

Author John Lindsay rides his USX all over Port Townsend

## Real World Use: The Sun USX Delta Trike

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**B**efore letting my gas-gulping van die years ago, I started commuting 30 miles per week by bicycle. Over the years I developed a case of carpal tunnel syndrome and a degenerated spinal disc. When my wedgie started breaking down I decided to look for a new bike. I discovered recumbents while looking for a utility bike and ended up buying one of the first new Sun EZ-3 USX delta trikes.

Sun offers many models of affordable recumbent bicycles and tricycles. The USX is the delta trike (two wheels in back) that is hinged and sprung at mid-frame. There are really no other trikes like this one — especially at this very affordable price. This article will discuss my experiences outfitting the USX for my daily transportation needs.

### SYSTEMS

**Frame:** The USX has a two-section hi-tensile steel frame that is connected at a hinge with a spring shock (mid-frame suspension). The midsection suspension is mostly for looks and ease of folding the frame, but seems very durable — as well as offering some suspension.

When the frame hinge bolts worked loose

there was a horrible creaking sound. I replaced the post bolt with a solid bolt and two lock nuts so there is no chance of it coming loose. Applying Loctite to the hinge bolt may also solve the problem.

**Steering:** The giant “U” shaped steering side-stick under-seat handlebars pivot and are connected to a steering rod that runs to the front fork. The bars are adjustable for arm length and width.

**Rear End:** The rear end is fairly simple. The USX has one-wheel drive, and each wheel has a stub axle. A freewheel connects to the drive wheel axle, and the chain runs forward to the crankset. I found the freewheel difficult to remove, and the rear axle bearings (cartridge sealed) are press fit into the frame which will make removal and maintenance more difficult.

**Weight:** Sun is not known for building lightweight recumbents. In fact, their trikes are among the heaviest available. Sun states the USX’s weight at 65 pounds. We could not verify this weight. According to Sun, the EZ-3 weighs 50 pounds (AX) and 56 pounds (CX). The Hase Kettweisel weighs 40 pounds (RCN 078 road test) and the Lightfoot Greenway weighs 50 pounds.

### DRIVETRAIN

**Shifters:** In cold wet weather the SRAM twist shifters are difficult to operate — and shifting is even worse with gloves. I read in RCN about similar shifters failing. I was lucky to find a set of used Suntour bar-end friction shifters (\$30) and replaced the twist grips.

Sunrace offers new thumb shifters that cost \$12-\$17 ([www.rivendellbicycles.com](http://www.rivendellbicycles.com)). Better yet, look for a stock set of Shimano or Suntour thumb shifters. You can also make thumb shifters using Shimano bar-ends and Paul Thumbies (\$55 + cost of 8 or 9-speed Bar-Cons) from [www.paul.comp.com](http://www.paul.comp.com).

**Gearing:** The gear-inch range is 20.3-76. The low gear is too high for riding the hills of Port Townsend while pulling a trailer full of groceries, and the high gear could be higher.

There are several ways to widen the gearing. The easiest would be to substitute a 24-tooth inside chainring for the 30-tooth. This would lower the low gear to 16.3 gear-inches. You might want to consider a new crankset, perhaps one with shorter crank arms (see RCN 086, page 18).

I decided to install a fourth chain ring: a Mountain Tamer triple adapter with an 18-tooth chainring ([www.abundantadventures.com/quads.html](http://www.abundantadventures.com/quads.html)). This gives me a low gear of 12.5 gear-inches and enables me to climb a 14% grade with a 400-pound load (rider + trike + cargo).

To shift down to the fourth ring I have to stop and move the chain by pushing the chain tube over while cranking backwards by hand. Shifting up works, but not perfectly. I moved the chain tube up a bit to keep the chain off the bottom of the derailleur cage.

I made one more change to the gearing by installing an 11-34 7-speed freewheel (requires a gear puller and removal of one axle). This gave me a low gear of 10.5 gear inches!

Another more expensive option is the Schlumpf Mountain Drive ([www.schlumpf.ch](http://www.schlumpf.ch)), a 2-speed bottom bracket single chainring crankset which offers a 1:1 gear and a 2.5:1 reduction gear, shifted by a heel button (at the crank’s dust cap).

**Short Cranks:** I decided to experiment with shorter crank arms, so I ordered Tandems East pedal shorteners (\$80 from [www.hostelshoppe.com](http://www.hostelshoppe.com)). These offer shortened crank arm settings of 146 mm, 129mm, 112mm or 95mm. I have a 30” inseam and set them up using the 146mm setting. When I tried the 129mm setting, I couldn’t get enough leverage climbing the hills.

This low gear combined with the 146mm cranks are a near perfect solution. If I go to any shorter crank arms, I’ll need an even lower gear.

The shorter cranks immediately relieved the pressure on my knees — which was noticeable on the first ride. They also allow me to push harder with a faster cadence, but it is more

difficult to climb hills due to less leverage.

For more information on the use of short cranks, see the RCN 086 article on Recumbent Components.

**Chain Management:** Both the upper and lower chain run through chain tubes back to the rear derailleur. The rear derailleur clears the road by only one inch in the lowest gear.

**Bottom Bracket:** The BB's lock ring kept working loose, so I eventually replaced it with a new Shimano cartridge-sealed bottom bracket (68 x 127 mm spindle).

**Brakes:** The disc brakes are so nice to have flying down a 14% grade hill in the rain with a busy cross street at the bottom, even if they do take a bit of effort to keep them balanced. They are both on the same right hand lever. I have found that these brakes need to be carefully adjusted (to keep from dragging on the rotors) and the bolts are rusting. I did replace the pads which was easy.

**Wheels & Tires:** The USX comes with a 65 psi recreational tire that was inadequate for my use. After I had blow-outs on both rear tires, I replaced the rear tires with Primo Comet 2.1" 110 psi tires.

The wheels seemed to wear prematurely. I eventually broke a spoke on the non-drive side rear wheel. To improve durability, I decided to order a set of hand-built wheels (\$133 each) using triple crossed DT spokes and Sun BFR (Big Fat Rims). I think stock wheels should be okay for recreational riders.

## COMFORT

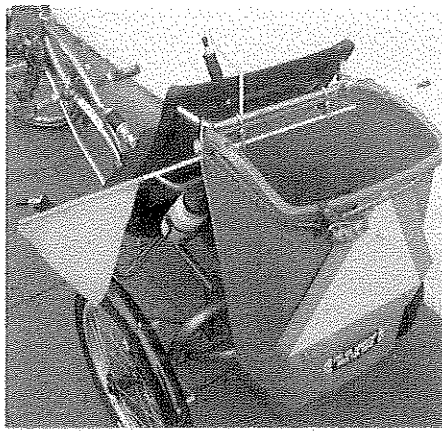
**Seat:** The USX utilizes the heavier of the two Sun seats (steel frame). The seat base has a Lycra cover over the foam. It isn't waterproof, so it should be covered on rainy days. The seat slides on a channel, and is locked in place with two quick-release levers.

I found the seat to be comfortable, but some riders may want a headrest. I think recumbent riders must have more neck stress than they are willing to admit. Easy Racers is reported to be working on one, but I may make one from PVC tubing.

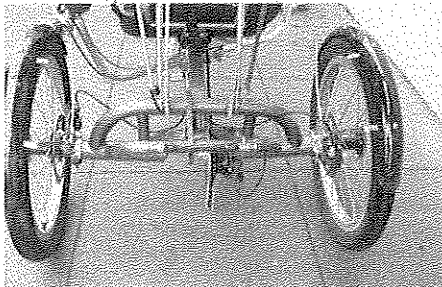
The hinge where the seat back and base connect is loose and appears to be irreparable. Sun suggested to the dealer to add a washer to take up the slack, but this didn't work and I still have a wobbly seat. I guess I'll have to buy a new one. Sun Bicycles is not very clear about the limits of the warranty.

## THE RIDE

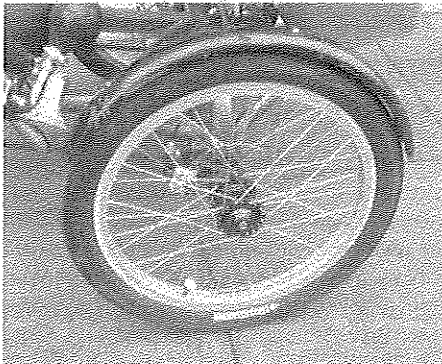
What a luxury — no more slow speed balancing problems, and I can ride up hills that I never could when I was perched on top of two wheels. And with the lumbar support of the seat, my back doesn't hurt nearly as much as on my MTB. On my first ride I discovered that I must not let go of the handlebars because the front wheel will not "track" in a straight line by itself (no gyroscopic kinetics). I can feel



*This Sun USX is John Lindsay's daily transportation. Note custom horizontal safety flag and trash bin cargo carrier.*



*Note the rear end, beefy upgraded tires and wheels.*



*The new custom wheels*

the road vibration more at high speeds on smooth roads. If you want to go around corners fast, get a tadpole trike — as this delta could throw you right off. Yet I can corner at least as fast as a two-wheeler on a gravel surface. Having three wheels is great when it comes to low-speed climbing. I just gear down and spin up hills at my own speed.

What two-wheeler riders might not know is that most road surfaces are crowned, so that the edges are lower than the middle. As a result, when a recumbent tricycle rides down the outside edge of the road, there is a considerable amount of leaning to compensate.

Another trait common to delta trikes is to have the front wheel ever so slightly lifting off the ground and sliding to one side, when climbing steep hills, or in other low-traction situations. This is caused by the rearward weight bias of the delta and the one-rear-wheel

drive. When I crank slow enough with an even cadence, it is less likely to lift off.

Riding on a narrow road requires some new skills to keep cars from passing from both directions at once. Some drivers think they should slow down and pull over so the car behind me can pass. This is how I was hit several years ago. The car coming towards me in the opposite lane didn't have the room to move over and the driver behind me thought he did. I always prevent this by moving out into the road so the car behind cannot pass until it is safe.

## OPTIONS

**Water bottles:** I installed two bottle cages on the back of the seat using hose clamps (there are no braze-ons for this).

**Lights:** Several outfits sell derailleur tube light mounts. I made my own using a recycled handle bar stem and a cut-down handlebar.

**Cargo:** I recommend using a two wheeled-trailer or just hang a basket off the back of the seat. I use a trash hamper for a large basket. One problem with carrying a load on the rear of the USX is that the delta's rear end is already heavily loaded by design.

I have a horizontal safety flag on my bike. A local bus driver once told me that the flag is such a good idea that I should patent it. It does help drivers think clearly about how much room they need to give you. The 32" width of this trike helps also.

## PURCHASE

Any bike shop that deals with J & B Importers/Sun Bicycles can order a USX. The price is \$825 plus shipping and fenders. I have about \$1,700 into mine (with upgrades and repairs). Dealing with a shop that knows Sun Recumbents is a good idea. An experienced shop can assemble a USX, make upgrades (such as wider gearing options, bar-end shifters), lube and tighten the bolts and true the wheels. My trike required constant tightening of nuts and bolts during the break-in period.

**Market:** The Sun USX is the most affordable trike of its kind (delta USS). Sun also offers two over-seat steering models: the 56-pound EZ-3 SX with a hi-tensile steel frame (\$725) and the EZ-3 AX with an aluminum frame (\$1295). Two new tadpoles have also been introduced for 2005: the hi-tensile steel SX (\$1095) and cromoly CX (\$1495).

## VERDICT

I believe the EZ3 USX is an ideal first trike. The USX componentry was not designed to sustain daily commuting. If you use it for this purpose, you are likely to have to replace many of the components as they wear out. This trike is too heavy and the gearing is not wide enough for long or fast commutes. More serious users might want to consider a tougher vehicle with

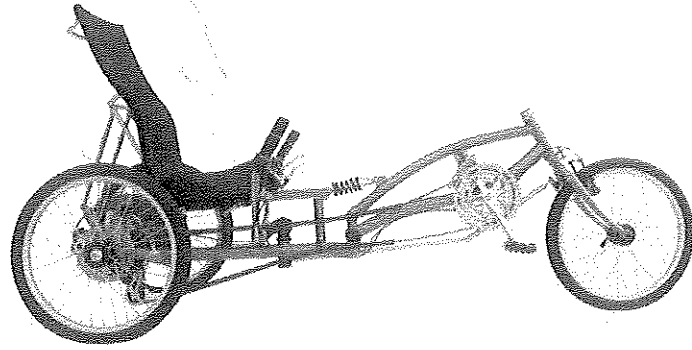
better components such as the Lightfoot Greenway or Magnum trike.

The Sun USX trike was designed as an entry-level recreational trike for cruising on a sunny afternoon cruise. The USX is an excellent value and has been a surprise sales success in many shops. The USX is a glorious value. Oh Yeah!


I would like to hear from other people trying to live with utility cycles or if you'd like further information about this trike. ♦

*Editor's Note: I ran into John the other day while riding around town. All of his updates are working out well (with the exception of a chain breakage problem he's dealing with). While making the USX into a commute worthy vehicle did require costly upgrades, John is happy with the result. If you plan to buy a USX and place it into extreme commuter or touring use, you may want to consider upgrading the following parts:*

- Bottom Bracket
- Wheels
- Tires
- Shifters
- Chain
- Wider range gearing.



*The Sun USX delta trike retails for under \$1000. While most any bike shop can sell you one, we suggest you deal with a recumbent specialist who has experience setting them up, can suggest upgrades and handle gearing changes.*



## Atlantic Bicycle

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