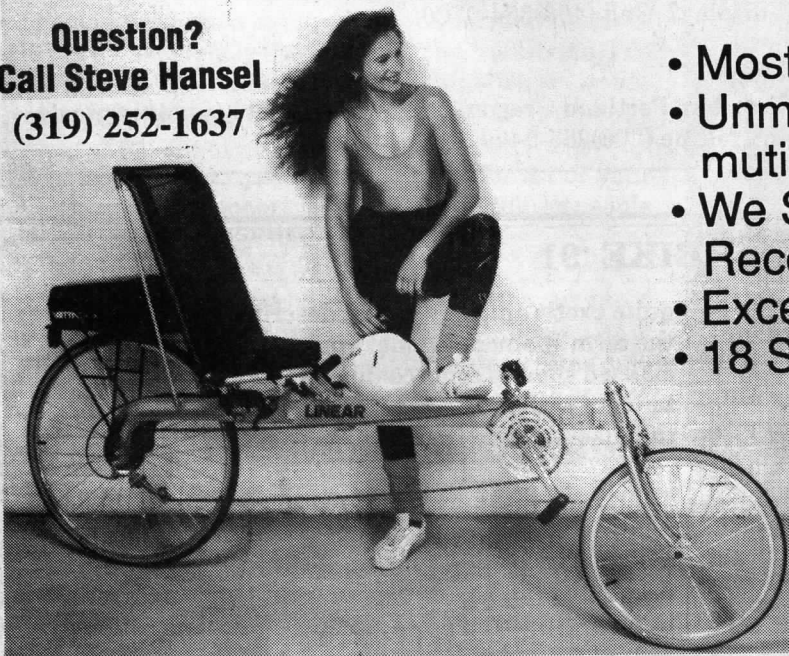
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EDITORIAL LICENSE

by Dick Ryan

Bob Bryant says that because I started this thing, I can say anything that comes to my fertile often overloaded mind.

Let me start off by saying that I have a history of biting off more than I can chew. If it weren't for the help of Debbie Garth of Nashua, N.H., who has efficiently handled the mail and bank account, and Ted Pothier of Arlington, MA., who has dealt with the computer data base and mailing chores, the Recumbent Cyclist would probably not be where it is today. Of course Bob Bryant should have some mention here. The R.B.C.A./ Recumbent Cyclist would really have been in deep do-da if Bob had not come to our salvation. In my opinion, Bob has done as much as anyone on the planet to promote our favorite machines. Bob is literally running the entire operation as of this writing. I originally started the R.B.C.A. as a club, but it has evolved into a magazine and the club thing has been kind of lost along the way. Hopefully we can eventually find a way to do both.

Recently, I attended the Anaheim Interbike show. The people from the bicycling press must be ecstatic that they will actually have something to salivate over other than a 1/2 degree change in the head tube angle of their favorite drop bar bike that they so constantly show on the covers of their publications.

The hot thing at the show was suspension, literally every manufacturer had one. Some very sophisticated systems. I personally think that they are great, it's about time that they got away from paint-job engineering and found something that will improve the conventional bicycle.

A discussion with some of the editors from **Bicycling Magazine** was interesting, when asked why the covers on their publication were interchangeable (always the drop bar racing bike) and why they never seem to cover anything other than the same old stuff, their reply was "OUR CIRCULATION HAS GONE UP EVERY YEAR FOR THE LAST EIGHT YEARS, WE MUST BE DOING SOMETHING RIGHT!" They also mentioned that their average reader subscribed for two years. Well one can't argue with success. If they lose their entire readership every two years and find the same number of new people plus a few additional subscribers, then it would seem to me that they are missing the boat somewhere, I would think that it would be more desirable to retain their old subscribers and add the same number of new ones every two years.

Bicycle Guide Magazine seems to be more open to covering things outside the main stream. As you may know, they did an article on the Vanguard. This article has resulted in a tripling of our sales. In conversations with my competitors it seems that everyone has been seeing an increase in sales this year. I find this very encouraging, considering that a large part of our country is in a depression.

Contrary to what one might believe from reading the major magazines, bikes in the thousand dollar range represent a tiny minority of new bike sales. According to a survey done by one of the major mags, the number of people who are considered enthusiasts in this country is about 875,000 people, the average price that they paid for their new bike was \$640. Selling \$1000 bikes is not easy in good times.

Eventually one of the major manufacturers will realize that there is a huge market for bicycles that are safe, comfortable and the average person can ride and enjoy. When this happens we will see recumbents on the market that will be affordable to everyone.

SPECIAL THANKS to Dick Ryan for the guest editorial—RJB.

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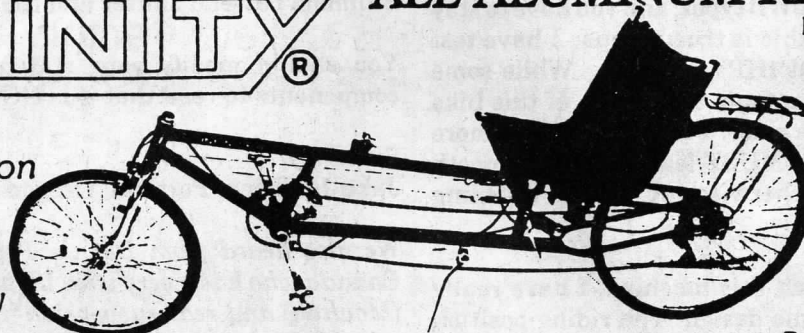
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MAIL-BAG

LIGHTNING RESPONSE

Dear Robert,
Concerning the P-38 road test. Ask <RCM Interbike Reporter> Mark Stone about the bike he saw at Interbike concerning brazing quality and shifting characteristics. I am now using Grip Shifts and a Suntour freehub (change over from a Shimano freehub), which works better and the shifters do not touch your knees in a low-speed turn.

The reason I don't connect the cables for shipping is because of the small shipping box that you mentioned, there is not enough room. The reason for the small box is it saves money went sent by air/ or overseas.

I will admit the handling on the P-38 is quick; however, most of my customers do not experience any problem or have to concentrate on it more than usual after they become used to it. My mother, 62 years old, rides one with no problem. Perhaps you must need to be born with the right reflexes.

The pressure on the Moulton 17" tire is 70 psi. I run mine at 80. I had some people call me up wanting to buy the 100 psi Moulton tire, of which I don't have. The rider who had numerous front tire flats while riding across the USA used a Moulton front tire. I now put a Pro-Tec liner inside the Moulton tires to greatly reduce this problem.

Sincerely,
Tim Brummer, Lightning Cycle Dynamics, Inc.

I'll continue to work on those reflexes.....editor

Dear Robert,
I just got my copy of RC in my weekly care package from home. I read the P-38 article with great interest, and I think you gave a well-balanced view of the machine. You did point out some things we Lightning fanatics tend to ignore, but which some other people might zero in on as a reason to choose some other bike.

The handling of the P-38, for instance, is trickier to master and less forgiving than the LWB types, and you have to stay alert when riding. I know this is true because I have test ridden other recumbents at IHPVA events. While some might see this as a disadvantage, the design of this bike forces you to become a better rider. You WILL become more aware of your balance. You MUST learn to pedal smooth circles in order to go fast, otherwise you will be wobbling all over the road.

In the short time I have had this machine, I have really come to appreciate the frame design. The riding position which you characterized as a racing crouch is just that, only rotated 90 degrees. All the power and none of the pain.

However, I disagree though, with your opinion that this machine "is" more suited to sport or high-performance riding than to practical daily transportation." I commute, tour, pull the kids or groceries in a trailer, and race with the same bike, by simply changing the gearing. It is the only bike I own, the only bike I want.

I was excited to read about the new aluminum seat frame. I want one if it will retrofit to my bike and allow me to save some weight. Also, my seat frame is dented from a couple of falls.

The custom fairing on the P-38 pictured in your article is intriguing. I would like to correspond with the owner. Also, what can you tell us about the custom handlebars on this machine? The top bar seems to be much lower than on my machine.

Dennis Kathrens

Thanks for the input Dennis. You can reach Jack Schaeffer at: 512 Bourbon St., Havre de Grace, MD 21078. His corrected phone number is #(301)939-9186, (Sorry, Jack). Dennis Kathrens is currently converting it to a 20" X 1-1/8" front wheel. —editor

INDEX WOES

Robert, In the latest issue of Recumbent Cyclist your lead article is on the Lightning P-38. In it you state that you had trouble with the index shifting and the rear derailleur. NO DOUBT!

The fault was not in the rear derailleur. The Suntour XCLTD is an excellent component which works very well when combined with a Suntour shifter and a Suntour cassette or freewheel.

Therein lies the problem. You were attempting to make a Suntour bar-end shifter properly index a Suntour derailleur with a Shimano freehub. WILL NOT HAPPEN! Shimano freehubs & freewheels are spaced differently and are not compatible with Suntour shifters. Slap on a Shimano bar-end shifter and the problem goes away.

You should modify your statement about the mix of components to read that it is NOT very well thought out.

Sincerely,
Jake Jacobsen, Portland Oregon

We also heard from Dennis Taves of Toronto Ontario Canada who has a very trick Lightning. His bike has front (Moulton) and rear suspension and an intermediate free-wheel/ dual chain drive. Planned improvements for '92 are: improved steering, the addition of a 20" front wheel, electric assist and Kevlar belt drive.—editor.

The Companion

by Rotator Tandem

Some time ago, an article appeared in Bike Tech that discussed the concept of having **individual cadence** capabilities on tandem bicycles...

Recently I finished a recumbent tandem that is designed so each rider can select his or her own pedaling rate. Of course the extra complexity creates more weight... however, it also adds some distinct benefits:

- start-up is smoother
- less power-induced steering oscillations
- the stronger rider cannot overpower the weaker rider and cause early burn out
- the weaker rider cannot hold back the stronger rider
- shifting can be done at any time. While one person carries the load, the other can select the proper gear. This is a tremendous asset for hill climbing.

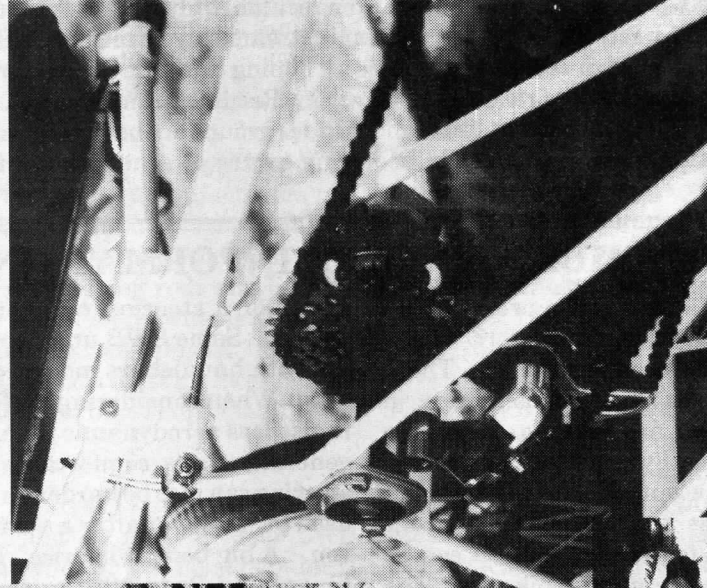
Is it faster? So far, we haven't done conclusive testing to say yes or no. My intuition tells me it will be.

Modern automobiles continue to become more complex with four valves per cylinder, twin overhead cams, and turbo charged engines. This makes sense because it improves performance.

Dual cadence tandems make sense because they improve rider harmony which will help increase performance.

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...Stephen Delaire



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RECUMBENT BUYERS GUIDE

THE WORLD'S MOST COMPLETE GUIDE TO RECUMBENT VEHICLES

We are very happy to say that 1991 has been a banner year for recumbent enthusiasts everywhere. We are finding people all over the world who have a hunger for recumbent bicycle information and the Recumbent Cyclist seems to be filling the need. It seems that the mainstream bicycle market is finally offering customers a comfortable bicycle in the hybrid or crossbike. We are all hoping that this search for a more comfortable bike paves the way for the popularization of recumbent bicycles. Recumbent manufacturers report that sales are up, even as we are in the midst of a recession. Recumbent Rider groups are being formed, the Recumbent Cyclist is continuing to grow and the public is slowly becoming aware of a new and different side of bicycling,

RECUMBENT DESIGN INFORMATION

LWB (Long wheelbase: 60"-71"): This is the predominate configuration for recumbent bicycles. Over 80% of the bikes currently built in the USA are long wheelbase. These bikes are very smooth, stable, fast and inspire confidence in first-time riders. For some they are less maneuverable than their SWB relatives but usually more stable at speed. LWB recumbents usually come outfitted with the more standard 26" or 27" rear wheels and 20" BMX size front wheels. Some of the negative features of a LWB can be maneuvering on a busy city street or narrow bike trail. The LWB bikes are usually heavier than SWB models, although there are some exceptions such as the Infinity and Easy Racer Gold Rush Replica. There are many LWB models to choose from. They are easier to design because there is no heel interference involved and the drivetrains are relatively simple and standard.

SWB (short wheelbase: 33"-39"): The SWB is a popular design, but only a limited number of bikes are manufactured commercially. Currently 20% or less of the recumbents built are SWB. These bikes are quick handling, accelerating and extremely maneuverable. They can be lighter, with some of the better models weighing in the mid 20 pound range. SWB recumbents also fit car racks better and can stow easier than LWB recumbent bicycles. The exception to this rule would be the Linear with its folding aluminum frame. Some SWB recumbent high seat heights can cause problems for shorter riders. They also have more complicated drivetrains with chain idlers, large chainrings or multi-chain drive systems. Some models come with 16"/17" front wheels which are harder to find replacement parts for; a newer breed of SWB offers the superior 20" front or even 20" wheels front and rear. Another obstacle to the would be purchaser is the lack of entry level SWB models. The final consideration is handling. On wet pavement or riding in sand, gravel or snow, the SWB can be harder to control. Most SWB riders are almost religious about their choice of bike; to them all of this is worth while to achieve that fast and exciting ride that only a SWB recumbent can offer.

UNDERSEAT STEERING: This is when the handlebars are placed underneath the recumbent bike's seat. The steering on the LWB underseat models are via aircraft

cables or a steering rod, both work well and are viable options. Some SWB underseat steerers offer direct steering with handlebars mounted at the fork or into the head tube. When considering performance, underseat steering is also less aerodynamic than upright handlebars, but it is generally more comfortable for long rides. Underseat steering can also be harder for recumbent newcomers to get used to; however after a short while, the balance comes to you. A big benefit is price. Manufacturers like Infinity, Linear and Ryan offer some real values in an arena of expensive recumbent bicycles. Fairings can be mounted to underseat steering recumbents, but it is harder and more expensive. For the LWB's, Zzip Design manufactures aluminum mounts that fasten on the frame top tube. For SWB's, a boom mounted nose fairing can be adapted.

UPRIGHT HANDLEBAR STEERING: This is your standard bicycle steering set up. With recumbents it can take some different forms. Consider the long sleek Tour Easy bars or the "fold forward" bars from the Counterpoint Presto that allow easy entrance and exit. This type of steering is more aerodynamic and all of the serious performance machines use it. Some riders feel that upright handlebars offer more control and are easier to learn to ride with. Others complain of tiller like feel on the LWB types. You will get used to upright handlebars quicker than you will to underseat steering. The major benefit to this set up is that it needs no special parts such as steering rods, rod-bearings, and cables. Upright handlebars are much easier to mount fairing to, they generally mount directly to the bars with little or no complicated mount systems.

EASE OF RIDEABILITY: In extensive testing throughout 1990, we have compiled information on which types of recumbents (bicycles) are easiest to ride. I will prerequisite this information by stating that any commercially built recumbent is within the range of the average bike rider to learn to ride within a day or so of practice. We found that the easiest bikes to ride were the upright handlebar LWB and shorter LWB models like the DH, Rans Nimbus and Tour Easy. Next are the underseat steering LWB models. Inside this group, the models with the fatter tires were the easiest. The SWB models were the most difficult for first time riders. Seat height, heel interference and quick

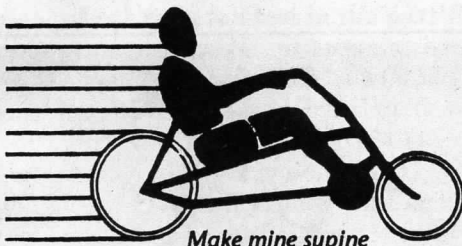
handling were the concerns. There was no data available on recumbent trikes, but the ones that I have experienced: The Earth Traveller and Trice, were all very easy to ride. The main reason is that with three wheels, no balance is needed. The only difficulties experienced were more arm pressure needed to turn, the low rider height takes some getting used to and a trike takes up a lot more of the road.

RECUMBENT COMPONENTRY: A quick word on components: for the most part, the components found on a recumbent are very similar what is found on hybrid, mountain and road bikes. Major recumbent manufacturers use what works best on their bikes. The only non-standard parts are: chain idlers, long chains (standard chain/ two-three lengths spliced together), steering rods and linkage (underseat models) and the small front wheels that are generally BMX or other smaller sized wheels. Replacement and drivetrain parts along with most kinds of bicycle accessories are as close as your local bike shop or mail order company.

RECUMBENT WHEELS: A favorite subject for some, while others wish it would just go away. Most LWB recumbents use standard rear wheels. The most popular is the standard touring wheel, the 27" X 1-1/4". These are almost always high pressure and a wide range of tires are available at any bicycle shop. Another choice is the 700c series. These will generally work in place of the 27", but not

on the same rim. Next is the 26" standard mountain bike wheel. This is tough, durable and many excellent street tires are readily available. For speed, the Specialized FAT BOY 1.25" is excellent. For durability and comfort, the Tioga City Slicker or similar tire really fits the bill. Some recumbents are going to 24" rear wheels. This can make for a compact design, but beware and do your homework. There are many 24" wheel sizes available. For front wheels and tires, the 20" is the standard for LWB models and the choice for the new breed of SWB. 20" tires come in three main configurations: the 20" X 1-1/8" IRC 100 p.s.i. Roadlite is the hot rod, the 20" X 3/8" Cheng Shin 65 p.s.i. is a comfortable choice and finally the extremely durable 20" X 1.5 65 p.s.i. Haro slick and ACS 20" X 1.75" 100 p.s.i. which are the #1 choice for commuters and tourists. NOTE: the 20" X 1.5/ 1.75 uses a different size rim than the 20" X 1-1/8"/ 1-3/8".

A few SWB recumbents use the smaller 16 & 17" front wheels. The two most popular sizes are the 16" X 1-3/8" and the 17" Moulton high performance wheel. The only problems are availability on the 16" and cost on the Moulton. A Moulton tire and tube can cost nearly \$50. The only economical/ readily available choice is the 16" X 1.75 (or 1-3/4"). These are generally steel kids bike wheels. There is a definite industry and enthusiast move towards the 20" front wheel for most recumbents SWB and LWB alike.



Make mine supine

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Box 255-H
Freedom, CA 95019
Or call 408-722-9797

Complete bikes, framesets, plans.
Also, narrow 100-lb. 20" tires and rims.

Winner, Dupont land speed prize, 65.4 mph

Tour Easy

by Easy Racers, Inc.



DOES YOUR BICYCLE HURT YOU? WHY NOT RELIEVE THE PAIN.

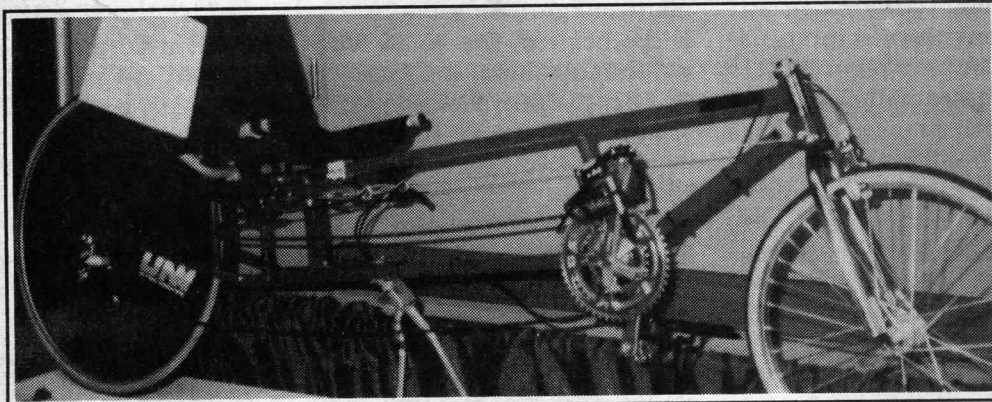
GET THE COMFORT YOU DESERVE . . . RIDE A *Tour Easy*

COMPANY LISTINGS

ACE TOOL & ENGINEERING'S INFINITY
 PO BOX 325, 292 W. Harrison St.
 Mooresville, Indiana 46158
 Phone #(317)831-8798
 Contact: Don Barry

NOTES: Please enclose S.A.S.E with correspondence.
 NEW FOR '92: "My philosophy is keep it simple, rugged, reliable and inexpensive. We offer ready-to-ride 10 speed recumbents for \$400. A do-it-yourselfer can get an unpainted frameset for \$150 and finish the bike completely with standard bicycle components," Ed Roeters.

BIKE: The new Infinity III (new model designation not



"Infinity Recumbent"

ADVANCED TRANSPORTATION PRODUCTS

550 3rd Ave. N.
 Edmonds, WA 98020
 Phone#(206)771-3719
 Contact: Joel Smith

BIKE: The all new model R-20.
 STYLE: SWB. WEIGHT: under 30 lbs. WHEELBASE: 38" WEIGHT DISTRIBUTION: (approx.) 55% front & 45% rear. FRAME: TIG welded Chromo-

ly, one size, adjustable boom. STEERING: underseat connected to fork. DRIVETRAIN: dual chain, intermediate idler 21 speed index shifting, full Suntour XC-LTD Component group with cantilever brakes. WHEELS: 20" X 1.75 100p.s.i. ACS front and rear. PAINT: Powdercoat Aqua. SEAT:

final). STYLE: LWB underseat steering, BIKE WEIGHT: 27 lbs. WHEELBASE: 67". FRAME: welded square structural aluminum, one size, sliding seat. Fits riders from 4'11". HEADTUBE ANGLE 73 degrees. STEERING: underseat via aircraft cables. DRIVETRAIN: Suntour or Shimano Derailleurs/thumbshifters/Sakae crankset/Weinman sidepull brakes, 12 speed non-index drivetrain. SEAT: aluminum framed mesh. WHEELS: 27" rear, 20" X1-1/8" 100p.s.i. front. PAINT: Powdercoat Yellow, Red or Blue. SEAT: aluminum frame/mesh. FAIRING: Infinity Zzipper \$299. available from Zzip Designs.

COST: \$499 + \$85 for the triple crank option.

NOTES: Information \$1.

NEW FOR '92: The latest news from this major recumbent manufacturer is a standard size bottom bracket and headtube for '92. Infinity has had a very busy summer season. For a '92 model, better plan early for this popular bike. The Infinity gets our vote for the "best recumbent deal." The long awaited medium wheelbase "Bulldog" is now slated to be a '92 model....Word had it that orders will be taken March 1, 1992.

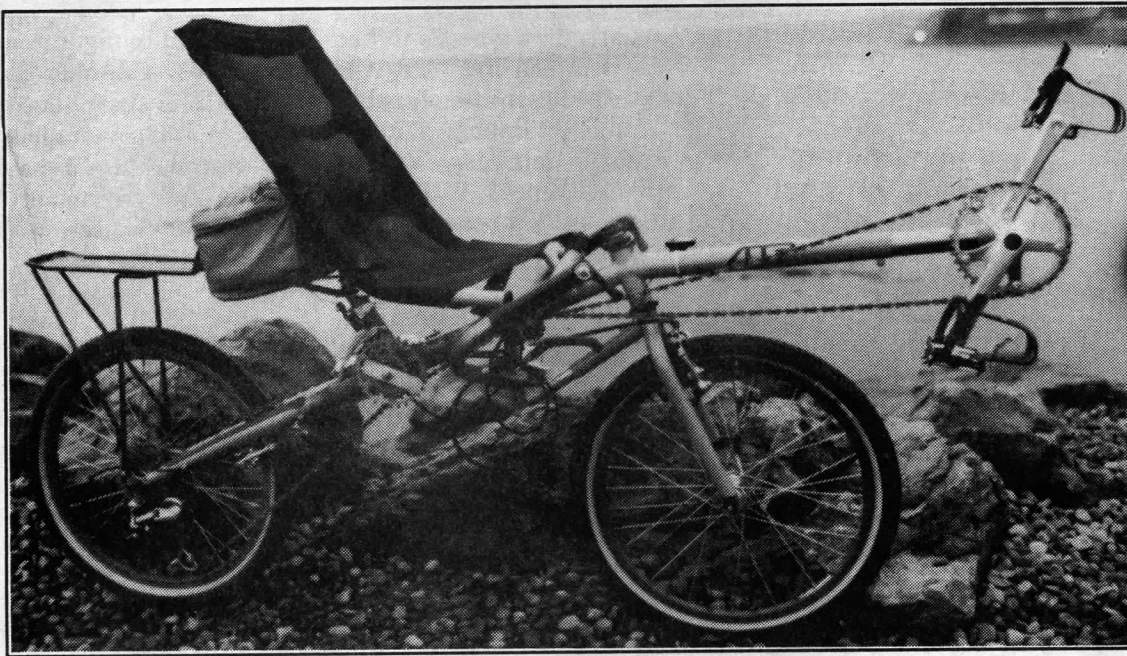
ALTERNATIVE BIKESTYLES

P.O. Box 1344
 Bonita, CA 91908
 Phone #(619)421-5118

BIKES: "Kick Back Series" Maverick & Renegade.
 STYLE: entry level steel recumbent, LWB/upright handlebars. COST: Framesets from \$200, complete bikes from \$395. Used bikes are available.



"Alternative Bikesstyles LWB"
 "Modified with seat and handlebars from Rans."
 (Photo by bike owner Mark Colliton)



"The A.T.P. R-20"

(Photo courtesy of A.T.P., Edmonds, WA")

suspended mesh.

COST: \$1350, framesets are also available.

NOTES: Information pack \$2.

NEW FOR '92: The all new ATP R-20 is a new and different SWB design. The Hyperdrive drivetrain takes care of any gearing problems commonly associated with bikes using two 20" wheels. The standard gearing is 25 -125 gear inches. Look for a full test in the next RCM.

ANGLE LAKE CYCLERY

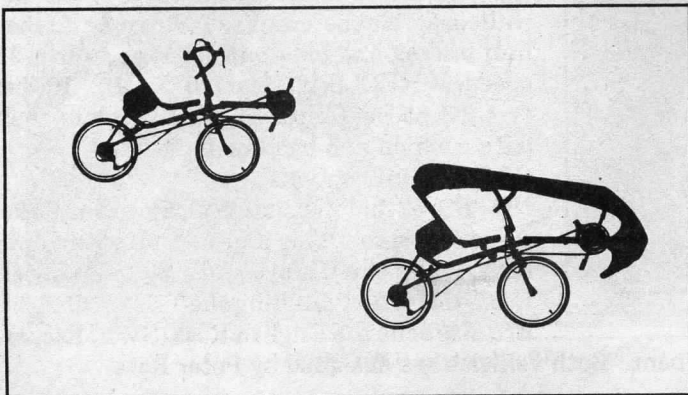
20840 Pacific Hwy S.

Seattle, WA. 98198

Phone #(206)878-7457

Contact: Kelvin, Matt or Bob

BIKE: Counterpoint Presto STYLE: SWB. BIKE WEIGHT: under 30 pounds. WHEELBASE: 36.75" WEIGHT DISTRIBUTION: 54% front & 46% rear, FRAME: TIG welded 4130 chro-moly, stainless and hi-tensile steel, one size adjustable boom (inseams of 28-35"). STEERING: upright handlebars that hinges forward for ease of entry. DRIVETRAIN: Suntour derailleurs/Bar-Con shifters/ Suntour



recumbent bicycles available today. They are continually testing and upgrading the bike. The Presto is available with an optional folding boom. Paul Atwood's "Roots in the Sky" option package includes a wheel skirt, Kevlar nose fairing, composite chainguard, and the new rain cover that stretches from the nose cone back to your head. The Presto can be outfitted as a full HPV for urban and commuting use. LATE NOTE: Angle Lake Cyclery will be offering a trike version of the Presto. The new trike uses a Sachs 5-speed internal hub gear with a coaster brake, along with a caliper brake in front. Estimated cost is \$1950.

CAR CYCLE/ ZIPPER

Original Car-Cycle Technology

1311-Victoria Ave.

Victoria, BC, Canada V8S 4 P4

Phone #(604)598-7830

Contact: Bob Stuart

TRIKE: This company is currently designing a fully faired commuter trike. The prototype is well known at HPV events in the US and Canada. No production dates have been announced. NOTES: Write for details.

DH RECUMBENTS, INC.

4007-G Bellaire Blvd.

Houston, TX 77025

Phone#(713)666-4452

Contact: David or Richard

BIKE: DH1000 & DH5000. STYLE: LWB (shorter version) WEIGHT: DH1000 @35lbs, DH5000@ 30 lbs. WHEELBASE: Small size 56", large size 60". FRAME: brazed aircraft chro-moly. STEERING: indirect linkage /upright handlebar. DRIVETRAIN: DH1000@ Shimano derailleurs/ thumbshifters/ Sakae triple crankset/ BMX sidepulls 18 speed index shifting, DH5000@ Shimano Deore derailleurs/



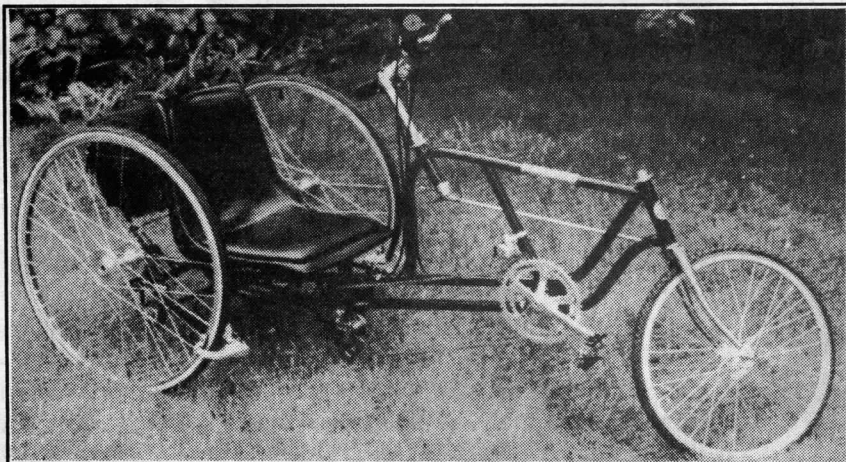
"DH1000"

thumbshifters/ Avocet triple road crankset/ alloy side-pull brakes-21 speed index shifting. WHEELS: 1000: 26" rear and 20" X 1.5" front; 5000 27" rear and 20" X 1-1/8" IRC 100 p.s.i. front. SEAT: hard shell covered with foam and cloth. PAINT: Imron Blue, Red or Metallic Black. FAIRING: DH Zipper available from DH Recumbents as an option. COST: DH1000 18 speed \$999, DH5000 21 speed \$1395. NOTES: Write for more information.

NEW FOR '92: This great design continues to evolve. A new chromoly fork for use on either bike will allow the use of cantilever brakes and/or the wider 20" X 1.5" tire. DH also continues to improve the design of the sliding seat adjuster and steering extension. Magura HydroStop brakes are new an option on the DH5000 for \$250. Other possibilities include the new Sachs Twist-Grip shifter. DH Recumbents get our vote for "best recumbent seat."

EARTH TRAVELLER

1475 Lillian St.
Livermore, CA 94550
Phone#(415)449-8312
Contact: Earl Aldrich



"Earth Traveller Trike"

(Photo courtesy of Earth Traveller)

TRIKE: Two wheel's in back design LWB configuration. WEIGHT: 55 lbs. TRACK WIDTH: 33" FRAME: TIG welded 4130 chro-moly tubing. STEERING: above handlebar indirect linkage DRIVETRAIN: Shimano Derailleurs (Rotary-chain drive)/Stronglight crankset/Dia Compe brakes, 21 speed. WHEELS: 27" X 1-1/4" rear 48 spoke with custom sealed bearing hubs, 20" front. SEAT: fiberglass shell with foam pad and cover.

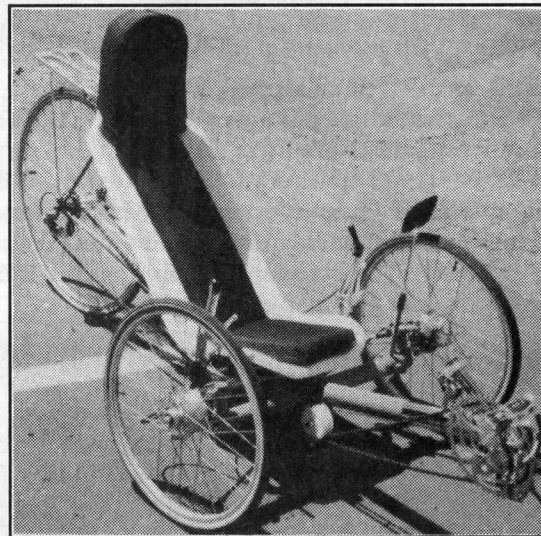
COST: NA

NOTES: \$1 for information.

NEW FOR '92: The Earth Traveller has had years of prototyping and this trike has incredibly beautiful finish & detail work. For 1992 this trike will be getting a newly designed, more comfortable seat.

ECO CYCLE

5755-Fair Oaks Dr.
Corvallis, OR 97330
Phone #(503)753-5178
Contact: Ken Trueba



"Eco Cycle's Trike"

TRIKE: The "Trice" STYLE: two wheels in front trike, SWB configuration. WEIGHT: 34-36 lbs. WHEELBASE: 39.4". TRACK WIDTH: 32" or 26". FRAME: Steel, one size adjustable boom. STEERING: underseat via extension type handlebars. DRIVETRAIN: Suntour derailleurs/ Sakae crankset/ Sturmey Archer hub brakes and side pull parking brake, 21 speed. WHEELS: 26" rear, 20" X 1-1/8" 100 psi or 1-3/8 65 psi front. SEAT: fiberglass shell with cushion and head rest. COST: \$1499+options.

NOTES: \$2 for information package and \$9 for video. New for '92 is a nose cone with fabric body, wider chain stays and a 26" rear wheel. Eco Cycle is now building the Trice in Oregon. Eco also sells the English Ross (SWB) Recumbent. Both vehicles are designed by Peter Ross.



"The English Ross Recumbent"

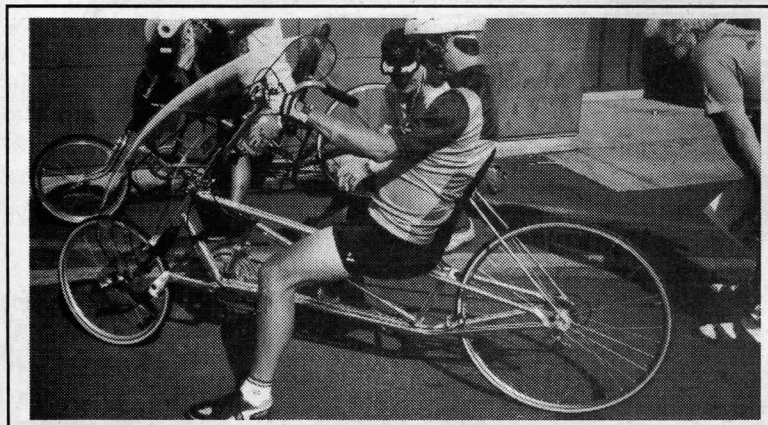
EASY RACERS, INC
2891 Freedom Blvd.
Watsonville, CA 95076
Phone #(408)722-9797
Contact: Gardiner Martin

BIKE: The Tour Easy. **STYLE:** LWB **WEIGHT:** 29 lbs. (med. size) **WHEELBASE:** 63"/66"/69" **FRAME:** TIG welded chromo-moly, available in three sizes. **STEERING:** upright handlebar steering. **DRIVETRAIN:** Suntour derailleurs/ Bar-Con shifters/ Sakae or Shimano Deore crankset/Dia Compe (roller-cam)-Weinman side-pull front, 12 speed or 21 speed index shifting. **WHEELS:** 27" rear, 20" X 1-1/8" IRC 100 psi or 1.5" Haro 65 psi front. **PAINT:** high quality Powdercoat in Candy Red, Blue or Black. **SEAT:** Composite shell with layered foam and Lycra covering. **COST:** \$1495 includes base model Zzipper fairing, Super Zzipper additional. (Est. '92 prices).

NOTES: \$2 for catalog.

PLANSET: 40 page instruction book on how to build an Easy Racer \$35.

NEW FOR '92: The new Kevlar/carbon fiber/ fiberglass composite "Cobra" seat is now standard on all bikes. Choice of two seat base sizes. A full Kevlar "Gold Rush" seat and the Lycra body are now optional equipment on the Tour Easy.



"The Gold Rush Replica"

BIKE: The Gold Rush Replica. **WEIGHT:** 26-28 lbs. **FRAME:** TIG welded oversize heat treated aluminum built by Stephen Delaire, comes in two sizes. **DRIVETRAIN:** Shimano Deore XT short cage rear derailleur Suntour Moun-Tech front/Shimano Deore crankset, 28-46-54/105-SC dual pivot point & hubs, 21 speed index. **WHEELS:** 700c X 25 125 psi rear, aero rim-aero spoked 20" X 1-1/8" 100psi IRC. **PAINT:** Polished Aluminum finish. **SEAT:** ultra-light Kevlar shell Cobra.

COST: \$1650 frameset, \$2300. (Estimated '92 pricing).

NEW FOR '92: The Replica of the "Fastest bicycle in the World."

LIGHTNING CYCLE DYNAMICS

1500 E. Chestnut Ct.
Lompoc, CA 93436
Phone#(805)736-0700
Contact: Tim Brummer

BIKE: Lightning P-38. **STYLE:** medium wheelbase. **WEIGHT:** 25 lbs. (large size). **WHEELBASE:** 44". **FRAME:** brazed chromo-moly, three sizes. **STEERING:** upright handlebar. **DRIVETRAIN:** Suntour rear derailleur, Shimano front/ Grip Shifts/Sakae crankset/ Dia Compe side-pull brakes with Aztec pads, 21 speed index shifting now with SRAM Grip Shifts. **WHEELS:** 700c X 28 rear, 16" X 1-3/8" 65 psi front (optional Moulton 17" available). **SEAT:** aluminum frame/mesh. **PAINT:** Powdercoat: Blue, White or Red. **FAIRING:** P-38 Zzipper.

COST: \$1750 Zzipper Fairing optional.

NOTES: \$2 for Info.

NEW FOR '92: A suspended front fork for the F-40 (optional on the P-38).

LIGHTNING CYCLE, INC.

3819 Rt. 295 Dept. RC
Swanton, OH 43558
Phone #(419)826-4056
Contact: Gene Lemle

BIKE: The Tailwind. **STYLE:** LWB. **WEIGHT:** 33 lbs. **WHEELBASE:** varies. **FRAME:** brazed chromo-moly, custom built to order (your measurements). **STEERING:** underseat indirect with steering rod, unique handlebar set up. **DRIVETRAIN:** Suntour (varies). **WHEELS:** 27" rear, 20" X 1-1/8" 100 psi IRC front. **SEAT:** Steel frame/mesh patented quick adjusting system. **FAIRING:** by Zzip Design <Ryan model> \$299. available from Lightning or Zzip Design.

COST: varies.

NOTES: \$1 for brochure.

NEW FOR '92: Lightning also offers a 10" shorter, 5 pounds lighter and twin 20" wheel version of the Tailwind called the "Micro." This bike also uses the CycloPedia dual chain drive, intermediate idler

system, new for '92. All Lightning bikes are custom built to order.

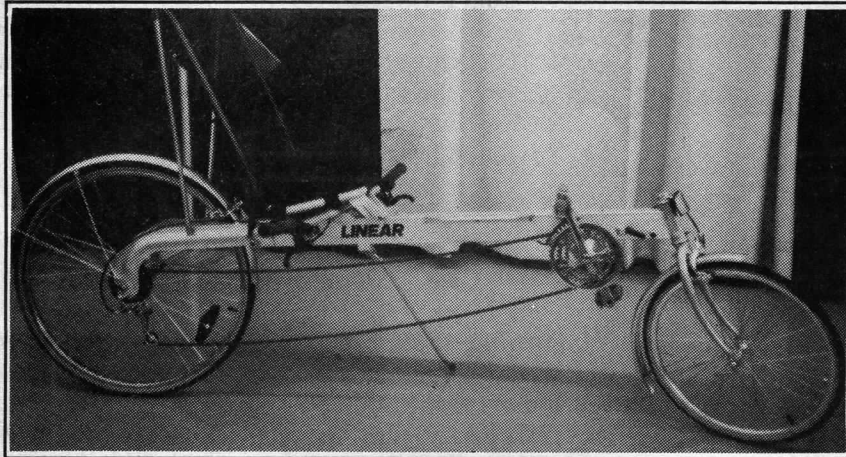
LINEAR MFG. INC.

R.R.1, BOX 173 RC
Guttenberg, IA 52052

Phone#(319)252-1637, FAX#(319)252-3305.

Contact: Steve Hansel

BIKE: Linear folding aluminum. STYLE: LWB. WEIGHT:



"The Linear Folding Aluminum"

32-33 lbs. WHEELBASE: 62"-68", FRAME: aluminum I-beam extrusion, chromo-moly fork and head tube. FRAME

SIZES: 36", 39", 42", 45" and 48" STEERING: indirect underseat via rod, (pullback upright bars area an option). DRIVETRAIN: Suntour derailleurs/thumbshifters/Sakae triple crankset/Dia Compe side pull brakes, 18 speed index shifting. WHEELS: 27" rear, 20" X 1-3/8" 65 psi front. (optional 1-1/8" IRC may be available). SEAT: easily adjustable aluminum framed/mesh with high-density foam cushion at base. PAINT: silver or gold anodizing. FAIRING: Linear Zipper available from Zzip Design. COST:\$875.

NOTES: write for color brochure.

NEW FOR '92: The best-selling Linear recumbent is sold

exclusively through retail bike dealers around the world. Linear's folding feature allows it to fold with no tools and fit onto standard bicycle bumper racks. All quick release joints are stainless steel. Linear offers a lifetime original owner's warranty on the frame, fork seat and handlebars. Linears ship in one UPS carton and each bicycle is fully assembled, test run and folded for shipment.

RANS RECUMBENTS

1104 E. HWY 40 By-Pass

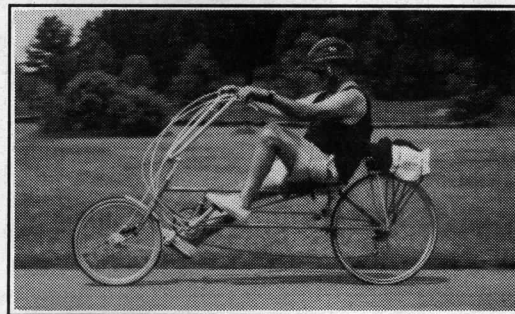
Hays, KS 67601

Phone#(913)625-6346

BIKE: Rans Stratus A & B and Nimbus STYLE: LWB. WEIGHTS: 29.9 lbs. WHEELBASE: 63-67" FRAME: TIG welded 4130 chromo-moly. STEERING: upright handlebar steering. DRIVETRAIN: Shimano Deore derailleurs/thumbshifters/Sakae crankset/Shimano side pulls. WHEELS: 27" front and 20" X 1-1/8" front. SEAT: laminated fiberglass with foam cushion. PAINT: Pastel Green, Blue, Red or Hi-Tech Gray. FAIRING: Rans cloth fairing or Super Zipper from Zzip Design. COST:\$995 -\$1495 (Deore XT option).

NOTES: Write for color brochure.

NEW FOR '92: Upgrades have not been announced as of press time. RCM will be featuring a long awaited Rans road test, featuring the updated '92 Nimbus and Stratus B models.



"Charles Osborne on his Rans Nimbus"

(Photo by Mike Eliasohn)

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- Rans Recumbents
- Ryan Vanguard
- DH Recumbents
- Infinity
- Linear Recumbents

"See our 1991 Gold Rush Replica" We ship recumbent bicycles anywhere in the world. We are a full-service mail-order Company. Retail demonstrations by appointment. only. Please call.

Please send \$3 for our new '91-'92 16+ page catalog:

MILLENNIUM

Recumbent Sales Dept.

17650 - B6 - 140th Ave SE (Suite 341-B)

Renton, WA 98058

ROTATOR CYCLES
 915 Middle Rincon Rd.
 Santa Rosa, CA 95409
 Phone#(707)539-4203
 Contact: Stephen Delaire

designs include: Rotator Super-7 Streamliner (LWB with 20" wheels) and Rotator Companion Tandem (SWB configuration face forward recumbent tandem).
COST: Tandems from \$3000, other on request.

BIKES: Custom builder; custom or your design. Stock

NOTES: S.A.S.E. for with correspondence.



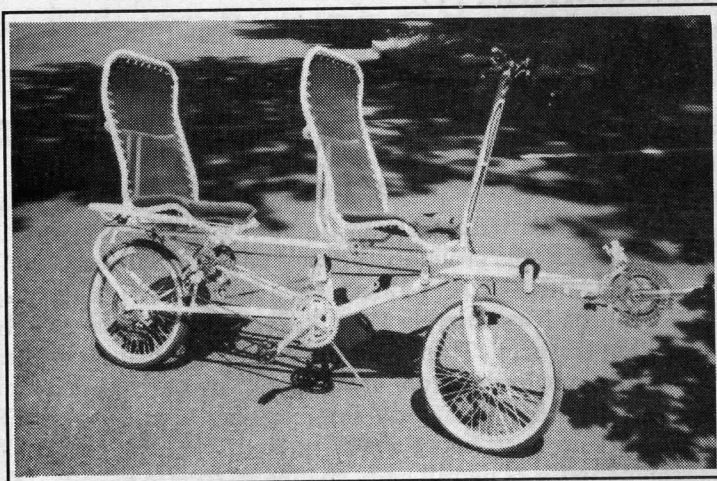
"Stephen Delaire in his Rotator Super-7 at Portland Raceway"

NEW FOR '92: Rotator does custom fabrication, framebuilding, and is the Easy Racer Gold Rush Replica frame builder. The limited-production "Companion Tandem" can be built with upright steering or underseat along with your choice of a standard tandem drivetrain or individual cadence systems. We are frequently asked "who could build my design?" Here is the answer, call Rotator.

RHOADES CAR

Rhoades International
 100 Rhoades Lane
 Hendersonville, TN 37075
 Phone#(615)822-2737 ext. 104

BIKE: 4-wheel pedal car. **STYLE:** 1,2 or 4 passenger recumbent pedal cars. **WEIGHT:** 99-150 lbs. **DRIVETRAIN:** 1,5 or 25 speed.
COST: \$999 and up.
NOTES: color literature \$4, video \$19.



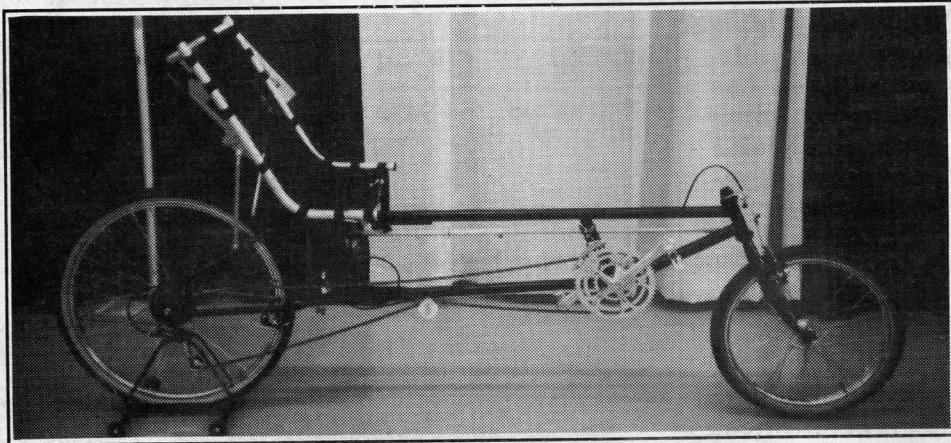
"The Rotator Companion Tandem"

RYAN RECUMBENTS

3910-Stewart Rd. Unit F
 Eugene, OR 97402
 Phone#(503)485-6674

BIKE: VANGUARD. **STYLE:** LWB underseat steering. **WEIGHT:** 30.5 lbs **WHEELBASE:** 66" **FRAME:** TIG welded 4130 chro-moly **STEERING:** indirect underseat via rod. **DRIVETRAIN:** Suntour-Grip Shift/ Sakae/ Dia Compe cantilever brakes, 21 speed indexed drivetrain. **WHEELS:** 26" rear, 20" X 1.5" or 1-1/8" front. **SEAT:** aluminum frame/mesh. **PAINT:** Red, other Powdercoat colors are \$90 extra. **FAIRING:** Ryan Zzipper available from Zzip design: \$299. Coming soon for '92 "Ryan Lycra Body" option for the Ryan Zzipper also available from Zzip Design.
COST: \$995.

NOTES: \$2 for information package. **NEW FOR '92:** Special incentive: Through April 10th 1992, purchasers of Ryan bicycles will receive a Blackburn rack and waterbottle cage free of charge. The Vanguard gets our vote for "best recumbent value." **LATE NOTE:** Ryan Recumbents is working on a trike



"The Ryan Vanguard"

THEBIS INTERNATIONAL

110-2031 Malaview Ave.
Sidney, BC Canada V8L 3X9
Phone# (604)656-1237, 1-800-667-6801.

TRIKE: Thebis 201 Touring Trike. **STYLE:** two wheels in the back. **WEIGHT:** 26 lbs. **WHEELBASE:** **FRAME:** Magnesium alloy; three frame sizes. **STEERING:** dual rear wheel drive automatic self centering rear wheel steering. **DRIVETRAIN:** Sachs Huret Aris Group with twin Mathauser Hydraulic Brakes. **WHEELS:** 24" X 1" rear wheels with 90 p.s.i. tires & 20" X 1-1/8" 100 p.s.i. front. **SEAT:** sling type mesh **PAINT:** Dichromate Conversion Coating & Anodizing.

COST: \$2990 US.

NOTES: Call for a brochure/ info packet. Thebis video \$20. **NEW FOR '92:** This is an incredibly beautiful machine! The BMW of recumbents. Thebis offers a 15 day money-back guarantee, a 36 month parts and service warranty, shipped fully assembled with a guaranteed shipping date, tool kit with pump and an owners manual. The Thebis 201 gets our vote for the "most inovative design."

TRAILMATE

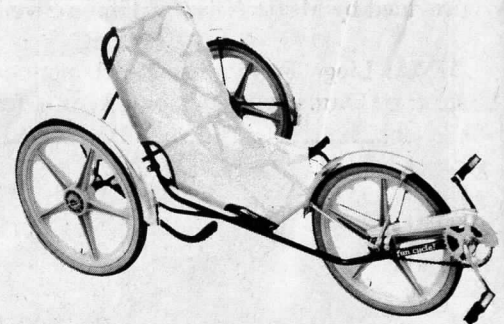
2359 Trailmate Dr.
Sarasota FL. 34243
Phone # (813)755-5511

TRIKE: Fun Cycle (20" wheels) and the Banana Peel (16" wheels) **STYLE:** Front drive, lean steer, two wheels in back one in front.

D R I V -
E T R A I N :
s i n g l e
speed.

COST: \$399
N O T E S :

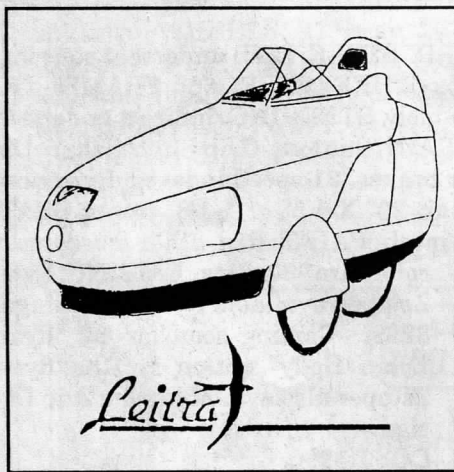
These are the fun looking three wheeled parking lot racers that you've seen, ridden or rented at the beach or vacation spot.

FUNCYCLE™**EUROPEAN RECUMBENTS**

For information on any of these recumbents, please send two International Reply coupons. USD= USA Dollars.

TRIKES:

THE LEITRA: possibly the largest selling fully faired commuter trike in the world. These trikes have been sold in 11 countries including Japan and Canada. The price for a ready to ride trike is \$2000 US dollars. The full body is



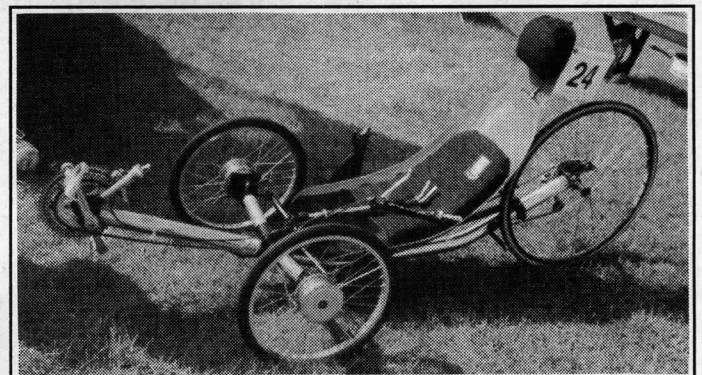
another \$2000 USD, for a total of \$4000 USD. Shipping from Denmark is \$700-\$800 USD. Designer and builder C.G. Rasmussen reports 1,000,000 kilometers without anyone being hurt. Mr. Rasmussen has been building three wheeled commuter vehicles since 1950.

Leitra APS, PO Box 64, DK-2750 Ballerup, Denmark.

KABINECYKEL "HAJEN" (Shark!): Fully faired recumbent trike, \$3500 USD Info. (Info provided by Mats Nilsson, Umea Sweden): Kabinecyckel Hajen,

Mejerigaardsvej 13, Lynerup, DK3600, Jagerspris, Denmark

THE WINDCHEETAH: by Burrows Engineering. This is the classic. It is probably the most sought after recumbent vehicle in the USA. Immortalized in Richard Ballantines "Richards New Bicycle Book," The Windcheetah is only sold in kit form. This is not a casual kit, but castings that require machining and/ or milling. The current price for the kit is £351.50 (Pounds) shipping is £150. and the kit will require up to 40 hours of skilled labor and £700 in bicycle components. The full body shell is go fragile to ship. Mr. Burrows reports that he answers hundreds of inquiries each year and has only sold 2 kits in the USA. He asks that



"Burrows Wincheetah from kit"
(Photo by Mats Nilsson, Umea Sweden)

if you write, please enclose \$1 bill (or the two Int'l reply coupons). Our estimates are that a ready to ride unfaired Speedy will cost \$3000 USD or more if you have the work done by a competent builder. Burrows Engineering, 11 Basey Rd, Rackheath Ind. Estate, Norwich, Norfolk, NR13 6PZ.

TWO WHEELERS:

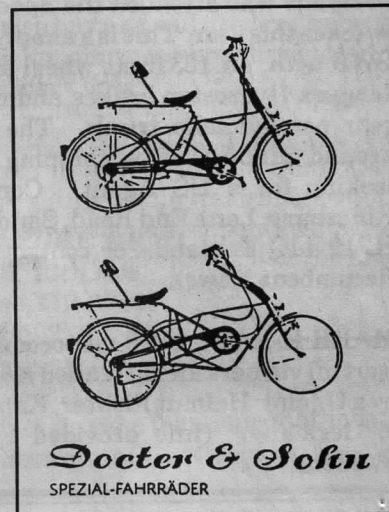
DAS RELAX LIEGERAD: LWB/ trike monobeam underseat steering recumbent: No address given. (Info provided by Matts Nilsson, Umea Sweden).

DIMA: Liege Fahrräder, LWB monobeam/scissor-action sprung frame with mono-fork, underseat steering very



Witten, Germany. (Info provided by Matts Nilsson, Umea Sweden).

DOCTER & SOHN: Cruiser type bike that reclines into a recumbent: Docter & Sohn, Spezial-Fahrräder, Petkumer Str. 298, 2970 Emden, Germany. (Info provided by Matts Nilsson)



interesting design: Marion Dickhofer, Helzstrabe 56a, 5810



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"Danny Ray
Burdick pictured
at the helm of
"Sasquatch," his
Zipper Fairing
equipped Ryan
Vanguard
Recumbent"



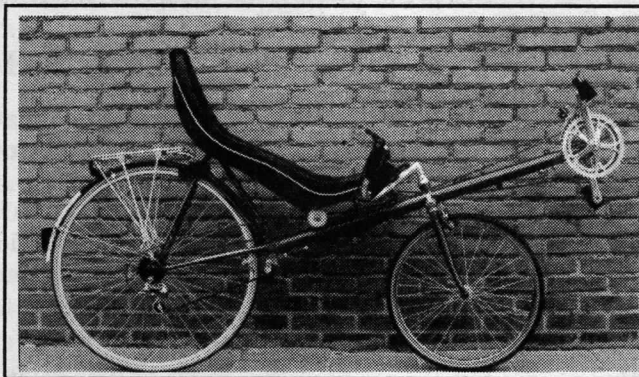
FATEBA WINGLET, L1: This is a Swiss LWB similar to the Avatar. Many have been spotted touring throughout the USA: Fateba Bachman & Co., Rosenstr. 9, 8400 Winterthur/ Switzerland.

FLEVOBIKE: FWD SWB Recumbent. Bikes are \$1000 USD but for some reason cannot be shipped to the USA. Plans are available for \$15 USD to: Bas Ten Brinke, Postbus 10075, 1301 Almere, Netherlands.

KINGCYCLE: This is the production version of Miles Kingsbury's record holding FWD (The Kingcycle is RWD). "BEAN" SWB recumbent that made such an impression on everyone who attended the Speed Championships in Milwaukee this year. This is a simply designed twin oval tubed SWB with an 18" front wheel and a 24" rear, 21 speeds, Magura Hydrostop brakes and optional front fairing and rear aerodynamic trunk. The Kingcycle base price is around \$1300 USD + shipping. Kingcycle is currently looking for a US Agent. Contact: Kingcycle, Miles Kingsbury, Lane End Road, Sands, High Wycombe. Bucks HP12 4JQ England. or contact: Neatwork. (see RCM#7 Recumbent News).

MARK K-RAD: LWB monocoque frame upright steering (sort of) via bars and extended stem connected to head tube by a U-joint: Helmut Richter, Kapellweg 3, 7808 Waldkirch 2, Germany. (Info provided by Matts Nilsson, Umea Sweden).

M5: Very Racy looking SWB recumbents. I have seen M5's with any number of combinations of wheel sizes. They have also built tandems (SWB style) and composite frames: M5, Bram Moens, Waalstraat 41, NL-4335 KL Middleburg/ Netherlands.



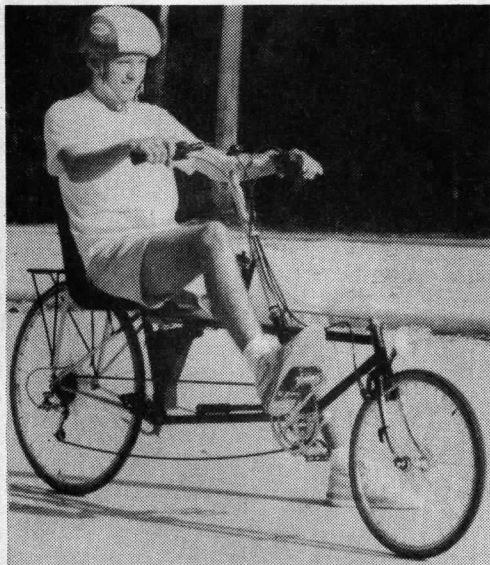
"The M5"
(Photo by Bram Moens)

MERTENS: SWB Recumbents: Guido Mertens, Ippledorffstrabe 60, D-5308, Rheinback 4, Germany/ RFA.

PICHLERRAD: German LWB similar to Avatar: Kurt Pichler, Radtechnik, Steinstr. 23., 7500 Karlsruhe 1, Germany.

RADIUS: German LWB similar to the Avatar. Peer Gynt model comes with rear suspension and Magura Hydrostop brakes. From \$1300 USD, Peer Gynt from \$1850 USD. Radius-Spezialrader, Frie-Vendt-Str. 16, D-4400, Munster, Germany/ RFA. This bike is also available from Neatwork.

DH Recumbents

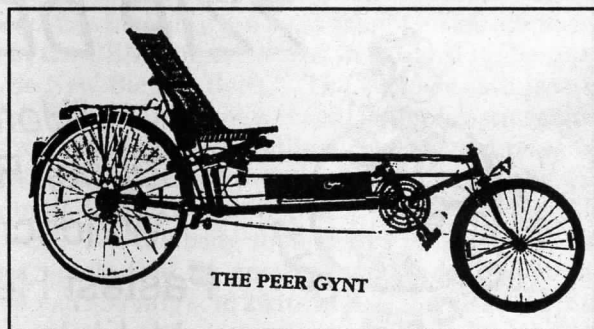


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DH RECUMBENTS INC. • 4007 G BELLAIRE BLVD.
HOUSTON, TEXAS 77025 • (713) 666-4452



THE PEER GYNT

ZWEIRAD UND ZUKUNFT: SWB "space" type frame, saddle is a Brooks leather saddle hanging suspended by strings, (Info provided by Matts Nilsson, Umea Sweden): Zweirad und Zukunft, Gaubstr. 19. 2000 Hamburg 50, Germany.

EUROPEAN DEALER:

NEATWORK: Dealer for Radius Recumbent bicycles and trikes, wheelchair tandems, English style work bikes and Kingcycles Recumbents. Will ship to the USA: Neatwork, The Lees Stables, Coldstream, Berwickshire, Scotland TD12-4NN. Phone & Fax Scotland and 0890-2709.

RECUMBENT DEALERS AND PARTS SUPPLIERS:

ARIES SENSIBLE CYCLES

Boston, MA.
 Contact: Ralph Frankel
 (617)422-1633

PRODUCTS: Linear Recumbents

CYCLOPEDIA

PO Box 884
 Adrian, MI 49221
 Phone #(517)263-5803 Information
 Phone #1-800-678-1021 order-line.
 Contact: Gaylord Hill

PRODUCTS: hard to find bicycle parts and accessories, wheelbuilding and HPV/recumbent parts specialty. A full line of 16", 17", 20".... wheels and tires. NOTES: Main Catalog \$2, Frame Building Parts Catalog \$1 and the legendary HPV/ Recumbent Parts Catalog \$1.

BUILDING PLANS: Econ-Bent SWB Recumbent \$30.

DR. BIKE

22 Camp Ave.
 Merrick, NY 11566
 Phone #(516)868-0100
 Contact: The Dr.

PRODUCTS: full service bike shop featuring Infinity, Lightning, Tour Easy and Linear.

DUISENBERG CYCLE DESIGN

3081 Roland Ct.
 Santa Cruz, CA 95062
 Phone #(408)479-9002

PRODUCTS: Dealer for Ryan Vanguard; recumbent frame building, modification, parts & accessories, friendly advice and consultation.

MILLENNIUM RECUMBENT CYCLES

17650-B6-140 Ave. SE, Suite 341-B
 Recumbent Sales Dept.
 Renton, WA 98058
 Phone #(206)255-9479
 Contact: The Recumbent Hotline!

PRODUCTS: Large mailorder recumbent dealer-discount pricing. Representing: Easy Racers, Linear, Ryan, Rans, DH Recumbents, A.T.P. Recumbents, UNI Wheel discs and Zipper Fairings. Custom built-up bikes, replacement parts & restorations. We also buy and sell used recumbent bicycles. Call for test ride appointment and directions to our showroom, by appointment only.

NOTES: New 1992 18+ page Recumbent Catalog, \$3 includes postage.

SECOND NATURE BICYCLES

446 E. 13th Ave.
 Eugene, OR 97401
 Phone #(503)343-5362
 Contact: Kurt Jensen

PRODUCTS: full service bicycle shop featuring Ryan Vanguard, Linear and DH Recumbents. "Oregon's largest recumbent dealer."

Zzip Designs

P.O. Box 14-RC
 Davenport, CA 95017
 Phone #(408)425-8650
 Contact: Karl Abbe

PRODUCTS: Largest recumbent fairing manufacturer. Fairings & mounting kits for Ryan, Tour Easy, Linear, Infinity, Lightning along HPV experimenter kits and fairings for conventional bicycles.
 NOTES: Call or write for a free brochure.

KITS and PLANS

ECON-BENT (see above CycloPedia listing).

EASY RACER PLANS (see above Easy Racer Inc. listing).

BIKECAR CORPORATION

P.O. Box 7077
 Endicott, NY 13760

PRODUCTS: four wheel recumbent bike-car plans, parts and information.
 NOTES: \$12.95 for plans.

COMPOSITE FRAME RECUMBENT PLANS

D. KERNS
 2751 Union St.
 Lake Station, IN 46405

PRODUCTS: LWB plans
 NOTES: \$14.95

COOS BAY CUSTOM BICYCLES

790 Commercial Ave.
 Coos Bay, Oregon 97420
 Phone #(503)267-7255
 Contact: Don Harse

PRODUCTS: LWB Trike plans (2 wheels in the rear design) and custom built HPV's.

NOTES: LWB Trike plans \$25, SASE for more information.

HARPER FWD PLANS

W.A. HARPER
P.O. Box 491871 Dept. RC
Redding, CA 96049

PRODUCTS: front wheel drive recumbent building plans.

NOTES: \$2 for information package and \$12. for plans.

HUDYN VEHICLES

PO Box 22444
Indianapolis, IN 46222

PRODUCTS: trike kits, plans and manuals

NOTES: S.A.S.E. with correspondence.

TRAYLOR F.W.D. PLANS

T.D. Traylor
22407 Warmside Ave.
Torrance, CA 90605

PRODUCTS: front wheel drive recumbent building plans.

NOTES: \$13 for plans.

TURNER ENTERPRISES

PO Box 36158
Los Angeles, CA 90035
Phone #(213) 383-0030.
Contact: Milton Turner

PRODUCTS: Laid Back Bicycle frame-kits. Two models, the "E" sells for \$299 for frame, fork, seat and handlebars. Add \$75 for tall seat option. The LB'90/LB-4130 chromoly frame-kit should be available in early '92.

PRELUDE RECUMBENT PLANS

J. Benditt Co.
P.O. Box 335
Pennsboro, WV 26415-0335

PRODUCTS: Prelude plans, Prelude Kits

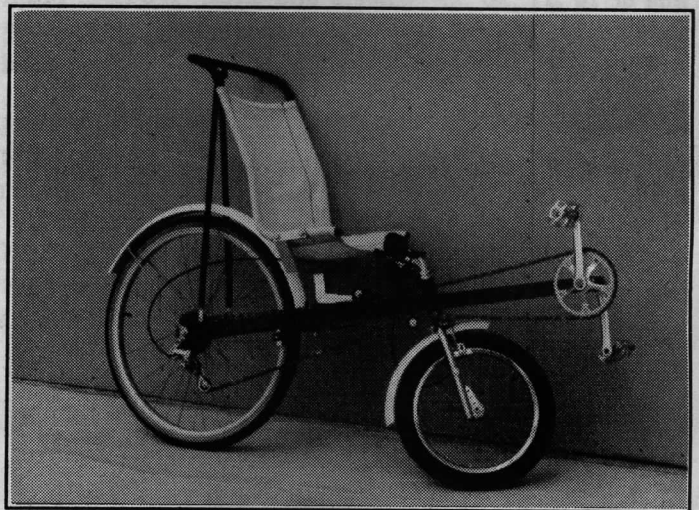
NOTES: Plans \$12.95, Kits \$129.75 and information S.A.S.E.

REBEL CYCLE PLANS

Tony Woodrooffe
Aardmore Airfield
Papakura, Auckland
New Zealand

PRODUCTS: Rebel Cycle (SWB) Building Plans and soon kit pieces and possibly a fairing.

NOTES: Info Pack \$2, plans \$20.



"The Rebel Cycle"
(Photo by Tony Woodrooffe)

HOMEBUILDER PARTS

WICKS AIRCRAFT SUPPLY

410 Pine St.
Highland, IL 62249
Phone #(618)654-7447
Phone#1-800-221-9425 (order)

PRODUCTS: Steel and aluminum tubing, foam, fiberglass, resins etc.

NOTES: mailorder catalog \$5.

FOMEBOARDS CO.

2211 N. Elston
Chicago, IL 60614
Phone #1-800-362-6267

PRODUCTS: Light-weight foam/plastic laminate suitable for recumbent fairings.

COROPLAST INC.

3025 Skyway Cir. N.
Irving, TX 75038
Phone #1-800-435-2241

PRODUCTS: twinwall corrugated plastic sheeting suitable for recumbent fairings.

UNUSUAL COMPONENTS

ANGLE LAKE CYCLERY (see previous listing)

PIERRE BLANCHARD BICYCLES

300-2734 Glen Drive Ste. 300
Vancouver BC, Canada V5T 4B6
Phone #(604)874-8152

PRODUCTS: The PB derailleur, an inboard mounted indexing rear der.; PB 80T Folding conventional bicycle with a unique 80 tooth chainwheel suitable for recumbent use.

CV-POSI-DRIVE CORP.

3832-148th Ave. NE
Redmond, WA. 98052
Phone #1-800-473-6457

PRODUCT: Paradigm variable ratio drive system.

SACHS BICYCLE COMPONENTS

22445 E. LaPalma Ave. Suite J
Yorba Linda, CA 92686
Phone #(714)692-6696
Contact: Russ Okawa

PRODUCTS: Sachs Components: Orbit ATB hubs: 2spd rear drum brake hub \$150, matching front ATB drum brake hub \$90. Three piece Twist-Grip ATB Shift system including two controls and a rear derailleur \$150. Available direct or through many bike shops, recumbent dealers and manufacturers.

YANKEE BICYCLE CO.

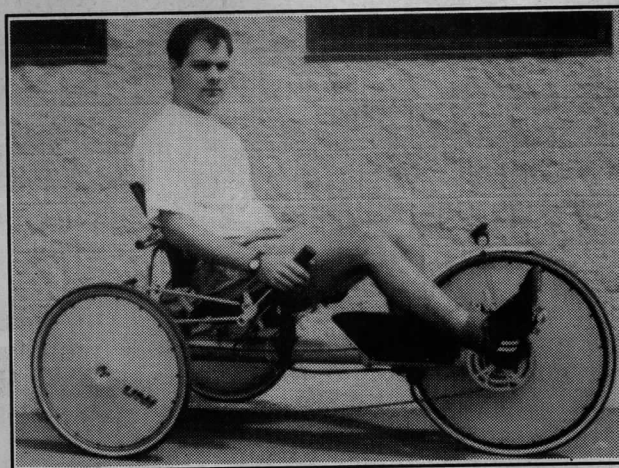
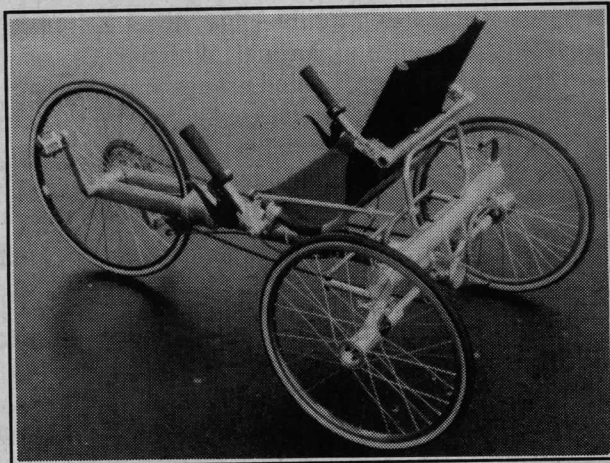
445 Interstate Rd.
Addison, IL 60101
Phone #1-800-828-9990 ext.3113

PRODUCTS: The very unique Yankee bicycle (conventional), with its Radial Gear Transmission and Rim Band Brake. This bike has been awarded 24 patents! We will be reviewing this very interesting bicycle and drivetrain in a future issue.

Thebis 201 Touring Trike

by Perkins

- Dual Hydraulic "fail safe" brakes.
- Fully adjustable orthopaedic seat.
- 21 speed gearing with twist grip, indexed shifters.
- "Air bag" seat cushion.



- Magnesium alloy - main frame, fork, rear axle, hubs, clutch housing, king pin housings etc.
- Automatic "self-centering" rear steering, with variable ("town & country") ratios.
- Dual rear-wheel drive (Torrington needle roller clutches and "Boeing" light bearings.)

Thebis International Ltd.

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(A Canadian Western Economic Diversification Project)

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BOOKS AND PUBLICATIONS

Richards New Bicycle Book by Richard Ballantine, Ballantine Books. This excellent book on cycling has a wonderful chapter on human powered vehicles and recumbent bicycles.

Bicycle Guide Magazine: March 1986 issue; Lightning P-38 Road Test, Lightning Cycle Dynamics would be the best resource for a copy of this road test (see manufacturer section).

Bicycle Guide Magazine: June 1991 issue; Ryan Vanguard test.

Cycling Science: "New Developments for the Technical

Enthusiast," many stories on all kinds of cycling, racing, human power and some the occasional story for us recumbent enthusiasts. Subscriptions are : \$22.97 @ yr. US and \$31.97 @ Yr; foreign- US funds/ CAN. -CAN. funds to "Cycling Science, PO Box 1510, Mount Shasta, CA 96067.

NEW CYCLIST: An English cycling magazine with European HPV/ recumbent coverage. £57.75 Pounds, anywhere in the world air mail subscription to: New Cyclist, Unit 1, Hainault Rd., Romford, Essex, RM6 5NP, England.

The Recumbent Cyclist Magazine: Still the planets only resource devoted specifically to recumbent bicycle and their enthusiasts! Spread the word, subscribe or buy a sub. for a friend.

RECUMBENT HAPPENINGS

GOLD RUSH DEATH RIDE TOUR

Remain seated! ...as you climb 15,180 feet in the 1991 Death Ride Tour of the California Alps. First ever honors for recumbent bicyclists go to Don Gray of Oakland CA who completed the Five Pass Tour in 13 hrs. 55 min. That time



"Gold Rush Death Ride Tour"
(Don Gray on his Gold Rush Replica)

includes all rest stops. Windy Luther Pass and 80 degree temps may have daunted other recumbent riders, but Don Gray was confirmed first and only recumbent finisher by tour organizer Curtis Fong.

Riding his stock "Gold Rush Replica" (without fairings) geared at 54/40/24 front, 12-28 rear the 50-year old Oakland resident kept his concentration ...and his seat...while demonstrating the climbability of the Easy Racer machine ridden by a "civilian" who started cycling in 1988. That was the year Don quit tobacco in July and alcohol in November. Challenged by the loss of an arm as the result of a motorcycle accident, Don chose cycling as his preferred fitness program. User-friendly Easy Racer modified a stock Gold Rush Replica to fit Don's riding needs. That Saturday, 13 July 1991, Don weighed 128 lbs, his aluminum Easy Racer 27 lbs...with 2 water bottles counted in... Don Gray achieves another first and thereby brightly burnishes the luster of Gardner Martin's Cycling shop located near Freedom, CA USA.

WHITTIER GRAND PRIX

Thanks to RBCA/ RCM subscriber Allan Zolnekoff, on October 20, the second annual Whittier Grand Prix Criterium race program hosted a hugely successful HPV race. The impressive assortment of recumbents included fully faired and unfaired designs. All 16 vehicles wowed awestruck spectators and residents of the Los Angeles suburb. Four of the five Lightning F-40's lead the entire five mile race on city streets, lapping many slower vehicles on the one mile L-shaped course. Gregory Duvall one the race, on his F-40 outcornering RAAM racer Randy Olsen and Tim Brummer in the last turn. Gerry Pease had to settle for a not-so-close fourth place. \$200 in cash prizes and ribbons were awarded to the fastest finishers. All riders agreed the event was a blast and are looking forward to returning next year.

RECUMBENT RIDER GROUPS (please send an S.A.S.E. with any correspondence)

WASHINGTON DC AREA: W.H.I.R.L.L. (Washington's Happily Independant Recumbent Lovers) The brotherhood meets at the Viers Mill Rec. Center parking lot on Saturday

Mornings around 8am This is a model rider group with No rules, No by-laws and No meetings, "Just a bunch of guys who ride cool bicycles together," says non-club non-organizer Vic Sussman. Word of Warning: No Lycra-Heads allowed. For more info contact: Vic Sussman at (301)897-5959 or Allan Pollock at (202)363-2244.

SOUTHBAY RECUMBENT RIDERS (Los Angeles area) Riders meet at Burton Chase Park every third Sunday of the month at 10-11am. Contact: Tom Howe (213)838-8634 or (213)377-8081.

OREGON HUMAN POWERED VEHICLES (Portland area) Meetings, Muster's and a bimonthly newsletter. Contact: Jake Jacobsen (503)644-7038 or Rick Pope (503)244-0908.

MICHIGAN HPV ASSOC. Meetings, race events and a

quarterly newsletter. Contact: Gaylord Hill (517)263-5803.

HUMAN POWERED VEHICLES OF SOUTHERN ONTARIO c/o Dennis Taves, 14 Croft St., Toronto, Ontario, Canada, M5S 2N8. Phone # (416)964-7857.

STREAMLINER RACING ASSOC. (Washington/ Oregon areas) Several recumbent race events. Contact: Stewart Delaire (206)692-9738. Membership \$10 @ yr. Information: S.A.S.E.

SEATTLE AREA RECUMBENT RIDERS: (King County & beyond) If you are interested in meeting on an occational Saturday or Sunday for a leisurely ride or want to help organize a Northwest W.H.I.R.L. type group please give me a call: Robert (206)255-9479. Several people are riding by themselves on all of the popular NW bike routes, there is strenght in numbers.....

RECUMBENT BUILDERS CORNER

The purpose of this column will be to pass along ideas and suggestions to other amateur (and would be) recumbent builders. I have been studying, designing, building and riding recumbents for about seven years. My current prototype has just hit the road. It is called the "2020" as it has 20" wheels front and rear.

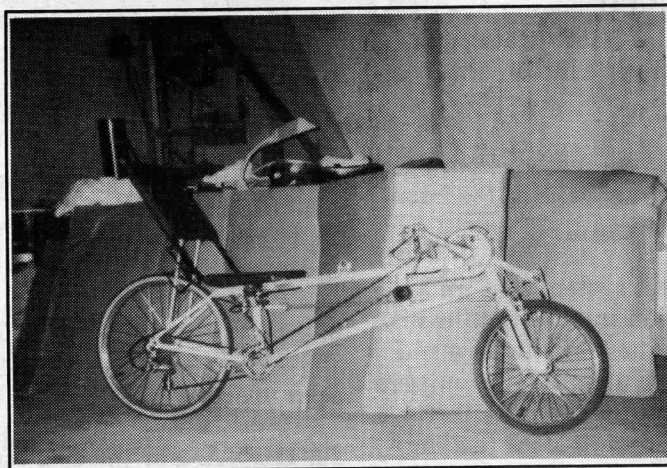
The very first step for a would be recumbent builder is to start collecting junk bikes. Even though it will drive your spouse or family crazy, do it. Lots of people will give you their old bikes. There is no better or cheaper way to put your prototypes together than with old frame pieces. If you really like the prototype, then you can purchase chromoly tubing and do it up light!

Don't think that you have to be a professional fabricator or have access to expensive machine tools to build a functional and safe machine. Being able to weld or braze is a big plus, but an alternative is to take the pieces to be joined to your neighborhood welder all prepared and held in a make shift jig or fixture. He should be able to take care of you quickly and inexpensively.

My first recumbent was an Easy Racer built from a couple of overweight department store frames. At that time, I did not braze so I got a friend to help me. Garner Martin's very thorough Easy Racer plans allow a first-time builder to come up with a well aligned bike with minimum hassle. Even if you want to build a design other than an "Easy," the info contained in these plans is invaluable.

A little extra time spent on fixtures to hold things in proper alignment while welding or brazing will pay dividends later on in a straighter frame that will require little or no "cold setting." These fixtures don't need to be fancy or elaborate, just fairly accurate. I typically use 2 X 4's and / or pieces of plywood. You may scorch the wood while brazing, but so what! You'll probably only use it once anyway.

The seat on a home-built recumbent can be a real "make or break" point. You may want to consider a ready-made seat from one of the commercial recumbent manufacturers. Commercially built recumbent seats can be expensive. Prices typically run from \$100-\$200. A simple workable seat can be built from some 1/2" plywood, dense foam (1-2" thick), and some vinyl for covering. A good trick is to join the seat bottom and back together using a piece of piano hinge. This will allow you to experiment with



"2020 Homebuilt"
(Built by Tom Briggs)

different seat angles. The seat should be at least 20" tall to support most of the back.

By Tom Briggs, Waterford ME

For more information on building plans refer to RC#3 and elsewhere in this issue. This is an available back copy for \$4 from The Recumbent Cyclist Magazine. We highly recommend taking a look at as many plan-sets as you can. Most of these plansellers have spent hours perfecting their designs. Also recommended is the CycloPedia HPV Catalog, available for \$1.75 from CycloPedia, PO Box 884, Adrian, MI 49221-0884. RJB

HYBRID RECUMBENT VEHICLES

by Robert J. Bryant

In June of this year we had the opportunity to do a recumbent bicycle display at the Alternative Energy Fair in Bellevue (WA) put on by Olaf Sundin. The main interest here was electric vehicles. The people who attended the show seemed to be very interested in our recumbent bicycles. The world of human power solar power and EV's seem to be in some remote way related maybe it is just a mutual interest in alternative transportation or just being different. Many people who have considered electric autos have also at one time or another considered electric bicycles or recumbents.

This, along with an article in the March/ April HPV News (IHPVA's publication-article by John Tetz) on adapting a small gas motor to a recumbent bicycle has prompted us to compile this list of usable technology for those interested in a hybrid/ gas/ electric powered recumbent bicycle.

GAS MOTOR ASSIST: For many of you this is taboo. For others, it is the most logical way to go. The small gas motor is very light, John Tetz's Lightning P-38 with 21cc McCulloch Weedeater motor weighs only six lbs. with gas. He claims with intermittent use he can get 1000 miles per gallon. For more information on this, you may want obtain a copy of the IHPVA article. Sources for gas motor conversion: The drawbacks here are dealing with a potentially finicky gas motor and the noise.

1.) **Performance Speedway:** 2810 Algonquin Ave. Jacksonville, FL., 32210. Ph.# (904) 387-9858. Catalog is \$5. They offer the Super Bike MX-5 Bicycle Motor. It weighs 20 lbs. and costs \$249.

2.) **Staton-Phillips, Inc:** offers small motors from 24cc-48cc. Staton-Phillips, Inc, 4303 Ryan Dr. NE, Piedmont, OK 73078. Ph# (405)373-1620.

3.) **Power-Treads:** This is the best system that we have seen. It first came to our attention in a Mountain-Bike Action Magazine article, Oct '91. The kit includes a small Sachs two-stroke gas 30cc motor, clutch, 26" aluminum mag wheel with drum brake, muffler, gas tank (in a waterbottle). This efficient unit gets 150 MPG (during constant use), weighs 22 lbs. and offers a top speed of 22MPH. The cost is \$599 from: Eurosport America, 20211 Prairie St. Unit B, Dept RCM, Chatsworth, CA 91311. (818)882-5049.

HYBRID ELECTRIC POWER BICYCLES: This can be done from scratch or by using a kit. By the time you buy batteries, a controller, charger and frame modifications you can have a few dollars into your vehicle. The drawbacks here are the added weight and limited range.

4.) **Palmer Industries** has been a leader in electric bicycle and tricycles for along time.

They offer a kit for front or rear wheel friction drive. Bosch motors are used along with a 92 amp deep cycle battery offering a 40 mile range. For a complete kit with upgraded motor, battery and charger with a twist grip controller, the retail price is approx. \$600: Palmer Industries, PO Box 707, Endicott, NY. 13760, Ph#1-800-847-1304.

5.) **Rotator Bicycles** in Santa Rosa California has modified a Rotator Super-7 streamliner to incorporate electric power. Rotator's Steve Delaire used a large electric motor with a golf-cart controller and three batteries. This vehicle was built for the Electrathon Race Series. (small electric vehicle racing class; that look like miniature Formula-One cars). Steve said this modification added 75 lb. This EV used three batteries vs. the Palmer kit's one. Steve can build you a custom fork to adapt to your production recumbent that will hold the motor (chain or friction drive) and a battery. This is all custom fabrication and not a kit: Rotator Bicycles, 915 Middle Rincon Rd., Santa Rosa, CA. 95409. Ph#(707) 539-4203.

6.) **BIKECAR CORP:** (see buyers guide, plans section)

Here are some interesting newsletters/ magazines for the HPV/EV enthusiast:

7.) **Alternative Transportation News:** PO Box 743, Mariposa, CA. Quarterly \$20 @ yr. An excellent publication. June/ Aug. '91 had a great article on a Trice-like three wheeled recumbent.

8.) **Alternative Vehicle Constructors Newsletter:** This publication is for builders of the Doran EV kit car. \$12 @ Yr. from: Doran Motor Co., 1728 Bluehaven Dr., Sparks, NV 89431.

9.) **Solar Mind:** \$25 @ yr. for six issues from: Joe Stevenson, 759 S. State #81, Ukiah CA. 95482. This newsletter covers solar, electric and Electrathon racing.

10. **IHPVA:** For information regarding the Tetz article: IHPVA, PO Box 51255, Indianapolis, IN 45261. (The Mar./ April. and Sept./ Oct. '91 HPV News)

Human Power/ HPV News subscription is \$25 per year. The IHPVA also sells many HPV related books, articles and proceedings from their scientific Symposiums. Request their Resource catalog.

RIDER POSITION AND SPEED

Out in this neck of the woods, the Michigan Human Powered Vehicle Association is composed largely of engineering types, so our annual, Waterford Rally, is designed like an engineering test course to measure different kinds of vehicle performance. For example, the hill climb test gives the power to weight ratio, the coast down test gives air-drag, etc. Winners of each event receive a Mike Eliasohn bike frame. Thanks to people who put on this rally, Bill Frey, Jon Stinson, and Gaylord Hill (CycloPedia), we have the data to derive the following chart.

Note that recumbents with underseat steering, having the arms at the sides, are slowest of all. In this small sampling, they were even slower than conventional bicycles.

Moving to the handlebars in front of the rider, like a Tour Easy or Rans bike, it speeds you up, as does raising the bottom bracket* relative to the seat. Having the bottom bracket (B.B.) higher than the seat can make the bike approximately 7% faster than a Tour Easy style bike, which is about the same improvement as adding a Super Zzipper Fairing, which in theory makes the designs equal.

(*Editors note: It should be noted that the following people have had dissimilar results in testing of high B.B. placement versus low: Gardiner Martin of Easy Racers Inc., Randy Schlitter of Rans Recumbents and your editor, Robert Bryant.)

Finally, the fastest unfaired bikes in IHPVA (Int'l Human Powered Veh. Assoc.) competitions lay the rider down pretty flat.

I have built some fully-faired bikes, and they were hot, hard to get in and out, hard to transport, susceptible to winds and generally a nuisance. For something to ride everyday, I prefer partial and unfaired bikes.

Average speeds of vehicles at the '88 and '90 Midwest Rallies.

KEY: B.B.= BOTTOM BRACKET HEIGHT; R'BENTS= RECUMBENT BICYCLES

VEHICLE TYPE	ONE HOUR TIME TRIAL	200 METER SPRINT
FULLY FAIRED RECUMBENTS	26.7 MPH	41.9 MPH
PARTIALLY FAIRED R'BENTS HANDLEBARS IN FRONT OF THE CHEST, B.B. BELOW SEAT	20.8 MPH	33.9 MPH
PARTIALLY FAIRED R'BENTS HANDLEBARS UNDERSEAT B.B. BELOW SEAT	19.5 MPH	32.3 MPH
UNFAIRED RECUMBENTS HANDLEBARS IN FRONT OF CHEST, B.B. ABOVE SEAT	20.7 MPH	31.9 MPH
UNFAIRED RECUMBENTS HANDLEBARS IN FRONT OF CHEST B.B. BELOW SEAT	18.4 MPH	31.6 MPH
UNFAIRED RECUMBENTS HANDLEBARS UNDER SEAT, B.B. BELOW SEAT	18.3 MPH	30.3 MPH
UNFAIRED UPRIGHTS	18.4 MPH	30.4 MPH
PARTIALLY FAIRED UPRIGHTS	20.7 MPH	32.9 MPH

Editors note: remember that these are all vehicles in which the riders are familiar with. The conditions are ideal, and may not be the same when tested in practical situations like street riding or commuting.

From Death to a Coast to Coast Bicycle Greenbelt

When 24-year old Martin Krieg awakened from his seven week coma, he had to be convinced he was paralyzed. While vacationing with his brother in Idaho, their vehicle was struck by a four ton truck. During his coma, he went into cardiac arrest and almost died twice. In addition to his paralysis, he awoke unable to speak, had the mental abilities of a 2-year-old, and was expected to live out the rest of his life in a nursing home. Besides his physical debilitations, Krieg, a former accountant, was humbled by the emotional frustration of relearning how to eat, tie his shoelaces, and say his own name. After enduring two years of pain and rehabilitation, he made his first journey across the U.S. alone... on a conventional bicycle.

Since then, he has duplicated his transcontinental crossing as a representative for the National Head Injury Foundation (this time on a **recumbent bicycle**) won awards as a fitness counselor and has been nominated for the 1992 Healthy American Fitness Leader Award. This award is given yearly by the U. S. Chamber of Commerce. Actor and former bodybuilder Arnold Schwarzenegger is a previous winner.

This amazing recovery was a product of Krieg's monumental tenacity as well as a network which included: former Olympic trainer, Don Chu; speech, physical, and occupational therapists; friends, family, and the bicycle. Now able to utilize the bicycle to contribute to his community, Krieg, who no longer owns a car, wants to build the Coast To Coast Bicycle trail which he calls "The Greenbelt." He publishes bicycle travel guides to broadcast this vision.

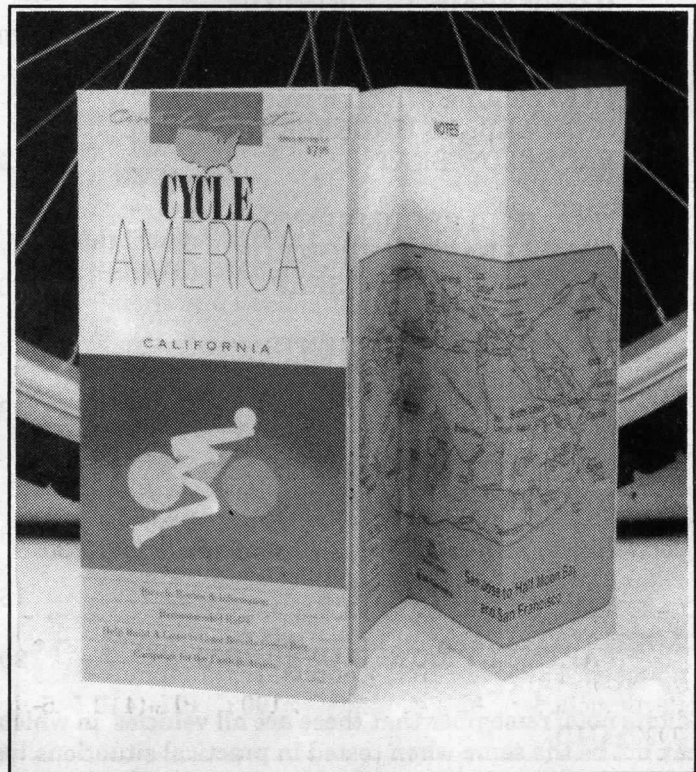
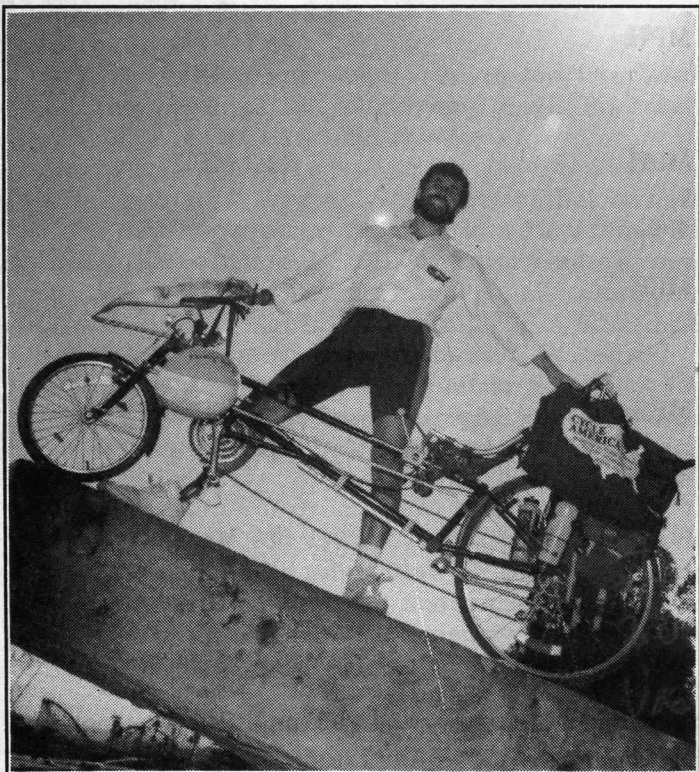
His recently published, "Cycle America Regional Directories for California's Central Coast," showcases the area from San Jose to Santa Barbara. Jam-packed with information, this pocket sized book includes: eight detailed, full-color, bicycle road maps of the area; mountain bike places to ride; a resource section about **recumbent bicycles** and a comprehensive bike shop directory. This handsome guide also lists those businesses where the cyclist can eat, sleep, shop and recreate.

Another section of the book describes the environmental organizations which are doing things to make The Greenbelt possible and how one can help them.

Krieg maintains that the recumbent bicycle enables him to re-experience the joys of cycling. He says that in comparing his two rides across the US, the recumbent journey proved far superior in terms of comfort, the numbers of people he met and doors it opened for him. He says that he saw more of the US, got a much better sun tan, had much more energy at the end of a day and in general enjoyed the ride a lot more on the recumbent bicycle.

He is committed to spreading the recumbent word to as many people as possible. Toward this end, his company logo which appears on all of his stationery. Within the conventional bicycle industry, because of Krieg, the Cycle America name means recumbent bicycles.

To order Krieg's latest publication, send \$7.95 to Cycle America, 147 River Street South, Suite 222, Santa Cruz, CA 95060.####



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USED RECUMBENTS

FOR SALE: Tour Easy Recumbent, medium size, Shimano 600 SIS shifters and derailleurs, triple crank and 12-28 6 speed cassette. Avocet tires and a Blackburn rear rack. Bicycle is in excellent condition and flawless in operation. Asking \$800. Call (216)864-0910. (OH)

FOR SALE: LWB Recumbent Frameset. Includes fork and seat frame. Uses 2 -20" wheels with a 69" wheelbase. Seat height is 10" off the ground and weighs 20 pounds. \$350 OBO. Full fiberglass fairing for above frame, 8'2" pmg. 20" wide, 43" high, 35 pounds with mounting brackets. Has door and pop top bubble for self entry. \$500. OBO. Send for pictures to: Allan Mikoleit, 24664 SW Gage Rd., Wilsonville, OR. 97070. PH# (503)638-4255.(OR)

FOR SALE: 1991 Linear Recumbent with Esge fenders and Blackburn rack, 18 speed. New last May, Price \$699 + shipping. Contact: Larry Lookabill Phone (206) 780-9206 eves (206)296-2551 days, (WA)

FOR SALE: Two Linear Recumbents like new, very comfortable, 18 speeds. Sacrifice \$450. Call: (608)795-2608.

FOR SALE: Infinity II, 1990 LWB Recumbent. Like new, red, 18 speed \$450. Contact: Mark Horton, 2535 Parliament Dr., Abingdon, MD 21009. PH#(410)515-0920. (MD)

FOR SALE: Infinity Touring Recumbent. American Classic Hubs and bottom bracket, Stronglight Delta Headset, T.A. Crankset, Magura Hydrostop brakeset, Shimano Deore XT Derailleurs and bar end shifters. Price \$750. Call Al Christian (815) 338-1270.

FOR SALE: HYPER-CYCLE, mid 1970's SWB. This is the grandfather of the current Laid-Back Bicycle. Just been upgraded to 18 speed. All new components. 105 Headset, XT b.b., XCD derailleurs, new wheels, click-shift with bar-cons and new paint. Perfect in every detail. \$500. Call: Don Check (205)831-0308. (AL)

FOR SALE: 1990-1/2 Turner LB-E:Black, tall seat, 14 speed index shifting with thumbshifters, 16" front wheel and a 24" rear. \$599. Contact: John Ross, Box 908, Bamberg SC, 29003. Call: (803)245-4490 (HM), (803)245-4327(WK). (SC)

FOR SALE: Roulandt Recumbent, showroom new condition, black metallic with 12 speeds. Also available is a stock of Roulandt OEM parts. S.A.S.E to: Roulandt, PO Box 73, Mercer Island, WA. 98040.

NEW RECUMBENTS

FOR SALE: Rotator, "handcrafted human powered transportation" The Companion Tandem, designed for fun, it can be built with underseat or overseat steering. The gear systems can be built with a standard timing chain or the more efficient individual cadence option. Seats adjust for rider height. 20" wheels front and rear. Seat height 25", overall height 48" and overall length 86". Base price \$3000. The Super-7, designed for racing with a streamlined body. Points series Winner for 1989, 90 and 91. Works great around town too. 20" wheels, seat height 15", height 36", length 88" Base price \$1500. Custom fabrication also available. Rotator, 915 Middle Rincon Rd., Santa Rosa, CA 95409, Phone # (707)539-4203.

FOR SALE: Available for immediate delivery: 1)1990-91 **Linear Recumbent** (folding aluminum) demo's, Assorted sizes, 18 speeds with index shifting, Starting from \$699. 2)Used **Linear Recumbents**, assorted sizes, most used as RAGBRAI bikes. Bargain prices—Call! 3)New 1992 **Linear Recumbents**, Retail list price is \$875, call for out low price. 4)1991-1/2 **Tour Easy, Jet-Black**, Triple crankset, 21 speed index shifting with Super-Zzipper Fairing New and never ridden, for immediate delivery. **Absolute guaranteed**

lowest price of the year! Beat the 1992 price increase order your Tour Easy today! **5)1992 Infinity III**, Red and factory fresh, 18 speed, not even set up yet, available for immediate delivery. **6)Advanced Transportation Products "R-20"** the newest SWB recumbent, full SunTour XC-LTD group two 20" wheels from \$1350. **7)1992 Gold Rush Replica "need we say more...."** In stock and available for immediate delivery! Call for pricing and

delivery dates. **Order our new 1992 18+ page Recumbent Catalog, our best one EVER! \$2 + \$1 postage and handling (\$3 total).** If you have ordered a Millennium Catalog in the past send the back page in for \$1 off! Millennium Recumbent Bicycles, 17650-B6-140 Ave. SE, Suite 341-B, Recumbent Sales Dept., Renton WA 98058 **"Recumbent Hotline 206-255-9479"** (11am-6:30 pm daily). Demonstrations by appointment only.

Classified Ads are free to subscribers, Non-subscriber's rates are \$15 per insertion. Commercial classifieds are \$30 @ 50 words and \$50 @ 100 words. **Display ads** are as follows: 1/8 page \$50, 1/4 page \$80, half page \$150, two-thirds page \$215 and full page \$270.

THE COOS BAY CUSTOM CYCLES TRIKE

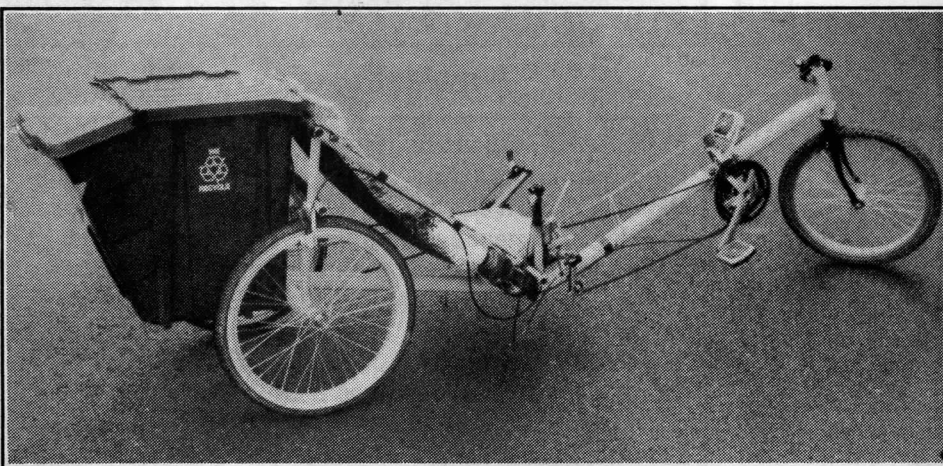
While working in the maintenance shop at Ken Keyes College in Coos Bay Oregon, Don Harse designed and built a new three-wheel recumbent bicycle. Don has been designing bikes for over seven years, and has produced several models of recumbent bicycles. For this new design,

also display extreme stability on gravel roads and trails where other recumbents dare not travel.

Don's new trike design incorporates several major technical advances. The frame is both simpler and lighter than other trikes on the market. State of the art Magura Hydraulic brakes are used providing this very fast vehicle excellent stopping ability, even from 40 mph and above. The trike has 96 speeds. This wide range means you can make it up hills, even when hauling groceries and scream back down the hill without "spinning out." The aerodynamics (30%+ reduction in frontal area) enjoyed by this cycle allows it to out run most conventional two wheelers.

The prototype is a tremendous success. It is totally unlike any other three-wheeler you may have seen. Its low, lean and fast. The steering is quick and responsive. The best surprise is the ride quality, resulting from the flex of the monotube frame and shock absorption designed into the seat. If you are in the market for a practical HPV that is fast and comfortable to ride long distances, this may be for you. For more information, send an S.A.S.E, or \$25 for a set of building plans. Contact: Coos Bay Custom Bikes, Don Harse, 790 Commercial Ave. Coos Bay, OR. 97420. PH#(503)267-7255.

By Wade Nelson

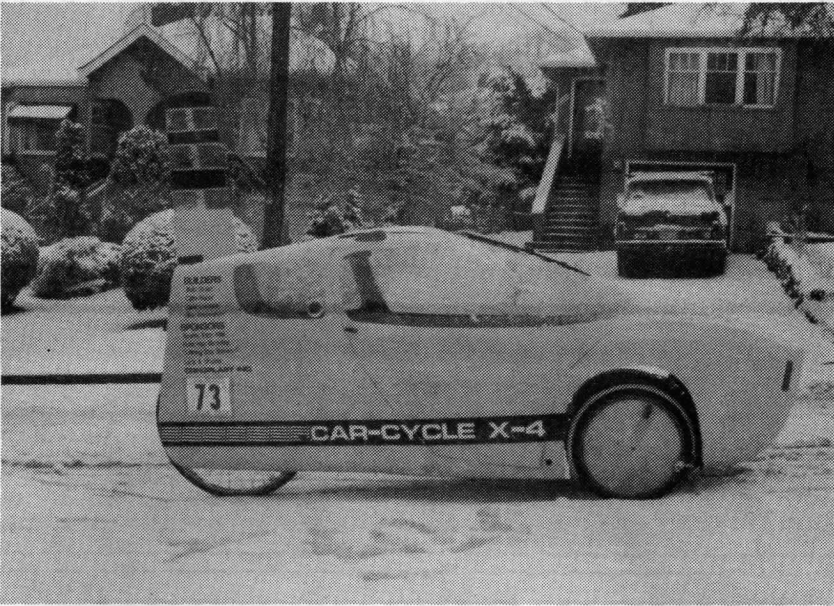


(Photo courtesy of Coos Bay Custom Bikes)

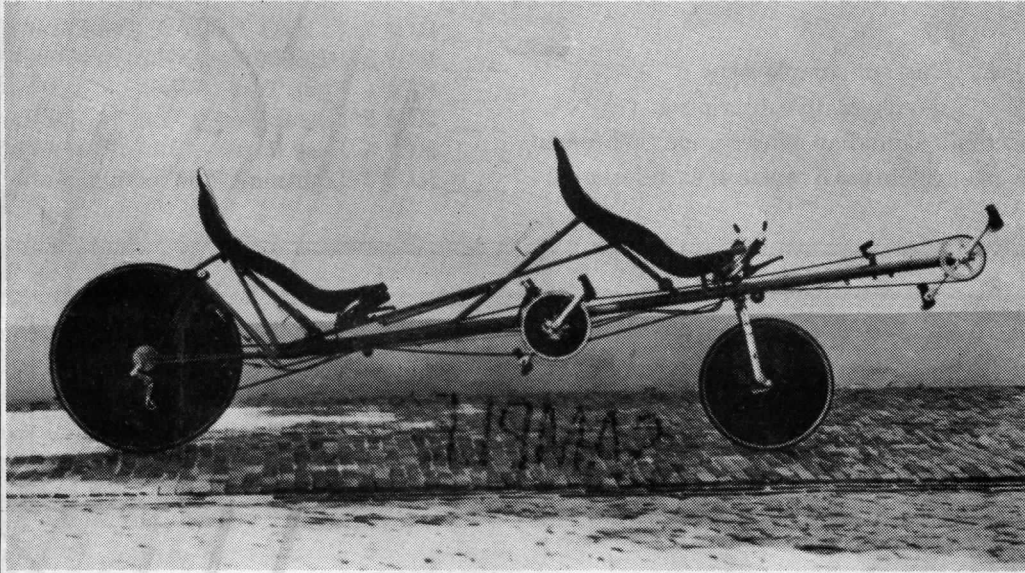
Don's goal was simple, to design a three-wheeler that he would enjoy riding himself. This lightweight, very practical three-wheeler is designed to out perform conventional bikes, especially when hauling a small cargo, supplementing and often replacing the automobile for short errands.

Two wheeled recumbents, like conventional bikes, will fall over at stop lights if the driver does not support the bike. A three-wheeler totally eliminates this problem and you will not have to take your feet off of the pedals. You can add a child's seat and not have to find some way to support the bike and child while you run your errands. Three-wheelers

By Wade Nelson



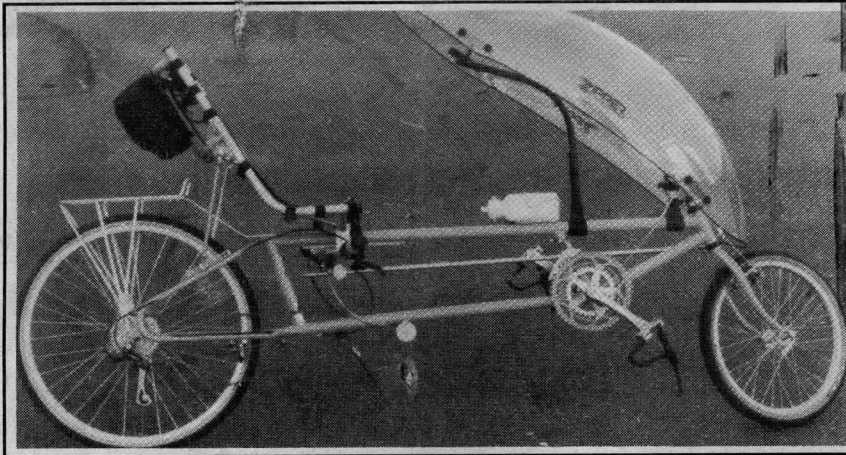
"Cav Cycle X-4 Prototype"
(Photo by Rob Stuart)



"M5 Tandem"
(Photo by Bram Moens)

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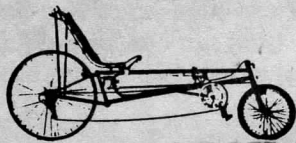
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