Seat of Power

How to keep your battery topped up: flywheel to alternator to battery to inverter to TV and overhead lights. At lower left is a DC motor (for a related experiment that shows what you can fry without proper voltage regulation).

Welp, that's 4,000 miles on the exercise bike that I hooked to an alternator because I got tired of wasting so much food energy.

I found a bike with a big, heavy flywheel, then took off the friction belt, substituted an automotive belt, and hooked that to a standard car alternator that I mounted on a bracket screwed into a plywood sheet. The belt is tensioned by a turnbuckle on a hook screwed into the wall.

I attached the alternator to a combination starting/deep cycle battery, hooked an inverter to the battery, a TV and a big fluorescent light fixture to the inverter, and presto, I had a painful little set-up.

The flywheel on the bike has a 16" diameter, and the alternator pulley has a 2" diameter, which gives a ratio of 8:1 (not allowing for some slippage, of which there's a bit). The flywheel revolves 3.1 times per full pedal stroke of 360°. At cruising speed I pedal about 90 strokes per minute, so that gives an alternator speed of about 2,200 rpm. It would probably work better if I could spin it at 5,000 rpm, but I don't have enough gears or legs. Anyway, the battery seems to be in good shape after a year and a half.

There are some tricks to working the system: You have to sprint for a few seconds to get the alternator to kick in; then you can back off to cruising speed. During normal pedaling, the alternator voltage is about 14.5V, the battery voltage at the terminals during charging is about 13.6V, and the battery's standing voltage after an hour or so at rest is about 12.5V.

If you crank up the load with both fluorescent lights (80 watts) and the TV (65 watts), and you start slacking off the pedals, the load starts to get ahead of you and the riding gets harder. If you slow down enough for the alternator to stop charging, and the battery voltage goes down below about 12.3V, you have to stand and battle uphill for quite a while just to get back to the point where you can sprint the alternator back into action again. (This would be the stair-climber feature.) Sometimes you have to turn off "I Dream of Jeannie" in order to get things right, and that's hateful.

Four thousand "miles," as measured by the bike's odometer, has taken about 12,000 minutes or 200 hours. The average output is 4.5 amps. So that would be about 900 amp hours.

After all that work, I have only one thing to say, and it has already been said: What a frail thing is man.

That's about 15 hours of run time for a diesel engine with a stock alternator. Shoot, you could carry in one jug the amount of fuel that a Yanmar 3GM would burn at minimum charging speed to get the same result. No wonder we like fossil fuels and internal combustion engines so much.

Still, we have to break ourselves at least partly from this lousy addiction. In a sidebar to our story about deck-fill fuel filters in the November 15th issue, we remark the obvious: Fossil fuels pollute, destroy ozone, and warm the globe (in both temperature and tension). Sailors should be among the first to withdraw from this addiction. But I can tell you this: If you want to keep up the juice to run an electric windlass or a microwave on your boat, you won't be doing it on muscle power. Bring on the solar, bring on the soy diesel, bring on the fuel cells, and don't spare the wind.

—Doug Logan

Practical Sailor

Editor
Douglas Logan

Executive Editor
Dale Nouse

Editor at Large
Nick Nicholson

Contributing Editors
Ermanno Di Lorenzo, Richard Greenhaus, Ed Lawrence, Doug Ritter, Jay Chris Robbins, Robby Robinson, Scott Rosenthal, Rick Strand, Dan Spurr

Publisher
Timothy H. Cole

Editorial Offices
10 Bluff Ave. #111
Clinton, CT 06413
e-mail: practicalsailor@aol.com

Subscription Department
800/829-9087
pracsailor@palmcoastd.com
www.practical-sailor.com - click "Subscribers Only"

Box 420235
Palm Coast, FL 32142-0235

for Canada
Box 7820 STN Main
London, Ontario N5Y 5W1

Web, Back Issues, Fax Service, Other
Customer Service
PO Box 2626
Greenwich, CT 06836-2626
800/424-7887
customer_service@belvoir.com

Quantity Reprints Available
Minimum Order: 1,000
Contact Mona Kornfeld, Belvoir Publications, 203/422-7343

The *Practical Sailor* (ISSN No. 0161-8059) is published twice a month (except March, June, September, and December, which are combined) by Belvoir Publications, Inc, 75 Holly Hill Lane, Box 2626, Greenwich, CT 06836-2626, (203) 661-6111. Robert Englander, Chairman and CEO; Timothy H. Cole, Executive Vice President, Editorial Director; Philip L. Penny, Chief Operating Officer; Greg King, Senior Vice President; Marvin Cweibel, Senior Vice President, Marketing Operations; Andrew Thorne, Vice President, Group Circulation Director; Michael N. Pollet, Senior Vice President, General Counsel. Periodicals postage paid at Greenwich and at additional mailing offices. Revenue Canada GST Account #128044658. Canada Publishing Agreement Number #40016479.
Subscriptions: $84 annually. Single copies, $7.50 (U.S.). Bulk rate subscriptions for organizations and educational institutions are available upon request.
Postmaster: Please send address changes to Practical Sailor, Box 420235, Palm Coast, FL 32142. Practical Sailor, P.O. Box 39, Norwich ON, N0J 1P0 Canada.

PRACTICAL SAILOR ACCEPTS NO COMMERCIAL ADVERTISING