



“SAM - WE JUST SPOTTED A SHARK - glad Bryan made it all the way.” Paul MacCready’s profound announcement over the intercom from the cross-channel navigation boat was the exciting climax to his two and a half years of human powered flight experiments. Who really believed that after the first flight of the original Condor on December 26, 1976 that by August 1977 Paul’s team would have captured the hitherto elusive 50,000 prize awarded by Henry Kremer for the first figure-of-eight flight? Or that barely a year after the first tests were made with the third generation MPA by MacCready, the Albatross would have met its seemingly ultimate challenge? When Henry Kremer sportingly gave 100,000 into the keeping of the Royal Aeronautical Society for the first crossing from England to France, neither he nor anyone else connected with man-powered flight could possibly have anticipated such speed of progress. We spent many inspiring hours with the talented and youthful Albatross crew during their six week stay in England. Almost every one of them an aeromodeller and most with hang gliding experience, they shared a mutual understanding of creativity and imparted such a sense of purpose that merely to be associated with them was an absolute pleasure. There never seemed to be any question that the result would be other than successful. And yet when the absolute achievement came, there was no yelling or cheering, just a simple

Epic story of Paul MacCready’s 100,000 Kremer prizewinning Man Powered Aircraft

as seen by Ron Moulton with Martyn Cowley and Pat Lloyd

statement from the incredible “engine” Bryan Allen - “I’m just a biologist from Bakersfield” . . . Modesty has its virtues.

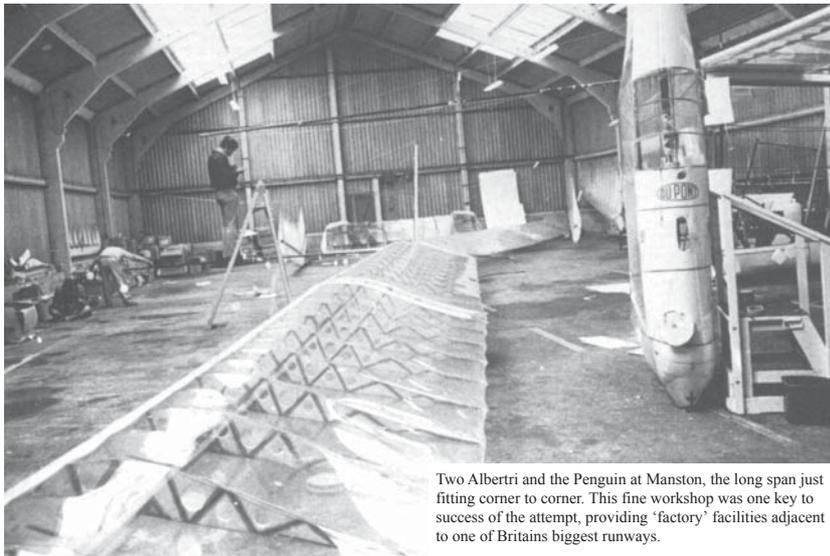
THE MACHINE

Finished by June 1978 the first Albatross test flights made in July and August gave encouraging results over the Mojave desert; but when moved to Long Beach, and test flown over airfield runways close to the sea, a series of malfunctions resulted in crashes that demanded improvement. Like many a good model, the Albatross improved through repair and became a reliable bird. Tested at Harper Lake, the Albatross started making fifteen minute flights which were twice the duration of anything previously achieved, but disappointingly, Bryan Allen and his back-up pilot Kirk Giboney were landing somewhat exhausted. Solutions came in a surprisingly simple way. They changed the propeller. Over on the East coast at MIT, Massachusetts, Professor Larrabee had produced an optimised propeller design from his computer. He plotted chords and pitches for a blade design using Eppler 193 aerofoil section. Aero modelling hot wire wing core cutting techniques were used to make the new propeller in Dow SM styrofoam (2.2 lb/cu ft). To cope with the blade twist, the prop was “chopped” into sections of eight

to ten inches length to accommodate progressive angular changes so that at no stage was there an error of pitch greater than half a degree.

The root section had a spanwise hole cut in it to accept a one inch carbon tube which eventually joined it onto the prop shaft gripped by a simple hose clip, each other section was notched for carbon spars which joined the tube at the root. Butt-joined end-to-end then covered with Kevlar and epoxy finished the new prop contrasts with the previous lightweight built-up constant chord ‘Paddle’. Kevlar is not only considerably lighter than glass fibre but it is also much stronger, however it does have the disadvantage of fuzzing when sanded and is thus more difficult to surface finish. There was a weight penalty compared with the original built-up prop but the pilots reported that, “If you put power into it, it really put power out”. By which they meant that they could really feel the response in thrust to extra pedalling effort. In fact, such was its power absorption that on two occasions Bryan Allen shattered propshafts through the load generated by initial acceleration.

On April 25, Bryan Allen made the first long flight of 69 minutes, covering a distance of 13 air miles over Harper Lake. Only reason he landed was that by then he had returned to the start point and it was

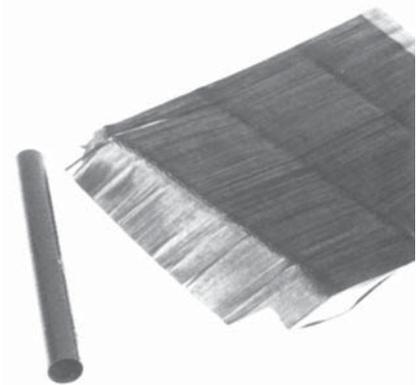


Two Albertri and the Penguin at Manston, the long span just fitting corner to corner. This fine workshop was one key to success of the attempt, providing 'factory' facilities adjacent to one of Britains biggest runways.

Kirk's turn to fly. Confidence abounded and with Du Pont sponsorship secured, the long move to England was imminent. Viewed from afar, it appears somewhat hasty that after only one long flight on a Wednesday, the machine should be loaded three days later over the following weekend on a Royal Air Force Hercules returning from Nellis Air Force Base in Nevada to RAF Lyneham. Yet in the meantime, the Albatross had been dismantled and trucked hundreds of miles to Los Angeles where it was found that TWA Cargo holds would not accept the components through their doorways! Needless to relate, not a little influence was bought to bear and with the wholehearted cooperation of the RAF, three MPA's were airlifted all the way to the UK. The original Albatross was accompanied by the much lighter and improved but incomplete structure of a near duplicate Mark II and a 75% sized version known as the Penguin with 72ft instead of 96ft span. By May 2nd this unlikely package was in Wiltshire, with no place to go! Yet within a day, a home had been found at RAF Manston in an eminently suitable motor transport "hangar". The team based themselves in a local hotel at Ramsgate after following on standby's and Skytrains. Then Albatross was assembled and by Saturday, May 5th it made its first flight in England - only 10 days after that magic 69 minutes duration flight in California. To qualify for the cross-Channel attempt, all machines

have to go through an airworthiness test in which a flight of at least 2 minutes or 400 meters length is demonstrated. Such a task was a mere nothing for Bryan Allen and the Albatross and two flights were made on May 10th at 4.30am along the vast Manston runway each creating new, unofficial European records. Now it was a matter of sorting out the complex logistics and the innumerable fine points attached to setting up the crossing; but first there had to be a promotional announcement to the National Press. Where else to hold such an affair other than the United States Embassy, Grosvenor Square, London? The Ambassador, Kingman Brewster declared that he was personally interested "because he was a one-time model plane maker". It was at this press reception that the quiet confidence of the team emerged to impress the otherwise hard bitten aeronautical journalists of the world. "No" said MacCready "we've never flown over water except maybe over a runway puddle at Long Beach". Pressed for a prediction on when he might try he said, "Well certainly not before next Monday". It was in fact to be some time before another flight was made, at the very end of May after three frustrating weeks of typically British weather variations. During that time the team had just one day off and that included seven hours of driving to visit a Flying Day at Old Warden and the British Indoor Nats at Cardington. These were pleasant, reflective breaks. Slow flying indoor duration

models were familiar to MacCready who'd once been US National Free Flight Champion (as well as the first American to win the World full size gliding Championships) but to others in his team, the sight of microfilm was a novelty which helped to inspire them in their work. Although less like a gigantic indoor model than the original Condor, the Albatross is very much an enormous man carrying model. Its structure carries no balsa. It could be claimed to be almost entirely plastic. "A flying sandwich wrapper" is the sponsor's (Du Pont) claim; but this over-simplifies the situation. Main differences between



Epoxy impregnated fibres (right) which roll into tubes (left)

the Albatross and the Condor II lie in the reduced wing area, meaning increase of aspect ratio, and much shorter wing chord, reduced by over two feet, together with the changeover from aluminum main structure to carbon fibre reinforced plastics. Everything that stands out black in the photographs of the Albatross is carbon fibre. All ribs are capped with a 1/4in wide strip and they are also strengthened with black diagonals. One pound grade expanded polystyrene which is used for the majority of the rib and leading edge structure is reinforced in this way, and so too are all the tubular spars made from flat sheet epoxy-impregnated carbon fibre. Bill Watson, an aeromodelling deep thinker from Van Nuys created the tubes in a homemade cooker. The carbon fibre is wound around an aluminum tube of either 1 in, 1 1/2 in or 2in diameter according to its ultimate purpose. Similarly the pitch of the spiral winding over the tube determines the strength. For example, spars which have to stand compress-

sion have a 15ø spiral winding whilst the forward canard or stabiliser spar which has no compression loadings has a 40ø spiral winding. There can be up to as many as four layers of these .007in carbon fibre applications which are made one above the other in opposite spirals and then bound by another home-made machine with strapping of Mylar tape at approximately 1/4in pitch. The aluminum tube, now wrapped with its multiple layers of CF and tightly bound by the tape is put inside a 4in aluminum tube. This has an epoxy and NiChrome wire sandwich wrapped around the outside

placing a 3in long splice tube between the two lengths, rewrapping around that area with fresh carbon fibre elements and re cooking in the oven with the joint in the centre of the oven tube to make a 24ft spar or bowsprit. The Albatross can be broken down to a simple basic tubular structure. Its bicycle frame leads up to its support of a tin carbon fibre prop shaft, the thrust of which is taken against a universal bearing at the front, with a large diameter ball bearing at the rear. The whole hangs underneath the crucial centre joint on the spar, and from the same position the bowsprit projects forward. All the

leading edge, hidden amid the light styrene structure. Whilst the wing structure is extraordinarily simple, all connected with its making declare that the second Albatross version is infinitely lighter and more satisfactory due to accumulated mods. A misfire with glue, using contact cement instead of epoxy in the first instance called for a complete recover of the wing. For transportation the wing had to be cut and inserts fitted which added weight and reduced span. Hole cutting proved to be a false economy, saving a mere 4 1/2 ounces, at the same time creating buckling which had to be compen-



Bill Watson, demo's how he does it.



Blaine Rawdon contemplates a Styrofoam prop.



Rib maker Ted Ancona and 2oz Rib section.

which connects to any 40 volt direct supply and cooks the tube up to 300ø. After four hours the epoxy is set rock hard but the tube has expanded with the heat and the Mylar shrunk tight around the carbon. It is removed, allowed to contract, the tape detached and all that remains to be done is to etch the aluminum core out with Muriatic acid such as is used in California for cleaning outdoor pools. End result is a very light carbon fibre tube. There are snags. The large diameter (2in) needs a styrofoam plug about every 8 or 10 inches to hold shape and prevent ovality. (The tin tube especially with four layers is immensely strong and has other applications not only for aeromodelling but also for bicycle frames of the future.) Since the carbon fibre does not come in very long lengths, it has to be carefully joined when setting up the spirals. Similarly the cooker itself is limited to a 12ft length. But the wing is 96ft and each section 24ft long so joins had to be made. These were simply effected by taking two lengths,

vital angles are set in this one main joint and a total of 25 external plus a further 5 internal brace wires hold the whole assembly together in yacht rigged fashion. Because the wing spar is set at the aerodynamic centre, the surfaces remain remarkably warp free and do not have any twist in flight except that which is induced by the pilot. Covering is tensiled Mylar, so arranged that the main tension is spanwise to sustain the aerofoil accurately. Herein lies another enormous difference between the Condor and the Albatross. The later wing is better in every way. Reduced chord of 5 ft 6 in enabled 1/4 in foam 'solid' ribs to be hot wire cut using a plywood template and apart from the carbon fibre around the outline and cross bracing, there is only a 1/32 ply ring reinforcement at the spar hole. A single wire forms the trailing edge and inevitably adopts a scalloped effect between ribs as the tensiled Mylar pulls-in (at the same time also bowing the entire structure considerably as shown in the drawing). There is also a tension wire along the whole

sated with the many diagonals and extra glue joints. Weight of the glue in the wing became critical and many of the assembly diary records concentrate on the rate of application and the weight of the amount of glue used. Five minute epoxy was the standard medium, together with the inevitable blow dryer used also for tensioning the covering (which incidentally is only held in place by twin stick tape of a rather special lightweight variety). Designed to operate at 6ø using Lissaman 7669 section, the wing incorporated the same warp control first devised for the Condor's figure-of-eight flight though this was to be used as a correction only three or four times during the Channel crossing. Instead, all course deviations were induced by the Canard stabiliser which is suspended on a single floating 10 in styrofoam strut (reinforced with CF) and controlled by Kevlar strings direct from the two hand controls in the cockpit. These actuate small ailerons, scarcely bigger in area than a ceiling tile each, at the stab tips and



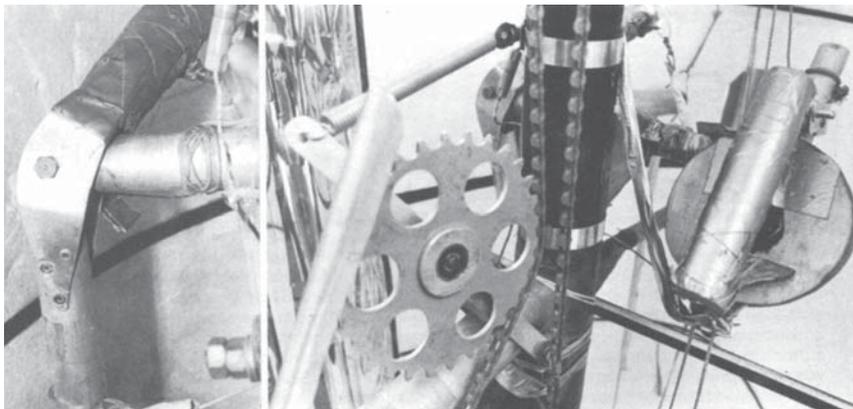
same plastic chain as manufactured by Winfred M. Berg (Max-E-Pitch timing chain) has been used and proved to be invaluable. This comprises a plastic covered stainless steel cable on either side of rigid discs which are all encased inside red polyurethane plastic. The pitch fits French racing cycle sprockets and tension rollers, without apparent stretch problem, so the chain has contributed in no small measure to the success of the machines. All of the propulsion system; the undercarriage with its two child's toy wheels; instrumentation which includes the transducer Polaroid camera focusing height sensor, altimeter, thermometer; plus an important ventilation system to reduce the internal humidity, is

Only another hour to go! - Joe Mastropaolo checked Bryan Allen on daily ergometer runs at .3hp. Note 2 litre water bottle for controlled intake.

it comes as somewhat of a surprise when one stands close-by to see its enormous bulk, almost 10 ft high and over 8 ft long. Also to realise that it is hanging under the massive spar centre connection, all held together with epoxy, Kevlar string, and a single nut and bolt!

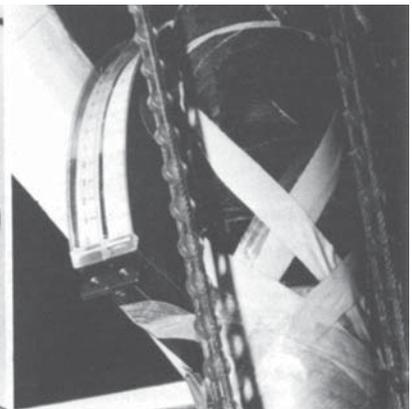
TOWARDS THE FLIGHT

For weeks we were, even more than usual, wind-watchers. Late night calls to Ramsgate and early morning peeps at the wind rustling leaves in the dawn conflicted with the prediction that the first week in June would be as in almost every year before a window in the Channel weather. Thirty five years before, Eisenhower had chosen this week for the D-Day Invasion. Thirty five years before that, Bleriot had flown the Channel,



Left hand controls pitch and turn

Right hand selects clickstop warp disc. Note plastic chain and sprung idler for chain slack



Airspeed and altitude vertical scale taped to tube

as servos, they tilt the surface 90° to either side to induce a turn. Other strings adjust the pitch, up or down. The Canard is not typical in that it operates at a lower CL and considerably less angle of attack than the main wing. In fact, the CG of the whole machine is almost in the position of a flying wing due to the reflex section and $70^\circ 30'$ mean sweep. Being extremely docile in control, with one or two seconds lag in operation, the pitch and roll corrections absorb only a minute fraction of the pilot's horsepower during his major effort at propulsion - a critically important factor for long flights! One major change over the Condor is that the pilot has been moved into a more natural bicycling position from the supine attitude. The

enclosed within a streamlined gondola reminiscent of the high speed bicycles which are becoming popular in California. Dr Chester Kyle designed a racing cycle streamliner which achieved almost 50 mph in 1974. Paul MacCready, Jack Lambie, Dave Saks and others in the Condor/Albatross team have all been involved in the IHPVA (International Human Powered Vehicle Association) which achieved remarkable speeds in unpaced runs at the Ontario Speedway near Los Angeles. Kyle's racer had indirect influence on the shape of the Albatross fuselage. So too was there an aerodynamic influence through the flow straightening effect on the propeller thrust. A deep fuselage is an essential to carry the wing bracing, enclose the pilot and provide the vertical fin area. But

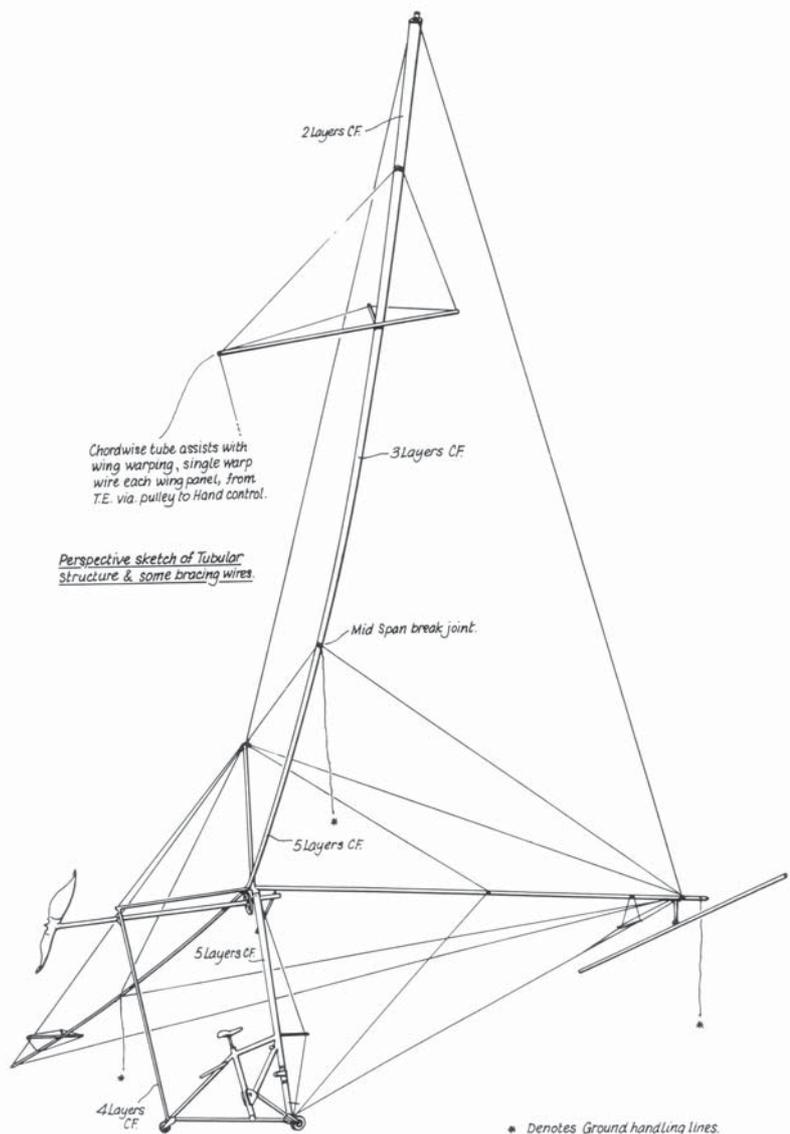
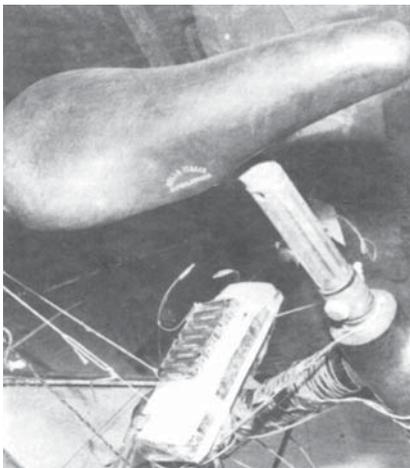
so why should this not now be the time for the great crossing? But we went through that week from June 4th to 10th (Scale day at Old Warden) with just too much breeze over the sea. On Monday 11th an almost stationary "high" centered itself over England gradually moving south-easterly. This was what we were waiting for. By mid-afternoon Sam Duran advised us there was better than a 50% chance of at least a 'practice' for the massive operation which had now built up. Two motor launches, four Zodiac rubber rescue boats, countless suits for underwater diving, flares, involvement of the Coast Guard, the Lifeboats, Customs and all the other paraphernalia attached to an otherwise simple crossing of the Channel were by now

energised. At midnight, the telephone recording in Du Pont's master office at Deal was sending out the message that "Dr Paul MacCready had moved his troops from Ramsgate to the Warren at Folkestone". Our own arrival in the dead of Monday night might well be compared with a flashback to Kitty Hawk. With little to illuminate the narrow pathways down to the British Railways' platform on the sea edge, we found our way (Pat Lloyd, Martyn Cowley and myself) to the large shed which housed the Albatross. Inside we found a single guardian, his radio playing pop, the local paper being read in the miserable light of a single hurricane lamp, yet he was surrounded by parts of an historic $\approx 100,000$ aeroplane dangling from the ceiling on cords in various pieces. We inspected the intricacies of this familiar shiny dragonfly by torchlight. I doubt if we'll ever forget the atmosphere of the moment. Two hours later the scene was to change completely. The troops had "arrived". A mobile generating plant was started, its overhead cluster of lights spreading a pool on the white concrete in the midst of dead blackness. The pieces were carried gently outside. There was not a breath of wind and assembly over the heaven-sent platform was a simple, very quick process. We took the opportunity to check the wing sweep, a matter up to then of much conjecture, complicated by the rigging and the spar curvature. By 02.30 the wings were being lifted off the concrete and erected on the fuselage. Paul MacCready was followed every-

where in his movements by a cluster of newsreel and radio men. Their long mikes poked through the heads to catch his every word and listen to the slow deliberated pronouncements of this catalyst who had brought together such a fantastically talented team. "At this moment, the wind here and at Cap Gris Nez is still, but at mid Channel it is 5 to 6 knots and on that basis we would have too long a flight"-that was the first announcement. Bill Watson confided this was going to be no more than a good full-scale exercise. Like us he felt it in his sleepless bones. Assembly progressed slowly with pilot Bryan Allen playing his part by attaching the canard and checking the control system. Time melted away. We played Bryan our tape recording of the great Lord Brabazon's account of his first ever flight-and crash. This light relief at a moment when tension was rising as

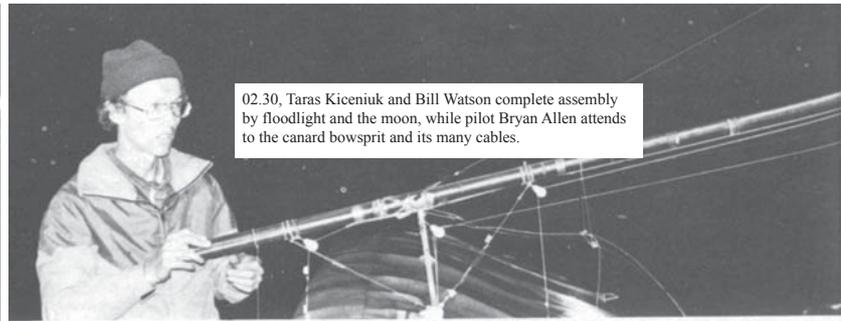
fast as the eastern dawn, set the scene. When we arrived and found the lone guardian it had been like visiting Kitty Hawk to find the Wright Brothers. Now we were in an atmosphere of being on Roosevelt field, Long Island amid growing crowds awaiting for the departure of Lindbergh on his flight to Paris. Marines kept the spectators at bay. Four Bobbies added authority. Boats were in position, and as the full moon reappeared out of the overcast, we could just make out the anchored master launches about a half mile off shore. Changed from their California casuals and indistinguishable except by shape, in their Black Knight wet suits and waterproofs, the team were ferrying the Zodiacs back and forth to the Tartan Gem and Lady Ellen Elizabeth which were to be the flotilla leaders. By 04.20, the decision was made to move everyone into

Hot seat from Stella Italia, and lightweight radio

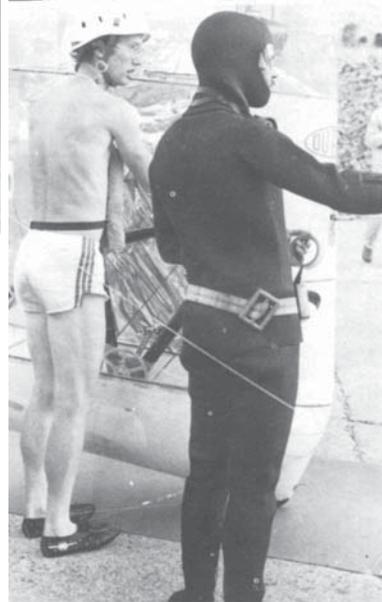




position for a “practice” and the take-off runway of hardboard sheets laid down to smooth the way over the rough concrete surface. Early morning light gave a ghostly tone to the Albatross as it poised stationary, held only by the two handling cords from its wings as Bryan got aboard his Italian saddle, aided by the omnipresent Sam Duran. Out in front, looking after the stab and the end of the bowsprit was young Marshall MacCreedy, one of three sons who were helping their father Paul in this historic attempt. Out at sea with the other MacCreedy’s on the Lady Ellen which had positioned from Sandwich after an all-night voyage, I watched anxiously. Paul advised by 05.10 that there was to be a take-off. Great! After 20ft roll Albatross pitched forward, and stopped abruptly. Over the VHF a calm and collected Bryan announced that he had “a little wheel trouble”. More than a little. The change from the original nose wheel which had split on the last of the seven flights at Manston, had become a small disaster. Taras Kiceniuk, pioneer of Californian biplane hang gliders and designer of the famous Icarus series, leapt from a Zodiac into action. Another spare wheel of the original type was hastily fitted. For one anxious moment they ran out of pliers but a shout brought dozens from car boots, tool kits, everywhere, among the anxious onlookers. By 5.20 the wheel difficulty was being



02.30, Taras Kiceniuk and Bill Watson complete assembly by floodlight and the moon, while pilot Bryan Allen attends to the canard bowsprit and its many cables.



Wheel replaced, life jacket on, Bryan has Tares point the way.



Bill Watson seals the 'door' as Sam Duran makes final checks.

overcome; but it was to take another nail-biting 20 minutes before all was ready once more and the pilot re prepared for his venture. The risk was now that any flight of longer than 2 hours would mean an arrival in blustery conditions on the far coast. Falling tide and a rising sun brought their own complications. Bryan had a Mylar reflective heat shield on the left side of the nacelle which was intended to diminish the heat effect, and he would be looking forward to a full expanse of sand at Wissant but as the day wore on (still only 05.45am!), it was the sands of time which were running out rapidly. British Rail found some more sheets of 3/4in ply and laid these end to end to extend the runway, headed out towards the Dover Harbour profile looming through the rosy early mist. At sea, the Zodiacs led by Project Manager Sterling Stoll awaited what was still to be a “practice”. If need be, Bryan could possibly land the gondola on the larger Zodiac whilst others in formation secured the dangling lines. In this way it was

hoped that even a “water” landing might be kept dry for return to base. There was also a scheme to hook on a towline in case of trouble in the air.

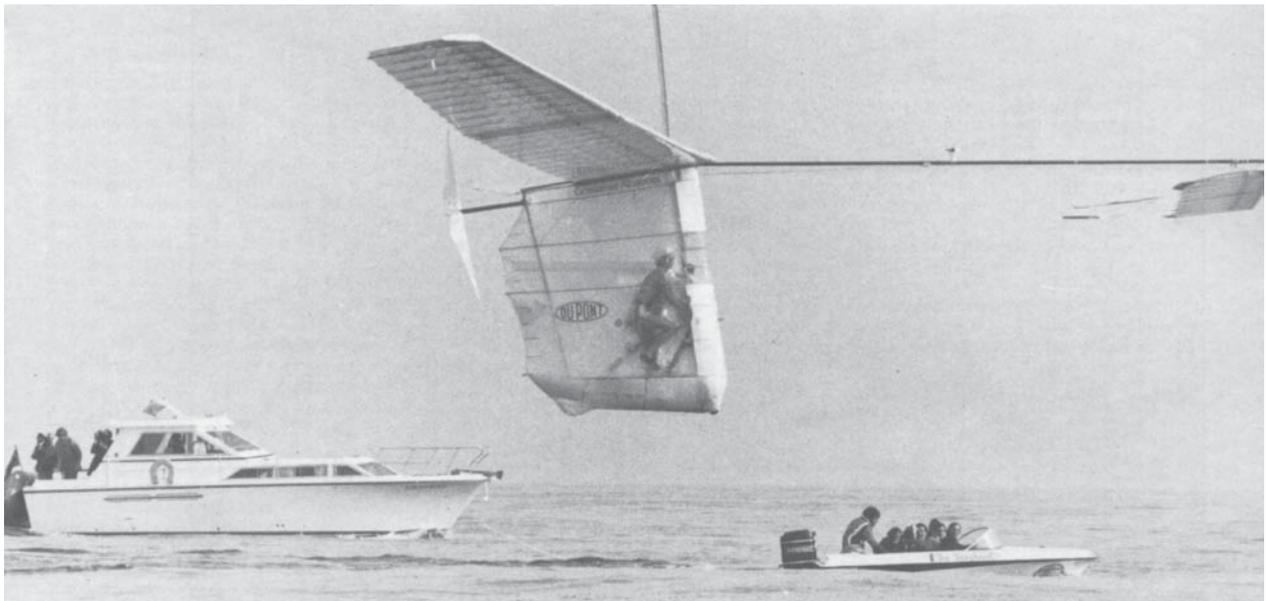
THE FLIGHT

Below deck in the Lady Ellen, VHF radio told Paul that all was set once more for take-off. He gave the okay and came on deck to watch with Parker and Tyler his elder sons, each a qualified man-powered aircraft pilot, and from the Moonraker now rolling in the ebb tide we viewed a panorama of cliff backdrop to a scene like silent cinema. Passengers in the early morning train from Folkestone to Dover could hardly have been aware of the drama being played out 100ft below them at the shoreline. Inexorably, the off-white profile began to roll forward as if to chase the train. We crossed fingers as it gained speed. Martyn and Pat, close by, felt each jolt of the plastic wheels as they jumped the ply joins. Still rolling as she ran out of panels, Albatross lifted gracefully at 05.51 and seconds later was over the

platform edge, headed seawards - and eastward! "Wow" was Bryan's first thought as the long line of well wishers yelled encouragement. A chorus of outboards opened up as the flotilla fell in behind the graceful aeroplane. From our seaward position, we flashed a red guide light for all to follow. Motors idling, and heading 135 degrees, the Lady Ellen was to be Command Post. No doubt now that the challenge was 'on' as the Albatross approached, steadily growing in size as it turned to face

path but with a safe and adequate margin. Now firmly set on 135 degrees, the Lady Ellen spearheaded a small armada with the white surfaces of the foam plastic in Albatross shining bright in the early sun, fifteen feet above the black Zodiacs. In the confines of the Mylar gondola, Bryan's rhythmic pace of pedalling at 75rpm, which he had practiced daily for months made the gruelling task almost a bore... A calm sea made it seem so easy yet only five minutes later at 06.10, the first

pumping away, the propeller still flickering before our eyes and defying an rpm count (we made it anywhere from 85 to 115 rpm-though in actual fact it was a constant 95 rpm almost all the way). As we left the inshore traffic zone and entered the stronger mid Channel tide drifting at up to a knot from the North Sea, our own heading veered to 115 degrees. This was one factor we hadn't fully appreciated. Whilst the navigational boat has to contend with the water surface variations of tide and conse-



Away! The Siegfried and The Vagabond Press boats make Channel crossing seem so easy but...

us, holding 15ft above a mill pool surface. Could it be true? The whole scene was unreal. For a full 5 minutes the Albatross curved on to course, its orange tipped prop blades strobing as though pulsed by each stroke of Bryan Allen's powerful legs. "Lets go" came the command as Parker's rule of thumb (actually thumbs on a ruler sight) told us that the craft was within 1500 metres! With a flurry of foamy wake the Lady Ellen opened up. 10 knots was the estimate, and a further five minutes proved that Bryan's speed was exactly that. The reality of the mission was emphasised as a yellow topped lifeboat out of Folkestone came to join the fifteen other boats and a total of five inflatables. Ahead of us with an indistinguishable horizon lay a seemingly unlimited sea punctuated by the shapes of the huge tankers. Within fifteen minutes of the take-off a large container ship crossed our

indication of difficulty arose. Until that moment the modified Motorola two-way radio had been perfect. From our command post to Bryan Allen and Sam Duran in the accompanying pneumatics, there had been a complete link but now Bryan was making signs that he was speaking and not getting answers. Obviously he could still receive, and fortunately the rescue boats could stay close enough to ensure that by a wave of a hand, Bryan had heard the instructions. A sense of isolation, created by inability to talk back emphasised Bryan's feeling of total responsibility for the success of the flight... The Lady Ellen's skipper Ron Ward told us before we had started that "if the flight isn't made today it would never be made", meaning that conditions were extraordinarily exceptional for the treacherous Channel. Unbelievably, we progressed over six miles at this steady ten knot pace, Bryan

quent drift also the rise and fall of the water, the following aircraft is operating at a constant height and heading when there is no wind. Until we had gone to the eight mile point and were approaching the Varne Lightship at 06.47 the dream-like trouble free sequence continued interminably. It was shattered somewhat when a worried looking Paul MacCready emerged from the navigation room, to look ahead at the ripples appearing on the surface. The perils were all too apparent. Behind us lay a millpool, almost desperate effort to remain airborne, its pilot struggling to increase thrust, and flailing against a headwind that threatened to cancel the whole mission. Project leader Sam Duran then radioed Bryan to confirm that flying in such turbulence seemed hopeless, and that if he wanted to abort the flight and take on a tow he should raise an arm to signal. Bryan did not want to give up - no-one

Zodiacs close-in as Albatross sags low over mid-channel swell against a cruel headwind. At times the clearance was mere inches! Don Monroe photograph.

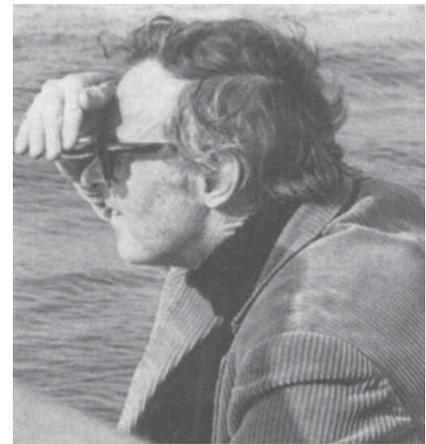


wanted to give up; he pedalled bravely on this was the point of no return! Guests on the bridge of Horsa by kind invitation of a hospitable Captain and Purser, Judy MacCready and young Marshall were looking at the scene from afar through the ship's binoculars. They had at the last moment dashed to Folkestone and persuaded the ferry to take a parallel course on its normal journey to Calais. While our attention had been captured by the bulk of the Horsa on our port side, a new hazard emerged from the mist ahead what could have been described as acres of rapids. As we approached, it did not seem too bad, but it was clear that we were gaining considerably on the Albatross and the order was given to slow engines and slow we did, steadily, as Parker and Tyler MacCready called out the distance remaining between the Albatross and the Lady Ellen. We lost all of five knots. What's more it was not a convenient headwind but one from the port quarter which added to the complication of the tide. Paul estimated that at this rate the crossing could not possibly be completed within two and a half hours, until then considered to be an absolute limit of endurance. There was no land reference to be seen, only a minesweeper orbiting our group in curious fashion. We might well have been in mid-Atlantic! Bryan was clearly having a great struggle physically and mentally as the hopelessness of the attempt dawned on the team. These were moments when even the committed official observers daren't look at this white bird in mid ocean, its stabiliser

Headed for rocks, desperate to succeed, exhausted, fighting side wind and cramp, Bryan approaches the Wissant beach.

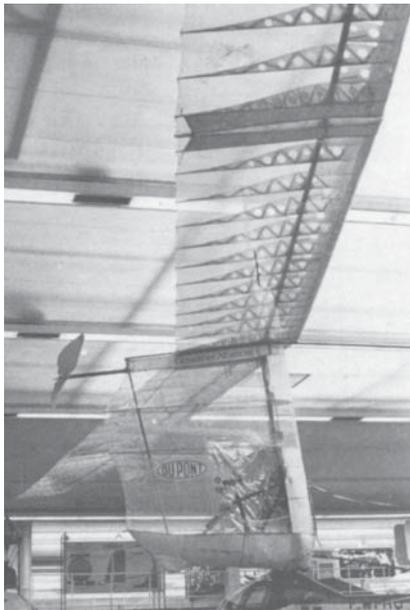
flopping side to side in for another five minutes before finally submitting and signalling to the boat crew. As the lead Zodiac positioned itself under Gossamer Albatross, Bill Watson stood up with the modified fishing rod ready to hook up under the front wheel. Bryan pedalled his craft up to fifteen feet altitude to allow the Zodiac to get in underneath, and as he did so noticed a marked improvement in the Albatross's performance. The air close to the rough sea was turbulent, but here only a few feet high it was markedly much smoother. Bryan now realised he could fly on a little further and now began yelling and waving "don't hook up yet!" Fortunately, Bill heard him and Bryan flew on - and on. The plan had been to skim the surface of the water to benefit from ground effect lift, from now on when the surface of the sea was calm Bryan would fly low as planned, but when the surface of the sea was choppy he would return to this higher level ... Over to one side the Seaspeed Horsa channel ferry boat provided a dramatic reminder to those followers with only a couple of inches of

freeboard that directly ahead-on a collision course. One of the biggest of all tankers lay right on our path. It seemed inevitable that we would be heading for either a collision, or a turbulent near-miss. Navigator Frank Booton was already in touch with HM Coastguard at St Margaret's Bay who were plotting the positions by radar and radioing the Captain to alter course. This deviation was taking us to the south of our destination. It could not last for long, but in fact for almost two miles we were now moving with some 3 Kts tidal



Designer Paul MacCready seeks landfall.





Feted in Paris at the Musee de l'Air, le Bourget, the Albatross was honored by dignitaries in the aeronautical world.

assistance to the south of our true line between Folkestone and the Cap. There were troubles among the Press boats too. A small launch, commissioned by Japanese TV broke down. It had to be left behind. Presumably they fixed the problem as we heard no more! To Bryan, the flight just continued remorselessly, with the flat, featureless seascape of the channel extending limitlessly in all directions. He was apparently making no visible or mental progress as he pedalled to the continuous rhythmical accompaniment of the outboards and motorboats pop-popping along . . . 14 miles gone and now 7 knots on the log, we resumed the heading to bring us north of Cape Gris Nez, now we were heading 123 degrees. Soon after the 2 hour point, problems started mounting for Bryan. His carefully measured, weight conscious rations were running out. First he exhausted the two litre water supply, of which he needed to drink a measured amount regularly, to prevent draining his energy through dehydration. Soon after both altimeter and airspeed indicator failed with flat batteries. He was flying blind, in danger of dropping into the water or falling below stalling speed. Unable to accurately determine his position over the translucent swell of the channel, his only reference now came from Taras Kiceniuk radioing his height, "two feet... one foot ... 6

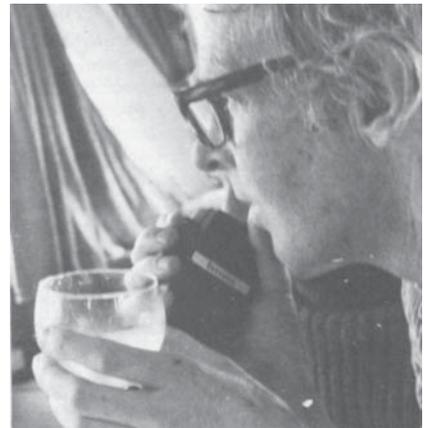
inches, pedal Bryan, pedal". On several occasions Bryan was literally inches from being swallowed by the sea. Only a super-human spurt on the pedals lasting 15-20 seconds, equal to the power of another take-off run saved him. Such exertions kept him aloft, yet drained his energy still further and now he was suffering from leg cramps as dehydration set in. He felt during each minute that he could go no further yet he continued, with 4 1/2 miles still to go ... It was now 8.00 o'clock and a hundred press men were willing Bryan to "Come On". Though the sea surface was now calmer, it was by no means a millpool and clearly the French coast was going to present us with some unanticipated difficulties. The wind seemed to be approaching north-easterly, parallel to the coastline. It was critical that when the Cap emerged, that we should be to the north side because any drift past that point would be nothing short of disaster! Two and a quarter hours gone and still only the barest shape of land in sight. Nothing solid. We slowed a little then the calm sea ahead gave us encouragement and almost simultaneously, that so welcome lighthouse arose from obscurity. When Bryan finally

sighted land, his heart sank. To give up in mid channel was somehow excusable as a brave attempt. To surrender in sight of land would not only let the whole team down, it would be a tragedy. Yet the Cap was still 2.7 miles away! As Bryan's right leg muscles seized up he continued by making up with more power from his left. When this leg gave pain, he reverted to the right. Finally he was literally limping along in the air with the French coast hardly moving perceptively any closer... There was a wind even if it didn't ruffle the surface and Bryan was making a bare 7 or 8 knots. Fifteen more minutes and land was looming larger, we were now obliged to veer off to the left ourselves to avoid the shallows off shore. Paul, Parker, Tyler and fellow observer Brian Faulkner Bryant were now wreathed in smiles. All Bryan had to do in the Albatross was to make those last 1; miles, to position himself over the sandy beach. Through the glasses we made out a small group of welcoming French people on the rocks and then a red balloon ascended. It was carrying a transmitter aerial aloft for live coverage on French radio and TV, and unwittingly provided a perfect signpost for Bryan to locate

In borrowed jacket 10 and pants with a bunch of flowers in celebration, Bryan the engine gets his feet wet for the first time.



Paul at the moment of congratulation to the victorious team. "That's one job we don't have to do again."



Taras, Blaine and Dave Saks are jubilant as they lead Ted and Bill Watson off the beach, their job done.



his landing point. With an air temperature of 68 degrees, sea temperature 54 degrees and his own body temperature building inside the fuselage, up to 72 degrees the Mylar had mostly misted over and forward vision became limited. Near exhaustion, Bryan was not thinking clearly. Should he head for the nearest coast and crash on the rocks to at least make landfall? Or should he try to continue along the coast to the beach and risk falling into the sea and losing the prize at this final hurdle. He willed his legs not to let him down and negotiated the surf-splashed rocks, now covered with French reporters. Eyes straining against the haze, we followed Albatross as Bryan threaded his way through the rocky area towards the strand of beach. Minutes ticked by interminably, 8.30 ... 8.35. Rounding the final outcrop of rocks into the bay the wind again took the upper hand and Bryan found that full canard deflection and wing warp were having little effect. Albatross was being blown back onto the rocks, yet finally it responded, he was back on course over the surf, over the beach. Albatross hovered in the breeze savoring the final seconds of its epic flight before alighting on the beach in France at a magical 8.40 am. It was down - people were running, grabbing the lines to hold Albatross steady and upright on the beach. We raced from the Lady Ellen after cracking a bottle of the Skipper's champagne and congratulating the crew for a fantastic piece of navigation, and waded our way through the surf from a Zodiac to find Bryan, now in the care of Dr Ingrid Dodd. Modestly, he was receiving the acclaim of the world's press, clamoring to capture historic photographs. Paul MacCready hobbled through the surf, one leg still in plaster after cracking his ankle in a recent jogging accident, to congratulate Bryan with the words "Well done kid, take the rest of the day off". A bemused Gendarme and even more important-looking Customs officials were there to be photographed, formalities forgotten! More boats arrived, more press men, school children, holiday makers and the lady

Mayor of Wissant with a delightful posy of flowers together with an American/French Tricolor flag. Celebration was an inadequate expression to describe this exhilarating scene. Meanwhile the team were at work, in the excitement of the moment immediately after landing there had been a minor crack upon the spar but not to worry, the carbon fibre had done its job. Officially the time was 2 hours 49 minutes and the distance 22, miles, although the distance flown through the air allowing for head wind was equivalent to 33 miles. As physiologist/trainer Professor Joe Mastropaolo was to tell us later, he had predicted that Bryan's eventual limit of power output sufficient to fly the Albatross was 170 minutes so there was a whole minute to spare after all! Dismantled, the incredible Albatross was taken to the double garage of a beachside house which Paul had predictably reserved for that very purpose. Alas, an excited dog chose to attack it but again no matter, polystyrene is easily replaced and no-one was dismayed by the incident, except perhaps the owner of the dog. Still in their wet suits the teams were ecstatic over the achievement, it was no less than they had expected but even so they were conscious of the historic occasion. What made them happiest of all was the fact that among the first to welcome them on the beach were two Belgian pioneers of man-powered flying, the Maaschelein brothers, who had heard that very morning over French radio that the attempt was "on" and they dashed hundreds of kilometers at top speed to be sure to be there. For MacCready and the team it was to be the longest of long days. A celebratory lunch which started at 10.00 am and finished somewhere in the afternoon dragged on until eventually arrangements were made to move Albatross for showing at the Paris Salon Aeronautique, Le Bourget. There it was to be honored by the world's leading authorities in aeronautics, gathered for the bi-annual occasion. It could not have been more fitting that the Albatross should hang amongst the collection of very famous French prototypes in the

Musee de l'Air. Moved to Calais for the Bleriot celebrations it was eventually shipped back to Ramsgate and crated for return to the USA. Meanwhile, the other Albatross and Penguin were containered ahead to Texas and transported to the EAA rally at Oshkosh. There should be no anti climax after this magnificent achievement. Instead, we should look upon it as a turning point in man-powered flight inspiration. Three prizes still remain, £1,000 for the first to fly 3 minutes, £2,000, £1,500 and £1,000 awarded to the first three to fly the slalom course and yet another £10,000 for the first other than an American or American design to fly the famous figure-of-eight. Now that this young team of Californian aeromodellers and air enthusiasts have shown that it takes little more than adaptability, know-how and initiative to achieve success, surely there must be more enthusiasts among us who want to follow their lead? Henry Kremer's most generous gifts of prize money, the goal which motivated these young aviators, which have been administered by the Royal Aeronautical Society deserve the final accolade in this remarkable story.

Ron Moulton and AAP Lloyd
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