

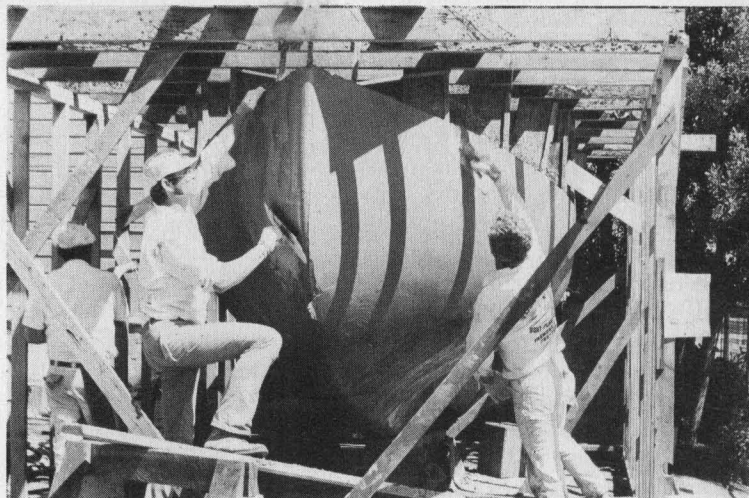
# HOW TO BUILD FLICKA

## PART THREE PREPARATION FOR PLASTERING

Complete Plans/Illustrations  
By Bruce Bingham.

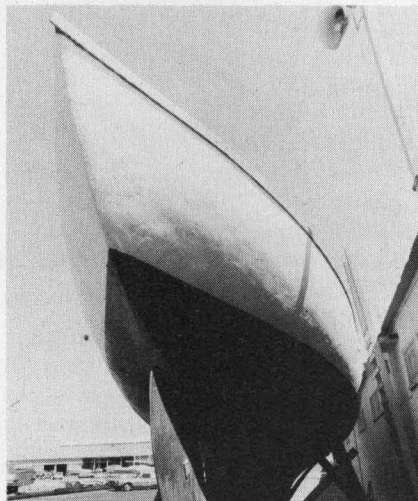
□ I've read scores of books on plastering (and there are only a handful of good ones) but none of them can make a professional out of a novice. In the final analysis, experience is the most valuable commodity on plastering day. Unlike the mesh layup, plastering is usually a one day affair and when it's over, the quality of your hull is fully committed. The finality of concrete is staggering and it can make or break the potentially fine yacht. There's no second chance! If your plastering is successful, your dreams, labor and financial investment have the best chances of paying off. But if you botch-up the job or make one critical mistake, your boat may be labeled worthless.

The evidence of the high percentage of failures may be seen in backyards throughout the country. They manifest themselves as junky hulks disfigured with bumps, cracks or inconsistent textures. Some boats become rust stained due to an improper mortar thickness, while others are "holed" by their own cradles (evidence of the bad concrete penetration). These boats are sad reminders of those who plunged ahead without adequate preparation or who thought they knew all about it. I must sadly admit that the failures presently outnumber the successes among those boats which have been plastered by amateurs. My heart goes out to those well-intentioned builders who specifically avoid professional help. There are two basic reasons for this. First, it costs a good deal of money to bring in a highly-trained crew with the required experience of fairing a hull. The plastering rates vary widely, but the average for Flicka generally runs about \$200 to \$300. Secondly, many builders are driven unreasonably by their quest for accomplishment and ego gratification.



*John Daniel and his three-man professional crew save owner, Wayne Heyerly, a lot of sweat and anxiety. This Flicka was plastered in only four hours with full confidence that it was done right.*

These people simply won't take a word of advice, regardless of the credentials of the advisor. Granted, a builder may save a few hundred dollars by attempting the plastering himself. But the cost savings count only if the builder never sells the boat or if he refuses to carry adequate insurance. If, however, he chooses to cash in or liquidate at some later time, a bad plastering job will take its toll in a lower resale value. A poorly troweled yacht will also affect the owner's sense of pride, especially when he docks alongside a well-built production yacht or custom vessel.



*The gruesome eyesore of abandoned cement hulls should serve as a warning for future builders. There is much the amateur can learn from these sad examples.*

My only recommendation is not to "go it alone", with no professional help. It takes a long time to fully grasp the knack of "pushing mud" and the yacht's fine finish is best created by someone who's done it before.

### PREPARATION

The term "plastering day" is a very deceiving one. It has caused many

builders to become blinded by complacency only to be rudely awakened when it's too late. If you think it's going to be easy, you never should have started. All of my explanations will not replace the value of first-hand knowledge; my only function at this time is to attempt to convey to you some of the tricks of the trade and to point out some of the problems which are not readily apparent. The real name of this game is "look before you leap." Track down as many ferrocement boats as you can well in advance of your own plastering. Look at the bumps, examine the visible problems, develop workable solutions. Think in terms of "what could have made the other boats better."

Ask the other man any questions which bother you or, better yet, force him into a bull session. Keep in mind, however, that he is also an amateur with limited experience and quite often "bum dope" may be transmitted in this way. "Instant experts" are a dime-a-dozen so be on your guard for faulty information and irrational statements. Get the opinions of as many successful builders as possible (keeping notes as you go) then sort out the bad from good. Arrange your notes in sequence and review them over and over again, continually filling in questionable areas as you go. Remember that one person's suggestions may not always apply to your own construction method or personal capability, so keep your mind open. Do not commit your cementing procedure until you are absolutely sure of every last detail. Don't stagger along blindly, repeating the same old errors made before.

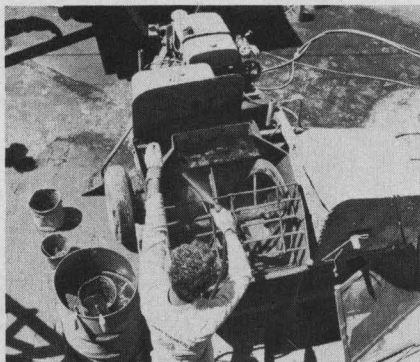
It is essential that you choose your helpers very carefully and well enough in advance so they can adjust their schedules for the big day. Don't let

yourself be stuck with a third or fourth-draft choice but shoot for a winning team. Invite your people over several times so that you can point out the problem areas, delegate responsibilities and encourage their suggestions which might help in streamlining the plastering operation. Try not to bore them to death or scare them off, but impress upon them the importance of their work. Always include a few extra hands on your roster as someone is quite liable not to show up.

### THE TOOLS FOR HAND PLASTERING

The correct supplies in the correct amount are prerequisites for getting the best day's work out of any plastering crew, professional or otherwise. You may be able to hire them from the same firm who supplies your cement or they may be available from most "rent-all" companies.

The common rotary drum mixer should be avoided because it overworks the mortar. As this drum revolves, the fresh concrete makes a "slop, slop, slop" sound and this sound indicates excessive agitation—which traps bubbles of air within the mortar while breaking down the formation of delicate crystals (the strength element of concrete). Ideally, your mixer should be of the gas-powered, horizontal screw blade type. This provides the most consistent mixture with the least motion. Because mixing and concrete application equipment have been known to fail in the middle of the job, be sure you have a source for immediate re-



The horizontal-screw type of mixer yields the most consistent mortar blend with the least agitation. John cleans his equipment thoroughly before the first batch.

placement. You may even have to slip the rent-all people a few extra dollars to have them "freeze" the equipment for you. A broken mixer or punctured hose has caused the complete ruin of many potentially fine yachts. Whether you do your own plastering or use a professional team, be sure you have at least one man with the know-how to keep the gear running and in good order. This preparation alone may "save the day" from possible disaster.

Each man on the hull team should be equipped with a steel "pool" trowel (about 24 in.) and a shorter "steel float." Be sure that these trowels are not bent in any way, and are highly polished and free of rust. The steel trowels may be used not only for finishing but for "pushing" the mud as well. Some builders prefer a wooden trowel for pushing, but it makes little difference.

The "hawk" (a hand-held platform) is used by the mason to hold small

quantities of mortar nearby. In boat plastering it is particularly useful when applying the finish coat as this is added to the hull little by little.

The "sponge float" is a small wooden trowel (only about 10 in. long) with a 1/2 in. layer of sponge attached to the underside. In use, the sponge float is dampened (not wet) then drawn lightly over the finished hull. This should occur after the last steel-trowling when the hull has set hard but is still moist. The purpose of the sponge float has the visible effect of knocking off the sheen of the hull, which is most desirable.

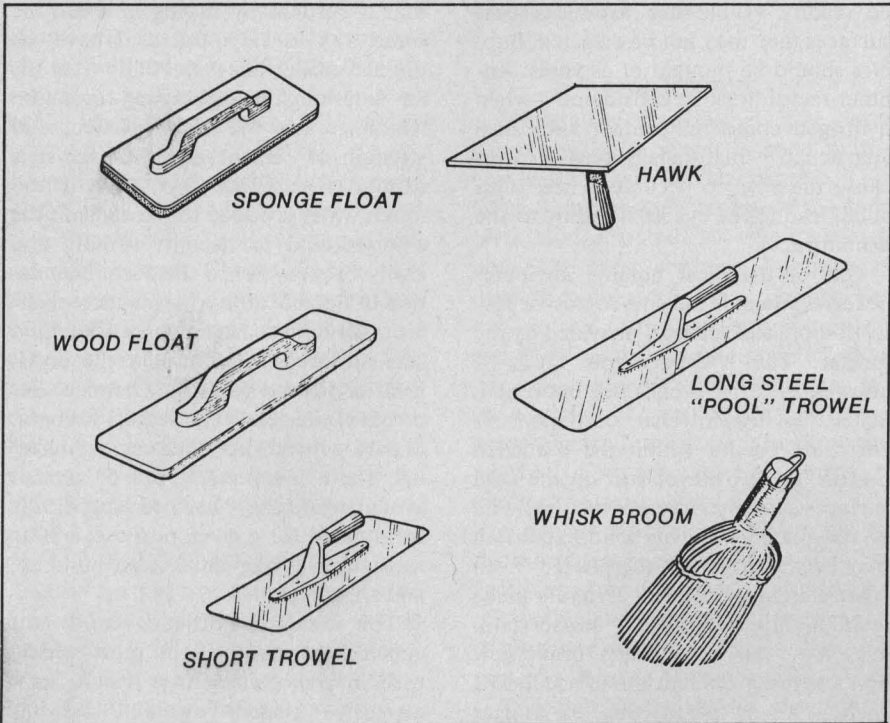
Adequate lighting of the hull interior is absolutely essential. Without good lighting sources, it is impossible to see the mortar penetration or to detect voids in the shell. Back plastering is a miserable job if your men can't fully see their work and this effect gets worse as the hull is progressively closed in. You might look into the use of metal photo-flood reflectors for use with common 150-watt bulbs. They're usually inexpensive and available with spring action clamp handles for easy mounting.

If you are plastering to the recommended open-mold system, you may finish your interior with small whisk brooms after the mortar has set. This will have the effect of roughening the surface. This "brush finish" is desirable when making epoxy attachments, adhering insulation with contact cement or simply sealing the hull surface.

### VIBRATING

Many types of commercial vibrators are available from your cement supplier or local rent-all. The most popular and versatile is the "pencil" vibrator. It consists of an electric power unit, a flexible hose-covered drive shaft and a 12 in. steel wand. The wand may be held perpendicularly or angularly against the hull, or may be held flat. The individual circumstances best dictate its use. Some builders have made vibrators by attaching a long piece of plywood to a small electric sander. These may work quite well, but I feel that they are dangerous. Should water or fresh mortar get into the workings of the sander, the workman may become a short circuit. The saving of a few dollars isn't worth the risk.

Vibrating is an extremely effective way of assuring full mortar penetration in hard-to-get-at areas or where a large bulk of concrete is required, such as for solid mast steps. Vibrating is usually needed in the deadwood area, at the



Continued on next page

intersections of bulkhead webs or around the sheer where there may be a high concentration of re-rod. It is imperative that the vibrator be applied the length of the centerpipe and stern. You may also run the vibrator along the length of the mold battens or against large steel weldments as these are always trouble spots which almost always yield massive voids after you remove the forms. This is when you stop.



*The pencil vibrator is an invaluable tool for ensuring mortar penetration in difficult areas but must be used sparingly.*

Too much vibrating can produce some disastrous effects. At the moment you first touch the wand to the fresh mortar, water will suddenly appear on the surface. This is a visible indication of the strange phenomenon of material separation. If you persist with the wand, the aggregate will also depart from the cement. If the outward effects of vibrating are so apparent, you can imagine the extent of breakdown deep inside the shell. Vibrating also destroys the delicate crystal formation of the fresh mortar that is so necessary for ultimate strength.

You should also realize that if you apply the wand at the aft end of the hull, the modulation will travel the full length of the boat to the bow. In essence, you do vibrate the whole hull while trying to concentrate in a given area. It is imperative that you not try to vibrate any mortar which has "taken up" (begun to harden). It does not correct the slightest void but causes the mortar to loosen from the armature. If you are aware of a void in the hull but the mortar has set, break away as much of the plaster as you can and redo the opposite side of the shell as it may then be successfully back plastered. It is far better to use your gloved hand whenever possible to achieve total mortar penetration. But if it is obvious that vibration is necessary, do it first (and sparingly) then follow with the hand work. Moderation is the very key to the successful outcome.

## THE WATER

Because the formulation of concrete is not a haphazard order, it is vital to strength that your water be accurately pre-measured. Tap water will suffice but never use sea or pond water or that which is extremely hard or high in alkalis. Using five gallon cans, set aside the required amount in 32 lb. lots. This will provide for a .35 to 1 water/cement ratio based on one a bag mix. This ratio is considered ideal for the highest strength and workability. Don't forget to deduct the weight of the cans when measuring your water. Keep your water covered to prevent the intrusion of foreign material.

## CHROMIUM TRIOXIDE

To understand the importance of this additive you must first consider the nature of the electrochemical inter-relation of dissimilar metals (zinc, galvanized mesh and steel reinforcing rod) when immersed in an electrolyte (wet mortar). Very little has been said about this phenomenon but hundreds of boats have suffered tremendous losses in strength because of it. When the fresh mortar is applied to the hull, it provides a complete galvanic circuit which allows the flow of electrons from the zinc coatings to the re-rod. This electrical current can actually be measured. Where hydrogen ions acquire the electrons, hydrogen atoms are formed as a free gas along the surface of the steel. The gas layer breaks the bond between the mortar and the steel and may even collect as bubbles within the shell. On horizontal surfaces these bubbles may be readily visible but within vertical surfaces they may not be detected. Bubbles should be thought of as voids. Another factor must be considered—when hydrogen comes in contact with steel (particularly high-tensile types) it may cause the steel to become brittle. This could lead to the eventual failure of the armature.

One of the most notable attributes of ferrocement is the anti-corrosive protection of steel surfaces provided by the mortar. The hydrogen gas layer, if allowed to form, breaks this bond and, hence, invites internal corrosion. If corrosion occurs within the hardened mortar, the growth of rust on the steel surfaces actually increases the steel wire or rod diameters. This solid expansion may eventually crack the plaster (even when standing) and will certainly make a hull highly susceptible to impact damage. You may have seen brand-new boats with visible hairline cracks in the shell. This is partly due to mortar

shrinkage as well as to internal corrosion during curing. Cracking due to corrosion may continue to occur throughout the lifetime of the vessel.

One way to eliminate the foregoing problems would be to avoid dissimilar metals within the armature by using all non-galvanized steel. But employing a non-galvanized mesh would create serious corrosion problems from other sources, and galvanizing re-bar is expensive and it softens the steel markedly.

There is an extremely simple solution to galvanic action and its related effects. If a small amount of chromium trioxide powder is added to the mortar (it is always pre-mixed with the water), the chromium ions will inhibit the zinc and retard the electron flow. Extensive testing and research on this problem has been conducted by many leading institutions, notably the University of California, and the number of successful hulls proves the consistently favorable results. Chromium trioxide (CrO<sub>3</sub>) is purchased as a powder and need only be used very sparingly to be absolutely effective. Normally used in diluted concentrations of 100 to 300 parts per million (by weight to that of water) you should break its use down to approximately 5 to 13 grams or a level teaspoon of powder for every 100 lbs. of water. This will turn the water green, but don't worry about it. It will not stain the hull or have any detrimental effects.

## CEMENT

Many people completely misunderstand the nature of cement, believing that it hardens by drying in much the same way as clay. But as I have explained earlier this is not at all true. It's an interlocking crystalline formation which creates the binding effect and strength of cement and these crystals cannot grow without hydration. If too much water is added to the cement, the crystals tend to become spindly and easily broken, hence the recommendation of notable authorities to use a minimum amount of water for workability. The molecular structure of the crystal itself is derived from the chemical elements of the cement so that its strength, in part, depends upon the cement makeup. There are many types of cement available and they have been specifically formulated for a given purpose; sulfate resistance, curing time, head build-up, and shrinkage.

The standard Portland No. 1 is a general purpose cement most widely used in civil contracting. It's the least expensive cement available and its

strength and setting time are both moderate. It may be recommended for internal structures which will not be continually subjected to salt water or other sulfate actions. Portland No. 2 will be slightly more expensive than the No. 1 and is considerably more resistant to sulfate attack. It holds up excellently in salt water and because of its moderate setting time, it can be considered excellent for amateur use. The Portland No. 2 is also excellent for use in fuel, water and holding tanks. This cement should be your second choice if Portland No. 5 is not readily available. Portland No. 3 cement sets very fast and, as a consequence, it is very difficult to work, particularly in the hands of the inexperienced plasterer. As I have mentioned previously, it is much to your benefit to be able to control the time factor. By using the type No. 3, time will not be on your side. Otherwise its characteristics for ferrocement are excellent.

Portland No. 5 should be your first choice, even though it is quite expensive. Its characteristics are a slow set but high cured strength. It's the most resistant of all the elements to sulfate attack and is the least permeable by fuels, sewage and salt water. Because its use is so specialized, it may not be available in your area, so I would suggest that you order this cement well in advance. Your supplier may not be inclined to stock this for you unless he is able to ship a substantial quantity, so it's a good idea to combine your order with those of other ferrocement builders.

Chem-Comp is a cement produced by Kaiser and is to be considered comparable to Portland No. 5. It has become extremely popular on the West Coast of the United States where it is readily available. It is considered that Chem-Comp may be mixed with slightly more water than any other Portlands and hence produces a more workable and creamier mortar. Chem-Comp is particularly suited for use with a pump gun where a drier mix may tend to load or clog the equipment. The wetter mix makes for excellent armature penetration, especially in those areas which are hard to get at. Regardless of the cement chosen, at least eight bags will be required for Flicka's completion.

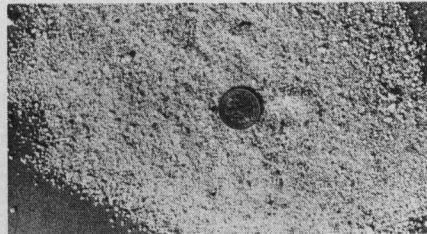
#### PACKAGED SAND

Both crushed rock and beach sand are available in 94 lb. bags. Before packaging, it is thoroughly washed and dried and is available in many grades and combinations. You may safely pur-

chase bagged sand for ferrocement construction although it does cost a little more than a bulk delivery. There are advantages to this, however, which are well worth the extra cost:

1. You can be absolutely sure of proper grading so that you will not have to go through the tedious sifting and sorting process.
2. Because the sand is carefully air or kiln-dried, you do not have to make adjustments in the mix formula to account for moisture in the sand.
3. Because the sand is pre-weighed, your batching of mortar is greatly simplified.
4. By opening your sand bags only as they are required, you do not have to worry about the intrusion of undesirable foreign elements or moisture. Bags also provide easy storage, especially if you are working in a wind-swept area.

The ideal combination of bagged sand seems to be a mixture of equal parts of No. 16, No. 20 and No. 30.



*A proper sand gradient may be achieved by using packaged aggregates. Equal parts of #1 and #3 sand yield a satisfactory range of partial sizes. The dime gives an idea of scale.*

#### ADMIXTURES

Pozzolan is an extremely fine powdered aggregate which is used to increase the density of the concrete. This adds slightly to the strength of the concrete, and also reduces water absorption. The most common Pozzolan is diatomaceous earth and is popular because a one to two percent mixture by weight of cement has the same effect as 15 percent of most other Pozzolans. Increasing the cement density has some very beneficial results as it reduces the amount of water required without affecting the workability of the mortar. The density also retards the takeup of the mortar, once again placing the time factor on your side. Pozzolans also trap air within the mortar, therefore reducing detrimental effects within the concrete because of cold weather.

There are Pozzolans specifically for-

mulated for the purpose of air entrainment. This additive greatly enhances penetration while helping to produce a slick, less porous and somewhat lighter outer skin coat. These air-entrainment Pozzolans may reduce bulk weight from three to five percent, but they should be used very sparingly as structural strength may be decreased. The manufacturer's recommendations must be followed to the letter. Pozzolith may be used specifically to reduce the required water content by as much as 12 percent while retarding the set of the mortar up to 45 minutes. This retardation may be extremely helpful when plastering in hot weather. Pozzolith 8A is essentially the same product as Pozzolith 8 except that it also contains an air entrainment ingredient. The Masters Builders Company (outlets world-wide) are the prime manufacturers of the foregoing products. (There are many admixtures that may be used for various reasons but I shall not go into their use as their application is extremely delicate and should be attempted only by professionals who are acquainted with them.)

By using a small plastic bag, you may pre-measure your admixtures. This will save a great deal of confusion on plastering day. Use the following chart for determining the proper amount for a one-bag mix.

#### EXTRA FINES ADMIXTURES

Pozzolans—14 lbs.	Pozzolith 8—4 oz. or Pozzolith 8A—4oz.
Diatomaceous Earth—1.4 lbs.	Vinsol Resin Air (Entrainment Agent)—3.75 cc (about one heaping teaspoon)

#### TESTING AND SURVEYING

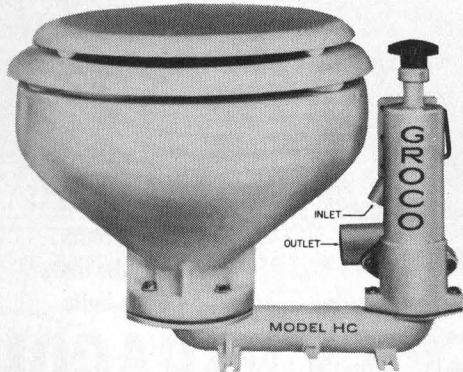
This is one of the most vital elements in the life of your boat, but very few builders have pursued the proper course of action on this score. Because the armature construction and plastering process is the most crucial stage of hull development, it must be fully inspected and observed before and during plastering. Make arrangements with a reputable surveyor who has a knowledge in ferrocement well in advance of plastering day so he can make his tour a day or two ahead.

Prior to his arrival, photograph every conceivable construction detail (stem, chainplates, centerpipe, keel, ports, bulkhead webs, etc.) and have an extra copy made for his certification of authenticity. These photos will become a

Continued on page 72



## A Head is really ahead with the new GROCO Model HC toilet



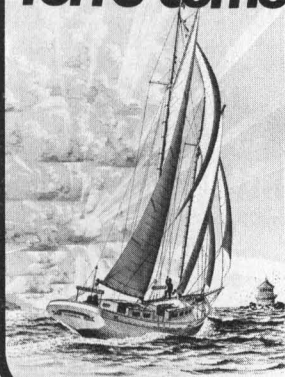
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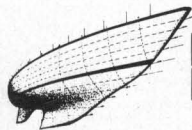
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## RADAR Continued

Light weight antenna units are now on the market to greatly reduce the weight aloft, and also the indicator units are using all transistors to reduce the power supply weight.

WARRANTIES must never be overlooked. Many times one radar is chosen over another simply because the warranty is more extensive, or there is an authorized service station nearby. Check and see where the warranty stations are before buying.

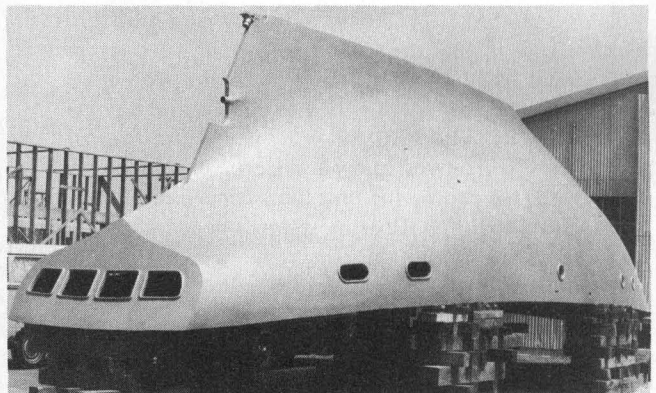
Choosing a radar is a formidable task. The accompanying chart will give you some clues on what to look for and some of the points to check before choosing a particular radar. The set you select may be the "eyes" that will save your life in the upcoming months, so choose it carefully. □

## FLICKA Continued from page 57

permanent part of his report which should remain with the vessel throughout her life.

Don't forget to wire up a test panel armature. Use the same mesh and rod as that of the hull, maintaining identical rod centers, wire ties and nesting. The panel should measure 18 in. by 50 in., although the test laboratory may elect to cut it down to a different size. If your surveyor does not intend to test the panel himself, you may have to arrange this on your own. Certification of strength is imperative in order to guarantee insurability. On plastering day, have the test panel troweled in the same manner as the hull and have your surveyor initial it for authenticity. Cure it under the same conditions as the hull.

As the hull is being plastered, steal a handful or two of fresh mortar and force it into a 2 in. mailing tube. Rod it and vibrate slightly to ensure against voids and air pockets. This cement cylinder should be cured in the same way as the hull and delivered to the test lab for compression, sheer and tensile calculations.



A well finished Samson Hull, the product of careful planning and experience. While ferro-cement vessels of this fairness are still a rare sight, there is no reason for demanding less.

Because the makeup of the test cylinder and panel are difficult to ascertain once cured, fill plastic bottles with cement, admixture and water samples. Small amounts may be analyzed from time to time during the ship's service, so don't discard it. Plan on storing it permanently so it may be retrieved as much as 30 years from now. I cannot over-emphasize the importance of this test information and certificate of survey. It will surely have a tremendous impact on the value of your vessel, as well as your own peace of mind. The test curves shown are typical for several different layouts but remember that each vessel is different.

## RUSTED METAL

Have you ever seen a light rain sprinkle on powdered clay? When the droplets hit the ground, they simply form small balls of water without being absorbed into the soil. Fresh plaster will do exactly the same thing if it is laid onto loose or powdered rust. A light surface rust is actually quite desirable as it forms a tooth in the steel, thus assuring an excellent bond. But if you are able to wipe the rust off the armature you may be in trouble. I strongly suggest blasting the entire armature with an air gun to blow off the rust within the rod and mesh layers, then go over the hull with a wide wire brush. Realizing that most weldments are covered by the armature, you should be most concerned with those which are to be exposed to water or weather. Reach all the steel work you can and attempt to produce a bright steel finish. On plastering morning, coat these same surfaces with an epoxy bonder to produce the best adhesion. (Colma-Fix or Concesive or an equivalent.) Put your entire hull crew on this job if necessary even before you begin mixing the mortar. If this sounds like a lot of work, it is. But if quality and strength are your goals, then it's worth the additional effort.

## COLD JOINTS

If you have pre-plastered any part of your boat (i.e., deck) prior to troweling the hull, it is imperative that you clean away all loose, dry mortar or aggregate. This is best done with an air gun but in a pinch, a vacuum cleaner may have to do. The concrete edge should be etched with a five percent solution of muriatic acid then neutralized with soda. On the morning of your plastering day it is vitally important that joint edges of the cured mortar be well coated with an epoxy bonder. If you fail to attend to this one precaution, a weak "cold" joint will result which may eventually crack, rust or fail.

## CONCLUSION

As you can clearly see, there's a lot more to cementing your boat than simply mixing up concrete and laying it onto the armature. Study all of the foregoing points well before rushing blindly into plastering day. Because the troweling of ferrocement is an art in itself, I have chosen to deal with this construction stage separately. Waiting for your next RUDDER issue will give you the necessary time to put everything in order. □

## ST. LUCIA Continued from page 39

Doulton and Wedgewood china, crystal, and local handicraft.

I prefer a refreshing drink on one of the second story balconies overlooking the Castries activity, but M & C's soda fountain (!) seems to be a gathering place for visiting yachtsmen. M & C is a more complete department store than you find in most medium sized American cities—they stock everything. Y. DeLima Ltd., a Caribbean chain, has the best stock of imported watches, cameras, and jewelry.

Taxi license numbers begin with H. Have the driver take you to the top of Morne Fortune, south of Castries (ask him to wait). This commanding height was fortified to protect the harbor and was the scene of many battles.

We had lunch, East Indian cuisine, at Rain, which is one flight up, on the south side of Columbus Square. Another popular spot is the Calabash Restaurant, also upstairs.

Continued on next page



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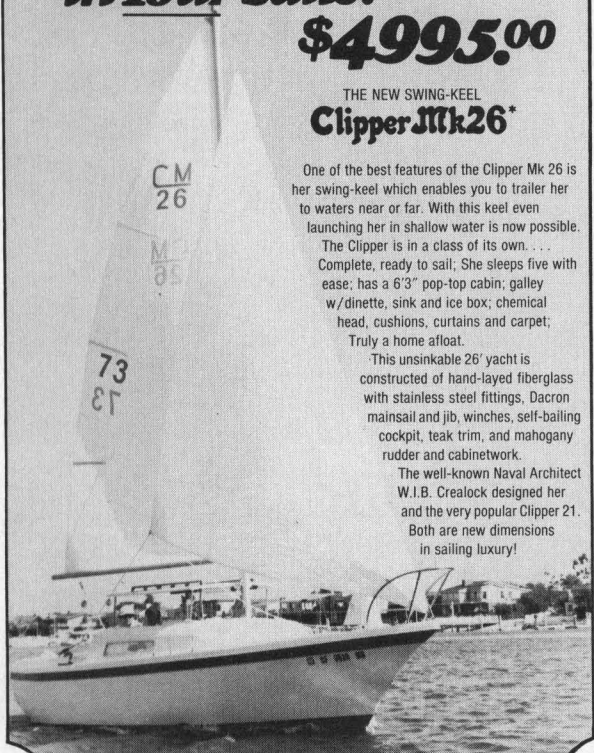
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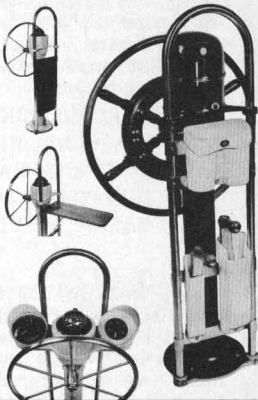
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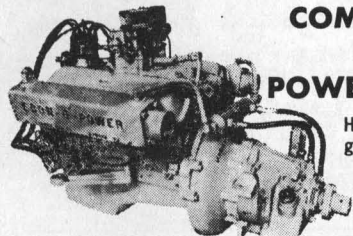
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## ST. LUCIA Continued

### Reduit Beach (pronounced Red-wee)

This is on the mainland, just across Gros Islet Bay from Pigeon Island, just south of the little fishing village of Gros Islet. Reduit is about a mile long, the northernmost of a series of excellent palm-lined beaches you pass as you head north from Castries, and I think, one of the best beaches on this island or any other.

Anchor off one of the hotels. The southernmost is St. Lucia Beach Hotel, one of St. Lucia's finest. We found it a lively, bustling place and enjoyed their bar. Many guests are families. North of it is a new Holiday Inn, just opened last year. We had dinner there, and found it more staid, quiet, and genteel. You can anchor close to the beach. The everlasting easterly will hold you off with nary a ripple.

I checked progress on the new harbor under construction behind Reduit Beach. I found breakwaters completed just south of Gros Islet village and plenty of deep water between them (over six ft., sounded with an oar), but a sign, "Notice Danger Ahead, Unsafe for Navigation." I took the dink in anyway but found progress blocked by dredging pipes at the entrance to the lagoon. A couple of dredges were hard at work in the swamp shown on Chart HO 1261 (new no. 25081). The dredging was recently completed, OK for 12 ft. at MLW. A marina and yacht basin is planned, but no work has been started.

### Pigeon Island

St. Lucia wins the prize for choice harbors. Pigeon Island is another one. We anchored just off the east shore, about 100 yards SE of the small stone pier. A causeway has been built from the mainland, over the reef shown on HO chart 1261 (new no. 25081). They must have done some dredging to build it because we found more water east of the pier than shows on the chart. The water was strangely murky—no good for snorkeling. The holding ground was excellent. We took a series of easterly squalls there shortly after anchoring and again through the night, but no seas built up and we didn't drag.

Our anchorage was off a perfect horseshoe-shaped little beach, palm fringed, with a line of stone, thatched roof cottages lining it. Exploring ashore next morning, we found these deserted but in excellent condition, as was a large central building with a kitchen, bar and restaurant. This is the remnants of Miss Josette Leigh's hotel. She was known throughout the Caribbean as "Madame Snowball," but had gained earlier fame as a member of the D'Oyly Carte Opera Company.

Hank and I climbed ruined Fort Rodney at the southernmost of the two hills on the island. A trail leads generally SW from the beach, passing an interesting cemetery. The steepest part of the trail has steps. It was from Fort Rodney that the British sank the whole French fleet. To drag cannon up there was a remarkable achievement. I had trouble enough dragging myself up!

Vieux-Fort may be the most interesting, the Pitons the most dramatic, but I'll never forget the gunkhole we had all to ourselves off Pigeon Island, or the perfect jewel of an anchorage at Marigot. Add Castries, Reduit, Soufriere, sightseeing, excellent beaches, a complete range of resort hotels, beautiful flowers, scenic mountains, and hospitable people—St. Lucia puts it all together. □