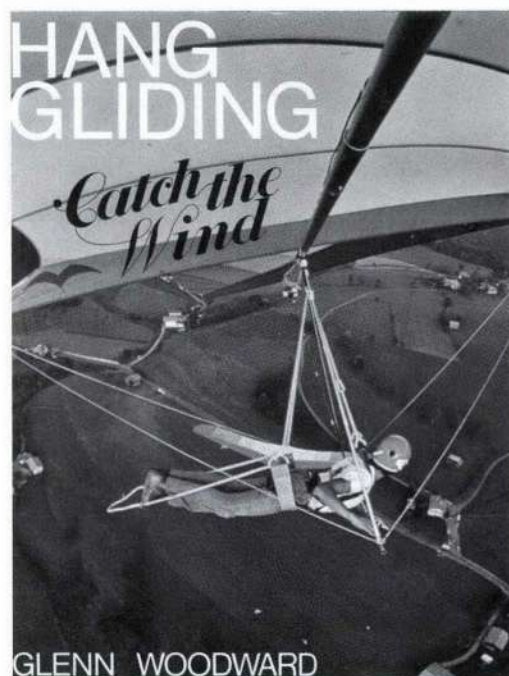


The Concise Revised History of Hang Gliding 1963-1973 – Part 1

Graeme R Henderson © 2010

THERE ARE MANY DIFFERENT VERSIONS OF HANG-GLIDING HISTORY, BUT NONE OF THEM MAKE SENSE TO ME. THEY FAIL TO EXPLAIN HOW THE WING WAS INVENTED AND THEY ALWAYS INCLUDE A GREAT DEAL OF STUFF THAT SEEMS IRRELEVANT.



Front cover of 'Catch the Wind', courtesy of Glenn Woodward

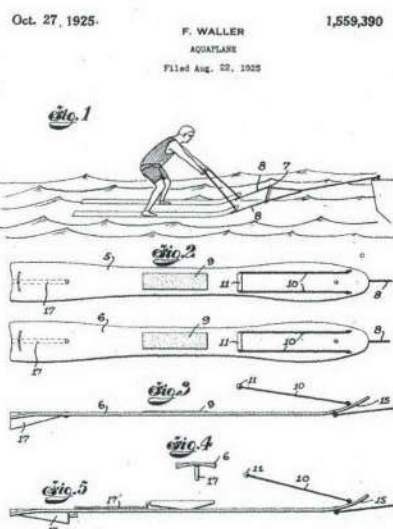
I had heard of John Dickenson and his 'Improved Gliding Apparatus' [the title of Dickenson's Patent Application] through one of the first hang gliding books I ever bought – 'Catch the Wind' by Glenn Woodward.

Even so, when I stumbled into the world of hang gliding history four years ago, I discovered a far more interesting tale, one that is supported by real evidence, and one that makes sense. This article will endeavour to explain what my four years of research has revealed.

No other account even starts the story in the right place, so let's correct that first.

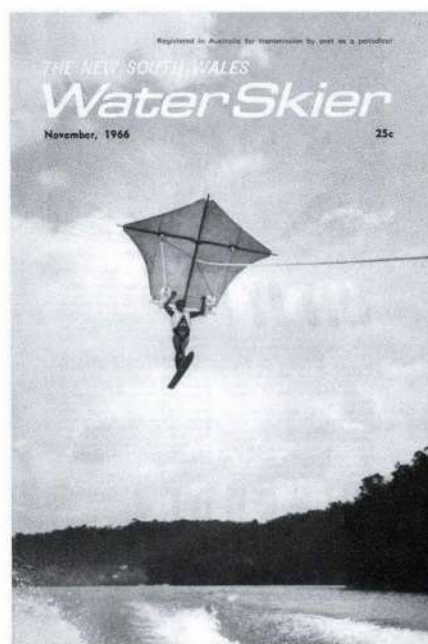
It appears that the first person to water ski was the American Ralph W. Samuelson, in 1922. However, his achievement remained largely hidden until the 1960s. His efforts were successful, but it appears that they were not copied.

Water-skiing was re-invented a couple of years later by Fred Waller, another



Fred Waller's Aquaplane patent drawings

American, and I am unaware of any connection between the two. In 1925 Waller patented his Aquaplane, US 1559390, and the sport of water-skiing began in earnest. With the exception of the invention



Flat kite on a cover of Water Skier magazine

of the power boat, this point marks the beginning of the trail that leads to the invention of the modern hang glider.

The next big step happened in 1951 when Paul Updike and Vern Crary launched their five-sided water-ski kite at the California State Fair in Sacramento. Ken Tibado then refined both the kite and the flying techniques. He lived at Lake Wales, Florida, and regularly performed at Cypress Gardens.

He is also credited with adding the safety harness. This harness does not work in the same way as hang gliding harnesses, but it was an aid to ease the strain on the pilot's arms. Among the many feats performed by Tibado was a flight from Florida to Cuba.

Doug Laversha is credited with being the first Australian water-ski kite pilot, when he brought a Tibado kite back from the US in 1953.

The next step in the creation of the modern hang glider was of course when fellow-Australian John Dickenson was



It is somewhat ironic that John Revelle made the first harness, here he demonstrates how stable a well designed flat kite is, as well as his abilities as an acrobat
Photo: Courtesy John Revelle



John playing with his third autogyro on Narrabeen beach in 1968. John was very enthusiastic about gyros. He was adapting the chassis of this gyro to attach to a hang glider as he worked towards powering his wing

Photos: Courtesy John Dickenson

asked to build a water-ski kite, but could not make a five-sided kite work to his satisfaction.

There were many influences acting on Dickenson at this time, as he came up with his 'Improved Gliding Apparatus'. It was a fragile and serendipitous process. Right place, right time, right people.

Dickenson's interest in aviation goes back to his childhood in Sydney. He spent a lot of time sitting on the flat rock above Curl Curl beach watching seagulls, and he built many kites and gliders.

He became interested in autogyros, eventually building one and teaching

himself to fly it, which was no mean feat. Gyrocopters and autogyros have come a long way in the past 50 years, but in those days their notoriously over-sensitive control system killed a lot of pilots. New pilots would over-correct after take-off, and the over-corrections would usually continue until they crashed.

In 1961 John Dickenson, then an electronics technician, moved to Grafton in New South Wales with his wife Amy and their two young children, Helen and Mark, to work for Gus Robinson Electrical. One of the people working under Dickenson at that time was Bruce Young.

Young towed Dickenson along Woolgoolga beach when he was testing his autogyro, and it was Young who told his fellow members at the Grafton Water Ski Club about their new member, Dickenson, and his flying prowess. Thus, in early 1963, the Grafton Water Ski Club made the fateful request that would lead to the creation of the modern hang glider – they asked Dickenson if he would build and fly a water-ski kite for their display at the annual Jacaranda Festival.

As new arrivals in Grafton the Dickensons had joined the Water Ski Club, not just for recreation, but also to help them to integrate into the local community. This really was the strongest force acting upon Dickenson when he accepted the task. He had no 'dreams of glory', no 'grand plan' to revolutionise aviation, just a simple desire to contribute to the community in which he lived.

His father had taught him how to make five-sided kites when he was a boy. How hard could it be? Dickenson had never seen a water-ski kite, so he set about building models, working with the descriptions he was given by various club members, and his acquired knowledge of kites and wings. All the versions he came up with worked fine, until he hung a weight under them, when they all became horribly unstable.

As this process continued, Dickenson heard more accounts, not just of the kites, but of the flights, and all these accounts ended with spectacular crashes. He began to lose interest in the five-sided kite idea, and started casting about for a more stable design.

Through experience, he also knew that powerboats often stopped unexpectedly. They could run out of fuel, have water or dirt in the fuel, or just run aground on sandbanks. In a kite, this meant you dropped from the sky without any dignity. He felt that an ability to glide



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Nature's flexible wing, the Flying Fox or Fruit Bat

Photo: Courtesy Drew Taylor

would be good, so the pilot could simply fly down and land gracefully and safely. He was after only a 1:1 glide angle, just enough to get down to the water in some comfort and style.

At this stage Dickenson started to look closely at flying foxes that are common in many parts of Australia. These creatures are amazing fliers, being capable of gliding flight, extreme aerobatics, and they can even fly backwards.

He began building models based on these wings. One rainy night, accompanied by his friend Dave Williams, Dickenson cornered and captured a flying fox in his hen run. Williams' account of this was hilarious, with lots of slipping over on lots of mud. Anyway, Dickenson had a very close look at these amazing flexible wings, and the mechanics involved in them. Batwings are quite complex to build. Dickenson built models based on these studies and they flew very well with a good 7:1 or 8:1 glide angle. That was much better than the 1:1 glide angle Dickenson wanted – in fact, it was too good. Such a glide angle meant that if an emergency landing was necessary, the wing could end up over land, or worse, in a crowd of people. Better control would be needed if the wing was to be safe.

It was at this stage that John Dickenson was shown a photograph of a wing NASA was working with.

The photo shown to Dickenson was of a paraglider, a structureless wing being



A photo showing the NASA paraglider. Although we are not sure exactly which photo John Dickenson saw, he believes it was similar to this, but from a more front-on angle

Photo from 'Flexible Wings for Transportation' a presentation by F.M. Rogallo

designed by a number of engineers at NASA. Dickenson was led to believe, from his one sighting of the article, that the paraglider shown in it was a successful design, that was actually being used to return space capsules to earth. This of course turned out to be an incorrect assumption. This is true for the many articles published about the NASA/Ryan paraglider program, the Fleep, the Flexwing, the PARESEV and the paraglider were all presented to the public as successful designs when in fact they were known to have stability and control problems.

While NASA was the acknowledged source of the wing for Dickenson, all Dickenson took from them was the double conical airfoil. This airfoil dates back centuries to the Japanese kite, the Tosa Dako. The famous French artist Jan Lavezzari used the airfoil in his 1904



Lavezzari experimente son planeur sur la plage de Berck.

To date this photo is the only evidence of the efforts of Frenchman Jan Lavezzari. It was taken in 1904

attempts to fly. [Note, it is most probable that Jan Lavezzari based his wing on boat sails, rather than the Japanese kites.] The airfoil was next fully explored by Ulysses Lee and William Darrah in the US. The explanation of the aerodynamics of this airfoil are in their 'Flying Machine' patent US 989786, filed early in 1910.

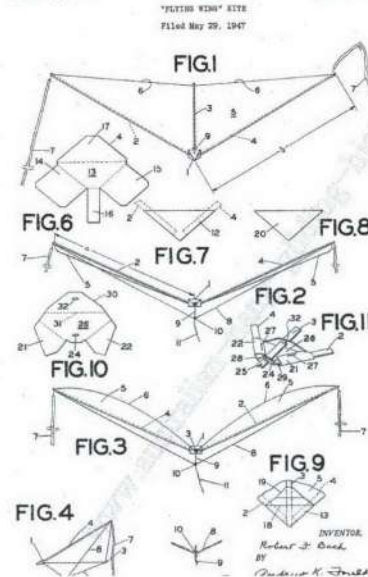
The airfoil was also used by both Robert Bach, US 2463235, and George Wanner, US 2573560. It was not, however, part of the Gertrude Rogallo kite patent, US 2546078.

There is also evidence – TV News footage – of this airfoil being attached to water-ski kite airframes in Indonesia in the mid-1950s.

Dickenson's first thought was that he would need to give it a frame so that it could be held out of the water, and he came up with an original airframe. Others had used the double conical wing before this, but their airframes were substantially different from the elegant simplicity of the one that Dickenson assembled. His wing was almost a marriage of the Wanner and Bach kites with a control system added.

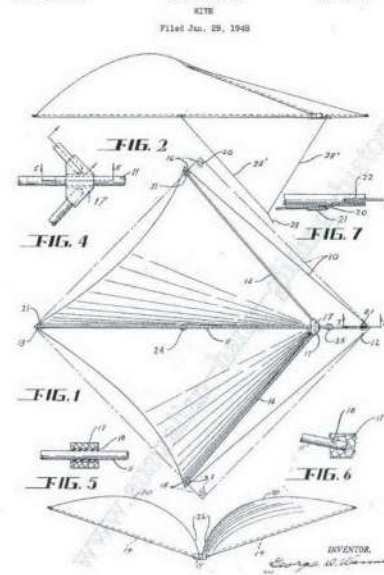
In fact it was fortunate that Dickenson had not seen photographs of any of these other rigid-framed machines, or it would

March 1, 1949. R. F. BACH 2,463,135
"FLEXIBLE WING" KITE
Filed May 29, 1967

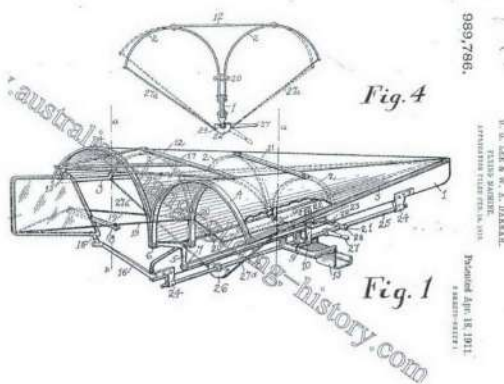


Robert Bach patent

Jan. 9, 1951 G. D. WANNER 2,537,560
KITE
Filed Jan. 29, 1949



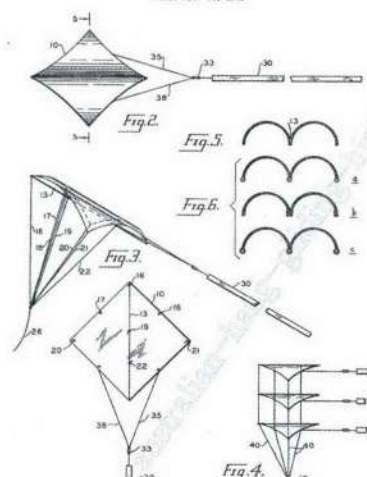
Lee Darrah patent



The Lee and Darrah patent drawings

March 20, 1951 G. S. ROGALLO ET AL 2,546,078

FLEXIBLE KITE
Filed Mar. 22, 1948



Gertrude Rogallo kite patent

have polluted his thought process. For example, had Dickenson been aware of the hang glider Barry Hill Palmer built in 1961, he would simply have copied it. Even the strange and flawed design of the PARASEV could have altered the result. Had Dickenson been shown a photo of it, he was better off seeing less, not more, of the strange goings on at NASA.

Dickenson made models using a simple four-stick airframe. He quickly concluded that a 90-degree sail cut, with an 80-degree nose angle, gave the most stable results. There was, however, one problem – the wing performed nearly as well as the batwing-based models. Dickenson still needed control.

It is worth considering that it was a lack of adequate control that caused Otto Lilienthal's fatal crash after nearly 2500 successful flights.

Although many people had built hang gliders that flew following Otto Lilienthal's

first hang glider flights, control at speeds below 25 miles per hour was still the real problem. Three-axis control needs airspeed to make it work. Until you reach that speed you are out of control. I have yet to learn of anyone foot launching a Volmer Jenson VJ23 in still air.

The style of weight-shift control used by Otto Lilienthal, and later by others right up until the 1970s, was so inefficient that the pilot could not correct for even mild turbulence. You also had to literally hang on to the glider as well. This is not conducive to long flights, nor to high flights. Indeed the advice was: "Don't fly higher than you are prepared to fall." It was ground skimming rather than free flying.

So Dickenson now had two wing designs – one simple to build, one a real challenge, but both requiring a means of adequate control.

As is well known, the solution came to Dickenson while he was pushing his daughter Helen sideways on a swing at a park. The swings are gone now, being considered too dangerous in today's cotton wool world. In 1963 they provided the vital clue to enable controllable low-speed flight.

So now Dickenson had a theory about control, he needed to establish if it could work.

Using materials scavenged from a rubbish tip, and some banana bag plastic, he built a half-sized model. This development model was not intended to fly, indeed it was built small to ensure that it wouldn't, at any reasonable speed. At 200mph it could have been an exciting toy, but at the maximum speed of the club's ski boats it was never going to carry a pilot.

The test was successful. By swinging his weight John Dickenson was able to get the small wing to take him from side to side while skiing. The wing knocked his helmet over his eyes so the trial ended in an inglorious fashion, but it proved to Dickenson that his idea could work.

Bruce Young and a couple of other enthusiastic club members spent some time after that tearing up and down the river trying to get the little wing to lift them off the water, but Dickenson was already away working on the real machine.

Money was an issue for Dickenson, and the wing was intended to be used only for the festival displays, and then thrown out. There was no justification for large investments in this project, and no funds to make them anyway.



John Dickenson launches the half scale model

Photo: Courtesy John Dickenson



John Dickenson getting under way with the half scale test model

Photo: Courtesy John Dickenson



Bruce Young takes the half scale model for a run

Photo: Courtesy John Dickenson

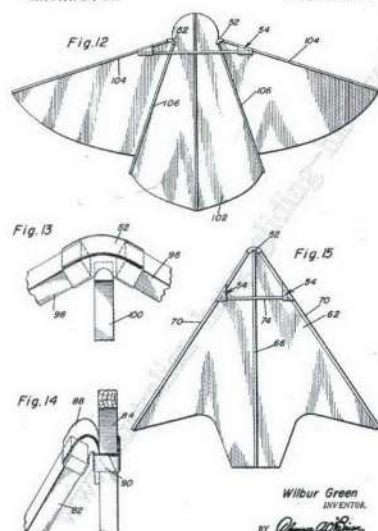
Building models is one thing. Building a man-carrying wing is quite another. Even though the stunt was planned to be over water, it was not desirable to have the wing fold up on launch.

Oregon [Douglas Fir] wood was used for the main spars, its strength to weight ratio being comparable to Spruce.

March 19, 1957 W. GREEN 2,785,870

Filed Oct. 27, 1955

3 Sheets-Sheet 2



Wilbur Green patent

May 2010



John Dickenson taxis out for his first flight

Photo: Courtesy Rod Fuller



The Mark 1 during final assembly at the Grafton Water-ski Club, 8 September 1963. Amy Dickenson at the clubhouse window, Helen Dickenson at the waters edge

Photo: Rod Fuller

Banana plastic was used for the membrane. John tested this to make sure that it was strong enough for the task. [Note: The three wooden spars and a membrane, by themselves would make a 'Flying Wing' kite of the type American Robert Bach patented in 1947. Of course John Dickenson knew nothing about the Bach Patent.]

Adding a crossbar, to define the nose angle, is an important step. With the Bach concept, the wing is free to flex as the leading edges swing in and out in turbulence. This is fine with a kite, but it is a problem with a glider. Changing the nose angle and billow also changes the centre of lift on a double conical airfoil [note: this is not an issue with a cylindrical airfoil] so the crossbar is an important aerodynamic component of the double conical wing.

Part of Dickenson's area of responsibility at Gus Robinson Electrical was the installation of TVs and TV Aerials. The aerial masts often had to be quite tall to get a good reception and they were being made of aluminium tubing braced with wire. While Dickenson did not erect the aerials himself, he had tested the components, and he had a real 'hands-on' understanding of the strength of both the aluminium tubing and the wire cable. He had tested the cables, and the method of tying the wire, to breaking point. Dickenson had access to aluminium tubing, but it was not strong enough for the main spars, and it only came in 10 foot lengths. There is an obvious transference of technology from TV aerial to the hang glider airframe.

The first task was to establish the size of the wing. Dickenson is very good at mathematics, and was wizard with a slide rule. He came up with a wing size using 16 foot spars and set about to build his water ski kite substitute.

Working alone, Dickenson began constructing his wing. The length of the aluminium meant that the spar/crossbar had to be forward of the optimum position, but that limitation was acceptable. This thing was still only a theoretical device, and it was meant to be disposable. Dickenson, at this point in time, still had no aspirations for the wing. His total motivation was simply to meet his commitment to the water ski club. There was no 'future vision' here, yet. He expected the wing to do no more than amuse a small crowd of spectators in a rural town. He did not, at this stage, imagine that he would build a second



John Dickenson testing the control system

Photo: Courtesy John Dickenson

wing. He was not thinking that others would copy it. He didn't know if it would even work, but the mathematics, and the models, said that it could.

There is mathematics involved in the control system as well. The distance below the Centre of Gravity to position the handle bar and the pilot. This is all about leverage and accounting for the pilot's arm reach. The seat was positioned to duplicate the position of a rider on a motorbike, Dickenson was an enthusiastic motorcyclist. He needed enough control, but not too much or he could end up with over-controlling issues.

The wing at this stage was rigged with fore and aft wires, from the handle-bar ends, to the front and to the rear of the keel. Steel struts went from the ends of the handle-bar to where the spacer/crossbar joined the leading edges, plus a set of cables going from the ends of the handle-bar to a point halfway between the rear tip of the leading edges and the strut/leading edge junction.

Making the sail was a huge undertaking, banana bag plastic stuck together with insulation tape sounds much easier to do than it is in reality. The banana bag plastic is very slippery to work with.

The solution Dickenson used to attach the sail to the frame, clamping the sail between the leading edges and a strip of wood with nails, was mechanically the same as the method adopted by Otto Lilienthal, but John Dickenson's version was crude, while Lilienthal's was a work of craftsmanship.

On the morning of 8 September 1963, John Dickenson carried the machine the two and a half kilometres to the Grafton



Unknown, as yet, club member having a play with the half scale model

Photo: Courtesy John Dickenson



Rod Fuller flying the Mark I before the A-frame was developed

Photo: Courtesy Rod Fuller

Water Ski Club room for final assembly. At this stage the machine lacked the refinements that would make it easily portable, and easy to assemble.



Part 2 follows next month

The Concise Revised History of Hang Gliding 1963-1973 – Part 2

Graeme R Henderson © 2010

FOLLOWING IS THE CONCLUSION TO GRAEME'S ARTICLE FROM MAY 2010 ISSUE.

Once the wing was assembled Dickenson tried to get it to fly. He exhausted himself being towed behind a boat with the wing, but he couldn't get it to fly. Norm Stamford was next and he encountered the same problem.

Adjustments were made and Bob Clements had a go. Now, strictly speaking, Bob Clements was the first to fly the wing, however, he went up fast, and down fast, to crash heavily into the water. Part of his problem was that Dickenson had moved the hang point back too far after the first two attempts showed it was possibly too far forward. Also, it is possible that the boat driver over-reacted to the high climb rate and cut the throttle, thus stalling the wing at a very high nose angle. It is also possible that Bob Clements over-reacted to the unexpectedly high nose angle and climb rate. The fact that the glider survived the crash from about 80ft demonstrated its structural integrity, as well as the value of testing over water. It also indicated that the boat had either stopped, or

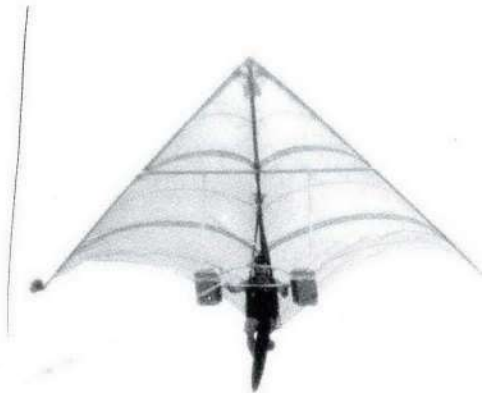
slowed considerably before the impact, thus reducing the forces on the wing.

John Dickenson made some more adjustments to the C of G, and then Rod Fuller had a go, *"It seemed like a reasonable proposition to me,"* is how Rod Fuller explains his willingness to have a go, even after the spectacular crash. With Pat Crowe as Fuller's chosen boat driver, and Bruce Young observing, the fourth attempt succeeded, the C of G wasn't perfect yet, and the strong wind made this a difficult exercise, but the three men involved made it work safely.

Rod Fuller and Pat Crowe have exciting stories of their roles in this success, but to Dickenson it seemed to be a non-event. From his vantage on the river bank, it simply went how he had hoped it would. Neither Pat Crowe nor Rod Fuller had any idea just how different this wing would be to a flat kite, but they were up to the task, neither panicked and they both dealt with their initial shock at their spectacular success with courage and intelligence.

Following this successful flight, and after listening to Rod Fuller's account, Dickenson made some more adjustments to the C of G, and he also moved the handle-bar forward. It was quite late when Dickenson finally got to have another go with the wing and the strong winds encountered by Rod Fuller had died away. Everything went perfectly, the wing flew well, there were no surprises and the control worked. Dickenson found that he could swing to each side and go up and down at will.

It was at this point, while up in the air in his creation, that the enormity of what



The Mark II

Photos: Courtesy John Dickenson

he had done hit home. He was suddenly aware that he was in a lovely little aeroplane, and that, inadvertently, he was continuing the work of Otto Lilienthal.

Dickenson's excitement was almost overwhelming and he immediately set about drawing up a patent application for his 'Improved Gliding Apparatus'.

Now everything was different for John Dickenson, aware of what he had, and suddenly with a vision of the future, he reappraised the glider.

By shifting the top of the struts from the leading edges to the keel he could substantially increase the glider's strength, for no appreciable gain in weight. This created the first 'A-frame'. The struts were replaced with a second set of side wires. The original configuration had two bolts through the leading edges at the nose plate. By abandoning the second



Rod Fuller flying the Mark I with the A-frame, early October 1963. This flight was conducted to promote the upcoming Jacaranda festival Photo: Courtesy 'The Daily Examiner'

unnecessary set of bolts, the wing became easier to rig and de-rig.

And so, by the time the Jacaranda Festival arrived, the wing, to all intents and purposes, possessed all of the desirable qualities that would lead eventually to it being cloned in the thousands, all over the world.

Fuller and Dickenson continued to fly the wing after the festival, but Dickenson was already working on the second wing. This time he used an all aluminium air-frame, but his lack of welding skills resulted in a rectangular frame to position the handle-bar. Dickenson again utilised the banana bags, and used contact adhesive to attach it to the airframe. The main spars were reduced to 14ft, he wanted to increase the take-off and landing speed to harmonise with the speeds that water skis work well at. The big wing wanted to fly before the pilot was able to ski properly. This glider, that we call the Mark II, flew well, but the contact adhesive was not up to the job and so the wing was quickly abandoned.

The next wing saw a return to the wooden spars so that the banana plastic could again be attached using nails. The wing was reduced in size yet again as the 14ft wing was still flying at a slower than desirable speed for water skiing.

Dickenson found a bent steel bed-head at the rubbish tip, by simply increasing the bends he was able to return to the triangular A-frame of the Mark I, without needing welding skills. It is interesting how many people copied that 'bed-head' bent basebar design, indeed it was still being produced in the late 1970s, even though it is an inferior structural design.



Terry Aspinall watches as Ron Nickel deals with a wasp nest in the bolt hole. The glider had been in the shed for 25 years and was covered in dust

Photo: Graeme Henderson
June 2010



The first of the Mark III gliders. This photo from Grafton shows it in its original configuration. The second set of side wires are visible. The sail is banana bag plastic and insulation tape. John Dickenson is preparing to launch

Photo: Courtesy John Dickenson



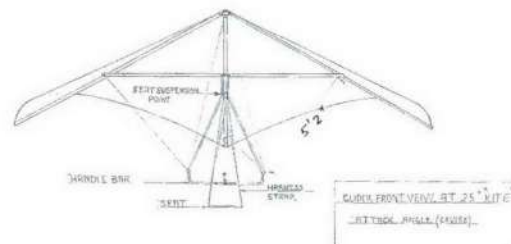
Diana Nickel, the author, and Ron Nickel, with the Mark IIIa, 2009

Photo: Courtesy Terry Aspinall

Dickenson flew this wing in many places, attempting to sell it to finance the next one.

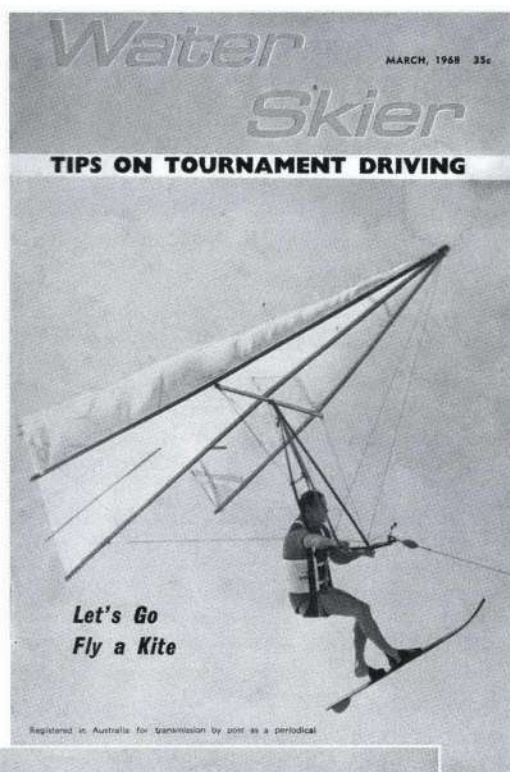
Finally, he sold the wing on 29 July 1964 to the owner of the Tweed Heads Ski Lodge, the late Rex Bernoth. This wing was flown by Ron Nickel and he still has the glider.

The next wing had a sewn sail, and Dickenson dropped the second set of side wires. It was sold to a person from the Forster area and its story remains a mystery. It was, however, the plans to this wing that Dickenson sent to NASA in November 1964 after they contacted him with a



From the plans John Dickenson sent to NASA in November 1964

request for information on his invention. Providing this material to NASA was probably Dickenson's biggest mistake as far as getting recognition for his



Water Skier magazine covers featuring Ray Leighton and his glider

invention was concerned, but he naively believed that NASA and its employees could be trusted.

The next wing was sold to Ray Leighton in 1965. Ray Leighton played quite a role in the promotion of the wing with his photo appearing on the cover of Water Skier magazines.

Shortly after Ray Leighton purchased his wing it was measured up by Bill Moyes. It is uncertain if Moyes built a clone at that time.

John Revelle was the first confirmed person to actually build a clone-based on Dickenson's glider. His glider suffered a snapped leading edge though. This was in 1965, and John Revelle used an all aluminium airframe while Leighton's glider had wooden spars. John Revelle sold that wing to Bill Moyes in 1966.

From here on the changes Dickenson made to the wings only involved construction techniques and different materials. This process culminated in the Aerostructures built wings, that were built to aircraft specifications.

In February/March 1967 Bill Moyes approached Mike Burns at Aerostructures, wanting to buy a wing. Not realising that Bill Moyes already had at least one wing, Mike Burns arranged for John Dickenson to teach Bill Moyes to fly the glider.

Moyes had wanted to learn on Sydney Harbour, but that request was refused as Dickenson was under the impression that it was to be a first lesson and he did not want someone giving his product a bad name, in the middle of the city. Bill Moyes was invited to attend a group demonstration John Dickenson had planned, and once the others had finished, Bill was given his chance. Bill Moyes climbed quickly, flew a short circuit, and released high, even though he had been instructed not to release from the rope and to just let the boat lower him back to the water. Bill flew down and landed perfectly. Both Mike Burns and John Dickenson thought Moyes was an absolutely natural pilot, for him to be able to fly so well on his first flight. But was it his first flight?

Bill Moyes purchased an Aerostructures wing at that time, which was brought back for repair a couple of times in the first weeks that he had it.

It is important to realise that the first record flights made by Bill Moyes and Bill Bennett were on Aerostructures wings. When Bill Moyes flew from Mt Crackenback he was flying an Aerostructures wing.

The next major change came when John Revelle adapted a parachute harness to replace the seat, he then developed the first prone harness so as to reduce drag from the pilot.

In 1969 Bill Moyes and Dick Rangott took a wing to La Perouse for some tethered flying. Moyes ended up soaring



John Revelle flying his Dickenson wing clone, looks at his wife Angela flying his flat kite. Both aircraft were built by John Revelle

Photo: Courtesy John Revelle

for 29 minutes when Rangott dropped the rope because there was no strain on it. When Rangott tried to emulate the feat after Moyes landed he unfortunately crashed the glider.

In 1969 Bill Bennett took the glider to the USA where it took off as a foot launchable aircraft. Then Bill Bennett taught Dave Kilbourne to fly it behind boats. Dave Kilbourne then ridge soared the wing, and asked for a larger wing that would fly more slowly.

When Bill Bennett built the 16ft wing for Dave Kilbourne the wing returned to its original size.

In 1970 on a trip to the USA Bill Moyes flew a glider into the Grand Canyon, even though a few Americans still claim it all started in 1971 in California.

On a trip to Europe in 1969 Bill Moyes sold a 13ft clone to Alfio Caronti, who eventually started manufacturing the wing under license to Bill Moyes. It appears that Alfio Caronti was under the impression that Bill Moyes had invented the wing.

In 1972 Bill Bennett took the wing to the United Kingdom. After one of his water ski displays he was approached by one of the early legends of hang gliding in the UK, Ken Messenger, about the wings suitability for foot launching from hills. The next morning Bill Bennett demonstrated the feat for Ken Messenger. Because of the high winds at the time, he flew it from near the base of the hill. Both Bill Bennett and Bill Moyes helped spread the wings popularity through



John Dickenson prepares to fly the third Mark III at Grafton, 1965

Photo: Courtesy John Dickenson



John Dickenson cruises past the club house, 1965. Mark Dickenson is standing on the water-ski jump watching his father

such acts of generosity. But they were not the only people spreading the wing.

The spread of the wing around the world was organic and explosive. Virtually everyone that got one became an

instant instructor, many became instant manufacturers.

As happened with the Leighton wing, gliders were copied, some people worked from photos to build their wings, some



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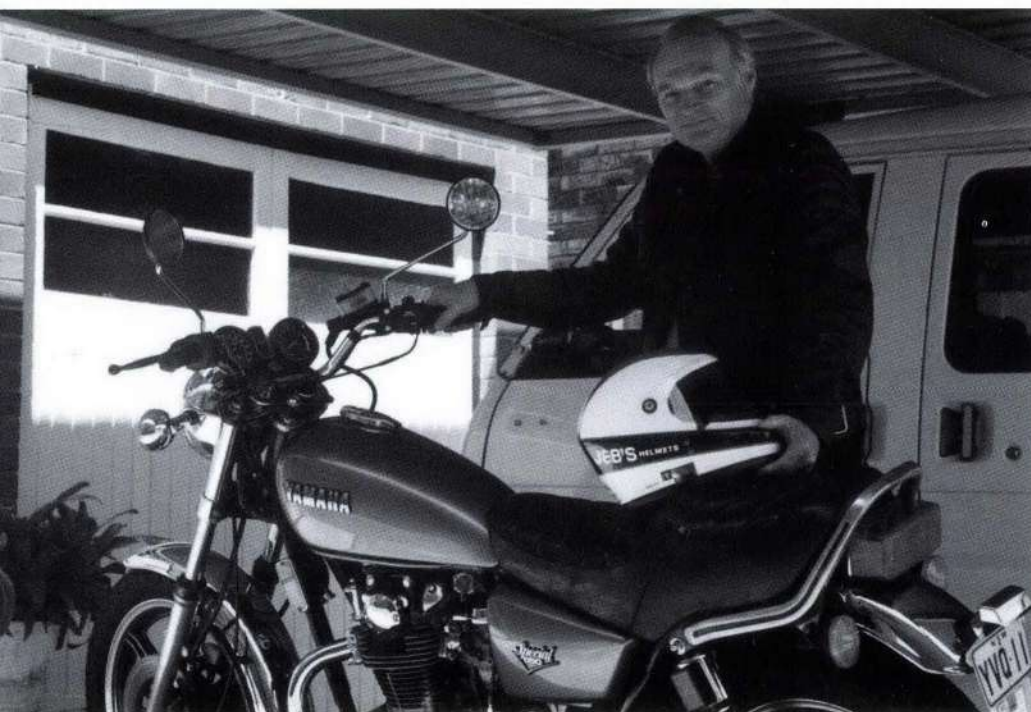
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A Volmer Jenson VJ23. This one has been fitted with a motor and the photo was taken as David started his flight across the English Channel

Photo: Provided by Terry Aspinall / David Cook



John Dickenson with his Yamaha 650

Photo: Courtesy John Dickenson

met people like Leighton, or Moyes, or Bennett, and were assisted into the activity. Those new enthusiasts spread the wing's popularity by teaching friends and interested spectators.

Later, Steve Cohen, influenced by the ridge soaring stories coming back from California, started pioneering flying sites south of Sydney and making profound

changes to the wing. Cohen was the first to fly from, and then the first to soar, Stanwell Park. He was closely followed by John Revelle and Ray Ryan for the soaring flight as they virtually all took off together. Cohen was the first to drop from a balloon in a hang glider, Bill Moyes was there to witness his landing.

Cohen also claims the first positive G loops in a hang glider, an SK1.

Cohen designed the keel pocket, the first really significant design change to the airfoil.

Another very important person who was involved is Kevin Mitchell. Mitchell was a sailmaker and his knowledge and his inputs were important. At one point Mitchell was making the sail for Cohen's business, Ultralight Flight Systems, as well as for Moyes.

Many people have contributed to the design of the wings as they evolved. Many people contributed to the spread of the wing. The popularity, and the money generated from the commercial exploitation of the original Dickenson wing supported that evolution and expansion. All modern ultralight aviation started here, there are only two wings that did not start in some way with John Dickenson, the Icarus by Taras Kiceniuk and the VJ23 by Volmer Jenson. However, even their limited popularity was largely due to the interest and media created by the wing invented in Grafton, NSW, Australia.

