Yes World, Sailors are Athletes Too!!

by Jane Kent

JONATHAN HARLEY

Jane is an active sailor who is also very interested in sports physiology. She has received her Masters in Physical Education (concentration — exercise physiology) from California State University, Long Beach, and plans to begin work for her doctorate at USC soon. Her sailing experiences range from driving a 505 to doing cockpit on a J/24 to tactician/alternate helmsman on a custom Peterson 44. She has competed in many National and North American championships, and in two World Championships.

She's got a lot of energy, and wants to help competitive sailors increase their potential for success by getting themselves in shape properly. In 1979 she designed and implemented a program for Ed Trevelyan and Rod Davis. Crewing for Robbie Haines in the Soling they won the 1980 Olympic Trials, sailed in a variety of conditions including heavy air. This winter she has designed programs for Rod, Kimo Worthington and Dave Ullman. Rod is preparing to crew in a Star Olympic effort, and to become the mainsheet trimmer/tailer for Tom Blackaller in his Twelve Meter. Kimo is preparing a Finn Olympic effort, and Dave is preparing to campaign both a 470 and a Soling.

I asked Jane to give a brief overview of her program, and to end with a few general thoughts on conditioning.

We'll begin with the basic premise that everyone involved in competitive sailing will benefit from being in top physical condition. This is especially true in the Olympic classes and other high-performance one-designs. In most cases sailing requires a great deal of lower-body isometric (static) strength and endurance, and powerful upper-body activity (strange combination!). So, the questions are: where to start, and how to proceed? Just as when undertaking any new major project, it is necessary to start with the basics and proceed from the general to the specific. That is to say, a foundation must be laid upon which future progress can be built. In this way there are *no weak spots* in the program.

When applied to physical conditioning for sailing, this principle calls for the establishment of a basic level of fitness. Once this is attained, work geared for the specificity of the job or action may begin. In other words, first get fit in a general way, and then start to work on the muscular demands of your specific position. Bear in mind that the physiological and biomechanical demands on the individual vary from position to position (i.e. helmsman vs. trapeze crew) and from boat to boat (Soling vs. 470). However, *everyone* has in common the need for a basic level of fitness. So, when starting a program with Rod, Kimo or Dave or any of the others, this is where we begin.

PRE-PROGRAM TESTING

In order to get somewhere, you first have to know where you are (very profound, eh?). For this reason each program begins with a series of tests to determine the present level of conditioning the person is in. The individual's strengths and weaknesses can thus be determined.

This includes the *basic data*, such as health histories, heart rate, blood pressure, height, weight, age, etc.

Skinfold measurements are taken to determine the person's body density and the percent of their total body weight which is fat. This will be useful information in determining both the person's ideal weight for health reasons, and the approach to take for attaining the ideal weight for their class and position. (Obviously this is a critical problem in the Olympic classes.)

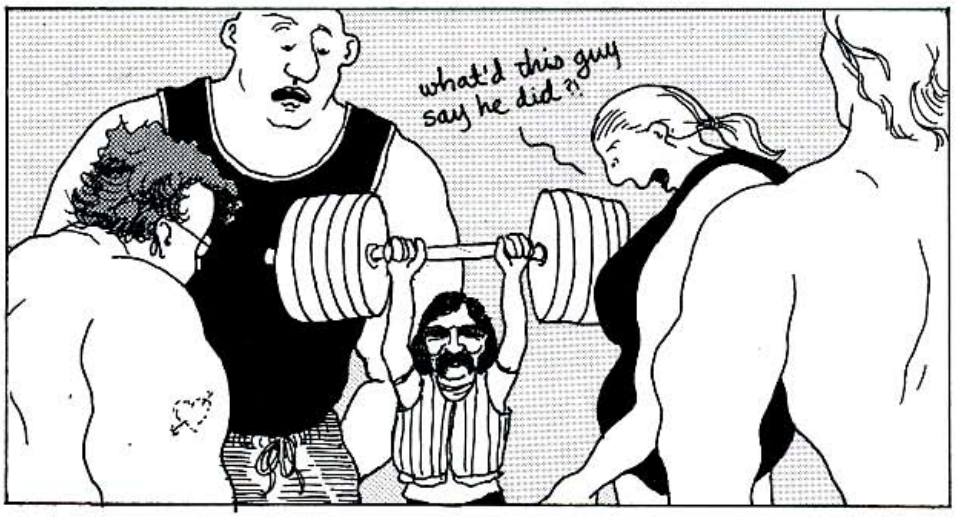
The maximal oxygen consumption test is then given to assess the person's ability to utilize oxygen during heavy muscular work. This gives an indication of their cardiovascular/aerobic/endurance capacity at that point in time.

Aerobic endurance (or the ability to push hard up that last weather leg) is a must — just ask any Finn sailor! This test is an all-out effort of four minutes on a bicycle ergometer (an apparatus which measures the work done by a group of muscles). While on the apparatus, you breathe into a valve which leads to a tube which goes into an air collector which is connected to some gas analyzers, which let us know what's happening to you internally. (You may have seen film footage of Eric Heiden undergoing this procedure.) This test is somewhat uncomfortable, but necessary because it gives an indication of your present maximal capacity.

At the same time, a measurement of the *amount of power* you generated for the four minute period is attained. This test is repeated at several levels of resistance on the bicycle so that an overall picture can be attained.

Additionally, a *stress electrocardiogram* is administered to anyone over 30 years of age. This helps to screen for any possible heart function abnormalities.

At this point, *aerobic training* can begin. After four weeks (for most) each person will be tested for muscular power output capacity. A general program of *power overload training* with weights will then be given each individual. After four weeks of this, the programs are then tailored to the *specific demands* of the person's job or actions. Remember, proceed from the general to the specific! Also be aware that it *takes time* to establish a wide and solid foundation on which to build. Proceeding too quickly can lead to injury. Also all workouts



will include a warm-up and cool-down period in order to avoid injury and soreness. Finally, I should mention at this point that *flexibility* is a must for all competitive sailors. Not only does flexibility allow for more powerful muscular contractions; but it also aids in avoiding injury (strains, sprains, etc.). For these reasons it is incorporated into all phases of the conditioning program.

AEROBIC TRAINING

For the aerobic training, a number of modes are available to choose from. These include: running, bicycling, swimming, cross-country skiing, rowing, etc; just about anything that can keep you working continuously at a set level for a minimum of half an hour. Dave, Kimo and Rod will start at half an hour, four times a week and will build gradually up to an hour or more five times a week. Tapering (cutting back) will occur for major regattas. These workouts will be heart rate monitored. That is, they will work at 60 to 80 percent of their estimated maximal heart rate per minute.

The estimated maximal heart rate = 220 minus age. 60 percent Intensity = (estimated maximal heart rate minus resting heart rate) x (.6) and added to the resting heart rate. Example: for Kimo, age 21 ... est. max. h.r. = 220 - 21 = 199 beats per minute. His resting heart rate is 68. (to get yours now, just count your pulse rate for 15 seconds and multiply by 4). So: 60 percent intensity for Kimo = (199 - 68) (.6) + 68 = 147 beats per minute. So this is the minimum heart rate for Kimo's workouts. To stay in aerobic metabolism, he should not work harder than about 80 percent of his est. max. heart rate. (173 b.p.m.) The exact range will vary from individual to individual depending on whether they need to lose fat weight or gain muscular weight. Working at a lower intensity burns off more fat.

Kimo hooked up to the bicycle ergometer.

Now, the aerobic activity you choose may incorporate your needs for the position you're in. For example, Rod, as mainsheet tailer/trimmer on a Twelve Meter will need a lot of upper body power, so he may choose swimming, which is 95 percent upper body work. On the other hand, he'll need leg strength and endurance for his Star effort, so he'll also do some running. Now Kimo in a Finn will need lower body strength and endurance to begin with; so he'll be running and bicycling. The same is true for Dave. Because sailing a small dinghy often requires grace and agility, ballet, Jazzercise or an aerobic dance class might also be a valuable part of the aerobic program. It all depends on the individual, as each program should be tailored to their needs, strengths and weaknesses, interests, personality, and access to facilities and equipment.

POWER OVERLOAD TRAINING

(after four weeks of aerobics)

Once the foundation building has begun sufficiently, power overload training may begin. Isometric exercises for the lower body will also begin now. With the exception of the lower body in hiking (not including jerk-hiking), virtually every movement made during a race is a power-oriented movement; that is, there is speed involved in overcoming a given resistance (i.e. pumping, jibing the pole, etc.). Power = force (resistance) x distance moved, divided by time. So why train with weights in the traditional way (i.e. slowly) when there is little power generated (remember the need for speed)? If power is what's needed in the boat, then it makes sense to train specifically for power.

Ideally this type of training would utilize

an ergometer-type weight machine, which sets the person up in the same positions as those found in the boat. However, since this does not exist yet, the next best step is to use a Universal-type weight machine; or set up something at home with free weights and pulleys. The idea is to begin with general overall exercises.

So Dave et al will begin training on a weight machine, emphasizing sets of speed, and beginning at weights of 40 percent their maximum. A time period is chosen (e.g. 10 seconds to begin with for arms; longer for legs), and they'll do as many repetitions as possible, as fast as possible, in that time period. This is considered one set. The number of reps per set are recorded. In the first week of training they'll do only *one* set of each exercise; the second week, two; the third week, three. This will continue up to the sixth week where the sets will drop to two for 15 seconds each, etc. They will spend at most 20 minutes per day, five days a week on it; and depending on how their aerobic program is going, the increases may be cut back to "maintenance level" around regattas, etc. The difference between this type of training and traditional weight lifting is that speed of movement is stressed.

SPECIFIC DEMANDS

(after four weeks of power overload training)

Four weeks into the general power training, specific exercises which will closely simulate movements in the boat are introduced. These exercises are job-specific, and will vary for each of them.

Because these guys will be doing alot of traveling, we will figure out ways of continuing training while traveling. Consistency is vital in order to make progress with this type of program. With each of these guys, we'll retest about every six months in order to check for progress and make any necessary program adjustments. Nutritional advice is also given. We will also be using a video camera in order to pick up any biomechanical inefficiencies while sailing. With some of these guys we'll also get into mental rehearsal and relaxation techniques. Remember, mind and body go hand in hand.

GENERAL THOUGHTS

Mind games: There's definitely a place for this during the workout. It can be useful, distracting and fun. For example, when going out for an hour's run, I will often set myself up out on the race course in my mind. Beginning pre-start, I'll visualize and *feel* the entire race from start to finish...complete with tacks, mark roundings and interesting tactical situations. It's amazing how you can lose yourself in this kind of game — time flies! However, you have to be a little careful about doing this in traffic. Another thing I'll do, instead of going "out of body", is to go internal. That is, I'll completely "tune in" to bodily sensation and visualize what's happening to me internally (my background helps me formulate a clear picture). This practice is useful to my sailing, because on the water my body automatically becomes very "in-tune" with the surroundings, picking up subtle cues I might otherwise miss. The human body when left to its own devices can be a great source of information and intelligence. Other distractions include: organizing a new project, reviewing past glories, or just letting your mind go blank. One thing is for sure, I have yet to come back from a run in anything less than a very good mood (this is due to the hormonal action of beta-endorphins which occurs in all of us as a result of physical activity).

Nutrition: basically, we get our best source of energy from carbohydrates (look in a book to see which foods are high in carbo's), so plenty of these should be consumed before and after a race. Dehydration is a big problem on the water. Electrolyte replacement fluids (e.g. Gatorade) aren't really necessary during a race. More importantly one should drink a lot of water and maybe some fruit juices. These have water and some carbohydrate content. Sugary foods and liquids *should be avoided.* They wreak havoc on the body's blood sugar level!

Stretching: as I said, flexibility is very important to sailors. All workouts *and races* should be preceded and *followed* by a warm-up or cool-down which includes stretching. This prepares the muscles for work, and thus alleviates injury and soreness. Additionally, performance is enhanced. The *most important* thing to remember when stretching: Don't Bounce! Stretch gently, gradually, and hold up to 90 seconds.

DISPELLING A FEW POPULAR MYTHS:

1. "No pain, no gain" There's *no* physiologic basis for this. Muscular or tendon/ligament pain (different from discomfort) during or after a workout or race is a sign of tissue damage and so should be avoided.

2. Nautilus type of weight workouts aren't going to help too much unless there's *power* involved in the use of the apparatus, which includes speed. Power is what you most often need in sailing (exception, hiking legs).

3. High-protein diets: not necessary. The average American gets *plenty* of protein in their diet. Also, we don't use protein as a primary source of energy, we use carbohydrates.

4. Vitamin supplements: unnecessary if you eat a balanced diet. However, if you don't get a balanced diet, I would recommend a multiple vitamin with iron supplement daily. Also when traveling, I always take such a supplement.

5. Drugs for weight control: bad idea. There are better, much healthier ways of approaching this problem! However, they do take more work.

RECOMMENDED READINGS

Here are some helpful books in both the areas of physical and mental preparation, based on facts and experiences, not fads:

Fit or Fat, by Covert Bailey
Women's Running, by Joan Ullyot
The Sportsmedicine Book, by Mirkin and Hoffman
Nutrition: Concepts and Controversies, by Hamilton and Whitney
Jonathan Livingston Seagull, by Richard Bach
The Inner Game of Tennis, by Timothy Gallwey
Sports Psyching, by Tutko and Tosi
Peak Performance, by David Kauss

Editors note: I also recommend Jane's series, "Performance Through Conditioning: Aerobics, Power Training, Sports Psychology and Sports Medicine, Nutrition and Body Composition". This series was published in Yacht Racing/Cruising magazine as a four-part series beginning in April, 1981; and was written specifically for sailors. For copies of the series, contact Jane directly,

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KEN ALLEN

Buddy, Bill and Bill just after receiving their gold medals. They didn't even need to sail the final race, but did and won it to end with 1-2-3-4-1-1 finishes!