

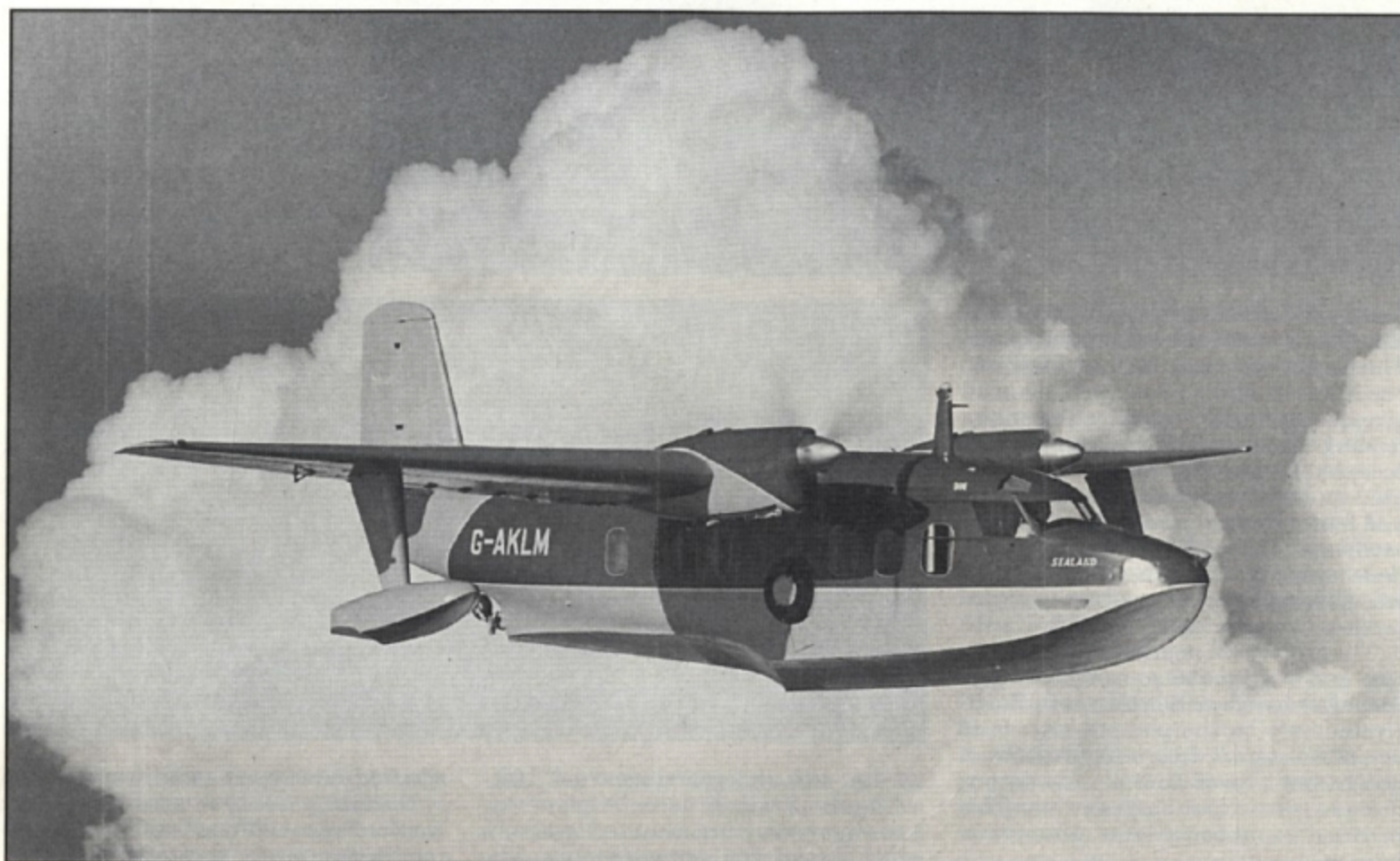


Reinhold Beck

POST-WAR PROPLINERS



John Stroud's series on European post-war piston-engined airliners



SHORT SEALAND

and Hønningstad 5 A Finnmark

It is with great regret that I come to the last article in this series to be devoted to flying-boats—in this case twin-engined amphibians, with one hatched at Belfast and the other being a one-off Norwegian product.

The British type came first, so it is only right to begin with the S.A.6 Sealand built by Short Brothers & Harland—it was actually the first Short prototype to be built at Belfast.

To quote from Chris Barnes's *Shorts aircraft since 1900* (Putnam, 1967), "Short Brothers were convinced, from

the many enquiries they received, that a market existed for a range of commercial flying-boats designed for their purpose rather than adapted from existing stocks of military aircraft. Accordingly, C.P.T. Lipscomb examined the prospects of three sizes of flying-boat, the smallest being designated S.A.6, an intermediate one S.A.7 and the largest S.A.8." Of these only the S.A.6 was built and the intention to construct it was announced in June 1946. The work was shared between Rochester and Belfast, and Harold Piper flew the prototype, G-AIVX, for the first

time, at Belfast, on January 22, 1948.

As a result of early test flights the engines were lowered to reduce drag, and at an early stage the vertical tail surfaces were modified.

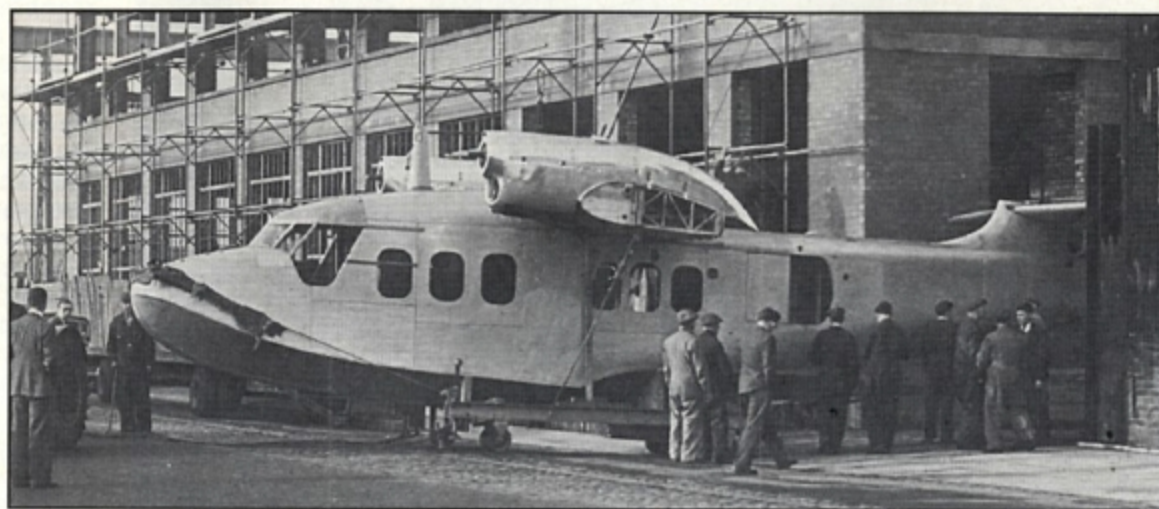
In layout the Sealand was a high-wing cantilever monoplane with two engines, single fin and rudder, wing-mounted stabilising floats and retractable tailwheel undercarriage.

The wing, with one main and one auxiliary spar, was of modified Göttingen 436 aerofoil section and built in three parts. The centre section, which carried

Heading photograph, G-AKLM, the first Sealand I, took part in the 1949 King's Cup in July and in October left for a sales tour of Scandinavia where, on the 15th, it hit a mountain in Norway and was burned out with the loss of its crew.

Right, G-AIVX, the prototype Sealand, being moved from the construction shop to the hangar in November 1947. The maiden flight was made on January 22, 1948.

KEITH WOODCOCK'S painting shows one of VLS's Short Sealand Mk IIIs.





Left, G-AIVX, in original configuration, on test near Belfast.

Right, G-AKLO with a reluctant starboard undercarriage unit.

Below, the prototype Sealand in original form with high-mounted engines and inset rudder.

Below right, VLS Sealand LN-SUF at the moment of lift-off at Bergen.

the engines, was untapered but the outer sections tapered in chord and thickness. The aspect ratio was 10:1, incidence 6° and dihedral $2^\circ 16'$. The wing had Alclad stressed skin with flush riveting on the leading edge only. The trailing edge was occupied by inset long-span fabric-covered aerodynamically-balanced ailerons and fabric-covered pneumatically-operated flaps. There was TKS leading-edge de-icing and the 120 Imp gal fuel capacity was provided by two tanks in the centre section — one on each side of the hull.

The hull was of near-rectangular section and of all-metal construction with Alclad stressed skin which was flush-riveted only on the planing bottom. It was a two-step structure of typical Short design but proved to have too deep a draught, particularly in fresh water. This involved a number of later attempts in improvement.

The mainwheel undercarriage swung up to be housed in boxes in the hull sides and these boxes effectively divided the passenger accommodation into fore and aft cabins, normally with three windows in each side of the forward cabin and two or three in the aft cabin. The entrance hatch was aft on the port side. There was a retractable tailwheel immediately aft of the knife-edge rear step. The single-step stabilising floats were carried on cantilever struts. Maximum hull width was 5ft 3in, the draught at the main step



2ft 1in, and undercarriage track 10ft.

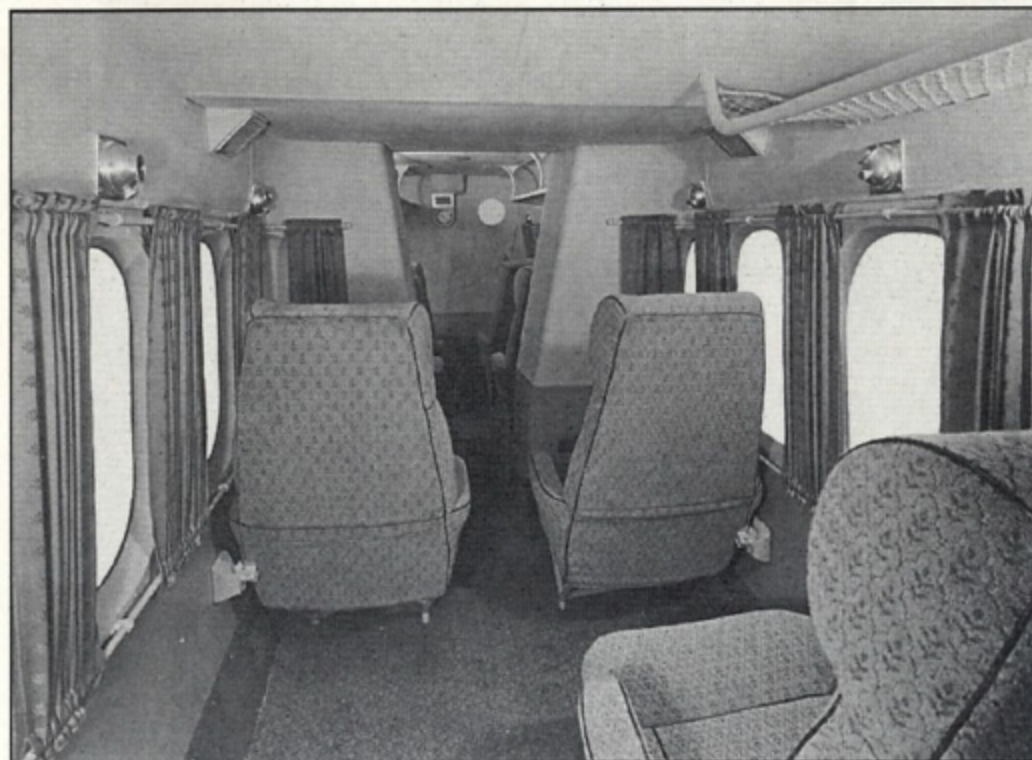
The all-metal cantilever tailplane was a two-spar structure mounted on the fin which was of similar construction. The elevators and rudder were aerodynamically-balanced metal structures with fabric covering and had servo tabs. The fin was later heightened and the rudder chord increased and instead of being inset was given a horn-balanced section above the fin. Production Sealands were powered by two 340 h.p. de Havilland Gipsy Queen 70-3 or 70-4 six-cylinder inverted inline air-cooled engines which were geared and supercharged and drove de Havilland three-bladed feathering and reversing propellers which greatly

assisted manoeuvring while waterborne.

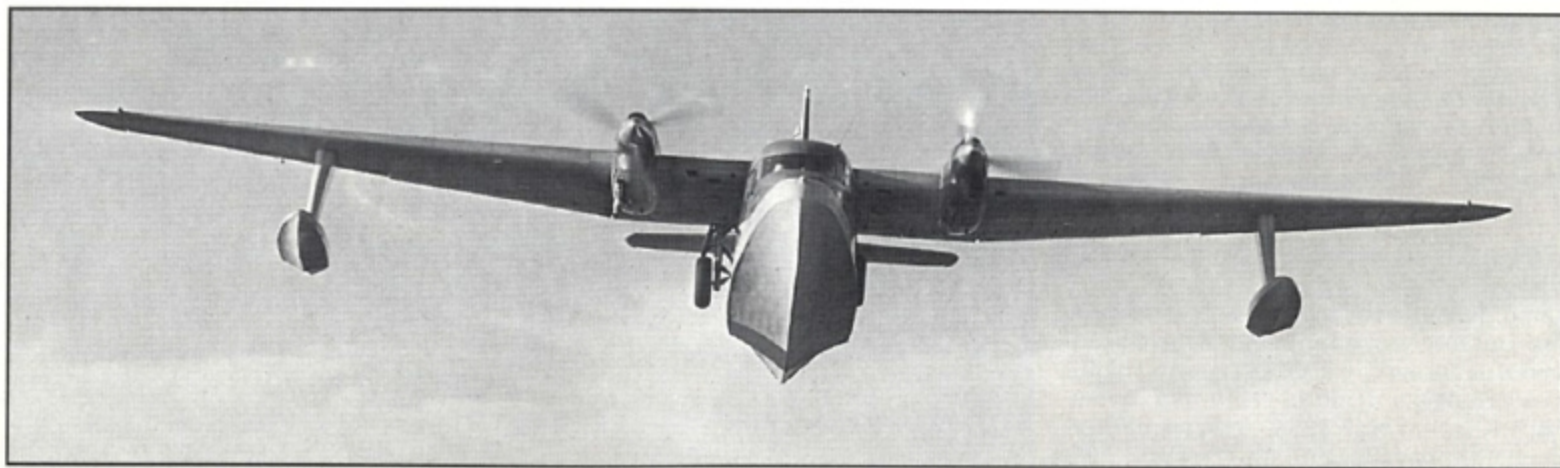
Normal passenger accommodation was for five to eight, but with the wheels removed ten passengers could be carried.

I again quote Barnes, in relation to the cockpit and mooring. "The cockpit was exceptionally well planned for either a solo pilot or a pilot and navigator; hinged drop panels below the sliding side windows simplified mooring, for which purpose a boat-hook and lanyard were stowed on the port side and an outside step was fitted on the starboard side for access to a mooring hatch in the bow." I am glad he did not write "easy access" because I had experience of mooring Sealands and looking at photographs now I am not quite sure how I succeeded — it certainly was quite a precarious operation. Sliding windows and open hatch yes, but a very narrow step and no handholds with who knows how many fathoms underneath. Then you had somehow to get up on the bow, do some acrobatics across the windscreen onto the cockpit roof and steady yourself by grabbing the radio mast. You then walked along the top of the hull and with more acrobatics got onto the tailplane. Once there you caught a line thrown from the jetty, put it round your back to prevent damage to the fin and were hauled in by those on shore — or at least that was how it was done in Bergen.

Before continuing with the development and history of the Gipsy-engined Sealand it is appropriate to mention that the second example of the Sealand was to have been the S.B.2 Sealand II with 520 h.p. Alvis Leonides L.E.4M nine-



A view forward through a Sealand. The undercarriage housing divides the accommodation into two cabins.



cylinder geared and supercharged air-cooled radials with 8ft 6in-diameter de Havilland propellers. This version would have had a 9ft increase in centre-section span and fuel capacity increased to 150gal. Speed and payload would have been higher than for the S.A.6.

I saw the mock-up of the Leonides-powered Sealand at Rochester but the aeroplane was never completed in this form and it became the first of four pre-production Gipsy-engined aircraft, G-AKLM. This Sealand received its C of A on July 28, 1949 and flew in that year's King's Cup race.

Following the four pre-production aeroplanes came a batch of ten and at that time Shorts mounted a sales campaign and G-AKLM went on a sales tour of Scandinavia but crashed in Norway. The next example, G-AKLN, was used for development work and G-AKLO replaced G-AKLM as the European demonstration machine.

The next Sealand, G-AKLP, was ordered by British West Indian Airways (BWIA), together with another two, to operate inter-island services in the Caribbean area and as VP-TBA RMA *St Vincent* was exhibited at the 1949 SBAC exhibition and displays at Farnborough. However, it was decided that the Sealand was unsuitable for operation from open sea, as would have been necessary, and none was delivered to BWIA.

Nevertheless, sales demonstrations did have some success and resulted in Sealands being ordered by Vestlandske Luftfartsselskap (VLS) of Bergen, Jugoslovenski Aerotransport (JAT) in Yugoslavia, a private owner in Egypt, the Christian & Missionary Alliance of New York, Ralli Bros and East Bengal Transport Commission in East Pakistan

and Shell but the biggest order was for ten for the Indian Navy. Twenty-five were built including the prototype and the last three planned aircraft, SH.1770-1772, were cancelled.

All Sealands were built as S.A.6 Mk Is but the two supplied to VLS, LN-SUF and LN-SUH, were converted to all-flying-boat configuration without land undercarriages and redesignated S.B.7 Sealand Mk III. Only the Norwegian and Yugoslav aeroplanes went into airline service — the VLS aeroplanes on the coastal route from Stavanger through Bergen to Trondheim and the JAT 'boats on Adriatic coastal services.

With VLS I made 14 flights in LN-SUF

and LN-SUH all over the Bergen—Haugesund—Stavanger route except for one flight from Bergen to Trondheim via Ålesund, Molde and Kristiansund. These totalled 7hr 22min.

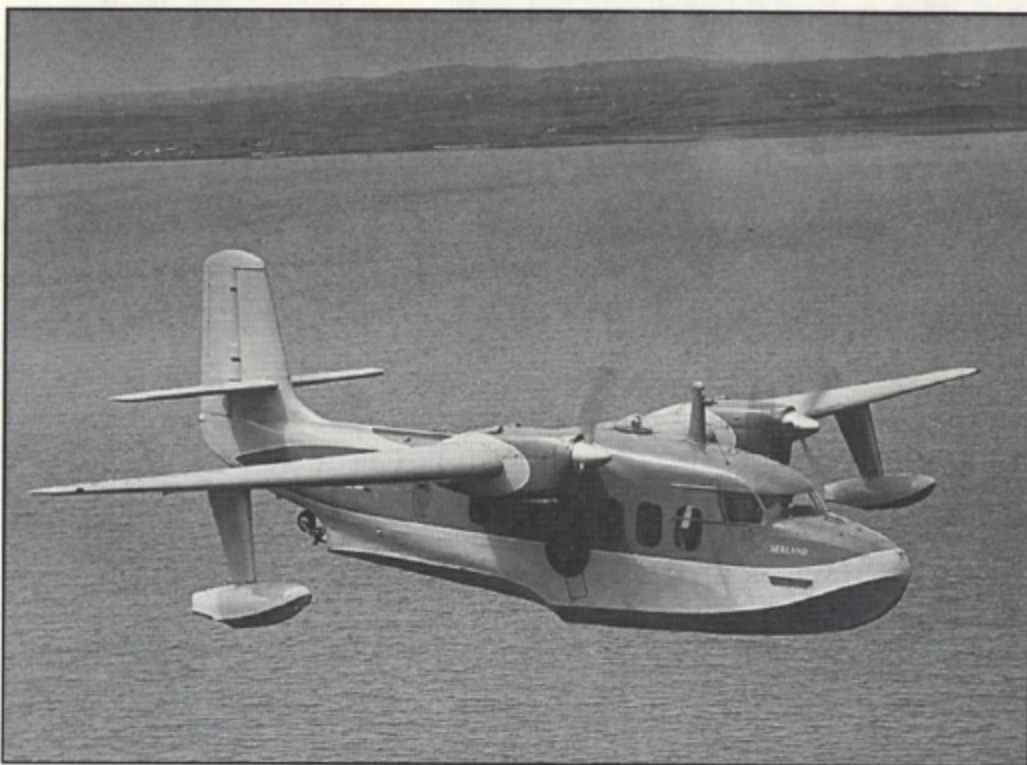
On a number of these flights I acted as second crew member, seeing passengers aboard seated and fastened in, taking on the mail and shutting the watertight doors. No-one ever questioned why there should be a crew member who mostly only spoke English. On several of these trips I was also responsible for mooring.

Two particular memories stand out. On the first take-off in a Sealand, from Stavanger-Sola, seawater came out of the ashtray and at, I think, Molde we porpoised badly on take-off. I was sitting thinking "cut the power, cut the power", but the pilot took a long time to take that decision and I was afraid that the Sealand was going to put its bows down and take a nasty plunge into the depths.

The only other time that I saw Sealands in operation was in December 1959 when I saw Indian Navy aircraft flying at Cochin in South India.

I think the Norwegian 'boats were withdrawn in mid-1956 after the opening of Bergen Airport at Flesland enabled

Below, this view of G-AKLO shows the modified engine position and heightened fin and rudder with horn balance.



Right, JAT's Sealands YU-CFK and YU-CFJ in formation with G-AKLV. These two Yugoslav Sealands were used for services along the Dalmatian coast and were delivered in 1951. One of them has spent many years stored outside for the Yugoslav Aeronautical Museum.

VLS to begin operation with a Heron 2. By that time the airline's Sealands were getting close to the modest tailplane spar life. Indian Sealands appear to have been taken out of service soon after I saw them. The prototype Sealand remained in use with Shorts until 1954 and frequently flew without its stabilising floats.

Following a number of criticisms of the Sealand by Marine Aircraft Experimental Establishment pilots, including its tendency to swing to starboard on take-off, G-AKLN was used to test modifications to overcome some of the problems. Full- and partial-span leading-edge slats were tried and improved lateral control, although with a speed penalty, but wingtip slats alone did not eliminate the swing on take-off. The hull was modified to increase buoyancy and wing span was increased by 2ft 6in — wing fences were also added. All Sealands were said to have been given the increased span but the VLS aircraft certainly did not have fences. Finally the swing was cured by fitting an asymmetric skeg, or small fin, just ahead of the heel of the planing bottom.

Although an attractive small flying-boat/amphibian, the Sealand could not be considered a commercial success. It was, however, pleasant to fly in and in Norway it served VLS well until the building of Bergen Airport.



The Finnmark

Like the Sealand, the Hønningstad 5 A Finnmark was a twin-engined high-wing cantilever monoplane with single fin and rudder but the Norwegian aeroplane was slightly bigger, had considerably greater loaded weight, was more powerful and had a shorter take-off and greater range.

The only example of the Finnmark, originally LN-10, was completed in 1949 by Norsk Flyindustri A/S which had pre-

viously been Birger Hønningstad A/S. The aeroplane first flew on September 17, 1949.

The wing was a shallow-gull configuration with 10° dihedral on the centre section but reduced dihedral outboard of the engines. There was taper in chord and thickness. The wing was a metal structure with split flaps and fabric-covered ailerons.

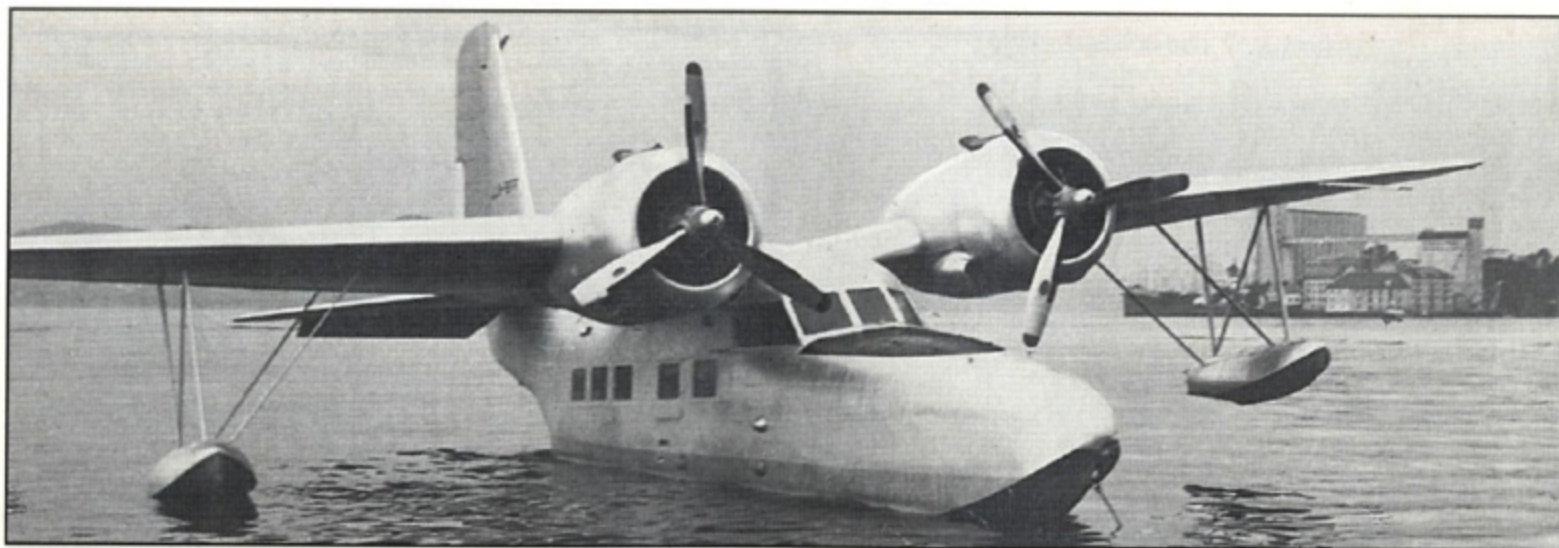
The quite deep hull had two steps, a long bow ahead of the enclosed cockpit and was divided into seven watertight compartments. There were four rectangular windows in the port side and five in the starboard. There were originally no stabilising floats. Instead there were sponsons, each divided into six watertight compartments.

The Finnmark was designed for operation in northern climates and apart from its flying-boat hull and sponsons had a combination wheel and ski under-



Left, the Hønningstad 5 A Finnmark at Fornebu, Oslo, with combined wheel/ski undercarriage. **Below,** INS-101, the first Sealand for the Indian Navy. **Right,** VLS's Mk III Sealand LN-SUH at Sandviken, Bergen. The wheel wells have been sealed.





Above, the Finnmark with stabilising floats in place of sponsons, and three-bladed propellers.

carriage which retracted backwards to be housed within the sponsons. There was a tailwheel immediately aft of the rear step.

The first flights were made with the Finnmark as a flying-boat and when the wheel/ski undercarriage was fitted in the winter of 1950-51 the aeroplane was redesignated 5 A-II.

The cantilever tailplane had leading-edge taper and inset elevators. The empennage structure was of metal with fabric-covered elevators and horn-balanced rudder. After early flight tests a dorsal fin was added.

The engines were 600 h.p. Pratt & Whitney Wasp R-1340-S1H1 nine-cylinder air-cooled radials. These were neatly cowled and originally drove two-bladed variable-pitch metal propellers but these were replaced with three-bladed Hamilton Standard Hydromatic fully feathering units. The exhaust pipes were on the upper centrelines of the cowlings. The engines were mounted close to the hull and well forward of the wing and obstructed the upward view from the cockpit. There was accommodation for two crew and up to 12 passengers and the entrance hatch was on the port side aft of the cabin.

After several years' use by its con-

Short S.A.6 Sealand and Hønningsstad 5 A Finnmark data

	Sealand	Finnmark
Dimensions		
Span	61ft 6in*	62ft 6in
Length	42ft 2in	46ft 4in
Wing area	359ft ² †	522ft ²
Weights		
Empty	7,007lb	7,716lb
Loaded	9,100lb	12,125lb
Performance		
Maximum speed	187 m.p.h.	180.2 m.p.h.
Cruising speed	169 m.p.h.	158.4 m.p.h.
Ceiling	21,000ft	-
Range	495 miles	699 miles
Take-off run on water	2,505ft	1,148ft

* Originally 59ft

† Originally 353ft²

Finnmark figures are for the flying-boat configuration

structors, the Finnmark reverted to flying-boat configuration but in a different form. The sponsons were replaced by wing-mounted stabilising floats carried on N struts and parallel diagonal struts. In this form, as LN-BFF, the Finnmark went into passenger service, in 1954, with Vestlandske Luftfartsselskap and worked on the Bergen-Haugesund-Stavanger route. However, it did not prove to be a commercial success and it was sold to Norrønfly, remaining in use until at least 1965.

Although on one or two occasions I saw the Finnmark at Fornebu, with its wheel/ski undercarriage, I never managed to get a ride in it.

Short S.A.6 Sealand production

SH.1555	G-AIVX	Prototype. Used by Shorts to 1954
SH.1562	G-AKLM	Demonstrator. Crashed in Norway
SH.1563	G-AKLN	Development prototype. To VLS LN-SUF Mk III
SH.1564	G-AKLO	European demonstrator. To Shell VR-SDS, later VR-UDS
SH.1565	G-AKLP	BWIA VP-TBA St Vincent, Shell VR-UDV
SH.1566	G-AKLR	JAT as YU-CFJ
SH.1567	G-AKLS	JAT as YU-CFK
SH.1568	G-AKLT	Christian & Missionary Alliance PK-CMA
SH.1569	G-AKLU	VLS LN-SUH Mk III
SH.1570	G-AKLV	Ralli Bros AP-AFM Pegasus
SH.1571	G-AKLW	Private yacht SU-AHY Nadia
SH.1572	G-AKLX	East Bengal Transport Commission AP-AGB
SH.1573	G-AKLY	East Bengal Transport Commission AP-AGC
SH.1574	G-AKLZ	Indian Navy INS-101
SH.1575	G-AKMA	Indian Navy INS-102
SH.1760	INS-103	Indian Navy
SH.1761	INS-104	Indian Navy
SH.1762	INS-105	Indian Navy
SH.1763	INS-106	Indian Navy
SH.1764	INS-107	Indian Navy
SH.1765	YV-P-AEG	Shell
SH.1766	INS-108	Indian Navy
SH.1767	INS-109	Indian Navy
SH.1768	INS-110	Indian Navy
SH.1769	JZ-PTA	Christian & Missionary Alliance. Replaced PK-CMA
SH.1770-1772		cancelled

All Mk I but G-AKLN and G-AKLU converted to Mk III (S.B.7) for VLS in Norway. Mk II prototype not completed



Next month: The Ilyushin Il-12 and Il-14