BNAPS News March 2019

BNAPS News Vol 9 Iss 2– March 2019

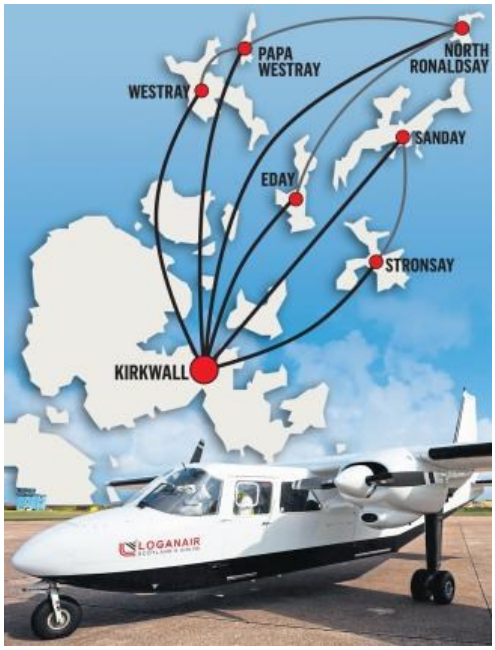
Electric Powered Islander for Loganair – reality or a dream?

Loganair, in conjunction with Cranfield Aerospace Solutions (CAeS), plans to adapt one of its Islanders, used on services from Kirkwall to six of Orkney's small islands, to fly on electric power rather than conventional fuel. Chief executive Jonathan Hinkles said the Paisley-based regional airline could beat others in the world-wide race to convert to cleaner, more efficient propulsion by making the switch by 2021.

Paul Hutton, chief executive of CAeS, is confident they can win the industry race to introduce the technology. CAeS is currently bidding for Government funding to support the research and development project and, if successful, could achieve the three-year timescale.

Loganair's plans would see one of the Islander aircraft it uses on the island-hopping service modified to be fully electrically-powered rather than using any form of hybrid system. Cost estimates for the project to develop the technology and for modifications to the Islander are in the region of £10m.

Bedford-based CAeS, which holds European Aviation Safety Agency (EASA) approval, has worked in the field of aircraft modification for a number of years. Last year CAeS started looking at new propulsion systems for aircraft and it is no surprise that the key issue is battery technology.



Electric propulsion for the Islander is seen as being suited to Loganair's short hop Orkney Islands routes.

The Islander is well suited for demonstration of the technology and if it is being used on short duration flights this form of propulsion is seen to be viable. CAeS believes the 2021 target is achievable if work starts immediately.

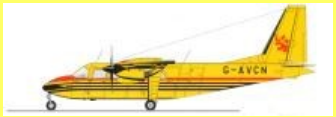
It is expected that if the 2021 date is achieved it would be the first commercial air service in the world to use this propulsion technology and could lead to Scotland exporting the technology around the world.

Loganair operates the inter-island flights, serving Eday, Stronsay, Sanday, North Ronaldsay, Westray and Papa Westray on behalf of Orkney Islands Council (OIC). Council leader, James Stockan, said: "This is a community with a strong track record when it comes to innovation and I am pleased that this pioneering project looks set to be developed in Orkney."

Industry observers may well have doubts that this project will "get off the ground". BNAPS News will be following this project with great interest.

In this issue of BNAPS News:

BNAPS Supporters Fund Raising Appeal – March 2019



Dear BNAPS Supporter,

Fund raising is still of critical importance to enable completion of the final assembly during the early part of 2019 and to ensure safekeeping of our restored Islander, G-AVCN, until a suitable place on the Isle of Wight can be found for it to be on public display. The current plan is to remain in the present workshop at least to the end of 2019.

The workshop will be re-arranged over the next two months to improve access for viewing the work during the final assembly stages. Viewing opportunities will be provided at open days and for pre-arranged individual and group visits. Open days and visits are free of charge but donations are always most welcome. These activities will be supported by other fund raising initiatives including sales of BNAPS merchandise, individual donations and income from BNAPS Supporters Club membership donations.

BNAPS is pleased to announce that it has recently been granted an award by the local Daisie Rich Trust. The award is much appreciated and will make a major contribution to ensuring that the restoration work can be brought to completion in the coming months.

If you wish to support the fundraising appeal please contact BNAPS by email bob@bnaps.org.uk or Telephone 01329 315561. All donations large and small will be gratefully received.

Yours sincerely,
Bob Wealthy, Britten-Norman Aircraft Preservation Society Chairman

Isle of Wight Sandown Bay 50+ Club
Sponsored Walks to Raise Funds for BNAPS.

Thanks go to Charlotte Winter and the 50+ club (walking section) for organising a series of sponsored walks to help raise funds for BNAPS to assist in the restoration and safekeeping of B-N Islander G-AVCN. The walks will take place as 11 legs at weekly intervals, starting on Wednesday 15 May, each leg covering a distance of around 5 or 6 miles.

Following the last walk of the series on 24 July, Tim and Jackie Hough (club members) have invited all walkers to a cream tea at their house in Winford where there will be a presentation of the funds raised to BNAPS Chairman, Bob Wealthy and BNAPS restoration team member Volunteer Keith Winter.

Our thanks go out to Charlotte and all members of the 50+ walking group for taking an interest in BNAPS and supporting the work undertaken by BNAPS volunteers to save an important part of the Isle of Wight's aviation heritage, the contribution to BNAPS funds will be most welcome and much appreciated.

G-AVCN Restoration Progress Report
January 2019 – March 2019

1. **Final Assembly Preparation:** The main activity has been that of devising a satisfactory method of lifting the wing and getting it positioned horizontally for the wing/fuselage to be joined. The use of a car engine hoist has been evaluated for possible use. However, whilst the hoist's lifting capability was adequate, the geometry of the lifting arm did not allow the wing to be pivoted through 90 degrees to a horizontal position. Investigation of loan of a fork lift truck is ongoing together with fabrication of lifting plates and a suitable lifting strop. The access doorway will need to be widened by about 50 – 75 mm to allow the fork lift truck to be moved in to the workspace.
   Meanwhile the provision of a pair of horizontal wing stands is being pursued. These will possibly be loaned to the project or more likely the stands will be built from material already to hand.
   There is a need to lower the fuselage support frame to take account of height limitations in the workshop for the wing/fuselage joining process.
   Bryan Groves has continued to collect together all the necessary fasteners, shims, washers etc needed for installation of the fin, rudder, tail plane, elevator, ailerons and flaps

2. **Fuselage:** Paul Thomasson has re-hung the pilot's door correctly. A new bush was made for the top hinge and reamed in situ to ensure correct alignment.
   The wing/fuselage trailing edge fairing assembly has been attached to the fuselage top skin.

3. **Wing:** Several access panels have been removed to enable investigation of fixing arrangements for lifting plate attachments and to gain access to the aileron control cable turnbuckle.

4. **Ailerons and Flaps:** Awaiting installation.

5. **Tail Plane:** A new access panel cover has been made by Mark Porter as one of the two access panels was missing. Tail plane is now awaiting installation.

6. **Fin, Rudder, Rudder Trim Tab:** Rudder trim tab hinge fasteners, together with trim tab actuator rod, have been fitted by Maurice Dyer and Steve Cooley. Fin and rudder are now awaiting installation.

7. **Elevator:** Awaiting installation

8. **Landing Gear:** Main landing gear leg tubes have been installed and fixed in place and main landing gear oleos installed. The nose landing gear oleo is already in place, nose and main landing gear wheels will be fitted at a later stage.

9. **Engine cowlings, engine mounting structures and air baffles:** Cowlings waiting trial fitting and adjustment during the final assembly work. Once fitting work is complete the cowlings will be top coat spray painted**.**
   Engine air baffle sets have been cleaned and are being refurbished as necessary by Bernie Coleman. Some baffles have yet to be found to make up a complete second set

10. **Missing Items List:** The list has been updated by Bryan Groves and Bob Wealthy to reflect a number of parts that have been obtained over the past 2 or 3 months. The updated list has been circulated as necessary.

G-AVCN Restoration Progress Report
January 2019-March 2019 (continued)

The following series of captioned photographs show the results of some of the work undertaken in the last period:

Picture 1

With the wing back on the vertical stands the main landing gear legs were installed. Seating the top end of the tube in the wing thrust block required a certain amount of persuasion. The fixing holes were aligned with some minor adjustments and fixing bolts installed.

Picture 2

Following installation of the main leg tubes the main leg oleos were installed.

Picture 3

Mark Porter (left), Guy Palmer (right) consult with Bryan Groves whose thorough preparation work had made the installation of the oleos a matter of routine.

Picture 4

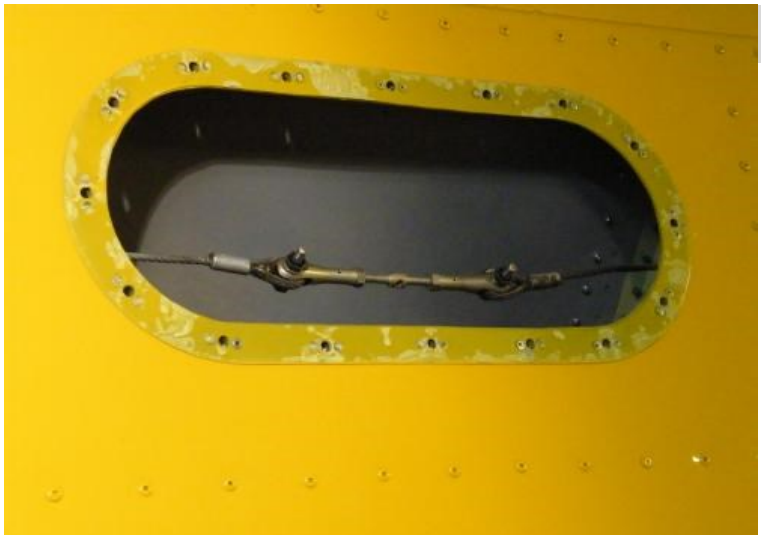
View of the starboard main landing gear oleo and axle assembly after installation.

Picture 5

Close up view of the port main landing gear axle and oleo

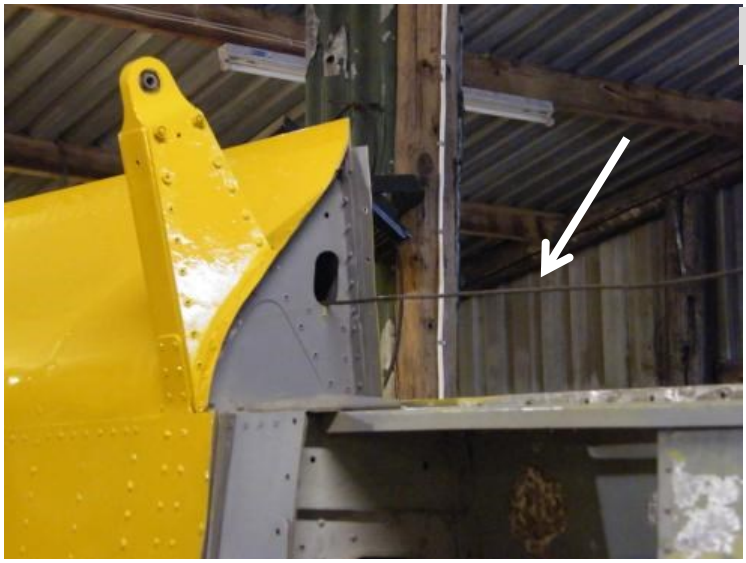
Picture 6

Nose landing gear axle and oleo, less wheel, determines the minimum height for the fuselage when it is positioned for joining to the wing. The vertical supports on the wooden wheeled support frame, seen here beneath the the fuselage, will be modified to suit.



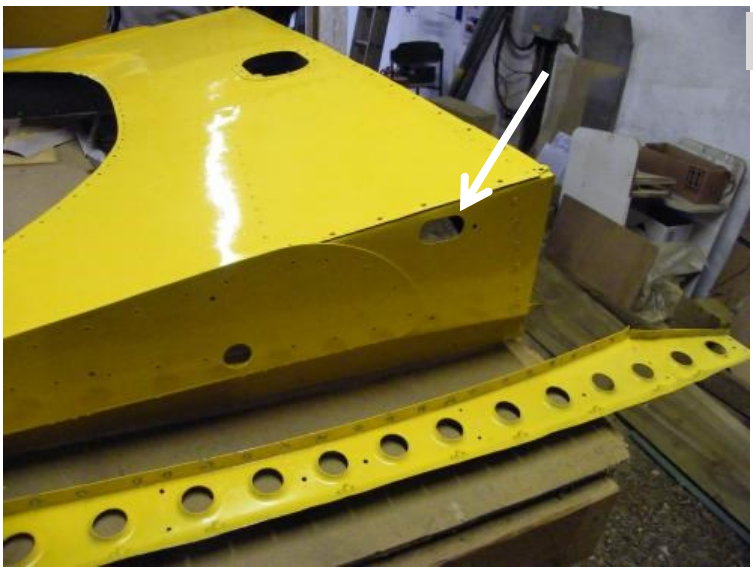
Picture 7

Wing upper surface access panel has been removed to provide access to the aileron cable turnbuckle.



Picture 8

Section of the aileron cable, see arrowed item left, will be looped back to allow it to be threaded through fairleads in the wing/fuselage fairing structure, see below.



Picture 9

View of the wing/fuselage fairing structure showing the aperture for the aileron cable end to pass through. After installation of the wing/fuselage fairing structure the end of the cable is then drawn through the fairleads in the wing and re-joined at the turnbuckle shown in Picture 7.

Picture 10

Steve Porter and Maurice Dyer completed fitting work on the rudder trim tab hinges and actuating rod.

Picture 11

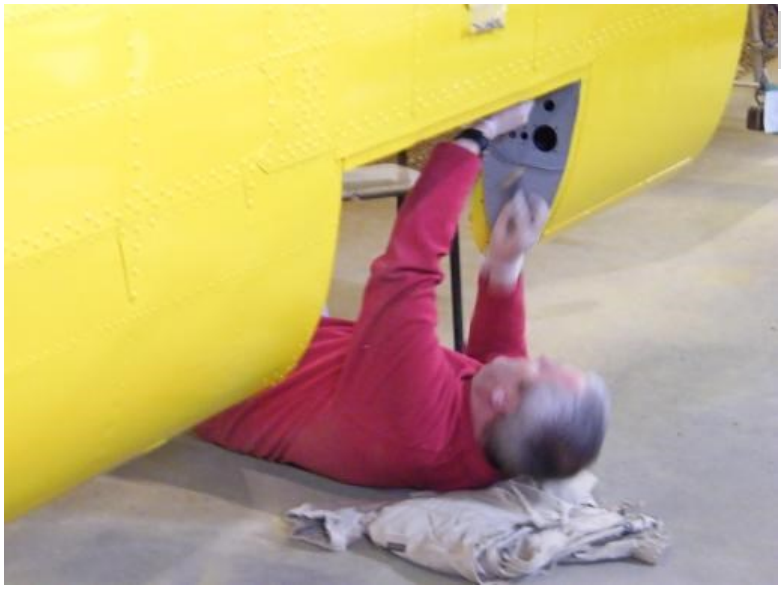
Bernie Coleman is cleaning and refurbishing engine air baffles ready for installation at a later stage.

Picture 12

Patrick Gallagher spray painted parts of the wing where the strengthening plates had been fitted as part of the scaffold pole support arrangement.

Picture 13

Steve Cooley is seen here spray painting those parts of the rudder surfaces where remedial work had been identified when the work to fit the trim tab hinges and the tab actuator rod was under way,



Picture 14

Mark Porter refitted several blanking plates on the wing box at the rear of the engine cut outs.

Picture 15

Bryan Groves installed several bushes that he had made for the engine mounting supports to replace missing items.

Picture 16

Maurice Dyer is seen here at work installing the wing/fuselage fairing structure.

Picture 17

Bryan Groves has manufactured a dummy Flap Actuator Bar to hold the flaps in the correct position until a working Flap Actuator becomes available.

Picture 18

Bryan Groves has been preparing some of the engine related items. Here a carburettor is being offered up to an Air Filter Box Assembly.

Picture 19

Thanks go to Tim Barton for fabricating a pair of lifting plates that will enable lifting strops to be attached to strong points on the wing for the vertical to horizontal lift operation.
The port side lifting plate is seen here during trial fitting. The required quantity of securing bolts is at present being sourced.

Picture 20

Paul Thomasson has cut out the wing profile boards needed for the horizontal wing stands.

Picture 21

First of the wing profile boards that was made by Paul Thomasson. This is a lower surface profile board.

G-AVCN Restoration Progress Report
January 2019-March 2019 (continued)

Work planned for the next period through to end of May 2019

1 Wing:
Install removable lifting eyes to enable the wing to be turned through 90 deg. to the horizontal plane. Lift the wing on to horizontal support stands and profile boards pending assembly to the fuselage.
Inspect and fit hinge bearings for the flaps and ailerons.
Separate aileron cable turnbuckle and secure ends of cable to maintain cable tensioning. Attach pull through wire to starboard side aileron cable end to allow cable to be re-threaded through fairleads as part of fuselage/wing centre section structure installation.
Trial fit flaps and ailerons.

2 Fuselage:
Complete the installation of the fuselage/wing centre section structure.
Obtain quotes for upholstery work for two new seat cushions and, if acceptable, authorise work to proceed.

3 Landing Gear:
Fit wheels to nose and main landing gear axles.

4 Fin:
Apply Aurigny heraldic lion logos to both sides of the fin.

5 Wing/Fuselage Assembly:
Move fuselage to the required position under the wing.
Subject to completion of wing lift in 1 above, proceed with wing to fuselage assembly and re-connection of the aileron cable.

In the Beginning 70 Years Ago……

In 1949 John Britten and Desmond Norman embarked on the design and construction of a light aircraft, the BN-1. The project was supported by the Ultra Light Aircraft Association and was intended to develop an aircraft of simple construction as a "home build". Following development of a number of design concepts, identified as BN-1A, B, C, D and E, the design that got past the drawing board stage was the BN-1F. The following gives an introduction to the BN-1F project and is based on an article by John Britten published in the August 1951 issue of Sailplane magazine.

The Home-Constructed "Finibee"

By John Britten

The BN-1F "Finibee", G-ALZE, is seen here at Bembridge Airport in early May 1951. It has been fitted with a 65hp Lycoming engine together with an enlarged rudder as a result of earlier test "hops" in August 1950 (Peter Gatrell).

The Britten-Norman BN-1F – the "Finibee" - was designed by Desmond Norman and the writer with several ends in view. We wished to design and build an aircraft that would cost us the minimum in terms of money, labour and materials. Secondly, we wished to prove that an ultra-light aircraft need not rely on a relatively gigantic wing area in order to get off the ground, for many ultra-light types are land-bound for a large proportion of their useful lives simply because of too many over 20 mph winds. Also a smaller wing means a shorter fuselage and hence considerably less to build.
We soon arrived at our specification. This called for a minimum sized aeroplane with a straight-across wing, reasonable engine power, in order to make up for the increased wing loading, and using the simplest forms of fittings and construction. Inherent stability and safety were further essentials.

Experience Gaining Venture
Final decisions on layout and general design were taken some two years ago and from that date the fun started, for it must be admitted that the whole project was treated from the beginning as an experience gaining venture that might or might not lead to a successful aircraft.

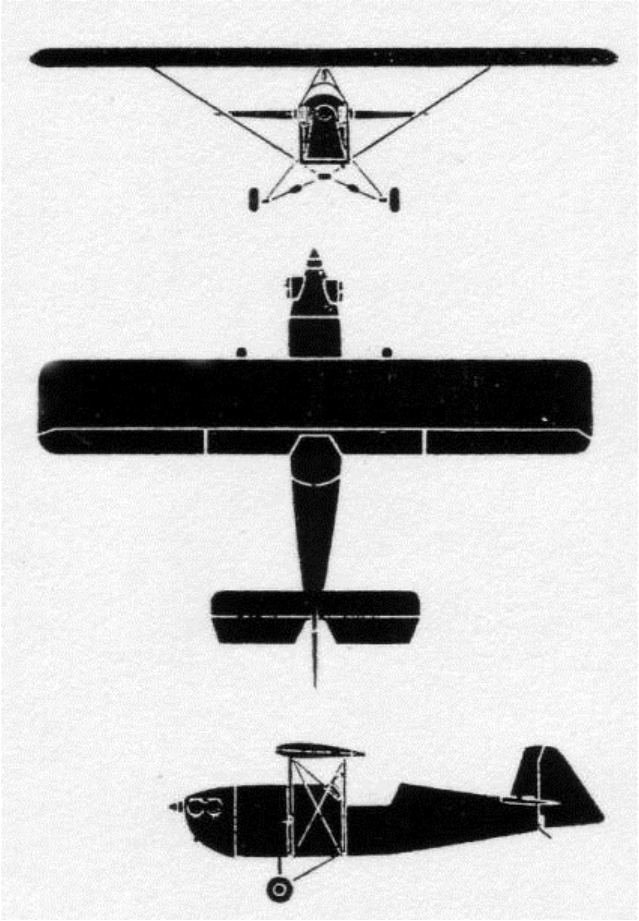
However, we were sure that at least if we could build it there was no doubt that others could do likewise, as we had no special tools or equipment and were unable even to achieve electric power. Ours is definitely an aircraft built right from scratch.
From a design point of view it might be thought that an ultra-light aircraft of an elementary nature is a simple problem. However, there is scant applicable aerodynamic data available, and in certain components such as propellers it is essential to obtain the last per cent of efficiency in order to obtain a workable aircraft. Weight saving is of paramount importance and the designer soon finds himself in deep water.
Nevertheless it must be admitted that the BN- IF turned out to be a fairly straight-forward proposition and a single carpenter was able to build the prototype in under seven months.

The First Tests
The BN-1F made its first tests in August 1950 but we soon found that we were wrong in our estimations in several respects. Both the engine and the undercarriage were unreliable and overweight for their performance and the rudder proved undersized. It was a case of "back to the drawing board."
We fitted a 55 bhp Lycoming engine and a completely redesigned undercarriage. The fuselage was also rebuilt and a larger rudder added, the cockpit slightly enlarged and improved fuselage lines incorporated.
The first proper flight trials with the redesigned aircraft started at the end of May 1951 and we soon found that at last we were on the right track. It is now a matter of modifying and changing until we can finally be satisfied that we have got the most out of the layout.
Then, perhaps, other people may care to build "production" machines to what should then be an approved design. Ultra-light aircraft are most certainly one answer to the cry for cheaper flying and the building of them is a sport in its own right.

Design Data

Dimensions.
Span, 23 ft; length, 16 ft 7 ins; wing area, 80 sq ft:
Weights (estimated). - Empty, 408 lbs: gross, 630lbs.

Performance (estimated). - Max. speed, 84 mph: cruising speed, 75 mph; service ceiling, 12,000 ft: range in still air, 200 miles; endurance. 2 hrs.



BN-1F Description

Construction

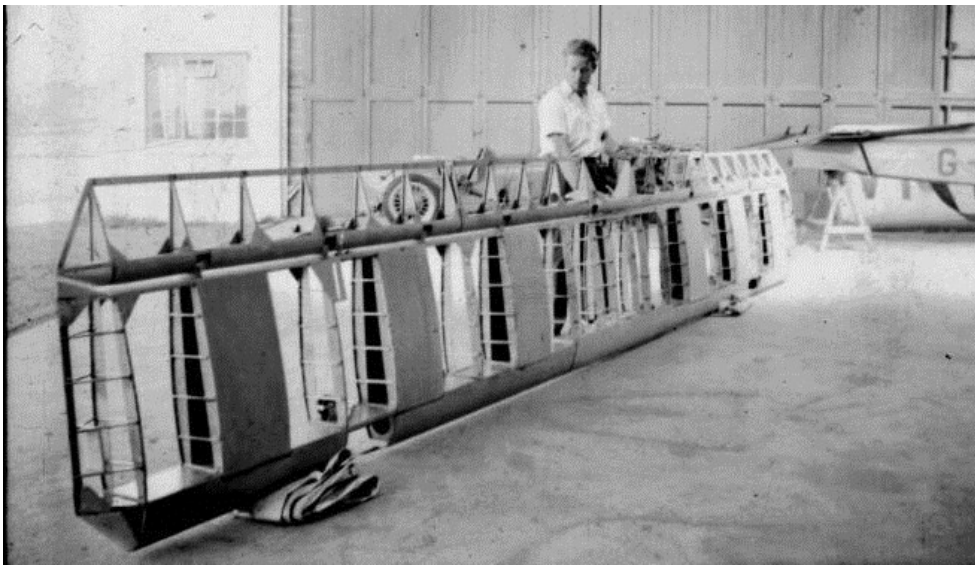
In the layout of the "Finibee" the designers chose a parasol-type wing for good lateral stability without the complication of dihedral, a tail unit of generous area to cope with any likely C.G. positions. Wing loading was kept relatively high, for an ultra-light aircraft, to ease handling in gusts and strong winds; and to ensure keeping within the ARB ultra-light requirements for a stalling speed of not more than 40 mph, flaps were included in the design.

Originally, the aircraft was designed around the 36 bhp J.A.P. engine as being the only proven type available in any quantity. The airframe was stressed, however, for a power plant of up to 75 bhp, and a 55 bhp Lycoming flat-four has since been installed.

To avoid the normal drawback of parasol wings in restricting visibility, the cockpit of the BN-1F was positioned well behind the wing. Vision during turns is, therefore; good. A parallel-chord wing was selected both for good stalling characteristics and, with its standard ribs, ease of construction. For the same reasons, the NACA 23018 aerofoil section, with its 18% thickness/chord ratio, was chosen. Its thickness enables plank spars to be used, and gives a shallow curvature for the ply-covered leading edge.

From the drag point of view, the extra thickness was considered to be negligible. A span of 23 ft, and an aspect-ratio of 6.4, provided a compromise between safe handling and minimum size.

The wing is strut-braced and has spars at 15 per cent and 17% of the chord. Although plywood-covered, the nose, forward of the 0.5 inch spruce plank spar, is not considered as a torsion box, but it nevertheless carries a large proportion of the wing loads. Every third rib bay is ply-covered to form drag boxes between front and rear spars, thus obviating any internal diagonal bracing.



This view of the partially assembled BN-1F's wing illustrates the form of construction (Peter Gatrell).

In effect, the wing is "self-jigging." The method of construction, which ensures precision, is for the halves of front and rear spars to be joined together by fishplates at the centre and, after the aileron spar has been placed into position, the ribs, complete with leading- and trailing-edge members, are slid on to the spars and glued into place.

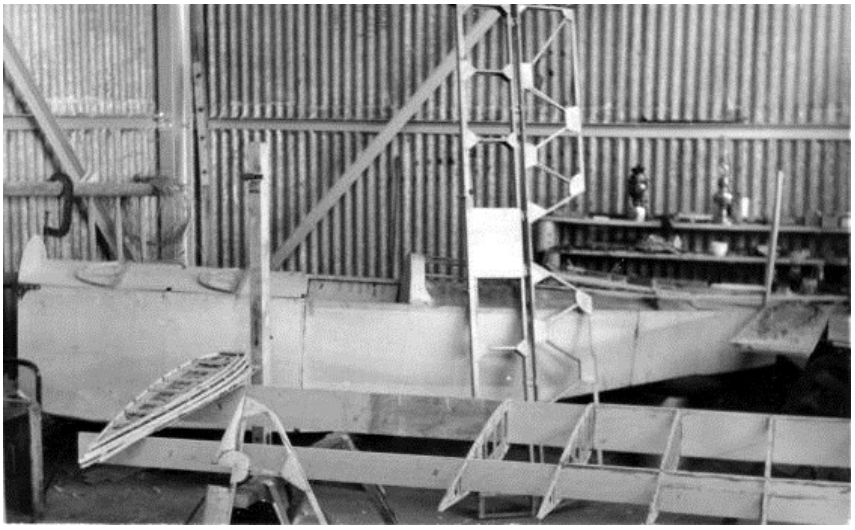
The ply leading edge is then attached, except for the bays opposite strut pick-up points, together with the skin for the drag boxes. The portion of the wing behind the rear spar-consisting of the aileron spar, ribs and trailing-edge member-is sawn off, the pieces between the rear spar and the aileron span are cut away, and ply torsion boxes are built on to the flap and aileron spars. Wing tips are square cut and Obechi blocks are used where any complex curves are required.

All hinges, throughout the aircraft, are simple U members, mounted on wooden blocks. Ailerons are cable-operated, with no differential, and are connected via a bell-crank in the centre section. The flaps are also cable-operated, with a rubber bungee return.

The wing is attached to the fuselage by six pylon struts and four main-lift struts of drawn 20 swg T45 tubes, with slightly flattened ends. All fuselage pick-up fittings are similar triangular plates, attached to two fuselage main frames.

Fuselage Structure

Construction of the fuselage, which is slab-sided, is conventional, and ply is used for covering. The decking of the rear fuselage is built up of formers and stringers, with a fabric covering. To the rear of the two main frames is the cockpit, which has a readily removable plywood seat for control adjustments.



Fuselage, tail plane and elevator components are seen here during construction (Peter Gatrell)..

The cockpit has an internal skin, and is neatly upholstered with red Rexine. Only a lap-strap is fitted as the BN-1F is in the normal category. On the port wall of the cockpit is the throttle, while on the other side is a flap lever in a standard Tiger Moth slot fitting. A tail trim lever below the throttle applies a spring bias to the elevator.

John Britten (left) consults with Desmond Norman before a test flight (James Morton)

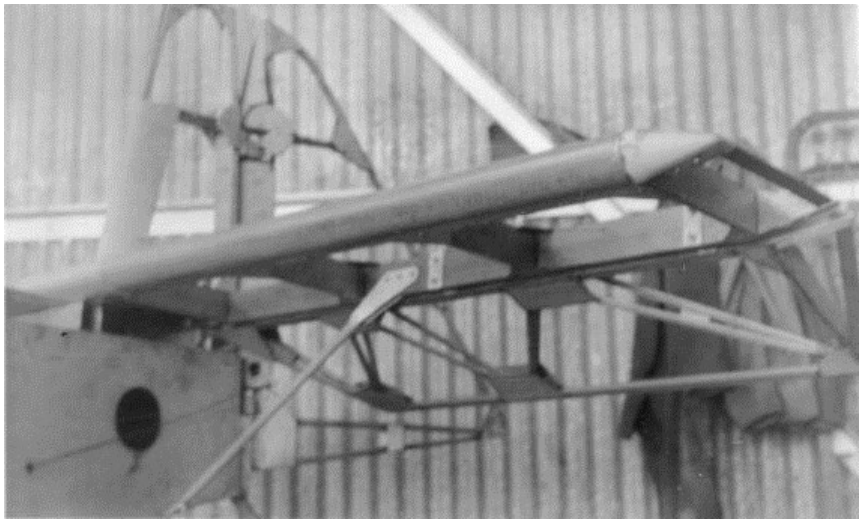
Basic flying instruments are mounted in a readily removable shock-mounted panel. The neat finish of the cockpit is completed by the control column, which has the luxury of chromium-plating. Harmonium-type rudder pedals are fitted and are mounted on the cross-beam of the undercarriage bay. All controls are cable-operated.

Originally, the undercarriage of the BN-1F comprised two cantilever legs with internal bungee springing, but this was redesigned after early trials. It is now an externally braced type, with rubber-cord shock-absorbers, similar in appearance to the well tried undercarriage of the ' Piper Cub.' It has a vertical velocity absorption of about 8.5 ft/s.

The BN-1F is seen here in its modified configuration as initially flown in May 1951 (A W J G Ord-Hume).

In front of the cockpit is a shaped aluminium fuel tank with a capacity of eight Imperial gallons gravity-fed to the engine. The firewall is of 26 swg stainless steel sheet and backed with 1/8 inch thick asbestos.

From the four fuselage longerons, the engine mounting is carried from flat plate fittings. The mounting is of welded steel 7/8 inch diameter, 17 swg tube, with rubber vibration dampers. Engine cowlings are 22 swg aluminium with quick-release fasteners.



View of the tail section of the BN-1F showing the form of construction (James Morton)

At the rear of the fuselage the fin is an integral structure and has a substantial kingpost for pilot protection in the event of the aircraft turning over. Together with the rudder, which was increased in chord by 5 inches, after preliminary tests had shown it to be too light, the fin has conventional fabric covering. All tail surfaces are of flat symmetrical section.

The tail plane is mounted on two mild steel fittings bolted to the top longerons and picking up the front and rear spar. A small strut braces the rear spar. The tail plane leading-edge is formed from 26 swg Duralumin sheet, and is then screwed on to the front spar.

Cushioning for the tailskid is provided by a rubber block, and the kingpost is strengthened by substantial metal fittings, attaching it to the two bottom longerons.

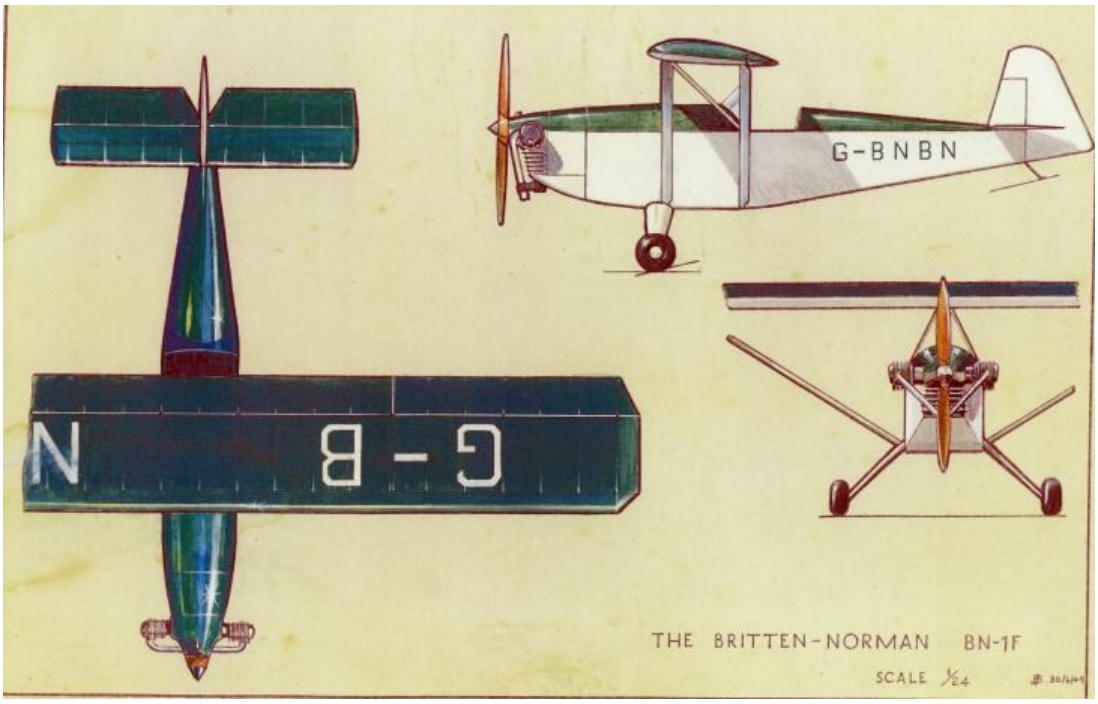
Summary

The "Finibee" would seem to go a long way towards fulfilling the requirements of a cheap and easily produced aeroplane having very low flying costs. Following the successful flight trials of the prototype, G-ALZE, it is hoped to market a kit of parts for the aircraft; this will be in three sections, tail unit, fuselage and wings, which may be purchased together or separately. It is proposed to offer an inspection organization for amateur construction which would be an inclusive part of the scheme for a small fee.

The prototype "Finibee" first appeared with a 36 bhp J.A.P. engine, but this has since been replaced by a 55 bhp Lycoming flat-four engine. The new Coventry Victor engine of 50 bhp may prove another suitable power plant.
The tail unit kit will include the spruce, plywood,, glue and all necessary metal fittings, hinge pins, etc., required for the tail plane, elevator, fin and rudder. It also includes the complete set of drawings and instructions for construction.
Besides all the necessary materials and fittings, the fuselage kit includes the undercarriage, and a semi-fabricated fuselage which obviates the need for any jigs. The final kit contains parts and materials for the wings and struts.
Total costs, exclusive of engine, are expected by its sponsors to be in the region of £173, which includes an inspection service. Four amateur constructors could complete the aircraft in, roughly, 14 weeks, working in a dry and warm room up to 25 ft. in length. Alternatively, the complete aircraft may be offered for sale, with the Lycoming engine, for £455.

From the BNAPS Archive

This early hand coloured general arrangement diagram of the BN-1F was drawn by John Britten and is dated 30/6/49 (Image courtesy of James Morton).



BN-1F "Finibee" at Solent Sky Aviation Museum Southampton

The BN-1F "Finibee" has survived and is now on view (right) at the Solent Sky Aviation Museum in Southampton.
The engine has been made as a mock-up of the original 35 hp J.A.P. engine which is not correct. The engine should be a 55 hp Lycoming for the final airframe configuration, with its enlarged rudder and fin, endplates on the tail plane, tubular frame main landing gear and increased wing span.

(Image from BNAPS Archive)

The BN-3 Nymph and the Grand Design Partnership

Following on from the BN-2 and all the efforts needed to get it into production, John Britten and Desmond Norman were not only looking variants of the BN-2 Islander, initially the stretched "Islander Super", that later evolved into the Islander MkIII/ Trislander, but also initiated the BN-3 light aircraft project which became the "Nymph".
A key principle for the Nymph project was simplicity of manufacture such that it could be offered to less developed parts of the world under the Grand Design Partnership (GDP) scheme.
As Chief Engineer, Denis Berryman was responsible for the BN-3 Nymph project that required a novel design approach in line with the GDP scheme requirements.

Britten-Norman's Light Aircraft Venture in 1969 – The BN-3 Nymph

The BN-3 Nymph was an all metal four-seat multi-purpose light aircraft and had been developed in the experimental hangar at Bembridge in conditions of unusual secrecy. The prototype Nymph, registration G-AXFB and c/n 5001, was first flown at dusk on the 17 May 1969. The reason for the secrecy became apparent three days later, on the 20 May, when the prototype was unveiled to the press and public and the philosophy behind the Nymph project revealed to all as a bold and determined attack on a hitherto American dominated market. The Nymph was designed, like the BN-2 Islander, to give maximum payload-lifting efficiency and safety on what would normally be considered low power for this size of aeroplane, a concept which was expected to appeal in particular to commercial operators such as air taxi companies and aircraft hire firms.

BN-3 Nymph G-AXFB seen over Bembridge during one of the early test flights in May 1969 (Ivan Berryman)

A significantly new feature of the project was the revolutionary plan for marketing the Nymph on a world-wide scale at a selling price that could undercut all existing competition. It was based on a technique similar to that followed by the motor industry for years, and involves final assembly by suitably qualified local organizations from kits of fully finished, interchange-able parts supplied by the manufacturer. Any repair and maintenance company, from a large fixed-base operator to a flying club engineer and his staff, are considered potentially suitable organisations in this context.

By offering local general-aviation engineering a chance to participate in the manufacture, as well as the sales and service, of a highly marketable product, B-N believed it had devised an effective challenge to the supremacy of the American light aircraft mass-production machine in world markets

At the time the bulk of the world's single-engined light aircraft are produced by three large U.S. manufacturers who export 25 per cent of their output. Each year about 12,000 light aircraft were produced and two-thirds of these were high-wing machines. This was the market which the Nymph, which looked quite conventional, was designed to attack; but behind it was a revolutionary sales strategy based on "Export Assembly" where the Nymph would be supplied in the form of completely knocked-down kits of finished parts for assembly under licence in the country in which it is sold. Advantages of this system included:

- greatly reduced shipping costs;
- the fact that import duty on kits (as opposed to complete aircraft) would generally be minimal or non-existent;
- economic employment of local assembly labour, which in certain areas would also be cheaper;
- government support accorded to an important national industry;
- full local factory support for service and repair.

The structure of the Nymph was expressly designed for “Export Assembly” and eliminated the need for the elaborate tooling usually required in the final stages of aircraft manufacture. All the detail parts for the aircraft would be produced from precision matched dies in the U.K., ensuring perfect assembly overseas by competent aircraft repair or maintenance organisations. A special assembly school would be set up at Bembridge for training the licensee’s foremen and supervisors.

The prototype Nymph, a 115 hp model, was built in a record breaking fifty-three days. Full type certification and delivery of the first kits are scheduled for September 1970. On its maiden flight, the Nymph was piloted by Desmond Norman accompanied by John Britten and flight engineer Andy Coombe.

The Nymph variants are illustrated in this colourful brochure produced in 1969 (Chris Michell)

Three versions of the Nymph were envisaged by B-N. The outwardly conventional high-wing Nymph was offered with a choice of engine - 115 hp, 130 hp or 160hp. The basic ex-works

price of the Nymph 115 airframe kit was provisionally set at £1,930 ($4,640) and of the equipment kit, which included the engine, at £1,390 ($3,340). In this way B-N believed that this would undercut all existing competition.

Nymph Licensed Production Concept

The Nymph was part of a bold and imaginative collaborative plan formulated by B-N Ltd, at the time the most hopeful name in British light aviation since de Havilland and Miles, and was called the Grand Design Partnership (GDP) with an imaginative marketing plan for world-wide licence production of the Nymph from kits of fully finished interchangeable parts produced centrally.

Prime object of the GDP proposal was to make light aircraft manufacture practical and economic even in countries where local markets were small. With an exceptionally competitive selling price in every country, and duty on the parts used generally minimal or non-existent, as was usual with supplies for nationally important prime industries, the Nymph appeared to be an attractive proposition. The economic case was supported by the fact that labour costs of assembly would be at local rates, while the assemblers would gain benefit from bulk purchase of materials and equipment and the amortisation of detail tooling and design support over very large numbers of units.

Many economies were also expected to follow from the hoped for situation where licence production was in the hands of suitably qualified organisations such as fixed-base maintenance and repair companies that were already dealing in general aviation, or the larger flying club engineering groups. It was suggested that assembling a batch of Nymphs (B-N considered that five aircraft was the practical minimum, and was therefore packing in bundles of five kits) could be undertaken at off-peak times when engineering resources were otherwise not working to capacity. Close familiarity with the machine by local licensees would also ensure good support for service and repair. Again, the scheme largely eliminated normal delivery charges, which could have been as much as one-third of the distributor's net cost. In addition, aircraft manufacturing usually demanded large sums of risk capital which was locked up for a considerable period while tooling and development costs were amortised. B-N believed that a GDP licensee would not require these resources and a healthy profit could be made on the investment after a remarkably short period.

The GDP licence assembly concept preceded the BN-3 design itself. The airframe structure was carefully laid out from the start for assembly by use of common hand tools and trestles. The success of this approach was demonstrated by the fact that the final assembly of the prototype was completed in a mere six weeks or so with an average labour force of less than 20 people.

In just a few years B-N had leapt to the forefront in light aircraft manufacturing with the BN-2 Islander. At the time the Islander was fast outselling the production capacity of British Hovercraft Corporation at East Cowes. In 1968 B-N had placed a major component manufacturing sub-contract on BHC to produce 230 Islander airframes for final assembly at the new B-N factory at Bembridge. The BN-3 had no doubt been maturing in the fertile minds of John Britten and Desmond Norman for as long as the Islander had been in existence, but the marketing plan was a new idea that occurred to them from their experience of getting the Islander into production.

After announcing the Nymph project B-N was inundated with requests from aircraft manufacturers, repair organisations and service companies all over the world wanting to enter licence production agreements to assemble Islanders for local distribution. With the GDP concept B-N aimed to satisfy customers' latent desire, worldwide, for a share in making the aircraft used locally.

Prospects for kit production

Producing kits of fully finished parts was seen as a far easier task, for a company the size of B-N, rather than trying to make complete aircraft. Also the rate of kit production could be made more flexible to allow adjustment up or down to suit demand. From the initial response it was envisaged that kit production could accelerate rapidly and with many dozens of

licencees around the world there could be a flood of machines appearing within a remarkably short time. The critical factor was seen to be the reaction time of potential licencees and how soon they could get the necessary staff trained and on the job.

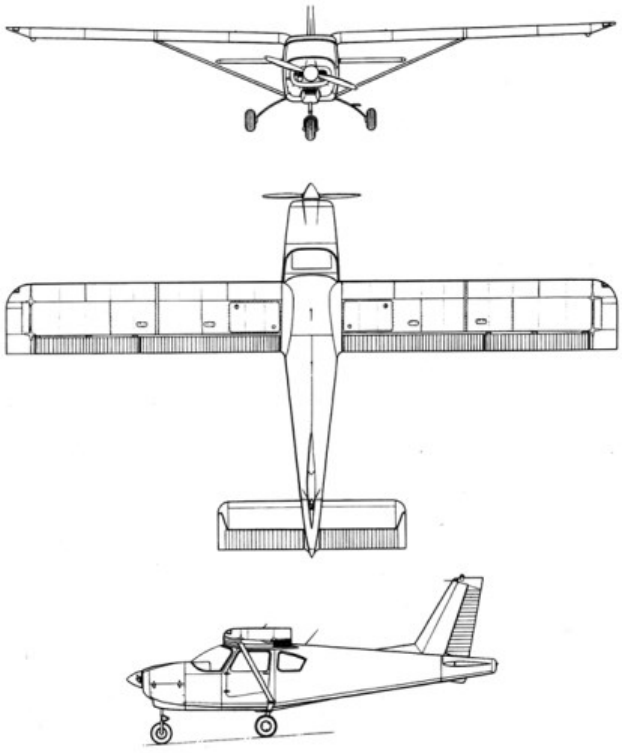
One of B-N's first priorities once kit production was underway was to set up a BN-3 Assembly School at Bembridge, to which every licensee would be asked to send at least one senior engineer and one craftsman for a three month training programme in the whole assembly and inspection process. At the time the BN-3 Nymph project was a B-N private venture that was believed to be well within the company's resources. Unfortunately subsequent events were to prove that this was not to be the case two years on when the company ran into severe financial difficulties.

Once the prototype aircraft had been flown, the immediate plan was to press on with development as rapidly as possible and to demonstrate the efficiency of the design itself so that it could be seen and evaluated by the market at large and by potential licensees. The prototype Nymph was shown at the 1969 Paris Air Show. A second airframe was made for structural testing and it was planned that the first airframe would be subsequently re-engined for clearance of the 130 and 160 versions.

Following granting of an Air Registration Board recommendation for a public transport category type Certificate of Airworthiness by September 1969, the aim was to start delivery of kits at about that time. B-N also hoped that the first licensee would, be someone based in Britain and fairly near the Isle of Wight, for the obvious reasons of easing liaison on teething troubles. B-N did not expect to have a production line of their own for complete aircraft, apart from a small number that may be produced as a by-product of student work in the BN-3 Assembly School.

Nymph Design Features

The BN-3 Nymph was a conventional high-wing all metal four seater. The strut-braced wing was of unusually large span to minimise induced drag at low speed and hence to confer good climb performance with an insignificant effect on cruise speed. Even on the minimum power of 115 hp, as installed in the prototype for its first flight, the useful load of production aircraft was expected to be 785lb. This was ample for the design load of one pilot and two passengers travelling with full airline luggage, a capacity which was considered the minimum for air taxis.

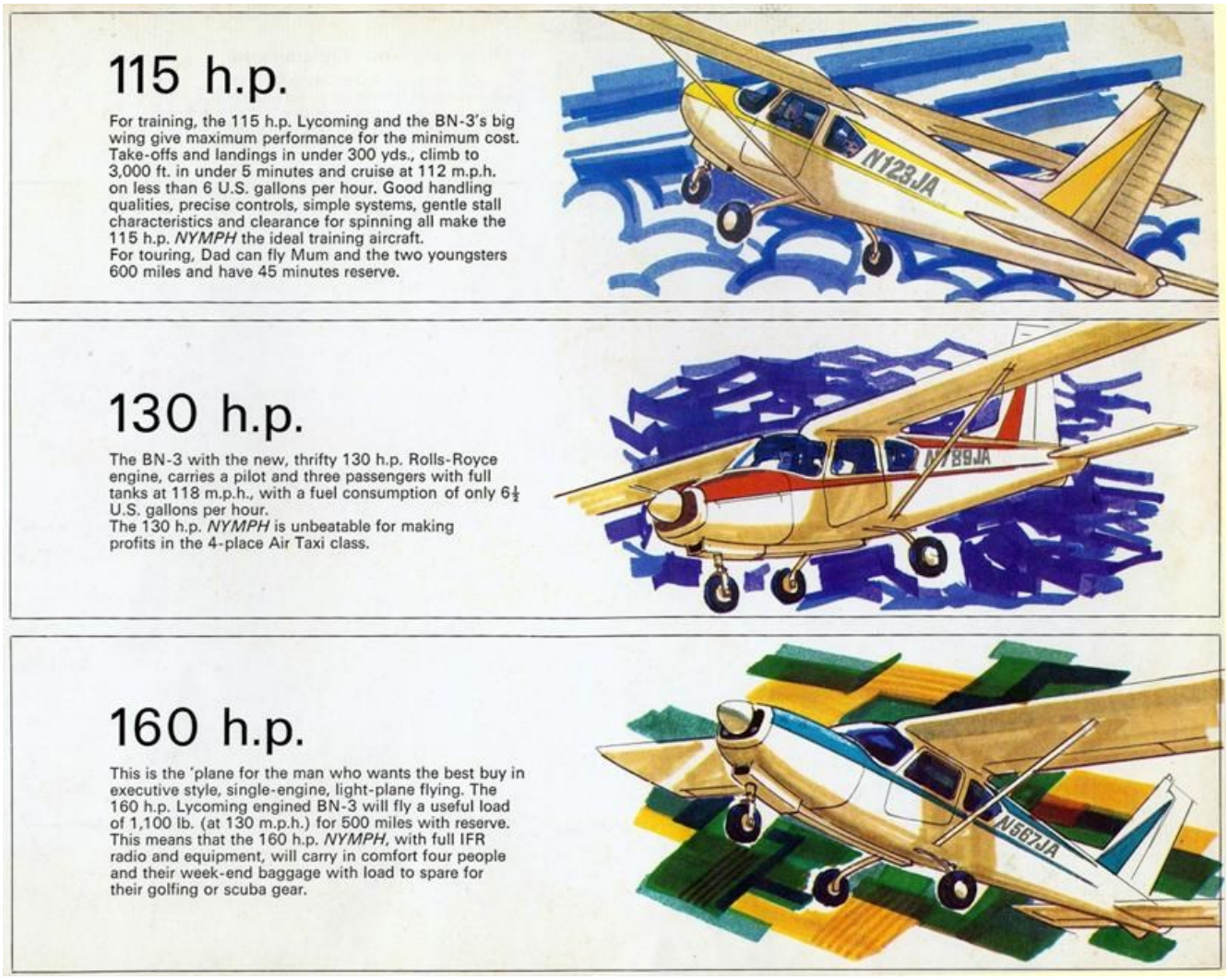


BN-3 Nymph prototype general arrangement (BN)

Even with basic IFR equipment it was expected to be possible to carry full fuel with this load and that the tankage (30 Imp gal) would be sufficient to give a range of nearly 500 miles cruising at over 110 mph in still air, with 45min reserve.

According to estimates the airfield performance was average for a light aeroplane of the size, and adequate for most normal GA airfields. At gross weight under normal sea-level conditions the Nymph required a take-off run of 900ft and to reach 50ft after 1,575ft from brakes off. Landing distances were estimated to be less than 950ft from 50ft with a 500ft ground run. In all-round capability the Nymph 115 fell between the Cessna 150 two/ three-seater and the Cessna 172 four-seater.

The Nymph was cheaper to buy than either of these aircraft in Britain and neutral overseas markets, but would have been about the same price as the 172 in North America.

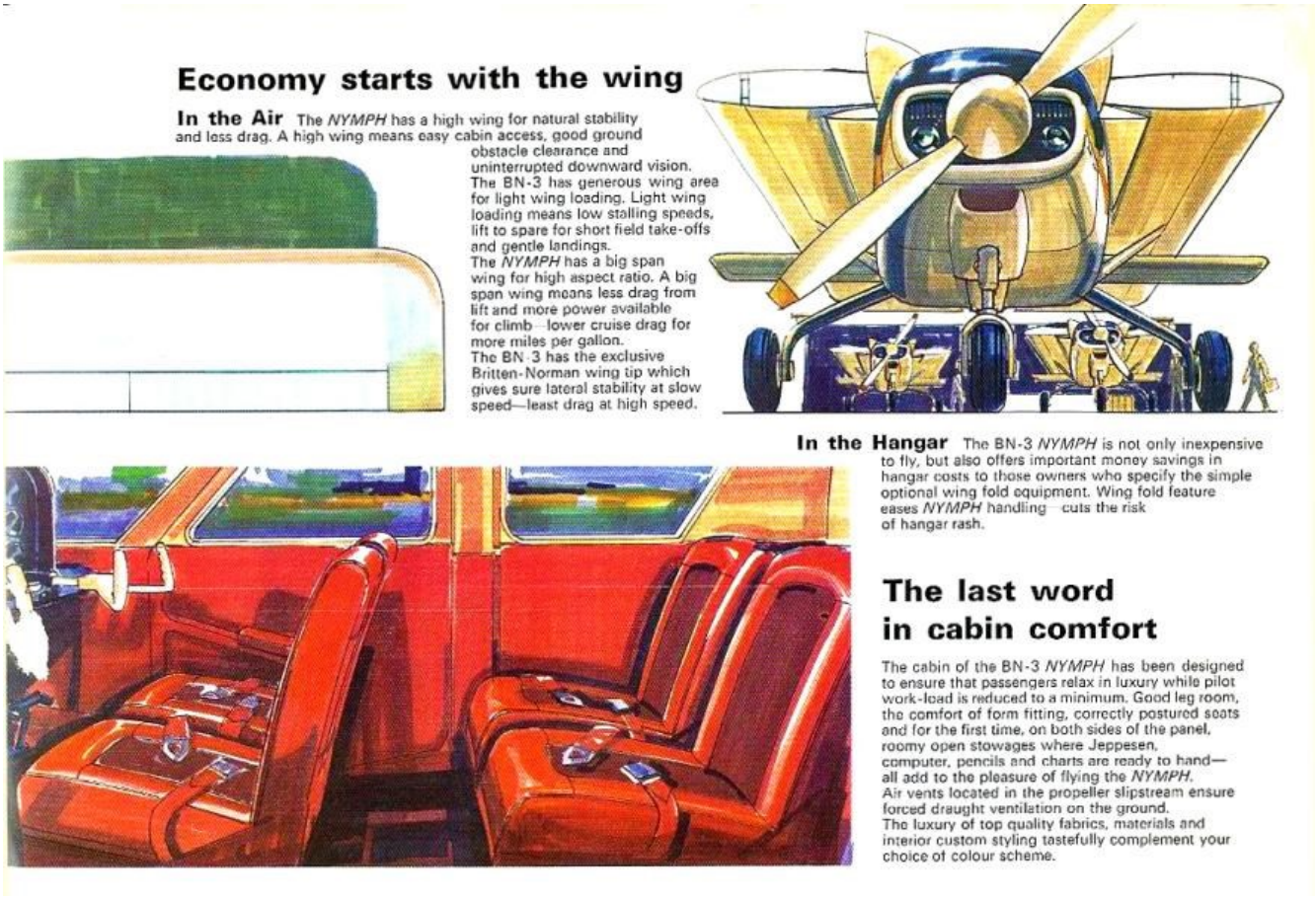


Proposed Nymph variants (Chris Michell)

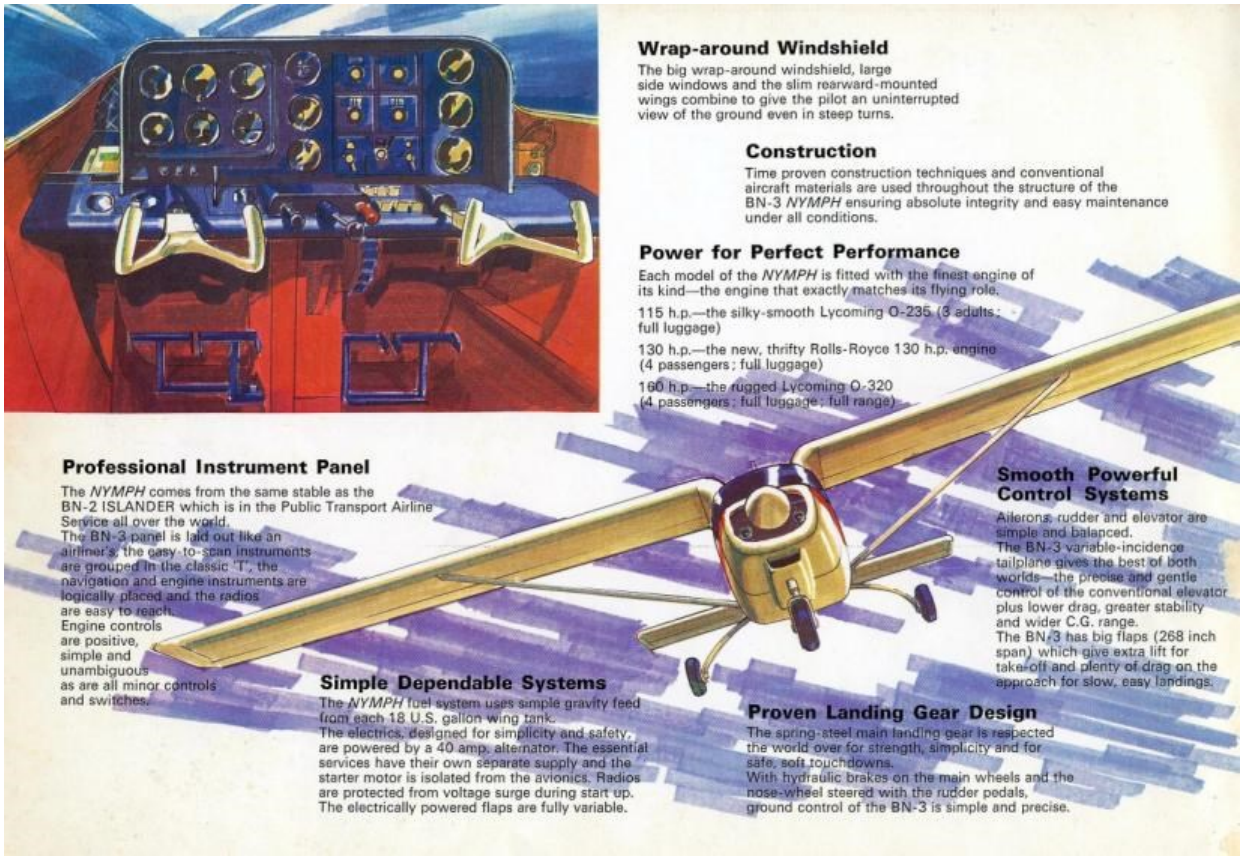
Higher-powered versions of the same basic airframe were envisaged and were planned to be certificated almost concurrently. With a projected 130 hp Rolls-Royce engine the useful load was increased up to 9201b and performance was fractionally better despite an increase in gross weight. Maximum utility was reached with a 160 hp Lycoming 0-320, when the useful load was expected to be 1,100lbs (enough for full practical use, simultaneously, of the cabin accommodation and tankage and IFR equipment) and the performance higher still at 130 m.p.h. cruise and take-off to 50ft in less than 1,500ft.

Performance and key characteristics of the proposed Nymph single engined variants is shown in the table below.

Version	Nymph 115	Nymph 130	Nymph 160
Powerplant	115 h.p. Lycoming O-235	130 h.p.	160 h.p. Lycoming O-320
Dimensions			
Span	39ft	39ft	39ft
Length	23ft 6½in	23ft 6½in	23ft 6½in
Height	9ft 2in	9ft 2in	9ft 2in
Wing area	169 sq ft	169 sq ft	169 sq ft
Weight			
Gross	1,925lb	2,100lb	2,350lb
Basic empty	1,140lb	1,180lb	1,250lb
Fuel capacity	30 Imp gal	30 Imp gal	30 Imp gal
Performance (at gross weight)			
Maximum level speed	117 m.p.h.	123 m.p.h.	135 m.p.h.
Cruise speed/fuel consumption (75 per cent power at 7,000ft)	113 m.p.h./ 5.8 Imp gal/hr	118 m.p.h./ 7.5 Imp gal/hr	130 m.p.h./ 8.3 Imp gal/hr
Rate of climb (sea level)	580ft/min	630ft/min	700ft/min
Take-off run (sea level)	900ft	850ft	830ft
Take-off to 50ft (sea level)	1,575ft	1,520ft	1,480ft
Landing run	500ft	520ft	540ft
Landing from 50ft	950ft	1,020ft	1,110ft

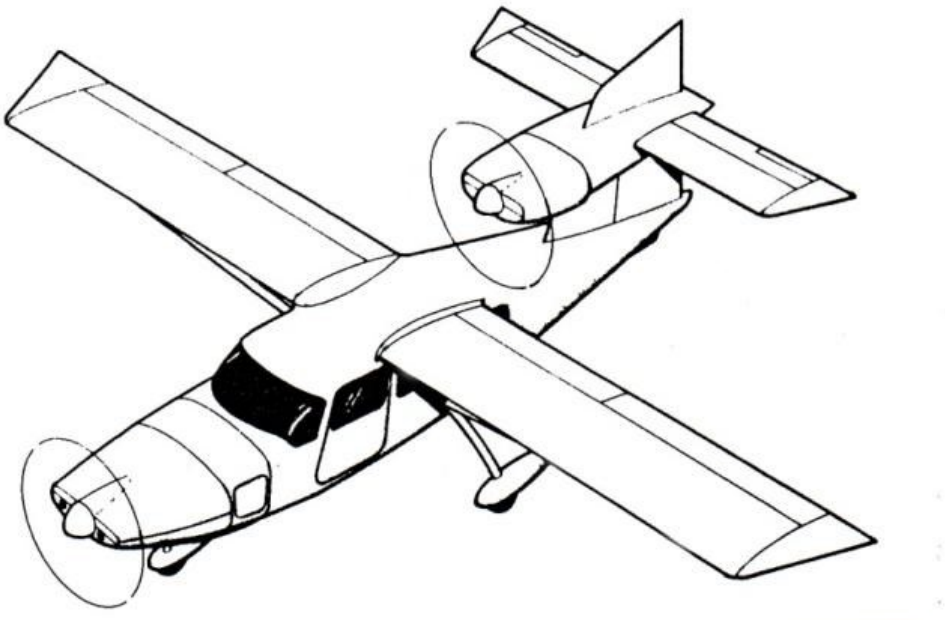


The Nymph was a well considered and practical design offering comfort with economy for the private owner (Chris Michell)



The practical design and key features of the Nymph are emphasised in this contemporary brochure (Chris Michell)

A more unusual development of the Nymph that appeared in a B-N brochure was the Nymph Twin. This development of the basic Nymph design included a second engine mounted at the junction of the fin and tail plane. Powered by two 180 hp Lycoming 0-360 engines the Nymph Twin was designed to carry six passengers plus baggage.



Outline drawing of the Nymph Twin Concept Taken from a B-N Sales Brochure c1970 (Ivan Berryman)

The tail mounted engine configuration was also adopted for the BN -2A Mk III, later to be called the Trislander. It is not known whether the Nymph Twin concept inspired the Trislander configuration. However, as the BN-2A Mk III was being designed around the same time it is likely that the idea arose from informal meetings of the B-N design team and brainstorming sessions that are reputed to have taken place in the Propeller Inn at Bembridge.

The cabin was designed around the typical minimum air taxi payload of pilot and two passengers plus luggage, an alternative loading is four people and hand luggage. A single (port) side door gave access to front and rear pairs of seats. Since the pilot must be last in and first out he was able to supervise passenger entry and exit; a starboard door was optional. Either back seat could be folded and stowed at the very back to give extra stowage, or removed altogether. Wing folding for economical hangarage was available as an option.

Engineering for Simple Low Cost Manufacture

Simplified building procedures using only ordinary hand tools and trestles without any need for special jigs or tools were a basic assumption in designing the airframe. Instructions for assembly of the whole airframe from the kit of parts were on 16 sets of illustrated instruction sheets. These had been carefully thought out to give clear step-by-step instructions for the assembly of each component. Further assembly aids were made available to GDP customers including photograph albums and a film, backed, of course, by mandatory attendance at the Nymph Assembly School.

The Nymph kit consisted of all metal cut to size and shaped where necessary (door surrounds, frames. ribs, fluted skins and rounded leading edges are the principal shaped metal parts). Rivets were the standard method of fixing, and drilling for these was simplified by having a standard pitch which allowed the use of jig-bored drilling strips, located by pre-drilled master holes. This method was accurate enough to eliminate all drilling fixtures and back drilling. The basic aircraft had no expensive accessories so that the constructor was able to offer the lowest possible price. Every single item of standard equipment was to be supplied in the kit. Provision was also made for a wide range of optional equipment.

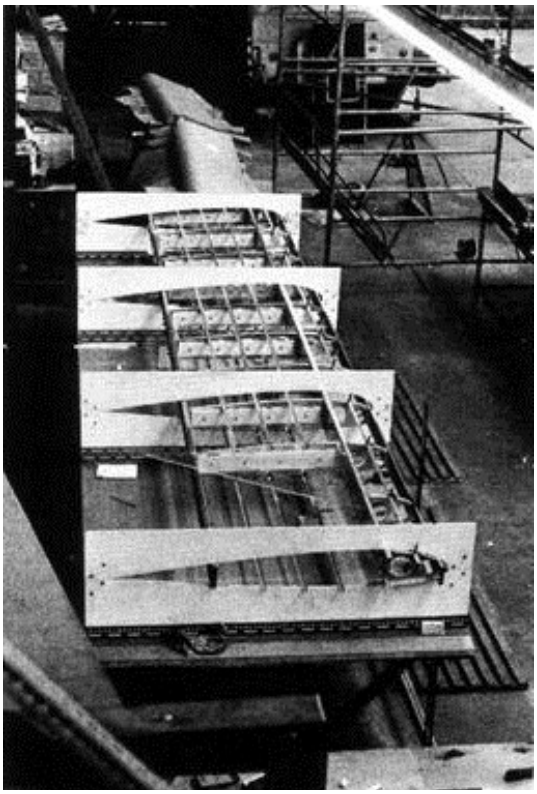
B-N recognised that meticulous inspection and quality control were essential to the success of the scheme, which ultimately depended upon public confidence in the integrity and workmanship of the assemblers. Inspection and quality control have been made as inherently simple and effective by the nature of the design. A mandatory aspect of the licensed production agreement with BN was that before assembly could begin the licensee must arrange and agree the inspection procedure with the relevant airworthiness authority.

The licensee would also need to maintain a properly controlled stores with records of all materials receipts and issues. A simple Cardex system for stock control would be supplied with every shipment, together with a guarantee. When equipment was purchased from other sources, the licensee would be responsible for making other arrangements for certification. If mistakes were made during assembly which could be cured by a repair scheme, then B-N was prepared to make recommendations at no charge, and, unless there are exceptional circumstances, provide replacement parts with minimum delay and thus avoiding local unauthorised repairs.

Construction Concept

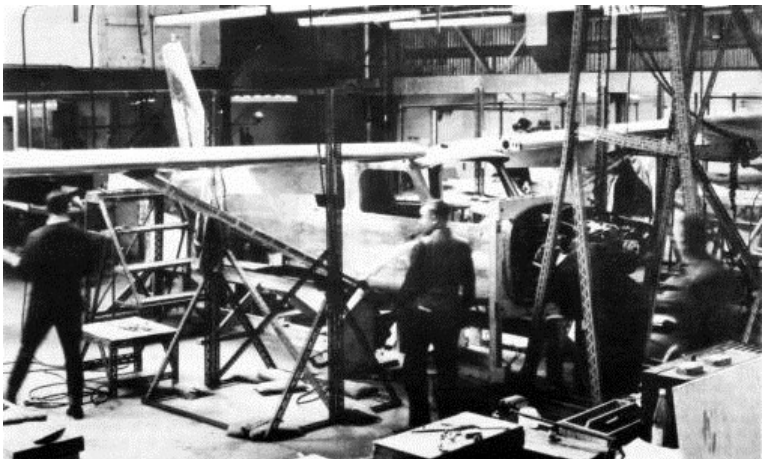
Assembly of all flying surfaces followed a similar sequence in each case, only the scale and the amount of detail marked the difference. The spars were built up first from webs and angle reinforcements, the latter were applied in varying quantities according to local strength requirements. Spar depths were controlled by the master holes in the case of the wing, and by the preformed U-section for the empennage and control surfaces.

All ribs were pre-formed with master holes drilled, additional reinforcements, equipment attachment brackets and other landings are simply riveted in where necessary. The internal structures were then temporarily joined by the master holes, using clips so that the remaining rivet holes could then be drilled.



Left: Nymph wing under construction in a simple assembly frame (BNAPS Archive).

Below: Nymph prototype under construction (BNAPS Archive)



Before final assembly the parts were taken apart for cleaning and corrosion protection. Deburring the holes was not recommended as this had a tendency to open-out the holes in thin material. Skins were then attached in convenient panels, first by clips while the remaining holes were drilled and then finally Cherry-riveted. The inter spar panels went on first, followed by the wraparound leading edges. The control surfaces were very simple structures with a minimum of internal stiffening, but with skin fluting.

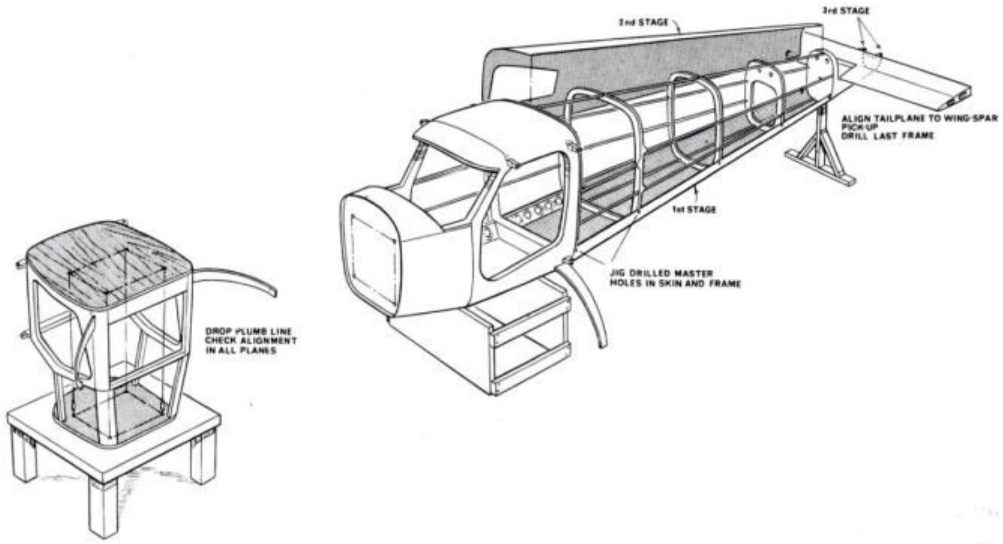
The single piece metal fuel tanks were located between the spars at the inboard section of each wing. The tanks were riveted and welded from a number of pieces, but for production it was intended that a single base pan would be used and welded on top. The wing spar and strut root-end attachments were designed to be of optional configurations to permit wing folding on the ground for economical hangarage.

The fuselage structure of the prototype was not fully representative of the visualised production version. In the interests of rapid construction of the first aircraft this was made along conventional lines, using frame boards and jigging. The anticipated scheme for the kit-built fuselage was for assembly to begin with the riveting together of the central box comprising the single-piece door frame pressing, undercarriage/ strut transverse box, and the two wing-spar carry-through beams.

The firewall, front decking and panel control column support beam, were located on the centre box in a vertical position. This latter method of assembly was expected to be the easiest way in which to check the correct alignment and relative position of the wing spar pick-ups and engine bearer attachment points.

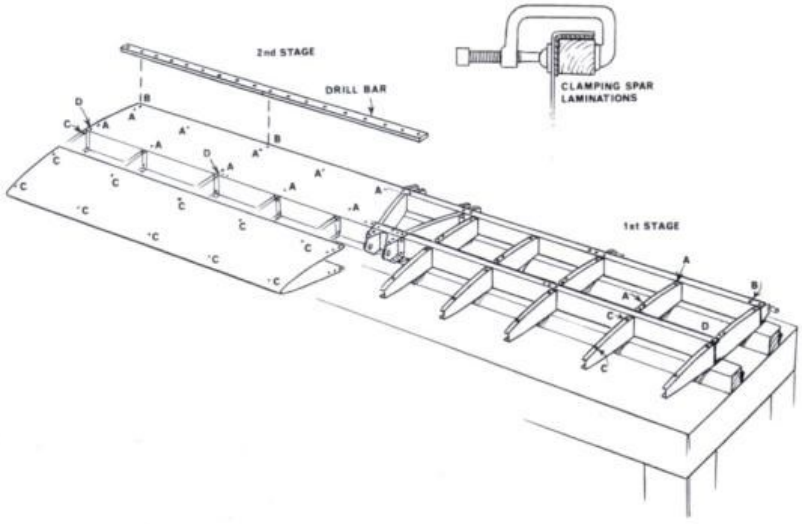
The fuselage back-end could then be attached in cantilever fashion, beginning with the single piece U-shaped bottom skin complete with stringers and frames, followed by the addition of the two side/top pieces. The tail plane hinge attachments were drilled after ensuring correct plan-alignment of the actual surface relative to the wing. Door assembly and fitting was simplified by the use of the single frame pressing.

The main undercarriage on the prototype used a pair of Cessna 172 spring steel legs, but on production aircraft it was planned that theses would be replaced by a tapered spring rod.



Stages in the construction of a Nymph fuselage also showing simple alignment verification technique (BW Collection)

The Nymph design allowed for easy access for all equipment stowage appears. Without the windscreen in place the back of the instrument panel was laid bare for connecting up wires, pipes and control cables. All cables ran back along the outside of the fuselage bottom main skin and were covered by a readily detached fairing. The unusual routing of the aileron cables via the back end of the fuselage and the positioning of the flap motor in the tail was chosen for minimum weight and least circuit drag, in the absence of sufficient strong points for pulley mountings in the region of the cabin aft frame. In the wings the aileron and flap control cables were arranged to pass along the outside of the aft face of the rear spar and were readily accessible since the flaps may be pulled down by hand without the release of any catches (the mechanism allows the flaps to be pushed down while a bungee and air pressure kept them up).



Simple self-jigging methods were adopted for the Nymph tail plane assembly (BW Collection)

Most of the detail in the engine mounting and cooling followed the Piper Colt practice including the bearer design incorporating the nose leg. The Nymph prototype used a Colt component for this purpose. The nose cowling (incorporating the landing lights) and the matching spinner were specially designed for the Nymph.

Costs and prices (as applicable in 1969)

B-N estimated that the recommended price for the basic Nymph 115 at $12,600 (£5,250) ex-works in most countries. This was judged as falling between that of the Cessna 150 and the Cessna 172 in neutral markets and about the same as the 172 in North America, but considerably less than either type in Britain. Price comparisons were difficult and complicated by the many different taxation and import terms applicable in various countries. Some

allowed the duty-free import of aircraft parts, whereas they charged on complete aircraft; in this situation such an arrangement meant that a locally assembled Nymph would benefit from a significant cost advantage.

Calculating the, likely cost of assembly from a kit depended on many local factors. The estimates given in Table 1 summarises B-N's provisional costings.

TABLE 1: Cost breakdown of Nymph 115 Assembly (provisional)

Number assembled per annum	5	100
Airframe kit, each	4,640	4,640
Equipment kit, each	3,340	3,340
Less the quantity discount	—	1,995
Nett cost per complete kit	7,980	5,985
Freight	200	200
Total, including freight	8,180	6,185
Labour and overhead at $5 per hour	2,500	1,250
Total cost to the licensee	$10,680	$7,435

The number of man hours needed was a fundamental parameter. Reliable statistics on light aircraft production were difficult to obtain and it was even more difficult to predict allowances for learning and the productivity of local employees. On their best knowledge of American industry practice B-N estimated that the Nymph 115 would be assembled in 500 man hours each at a production rate of ten aircraft per year and that this could reduce to around 250hr per aircraft for a run of 100 per year. B-N believed that the learning pattern was likely to follow very closely the formula that a second aircraft takes only 80 per cent as long as the first, that the fourth takes 80 per cent as long as the second, the eighth takes 80 per cent of the fourth, and so on.

The basic ex-works price of the airframe kit was set provisionally at £1,930 ($4,640), and the equipment kit (including engine) was quoted at £1,390 ($3,340). Assemblers of more than five kits were to be offered a progressive discount, reaching a maximum of 25 per cent if 100 or more were assembled in a year. Freight charges were a relatively small proportion of the costs and kits were planned to be shipped in minimum lots of five.

Rise and Fall of the BN-3 Nymph – *The prototype BN-3 Nymph, G-AXFB, made a first flight from Bembridge Airport on 15 May 1969, in time to make an appearance at the Paris Air Show. Despite an uneventful series of test flights, the project was overtaken by B-N having to call in the receiver in 1970. In the process of preparing the company for sale, by 1971 the decision was made to curtail the BN-3 project.*

However, that is not quite the end of the story. A few years later Desmond Norman left B-N and set up his own company, NDN Ltd. based at Sandown Airport, to develop the Firecracker. The company was later relocated to Wales as the Norman Aeroplane Company (NAC).

Desmond Norman managed to acquire the BN-3 Nymph from a museum in Scotland and used it as the basis for the prototype of his NAC 1 Freelance aircraft registered as G-NACI. This aircraft is still airworthy and is currently owned by Mark Gorlov and is based at Elstree.

A production batch of Freelances was laid down by NAC but the only one was built and is flown as G-NACA. This Freelance is jointly ownedby BNAPS Patron Alex Norman and BNAPS supporter. Patrick Caruth.

For more about the Nymph and Freelance story, BNAPS Ltd publication titled "The BN-3 Nymph and the NAC 1 Freelance" is still available.

The article "Reflections on the Islander in 2019" in January issue of BNAPS News surmised that the turbine engine was at a disadvantage compared to the piston engine for aircraft involved in third level operations where limited skills and facilities may make maintenance difficult and costly. BNAPS Supporter John Perera has responded to shed some light on the turbine versus piston question from his wide experience of aviation dating back to the early 1970s.
Thanks go to John for taking the time to put his thoughts together in the article that follows…….

Maintaining Turbine Engines in Remote Regions – A Myth?

By John H T Perera

The article in BNAPS News "Reflections on the BN-2 Islander in 2019" contained the statement "technical challenges and costs of maintaining turbine engines in remote regions". This is simply not true. What makes sense is that an aircraft (fixed or rotary wing) that needs an engine (or 2) up to 400hp is better for financial reasons (purchase and operating costs) with a piston engine. Anything bigger needs a turbine engine. Some modern-day piston engines – made primarily by Continental (now owned by AVIC) and Lycoming (owned by Textron who also own Beechcraft and Cessna) have been developed that are part electronically controlled and are capable of using unleaded aviation fuels. Continental also own Thielert and manufacture a range of diesel engines (over 5500 delivered to date).

Turbine engines have been adopted by general aviation manufacturers, such as Cessna & Beechcraft (Textron Aviation), Piper and Embraer (also manufacturer of the Bandeirante and Tucano), jet airliners and executive jets). Others include ATR (the leading turboprop manufacturer), Bombardier corporate jets and airliners (now part of Airbus), Gulfstream (corporate jets) and others. Pilatus is the leading manufacturer of turboprop trainers, single engine corporate/utility aircraft and now a twin jet PC-24. Robinson manufactures the piston engined R22, R44 and the turbine R66 (over 12,000 of the 3 models have been delivered).

The turboprop engine is more fuel efficient than jets for short distances (at low and medium altitudes). Turboshaft engines are typically used by helicopters. There are no major differences between the two. Three of the best-known engines are the Rolls-Royce M250 series (originally Allison T63 with over 31,000 built to date) - also used on the BN-2T. The Pratt & Whitney PT-6 series is used on a wide range of fixed wing aircraft (Twin Otter, King Air, Pilatus etc.) and helicopters (Bell 212, 412 etc). It also has marine applications and over 51,000 of all varieties have built to date. The Rolls-Royce (originally Allison) T56 powers the C-130, L-188 Electra and P-3 Orion and is used in other applications (i.e. marine). The General Electric CF-6 engine (DC-10 etc) was also developed into a marine and industrial gas turbine (LM2500) and over 1,000 of these variants have been built by GE and more under licence in India, Germany, Italy and Japan.

General aviation has long played a major part in the US economy as well in some other countries including Switzerland, Italy, Canada, Germany, France, Australia and New Zealand. Unfortunately, the UK general aviation manufacturing industry has faded away. It is worth noting that Cessna ceased production of single-engine piston aircraft (and twin turboprops) in 1986 due to the prohibitive cost of liability insurance. In 1994, as a result of lobbying by the aircraft industry, the U.S. Congress passed the General Aviation Revitalization Act, which established a limit of 18 years from date of manufacture on lawsuits against aircraft manufacturers. The company revived the upgraded 172 and 182 as well as the 206. The Caravan turboprop has been widely sold and over 2,500 of the short and long bodied aircraft have been delivered. Cessna recently announced the launch of the twin turboprop Model 408 SkyCourier, a 19 pax aircraft which in a pure cargo configuration can carry 3 LD3 containers. FedEx, a launch customer of the Caravan, has placed initial orders for 100 Sky Couriers with an option of 50 more. Also launched is the Denali, a low-wing single turboprop. The Citation range now includes 5 models ranging from the 525 to the Citation Longitude.

Many mechanics and engineers have started their careers in the general aviation industry. Some remain in that industry others have moved on to the airlines. The General Aviation Manufacturers Association (GAMA) reports for 2018 are linked below. Sales of the Airvan and PAC 750 continue to be very low. The Quest Kodiak is probably profitable. TECNAM has a well-rounded business – not reported is their subcontract work. A Portuguese pilot training school, Sevenair Academy, has just ordered 10 TECNAM aircraft.

The many gas turbine powered aircraft, tanks, warships and other civil and military applications means that there have been large numbers of mechanics and engineers trained since the late 1940s in turbine engine maintenance, repair and overhaul. From past-experience going back to the 1960s it was not difficult to recruit experienced mechanics and licenced engineers with turbine qualifications and experience to work in Malaysia, Indonesia or Singapore. All military forces have mechanic training programs and many aspiring engineers go the civil schools in various countries.

As of 2018, there are more than 446,000 general aviation aircraft in the worldwide fleet, ranging from small training aircraft and helicopters to intercontinental business jets. About 211,000 of these, or 47%, are based in the United States. The biggest problem facing airlines and commercial operators is the lack of pilots. This situation is worsening.

John H. T. Perera 4 March 2019

NOTE 1: GAMA STATISTICS FOR CY2018
https://gama.aero/wp-content/uploads/2018ShipmentReport02202019.pdf

https://gama.aero/issues/brexit-uk-exit-from-eu/

NOTE 2: UK CIVIL AIRCRAFT
Of the 21,000 civil aircraft registered in the UK, 96 percent are engaged in GA operations, and annually the GA fleet accounts for between 1.25 and 1.35 million hours flown. There are 28,000 Private Pilot Licence holders, and 10,000 certified glider pilots. Some of the 19,000 pilots who hold professional licences are also engaged in GA activities. GA operates from more than 1,800 airports and landing sites or aerodromes, ranging in size from large regional airports to farm strips.

It is a sad fact that in the UK the only remaining general aviation manufacturer is the B-N Group, with the BN-2B, the BN-2T and the Defender 4000 that are all derived from the 50+ year old BN-2 design. It appears that investment is just not available to come up with new designs.

Work Under Way in Mexico to rebuild Islander cn 24 XB-EBZ

A recent post on facebook from Aereo Pity S.A. in Mexico included video clips of what is believed to be Islander cn 24, XB-EBZ being painted in the company workshop at Canelas, Durango, Mexico. It is also understood that Islanders XA-DEW, cn 356, and XC-FEE, cn 2022, are also with Aereo Pity.

(Images via Allan Wright/BNH)

Cape Air Islanders Deployed on Caribbean Services for 2019

Late last year Cape Air's Islanders were offered for sale, presumably in anticipation of delivery of its Tecnam P2012 Travellers. However, a recent press release in Aviation Tribune has indicated that the Islanders will again be deployed in the Caribbean region in 2019……

Cape Air is reinstating air services between San Juan and Culebra and between San Juan in Puerto Rico and Virgin Gorda. Cape Air's Islanders are ideally ally suited to the short runways on Culebra and Virgin Gorda. Beginning on 10 April, Cape Air will operate four daily flights between San Juan and Culebra and three daily flights between San Juan and Virgin Gorda.

"As the Caribbean continues to rebuild, Cape Air has listened and responded to the demands and needs of these two communities," said Linda Markham, President of Cape Air. "We are committed to the regions we serve and are delighted to contribute to the improvement of air access for Culebra and Virgin Gorda."

Falkland Islands Government Air Service Announces Order for Second New Build Islander

From a news item in MercoPress South Atlantic News Agency - 6 February, 2019:

The Falkland Islands Government Air Service recently received funding approval from the Executive Council and the Standing Finance Committee for two new Islander aircraft.

A senior design engineer from Britten-Norman visited FIGAS to carry out a damage assessment on Islander, VP-FBM, which had incurred significant damage in a landing incident last year. It was determined that to restore the 30 year-old Islander would not be cost-effective and may have implications that would affect future airworthiness.

Therefore, the recommendation was made to purchase a new aircraft which should have a working life of some 35 years, rather than undertake the repair and refurbishment of VP-FBM. If the order for the new aircraft is placed before the end of March, it is estimated that it could be delivered to the Falkland Islands in the second quarter of 2020.

This investment will bring the FIGAS fleet to a total of six Islander aircraft, once the first new aircraft currently in production arrives later this year; this will further support the steady increase in passenger numbers, which has risen from 5,800 in 2011/12 to 8,800 in 2017/18. This increasing trend is forecast to continue with the burgeoning popularity of the Falkland Islands as a preferred tourist destination combined with the prospect of a second commercial air link with mainland South America.

FIGAS 70th Anniversary Postal Cover

A special first day postal cover below was issued late last year to mark the 70th anniversary of the Falkland Islands Government Air Service's founding in 1948 - Postal Cover image via Norman Hobbs

Channel Islands Aviation California – Visit Report by Peter Smithson

While on a visit to Los Angeles in April, Peter Smithson decided to go over to Camarillo Airport, the home to Channel Islands Aviation (CIA), which is North West from LAX and around an hour on the freeway (Photos courtesy of Peter Smithson).

CIA has had a long association with Britten-Norman products. CIA was formed in 1975 and after operating a number of different aircraft types, purchased their first B-N Islander, N55JA , c/n 295, one of a very large number of Islanders imported into the USA by Jonas Aircraft.

C/n 295 was built in 1971 and first flew on the 1 October with 'B' class registration G-51-295 before being registered N55JA in preparation for delivery to Jonas Aircraft in November 1971.

From New York it ventured down to the Bahamas where it was operated by Out Island Airways out of Nassau. Later it went to the Turks and Caicos Islands before being purchased by Baltic Aviation in Denver, although it spent its time flying for a drilling company up in Alaska.

In March 1976, it headed across to Indiana for Lark Aviation then on to Avenales Aviation in Nevada. Channel Islands Aviation purchased N55JA in September 1977 and have operated it ever since. It is now the sole CIA Islander operated and looks beautiful. The interior has been refurbished and the Islander is maintained in first class condition.

CIA Islander N55JA looking resplendent in the Californian sun on the ramp at Camarillo Airport

View of the cockpit of Islander N55JA showing original instruments and "rams horn" controls.

Interior view of Islander N55JA.

I spent a great couple of hours in the company of CIA's President, Mark Oberman who is very passionate about his company and had some superb stories about past operations including a short spell using a Trislander, N403JA , c/n 1029, as well as ferrying it across to Florida for onward sale.

Over the years CIA has operated 7 different Islanders and one Trislander. Everyone at CIA at Camarillo was very helpful and I cannot thank Mark and his staff enough for their friendliness and giving me access to their Islander.

Islander AL.1 ZG993 – New Exhibit at the Army Flying Museum

Previously titled the Museum of Army Flying, the Middle Wallop facility has undergone a major upgrade since last November. The museum is scheduled to re-open in April as the Army Flying Museum with one of the new aircraft on show being Islander AL.1 ZG993, cn 2202.

The following images show ZG993 being assembled and installed in the main exhibition hall (Images from posts on Key Publishing Forum).

1 - Assembly of wing and fuselage.

2 - Support structure on skates being moved into position.

3 - Propeller mounting structure installation.

4 - Tail plane (from Spectre Islander) and elevator assembled.

5 and 6 - General views before positioning on support structure.

7 - Lift carried out using two fork lift trucks.

8 - Islander on the support structure.

84 *(BN-2A)* C-GCXF Tsayta Aviation, Fort St James, British Columbia. To North Star Air Tours, North Saanich, British Columbia. 8.18. Reg to 1590877 Alberta Inc (North Star Air Tours), North Saanich, BC 23.8.18

164 *(BN-2A-26)* ZK-DBV Milford Sound Flightseeing, Queenstown, New Zealand. To Pacific Island Air, Nadi, Fiji. 11.18 as **DQ-DBV**. To Ardmore via a fuel stop at Paraparaumu on 6.11.18. It was then tanked for the delivery flight and departed 15.11.18 for Kerikeri and then direct to Nadi.

Ex Milford Sound Islander ZK-DBV which now resides in Fiji with Pacific Island Air DQ-DBV. Photo taken at Nadi on 16 December 2018 (M Beaven)

403 *(BN-2A-26)* G-BCEN B-N Group. Leased to Falkland Islands Government Air Service (FIGAS), Port Stanley, Falkland Islands. Left UK via Cumbernauld 15.11.18 to Reyjavik. Arrived Falklands late 1.19.

427 *(BN-2A-8)* TI-BGK Carmonair Charter, San Jose, Costa Rica. To Costa Rica Green Airways, San Jose, Costa Rica. 2018

TI-BGK in the colours of Costa Rica Green Airways (BNH Collection)

446 *(BN-2A-21)* 4X-AYH Nesher Aviation & Tourism, Herzlia, Israel. Withdrawn from use. in the yard of the Israeli Aviation and Space museum, Rishon Le-Zion. 2018.

719 *(BN-2A-26)* ZK-MCD Milford Sound Flightseeing, Queenstown, New Zealand. To Pacific Island Air, Nadi, Fiji. 11.18. May not go to Fiji as up for sale.

725 *(BN-2A-26)* ZK-MCE Milford Sound Flightseeing, Queenstown, New Zealand. To Pacific Island Air, Nadi, Fiji. 3.19 as **DQ-MCE**. ZK-MCE ferried from Christchurch direct to Ardmore 25.2.19 ahead of having ferry tanks installed to achieve the range required to fly from NZ to

Fiji. It departed Ardmore 1.3.19 for Kerikeri, then direct to Port Vila/Vanuatu.

833 *(BN-2A-9)* 5W-CSJ Samoa Air, Apia, Western Samoa. Withdrawn from use. Noted derelict in grass at Apia 30.11.18.

874 *(BN-2A-21)* C-GMZP Tsayta Aviation, Fort St. James, Canada. Sold in Panama, cancelled 16.11.15. It is now known that this became **HP-21**, noted at Panama City 3.4.16.

895 *(BN-2A-26)* N76JL Ridder Air, Whitman, Massachusetts. Cancelled to Panama 20.11.18.

1055 *(BN-2A Mk.III-2)* YJ-OO19 Unity Airlines, Vanuatu. To Anguilla Air Services, Wallblake, Anguilla. Arrived 22.1.19 after an extraordinarily long flight which started in Vanuatu in late October 2018. To become **VP-AJR.**

The former Unity Airlines Trislander YJ-OO19 was repainted in Anguilla Air Services colours within a couple of weeks of arriving in Anguilla. (Unity Airlines)

2040 *(BN-2A-26)* N908GD Air Flamenco, San Juan, Puerto Rico. To SR Aviation Inc, Sarasota, Florida
7.1.19. Registration **N908SR** is reserved.

2220 *(BN-2B-26)* N27BN Inter Island Air, Pago Pago, American Samoa. Damaged 30.9.09 at Pago Pago. CofA expired 30.6.11. Cancelled 16.7.13. Stored at Pago Pago, hangered, noted 7.12.18.

2223 *(BN-2T)* Wessex Aviation, Biggin Hill, Kent. Rebuilt. Due to be delivered to Air Alderney, Alderney, Guernsey in 2019. Reported to become **2-BILL**.

2297 *(BN-2B-20)* JA5324 First Aviation, Okinawa, Japan. To Colville Aviation Services, Archerfield, Queensland, Australia 24.1.19 as **VH-BNC**.

2298 *(BN-2B-20)* JA5325 First Aviation, Okinawa, Japan. To Colville Aviation Services, Archerfield, Queensland, Australia 24.1.19 as **VH-BNG**.

2314 *(BN-2B-20)* G-CKYC Britten-Norman Aircraft. Registered 26.6.18. First flight 8.1.19 as a BN-2B-20 at Solent Airport. For Channel Islands Air Search. Noted outside at Solent in primer doing engine runs. To Bournemouth for painting 9.1.19; returned to Solent 23.1.19 in new colours with **2-CIAS** under G-CKYC.

New Islander G-CKYC (c/n 2314) in Channel Islands Air Search colours at Solent Airport (R. Davies)

Great River Air

Recent news from Great River Air based in the Yukon is that the operator has acquired another Islander C-GHRK , cn 333.

Left – Great River Air Islander C-GHRK at St Andrews Airport near Winnipeg and is about to head west to Great River Air's base in the Yukon (Great River Air).

Right – Islander C-GHRK with Great River Air's oldest Islander C-GSAD, cn 7 in the background. This is the oldest Islander still flying (Great River Air).

Air Flamenco's Islanders on the Ramp at Culebra

Thanks go to Naldo R Perez for posting this view of four of Air Flamenco's fleet of Islanders on the ramp at Culebra

Belair Airways – Islander Operator in Vanuatu

News of Islander operator, Belair Airways, in Vanuatu has recently been posted on BNAPS facebook page. Belair operates two Islanders, YJ-TK2, cn 882 and YJ-BA1, cn 2042, on scheduled services in the region.

Members of Belair with the gifts of a t-shirt and card sent by B-N (Belair).

Belair Airways BN-2A -26 Islander YJ-TK2. This Islander was acquired in April 2015 and was formerly registered as VH-WRR with the Robertson Aeroplane Co in Australia (Belair).

Stewart Island Flights Islander ZK-FFL Rebuild

News has arrived that Islander ZK-FFL, cn 614, is being rebuilt for use by Stewart Island Flights. ZK-FFL was delivered to Southern Air at Invercargill in June 1983 and withdrawn from use in July 1990. The dismantled Islander had been in storage as a spares source for several years. It is not known when it will be airworthy again.

(Images via Jordan Kean)

Islanders for Guyana Defence Force

Minister of State, Joseph Harmon, announced on 27 April 2018 that the Guyana Defence Force (GDF) was in the process of purchasing two Skyvans and two Islanders

The two Islanders arrived at the GDF's main base, London Air Station at Tehmeri, on 8 August 2018. Both Islanders were acquired from Aero Star Táxi Aéreo in Brazil, PT-KRO, cn 742, and PT-KTR, cn 495.

The Islanders have been subject to inspection and overhaul in Guyana, it is not known at present when they will enter service with the GDF

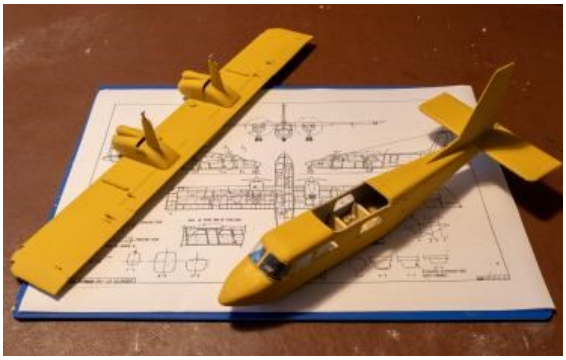
JLT Aviation in the Philippines

JLT Aviation engineers have been in the Philippines recently to work on Islander RP-C2132, cn 422 (right).

This Islander made its first flight on 16 January 1975 as a BN-2A-21 and was delivered to PADC in the Philippines on 11 February 1975. It now flies with Pacificair based in Manila.

Building the Valom BN-2 Islander Model Kit

Trevor Morecraft, Solent Sky Aviation Museum volunteer and model maker, has recently completed making up a Valom 1/48 scale model kit of Islander G-AVCN. The finished model will soon be on show in the Solent Sky Aviation Museum in Southampton. Trevor has made the observation that constructing the model requires a fair amount of skill to correctly align and locate the various parts, particularly the wing to fuselage and the engine cowlings to wing. Also there is a need for a significant amount of ballast weight in the nose and the main landing gear legs are glued as a butt joint so require care when handling the model.
The following images show various build stages and the finished model:



Valom BN-2 Model in BA/Loganair Colours

The mages on the right are of a Valom BN-2 model no 48010, in BA/Loganair colours, and were posted recently on the BNAPS facebook page by David Antrade.

B-N Expansion at Solent Airport

In a recent press release B-N has announced plans to expand its civil aircraft manufacturing and maintenance facilities at Solent Airport. A lease has been signed for two new purpose-built hangars that form part of Fareham Borough Council's newly established aviation park. This will provide B-N with modern, airside accommodation to further grow its business as part of its commitment to UK exports.

The additional 13,000 sq ft will provide a new aircraft final assembly plant for the group's manufacturing subsidiary, Britten-Norman Aircraft, as well as providing a dedicated space for Britten-Norman's aerospace services business, BN Aviation. From this site, BN Aviation will provide OEM aircraft refurbishment, EASA Part 145 MRO services, international field servicing and specialist avionics and mission systems integration. BN Aviation will also provide services to the wider General Aviation community.

View of the Business Aviation Hangars at Solent Airport (Fareham Borough Council)

The expansion will allow the group's military support business, BN Defence, to use its existing facilities at Daedalus to expand output to meet increased demand in the military MRO sector. Britten-Norman Chief Executive, William Hynett, has stated that the expansion plan confirms the company's commitment to regenerating the Daedalus Development site. B-N was a founding member of the Solent Local Enterprise Partnership (LEP). Since 2010 B-N has occupied various parts of the airfield and now occupies three hangars with a total work space of some 34,000 sq ft.

Wight Aviation Heritage Tours

Subject to demand BNAPS is planning a series of Wight Aviation Tours in 2019.

There is a discounted price of £65.00 For BNAPS Supporters Club members and £47.50 for those members already on the Isle of Wight and joining the mini bus for the tour at Ryde Hovercraft Terminal.

Wight Aviation Museum News

The museum is expected to be open to the public soon. The replica Black Arrow launch vehicle to be on show at a "Space Event" at Sandown Airport on 4, 5 and 6 May.
For more details see the Wight Aviation Museum facebook page and the museum's website: http://www.wightaviationmuseum.org.uk/

Valom 1:48 Scale Islander Model Kits Now Available from BNAPS

Valom 1:48 Islander model kits are available to order at £27.00 for BNAPS Supporters Club members and £30.00 for non-members, payment in advance. UK post and packing, first class signed for delivery is £5.00.
The following models are available:
48008 Islander- G-AVCN Aurigny Air Services colours
48009 Islander- Israeli Air Force colours
48010 Islander - Loganair, BA franchise, colours.
Please contact bob@bnaps.org.uk to place your order.

BNAPS Sales Catalogue 2019 Edition

Please contact Rita Edgcumbe at BNAPS Sales to if you would like to receive the latest catalogue by email: sales@bnaps.org.uk

BNAPS on the Internet - information and back issues of BNAPS News go to www.bnaps.org.uk

More BNAPS Supporters Needed

If any BNAPS Supporters Club member knows of someone who would be interested in joining please pass on contact details to our BNAPS Membership Secretary, Rita Edgcumbe at sales@bnaps.org.uk

The principal aims of the BNAPS Supporters Club are:
"*to assist BNAPS to preserve the history and aircraft of Britten-Norman through member donations and to provide assistance with the day-to-day operations of the charity*"
Anyone with an interest in local aviation heritage is welcome.
As a point of clarification, whilst BNAPS has contact with B-N Group from time to time, as a charitable trust BNAPS is an independent organisation.

Forthcoming BNAPS Events

No dates set as yet but we will be running an informal viewing of VCN at the workshop on a Saturday around April/May time

Further Wight Aviation Heritage Tours are planned for 2019 when visitors will be able to view Islander G-AVCN either nearing completion or later on fully assembled.

If anyone needs more information about BNAPS activities and what is happening please do not hesitate to get in touch.

BNAPS

BNAPS is a Registered Charity, No. 1100735, set up to "preserve the history and aircraft of Britten-Norman with the support of members' subscriptions, sponsorship and donations"

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Bob Wealthy is currently the Trust Chairman.

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