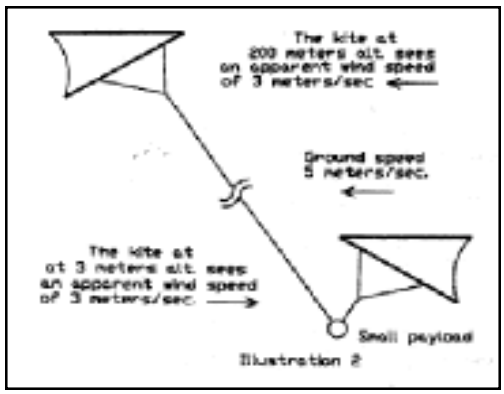
Catalyst

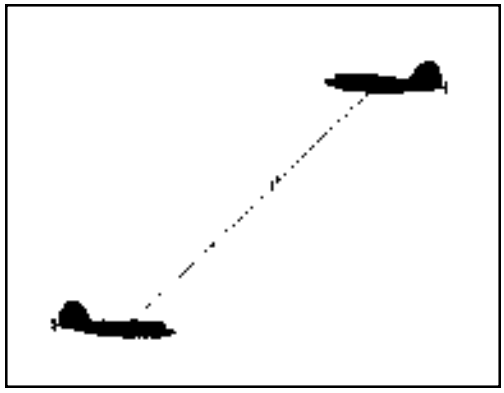
Journal of the Amateur Yacht Research Society

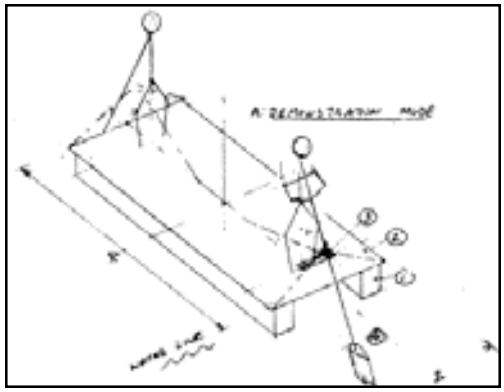
Number 30 April 2008

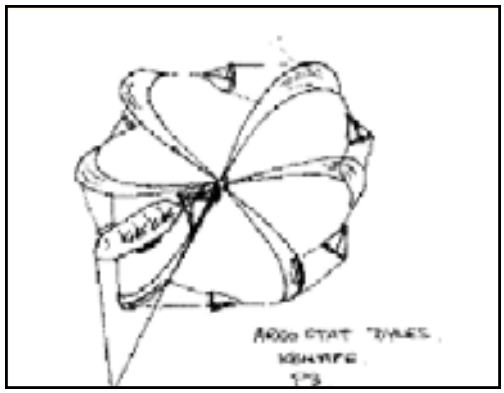
Features

Regulars









The Weta Trimaran
This little tri from New Zealand is certainly making its presence felt. We hope to have a review of its performance in Catalys *No 31.*

Photo: Weta.

Catalyst

Journal of the
Amateur Yacht Research Society

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Catalyst is a quarterly journal of yacht research, design, and technology published by the Amateur Yacht Research Society, BCM AYRS, London WC1N 3XX, UK. Opinions expressed are the author's, and not those of AYRS. AYRS also publishes related booklets.

Contributions are welcome from all. Email them to **Catalyst@ayrs.org**, or send (at your risk) disks or typed copy with illustrations to the Society's office. AYRS can take no responsibility for loss or damage in the mail.

AYRS subscribers receive both *Catalyst* and the booklets. Subscription is UK£20 or US$30 per annum for a Full Member, £10 or $15 for students and retired members. Subscription requests and all other queries to be sent to the AYRS Office, BCM AYRS, London WC1N 3XX UK, phone/fax +44 (1727) 862 268 or email: **office@ayrs.org**

AYRS is a UK Registered Educational Charity (No 234081) for the furthering of yacht science.

Website: http://www.ayrs.org

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ISSN 1469-6754

Catalyst

As usual, again, my apologies for the delay of Catalyst 30.

This journal and Catalyst No 31 includes all the material I have available. There are few suggestions in these journals; there are some discussions from people on the same side of thought — certainly for the use of extracting power from the atmosphere.

As previous comments to me and to the AYRS Yahoo group, an idea being discussed seems that there are (too) many 'blue sky' ideas, which are sketched on paper, but not followed through into building any actual or model-sized means of testing. There seems to be a gap between these and those models and full-scale devices which are fully operational even if being improved slightly in final form.

The method of refining the design for these devices, as Tim Glover has listed *[shortly to be published]*, means that there are few ideas that make it to a full trial device, and that a few things are tested, but with little design input.

Please feel free to write to the editor with suggestions as to how to improve this design-to-product progression. Maybe there should be funds from any prizes to aid this process? Or, maybe AYRS should be an 'enabler' trying to usefully associate an 'ideas man' with a 'builder'? Perhaps rather than individuals working away in their sheds, AYRS would encourage by collecting various people to provide some work teams towards a more complex trialling model or full-scale project?

We include in the wrapping *[as suggested by Tim Glover],* a few cards for each member to represent onwards the AYRS organisation, and to distribute within the population as you members may find any or chosen opportunity. Feel free!

Percy Westwood, 1947 - 2008
Catalyst Editor

Just as this issue of Catalyst was about to go to press, we heard that Percy had died very suddenly of a brain tumour. We had not the slightest idea that he was ill. We shall miss him.

Simon Fishwick, AYRS Hon. Editor

What Have You Done for AYRS?

I have been a member of AYRS for some years and the same old questions are asked at nearly every meeting I have attended:—

1. How can we get more members? (Young or old.) We prefer younger ones because the average age of our members at meetings seems to be rising inexorably. In thirty years time there will not be any left. So I am now making a positive personal drive to recruit more members.

I have AYRS burgees, which I fly on my yacht, my Hobie 14 catamaran and my amphibious land yacht. The wheels of the land yacht are 52 inches [1.3 m] diameter and next summer they will have the AYRS website address displayed on them. So what I am suggesting is that when any member is testing, towing on the road or otherwise displaying in public this design, please have AYRS information shown at the same time. You do not even have to speak if you find it difficult to talk to strangers. I am very lucky, I don't.

Take some copies of Catalyst with you. [Extra issues of Catalyst are availabk at cost plus postage, from the AYRS Office, BCM AYRS, London WC1N 3XX]. When I am out and about I take Westerly Owners Association stuff with me and try and 'sell' membership. I think they got over 100 new members at the last boat show. I will now spend my 'walk about? time with AYRS instead. So think how you can make AYRS membership increase. My goal for the year is to sign up just one new member. (If possible younger than I am, at 72.) If we all try and succeed we double the membership in one year. We are the best advertisement for AYRS. Spread the word.

2. I have been asked positively to contribute to Catalyst. Besides my big project *Newt*, an amphibious land yacht, I was asked to write an article on Patents and Patenting ideas. This is now underway. While engaged in this I asked how much time can I spend on AYRS as an ordinary member? 1-2% of my time? About thirty minutes a week. That does not seem a big commitment. So then I became embarrassed. I was asked to join the committee. I declined because I was 'too busy'. (Really)! So that is when I felt really guilty. How much time have you spent helping AYRS in the last year? The future is up to all of us. Please consider the following list

1. Get out and sell membership. (At the Yacht Club). When you see someone with a new yacht design, sign them up.

2. Think what knowledge you have that others may not: aluminium welding, glues and wing-sail making, where to get stuff, where to get things done. Write it down and send it to the Catalyst. *[We could list such useful resources in every Catalyst, and we can send internationally any images at any size, Ed]*

3. Have you ever dreamt up a project? (Come on, we all have.) Write your dreams down and send them in. There may be other members like myself who would love to help make them happen. Hold the other end while you do the rest; launching, taking pictures of the test runs (you can't sail it and be on the shore to take the pictures at the same time).

4. Have you ever stopped and thought how many hours the committee members spend on your behalf and how much effort goes into each copy of the Catalyst magazine [. . . blush, Ed]. I hope like me you are seriously embarrassed. Let's do something: — write, sell, do, and help. It's our society; no one else's. Lets get off our backsides and do something now.

T Glover ASIS FRPS
[repeated from Catalyst 29 - Ed]

Reply to John C Wilson concerning the gear ratio of Bauer vehicles

[For those whose memory is like mine getting shorter with the years, John Wilson, in Catalyst 28, raised a number of poiints of detail on Jack Goodman's experiment. Here is Jacks reply. - Ed]

I agree with John about the speed potential of the vehicle versus the ratio of the wind column leaving the propeller. When the air is blowing towards the rear and the ratio is greater than 1 to 1, the vehicle should go upwind. When the ratio is less than 1 to 1, it should go downwind faster than the wind. When the air column leaving the propeller is forwards, in the direction of the vehicle travel, it should go downwind slower than the wind.

Where I do not agree, is that the ratios can be calculated without knowing the efficiency of the vehicle. Propeller efficiency, size, gear train losses and rolling resistance all affect the ultimate speed potential.

The vehicle I built has a lift to drag ratio, as measured on a treadmill at 8mph, of 1.4 to 1. Meaning, for every unit of force required to push the vehicle at 8 mph, the propeller generates 1.4 units of lift or pull.

For this lift to drag ratio, the most suitable propeller speed to vehicle speed turned out to be about 0.57 to 1, and indeed it does go downwind faster than the wind.

If the vehicle losses were greater, the ratio would have to be higher – like 0.4 to 1, resulting in a slower speed.

If the vehicle were more efficient, the ratio would be lower – like 0.65 to 1, and it would go faster.

At an 8 mph wind to ground speed difference, the potential energy available to a 40 inch diameter propeller is 23.2 watts of energy.

That is all the power available, and does not change with the speed of the vehicle.

John asks how I reversed the gear ratio to get the car to go upwind. I flipped the fan over to put the concave side towards the wind and kept the rotation direction the same.

The gear ratio was reversed to have the fan become a windmill with the blade speed/pitch at 1.75 that of the ground speed.

I did nor experiment with different ratios because most people can agree that a vehicle can go straight upwind.

John also asked why I did not leave the gears in place and reverse the direction of the fan.

I saw no point in making a car that would go at about half of wind speed. In fact it would probably go faster if I disconnected the drive belt and held the blade stationary.

John asserts that the energy flow depends on whether the car is outdoors or on a conveyer belt. In all cases of DWFTTW, the fan is blowing the air backwards and the wheels always turn the fan.

The car gets its energy from the speed difference between the surface it is rolling on, and the air it is pushing against.

There is no difference from the car's point of reference.

Jack Goodman
imaginationltd@aol.corn

GBP 10, 000 available !

Following a suggestion made at the AYRS meeting last November, am considering offering prize(s) totalling GBP 10.000 to encourage the technique of Single-oared Sculling, or "yullah", on Britain's inland waterways.

Before proceeding, I'd need advice on a number of matters, including legal considerations and administration, given that I'm in the U.K. only 3 months in the year.

As my main target audience is youth organizations in under-privileged city areas, I'd also appreciate advice on attracting matching funding from public authorities and other bodies.

Ideas from AYRS members are particularly welcome

Mike <michael_bedwell@hotmail.com>

The Howard Fund

What it is, how AYRS will use it, and how you can apply for a grant

AYRS Committee

In April 2005, Mr Donald Howard, a member of AYRS, died, and having no family, left his estate to be divided amongst a number of charities, one of which was, to our surprise, the Amateur Yacht Research Society. Of his residual estate, we were left 30%, some £42000, with the instruction that the Committee use the money to "provide funds as grants to members for further development of their practical ideas".

Having thought about it long and hard, the Committee have decided that we will do this in the following way.

How will we distribute the money?

In principle, we could give it all in one hit, but we think it would be more use if we made the money last over a number of years. Firstly, this will allow us to earn interest on the capital, which we can add to the fund; secondly, it will allow people time to think about what they need and when. So we have decided that we will distribute about £5000 each year, which means we can go on for about nine years. This will usually be a number of small awards.

We have also decided that the projects to which we give grants: a) have to be practical (as Mr Howard required); b) they have to further nautical science or knowledge of nautical science (to be in keeping with the objectives of AYRS); and c) that grants will be awarded on merit and according to need, after review by the Committee and any panel of experts they may appoint. Needless to say, neither the members of the Committee nor their family and close associates, nor anyone else involved with the decision process will be eligible to apply.

How to apply

Applications for grants should *preferably* be in writing (see overleaf for alternatives), and will need to be submitted by a given date each year. For 2009, this date is **1st December 2008**.

Applications need to include:

a) Name and address of the applicant, executive summary of the application, etc

b) Details of the project, (suitable for publication), containing

1. A description of the project as a whole
2. Its contribution to nautical science (this may be the most important bit)
3. Progress so far
4. What the money requested will achieve (probably the second most important bit).

As with the John Hogg Prize, clarity of thought, and an appreciation of the audience will probably help us, and technical details may be best reserved to an appendix (but they ought to be there if they are known, although we will be prepared keep these details confidential if requested).

c) Some kind of costed project plan/budget statement - which we will normally keep confidential - i.e. what is to be done in total; the total cost of the project (with some indication of the reliability of this estimate!); what has been/is to be done when (with some indication of the likelihood of success); spend so far; forecast spend to completion year by year; the amount requested, and when it is wanted (as the grant could be spread over a number of years), and where any other funding is coming from. Any commercial interests must be declared.

d) An indication of what might go wrong with the project, things that might cause it to be delayed for example, and what the applicants propose to do to minimise the risk, and to handle the consequences if things do not go according to plan.

Part (a) is obviously administration; (b) should tell us what the project is about, why it's worth supporting, how much has already been done, and what our grant will add. Parts (c) and (d) give us an idea of how well the project is being managed. Clearly if detail is lacking here, then we must question whether the applicants have thought enough about what they are doing for us to have the confidence that the money will achieve what they expect.

We think it will take us about three to six months to evaluate the proposals, so a successful application should receive a grant in the first half of the following year. Applicants may choose to apply for grants to be spread over a number of years, and may (re-)apply in more than one year, but past performance will be taken into account! We should like to expose applications to the membership, by publishing them in Catalyst, or on the AYRS website, or both, so it would be helpful if applications were prepared with that in mind..

Remember that if you apply then you need to convince us that what you want to do with the money is sufficiently worth doing, that you stand a reasonable chance of doing it, that it's more worthwhile than other suggestions, and that the money will make a difference.

If we think your application is incomplete, we may come back and ask for extra information, or suggest you change your project plan, either as a pre-requisite to further consideration or to the eventual award of a grant.

Feedback after awards

We need to know, so we can tell others, that the money we grant has been well spent. We will require the successful applicants to come back to us, to report on the success (or otherwise) of their project, and to tell us what they managed to do with the money. Ideally too, they should do this in a form we can report to the membership, in Catalyst.

Clearly we do not expect 100% success with members' projects. Sometimes they may simply not achieve the contributions to nautical science that they expect to do. Sometimes they may find that their project management is inadequate, and they run out of money or time. Sometimes though they will achieve glorious success. Either way we need to know, both to avoid funding work that's going nowhere, and to ensure that we have greater success is sorting the good ideas from the bad in future.

So we are going to require regular progress reports, either in writing, or perhaps in the form of a project blog if we can work those onto the website (or you could use your own website).

What next?

Well, now that the Committee have decided what they are going to do, the rest is up to you! We need applications, and although the deadline is set, it would be helpful if we had them before then, if only so that we can begin the evaluation process, and feed back to you any points that we think need clarification before the cut-off date.

Send your application to:

Hon Secretary,
Amateur Yacht Research Society,
BCM AYRS,
London WC1N 3XX, UK,

to arrive as soon as possible.

You can also send it by email, to <office@ayrs.org>, preferably as a PDF file (with all the fonts embedded!), but Word documents, Powerpoint, Excel or HTML files are acceptable (but don't blame us if our browsers are not the same as yours, and make a total mess of what you send), as are videos. Don't assume we will be able to download material from the WWW when we read your application; as not all of us have permanently online Internet connections, and, anyway, we might be looking at it on a train!

For further guidance see the notes on sending articles to Catalyst.

Footnote: Intellectual Property:

AYRS is willing to consider applications for grants under a non-disclosure agreement which will not prejudice applicants patent and other rights in the event that an application is unsuccessful. However, applicants must agree to place the nature and results of supported projects in the public domain, free for anyone to use, before any award is made.

Some thoughts about unpowered heavier-than-air aircraft

Jack Goodman

Some time ago there was an extended discussion at the AYRS chat room, about the albatross' ability to stay aloft using the wind gradient that exists in the first 150 feet of the' atmosphere. They can cruise for months by flying in and out of the different wind speeds. Someone mentioned that it would be nearly impossible for humans to emulate this flight. As with the DDWFTTW discussion, this got me to thinking. It would not only be possible, it would be relatively easy, to make an aircraft that could fly for extended periods of time. I intended to build a working model, however my checkbook, eyesight and lack of skills with a sewing machine have held me back. So I will describe the simplest of the prototypes, in hopes that a more talented AYRS member will be the first to accomplish this task.

An aircraft can be built that will stay aloft using only the energy created by the difference in wind speed or wind direction at different altitudes. The aircraft would be composed of two glider-type 'planes tethered together but at different altitudes. The most common wind gradient occurs at the ground/air interface. The wind speed at 3 meters altitude, may be moving at 2 meters per second, while the wind at 200 meters altitude is moving at 8 meters per second. This is a wind difference of 6 meters per second. The aircraft, in its simplest form would be a kite that is capable of flying in a wind less than 3 meters per second.

First launch the kite and fly it to 200 meters altitude. Then tie an aerodynamic drag device to the lower end of the connecting line. This drag device could be parachute shaped and should be able to create the same amount of drag as the kite, without creating any downward force, as in illustration 1. Allow the assembly to drift downwind. Once it has reached a speed of 5 meters per second, both the kite and the drag device will be experiencing a 3 meter per second wind in opposing directions. The assembly will stay at this altitude as long as the wind gradients exist. The lower drag device could also be a kite capable of producing lift to help carry a payload such as a weather instrument, as in illustration 2. The wind gradients in the trade winds, especially over the ocean, are consistently greater than this. Also a longer line and higher altitude may be used to increase the chances of the upper craft finding sufficient wind. Small hobby-kites can fly with as little as a 1 meter per second wind. Also, the amateur kite altitude record is over 6,000 meters.

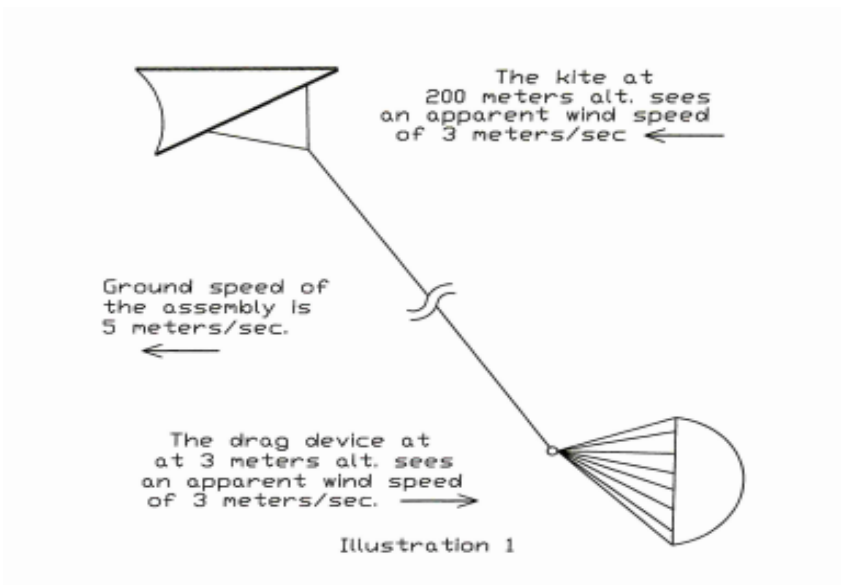


Illustration 1

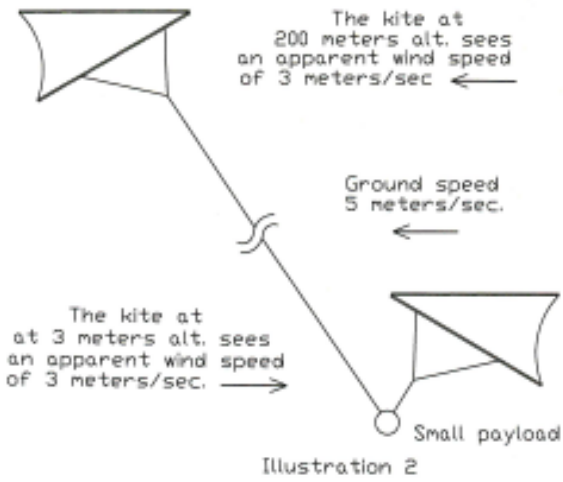


Illustration 2

The jet stream, at about 11,000 meters, offers another opportunity to find wind gradients.

Reliable gradients of 20 meters per second or more can be found in the lower portion of the jet stream.

The craft used here could be specially designed, more like high-performance sailplanes, and have controls that would allow them to manoeuvre perpendicular to the wind, comparable to a sailboat beam-reaching across the wind.

This could allow them steer as much as 45 degrees or more off the direction of the true wind, enough to remain in the jet stream.

A craft like this could stay aloft for extended periods, possibly years.

Jack Goodman,
Imaginationltd@aol.com

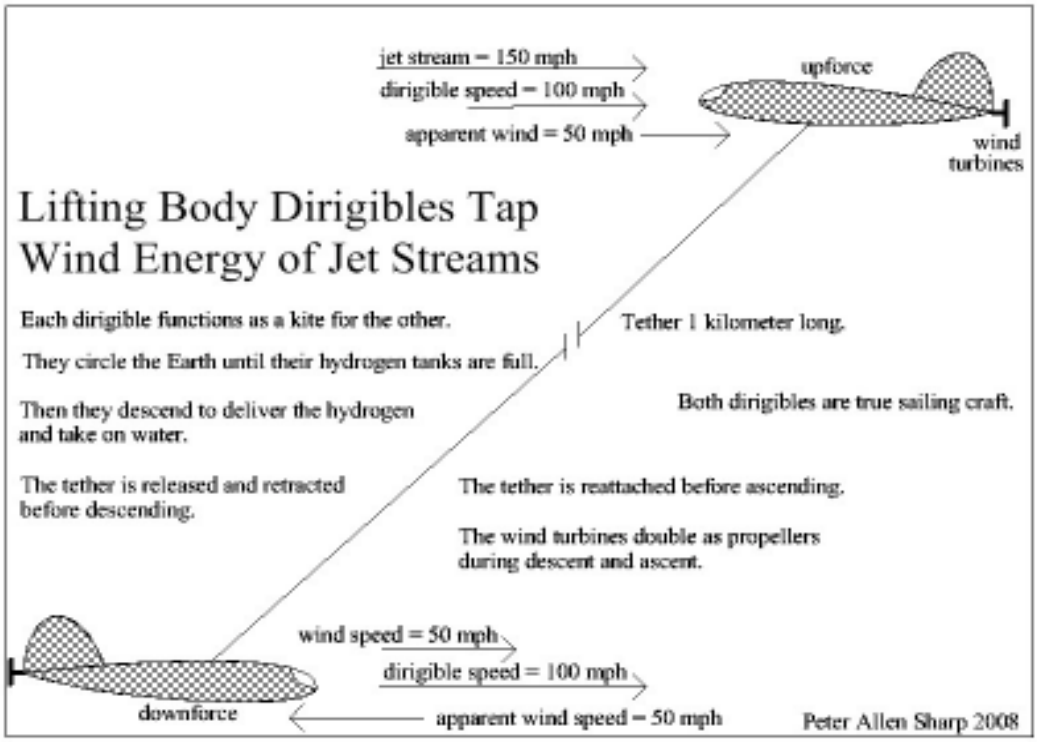
Sailing in the Jet Streams, to produce Hydrogen, to power the World

Peter Allen Sharp

There are four jet streams. They are located at roughly 30,000 feet, where commercial jet-liners fly. The jet streams have speeds that vary seasonally. A speed above 60 knots is considered to be a jet stream. Speeds can occasionally reach 250 mph. They are much wider than they are thick. Their location undulates considerably with respect to latitude. It has been estimated that 1% of the energy in a jet stream could supply the world with all of its energy needs [Ken Caldeira, Stanford University]. I can't personally verify that figure, but if it is even close, then it makes sense to figure out how to access that concentrated energy. Actually, it should be relatively easy to do, at least in principle. I wish to propose a method.

Use two lifting-body dirigibles as kites tethered to each other, with one flying in the jet stream and the other flying a kilometer or more below the jet stream in the slower moving air. The tether would be at about a 45 degree angle. The top dirigible produces positive (upward) lift and the bottom dirigible produces negative (downward) lift so as to maintain their difference in altitude.

Each dirigible carries one or more wind turbines. Turbines might be located aft of the wing tips to take advantage of tip vortex shedding. A small airplane used that technique successfully. The dirigibles face each other. They control their apparent wind speed (that they both feel equally) by moving up or down together toward or away from the jet stream. They would probably maintain an air speed difference of about 50 mph. but more advanced designs would increase that difference.



The dirigibles carry distilled water up with them and use the electricity from their wind turbines to convert it into hydrogen and oxygen. They store liquid hydrogen. For buoyancy, they use gaseous hydrogen. They remain in the jet stream until they have filled their tanks with hydrogen. They circle the globe one or more times while filling their hydrogen tanks. When they pass over their home country, they detach from each other, retract the tether, and descend to the most convenient delivery port. As they unload their hydrogen, they upload more water. Then the tethers are joined, and they ascend back up to the jet stream.

For buoyancy, they use large internal balloons filled with hydrogen. To descend, they pump air into balloons that are inside of the hydrogen filled balloons, thus pressurizing the hydrogen and increasing its density. The wind turbines have a reversible pitch so that they can function as a propeller (even though the twist is in the wrong direction).

In an emergency, the dirigibles release most of their hydrogen and glide back down.

Hydrogen can damage the ozone layer by interacting with ozone to produce water vapor (a greenhouse gas). As a precaution, part of the oxygen (02) produced on board is converted to ozone (03) and released at the appropriate altitude.

The United Nations would broker a deal with all nations under the jet streams to allow free passage of the dirigibles in their air space. In return, those nations would receive a percentage of the profits, and the right to inspect the dirigibles at any time to insure that they did not carry weapons or surveillance equipment. Violations would be adjudicated by the World Court.

The dirigibles would carry transponders, lights, radar reflectors, etc., and airplanes would be required to fly at least 2,000 feet above or below them.

The Hindenburg disaster led the public to believe that hydrogen dirigibles were dangerous. But research on the cause of the Hindenburg fire strongly suggests that the material used for the outer skin was the cause of the fire. It was highly combustible and probably ignited due to a spark of static electricity. Hydrogen fires burn upward and do not spread across the ground like gasoline fires. So, if one of the dirigibles caught fire, it would not tend to be a threat to people on the ground. A falling dirigible would be no more likely than a falling airplane, and probably less likely.

World commerce was initiated and supported for centuries by sailing ships. The time has come for new forms of sailing to transform world commerce and to stop global warming.

Single-Oared Sculling

Michael Bedwell

Design of a raft to promote a new recreation on the UK's narrow canals. The case for introducing single-oared sculling as a challenging activity for young people is given here: —

Today's industrial revolution is in the Knowledge Economy. By contrast the Industrial Revolution of the 18th-19th centuries concerned heavy engineering and heavy raw materials - coal iron ore and later cement. As roads were bad and railways non-existent, carriage by water was critical. So away from the coast, canals had to be dug, and it was cheaper where possible to route them through the plains rather than the hills. The decline of heavy industry thus explains one of today's social problems: unemployment is highest in areas remote from either the sea or the hills that elsewhere provide people with healthy and challenging recreation.

Fortunately, the canals also provide an alternative, thanks to the vision of a few enthusiasts some fifty years ago. They had the foresight to see that the very decline of the industrial use of inland waterways created both the need and the opportunity to exploit their amenity value. So today thousands of pleasure boats cruise the canals, and thousands of people fish in them. However, neither of these activities provides the physical challenge that many young people want — or, as their elders say, they need! Canoeing is an exception, but the placid water and speed limitations of the canal make them less fun than rivers. There is thus a case for a canal craft that offers the robustness comparable to a narrow boat, whilst requiring the teamwork and physical demands of a rowing four. But conventional rowing is awkward on narrow canals, especially when manoeuvring through bridges or into locks. Luckily, single-oared sculling provides the answer, as the blade need never move beyond the beam of the boat. (*AYRS Leaflet for London Boat Show, Jan 2006*)

The rest of this document sets out details of a raft to demonstrate this new recreation.

The **performance specification** is that the raft must:

1) **Float,** supporting the mass of at least two adults.

2) Be **stable,** i.e. reasonably immune to capsize.

3) **Fit in the standard UK narrow canal** — This means the beam width should be no more than 7 feet, and the draught no more than 2 feet.

4) **Allow the fore-and-aft position of a 2-person crew to be adjusted so that the craft can be used in both—**

a) the **trial-of-strength** mode, the crew sculling in opposing directions, and

b) the **cruising** mode, both crew facing backwards in either case exhibiting the correct trim

5) Allow use of my existing **single-sculling paddles,** which have a length of about 9 feet, with the crutch position about 6 feet from the lower end.

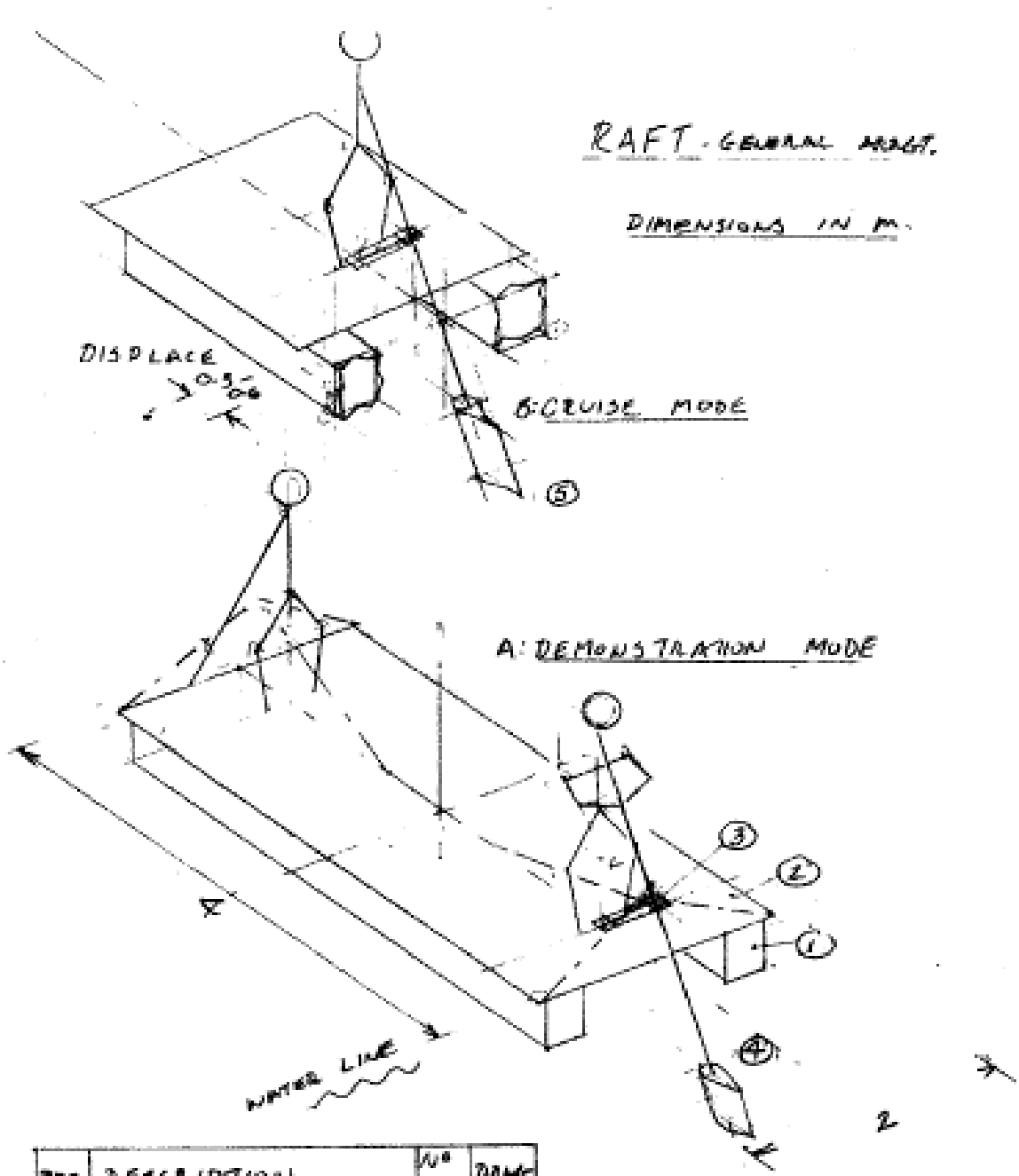
6) Be **portable** on the roof of a **large car or SUV**.

The initial construction need not be particularly robust, since the raft would he used for demonstration purposes only, and rarely have to stay in the water for more than 24 hours.

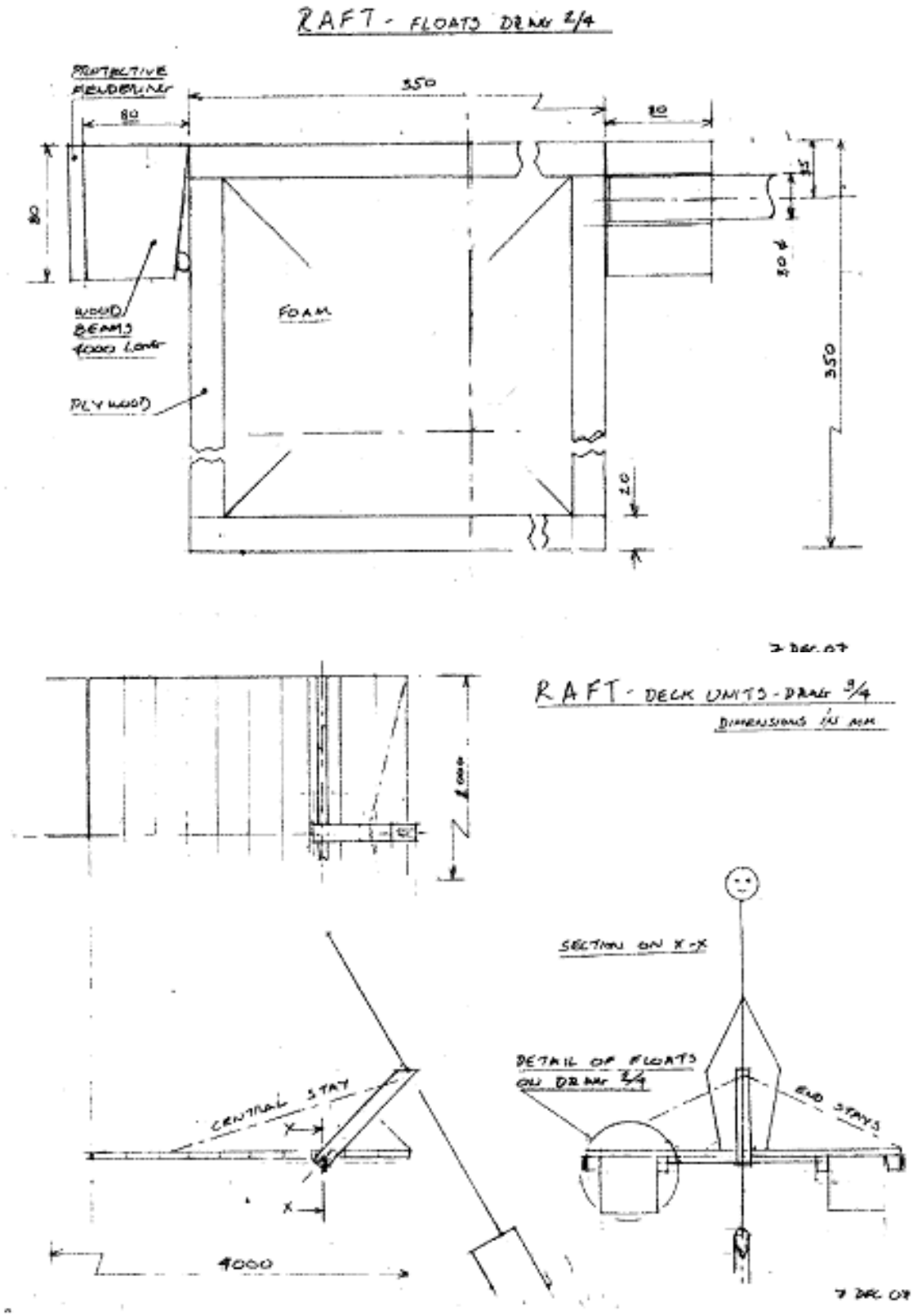
Proposed Solution

The general arrangement is shown in drawings that follow 1 through 4. The component parts, with suggestions for their manufacture, are:

(Contd page 12)



REF	DESCRIPTION	No OFF	DIAM
(1)	FLOATS	2	3/4
(2)	DECK UNITS	2	3/4
(3)	STRUTS	2	3/4
(4)	PADDLE (ORIGINAL)	1	-
(5)	PADDLE (NEW)	1	-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SECTION ON X-X
DETAIL OF FLOATS ON DRAW 2/4
CENTRAL STAY
END STAYS
X
X
4000
7 DEC 07

(i) Two hollow plywood floats 4 metres long and of 35 cm ´ 35 cm section, shown in drawing 2.

The floats may need some internal diagonal bracing, but most of the void should be filled with foam plastic that does not absorb water. When submerged to half their 35 cm depth, their submerged volume is therefore:
2 × ½ × 35 cm × 35 cm × 400 cm × (1/1000) litres/cc = 490 litres.

Given tbe density of water as 1 kg/litre, the total upthrust is sufficient to support a mass of 490 kg, i.e. that of two 100 kg (l4stone) adults plus 290 kg for that of stores, the self-weight of the raft and any additional masses needed for trimming.

The lateral stability should present no problem, since the centre of buoyancy moves to within the cross section of one float when the other one lifts clear of the water. Maintaining fore-and-aft stability will require care in getting on and off the raft.

Specifications (1) and (2) above are thus met, as is the draught requirement of (3).

(ii) Two struts incorporating the paddle crutch, shown in drawing 4/4. The crutch end is designed to act as a fulcrum as the paddle moves in its roughly conical orbit. It is suggested that the internal shape of this be made in the following stages.

Cut a Tufnol blank to the external shape shown; glue or screw it to the "horizontal" surface. Drill our the 40 mm diameter through hole, using the Tufnol as jig; rasp or file the wood to the rough conical shape shown. (maximum material condition, since further rasping can be done when raft is first trialled), and finally cut out the straight sides of the slot. A 20 mm through-hole beneath the slot is provided for a lanyard that restrains the paddle horizontally and supports its mass.

The lower end engages on a 30 mm diameter metal tube that is incorporated in the deck unit, described below.

(iii) Two deck units (Drawing 3) that serve both to hold the floats rigidly together, and also to support the crew and the struts described in (ii).

The units are in turn located on each float by two 80 ´ 80 mm longitudinal beams, the inboard face of each outboard beam being cambered as shown in drawing 2. The purpose of this camber is to accommodate lengths of rope of suitable diameter that, once the units are in their required orientation and longitudinal position, can be pulled tight to jamb the floats and deck units securely together.

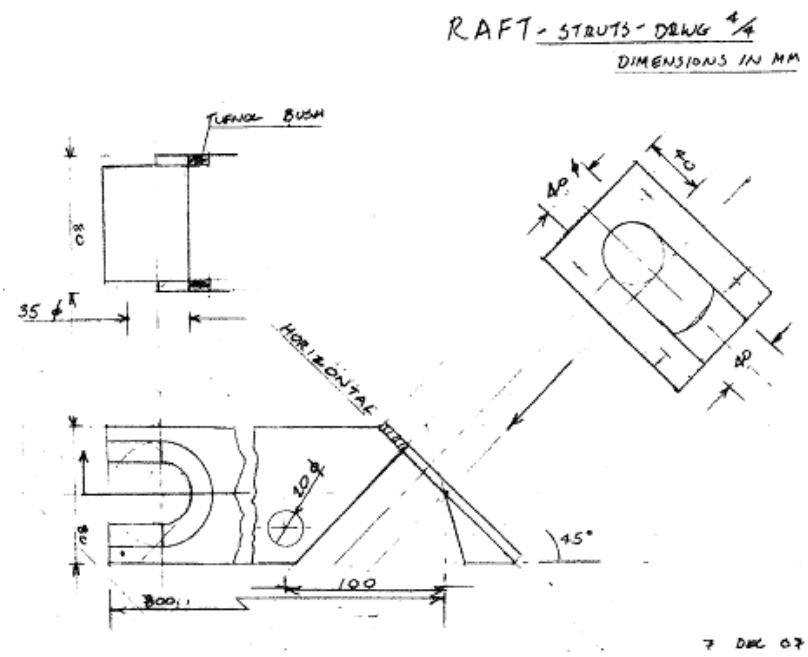
The two outboard beams also carry along their whole 4 m length strips of rubber, softwood or other attritive material to reduce damage to the raft sides.

Between the two inboard beams in each unit is secured a transverse metal tube of about 30 mm diameter; its purpose is to locate the lower end of the strut.

To the beams' upper surfaces is screwed the decking, consisting of, say, softwood planks of 20-30 mm thickness. Their length is 2000 mm to conform to the width limitation in specification (3) above. The longitudinal spacing of the planks allows the free engagement of the strut on the metal tube.

(iv) On each deck unit are low-stretch polymer stays to the strut; one to each of two of the deck corners, and one towards the other end of deck on the centre line. While this presents some trip hazard, it is amply low enough for the crew member to stand astride it while sculling.

Michael_Bedwell@homail.com



Kenape-type kite systems

Ken Upton

At last others are beginning to understand that rotating turbines never can work well in streams and rivers without all the water being diverted into a pipe. Non-rotating generators are doing well off the west coast of UK and the south-east coast of Eire.

Tidal power should be used far more; some of my ideas seem to match Curly's Electrotide, [*see Catalyst 29]*. These are very similar to my old designs from which EB Engineering made the Stingray Reusable Energy generator. This type of project I believe is still working some place in the north of Scotland, a reciprocating horizontal foil moving like a whale tail. I think Curly's idea is a multi-vertical version of this principle.

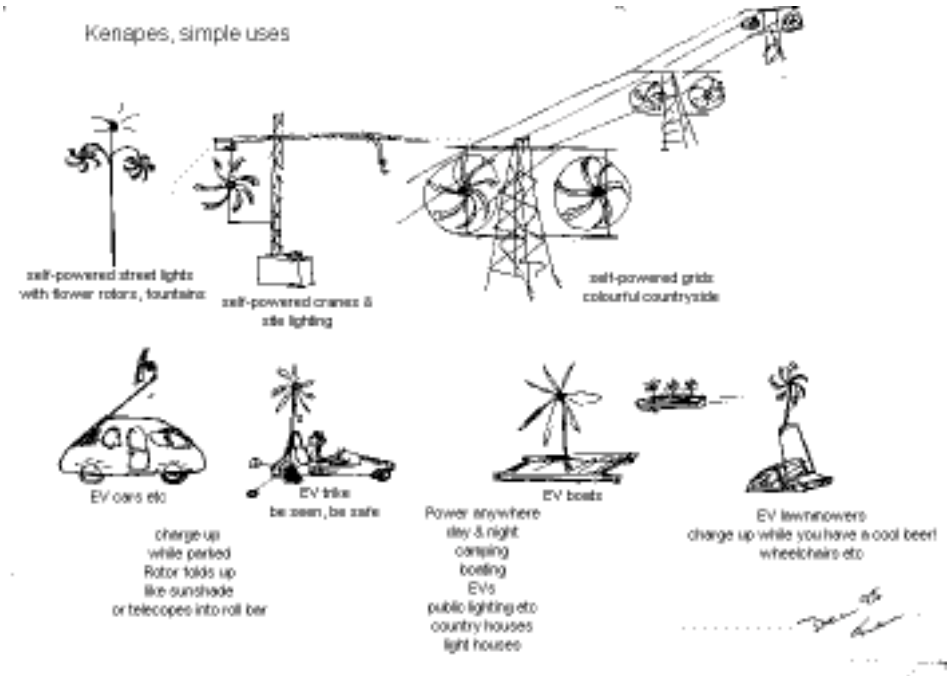
Now I have moved on to kite flight in water, which I think has a far greater future. Sure you can build cheap and strong with steel and concrete foils and hydraulics but in our new world of plastics and carbon fibres you can get a lot more strength for less. And keeping all the main parts in tension like my newer systems do, I think we have a way forward for renewable energy collection.

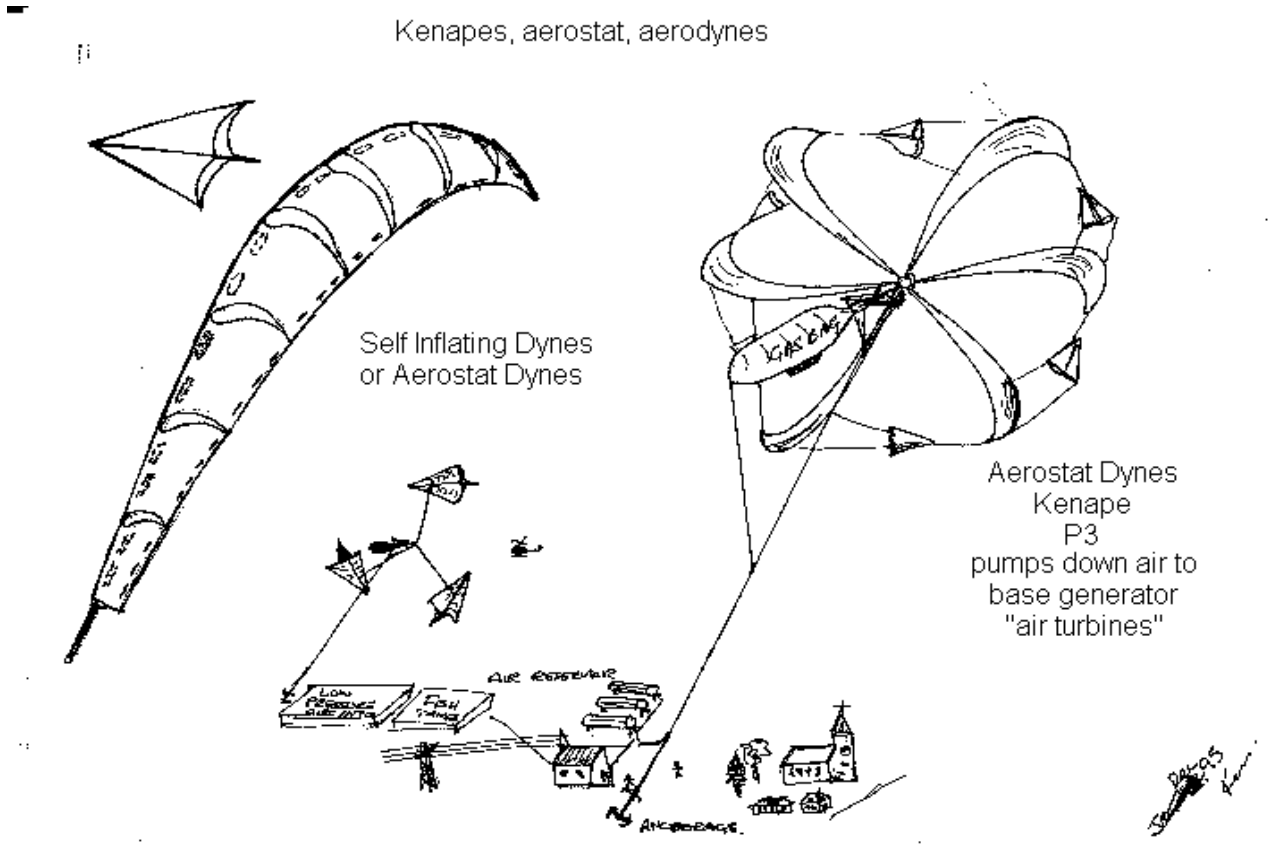
But they are only just starting to think about using kite power. Kites like to fly in a circle — that's the real way to make a wind turbine, Kenape!

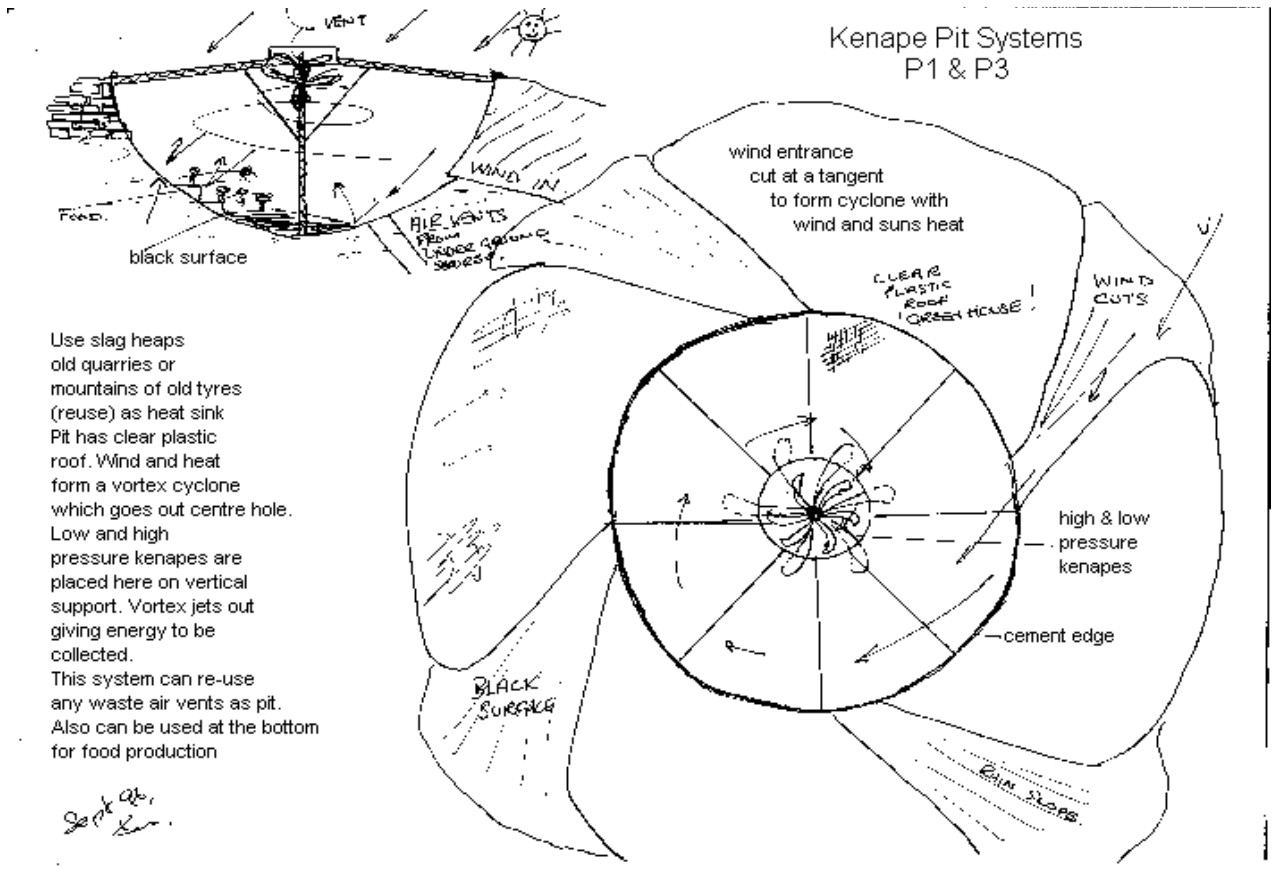
I always remember what Uffa Fox said about weight and dynamics. "Weight is for steam road rollers not boats and dynamics" *[see www.uffafox.com]*.

We should collect Renewable Energy from the tides and river streams, but I think making electricity directly on multipole generators on a smaller scale is better. This makes it much more flexible and makes more sense to me. With global warming and flooding, soon our grid systems are going to have mega problems. So big projects will not be able to work – the proof of that is here in Spain now. Many of the dams used to make electricity are not working (no water), and on the east coast of the USA they've got too much. So it's back to old man coal and nuclear. Here are some sketches that cover this area, and maybe will give some people inspiration.

Ken Upton




Kenapes, aerostat, aerodynes
Self Inflating Dynes
or Aerostat Dynes
Aerostat Dynes
Kenape
P3
pumps down air to
base generator
"air turbines"


Kenape Pit Systems
P1 & P3
VENT
WIND IN
black surface
wind entrance
cut at a tangent
to form cyclone with
wind and suns heat
CLEAR PLASTIC ROOF GREEN HOUSE
WINDS CUTS
high & low
pressure
kenapes
cement edge
BLACK SURFACE
Use slag heaps
old quarries or
mountains of old tyres
(reuse) as heat sink
Pit has clear plastic
roof. Wind and heat
form a vortex cyclone
which goes out centre hole.
Low and high
pressure kenapes are
placed here on vertical
support. Vortex jets out
giving energy to be
collected.
This system can re-use
any waste air vents as pit.
Also can be used at the bottom
for food production

No entries yet for the

AYRS John Hogg Memorial Prize Award 2008!

£1000 prize is still up for grabs!

The AYRS wishes to remind people that another award of a £1000 Prize in memory of John Hogg, the distinguished amateur yachting researcher, who died in 2000 is pending.

So far there are no entries!

The aim of this international award is to encourage and recognise important amateur contributions to the understanding and development of sailing performance, safety and endurance. Preference will be given to on-going work where the prize money is likely to benefit further development. Other than nominations for a "lifetime achievement" award, the work should have been performed within the last few years. Work that has previously been entered for the John Hogg Prize is not eligible, unless in the intervening period significant advances have been made.

Nominations, whether of oneself or another, should be submitted to the Honorary Secretary, Amateur Yacht Research Society, BCM AYRS, London WC1N 3XX, UK, to arrive by **30th October 2008.** Nominations may be made by or for anyone, whether or not they are a member of AYRS. Those nominating someone else must obtain the written agreement of the nominee and forward it with the entry.

'Amateur' in this context means primarily work done as a pastime and largely self-funded. Details should be given of any grants or other funding or assistance received. Work carried out as part of normal employment is not eligible, neither is paid-for research where the researcher does not own the results, but subsequent commercial exploitation of research need not debar work carried out originally as a pastime. Projects carried out as part of a course of education may also be admissible. A significant factor in determining the amateur status of such work is the ownership of the intellectual property rights in the results. Those with ongoing projects are as eligible to apply as those whose work is completed.

Whilst it is not essential that any innovations embodied in the work be demonstrated and "debugged", the work must have some practical application, which should be made clear in the entry.

The submission shall cover the following:-

- A summary, of not more than one page, identifying the nominee and the work submitted, and including a short statement of its merits to justify its submission.
- The description of the work itself, its novelty, its practical application, its degree of success to date, and (briefly) your hopes for the future.
  The work will be judged on the results achieved to date. Please spare us a complete history of your researches except to the extent that they are truly relevant. The use of your already published material, whether or not peer reviewed, incorporated in an entry, is welcome.

- Submissions must be made in English, IN HARD COPY sent by post, to arrive by the due date. FOUR COPIES ARE REQUIRED – one for each of the three judges and one for the Secretary.
  Electronic transmission, the use of website pages, and of direct extracts from patent applications (which are written by and for lawyers and can generally be shortened) have resulted in unsatisfactory presentation, hence the need for hard copy of a dedicated paper.

- Diagrams, graphs and photographs may be used, video material on VHS PAL videotapes or DVDs can be helpful supporting material. Programs and presentations on disk may be entered as part of a submission (accompanied by explanatory text etc). Appendices may be used, e.g. for mathematical workings. Direct reproduction of pages from an author's web site has generally proved unacceptable (due to formatting variations) and is not welcome.

- Entries should be printed on A4/letter paper in a legible font. Successful short-listed entries to date have ranged from about 22 A4 sides of text with 6 of photos, to one winner with 5 sides, 3 of photos and one A3 drawing. Clarity, legibility and brevity pays!

- Separately, a brief biography of the nominee(s) should be included, and their amateur status and qualifications should be explained.

- Nominees may like to say how they will use the prize should they win.

- AYRS will wish to publish brief summary accounts of entries, and may also seek further articles from entrants. Grant of permission to publish such articles is a condition of entry. To this end it will be helpful if entries can (if necessary) readily be abridged for publication in *Catalyst,* and if a computer disk copy of the entry is included. However any information received as part of a submission will be treated 'In Confidence' if so marked.

The winner and runners-up will be announced at the London Boat Show in January. All short-listed entrants will receive one year's free membership of AYRS and a certificate; the winner will receive a cheque for £1000.

The Judges, whose decision shall be final, will co-opt experts as required to assist their deliberations.

Submission of an entry will be taken as signifying the entrant's acceptance of these rules.

Queries concerning possible entries may be made by phone or e-mail to the AYRS Honorary Secretary on tel: +44 (1727) 862 268; e-mail: office@ayrs.org.

Tips for making your entry effective

1. Never forget that the winner of the John Hogg Prize is the entrant who can persuade the judges that his/her work is innovative, has merit, has practical application, and is the most deserving of the prize. Your idea may be the best, but unless you can bring the judges to realise that fact, it will not win.

2. Remember the judges have only a limited time to look at each entry. Don't expect them to wade through pages of dross to find the nugget that is hidden in them. Present your work clearly and concisely, and in such a way that they quickly understand it, its merits and its practical application.

3. Be sure your entry will stand alone. Don't expect the judges to come back to you for more information – they won't. By all means refer to books, articles etc, but make sure the judges can understand your idea without going and looking them up. If they are interested, they may do so, but first you have to get them interested!

4. The judges are all practical people. You don't need to "talk down" to them; but on the other hand don't force them to read pages of mathematics! (See 2.) Equations may be useful to demonstrate a particular point, but long mathematical derivations are best relegated to an appendix.

5. It helps, but is not essential, to have already demonstrated the practicality of your work. Theory is fine, but unless the judges can see the practical application, it will not get their attention.

6. Presentation ought not to win prizes, but it does help get a good entry noticed. Don't just send a collection of loose pages - put them in a binder and give them a pretty cover/front page.

7. Remember a picture can be worth a thousand words; and a picture in colour can be worth more.

8. Remember too that those pictures do not have to be static. One of the better entries to date sent a video, with an intelligent commentary on the sound-track.

9. You can add a sound-track to PowerPoint presentations as well, but if you send a PowerPoint file remember that not everybody has PowerPoint software, so use the "Pack & Go" feature so your presentation will run on any (Windows) system. [Sorry, Mac users]

10. Don't expect the judges to go and read your webpage. They don't have the time. Use it as a supporting reference by all means, but if the information there is essential make sure it is packaged with your entry.

11. Remember to send enough copies of your entry – FOUR – one for each judge and one for the AYRS Office. The judges can view things like videotapes at their meetings, or they can pass them round; but they don't want to share paperwork, and the AYRS Office has neither time nor resources to do lots of photocopying.

12. Finally, don't forget to put in a disk (CDROM for preference) with all the printable material on it. Most entries get printed in *Catalyst*, often in an edited form. We need the files to work from. Oh, and don't forget to make sure the files are in a format we can read! (See the AYRS website submissions page for more help.)

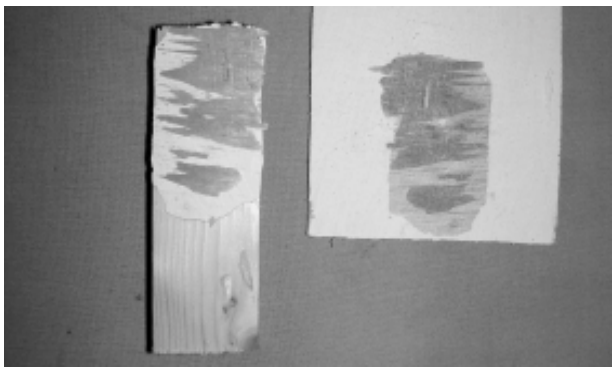
Chairman's Notes

Do you regularly back up your computer's data? I have to confess that I don't and have just had a nasty surprise, when installing from disk an upgrade of my Internet security everything went wrong and I was no longer able to log onto my computer! I rang the help line and with their help I was still unable to and was advised to resort to the System Recovery disk that came with the computer, being warned that it returns the computer to how it was when initially set up.

However as it happened the end result was not too bad, the disk produced a recovery program offering three options one of which left data alone *(didn't work)*, another moved the recognised data to a separate folder (*it worked thank goodness*,) and the third deleted everything that was not as original. I'm at the stage where I'm rearranging the data and reinstalling various programs and having thoughts about which security program to use and how often to back up data.

Now to the good bits of news, I had a very enjoyable weekend at Wembury attending the meeting hosted by John Perry; and have to thank him and Josephine for their noble effort and extremely generous hospitality.

Project Trimaran Kiteboat is making progress and with a bit of luck will be ready to take to Barton Broad March 28-30th (postponed to 3-4 May) but constructing the floats produced another thought which might make a simple project. How to protect the inside of inaccessible wooden structures? Easy if you use epoxy coatings but if you are using less sophisticated glue and paint systems maybe not so easy. On this occasion the underside of the deck has been left unprotected. I did a sample of ply coated with acrylic primer and glued it to a piece of strip wood and after two days applied violence and was pleased to find that much of the joint broke wood fibres. I will some time set up some more samples and subject them to water soaking (etc) before breaking them apart.



The broken joint

photo: Bernard Rhodes

Fred struggling with his kite, Barton Broad, 2007

Project Rusty Steel is continuing, weed growth is now complicating the inspection but most of the test strips are now showing some signs of corrosion. Fertan+ paint and the Finnigans Smooth are still in good order, the Bitumen is coming away from the lower part of the test strip so I definitely should have used a primer first and I am disappointed with the Ronseal No-Rust

As an matter of interest I have a book about Henri Mignet and the Flying Flea aeroplane which was not without troubles, it had a literally fatal flaw in its design as one wing obstructed the other at a certain angle of flight and it then went into a terminal dive. Later designs had the rear wing able to move as well as the front one and they were safe(r) to fly. [Henri Mignet and his Flying Fleas by Ken Ellis and Geof Jones, ISBN 0-85429-765-0] The problem was researched by mounting examples in a wind tunnel at Farnborough and also in France at Chalais Meudon.

Frederick Ball@tesco.net

Catalyst Calendar

This is a free listing of events organised by AYRS and others. Please send details of events for possible inclusion by post to Catalyst, BCM AYRS, London WC1N 3XX, UK, or email to **Catalyst@ayrs.org**

October 2008

4th – 10th Weymouth Speedweek
Portland Sailing Academy, Portland Harbour, Dorset UK. See www.speedsailing.com.

8th AYRS Weymouth meeting
Speedsailing. 19.30 for 20.00hrs at the Royal Dorset Yacht Club, 11 Custom House Quay, Weymouth. Location Map: www.rdyc.freeuk.com. Contact: AYRS Secretary, BCM AYRS, London WC1N 3XX; email: office@ayrs.org

November

2nd London Area All-day Meeting
9.30am to 4pm Sunday 2nd November 2007, Thorpe Village Hall, Coldharbour Lane, Thorpe, near Staines & Chertsey. Location map via the AYRS website www.ayrs.org. Details from Fred Ball, tel: +44 1344 843690; email frederick.ball@tesco.net

26th-30th Sail Power & Watersports Show
Earls Court, London, UK. Upstart rival to the London Boat Show in January (see below)! AYRS will NOT be there unless someone gives us a free stand, but we would welcome feedback from those who go as to whether we should be there in 2009. Details from http://www.earlscourtboatshow.com.

December

No AYRS London meeting

January 2009

9th - 18th London International Boat Show
EXCEL Exhibition Centre, London Docklands. AYRS will be there, in the North Hall. Helpers are wanted to staff the stand, sell publications and recruit new members. If you would like to help (reward: free ticket!) please contact the Hon Secretary on 01727 862268 or email office@ayrs.org

25th All-Day AYRS Meeting
9.30am-4pm, Thorpe Village Hall, Coldharbour Lane, Thorpe, Surrey (off A320 between Staines and Chertsey – follow signs to Thorpe Park, then to the village). Details from Fred Ball, tel: +44 1344 843690; email frederick.ball@tesco.net

25th AYRS Annual General Meeting
4pm, Thorpe Village Hall, Coldharbour Lane, Thorpe, Surrey (as above). Details from the AYRS Hon. Secretary tel: +44 (1727) 862 268; email: secretary@ayrs.org

Note: Items to be considered by the AGM, including nominations for the Committee MUST be received by the AYRS Secretary before 22nd December 2008 (post to AYRS, BCM AYRS, London WC1N 3XX, UK, or email: secretary@ayrs.org)

April

26th Beaulieu Boat Jumble
The National Motor Museum, BEAULIEU, Hampshire, UK. AYRS will be there!

May

2nd – 4th *Broad Horizons* – AYRS Sailing Meeting
Barton Turf Adventure Centre, Norfolk UK, NR12 8AZ. Contact AYRS Secretary AYRS Secretary, BCM AYRS, London WC1N 3XX, UK; email: office@ayrs.org. Note: All boats limited to 1.2 metre max draft!

23rd-26th UK Home Boat Builders Rally – Norfolk Broads
Barton Turf Adventure Centre, Norfolk UK NR12 8AZ. Details see http://uk.groups.yahoo.com/group/uk-hbbr/

June

5th – 7th Beale Park Boat Show
Beale Park, Pangbourne near Reading, UK. Open air boat show with a number of boats available to try on the water. AYRS will be there again selling publications. Contact: Fred Ball, tel: +44 1344 843690; email frederick.ball@tesco.net

How to supply information for publication in Catalyst:

The Best way to send us information:- an electronic (ascii) text tile (*.txt created in Notepad, or Word, with no formatting at all, we format in Catalyst styles). Images (logically named please!) picture graphic files (*.jpg, gif, or *.tif)

Any scanned image should be scanned at a resolution of at least 300 ppi at the final size and assume most pictures in Catalyst are 100 by 150mm (6 by 4 inches). A digital photograph should be the file that was created by the camera. A file from a mobile phone camera may be useful. Leave them in colour, and save them as example *clear_and_complete_title.jpg* with just a bit of compression. If you are sending a CD, then you can be more generous with the file sizes (less compression), than if emailing, and you can then use *.tif uncompressed format.

For complex mathematical expressions send us hardcopy or scan of text with any mathematical characters handwritten (we can typeset them), but add copious notes in a different colour to make sure that we understand. Include notes or instructions (or anything else you want us to note) in the text file, preferably in angle brackets such as <new heading>, or <greek rho>, or <refers to *image_of_jib_set_badly.jpg*>.

Otherwise: — If you write in longhand, and sketch or include photographic prints, and trust to snail mail (a copy, never the original) then all can and will be dealt with. If you have trouble understanding anything in this section, email to ask.

As examples, the polar diagram p16 of *Catalyst 28* was re-created from a second generation photocopy, photos of shunting in the Champion article in *Catalyst 27* (pp 19-21) were screen grabs from a video supplied on DVD. The rest of the images in that article were scanned from photographs, and the text was OCRed (Optical Character Recognition software) or keyboarded.

Send a copy of your work (copyshops can scan to file and email for you):
by email: catalyst@ayrs.org,
by fax: +44 (8700) 526657, or
by post: Catalyst, BCM AYRS, London, WCIN 3XX

Catalyst — *a person or thing acting as a stimulus in bringing about or hastening a result*

On the Horizon . . .

J wheels that run on water
The Tazmaran - oscillating mill-prop craft
Split junk sails
Yuloh theory & practice
Experimental platforms
More sources and resources: reviews, publications and Internet sites

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Printed by HenDi Systems & Communications, London N1 6DL.