

OWNERSHIP ROSTER REACHES 58  
(See Updated Roster Attached Hereto)

Assuming at least 129 boats were built, and knowing that one was lost in a boat-yard fire, there are some 70 Seawind MK IIs out there somewhere, unaccounted for.

We have contacted major publications - CRUISING WORLD, SAIL, PRACTICAL SAILOR, YACHTING - - and received some publicity regarding our attempts to find SW2 owners. This effort has produced modest results, but will require repeat publicity if we are to reach those not yet known to us. In line with this, we plan to carry the aforementioned publications as Associates of the SW2 Class and include them on the SEAWIND II WORDS distribution list. In return, we ask that they freely excerpt and edit items of potential interest to their general readership and give conspicuous credit to SEAWIND II WORDS, including mailing address.

John Winters/SW2 083C is currently attempting to contact the unknown owners of two SW2s in the greater Seattle, WA area. Another SW2 has just been located on Long Island's north shore, through a sales offer in the October issue of SOUNDINGS.

Each owner-of-record on our roster is encouraged to check local brokers' listings and used boat ads in newspapers and magazines, as well as yacht club bulletin boards, etc. It is to the advantage of all owners to close ranks in an organization that facilitates the maintenance and updating of our boats as well as keeping us informed about cruising experiences of extraordinary character.

Our goal for 1992 is a net increase of at least 10 ownership-additions to the roster as attached hereto. Just send in the names & addresses - - we'll do the rest!

FORMER ALLIED EXECUTIVES IN FLORIDA

Ed Costello/SW2 076S notes that former Allied Yacht Co. owner, Northam Warren, lives near Ed in Stuart, FL. Randall Manchester, a former Allied VP, is a neighbor, also. Ed, are they interested in becoming Associates and getting on our distribution roster?

Volume 91, No. 1 21 October 1991

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WHAT ABOUT TASK "A" - THE "CHANGE & INNOVATION LOG"?

The introductory 21 March 1991 letter to SW2 owners-of-record at that time suggested the preparation of a categorical reference volume of owner problems & solutions, recommendations & cautions, and changes & innovations. The principal source for this reference volume would be the past issues of informally presented issues of SEAWIND II WORDS.

Think of the convenience and confidence afforded by a responsibly sourced and well-organized summary of what other owners have experienced or have done to deal with adversity, and, or to optimize boat safety, performance, and comfort.

The information currently at hand and future input to be expected might be gathered into chapters such as.....

- Spars, Sails & Rigging
- Engine & Electrical
- Electronics & Instrumentation
- Hull, Plumbing & Tankage
- Cabin & Cockpit Configurations
- Safety & Security
- Navigation & Seamanship
- Legal, Taxes, Government Concerns
- Miscellaneous & Historical

If you'd like to become Editor-in-Chief of such a reference project (and perhaps develop your own, very different format), or just take on one or more of the chapter/categories suggested above as an Associate Editor, please contact me. Phone, if you wish: (516)749-8964. The mailing address is in the Masthead.

Then, of course, you may feel that the whole idea is without merit as proposed. Write or call and sound off; We need all the help available - - positive and negative!

.....please turn over

TIME TO THINK "ORGANIZATION"?

Several SW2 owners have already gone on record offering to help sponsor area get-togethers. These sessions, with or without boats, would be opportunities to exchange experiences person-to-person, and to explore prospects for future collective cruising or rendezvous, joint sourcing of goods & services, or simply to enjoy the good company of fellow SW2 owners.

Initial gatherings could also provide the forum wherein the groundwork for a simple SW2 Class Organization might be developed. There could be advantages in having a Seawind II Class Commodore to speak for the general ownership in matters of national & international yachting relationships, group insurance ratings, government regulations & taxation, etc. A 2 or 3 year term of office for the Commodore and for a Vice Commodore and a Secretary-Treasurer would provide sufficient depth and scope of responsibility to meet our needs.

On the more practical side, these area gatherings would be the beginnings of local/area Fleets - - consisting of owners in generally defined geographical areas where common concerns and sailing conditions prevail. Annual or semi-annual Fleet cruises or sail-ins, or just gams without boats, would add an ongoing personal touch to the existing remote relationship achieved through SEAWIND II WORDS, alone.

For example (and you are encouraged to propose alternatives), the following tentative Fleet Designations might be considered:

- Great Lakes (GL): Great Lakes coast of U.S. and Canada.
- Gulf Coast (GC): Florida Panhandle to Mexico.
- Florida West Coast (FW): Apalachee Bay to Key West.
- Southeast U.S. (SE): South Carolina to Key Biscayne, Florida.
- Mid Atlantic (MA): Chesapeake Bay to North Carolina.
- Northeast Atlantic (NE): Delaware Bay northward, including Canada's Atlantic coast.
- Pacific Coast (PC): California and Hawaii.
- Northwest (NW): Oregon to Alaska, including western Canada.
- Overseas (OS): Home/Hailing ports in other world areas.
- Highseas Voyagers (HV): Owners on cruises of 12 months or more.

But then, all this may be premature. Write about it. Others may share your opinion.

BOATS & EQUIPMENT FOR SALE / WANTED

(We'll include charters & swaps, and even real estate, crewing & delivery services - - whatever - - in this column. No warranties implied by appearance in this column)

FOR SALE: SW2 027K. Owner's exclusive broker is Fairwind Yachts in Greenport, NY: (516)477-0124. (From October edition of SOUNDINGS)

FOR SALE: SW2 122K. Ask for Cloven at (914)534-8616. (From NY Sunday Times, 20 October 1991.)

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PLEASE BE SURE TO ADVISE OF  
ADDRESS CHANGES, OWNERSHIP

TRANSFERS AND BOAT LOSSES

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If response to this edition yields sufficient copy, we'll try to get out another edition by year-end. Meanwhile, I'll phone volunteer editors and organizers to explore and encourage your expressed interests in taking on some of the tasks proposed herein. Please writ

The following is a sampling of the mail received during 1991. A bit of news, some questions, and the promise of more to come, we hope!

Your input to SEAWIND WORDS better assures its continuation. Tell us what you've done, where you've been, what your concerns are, and how you've solved your own problems and/or those of others. We welcome ideas and criticism, whether related to SEAWIND WORDS, our organizational structure, or matters in the public sector. In short, we need copy so keep it coming!

Culpepper/002K: Martin is leaving early in October for a cruise south from Fairfax, VA. Georgea will join him along the way. We'd like to hear from them as the voyage proceeds - - boat performance/shoreside facilities/etc.

Forrester/004K: From May to September, Darryl can be found in Weekapaug, RI. He winters in Charleston, SC. Darryl, do you sail SEAWIND II (name of Darryl's boat, by the way) to RI in the summer and back to SC in the winter? There must be a story, there.

Meyer/005K: Fred has done extensive re-building & upgrading of SUMMERWIND original Westerbeke 4-91. We enthusiastically accept Fred's offer to provide details of his engine work, and to provide alternative-source part numbers and sourcing for various engine consumables costing as little as 1/3 of Westerbeke prices. Space for his report is already reserved in the next issue

Meanwhile, Fred and Helen were planning to complete their voyage south via the Tenn-Tom Waterway and Mobile Bay during this past summer. We hope to hear about it, and will pass along the details to our readership.

Noyes- John and Karen's first voyage as new owners took place in Thompson/012K: July, from Toledo Beach, MI to Sandusky, OH. It gave them a great chance to prove the seaworthiness of their boat in 40-55 mph winds and 6-10 foot seas. They are fortunate to be docked near George Rowcliffe/041 whose knowledge & experience regarding SW2s are extensive. (See attached write-up by George, ANNEX A)

Gunelius/014K: We haven't heard from Judy and Farrell since they wrote to Dan Smith on 4/22/90, but we believe our mail is getting through to them - - nothing has been returned, yet. They had planned to depart in the summer of 1990 on an extended voyage from Naples, FL to the Bahamas to Maine, and then to Venezuela. Their account to Dan included reference to raising the mizzen boom 12" for headroom in the cockpit, and modifications in the cabin. We look forward to an interesting report from these voyagers.

McVey/035K: John reports that he and June lived aboard their boat for four (4) years, on a mooring in Monterey Bay, CA. They both keep busy with the dance studio that June has re-opened in Turlock, CA. We'd like to hear how they enhanced the on-board accommodations for their 4-year sojourn.

Rhudy/040K: Ed reports that he has 3900 hours on the original Westerbeke, not unrelated to considerable coastal cruising from Maine to the Florida Keys. He and Manfred Rott/070C seem to be our Carolina reps, and are in touch.

Rowcliffe/041K: It was like hearing from an old friend when George's 9 August 1991 letter arrived. In 1987, soon after I purchased my own boat, he responded to my CRUISING WORLD inquiry for advice on Seawind IIs. His 1987 advice is nearly timeless, and the entirety of his 1987 letter to me is attached to this SEAWIND WORDS edition as ANNEX A.

On current issues, George reported on his cruising in the Bahamas last winter where he encountered someone (name uncertain) from the Washington, DC area

on their Seawind II. This past summer, he has been trying to upgrade a bit on deck - - windlass and chain rode, midship cleats & chocks, and general clean-up. (We'd appreciate details, including sketches, from George for inclusion in our next SEAWIND WORDS.) Next projects include an accumulator to take the surges out of the pressure water system and an upgrading of the electrical system with meters, better charging equipment, and a larger alternator with better voltage regulation. (Other owners may want to exchange thoughts with George, directly, on these matters; but, please copy your current SEAWIND WORDS editor on pertinent correspondence that might be of value to our general readership.)

Of special interest is George's organizational commentary: "I like your idea on separate fleets and would make one further suggestion. I for one, and perhaps others, would be happy to have guests from the east coast on board my boat for a Great Lakes rendezvous and perhaps we from the hinterlands could get reciprocal invitations to attend the eastern gaggles." What do the rest of you think about this general subject of exchange visits? Please write.

Bowling/047K: Bob is interested in contacting other owners in his Astor, FL area for informal exchanges on problems & solutions. (Bob, the latest roster is attached - - but please keep us posted on any findings of general interest.)

Manuel/050K: Seemingly unending problems with excessive algae contamination in the fuel tank is driving this owner towards replacing the original 36" x 30" x 9", 40-gallon, Corten steel tank with a smaller, removable, V-bottom, +25-gallon, 5086 marine aluminum alloy tank with built-in tube to extract water/sludge/algae from the bottom of the tank itself. The contents of the existing tank have been flushed, Biobor has been faithfully used, and the tank has generally been kept full - - all to no avail. Racor filter changes have been necessary every 8-15 hours, on peril of clogging.

Another alternative - - on the suspicion that the boat was purchased with a pre-established accumulation of caked algae in the tank - - is to install an 8-12" Bomar cover plate in the cockpit sole and fit an inspection/clean-out panel in the top of the existing Corten tank.

Or thirdly, recent contact with the Texaco people at Port Arthur, TX acquainted me with FPPF Chemical Company's KILLEM biocide. Could the algae in my tank be resistant, if not thriving on, Biobor? The pertinent KILLEM literature is attached as ANNEX C to this issue of SEAWIND WORDS. (Note that the smallest container of the material is sold in 1-gallon containers - - enough to treat 2,000 gallons of fuel!) Some of you have surely licked this problem. Tell us!

Incidentally, Marge and I have a guest mooring in West Neck Creek, Shelter Island for any visitor. Just contact us in advance, if possible, at (516) 749-8964.

Hirsch/054K: Leon sails out of York River Yacht Haven, just across from Yorktown, VA. He reports that as of early this year, he had never seen another SW2 in his travels on the Chesapeake. Can there be an explanation? Chesapeake SW2 Owners, please contact Lee - - or visit him on the York River sometime, soon.

Schaeffer/058K: Dick is interested in the local fleet concept, and has offered to assist in such organization. He has owned FEIERTAG since it was built in 1977, and has been cruising the northeast waters with wife, Marlene, ever since. We will follow-up on Dick's offer and report results in the next edition.

Burdick/061K: Stan enthusiastically endorses the idea of "get togethers" - - either on water or on land - - in his several notes, to-date.

.....continued

Jacobs/066K: Talked to Charlie by phone last month to confirm address, etc. He's upbeat on the fleet concept and offered support.

Lohmann/069K: Grace and Werner reported plans to add additional equipment in preparation for extended retirement cruising and a move to Florida. They are stymied on the design for a cockpit bimini for use at anchor and under sail. Perhaps Allan Landsman/088K, Dick Weaver/075K (see ANNEX B, top of page B-5), or someone else who has such an arrangement could provide details, sketches, etc. SEAWIND WORDS would be glad to publish any offerings.

Meanwhile, the Lohmanns are well pleased with the Autohelm 4000, complete with remote and interface, which they installed 2 years ago. Others with similar equipment might report on their experiences for the benefit of those of us currently considering electronically controlled steering devices.

Weaver/075K: In a February 1991 letter to Dan Smith of the Seawind 30 Class organization, Dick Weaver reported that he and wife Maridell had just returned to St. Petersburg, FL in December from a 9-month cruise that encompassed the west coast of Florida, the Keys, the Bahamas, Bermuda, Maine as far north as Roque Island, and the east coast Intracoastal Waterway.

Now their story is in! Dick has sent me a remarkable account of boat evaluation & modification, skilfully intertwined with operational & maintenance experience that is sure to capture the attention of anyone who reads the 4th sentence; i.e., "Since then, we have sailed over 25,000 miles and anchored 500 nights, on cruises of lengths varying from 2 days to nine months." The full letter is attached to this edition of SEAWIND WORDS as ANNEX B. (And may your SEAWIND WORDS editor respectfully ask for copies of any correspondence enlarging upon the information which Dick provided in his letter as attached hereto. We'll pass the details on to our readership.

Winters/083C: John is on the trail of two SW2s in the Puget Sound area - - one in Anacortes and the other at Shilshole Marina in Seattle. The Seattle boat is up for sale, and the broker has been apprised of our organizational efforts. Hope to see John when Marge and I visit kids & grandkids in December.

Colwell/084K: Paula and Tim are preparing for a voyage to the Caribbean, departing in late October. They have reworked the cabin storage areas, and have promised to send fotos that we will try to reproduce in the next SEAWIND WORDS. Replacement of hoses to-and-from the head was started, only to reveal that the original hoses were in good shape. Topsides were painted, as was the rubrail. They were impressed with SW2 construction, upon finding dry sawdust - - yes, dry - - laying on top of the hull-to-deck joint when the rubrail was removed.

Busch/085K: Steve recently purchased PSYCHE, and the summer of 1991 is his first experience with the SW2. His concerns include (1) tips on tensioning the rig (when equipped with Seafurl jib); and (2), details on rigging a mizzen staysail. The back issues of SEAWIND WORDS, plus further contact with our two major contributing authors in this edition (Messrs Rowcliffe and Weaver) should get him on course with these two concerns.

Neth/086S: Dave has trimmed back on his cruising of late due to illness in the family. He is a past Squadron Commander in the USPS, and has taught celestial navigation for the past 27 years. A rare resource in these days!

Green/090K: Joe was an early correspondent of mine, offering useful information in a 1987 letter in which he (1) cautioned on fan belt selection, (2) mentioned his singlehanded use of a Thurston "Thrasher" spinaker with chute scoop), and (3) expressed satisfaction with his Autohelm 3000 among many other points.

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Of note was his reported experience with Adler-Barbour refrigeration, a category of interest for many SW2 owners. Incidentally, Joe's boat has a Westerbeke 20 HP (Buhk) engine, model P-20. His experience with less power (most of us have a W30 engine), might be of interest to anyone currently considering repowering. (See also the references from Don Bundy/129K)

Bell/092C: Roger returned to Annapolis early this past summer from his second trip to Florida. Stories, Roger?

Pierson/097C: Al stopped in at Shelter Island on his way north to Maine this summer. We had a pleasant meeting and tour of the Island while ROLLIN HOME remained in Coecles Harbor awaiting better weather.

From Boston, Al wrote that he had replaced the fly-wheel ring gear in New Bedford, MA, and the prop shaft & coupling in Boston. Happy to advise that he phoned from Mystic, CT on his way south in September - - everything going well.

Harris/104?: No word yet from Dave, but at least the mail isn't being returned to me. Dave, please drop me a line and recount your experiences as a new owner of a SW2.

Snow/106K: Ken wrote that he is a woodworking and mechanical freak who used to publish a monthly newsletter in color. Wow! My retirement as editor may be closer than I realized. We certainly shall harness Ken's expertise to all or some of the many aspects of our SW2 Class program.

Incidentally, I have a copy of the original Wright/Allied SW2 Owners Manual that came with my boat, MERMAID, when the original owner, George Curran took delivery. Additionally, I have the Westerbeke 4-91 handbook and a separate extensive list of parts - - all available to anyone who would like to borrow them for study and/or copying, instead of ordering them from Westerbeke.

Hornidge/110K: We're still hoping to get a response from Dick - - assuming that he is still owner of SKIDBLADNIR (or successive name). The mail has not been returned, so it may still be enroute to him at some distant world port.

Royal/119C: Doug and Bette have sailed SYRINX from Chesapeake Bay home waters to Long Island Sound, The Vinyard, Gloucester, and Maine. They have also ventured into Albemarle Sound, and have promised further details that will be relayed to all via SEAWIND WORDS.

Steffens/124S: Don and Gael have spent time in the Bahamas and made two trips to Bermuda, returning via Montauk Point and the Hudson River. For some of us, their Lake Champlain home waters seem like an intriguing destination perhaps with the option of going on north to the St. Lawrence and Canadian waters. Don and Gael, does that make sense? Please tell us about it.

Bundy/129K: Don is owner of what appears to be the last SW2 built. He was key to our publishing the back issues of SEAWIND WORDS, through his experience with printing & duplication services - - and competitive Florida prices. Happily, Don has agreed to help us get out this issue of SEAWIND WORDS, too, for which we are all appreciative.

Of possible interest to owners considering replacement power, Don's boat TALISMAN has a 55 HP Pathfinder engine. That's about 2X the power of my W-30's 27 HP rating. Perhaps Don will give us a brief resume of his experience and recommendations regarding the larger "iron spinnaker".

P.O. Box 21610  
Columbus, OH  
43201

June 10, 1987

Mr. Richard W. Manuel  
210 North Monroe Street  
Ridgewood, New Jersey 07450

Dear Dick,

I'm afraid I'm a bit tardy in responding to your request for my thoughts on the Seawind, having been busy with at least 47 things not the least of which is getting my own boat in the water. Even late, I'm happy to share with you what I have learned and I hope you find it of some use. As you say, we are always learning and that's what keeps it interesting no matter how long one has been at it. We have been sailing for about 15 years and had an Able 20 before we bought the Seawind in Annapolis and sailed her home to Sandusky on Lake Erie.

First the questions in your letter, then I'll work my way through your enclosures.

Owners Association - yes, there is one somewhere on the east coast. I haven't been that interested, being a bit isolated in the boonies. Tom Gilmer, the designer, is in Annapolis and would probably be familiar with the organization. The builder, Bob Wright, was still around Catskill, NY the last I heard, but that was some years ago.

My boat is Hull #41, equipped about as yours except with a marine head and holding tank (I had the holding tank installed). We have been sailing "Serenity II" for eight seasons and really couldn't be more pleased with the quality of the boat. The performance isn't the greatest, but then a ketch isn't a racing machine anyway, and she's built very heavily besides. She points comfortably about 52 to 55 degrees off the wind. Though she can be pinched in a bit more, it slows her down considerably.

The trade-off for performance is comfort and security in adverse conditions. We have ridden out many squalls on Lake Erie hove to with a double reefed main in winds to 65 knots and she is very secure and comfortable in those conditions. She is far more comfortable hove to than laying ahull as the sails provide a great deal of stability. I have sailed her a couple of times in 8 to 10 foot seas on various points of sail, and again she's comfortable and easy to handle in any conditions that I have found. My fastest long run was 45 miles in five hours with 25 knot winds on a broad reach surfing down the fronts of 6 to 9 foot seas. That was a ride!! My slowest is 27 miles in ten hours beating into a 30 to 35 knot wind directly from the destination with double reefed main and storm jib. Seas were running 5 to 6 feet.

There is an owner's manual, and a fairly good one at that. I'm a bit surprised you didn't get one with the boat. I would be willing to copy mine and send to you. Don't suppose it would cost more than \$35 or so, by the time it was copied and mailed.

In addition, there should have been a great many other manuals with the boat: a very good engine manual for the Westerbeke, and operating sheets for the various pumps, head, electrical accessories, etc., etc. The main value of many of these things is model numbers, parts identifications, part numbers, and all that detail. I'll try to look up the part number on the engine manual and I'm sure you can get a copy from Westerbeke. The other things can also be obtained from the manufacturer's, I'm reasonably sure, if they are still in business. You might even try contacting Bob Wright for a copy of the original Seawind manual. Lacking a phone number in Catskill, NY for Bob, you could try Hop-O-Nose Marina in Catskill and see if they know how to contact him. The marina is across the river from the old plant.

COMM/NAV EQUIPMENT. It looks like you have the basics well in hand and no further comment is needed. I have carried an RDF for years, but have found little use for it other than getting the weather. I did finally add a Loran C last year when the prices became reasonable enough. Mainly it is a back-up for the DR, especially at night when pilotage is tough, or when the fog moves in and the pilotage is well nigh impossible. I do a fair amount of night sailing and it's a great comfort to have another piece of equipment confirm that I'm really where I think I am. Of course, no piece of gear, especially electronics, should be totally relied upon if there are other options and DR is still the basic navigation method until I'm proven to have made a mistake.

I suggest you give some thought to a Loran C as the prices are right. I bought a King unit that I found on sale, but the Micrologic 8000 looks like a superior unit for not too much more money. I have used the Micrologics in aircraft and they are good equipment. Catalogs that I have are showing about \$1000 for the unit. Although you can get something like the SiTex EZ-7 for half the cost, a better quality unit is well worth the small additional cost in ease of use, reliability, accuracy, and overall satisfaction.

Doing a lot of coastal work you would probably find a radar useful, though I'm not sure the cost is justified. I haven't thought it of sufficient value to spend the money, but they are nice in fog and making inlet entrances as most of the entrances will have reflectors and show up very well. It would be far down my list of priorities, but it's something to consider.

You didn't mention charts, tide tables, pilot books, and all the rest of the publications, but I'm sure that you have what you need. The price of those is becoming absurd. When I came from Annapolis it took more than \$125 worth of publications and since then the prices have more than doubled. It seems that the government's idea is to drive the price up to where the average yachtsman can't afford to keep up to date charts and pubs.

ENGINE: It appears that you have a pretty complete set of spares. I don't carry much with me, though I would carry more if I were to be out of touch for extended periods. A sidelight on that - I have worked at learning to handle the boat under sail. All anchorages are made under sail and the anchor is almost always weighed under sail. When I use a mooring, I usually sail on and off it (with the engine idling for insurance), and occasionally I will sail on and off

→ One thing more I meant to mention - A professional compass survey is well worth the investment in peace of mind that the compass is adjusted and accurate.



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→ One thing more I meant <sup>to</sup> mention - A professional compass swing is well worth the investment & peace of mind that the compass is adjusted and accurate.

the dock. The practice served me well when the water pump impellor went a couple of years ago and I had to sail her into the dock. Fortunately the winds were ideal for the manuever and it was very successful. It's a comfort to know that you can do that sort of thing when you have to do it. Equally important, the experiance also gives you some judgment on conditions for which sail manuevers are impractical and the only solution is to drop the hook and wait for better conditions or for help.

Maintenance - I change the oil and filter every hundred hours or thereabouts. I have used Texaco XHD 10-30 oil, one recommended in the manual, and am pleased with it. A friend of mine operates stationary industrial diesels and recommends changing the oil every 50 hours though, so maybe I should do it oftener. I change the primary fuel filter/water extractor at the same time. This happens to come in the fall as I run the engine just about 100 hours a year, but regardless of the hours I would put in fresh oil for winter layup. I change the secondary fuel filter (on the engine) every other year. My units are Fram rather than Racor, but I doubt that makes any difference.

Since I went through the water pump impellor, I have been greasing it every spring. I pull the impellor and put on a thin wipe of water pump grease. They tell me that's a good idea, but the first one lasted 5 years and the second only has three on it with the grease treatment, so I don't know yet if it's really useful.

About every other year I put some belt dressing on the engine belts. Have had no problems. Haven't done a thing to the fuel tank, lines, exhaust system, instruments, injectors, glow plugs, or any of those things other than look at them a couple of times a year to see if everything is still there. Obviously I clean the raw water strainer now and then when it looks like it needs it. In the fall at lay-up I suck pure antifreeze into the raw water system until it runs out the exhaust to protect the raw water cooling system and exhaust. Keep about a 50-50 mix in the engine. Haven't had any problems.

Starting cold. About 15 to 20 seconds of pre-heat in real hot weather (say above 80 degrees) should be enough. About a minute when the temperature is near freezing, and proportionately in between. Set the throttle to about 1000 RPM for start. Run it at 1000 to 1200 until the water temp starts to rise. The manual says you should have oil pressure immediately in warm weather, within 30 seconds in cold.

SAILS AND HANDLING: I don't have a roller furling genoa, so I can't comment. I have a 120% working jib with a set of reefs, a 150% genoa with a set of reefs, a drifter/reacher, a storm jib, main, mizzen, and mizzen staysail. The 150% genoa is about 330 sq ft and reefs to about 280; the 120% is 245 or so and reefs to 190; the storm jib is 100 sq ft. The main has two sets of reef points.

She handles well for me under any of the combinations you mention, except that I can't comment on the roller reefed genoa. I have used all the other combinations you mention and in addition, when running in heavy air I frequently use only the jib. As the wind force increases usually the mizzen goes first - around 20 knots. Frequently a reef goes into the main at the same time, although I'm about as likely to furl the main and use the mizzen and jib if the wind is abeam or forward of abeam. Running the mizzen will always go first.

At about 25 knots with one reef in the main, I start thinking about a reef in the jib. At about 30 the second reef goes into the

main and I'm starting to think about the storm jib. Above 30 it's double reefed main and storm jib on the wind, or full jib alone off the wind, then reefed if she gets hard to handle, and finally the storm jib and bare poles. Fortunately, I haven't found anything severe enough to require running under bare poles yet. These are approximations, of course, and I really make the changes based on how she feels and how she's handling. Sea conditions will affect your judgment, as well as the exact point of sail, gustiness, etc. When she starts to become hard to handle - bitchy, one might say - it's time to reduce sail. I have found it a good rule to reduce sail the first time you think about it. It's easier then than if you wait too long. If you reef too soon and the wind eases, it's no problem to shake out the reefs.

You don't mention having a storm jib and I urge you to give it the strongest consideration. As you are probably aware, a boat will point higher with a jib and in severe conditions a storm jib may be all the area you can use. If there is a lee shore and strong waves you need every advantage and it's cheap insurance. I use mine about 3 times a year, and I'm always glad I have it when I want to set it.

**ELECTRICAL:** Can't comment on the Lectra-San. As noted I have a holding tank. -

Batteries - I take them out in the fall and store them at home, slow charging them a couple of times during the winter (I use a 10 amp charger. Don't set them on a cement floor - put them on a board. Keep the water level up. You can buy treated felt rings at Sears (and probably any auto parts store) that fit on the terminals to prevent corrosion. They work and I recommend them. I get about three seasons on a set of batteries, and I guess that's about par. The last ones I got are 110 AH. You can use the extra capacity if you use the water system, lights, a Loran set, a TV and FM radio, etc. Batteries are probably my least successful challenge. They don't seem to last as long as they should, but then they don't last in a car either.

**CABIN FITTINGS:** I have read a lot about LPG systems and the more I read the less I like the idea. I don't allow gasoline on my boat and haven't been able to discover any significant difference with LPG. Convenient and efficient, yes. Extremely dangerous, yes, indeed. Alcohol is dangerous enough for my tastes. I would go to kerosene as hotter and cheaper if I was on the boat more.

Do install a safety bar in front of the stove, if there isn't one. I used a piece of stainless pulpit tubing cut to length and stanchion fittings to mount it about level with the burners. When the boat lurches, the stove is such an obvious place for the cook to put a steadying hand. Then the stove gimbels and the cook falls into it, spilling the boiling soup all over the cook. Not a good situation and the safety bar will help prevent that, providing a handy handhold.

I installed a shelf in the hanging locker and have some teak vents to install in the fronts of the under seat lockers. We replaced the faucet handles on the shower and basin with some nice looking plastic ones and that greatly improved the appearance. I also installed a twelve volt cigarette lighter socket by the electrical panel. Handy to plug in things that are set up that way. I also made screens (wood frames, copper screening) to fit the hatches and companionway. Quite a job, but they sure keep out the bugs and look

lots better than the Velcro/nylon mesh rigs. About the only other thing of significance is a car stereo tape player installed at the nav station. The record feature is nice for a running log - easier than writing sometimes - and the music is good too. Running the dipole antenna and wiring the speakers was a pain though.

I haven't found the cushions especially comfortable and we have talked off and on of having new ones made with better, thicker foam. This is true both in the main cabin and forward.

My best change on deck is lines to secure the cockpit lockers internally. I rigged lines from inside the locker hatches through pulleys and fairleads as appropriate to pass through the bulkhead right abaft the companionway ladder to a pair of cleats mounted there. Use cleats with a center hole so the line can pass through the cleat as it comes through the bulkhead. I carved mine of teak. At the locker end the lines terminate in 6 inch stainless cables (1/16) so one couldn't slip a knife in and cut the line. The fittings are secured with fiber lock knots so a screwdriver alone can't remove them. You must have a wrench to hold the nuts. More secure, neater and handier than a basket of padlocks for which you have lost the keys or forgotten the combinations.

DINGHY: I used a 10 foot inflatable with the Able 20 - an inexpensive one to learn with. Promised myself never again!! When we got "Serenity" we bought an 8 foot Oxford dinghy in Oxford, Maryland. Now I'm no longer so sure. What I am sure of is that dinghies in whatever shape or form are surely the bane of a sailor's life. The Oxford is good dink, tows straight, rows well, sails fine, but it's still a pain. If it's not full of water, the varnish needs work, or else it's banging on the hull in the middle of the night. It's a little too big to carry on deck, but not as big as I would like when I load it up. But on balance I have to say that I prefer the hard dink to an inflatable.

As you note, they are also a pain, although the launching and recovery can be greatly eased using the halyards and a winch with the line led through a snatch block. Some people also lift them with the boom using the topping lift. Handling, of course, applies to hard dinks as well as inflatables. I think the biggest pain with an inflatable is stowage and blowing them up. My experience was that it was always inflated when you wanted to be on the way, and conversely it was always deflated when you wanted to use it. Altogether a perverse sort of creation. If I sound discouraged about dinghies, it's only because I am. I have the same general opinion of them that Don Street has of engines.

ANCHORS: You didn't mention what is possibly the most important piece of gear aboard - important in the sense that it may be the last resort when blowing down on a lee shore and all else has failed. The ultimate piece of gear may be the only way to save the boat.

I use a 25 pound CQR plow with 15 feet of 3/8 chain and 250 feet of 9/16 nylon rode. I wouldn't recommend anything lighter for general use and the experts recommend a minimum of a 35 pound anchor and all chain. I have given a lot of thought to going to 150 feet of 5/16 chain for general anchoring. The only reason I haven't done so is the cost of the windlass and gypsy and the chain. My present rig is heavy enough to let me sleep soundly at night and the only advantages

of the chain would be shorter scope in tight anchorages and abrasion tolerance. I have ruined one nylon rode when I got tangled in an underwater structure of some sort. It came up frayed where it had chafed all night and I was lucky it didn't chafe through and put me ashore. Fortunately the winds and waves were virtually nil.


I also carry a 12 pound Danforth high tensile in the aft locker with 200 feet of 7/16 nylon rode. This is for use as a lunch hook, a possible second anchor for a double spread if it's ever necessary, and most importantly, for an easy to handle brake to be dropped astern if I have to sail into a dock with a breeze aft.

Not on the subject of anchoring, but related, I also carry a 200 foot 1/2 inch nylon warp that I have found very useful many times. It's usual use is warping the stern in for a Mediterranean style mooring off a seawall or off the end of a dock with the anchor down forward. The Seawind, in common with most sailboats, is not at her best backing down unless everything is perfect. It seldom is, so I pass the warp to someone ashore, put the bow where I want the anchor, drop anchor and back down with the engine letting the person ashore steer the stern to the location desired with the warp. (That's an awful sentence, but I think you get the picture). If I have to anchor in deep water it can be bent on the end of the anchor rode. The warp is also handy for a tow-line, a very long spring line, or can be rowed ashore to tie off to a tree and hold the boat steady on her anchor if needed. It's just generally a very handy thing to have aboard.

I think I've covered all your points, perhaps not usefully in every case, but I hope it was of interest even if not useful. I'm sure you will enjoy the Seawind, especially the first time you ride out a squall and realize what a marvelously seaworthy vessel she is when the going gets tough. My philosophy in selecting boats is simple - get one that will take care of me when I'm not smart enough to take care of it. Both the Able and the Seawind have proven themselves capable of doing the job. Although I feel that the Seawind lacks many amenities I would like - a larger cabin and smaller cockpit, a good nav station, a good pilot berth, better cushions, easier access to the engine, better stowage, etc. - it is a comfortable, easy handling, heavily built, seaworthy vessel in every respect. Ultimately that's more important than amenities.

I hope you will stay in touch and let me know how my judgment of these things compares with yours when you have a bit of experience with the boat. I doubt we'll be around Shelter Island, though stranger things have happened. If we do come that way, we'll surely stop by and say hello. Let me know if you want me to proceed with copying the owner's manual. I suspect that you can find one on any Seawind, do your own copying, and save the cost of the postage, but if not I will be glad to do it. May the winds be always at your back and the waves small.

Sincerely,

  
George S Rowcliffe  
Serenity II.

Sept 23, 1991, St. Petersburg, FL

Dear Dick:

Following are some comments on our SEAWIND II, #75, IX CHEL. The ketch was purchased one year old, in 1978. The original owner had equipped it well. Since then, we have sailed over 25000 miles and anchored 500 nights, on cruises of lengths varying from 2 days to 9 months. We have lived aboard full time for 3 years. Our homebase has been this marina. Most of the sailing has been with a crew of myself, now 65 years, and my wife, Maridell. We have cruised the Bahamas 5 times, the Suwannee River, , Dry Tortugas 3 times, Florida Keys, Isla Mujeres twice, Cozumel, Belize, Roatan twice, Cayman Islands, Jamaica, Bermuda twice, Maine and the East Coast back to St. Pete.

Regarding performance: Of course, the best point of sail is a reach, beats and runs are slower. Our 155% genoa helps in light air. Upwind in a seaway, pitching slows us considerably. We have survived 60 knot Tampa Bay squalls, and 40 knot gales in the open Atlantic without serious harm. We have been pooped a couple of times, but the watch keeper was safety-harnessed and secure. We have raced locally using the SPSA (St. Pete. Sailing Association) rule, and have had modest success. We have also raced under PHRF with a rating of 243. We have usually finished in the middle of the fleet in races from Miami-Montego Bay, Daytona-Bermuda, St.Pete-Isla Mujeres. We have had crew of 5 or 6 on those races. Our best days run has been 167 miles, which we did twice. Once reaching north through the Straits of Yucatan with a following current, and once when we left Miami into the Northwest Providence Channel. A cold front was approaching, and the wind at the start was 15 knots from the southwest. For the next 24 hours it slowly clocked around to northeast. Most of that days run was under spinnaker, with 15 to 20 knots of wind. The knotmeter read 7 knots consistently and occasionally pegged at 10. The bow wave crested abreast the shrouds, as high as the gooseneck. We would have had a better days run but the crew, inexperienced on our boat, got cautious in the early morning and dropped the spinnaker for a working jib on the pole. Generally the boat has been as comfortable as can be hoped on a 32 ft. boat.

There have been some problems, however. We have developed blisters on the bottom, about 10 are 2-3 inches in diameter, and at least a hundred less than 1 inch. The boat has been in the water continuously for 14 years except for bottom jobs, and for two years before we knew the drain was obstructed there was standing water in the area forward of the water tank. Our boatyard has not recommended blister repair, they have had poor experience with it here, where the humidity is high and the sailing season 12 months. Maybe we will fix them one day.

We have had leaks in the hull-to-deck joint. It was tight for the first 2-3 years but has leaked rather consistently since. Our joint does not seem to have the 2 layers of fabmat overlaying the joint on the inside, shown on the Gillmer drawing, page 3, Seawind Newsletter #3. About 6 years ago we removed the aluminum rubrail as we thought the screws were wedging the deck and hull sections apart when rubbing against a dock or piling. We removed all the throughbolts, tried to fill the joint with 5200, then built a new rubrail of teak, with one piece throughbolted along the top of the flange, and another down the outside, all capped with a stainless rubrail. It was dry for a year or two and then the leaks recurred. Since then I have encountered two separate owners who have each proposed different solutions. One doubled the number of bolts through the flange, halving the spacing, the other smeared 5200 over the whole length of the inside of the joint. I have now done both, but haven't tested the joint yet at sea. The inside of the joint was dirty with mold growing on the hull, so although I cleaned it as best I could, I am doubtful the 5200 will stick well.

The bottom of the mainmast corroded away after about 6 years. The mast rides on a stainless step, which sets up corrosion in saltwater. We cut two inches off the bottom of the mast, and lined the mast step with plastic, then raised the step on a two inch block of plastic, material used to support bridges on their pilings. So far we do not see recurrent corrosion.

We had a lot of trouble with cracked swage fittings on the main shrouds and stays. Some of the replacements only lasted 2-3 years. We have now gone to Staylocks for the main rigging, and have had no problem yet. We increased the diameter of the wire in the doubled section of the main backstay so all the main rigging is the same diameter. There is a swage fitting rather than a Staylock at the top of the forestay, as the Staylock chafed the spinnaker halyard there. We carry a piece of 1x19 wire, longer than the forestay, with a Staylock on one end and another Staylock in the spares box so we can replace any piece of the main rigging if needed.

We have broken the bobstay twice. The first time we were on the wind, about 15 knots, in the Gulfstream, with 5-6 ft. seas, south of the Keys. The fork fitting at the bottom cracked, we could see it had been cracked for some time. A couple of years earlier we had run into the dock with the bobstay when the gearshift had failed as we tried to shift to reverse. This had put a slight kink in the bobstay but no other apparent damage. We quickly rigged halyards, the mooring cleats, dropped all sails and managed to motor back to the Keys. The bowsprit was pulled up about 1/2" at its forward joint with the hull, (the bowsprit is mahogany). We filled the defect with 5200 and have noticed no further trouble with it. We made a temporary replacement for the bobstay with 1x19 wire, (1/2" I believe), and a turnbuckle, then continued on our Bahamas cruise. When we returned home we replaced the bobstay with 1/2" stainless rod fabricated locally. It broke about 3 years later, hard on the wind in 35 knots in Tampa Bay under working jib and jigger. We again rigged halyards forward and dropped sail. The failure was stress corrosion at the threads to the bottom fork fitting. The bowsprit seemed unaffected by this incident. We now have a Navtek rod bobstay. It is not 1/2" diameter but its strength is appropriate for the job. Their stainless is said to be more corrosion resistant and its fittings have integral toggle action. This bobstay was more expensive but has lasted at least 6 years.

About 3 years ago we found the bottom of the rudder post loose in the heel casting. Inspection revealed electrolysis in the bottom 6 inches of the rudder post. This section is largely buried in the rudder. The bad bronze was cut off and a new section added. The new end was threaded into a tapped hole in the end of the old post. We believe this corrosion was caused by the two different types of bronze reacting together. The post is propeller shaft material, the heel casting is cast. We now have a zinc on the heel casting. The rudder post is electrically isolated from all other underwater metal on the boat.

This past year we have found crazing in the gelcoat of the topsides. On both port and starboard side, abreast the bulkhead to the chain locker there is crazing in an area 2-3 feet from top to bottom. When I beat on the hull here I found that the section aft of the bulkhead seemed to be stiff, it is supported by the shelf in the forward cabin. The section forward of the bulkhead was flexible, and flexed when I pounded on it. This crazing may have occurred in the gale south of Bermuda. There were a few seas that as we surfed down, I wondered if the bow would bury. They seemed pretty steep.

I reinforced the inside of the chain locker with fiberglass stringers glassed to the hull. That is not a nice place to work, the ventilation is terrible even with a fan. I don't know whether the dust or fumes were worse.



About sails: We have two mains, two mizzens, a light 155% genoa, heavy 130% genoa, 100% working jib, heavy weather jib, storm jib, storm trysail, mizzen staysail, mainbackstaysail (mule), 3/4 oz. tri-radial spinnaker, 1 1/2 oz. reaching spinnaker. The 155% is necessary in light air in Tampa Bay, but we usually find a lee helm when using it on the wind. We can hardly use the 155% at sea because of rolling from swell when the wind is that light. The 130% genoa is our main cruising jib. It is reefable but we have only reefed it once. We never carry the 155% over 15 knots apparent, then switch to the 130%. In the gale off Bermuda, we carried only a storm jib, and ran off, without any great problems. We have never set the trysail except for a tryout, and have not used the heavy weather jib for years.

The mizzen staysail is useful from a beam reach to run, with wind of 10 knots or less. In higher winds it causes too much weather helm. The mule helps going to weather in light air, but can't be carried over 10 knots. It has added at least a knot to our speed in certain conditions, mostly by overcoming lee helm, I believe. It must have a boom. We made a wishboom from a sailboard boom. I would be glad to answer questions about the mule if anyone is interested.

The spinnakers have been useful in racing and in fooling around in the Bay in light air. We usually don't carry them cruising. For cruising we have carried an extending Forespar pole (12 to 18 feet) on deck, to pole out a jib. This can be a big job to set in a seaway with a pitching foredeck. This last year we changed to a pole carried upright on the mast, as described by the Pardee's. It required a new heavier track, and a special track slide, from Forespar. It has a topping lift that never needs adjusting, and makes setting the pole very easy. The pole reaches from a few inches above the cabin top to just below the spreaders.

We have re-rigged the mizzen sheet. It now leads forward of the pushpit directly up to the mizzen boom with a 4 part purchase, then forward to the mizzen mast and down to a swivel jam cleat on the after side of the mizzen mast above the compass. It is a much more convenient rig than standard. The mizzen can be trimmed from either cockpit seat or the helmsman's seat. It also clears the area aft beneath the mizzen boom where the steering vane resides.

We put a key-pin shackle on the lower end of the mainsheet tackle, at the traveller. In harbor we hook this shackle to the boom bail and the mainsheet is out of the way of the companionway.

The boat came with the mizzen boom 5 feet off the cockpit floor. We hit our heads on it repeatedly. We obtained a two foot section of mizzen-mast from Helalmast Marine and had 1 1/2 feet welded to the bottom of our mizzen. This raised the mizzen boom 1 1/2 feet, required new mizzen shrouds and a shorter triatic stay. But the mizzen boom was now too high, furling the mizzen was difficult. We next lowered the mizzen gooseneck 6 in. to 6 feet off the sole. Now the mizzen can be furled easily, yet the mizzen boom doesn't hit my head. The raised mizzen boom provides adequate space for the steering vane and Bimini top. When we bought a new mizzen sail we had the luff made 6 in. longer to fit the longer mast, it seems to work O.K. We have fitted mizzen backstays, which are needed with the mizzen staysail. At one time I tried to dispense with the triatic stay in an effort to separate the main and mizzen rigging. I thought it would be desirable to have a mizzen stand if the main fell, but the mizzen head flailed around without the triatic. Our mizzen vibrates a bit in heavy weather, but it isn't a problem, however the mizzen has come loose on its step, so that it rotates a bit, providing as much as 5 degrees of unrecognized deviation to the compass. We reattached it to the step with stainless screws but in a year or so it came loose again because of corrosion from salt water and the combination of stainless and aluminum. The problem has been finally solved by using aluminum screws. The mizzen staysail sheet is led from the end of the mizzen boom to the gooseneck and then to a small winch on the mizzen. The

mizzen staysail halyard is used as the sheet for the mule. The mule requires its own halyard from the head of the mainmast.

We installed a pad-eyes port and starboard on deck near the rail forward of the jib sheet track, behind the shrouds. We use these for working jib leads and for the vang. The vang has a quadruple purchase with a camcleat at the top. The cleat can be controlled by its tail from the cockpit. We carry the liferaft on the foredeck just forward of the cabin. It actually makes work on the foredeck easier, as there is not such an expanse of free deck to fall or slide across. All our jibs are hank-on. We had Shaeffler roller furling that came with the boat, but we had bad experiences, once unable to furl the jib in a squall, and second it broke and tore the mizzen(!), so we stored it and have used hank-ons ever since. When cruising we carry jibs in long bags along either side of the foredeck. There they are accessible, and don't need to be carried fore-and-aft. The bags protect from the sun.

We have an Autohelm 3000 autopilot drive unit mounted on the port side of the cockpit, with the control unit on the back wall. This means that the direction buttons are reversed, but the connecting cord is short. The Autohelm works O.K. under power, although it is not precise enough to use running channels as in the Intracoastal Waterway, it is also satisfactory in light air except in a shifty headwind. We tried the windvane option but it did not respond quickly enough for beating. In heavy weather the belt slips on the steering-wheel pulley.

For 2 years we used an RVG steering vane. It required us to get a steering gear shaft lock from Edson. This has worn out its brakeshoe lining twice. The RVG did well, and better the stronger the wind. It has some drawbacks. On a few occasions it tacked us unexpectedly when on the wind in a seaway. It cannot be retracted, so is in the slipstream of the propeller, and slows the boat noticeably under power, 1/2 to 1 knot, I estimate. It is not a powerful vane, and could not hold a course while changing jibs. The boat became unbalanced and changed direction. This vane required two people on deck to change jibs, one at the helm, one on the foredeck.

Two years ago we acquired a second-hand Aries vane. This was the removable model, that allows the oar to be swung up out of the water easily. It has performed well, although below 10 knots true wind, it requires more attention. It sails to weather better than the RVG but our 7 1/2 Hp outboard on the pushpit interferes with its wind on a port beat, so our course is erratic on that tack. During the 40 knot, 14 hour gale, south of Bermuda, the Aries steered better than I could. We lead the steering lines forward along the port side of the cockpit. The forward blocks are removable so as not to interfere with cockpit seating when the vane is not used.

Our Edson steering gear has performed well except for occasional slackness, which can be adjusted out, and one occasion when the mounting bolts for the upper rudderpost bearing loosened.

We have replaced both Bomer hatches. They began to leak, perhaps I used the wrong sealant on them, it should be silicone. The new ones are two-way hatches, fore-or-aft opening, a big improvement. We have small hoods to put over them at sea, so they are open aft. This improves ventilation at sea immeasurably, but in heavy weather the forehatch must be closed as spray hitting the mast bounces down the hatch. Sometimes the center hatch can be left open in heavy weather, with its hood, if the dinghy is over it. I salvaged one of the old hatches to make a frame for the Coleman R.V. air conditioner that we mount over the center hatch in the summer. It is about 8000 BTU and just big enough to do the job. For quick cooling a larger one would be better. We have a cover to use at sea. We have used it for 3 years now, 4 months a year, costing about \$1 day additional for electricity.

We have a Reed's Sailmaker sewing machine, but haven't found space to stow it aboard when cruising. We made a bimini top, copied from the first one which was professionally made. We have gradually simplified it to a single bow, mounted on slides along the cockpit coaming. The bimini is secured forward around the mainmast, mizzen shrouds, and main backstays. The reduction to a single bow gives more freedom outboard of the cockpit for neck-craning, and working with trapeze or mizzen staysail sheets. The slides allow it to stow on the coaming at the bottom of the pushpit. The Bimini top is essential for Florida, Bahamas or Caribbean cruising. It protects from sun, and even somewhat from rain. We use on our third dodger, all professionally made. A dodger is a very difficult fitting job, particularly when trying to use the fittings of the last dodger. The dodger is needed in heavy weather, cold weather, and to keep water off the companionway hatch. We have made sail covers, near-professional grade. We have made covers for seat cushions, jib deck-bags, awnings and weather-cloths. We have used the weather cloths little, preferring to avoid cold weather. Our homemade 4-direction windscoop is great.

We have not found the perfect dinghy. We have an 8 foot fiberglass dinghy, a Quen clone, that we carry upside down abaft the mainmast at sea. In protected waters we tow it as it obstructs the view forward considerably. It overlaps the companionway slide about 6 inches. We have made removable brackets to hold it in place, and lash it to the handrail. The front panel of the dodger is removable and replaced with a bag-like section that allows the dinghy stern to protrude into the dodger space. We hoist it on the main halyard using a special sling which allows us to turn it over before launching it. It is worn but tows, hauls, sails and powers pretty well. It is difficult to board when snorkeling, and can't plane under power. It is worn enough to be almost theft-proof. We have two other dinghies, an inflatable dinghy which uses a 1 1/2 Hp motor. It is slow but relatively light. It doesn't row well. The other is a plywood transomed sportboat which takes a 7 1/2 Hp motor. It is fast, but the rig is so heavy we cannot drag it above the surf line on a beach.

Storage is a problem. The starboard cockpit locker is mostly full of sails, the port one contains two Dahon Bikes (just barely), fenders, anchors and rode. We carry the dinghy on deck, no matter which one we take.

We have a Westerbeke 30 engine with about 4000 hours, and a 3 bladed prop. The fourth gear lost it's seal at about 2500 hours. This led to an oil leak that caused the bolts on the flexible coupling to loosen, and the packing gland to loosen, so we took considerable water. We fished the bolts out of the bilge, (not easy) and were able to limp back to St. Pete from the Bahamas. We carry a mirror on a stick, a magnet on a string, a plastic toy hoe, and large barbecue tongs, to retrieve objects from the bilge. It is a difficult job, usually taking a few hours.

The transmission repair cost about \$1000

We have been stopped a number of times by the engine alarm, the engine overheating due to an obstructed outlet to the heat exchanger from the pencil zinc which has come adrift. Upside down, at night, at sea, in the cockpit locker is no fun, but I can now retrieve the old zinc and insert the new blindfold, I think. We have replaced the pencil zinc irregularly, but at least every 2 months, and the original heat exchanger still works well. In fact it works too well. We have difficulty getting the engine temp up to 180 degrees if the water temperature is below 75. A new thermostat did not help.

Once while having a sundowner in the cockpit, in an isolated anchorage in the Bahamas, we were charging the batteries and Maridell went below for a refill. She stepped on the cabin sole hatch and water squirted out! We were sinking! We turned off the engine and pumped the boat dry. Then we searched the boat from bow to stern, but could find no leak. Finally Maridell heard a slow drip,

drip from the back part of the engine. We started the engine and found a large stream of seawater coming from the rubber cover of the heat exchanger. The zinc had obstructed the heat exchanger outlet and the cover had burst from the pressure. Eventually I cut the nubbins off a diving-mask strap, strung together some spare hose clamps and clamped the strap over the leak. We powered a slow 500 miles or so back to St. Pete. We carry a spare heat exchanger in case it ever gives up completely.

The oil cooler has corroded away twice. The main symptom has been lubricating oil in the exhaust. This is a scattered, black streakiness, as opposed to a light sheen from diesel oil. The first time it was so severe as to drain the oil from the engine and the low oil pressure alarm came on. There was oil in the exhaust and seawater in the engine oil. He found a mechanic who replaced the oil cooler, then flushed the engine with a couple changes of oil, and the engine was apparently no worse for wear. The second time was not as severe, there was no seawater in the oil, and I changed it myself in Annapolis, with success. We carry a spare oil cooler now. There is a plugged hole on the after side of the oil cooler that can take a very thin pencil zinc. This hole is almost inaccessible in our engine room. A small socket wrench with a long extension can work it. Maridell guides the socket from the forward, starboard side of the engine, I work the wrench from the port after side of the engine. Neither of us can see the hole while working on it, it can only be seen with the mirror-on-a-stick. I don't know how often we will change this zinc, we have only now found out about it, but a new oil cooler costs \$285.00

We carry a spare raw water pump as well as spare impellers. The pump is hard to change, but easier than pulling the pump and then changing the impeller. If the impeller is bad, the broken vanes are probably downstream in the oil cooler which is on the starboard side of the engine. Retrieving them can take a couple of hours, removing the alternator, then the hose. I keep a couple of dental picks and a curved forceps, which makes the job a little easier. If too many of the impeller vanes are lost it may obstruct the raw water flow. If they are not retrieved and water still flows, they might wear away in time and not cause trouble.

The raw water strainers for the engine and the "fridge" have both been moved to the space under the sink for greater access. We have installed a hydrolift muffler to port of the after part of the engine. The exhaust outlet has been raised about 6 inches, and the stern is mostly clean after running. The old exhaust outlet has become the sink drain.

We have never had sea water back up into the engine, but Milton Baker, whose exhaust outlet was higher than ours, has had it happen a couple of times after heavy weather. The higher outlet means a shallower loop to obstruct the retrograde sea water. He said that clearing the sea water from the cylinders is not difficult. I would like to know how it is done.

We have installed a high output alternator from Ample Power. It has a special "3 step regulator" that works well. We have Prevalier batteries, which require a different regulator than wet cells. We had to have a special bracket made to support the alternator on the engine. The setup will charge the batteries as much as they will take, at below 1000 rpm. It may charge 100 amps to start, but gets down to 50 or 60 amps within 10-15 minutes. The big charge is hard on alternator belts, and changing an alternator belt means loosening the raw water pump to get access to the alternator pulley on the engine. We got Prevalier batteries because the battery box is so inaccessible that we were not servicing the wet batteries properly. While cruising we have been able to make ice, and use the ordinary house lights, etc, while running the engine about 80 minutes a day. We have a windcharger from Hamilton Ferris. It works well in winds above 15 knots, but not over 25. Below 15 knots it charges 2-3 amps, not enough for us. It can't be left alone, or it might overcharge and damage the batteries. It has limited usefulness. We have a towing attachment for the windcharger.

The water charger is more useful, charging 5 or more amps at over 4 knots. While sailing someone is always awake, so it can be used 24 hrs per day, and provides plenty of electricity if there is any breeze. But in a strong wind it is a bear to retrieve. The line is very stiff, and the propeller keeps turning as it is retrieved, so many stiff hockles develop that pinch the fingers as the propeller is retrieved. The system is not much good in the Sargasso Sea, it gets fouled with seaweed.

The boat came with a Grundent, coldplate, seawater cooled, 12 volt, refrigeration system. This has worked out well although we have replaced both the motor and the compressor. In the marina, the converter provides plenty of 12 volt power. When at anchor we run the "fridge" twice a day. Each time 40 minutes from the battery alone, (20 amps or 13 ampere-hours), then 40 minutes with the engine running, (20 amps of the alternator current going to the "fridge"). We run it less when it is cold. We have had some problems with the seawater cooling system for the "fridge". It has a separate water intake near the engine raw water intake. The system is susceptible to air lock, if the boat heels to starboard or if the bottom is cleaned. If the system air-locks, bleeding might take an hour. Eventually we arranged a bleeding system using a 3 way valve under the sink which allows the galley saltwater pump to pull new saltwater through the system until it flows freely, then the valve is restored to its normal galley position.

We had a lot of trouble keeping the icebox cold until a couple of years ago. The box was not adequately insulated for Florida. We eventually gutted the box from the inside, similar to the method described in Spa Creek's book "39 Ways to Improve your Box." We found 2 1/2 to 3 inches of poured-in-place foam. The lower foot of this foam was water-soaked. I believe the water entered the foam from the inside of the box. Wooden cleats on the inside of the box were held to the liner by self tapping screws that went through the liner. We put ice in the box to cruise, and the water leaked through the screw holes into the foam. You might test your foam by drilling a small hole from the outside bottom of the box into the foam. If water-soaked, water would probably run out. We rebuilt the box with 1" thick polyurethane foam sheets, built up to 5 inches thickness all around except the top, which is 2 inches.. Then I laid up in place a fiberglass liner, made from resin and fabmat, covered with epoxy paint. The box is considerably smaller now, but it holds its cold much better. Previously at sea we used the "fridge" to keep the ice from melting as fast, and ran it 4 to 5 hours a day to do that. Now we make ice at 2 1/2 hours a day. The new alternator and regulator reduced engine running time from 4 hours to 1 1/3 hr per day. We now use about 50 ampere-hours per day for refrigeration. The ice box reconstruction was a big job, done while employed and living aboard. It took a month, during which time we used an ice chest and block ice.

The wet-locker space has been converted to shelving for electronics. It is an unsatisfactory location for wet gear, as they had to be dragged over the chart table to be hung in the wet-locker.

We have both Loren and Satnav, the latter antenna is at the mainmast head. The Loren antenna is on the starboard rail abreast the mizzen mast. It works in Jamaica, Roatan, and within 200 miles of Bermuda. The combination VHF and 2-meter Ham antenna is on a short boom at the mizzen head. We have an ICOM 735 Ham HF rig, with the antenna tuner mounted below the port mizzen shrouds in the port cockpit locker. Its antenna is the forward port mizzen shroud, a jumper, and the triatic stay, all suitably isolated with insulators. The grounding system includes 2" copper strapping from the antenna tuner to the transceiver, to an underwater grounding plate, the engine, the water tank, and to the lead forward of the water tank. The lead was only a short way under the fiberglass locker. We threaded a stainless rod into it, then sealed it with 5200. Tom Gillmer says the keel was cast in one piece in all the boats built by Wright

Page 2

Boat Company. We seem to have a good grounding system and get good signal reports. We checked into the Waterway Net daily on our 9 month cruise to Bermuda and Maine.

Our boat originally was fitted with an interior plan having a settee to port and an L shaped settee to starboard, with a table set on a pedestal. Lockers were outboard the settees. The starboard settee converted to a double. We thought this was a good arrangement for port-to-port cruising, but not suitable for blue water cruising. We tore out the starboard settee and rebuilt it with a pilot berth, and an extension transom berth. We installed a gracefully carved teak stanchion on the midline from cabin sole to head liner and a teak dropleaf table with removable fiddles between the stanchion and head bulkhead. There is a lampneck light over the table on the stanchion. We like this arrangement much better. We have a bunkboard for the port settee that doubles as the settee back. There is a lee cloth for the transom berth, and bunkboard for the pilot berth. We have three sea-berths in the main cabin. This is really appreciated during races. During an earlier race, one man had to sleep forward, but complained because he occasionally hit the overhead when the boat pitched. I think we are finished racing now. When Maridell and I sail alone we use the pilot berth at sea, and the vee-berth in harbor. Then the pilot berth becomes a storage area. We have some kerosene lamps but they are too hot to use except in winter.

We have raised the rails around the chart table, in the galley, and at the forward sink, to keep objects from going adrift. In a seaway the stove cover fell off its cleats at least twice. Now barrel bolts hold it in place. We also installed a grab bar just inboard of the stove, along with pad eyes for the cook's safety belt. The stanchion has been a big help in maintaining an upright posture in the cabin. Before it was installed, in a seaway I often saw Maridell lurch across the cabin from the stove onto the settee.

We have installed a pump to drain the sink. It is behind the sink, its handle protrudes above the counter. Its outlet is at the stern. With the previous plumbing to the port cockpit drain, we occasionally found suds washing up into the cockpit.

At 2 AM one night, 50 miles off Belize, we were taking water. We searched but couldn't find the cause. It later became clear that the cockpit manual bilge pump was siphoning back. Now its outlet is high on the stern. It is harder to pump but it doesn't siphon. The original deck drains did not drain because of airlocks where the plastic hose sagged in the line to the stern. We installed new through-hulls high in the topside aft the deck scuppers, and plumbed them to the deck scuppers. On port we installed valves in the line to divert the deck water below where we can attach a hose and fill the water tank. When we were in Bermuda there was a water shortage. One night when it rained, we caught 45 gallons off the deck. Most of it was clear enough to drink. We ran it into collapsible 5 gallon jugs before pouring it into the tank. Some of the first water we saved for bathing. This, of course drains only one half the deck. We have filtered this water sometimes with a funnel and paper towel. The water is not always perfectly clear, but pathogenic germs are unlikely from the deck. Most suspended matter there is tends to settle in the tank anyway.

We have two manual bilge pumps. We also carry a large 1 gallon-per-stroke Edson pump, mounted on a board, in the starboard cockpit locker. The original cockpit "Guzzler" pump is almost non-functional. It is made of epoxy coated aluminum. Over the years the epoxy has worn away and the aluminum corroded so that its valves no longer are reliable. I have bought a new all-plastic pump which I hope to install this week.

We used the original alcohol stove for about 8 years. When on high it gave off alcohol fumes, also alcohol is expensive. It was not a very hot stove. Then

we installed a Force 7, 3 burner kerosene stove. We didn't like the explosive potential of propane, or the problem of installing a suitable tank locker for it. We have had a lot of trouble with clogged burners on the kerosene stove. We originally had "Diesel" burners, since we switched to "kerosene" burners we have not had trouble. The "Diesel" burners are a misnomer as they will not burn the ordinary diesel sold at the marina but a special winter diesel which is thinner. The "Diesel" burner appears to have a smaller orifice and may get clogged more easily. When we arrived at Bermuda we had only one of three stove-top burners working. It is possible the trouble was all with the grade of kerosene we used, but more likely it was the burner. We used the old alcohol burner that ran the kerosene stove. The new stove is certainly hotter, but doesn't like to burn cleanly. The owner of the boat, and the built-in thermometer factory, 9 pounds. We have a Taylor kerosene cabin heater over the forward end of the port settee which we tapped into the same fuel tank. We installed a "Diesel" burner in it so it wouldn't surge so much. It doesn't get as much use as the cook stove and perhaps fouling won't be a problem. The heater can warm the cabin pretty well, but layering invariably leaves cold feet. If the heater were mounted lower it would work better, but there isn't space.

In Maine we had a lot of trouble with condensation on the inside of the hull. It ran out from under the port settee in a steady stream across the cabin sole. Swabbing it up made no difference, it quickly recurred. We never saw this from the starboard settee. Perhaps there is some drain for the condensation there. Our boat has a slight heel to starboard at rest, so it might pool a little to starboard, but we could not find a pool under the bunk. I don't know how to avoid the port condensation drip, but would like to have suggestions.

We installed a small 11 gallon specially made water tank under the forward portion of the starboard settee. This met the ORC requirements for the race to Bermuda. We have never really needed it, as we are generally frugal with fresh water. We do not have a shower in the head. I am just as happy we do not, as I do not like the idea of fresh water seeping around the bottom of the bulkheads to promote rot. In the Bahamas we often take salt-water baths in the water or in the cockpit. Further north we have used the sun shower in the cockpit or perhaps heated water on the stove. There is no hot water heater. When possible we do dishes in salt water, but that isn't possible most places in the U.S. With Cholera now present in Central America we will have to be more careful. The Cholera Vibrio can maintain its life in salt water. I plan to find out about treatment of Cholera. It is a severe sudden illness that may be fatal within 24 hours. I believe rather simple fluid treatment can treat it.

There used to be an Electra-San mounted under the starboard vee-berth but it died, and was discarded. For years we used direct overboard discharge. Although not strictly legal this is not the problem here that it is in the Great Lakes or the Northeast where the population density is greater. Outside the 3 mile limit overboard discharge is legal. Now I have installed a Y-valve leading to a "holding tank" consisting of a 2 1/2 gallon collapsible water jug. The connection to the jug can be found in the Defender Catalog. I don't plan to ever use this rig, but I hope it will pass Coast Guard inspection. We have been boarded by the Coast Guard twice, but never in U.S. waters.

Originally the head was secured to a platform but the platform was not anchored. Maridell discovered this suddenly one day when we were on starboard tack. She did not fall out of the head, but was surely surprised. Now it is anchored by a small cleat on the after head bulkhead.

There is space forward of the water tank, beneath the head and beneath the passageway forward. It is about 10 inches high, perhaps 30 inches long. This space has a scupper that drains aft into the main bilge. As delivered from the factory this space is inaccessible. An access plate can be set into the bottom

of the head, beneath the grate, this will permit inspection of the wooden post which supports the corner of the head beneath the mast. I have heard of one such post that was rotted. We had trapped water in this space for about 2 years until we found the drain on the forward side of the main bilge space, under the water tank. When we ran a wire up this pipe, we got lots of water. Milton later provided us with the dimensions for a hatch to the space. It is 9 inches long by 7 inches wide. Located 2 inches to port of the fore-and-aft head bulkhead and 4 inches forward of the after head bulkhead. It is in the cabin going forward. The cabin sole is very thick here, particularly laterally where it had been built up with fiberglass mesh. Milton says he kept wine in the wine cellar.

We have removed our forward sink. The space can be better be used for storage. We have built a grating across the inboard side of the sink space and use the space to store our computer and printer. Access to the medicine chest is not very good while used this way. Perhaps one day we will build a closet or chest of drawers here.

We have got down the rooming around the indentation in the vee berth, put in a filler, and use it only as a double berth except for access to the chain locker. We have a bookshelf on the chain locker hatch.

We have a removable but sturdy bulkhead fore and aft in the chain locker. The Simpson-Laurence hand operated windlass loads directly down into the starboard position. A hawse pipe goes to the port half. For some years we used a 35 lb CQR with 30 feet of chain and 250 feet of 1/2" nylon as our primary anchor, carried on the bowsprit. In the Bahamas we used a 22 lb Danforth with a similar rode, to make a Bahamian Moor. We carried the Danforth lashed to the pulpit. Only one time did the CQR drag, that was in grass, and we discovered it before any trouble developed. Later we changed to a rode of 150 feet of 3/8" PBB (short link) chain with 250 feet of 1/2" nylon. This never did drag. We usually anchor in 8 to 20 feet, rarely if ever did the rope get out of the locker. With an all chain rode the scope is less, usually 4 to 1, and we rarely need a Bahamian Moor, even if other boats in the anchorage do so. The chain was well worthwhile in the Cayman Islands where our rode swung onto a coral head while we were anchored in about 35 feet. Nylon would have chafed through.

Now we have bought a 45 lb CQR as our main anchor. We carry this on the bowsprit with the chain rode described above. When it goes down we feel STUCK IN THE BOWSPRIT. It is a good feeling. It is better than insurance, which we don't have any of, anyway.

When we first got the windlass it did not have a stripper, and that caused lots of jams when retrieving the rode, but now we have made a stripper, it works well. Sometimes when most of the rode is in, it will pile up in the locker and jam, but the windlass handle can be wiggled down the hawse pipe and knock the pile of chain over. Sometimes when we have been in heavy weather the chain will fall over or get knocked over. Before we built the partition this was a frequent problem, but with the partition it tends to stack better. The port chain locker contains a rode of 30 feet of 3/8" chain and 300 ft of 1/2" nylon. We have used this with the 45 lb CQR when in mud, so we do not bring so much mud on deck.

We now carry the 35 lb CQR in the port cockpit locker, along with the 22 lb Danforth, and a 75 lb Luke. Also two additional nylon rodes and chain. We may be overanchored, but in a hurricane, maybe not.

We have made snubbers that prevent chafe on the anchor rode or snubber. They consist of a section of 3/8" 7x19 stainless wire made into a loop, connected to a section of 3/8" stainless chain, connected to 1/2" nylon line, one of which ends in a chain hook. The nylon is protected with thimbles. The wire fits over



the mooring cleat and it tends almost to the chock at the end of the bowsprit. The chain leads through the chock, to the nylon which provides the elasticity in the system. If the anchor rode is nylon, the snubber is bent to the rode with a rolling hitch. There is no strain on the windlass, practically no chafing on the chock and no chafing on the rode. We have used this system for about 250 nights now without trouble.

We have installed a Firdell Blipper on the front of the mizzen mast. I'm not certain that ships watch for radar reflectors however, we were nearly run down twice last year. Once in broad daylight, with a big radar reflector between the display and the Fratic.

We have had to raise the waterline 3 times now. I think we draw about 5 feet.

Our experience about getting off when aground is: If there is a nearby updraft, he may get us off by speeding around us in circles. The wake may be enough to lift us. But the favored method is to quickly get an anchor out of the bow, put all possible weight into the bow, which raises the back of the boat, the deepest portion, then take it on the windlass. Rocking may help a little.

In the past 2 months two SEAWIND II's have been sold by a broker here. Both seemed to be in top, although not extraordinarily equipped. I am told one sold for \$12,000, the other for \$91,000. The salesman mentioned that one of the boats had a rattle bottom repaired and had no blisters. He said that all the Seawind II's he had seen had blister problems.

The Seawind II is not a perfect boat, there is no such thing. I think it is the best boat the Haridell and me. It is shoal draft enough for the Bahamas, the total rig means that no sail is too large to handle, and sail can be shortened quickly. Either Haridell and I can handle the boat alone. After 13 years we have it almost perfected!

Richard and Haridell Weaver



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totaly disperses water, keeps system  
clean, prevents waxing & gelling
- COMPLETE.....Boiler Water Treatment
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**PRODUCT  
USES:**

Kill'em can be used in marinas, fuel supplies and storage depots, auxiliary diesel generators, home fuel, railroad diesel and other users of non-gasoline, hydrocarbon fuels exposed to storage, humidity or contamination.

**PRODUCT  
CHARACTERISTICS:**

## Active Ingredients:

Methylene Bis (Thiocyanate)	2.5%
2-(Thiocyanomethylthio) Benzothiazole	2.5%

Inactive Ingredients:	95%
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Approximate Weight per U.S. Gallon	8.01 lb.
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Flash Point (TCC)	158° F
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Kill'em is the most concentrated EPA registered and approved biocide for fuels on the market.

**DOSAGE:**

16 oz. Treats 1920 Gallons Diesel Fuel.

1 oz. per 120 Gallons.

**Highly Contaminated Fuel-Double Dose.**

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Keep closed when not in use. Do not expose to extreme temperatures. Do not contaminate water, food, or feed by storage or disposal. Hazardous to humans and domestic animals. Corrosive, causes irreversible eye damage and causes skin damage. Harmful or fatal if swallowed or absorbed through the skin. This product is a potential skin sensitizer. Workmen handling this product or treated material should wear impervious gloves, goggles or face shield, and protective clothing. All protective clothing, work shoes or boots, and equipment must be left at the work site at the end of the day. Eating, drinking, or smoking during use of this product is prohibited.

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## IDENTIFICATION AND CONTROL OF BACTERIA IN FUELS

(Kill'em Technology)

Bacteria is in everything we can see, touch and yes, even eat. Most of the time bacteria goes through its normal life and death cycle without causing any problems, however, when it grows beyond control it presents serious problems.

Bacteria in fuel oil (heating, #2 diesel, or #4) can cause numerous problems if not controlled. Plugged filters, plugged fuel lines, corrosion of metals in contact with fuel, faster aging of fuel and corrosion of metal tanks are some of the more obvious problems.

We present some suggestions for fuel treatment with KILLEM based on the following:

First: How to identify bacteria in fuel oil or determine if a potential for growth exists.

Second: How KILLEM works.

Third: How KILLEM compares to the competition, especially Biobor.

Lets examine how bacteria growths develop in any type of fuel oil storage tank. All storage tanks are vented to the atmosphere. If these tanks were not vented, they would collapse as the fuel level is drawn down. This venting process pulls in outside air which contains humidity and airborne, microscopic, bacteria spores. The fuel oil tank and fuel are usually cooler than the outside air and the humidity condenses into water droplets. Since water is 8.4 pounds per gallon and #2 diesel fuel is 7.3 pounds per gallon, the heavier water collects under the fuel and forms an interface of fuel and water. The microscopic bacteria spores will collect in the moisture on the exposed inside tank surfaces or be carried with the condensed water underneath the fuel. It is possible to have aerobic (needing air) bacteria and fungi growing above the oil surface on the sides of the tank and anerobic (not needing air) bacteria growing at the interface of the oil and water layer.

How to identify bacterial growth or determine the potential for growth.

The most accurate method to determine if growth has or does exist is the plugging or deposits on the fuel filter located between the storage tank and fuel use tank. Mats of bacteria on the sides of the tank or at the water-fuel interface, grow and become large enough to let loose and are pumped to the filter and plug. If a facility (marina, terminal, ship, truckstop, etc.) has experienced filter plugging in the warmer months of the year, they have a bacteria problem. Inspecting the fuel storage tank through a manhole or inspection port might show growth on the

sides of the tank. If these growths are visual, then there are more growths (under the oil) that are not visible.

The warmer the outside temperatures, the warmer the fuel (and water) and the faster the growth of bacteria. In warm, humid climates it has been estimated the bacteria counts (measured in 100,000 counts per 1 ml. of water sample) double every 4-6 hours.

The question often arises as to whether a sample of water, taken from under the fuel, can be tested to confirm the presence of bacteria. The answer is no. In-field testing cannot confirm anerobic bacteria. This type of bacteria does not need air or light to grow (algae needs both air and light!) and if anerobic bacteria is exposed to air and light it is destroyed, thus taking a water sample and exposing it to air and light will keep the anerobic bacteria and provide inaccurate counts.

The technical approach to determining bacteria growth is the past history of filter plugging in warm weather and (if possible) visual tank inspection. The ideal result is to feed KILLEM at 1 ounce per 120 gallons of fuel on (stored) to eliminate any potential problem.

Don't be too surprised if after the addition of KILLEM, fuel filters start plugging frequently. This shows bacteria is being killed and the tanks are in the process of being sterilized.

The best time to add KILLEM is when tanks are low. Estimate the gallons of fuel in the tank, add to that the quantity (gallons) of fuel to be delivered, divide by 120 and that equals the ounces of KILLEM to be fed. Or in formula form:

$$\frac{\text{Fuel (gallons)}}{120} = \text{ounce of KILLEM}$$

Add the calculated ounces of KILLEM to the almost empty tank just prior to filling - this allows for mixing, the most important aspect in helping the product to work best. If bacteria is known to be present, double the treatment dose.

How KILLEM works

Most biocides (old technology and chemistry) rely on the use of very toxic components to kill. This is the case of Biobor, an extensively used biocide, developed almost 25 years ago, by U.S. Borax.

Biobor is 95% active organic boron complexes and 5% petroleum naphtha (naphtha, mineral spirits or kerosene). The EPA (Environmental Protection Agency) is taking a long, hard look at boron, borax and borate ingredients because they are known pollutants. It is possible Biobor may be recalled by the EPA.

KILLEM on the other hand is 5% active ingredients and 95% inert. Thus, it would appear Biobor has a higher level of ingredients and should, therefore, have a faster-better kill rate. Not so! In the 25 years since Biobor was developed, biochemists have developed newer biocides and organic reaction products more effective with lower concentrations and lower feed rates.

The attached picture of a "typical" bacteria shows a gelatin type protective film(capsule) around the living portion of the cell. The cell absorbs nutrients through these layers and through the flagellum. Bacteria needs both water and fuel to grow and reproduce. They actually excrete sulfuric acid as part of their life cycle which is corrosive to metal storage tanks.

Two aspects make KILLEM unique:

First - The 95% inert portion of KILLEM is a special balanced blend of non-ionic wetting agents and surfactants to allow KILLEM to penetrate the cell walls of bacteria. This provides a faster kill, a more complete kill and easier mixing for ultimate contact. Also(what happens to the dead bacteria-slime?) the dispersants and wetting agents disperse the dead bacteria to reduce filter plugging. All bacteria is 90-95% water, when killed the bacteria releases the water and the small residue is further dispersed by the surfactants.

Second - KILLEM is soluble(dissolved) in both the fuel oil and water. However, only 25ppm(0.0025%) is soluble in the water phase(we only need 8ppm for complete bacteria kill). As with any biocide, KILLEM kills, is consumed, and any portion that is not consumed, starts to degrade. In time it changes into a different by-product. This causes the 25ppm concentration to decrease and when this happens more KILLEM moves from the oil phase to the water phase to maintain 25ppm and provide a long term time kill or a better statement is KILLEM provides a "time release" kill.

How KILLEM compares to the competition especially Biobor.

There are many products and fuel additives on the market that claim to be a fuel biocide or claim to remove water thus preventing the medium for bacterial growth.

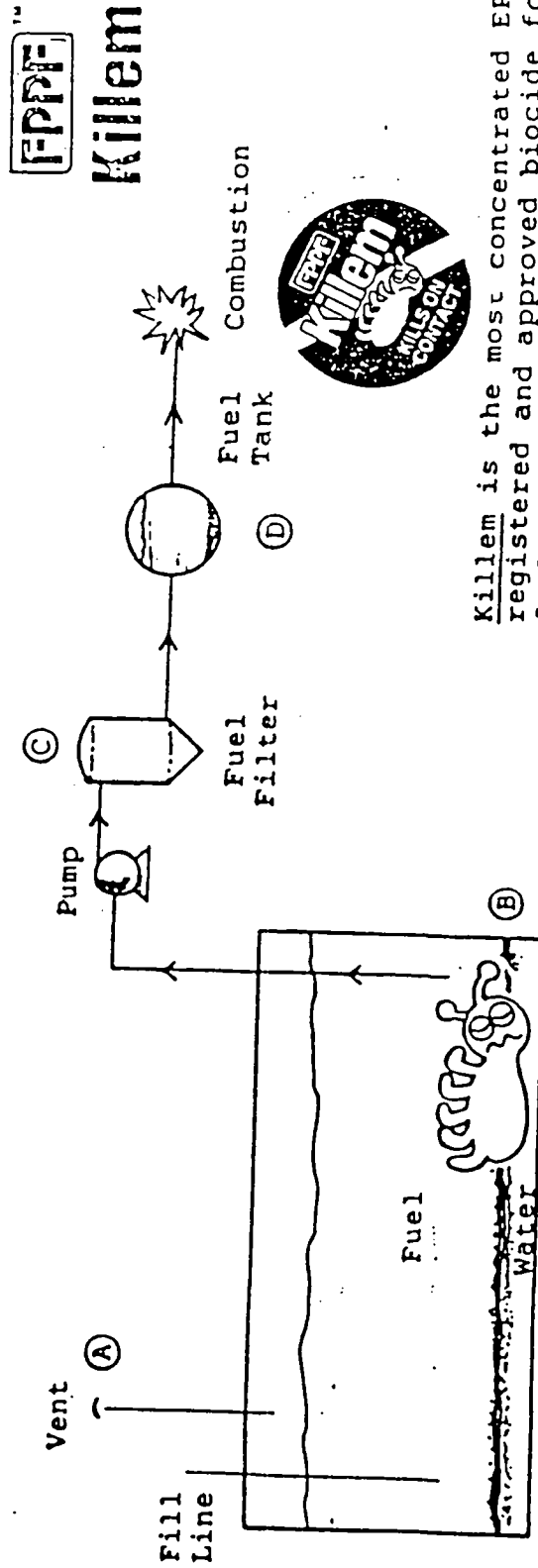
For a product to be a biocide it must clearly show 3 things on the label: the active ingredients, an EPA registration number and an EPA establishment number. A biocide must contain all three, no claims, no exceptions. A product that makes biocide claims but does not meet this 3 criteria is not an EPA approved biocide and probably not a biocide.

KILLEM is the newest, most effective, time release and cost effective product on the market. The retail price of Biobor varies slightly but the average price is about \$10.99 per 8 ounce can. KILLEM sells for about \$12.00 per 16 ounce bottle. Compare the following:

	<u>BIOBOR</u>	<u>KILLEM</u>
Treatment	1 ounce/70 gallons	1 ounce/120 gallons
Cost per Ounce	\$1.37/ounce	\$ .75/ounce
Cost per Treatment	\$1.37/70 gallons	\$ .75/120 gallons
Treatment cost per 100 gals. of fuel	\$1.96	\$.63

BACTERIA PROBLEMS IN FUEL OIL

- (A) The fuel tank vent allows humidity, dust and pollen to enter the tank.
- (B) The interface of the water/oil layer allows the growth of fungi, slime and bacteria to grow. Bacteria secretes acid-causing corrosion and grows into stringy mats.
- (C) Fuel filter is designed to remove contaminants. Rust particles, slime and bacteria plug and clog filters.
- (D) Bacteria and water not removed forms growths in fuel tank, ultimately may cause corrosion in tank, plug injectors, form carbon deposits and cause dark exhaust gases.



Killem is the most concentrated EPA registered and approved biocide for fuels on the market. Killem prevents corrosion, fouling, sludge, plugging and slime from tank to combustion.

Killem feed is 1 ounce to <sup>125</sup>~~300~~ gallons versus Biobor feed of 1 ounce to ~~35~~ gallons.

KILLEM VERSUS BIOBOR

KILLEM is more concentrated than Biobor

KILLEM is more modern and up to date than the 25 year old Biobor product

KILLEM is less toxic to the environment

KILLEM has a time release approach

KILLEM uses surfactant technology versus poison technology

KILLEM is less expensive to use

KILLEM treatment cost is less than any other product



COMPONENTS OF A TYPICAL BACTERIUM

