The Easy Go Yuloh

The Chinese yuloh is a viable alternative auxiliary propulsion devise for small to medium size sailing yachts. The thoughts of a Chinese lady with child slung on her back who can propel a 2 to 3 tonne sampan at up to 3 knots for prolonged periods is enticement enough for me.

Our present yacht, Easy Go, is a 34’ Junk Rigged Dory Schooner of Jay Benford design. She has no motor and relies entirely on wind, yuloh and kedge anchor for propulsion. We have found, through experimentation, that it is indeed possible to abandon the Internal Combustion Engine for an environmentally superior form of auxiliary propulsion.

We, Kathy and I, have been messing around in boats as long as we can remember having jointly purchased our first ones somewhere around forty years ago. At that time we were in a small sunfish sailboat and a canoe, both of which relied on human propulsion or the wind. We did sail the canoe on occasion although paddles were the primary motive force. While living in the Temagami area of Northern Ontario, Canada, we found the sculling action of a canoe paddle would allow one to approach wildlife closely. Indeed I once bounced off the side of a moose as the canoe glided in a little too close. Many other paddling techniques in a canoe also simulate the sculling motion.

Moving forward in time we became increasingly interested in rowing and sculling both of our “Easy Go” sailboats. The first, a Grampian 26 fibreglass boat, was a test for both rowing and sculling with conventional yulohs. Rowing was a success and sculling left a great deal to be desired. The future of moving the yacht without a motor was a firmly planted idea and has encouraged our continued ongoing research.

In 2005 we built the present Easy Go. Determining that we were going forward without a motor, the first prototype yuloh was built in Gaspe Quebec, Canada, using locally available birch. This yuloh was designed from information gathered by our first researches on the Internet and the fortunate review of The Junks and Sampans of the Yangtze by G. R. G. Worcester.

The first yuloh was about 18 feet long with a six inch wide blade at the tip which tapered to about four inches where the blade exited the water. We mounted the yuloh on a trailer hitch ball, more commonly seen on the rear of cars for towing boats and utility trailers. This yuloh was in two pieces so that we could do some adjustments, if required lengthening or shortening became apparent. From our research we felt that we had a prototype that met the basic design factors. We were not sure about how the bent shaft would work so this was not built in. A straight shaft with the top end of the handle attached by a lanyard to the deck at waist level was our first introduction.

A couple of important design flaws became apparent and were eventually easily remedied. We worked with both of the flaws for some time before finding their remedies.

The first, and one that I feel most builders will find on the Internet, is the blade configuration. All the pictures, sketches and photos we could find showed a blade with a curved side and a flat side. Think of the side view of a Frisbee and you will get the idea. We made the curved side the top and the flat the bottom. It seemed logical in providing an easily feathered blade that would

move quickly and with little effort on each of the strokes. It moved easily and moved our ten ton displacement boat in and out of anchorages. However the strokes seemed a little too easy and discussions with others, particularly Slieve McGalliard of the JRA (Junk Rig Association), started our progression towards where we find ourselves today.

Our first modification was to disassemble the two part yuloh and flip over the blade so that the flat surface faced up and the curved faced down. Our first trials while we were cruising in Morocco proved that we were heading in the right direction. The power of the yuloh was exponentially greater. The yuloh shaft and blade blade bent on each of the power strokes leaving vortexes at the end of each stroke.

The second modification was needed as a direct result of this power. With a straight shaft on the yuloh tied down to the deck at waist level it proved difficult to roll the blade to its proper feathered position on each stroke. Lashing a one inch by sixteen inch piece of doweling to the inboard end of the handle provided the necessary leverage to twist the yuloh to the proper angle on each stroke and allowed us to easily access harbours, bays and rivers that were previously the domain of engine powered water craft. In some cases we were able to access areas that might at first appear to be impossible to get into. Slow speeds and good manoeuvrability make touching bottom less important and grounding is not the problem it once was.

With a prototype now working to perfection it was time to make the last modification that would make it a truly authentic Chinese yuloh. I tried every way to adapt our, now, close friend but it was not to be. Back to the drawing board and using new design factors obtained again through research and discussion with others a final plan was designed. I learned a long time ago not to name something unless you planned to keep it. So now we have Yuli the Yuloh to keep Reggy the Regulator (wind vane steering) and Billy our outrageous Handy Billy company.

This is the design criteria of the Easy Go Yuli.

1. We made a scale drawing of the side elevation of the hull. Having built Easy Go from plans provided by Jay Benford we had accurate drawings of the hull. Using this drawing we performed the following sketches to achieve the design from which to build.

2. Draw a line at 45º clear astern of the hull provided the starting point. T (Tip) – W (Waterline) – F (Fulcrum) – L(Loom).

3. Make the line 60% of the hull length, such that the bottom mark (T) is 30% of the length below the waterline, and L is 70% of the length above W.

4. Mark point F (fulcrum) 66% up from the bottom.

5. Transfer the line forward to the hull to position where the fulcrum will be located. Easy Go is a double ender without a transom. It was necessary to build a small platform near the stern on which to mount the pin that would become the fulcrum

6. Draw in the yuloher to scale, and adjust his/her position so that the tip of the loom (unbent) is above their head. This should indicate the level of the platform they should

ideally stand on, and may be at cockpit seat level rather than at the cockpit sole level. In the case of Easy Go our foot well is very small and the back deck and hatch is where we stand while using the yuloh.

7. Mark the bend point a short distance below the yuloher's aft hand and just below the level of his shoulder, and draw in the upper section of the loom bent forward some 9 to 10º to get L_2.
8. Draw in the lanyard from the tip of the loom sloping forward some 14º to the level of the yuloher's feet. We placed a eye bolt in the rear bulkhead at the deck level giving a forward angle that seems to be doing the job. I don't believe it is a full 14 º but it does work.
9. This is the general setup to decide on the blade width and cross section which may vary from near the tip to near the waterline.
10. A reasonable starting width for the blade of a large vessel would be about 4% of the yuloh length at the tip, tapering in a straight line to 3% of the length at the waterline, and 0.4% of the length thick at the tip increasing to about 0.8%L thick at the waterline.
11. Make sure the blade is cambered with well rounded edges on the lower surface, and flat on the top surface if not slightly concaved near the tip.
12. Prepare for the fudge factor. On Easy Go we could not meet all the criteria perfectly and made our compromises to fit the space available.

Here are the measurements that we ended up with for Easy Go:

1. Yuloh Length 60% Hull Length, 20 ft actual (calculated to 20.4 ft)
2. Blade length 6'2" from tip to waterline
3. 12' 6" from blade tip to fulcrum
4. 4' 0" from fulcrum to bend in handle
5. 3' 6" from bend to top of handle
6. Blade width tip 9.8"; waterline 7.3"
7. Blade thickness tip 1"; waterline 2"

Our yuloh is made of locally available black spruce barn byulohd planks that we were able to pick up in rough finished 1"x9" pieces about 16 feet long from a local farmer/logger. Using epoxy

resin the planks were glued together. Cutting out the rough shape from the “recipe” gave the blank that we then shaped in the final process. The tricky part was scarfing the planks together to create the bend in the handle. Using a power plane the scarfs actually worked out quite well. Final shaping was done with the power plane to give the shape that was desired. We were pleased to find that when following the “recipe” precisely the taper from the tip of the blade to the very end of the handle is constant creating a pleasing form for the eye and a strong yuloh. We chose not to round the handle but to simply round the edges with a router. Keeping as much material on the handle seemed to be more important for strength. The edge of the handle, as shown in the picture is used to guide the yuloh. The pushing and pulling is done with the rope that attaches the handle to the deck.

Storage of the yuloh can be somewhat problematic. Easy Go has a raised deck cabin and with a couple of chocks with tie downs the yuloh resides safely and comfortably on the port side of the deck. It is not instantly available so should not be relied on in emergency situations.

Until recently we had no lifelines and the premiere version of our yuloh simply slipped back on the deck (we didn’t even have chocks for this one but it did rest firmly lashed to the deck for two trans Atlantic crossings) and dropped on to the ball, tied to its attachment point and away we went. Installing stanchions and putting on lifelines created complications. However we completed the yuloh, put its mounting pin in place then untied the lifelines and gave it a test run. Oops, back to the drawing byulohd. The yuloh snagged the stanchion at the cockpit and required a rethink. The simplest solution was to cut the stanchion off near the base and epoxy in a plug so that now the stanchion is easily removed along with the lifelines and there are no obstructions while the yuloh is in place. The lifelines are secured to the furthest back stanchion by lashing tying them to it. The lifelines are made or rope and are easily tied so that while the yuloh is in place the lifelines are still somewhat effective.

The pin to mount the yuloh on was easily solved by taking a piece of a dock spike. Solid steel and about ½” in diameter and ground down to a rounded top. This has provided an excellent mounting point for the yuloh. Many sources of information indicated that a small ball should be welded to the end of the pin but we have found this to be totally unnecessary. The yuloh as built rests comfortably on the pin with no further restraints to keep it in place. It is tied to the boat by the lanyard so that it is instantly available when required. Preparing the yuloh before entering the harbour and stowing after leaving gives the flexibility and instant availability that was only previously found with a motor.

The yuloh has a replaceable board with a hole drilled at 45 º hole drilled in it to accept the mounting pin. Presently it is made of spruce with the hole hardened with epoxy and filler. Eventually it will be replace with a piece of white oak when we come across one.

We thought we might need to fabricate a weight to put on the end of the blade to sink it. Using the yuloh has made this initial impression unnecessary. The yuloh does float a little at rest but once it is started it quickly sinks down to its working position. The operator simply starts the sculling action with the shaft in both hands. After one or two strokes the yuloh lifts to its full operating position and the thrust and pull of the yuloh is made with the lanyard. In our case the yuloh is mounted on the port side. The right hand is the power hand on the lanyard and the left hand is the balancing hand located on the yuloh near the bend. The bend in the yuloh provides a fulcrum that flips the yuloh with very little energy expended.

The desire to push the yuloh quickly is counterproductive. Our modest experiments to date show that about 20 complete stroke cycles per minute, (20 to the left and 20 to the right for 40 strokes total) can be maintained for extended periods. Depending on the conditioning of the sculler higher speeds can be achieved although we find that even lower speeds concentrating on form will produce very respectable results.

Physical fitness will improve with use. Stomach muscles, arm muscles and the entire cardio respiratory system will leave one tired after extended use. The yuloh is a product of an ancient civilization and its use was ingrained at a very young age. Remember the baby mentioned at the beginning. In an era of rediscovery the yuloh is a device that is practical and valuable in the world of modern sailing, yachting, and small craft.