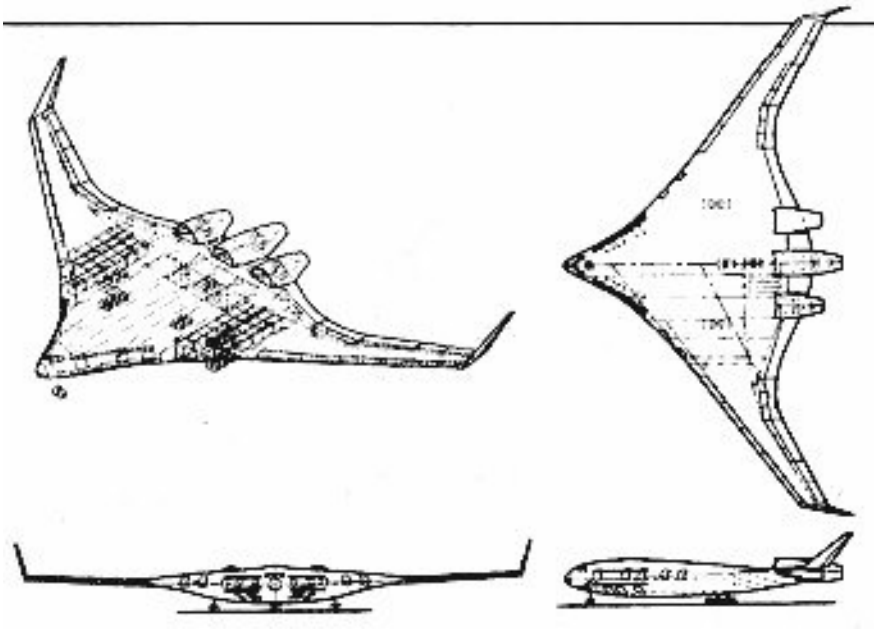
No. 157 JULY 1999

T.W.I.T.T. NEWSLETTER



BOEING's concept of the future commercial airliner called the Blended Wing Body (BWB). The integrating of the wing and body underwent several significant blending and smoothing alterations, the central disk was flattened out and the long slender wings became more and more part of the fuselage. Engines are mounted at the rear so the fuselage is also a wing, an inlet for the engines and a complete pitch control surface. The vertical winglets provide directional control and increase the effective aspect ratio. A bullet nose is added for enhanced cockpit visibility and it also improves effective wing chord at the centerline, offsetting compressibility drag. See page 4 inside for more.

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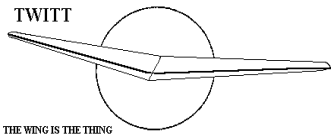
T.W.I.T.T.
The Wing Is The Thing
P.O. Box 20430
El Cajon, CA 92021

CELEBRATING 13 YEARS OF SERVICE

The number after your name indicates the ending year and month of your current subscription, i.e., **9907** means this is your last issue unless renewed.

Next TWITT meeting: Saturday, July 17 1999, beginning at 1:30 pm at hanger A-4, Gillespie Field, El Cajon, CA (first hanger row on Joe Crosson Drive - Southeast side of Gillespie).



THE WING IS THE THING
(T.W.I.T.T.)

T.W.I.T.T. is a non-profit organization whose membership seeks to promote the research and development of flying wings and other tailless aircraft by providing a forum for the exchange of ideas and experiences on an international basis. T.W.I.T.T. is affiliated with The Hunsaker Foundation which is dedicated to furthering education and research in a variety of disciplines.

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Meetings are held on the third Saturday of every other month (beginning with January), at 1:30 PM, at Hanger A-4, Gillespie Field, El Cajon, California (first row of hangers on the south end of Joe Crosson Drive, east side of Gillespie).

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PRESIDENT'S CORNER

I was really surprised that no one wrote or called in to tell us about the error on the cover of last month's newsletter. I accidentally put July on it instead of June. So to keep everything straight, please cross through July on Issue No. 156 and write in JUNE so you will have a correct label if you ever need to go back to it later.

This has turned out to be an interesting newsletter with several of the letters and the long article covering the blended wing body conceptual airliner. I included as many of the concept drawings from the magazine as possible since I have been getting positive feedback that pictures are good. So I am trying to find as many as I can for each issue. If you have one that you would like to share, please send it our way and I will scan it into the newsletter (that way you can have it back if you wish).

Some one had asked to see more pictures of the Horten IV scale project Bob Fronius is working on, so I have placed those out on the web page. Next month I will put a couple of them in the newsletter for those of you who don't have Internet access yet.

If some of you who don't have a computer or Internet access, don't forget you can often get this through your local library. You may have to sign-up for a block of time and be limited to it if there are other waiting, but it would be worth doing it a couple times a week. I am always amazed at the number of web sites out there with some type flying wing material, whether it is models or the real thing. This area of aviation seems to be growing every day, with aerodynamic engineering students realizing the benefits of flying wings and doing more of their thesis papers on some aspect of these type aircraft.

I hope everyone is enjoying their summer flying seasons so far. Keep'm climbing.

Andy

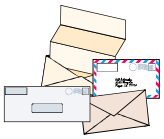
JULY 17, 1999 PROGRAM

In typical Birthday Bash fashion we have Tara Kiceniuk coming down to talk about dynamic soaring and building a new type of variometer that will allow gliders to soar when there is only sink. This will be a more detailed explanation of something we saw/heard about in May with the German student's zooming glider graphics video and Bruce's comments on the future of the future of microlift soaring.

As for the "ultimate" variometer, modern technology has finally made it possible by using a combination of GPS, piezo gyros and microprocessors mounted at several points on the sailplane to measure multiple vectors and convert the information into something that can be used by the pilot. It's complex, but makes soaring possible under conditions never before practical.

Part of the program will include some video footage from Jim Marske's promotional tape for his Pioneer and Monarch line of flying wing gliders.

In the good tradition of birthday parties, we will be having cake and ice cream to celebrate our 13th year of providing service to the flying wing community.



LETTERS TO THE EDITOR

5/29/99

TWITT:

I am a model builder, retired Flight Test Engineer, and currently a Flight Test Consultant. I recently was contacted by Paul MacCready regarding my bird-modeling activities over the last ten years. He suggested I join your organization and that it would be a good forum for my ideas. He sent me a copy of your April newsletter and I agree that you are "my kink of folks".

I am not sure of the annual membership fee, but thought Paul said $20. I am enclosing a check for that amount. If it is incorrect, please let me know and I will remit the difference. I am a fair distance away so won't make all the meetings, but would certainly enjoy reading the newsletter and submitting an occasional letter.

I also noticed in the April newsletter your plea for programs. I would be very happy to drive down and present my paper "Research on the Stability and Control of Soaring Birds". It was originally presented to the AIAA at their biannual Flight Test Symposium at Hilton Head, SC in 1992. Most recently an updated version was presented to the Society of Experimental Test Pilots (SETP) at their annual meeting in September 1998. (It requires a viewgraph and VCR.)

If you need more information, please feel free to call or contact me on e-mail.

Robert G. Hoey
1353 West Kildare
Lancaster, CA 93534
(661) 948-1102
bobh@patprojects.org

(ed. - Welcome to TWITT. I nice to know the Paul is looking after our interests throughout the aviation world. The subscription dues you sent were the right amount so there is no need for any further payment.

It was sort of my understanding that when you referred to modeling your meant radio controlled simulated birds, is this correct? Have you experimented with diffuser tips using multiple feather like extensions that are controlled by the pilot? This is an area of interest to some of our members since the seem to feel there is an advantage to this configuration. There have been several discussions in the past about diffuser tips in general, but I don't recall there being any definitive answers yet.)

6/15/99

TWITT:

I am looking to set up a complete facility to produce Mitchell Wing kits and components in the Sonoma County area about 1 hour north of San Francisco, hopefully within the next few months.

How do I go about getting a listing in the classifieds section to offer blue prints for the B-10 and U-2 Mitchell Wings?

The wing on the TWITT logo is still on backwards - why don't you fix it.

Thanks and keep up the good work.

Richard Avalon
U.S. Pacific
(650) 583-3665
mitchellwing@earthlink.net
http://home.earthlink.net/~mitchellwing/

(ed. - Sounds like you are really getting serious about producing and selling the Mitchell Wings. I went through your website and it looks good so far. I hope you start getting enough inquiries to make it worth the effort. I gave someone your name and address the other day, so you should have heard from him by now.

As for advertising in the newsletter, you already have my e-mail and that part is all taken care of.

For those of you who are relatively new to the group, Richard was the designer of the TWITT logo many years ago. At that time the wing had more of a bottom view perspective, but the Board of Directors decided a few years *ago to reverse it and make the view seem to be from the top. A subtle change that we thought gave it a more*

normal appearance. One of these days I will have the ability to refine it a little more and experiment with a better perspective without tinkering with the basic design much.)

6/16/99

TWITT:

Just received the latest TWITT newsletter. Interesting reading about the Horton Wingless. I saw it at Orange County Airport on October 23, 1955, according to my dad's logbook. I was able to ride over there from Prescott, AZ in the AT-11 Twin Beech he was flying for a road contractor. Can't find the photo of it I was looking for, but here is one of a Waco cabin with it (wingless) in the background. Look like faint outlines of the rudders without fabric. The other photo is a 3/4 front view with some fabric ripped off from the "fuselage", as I remember. The man with the Cadillac was attending to the airplane.

Got to get going to work. Will continue looking for the other photo.

Best Wishes.

Larry Nicholson

(ed. - Other than Russ Eckre, I don't know if we have ever heard from anyone else who actually saw one of the Wingless aircraft.

By the way, you sent two copies of the same picture, the best we can tell.

The picture Larry sent was too large and the Horton too small and fuzzy to reproduce very well in the newsletter. It is hard to tell if it is the original prototype we showed in last month's newsletter, or the twin-engine version we have seen in the promo tapes.

It will be interesting to see what becomes of this concept now that Horton can try to get people involved in it again.)

ABOVE: "Winged Flyer" - two-place, side-by-side tailless airplane. The tricycle gear was meant to keep the aircraft low to the ground so it could run as if an automobile. Pilot: P. Nadot. Circa 1945.

5/30/99

TWITT:

I have enclosed the April 1999 issue of Wings for your perusal. There is an excellent article on some of the latest research and concept aircraft for the proposed next generation extra large passenger/cargo aircraft. Surprise, surprise! The most efficient and cost effective design solutions are all wing aircraft. I talked with Joe Mizrahi, the publisher of Wings and author of the article. He was very courteous and helpful and he has given TWITT permission to reprint the article in it entirety as long as Wings is mentioned. He also told me that John McMasters can be contacted at Boeing for more specific details regarding aerodynamics, airfoils, etc. He is one of the primary sources for the article and a strong advocate of all wing aircraft. I find this all very exciting and hope it can be shared with the TWITT membership.

Also, thanks very much for the quick response in sending me back issues 1 to 80. Please send me $50 more worth of back issues from #81 forward. Could you also send me the following: Al Bowers September '98 presentation, Paul MacCready's March '98 presentation and the "Synopsis of Flying Wing Development" paper. I have enclosed the necessary funds.

Keep up the good work!

Paul Spatrisano
Bend, Oregon

(ed. - First of all, thanks for the magazine and for getting the necessary permission for reprinting it. That sure makes my job much easier knowing that I am not plagiarizing someone's work.

I am not sure if you are aware of it, but Al Bowers is the chief NASA engineer on the blended wing body (BWB) project out of the Dryden Flight Research Center at Edwards AFB. From the video you have seen his enthusiasm for flying wings, especially Horten's H X.

Hopefully by the time you receive this newsletter you will have received your new order. I can't take all the credit for processing orders like yours, since Gavin, our archivist, is handling most of it now. He pulls everything together, lets me know what parts I need to produce, then packs it all up for shipping.

The article is quite long and contains a lot of history leading up to the current developments in large bodied aircraft. So I have tried to extract the most pertinent parts and scanned the most interesting drawings for inclusion in this newsletter. What doesn't fit this issue I will include in the months to come as space permits.)

6/16/99

TWITT:

I recently found this post card among some others which I picked up in France several years ago. It occurred to me that it may be suitable for the TWITT archives. Please make use of it as you wish.

Yours very truly,

Alfred Worsfold
New Bern, North Carolina

(ed. - Thanks for the card. I have included it here for others to see this 1945 design. I also had my daughter translate the description on the back to everyone could get an idea of its size and weight.)

Flight to the Future

Which Way The World's Next Generation Airliner?
A Look At The Past, The Present And The Possible!

by Joe Mizrahi

(As published in Wings, April 1999, Vol. 29, No. 2, Sentry Magazines, Granada Hills, CA, pp. 8 - 19 & 44 - 55. The material presented below is only a small portion of the original text, and has been edited to meet the information needs of this group.)

A New Shape For A New Century

With the advent of the rectangle, and then the tube with wings, twin characteristics of airliners and commercial flight since the early Twenties, airline manufacture has adhered to a well-established pattern. Whether a Ford Trimotor, Douglas DC-3 or -4, the long line of Boeings up through the 777, and the entire Airbus family, passengers have entered a more or less long cylindrical tube, which given enough push (jet engines) or pull (propellers) has then sped them away to their various destinations.

In 1966, when Boeing's 747 was launched, it was believed that the tube with wings configuration had reached the apogee of the form's usefulness. That very large aircraft was powered by four engines, yet in 1990 Boeing offered still another tube with wings airliner, almost as large, but with only two engines, the 777. In its latest -300 models, already in production, that design will have a fuselage length which exceeds the 747's by more than ten feet. Boeing has also been contemplating an even larger four-engined 747, the 747 XL (Xtra Large), a sort of scaled up flying watermelon that could seat up to 650 passengers. But that what many engineers consider to be a foreshortened freak will not be translated to metal, at least not by Boeing.

Boeing's 777 variant and those spun off from it will not greatly alter current airport facilities or operations, but a new giant from Airbus will. Known as the A3XX, and currently under final design, this behemoth, which may debut as early as 2005, will have a wingspan of 253 feet and a length of 250 feet. The fin will tower 75 feet above the tarmac, but no ordinary tarmac will be able to support its massive one million, eighty four thousand pound takeoff weight. Such a huge shape will also cause problems with wake vortex, passenger circulation and comfort, plus the daunting attendant psychology in flying in something that big. At a greatly higher price than the newest 747, it will only hold 75 more passengers without any significant increase in speed or range.

BELOW: The Boeing C-Wing, also known as the "Klingon Battlecruiser" by it two creators, J.H. McMasters and I.M. Kroo, departs from the standard tube with wings technology favorer by Airbus. (See page 5 for more.)

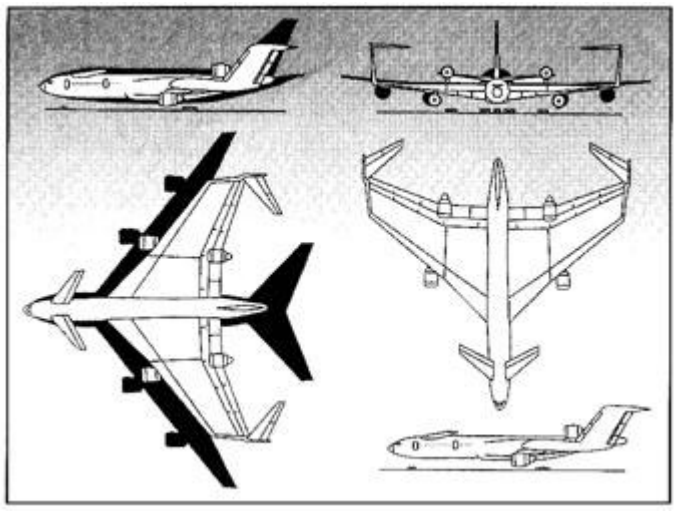
The reason these super jumbos are going to become reality has already been discussed. In the future, the world's airlines will have to move many more people than they do now, and each international takeoff will have to be maximized in terms of passengers transported. This prediction brings us to the subject of this article. Long before Airbus decided to go ahead with their super-jumbo Boeing evaluated a potential successor for its own 747, since the extended range 777 was only an intermediate solution to moving more people.

At a symposium held in January 1998 at Reno, Nevada, Boeing came up with two ambitious, but practical alternatives to answer the real need for a very large

transport airplane of the future. They are presented here. Each one would cost at least seven billion dollars to bring to fruition, but in the following discussion, the reader will see that either design is far superior to the standard tube with wings already chosen by Airbus, and one is a truly breathtaking solution.

The C-Wing Klingon Battlecruiser

To paraphrase John McMasters of the Boeing Company, "innovation for it own sake can be a great waste of time, but individuals with a sufficient depth of knowledge in more than one technical discipline can, working in teams, exploit the unorthodox to create a very workable design."



ABOVE: C-Wing proposal compared to that of conventionally shaped transport shown in black. This version has sharply reduced fuselage and wingspan, while absence of hortizontal tail allows it to easily fall within the confnes of the necessary 80 meter box above which aircraft size leads to gate, runway and taxiway restrictions.

The ideal cruising aircraft is a simple, elegant flying wing, and everything that does not contribute directly to generating lift should be integrated in or on that wing, if it is to retain an aerodynamic purity. In every large aircraft of this type, one that might accommodate up to 800 passengers, the possible laminarization of the wing could not be taken advantage of until it was think enough and large enough to carry that many people. So, if your goal is 600 passengers or more, you might want to choose the very thick subsonic Griffith airfoil, invented over a half century ago in England. With slots top and bottom and a number of additions, this basic football-shaped section, when viewed in profile, would provide the necessary lift, but its span would be on the order or 300 feet and passengers in the center section of this flying wing would sit 50 abreast.

A more promising alternative would be to take the basic wing structure, as described, graft a central tubular fuselage extending ahead and behind its center section on it, remove the hybrid laminar flow control outer wing panels and replace them with inward and rear-facing smaller horizontal winglets located at the tips of standard vertical winglets. In addition to reducing the span and eliminating the horizontal tail of a conventional alternative, sweeping the wing and the horizontal winglets by 35 degrees, allows the latter act as a horizontal stabilizer relative to the rest of the wing.

This configuration, which was patented by Boeing in 1995, not only lessens induced drag, keeping it within acceptable limits, but also down sizes the airplane all around, resulting in a fin and rudder 20 feet lower than what would be necessary on a scaled up conventional shape.

As conceived by John McMasters, I.M. Kroo and Richard J. Pavek, the C-Wing shape would be thick enough for spanwise distribution of payload, thus reducing high lift requirements, and would be commodious enough to seat 36 abreast. A canard, or foreplane, would act as a control surface during cruise, becoming part of the necessary high lift system when flaps were extended, as would the stabilizing surfaces of the aft swept horizontal winglets. Two engines forward and two aft would supply adequate power and also reduce noise. In effect, the C-Wing maximizes the positives found in the basic Griffith Wing layout.

An alternative layout with only three engines showed even more promise, with approach speeds of 135 mph, compared to 155 mph for a conventional shaped aircraft accommodating the same 126,00 pound payload. Range would be identical, 7,400 miles, although the C-Wing design in all its variants would be heavier by some 125,000 pounds and would require an additional 700 feet of runway to get off, but it could land within 5,400 feet, nearly 1,000 feet shorter than its large conventional rivals. It would also require and burn more fuel per passenger mile.

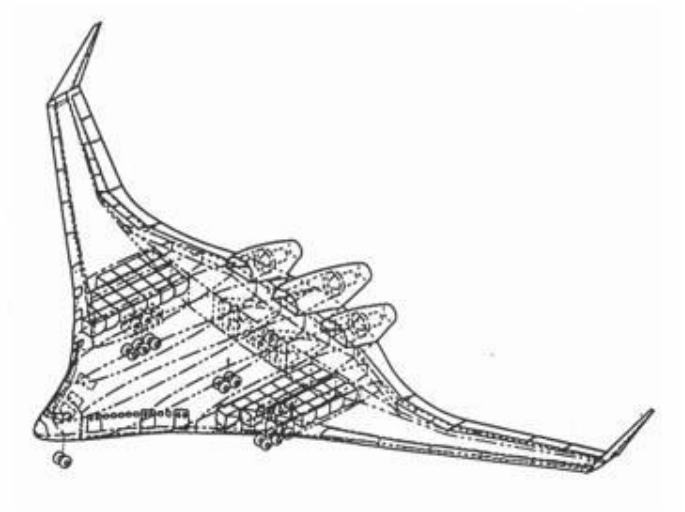
The Blended Wing Body

Additional weight and more fuel necessary to transport the same payload just as far will probably doom the C-Wing alternative, but when Boeing absorbed McDonnell Douglas, they also acquired the thinking of three more innovative design engineers, R.H. Liebeck, M.A. Page and B.K. Rawdon, who were working on the Blended Wing Body (BWB) transport of the future.

If ever a design represented innovation matched with utility, this one is the embodiment of that concept. According to intensive, well-reasoned calculations, the aircraft they propose would carry 800 passengers over a 7,100 nautical mile range and be ready to enter service in the year 2010. Quite an accomplishment considering that its fuel burn will be 27% lower than its conventional Airbus A3XX rival, with a take off weight 15% lower. Empty weight will be 12% less. It will only require three instead of four engines, and will match or exceed conventional performance, despite having 27% less thrust. Those factors combined with 20% better lift/drag capability translates to the phenomenal savings in fuel already mentioned.

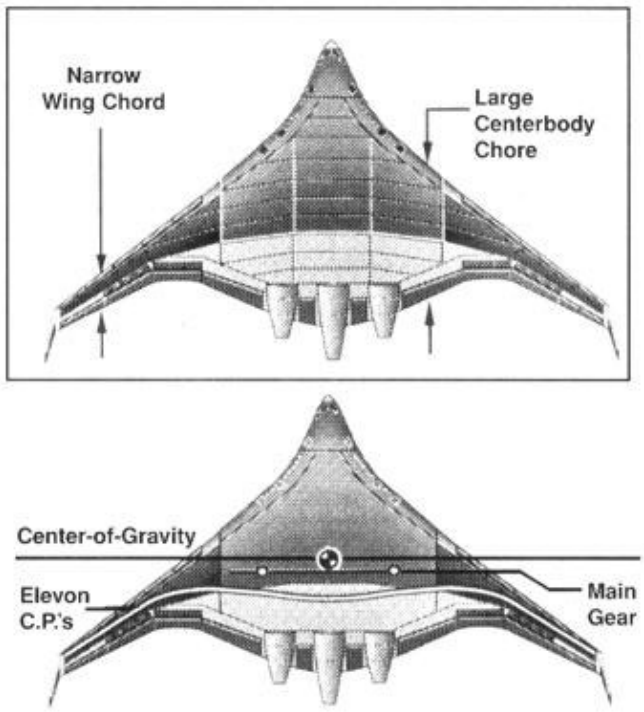
With a double-decked interior cabin located in the central portion of the blended wing, the extension serves to stiffen, buttress and extend structural integrity and aerodynamic overlap to the entire wing structure. The blended wing layout also serves as a very resilient bending structure, dramatically reducing the cantilever span of the thin wing section, distributing weight along the span more efficiently. This reduces the peak bending moment and shear to half that of a conventional configuration. Its shape also reduces total wetted area, or those portions of the aircraft which come in contact with the air. In this imaginative layout there is no need for a conventional tail. Unlike standard configurations, the blended wing's outboard leading edge slats are the only high lift devices required and, because the three buried engines aft of the central wing structure ingest the wing's boundary layer airflow, effective ram drag is also reduced.

A cylindrical pressure vessel was the starting point for what became the BWB fuselage. In order to seat passengers in reasonable comfort, it originally had a volume of 55,000 sq. ft. The minimum wetted area for this given volume, enclosing a passenger cabin for 800, plus galleys, lavatories and baggage, is best realized as a sphere, but a sphere is not conducive to streamlining, unless it can be flattened into a disk. In the case of the BWB, a streamlined disk integrated with the wing initially resulted in reducing total wetted area by 7,000 feet. Further revisions and modifications dealing with engine and control surface integration led to a total surface area of 29,700 feet, a reduction of an additional 33%.



ABOVE: This is the most promising furture airliner both aesthetically and in terms of economical operation. The BWB concept actually transforms John Northrop's historic flying wing proposition into tangible reality. Cleaner, less expensive to build, stronger, quieter, easier to handle and still within the parameters of the 80 meter box.

In this deign the fuselage is not only a wing, but a mounting for the engines that power it, along with their inlets, as well as a pitch control surface. By continuing to blend and smooth the streamlined disk, with a bullet nose added for enhanced visibility from the flight deck, the designers have come up with an aircraft that will fly at Mach .85, with an optimized wing loading fully 33% lower than that of conventional large size, long-range aircraft with less passenger carrying capacity. Since the wing blending hides most of the trapezoidal wing within the centerbody of the aircraft, the cost of wing area on drag is greatly lessened. In short, because the BWB planform has such a large chord, it requires a much lower sectional lift coefficient to preserve an elliptic span load, thus allowing the centerbody's thickness to maximize payload volume without a high compressibility drag penalty.



ABOVE: The BWB concept reduces the load on the outboard wing section airfoils, while the large centerbody chord provides enormous strength, requiring a much lower sectional lift coefficient. This reduced lift demand allows the large thick profile of the centerbody to hold passengers and cargo without exacting a high compressibility drag penalty.

In layman's terms, the low effective wing loading of the BWB meant that exotic high lift systems are not needed. A leading edge slat is necessary on the outboard wing, but all trailing edge devices are simple hinged flaps, which also serve as elevons. Low wing loading reduces control power demands. The small winglets provide primary directional stability and control, and split drag rudders, similar to those found on the B-2 bomber, are used for low-speed, engine-out conditions.

On a 5% scale model tested in Langley's wind tunnel, the BWB showed relatively small center of gravity variations, good stall characteristics and excellent control power

through the stall, the BWB handling extremely well in the normal flight envelope. Further tests at Stanford University explored extreme flight envelope characteristics and revealed so significant problems that could not be readily addressed and solved.

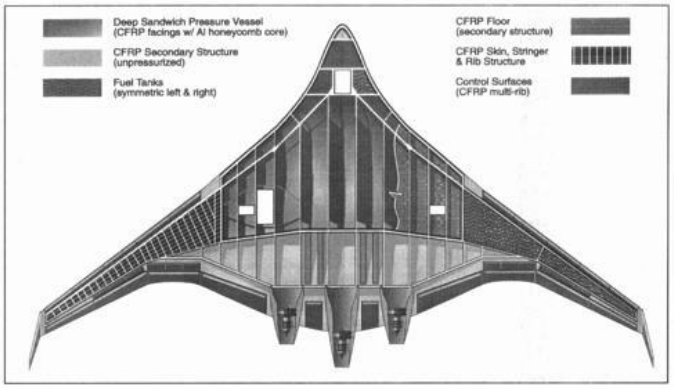
Like all next generation aircraft, the BWB will be constructed with composites. Bending and pressure loads on the structure can be carried by a 5-inch thick sandwich and deep hat stringer shell, or a deep skin/stringer alternate, both of which are already in wide application. Passengers will be accommodated in five longitudinal bays, each the width of a DC-8 cabin. Coach class will have six seats with an aisle between. Business class will have two/two seating with an aisle. Each separated section will be the length of a DC-9 fuselage.

Galleries and lavatories will be located aft. In addition to a forward view through windows mounted along the curve of the wing, flanking the flight deck's bullet nose, an additional promenade aisle will allow passengers to walk along the curve of the leading edge. On the ground, entrance and exit will be accomplished by means of main cabin doors in the wing's leading edge and through doors aft of the rear spar. Cargo will be carried outboard of the passenger bays, with fuel in cells further out on the wing, thus allowing a great deal of space between the tanks and the passenger compartment.

In addition to performance, comfort and capacity, the BWB concept has an inherently low acoustic signature. Exhaust noise will not be reflected off the wing's undersurface. There is little additional airframe noise caused by complex mechanism, such as slotted flaps. The aft location and staggered positions of the engines lessens the possibility of shards and debris from a failed powerplant penetrating the pressurized cabin or fuel tanks, destroying flight controls or causing the remaining engines to fail. Compared to conventional cylindrical tube fuselages, the center body pressure vessel of the BWB is much stronger, thus improving chances of survival in a crash.

Will such an aircraft ever be built? That's the decision the manufacturer will have to make. But if a large subsonic aircraft to take the place of the 747 is really needed, it appears that the BWB concept offers the most for the necessary investment. It's lighter, more commodious, more fuel efficient, requires far less power, and is certainly more aesthetic in appearance. True, looks aren't everything, but that old aviation adage still holds true, "If it looks good, it will fly good," and the BWB aircraft, in addition to much improved economy, simplicity and handling, certainly has any potential flying watermelon beaten hands down.

Eigthy-five years ago, when Boeing first began making a name for itself, in addition to farseeing design and exceptional engineering excellence, a willingness to invest in the cutting edge of future flight inevitably characterized it planes. Innovation has always been a prominent feature of



ABOVE: One of the beauties inherent in a BWB airliner is its strength. It readily absorbs both cabin pressure and wing bending loads, and in recent tests in the Stanford University wing tunnel a 6% scale model easily passed all extreme flight envelope tests.

Boeing's corporate initials. Taking a page out of it enviable history, it should, one again, invest in that future. The BWB airliner is the right plane at the right time and will, once again, keep Boeing in the forefront of economically viable aerospace technology.

(ed. - The remainder of the article covered the history of commercial airliners from other countries, and it included a large number of very good pictures of these aircraft.)

SERGE'S SEARCH

7/2/99

TWITT:

I hope the historic Weyl compilation arrived OK and meets with your satisfaction. I've always felt that his writings were extensive and comprehensive enough to merit a collective reference category of their own. Surely they were a landmark series.

I will make copies available to TWITT members who contact me by the end of the month. Based on recent experience, prices would be $20.00 (US), $23.00 (Europe), and $25.00 (Asia, Australia, NZ), airmail included. Each would be spiral bound in vinyl. While I continue availability and development of my Tailless Aircraft Bibliography, I can't furnish the Weyl collection indefinitely. I will put together just enough copies for members who contact me QUICKLY.

I am thinking seriously of making spiral-bound compilations of Northrop patents and/or tailless-aircraft patent drawings. These would be fairly large collections and be priced accordingly ($30 to $60). Is there any interest in such things? Contact me.

Finally, I'd like to reinstate my query about G.F. Myers.

(Query from 4/17: Today I posted a question concerning early aviation designer/inventor G.F. Myers to the Nurflugel List, and am requesting similar input from any other TWITT members familiar with his work. I have just run across a reference to "George Francis Myers' 1904 annular quadruplane" in an interesting article by W.R. Smith, entitled "The Sociocultural Genesis of the Flying Saucer"

(The REALL News; 6/95). Smith lists Myers' "circular, h-t-a multiplane and patent ... 1897-1904". Can anyone furnish information on this aircraft?

Although familiar with G.F. Myers (only through his patents for low-A/R and circular aircraft, ca. 1911- 1930), 1 have found in my "misc./unidentified" file a possible match for this plane in a photocopy (probably too poor to reproduce) sent to me a few years ago by Ed. Sharrett. Apparently from a British, Lindbergh-commemorative booklet, it features a photo of an annular planform quadruplane, mislabeled "One of the first aeroplanes built by the Wright Brothers"(!). The plane consisted of four annular wings (circular, with large central openings) stacked concentrically about a vertical axis, and diminishing in diameter from upper to lower wing. The pilot sat in a framework suspended below the wings. A vertical rudder, 6'-8' in height was attached between the aft framework and the trailing edge of the lower wing. Although standing figures obscure the front of the frame, and no propeller is visible in my copy, the craft appears to be a pusher with perhaps tricycle l.g. Was this aircraft built by G.F. Myers, and did it fly?

Myers' U.S. Patent No. 995,550 (undated in my Bibliography, but ca. 1911) is for a "circular aircraft with Concentric Opening in Wing". Although I haven't seen an 1897 Myers patent, all this makes me think the picture matches the inventor. If not, does anyone know whether the Myers Quadruplane mentioned by Smith was actually built?

It appears that another creative sort, known to me only through patents of an age past, may have left more of a trail than I'd suspected and may assume an even greater presence in the history of fancies that took flight. 'looks as though I'll have reopen that chapter! Meanwhile, any help from fellow TWITTs is appreciated.)

1999 West Coast

Sailplane Homebuilders Association Meeting
Jeff Byard Hanger - Mountain Valley Glider Port
Tehachapi, CA September 3-6, 1999

Friday - September 3

6:30pm - Gary Osaba - Sigman Returns
7:30pm - Taras Kicenuik - Dynamic Soaring

Saturday - September 4

8:30am - Jay Morrison - Trike for Ultralight Sailplane
9:00am - Mike Sandlin - Bug 1 & 2 Ultralight Sailplanes
9:30am - Dan Armstrong - Windancer Progress
10:30am - Bruce Holz - Two Light Sailplane Designs
11:30am - George Appleby - Zia Self Launching Sailplane
1:30pm - Joe Alvarez - Hands on composite construction & tooling. Light, strong wing/tail elements

Sunday, September 5

8:30am - Mark West - Truck Mounted Ulralight Test Rig
9:30am - Paul MacCready - Soaring Addictions and Perspectives
10:30am - Danny Howell - Progress on Lighthawk
11:30am - Al Bowers - Horten Light Sailplane
1:30pm - Joe Alvarez - Hands on composite construction & tolling, Light, strong wing/tail elements
7:00pm - Banquet - Gary Osoba
When Slower is Faster, The Fun Factor Soars

Monday, Sept. 6 - 9:00am - Business Meeting

The annual SHA Workshop and Meeting over Labor Day Weekend is usually a great event as can be seen from the topics and speakers lined up for this year. It has been organized to leave the afternoon open so that those of you with sailplanes can also use the time to put in some good flights. Or you can attend the composite construction session that lasts throughout the afternoon period.

If you can't come for all the days, at least plan to come on the day with the speakers and topics that most interest you. For those of you who like to camp, there is a camp ground at the airport, or for the less hardy there are several motels in town.