DANISH HM-II

A Stand-Off Scale model of an early 1930 float plane that can be built as a three or four channel aircraft. Ideal for those who have access to water areas. By Edward C. Miller

Pretty Miss Karen Riddell holds the RC model of the Danish HM-II in colorful arctic markings. Typical of the Greenland landscape is this rock-strewn hillside. Such mountainous terrain would give no quarter to a land plane forced down here, but with countless tens of thousands of lakes dotting the countryside, floatplanes always have an emergency landing area close at hand.

In the early 1930's, much publicity was given to a continuing series of air shows, long-distance air races, and other such activities. While designed to capture the public's imagination with their pure sensationalism, these events, in themselves, contributed little of practical value.

But, if there were those in aviation who wished to bask in the glow of such strictly publicity oriented activities, there were others whose unheralded service was providing a basis for the future growth of all aviation industries. One such little known endeavor was the aerial photo mapping of artic Greenland. The world's largest island, Greenland, lies astride the busy North Atlantic air routes. With its rugged, mountainous geography, and unpredictable, arctic weather extremes, this pioneering project was indeed an ambitious undertaking for this early era in aviation history. Begun in 1932, in association with the Geodetic Institute, this program required six years of strenuous flying over the desolate artic landscape before being finally completed in 1938.

As Greenland is a part of the island nation of Denmark, the aerial photo-mapping assignment was given to the Danish Naval Flying Corp's 1st Luftflotille. Formed on 12 October, 1926 this unit is the oldest numbered Danish military flight unit, the direct descendant of which is now the Royal Danish Air Force's Escadrille 721 (RDAF No. 721 Squadron).

The aircraft which the 1st Luftlotille used to conduct this photo-mapping assignment was the obscure Heinkel Model HE-8 floatplane. As this was the second hydro-monoplane type aircraft operated by the Danes, it carried their designation HM-II. An unusually large single engine aircraft by 1930 standards, the HM-II had a wingspan of 55 feet, and accommodated a crew of three in open cockpits, itself a real challenge in arctic flying. It was powered by an Armstrong-Siddeley Jaguar VI air-cooled radial 9 cylinder engine that was rated at 450 horsepower. The first aircraft of this type was delivered to the Luftmarinestation at Copenhagen on 17 August, 1928.

DANISH HM-II
Designed By: Ed Miller

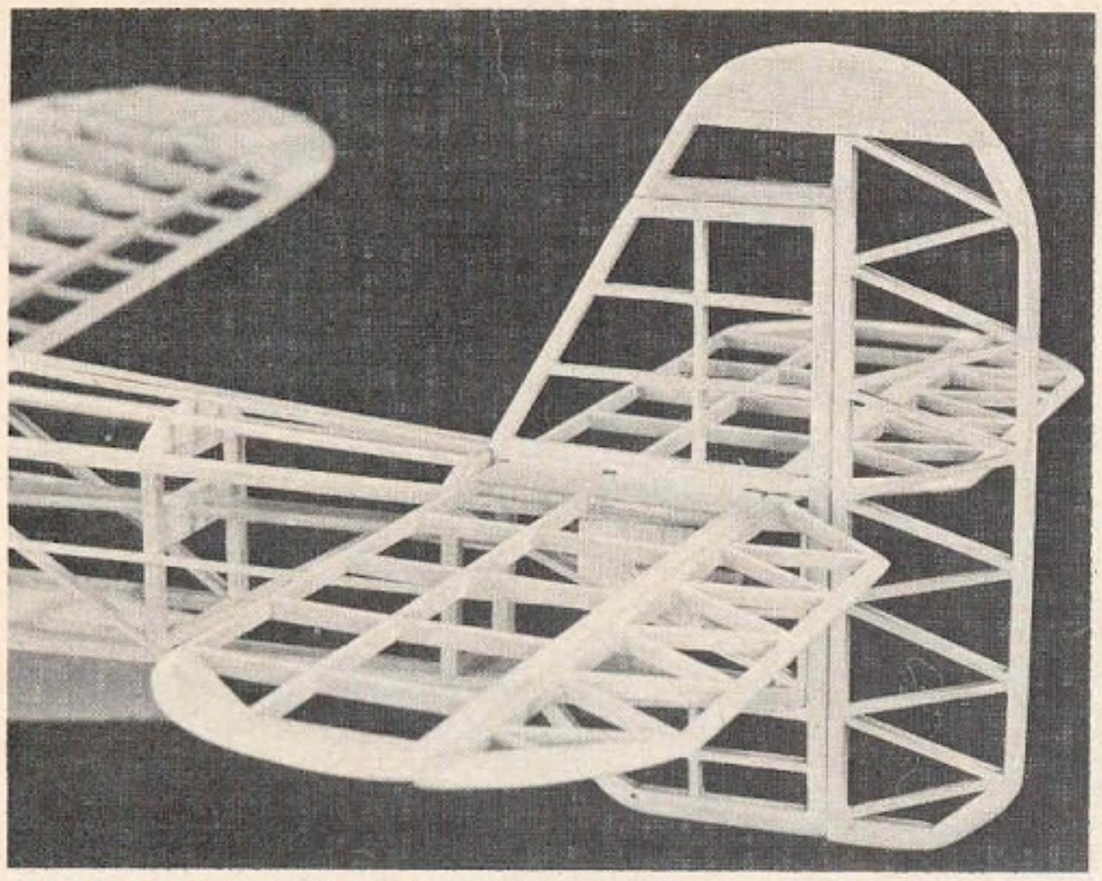
TYPE AIRCRAFT
Stand-Off Scale Float Plane
WINGSPAN
63"
WING CHORD
11⅜ Inches
TOTAL WING AREA
690 Square Inches
WING LOCATION
Low Wing
AIRFOIL
Semi-Symmetrical
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
2½ Inches
OVERALL FUSELAGE LENGTH
43¾"
RADIO COMPARTMENT AREA
(L) 7" x (W) 2¾" x (H) 2½"
STABILIZER SPAN
23 Inches
STABILIZER CHORD (incl. elev.)
6½ Inch
STABILIZER AREA
134 Sq. In.
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
11 Inches
VERTICAL FIN WIDTH (incl. rudder)
8 Inches
REC. ENGINE SIZE
.40 - .50 cu in.
FUEL TANK SIZE
8 Ounce
LANDING GEAR
Floats
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail. (opt.)
BASIC MATERIALS USED IN CONSTRUCTION

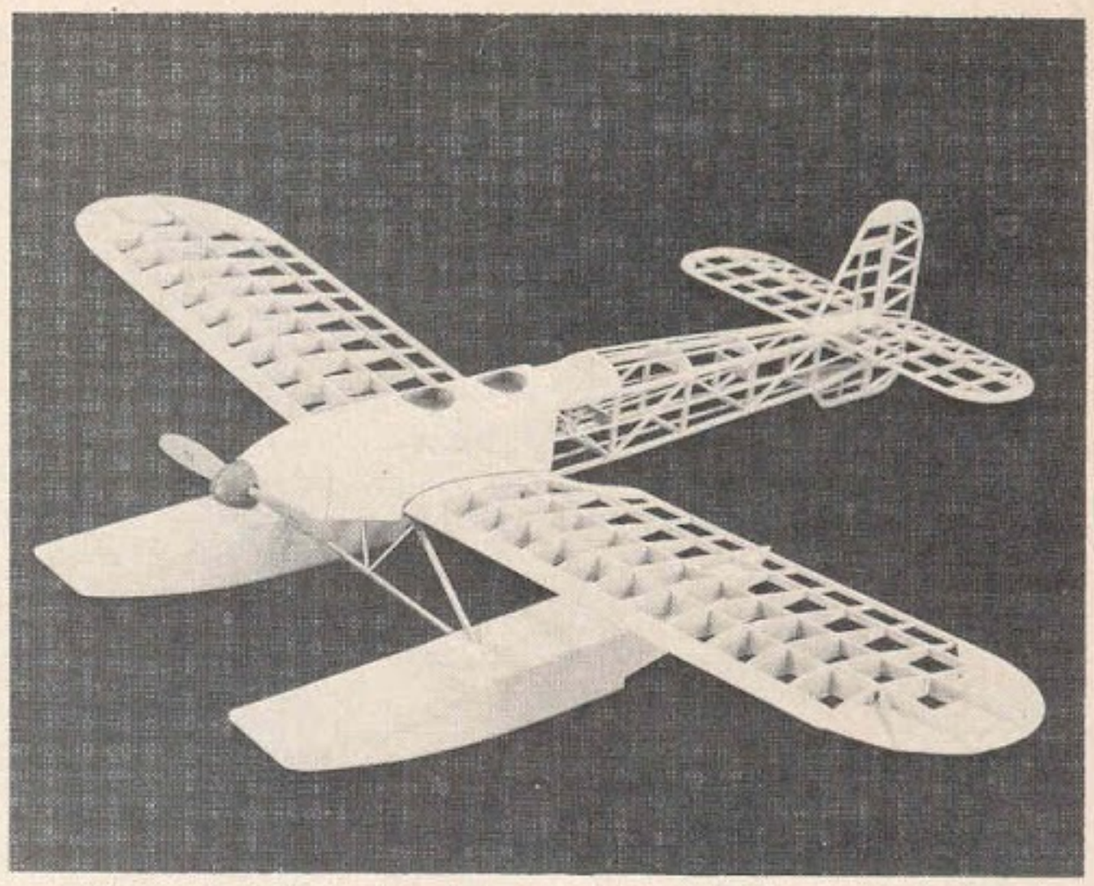
Fuselage	Balsa, Ply & Hardwood
Wing	Balsa, Ply & Hardwood
Empennage	Balsa
Wt. Ready-To-Fly	76 Oz.
Wing Loading	15.8 Oz/Sq. Ft.

The original finish of the HM-II floatplanes, when first delivered, was an overall light gray color, with black buzz numbers on the aft fuselage sides. The vertical fin and rudder assembly were emblazoned with the Danish flag, while the Danish roundels of red with white centers were carried on the top and bottom of both wings. The aircraft's number was also displayed on the bottom of both wings in reverse order (i.e., beneath the left wing the numerals appeared with their bottoms facing the leading edge, and on the right wing, the trailing edge).

For arctic operations in Greenland, the HM-II's assigned to support the Geodetic Institute project were overpainted red/orange on all upper surfaces, a practice still common today with arctic-duty aircraft. Light gray rectangles were left around the fuselage numerals and fin markings in order to provide a contrasting background. The forward cowling and top-decking around the three cockpits were left in their natural, burnished-aluminum finish. The total effect of this arctic-finish paint scheme is a spectacular spash of color, made even more vivid when viewed in the bright rays of the midnight sun of summer north of the Arctic Circle.

Later in its career, the HM-II had camouflage markings applied shortly after the German invasion of Czechoslovakia. When the German blitzkrieg rolled over tiny Denmark in April 1940, the remaining HM-II's were captured. Placed in storage by the German occupation troops, the HM-II's were ultimately destroyed by the Danish underground in 1943, a tragic ending of an otherwise successful career for these historic aircraft. For the World War II Scale events, a photograph of an HM-II in camouflage finish appeared on page 70 of the August 1975 issue of "Air Classics" magazine (back copies available from the publisher, Challenge





ABOVE LEFT: Scale construction design on the empennage is evident here. Also note interlocking key notch in top of horizontal stabilizer that mates with vertical fin. ABOVE RIGHT: The skeletal airframe prior to covering. Note that only the wire float attach structure has been fitted at this time, with notched 1/8" x 1/4" balsa fairings. The float to wing struts are non-load carrying, dummy 1/8" x 1/4" balsa only, with no wire bracing.

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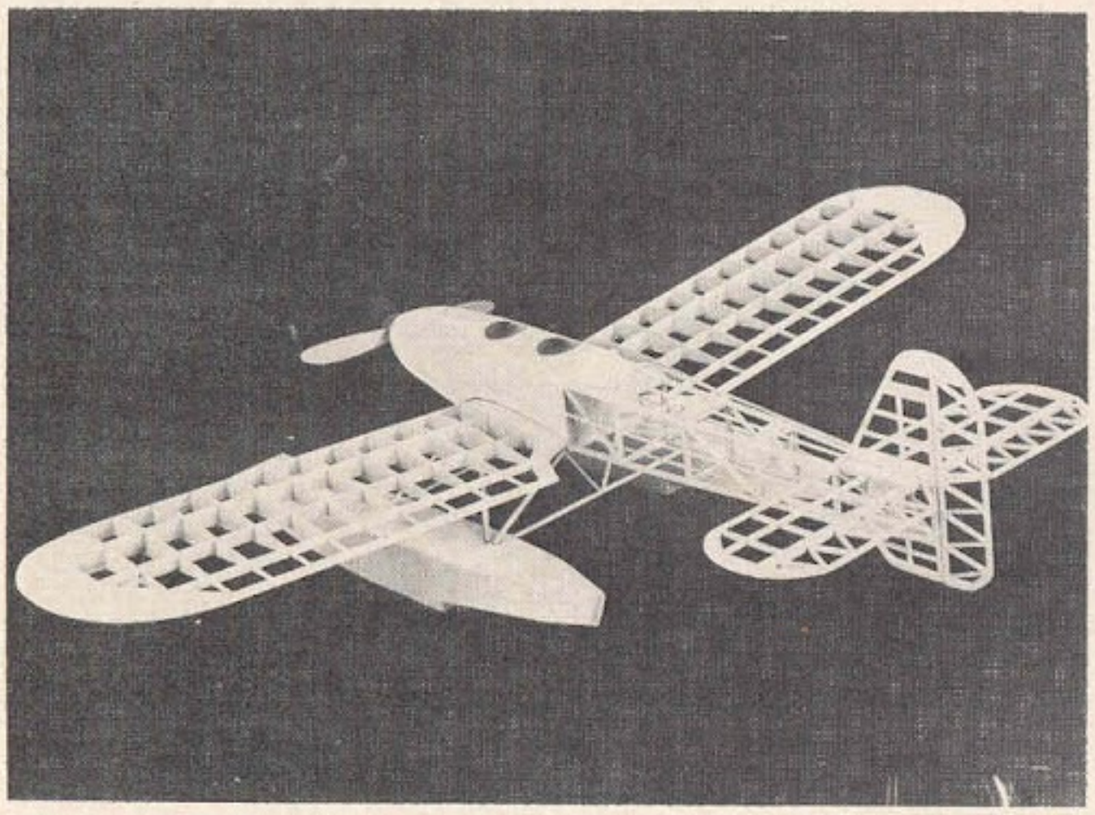
With its historic and relatively obscure background, functional design, and brilliant arctic markings, the HM-II makes an ideal subject for a sport-scale R/C floatplane. Built to a scale of 1.14 inches per foot, the 64" wingspan model is adequately powered by either a .40 or .45 engine that gives a realistic, slow flight characteristic of the original aircraft's performance envelope (max. speed, 134 mph). With its extremely lighweight structure that closely follows that of the actual HM-II airframe construction, this docile model is an ideal introduction to the unique world of flying floats.

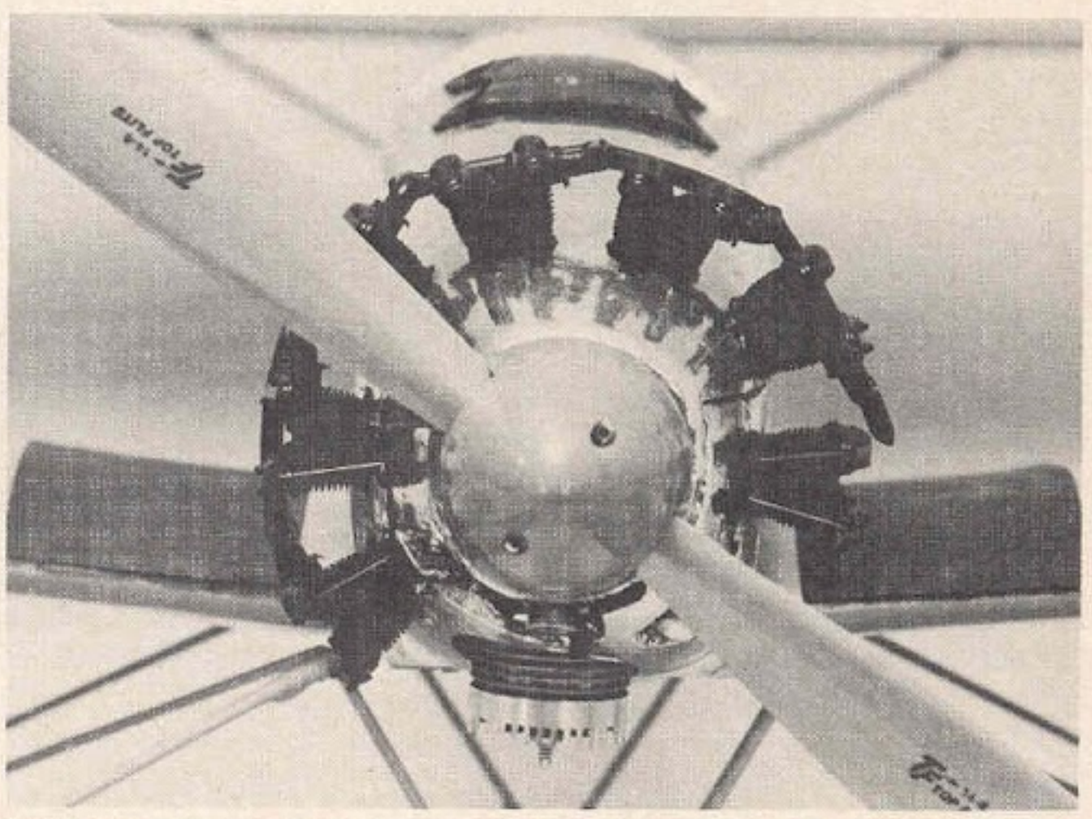
For anyone who has ever built a stick and tissue Guillow kit, the construction of the HM-II model is amazingly similar, although obviously quite larger. Since they present the only different aspect from the normal R/C land-based bird, the float construction is handled first. The basic 1/8" x 1/4" balsa framework is built directly over the plans (built in sets of two). Allow the top and bottom longerons to extend an extra four inches past the aft end to allow for the stern curvature when the sides are later assembled. After removing the framework from the plans, laminate each to a sheet of 3/32" balsa. Make sure to build two right and two left sides.

Assemble the completed side laminations into a basic box structure built around the two 1/4" sheet balsa anti-slosh bulkheads, Formers FF1 and FF3. In addition to providing separate, water-tight compartments, these bulkheads also provide the main compression, shock distribution point for water impact. (And if you don't think water impact can be hard on floatplanes, try jumping into a lake at about 50 mph.) Once the box structures have been allowed to dry, add the 1/4" square crossbraces and sheet the bottom of the floats.

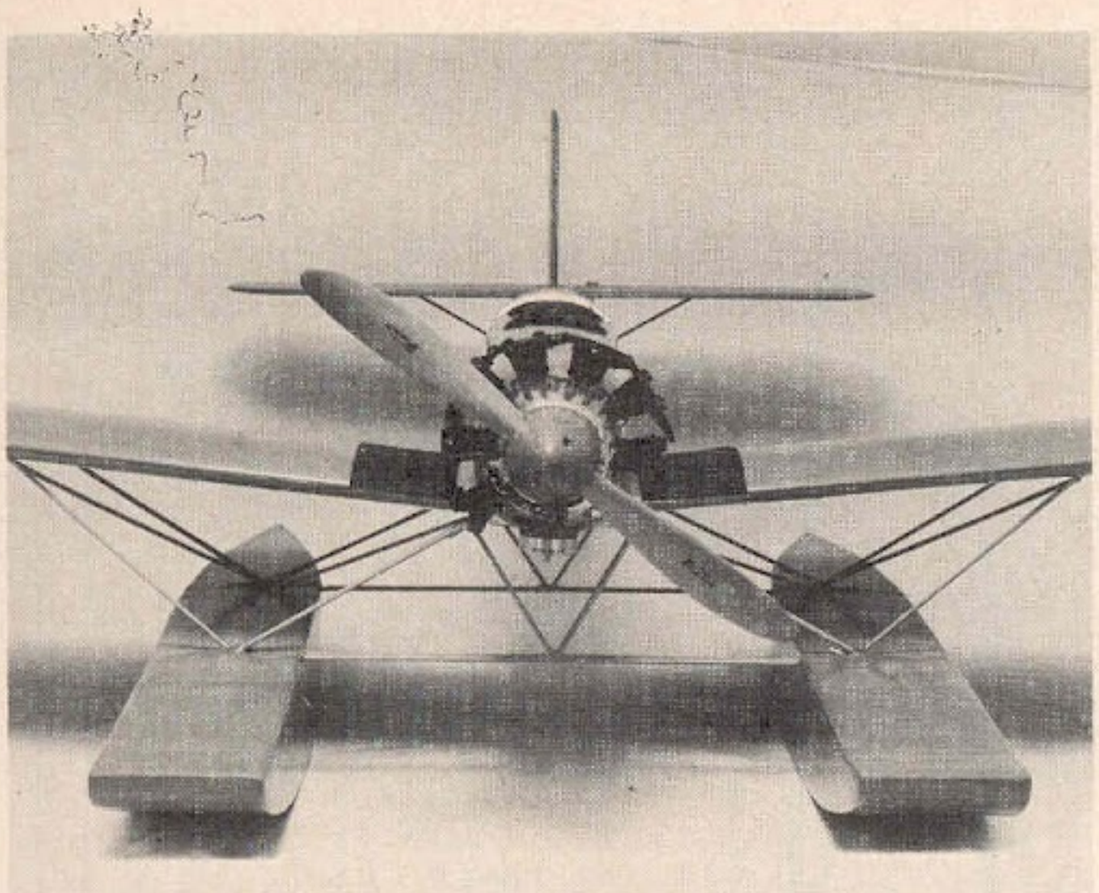
The next item is the 1/8" piano wire bird cage that joins the floats to the wings. The fore and aft struts are wire wrapped and silver soldered to their respective spreader wires that separate the two floats themselves. Then the four lower 1/4" x 3/4" hardwood beams are wire, or fishing line stitched around the 1/8" wire bird cage at the float attach points. Next, the four hardwood beams, with their attached wire bird cage structure, are epoxy mounted in place in the top of the open-top float assemblies. The hardwood beams are keyed in place with hard 1/4" balsa stress distribution gussets. It is **imperative** that this assembly be precisely aligned at this time to insure correct water-tracking. After the epoxy has cured, add the 1/8" wire N-struts that connect the fore and aft wire mounts. Thoroughly dope the inside of the still open-top floats with two coats of clear dope, then seal them up with the final pre-doped 3/32" top planking.

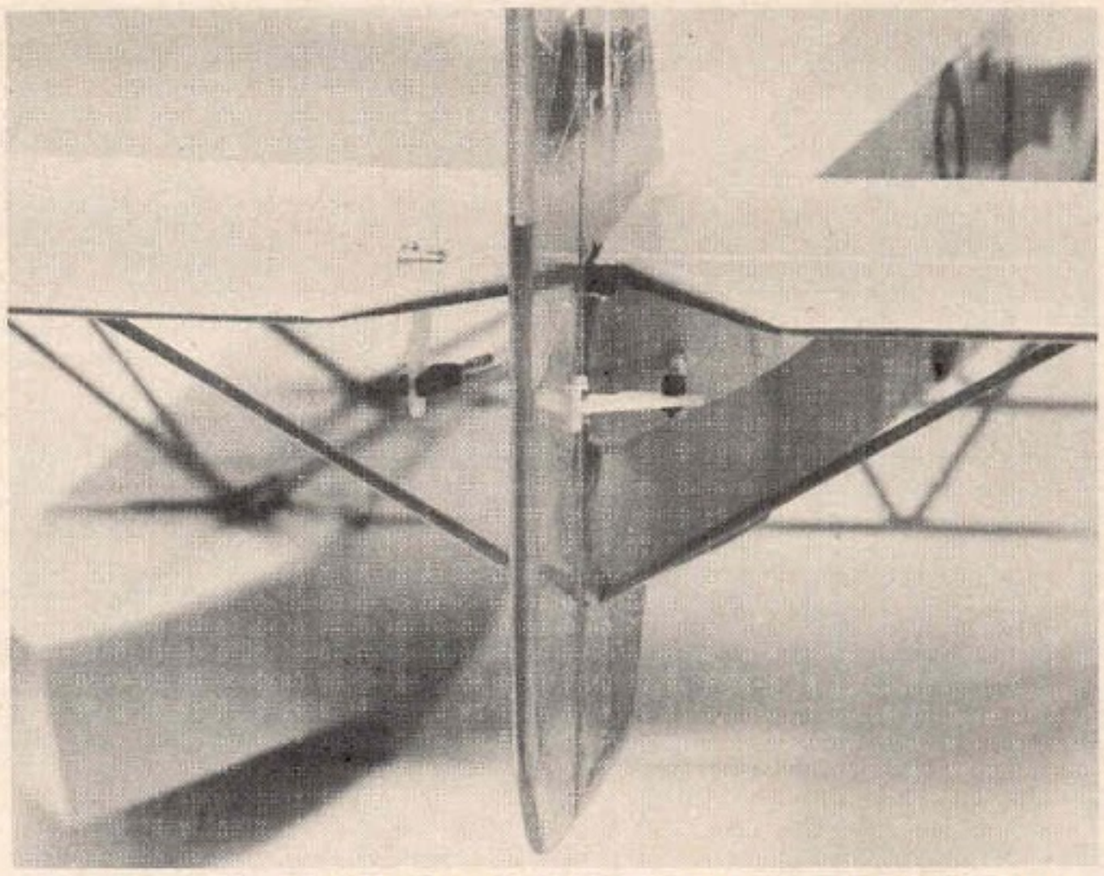
The fuselage is next on the agenda. Begin by assemling the 1/4" square, 1/8" x 1/4", and 1/4" sheet basic side directly over the plans. As with the floats, allow about an extra 4" of the 1/4" square longerons to extend past the





ABOVE LEFT: Aft view of skeletal airframe prior to covering. ABOVE RIGHT: The dummy Williams Brothers 1½" scale J-5 engine that was modified to simulate the Jaguar VI. The oversize 14-6 prop is used for scale effect in static display.





ABOVE LEFT: This frontal view clearly details the intricate array of struts used on the HM-II. ABOVE RIGHT: Scale placement of the pushrod exits and control horns is evident here.

tailpost to allow for fuselage curvature during final assembly. Build two assemblies directly over each other on the plans (separate by a sheet of waxed paper to prevent sticking).

Remove the completed side frames from the plans and assemble the basic fuselage box structure built around Formers F2, F3, and two top Formers F4 and F5. After this has dried, add the aft 1/4" square crossbraces and turtle deck formers and hardwood wing mount blocks. Score the 1/4" square longerons along the aft section, add the tail post, and clamp together. The NyRod pushrods can now be installed, and then add all the 1/8" square stringers. Finally, plank the fuselage top decking and sides with 1/8" sheet balsa. The lower, removable engine cowl is built-up from balsa blocks, as is the top nose section between the nose ring and the firewall.

The wings and tail surfaces are self-explanatory, being built directly over the plans. With the generous dihedral, large area, and thick, semi-flat bottomed airfoil section, ailerons were not used on the original model, but they are shown on the plans as optional.

Note that the vertical top and bottom fins are built as a single unit. The top fin is keyed to interlock into the stabilizer center section cut-out.

The entire airframe is clear-doped to preclude possible later water damage (dry-rot), then covered with Japanese silk. After covering and final doping, the tail surfaces are hinged (pinned hinges) and control horns installed.

Next, the final airframe assembly is completed by installing the tail assembly as a single interlocked unit, epoxied in place. With the finish doped airframe now assembled, markings and insignia are cut from MonoKote and added as shown in the accompanying series of photographs.

Chrome MonoKote is used to simulate the burnished aluminum nose and top decking of the original HM-II's. The metallic gleam of the chrome flashing in bright sunlight adds a final touch of brilliance and , when viewed up-sun, the partially translucent airframe radiates with a truly vivid coloring.

To simulate the Armstrong-Siddeley Jaguar VI engine used on the Danish HM-II's, a series of dummy Williams Brothers 1½" scale Wright J-5 Whirlwind plastic engine cylinders were installed. As the Jaguar VI had much lower profile rocker boxes than the J-5, the dummy J-5 cylinders were modified accordingly.

The RCM Classic System was installed on this particular model, but the cavernous (3"W x 2½"H x 8"L) fuselage compartment will accommodate any system. Whatever R/C system is selected, be sure to obtain a good, watertight seal at the wing saddle junction to eliminate any possible water seepage into the radio compartment.

An OS Max .40 R/C engine and a 10 ounce, round anti-foaming clunk tank were used on the prototype for reliable flights with good endurance. No water rudders were used, the large air rudder area being sufficient to overcome any weathervaning tendencies in winds up

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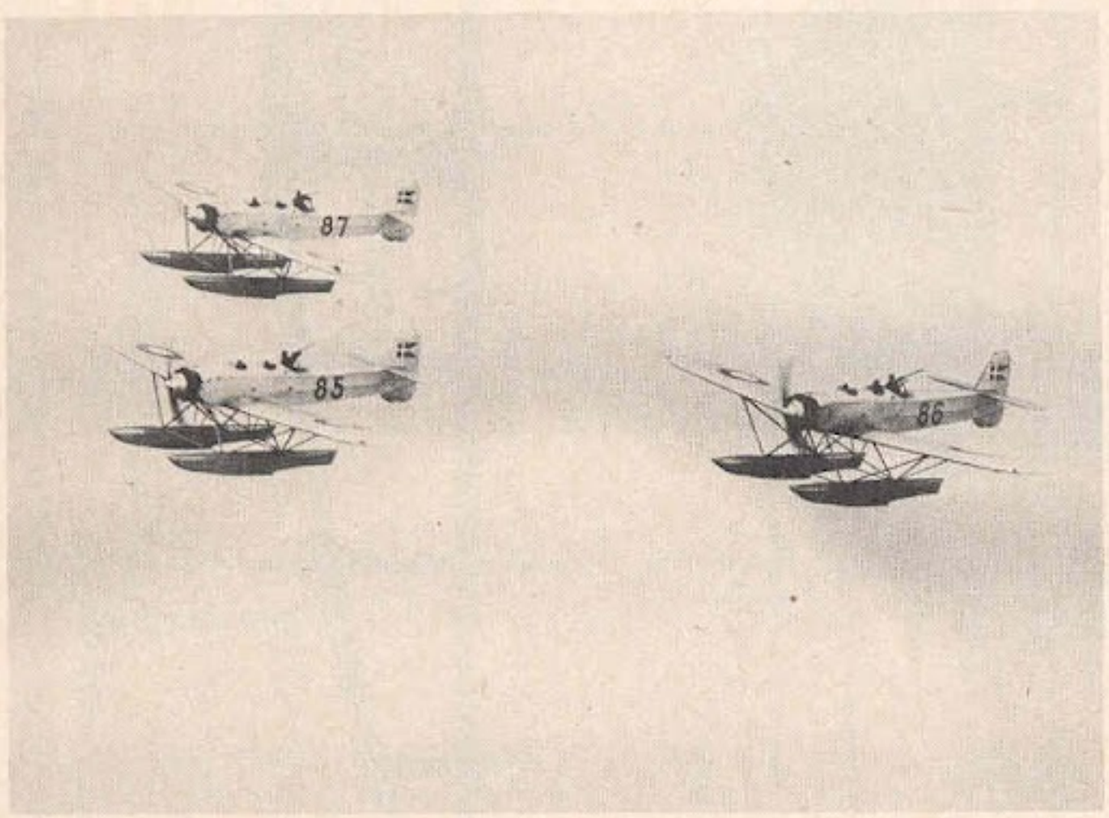

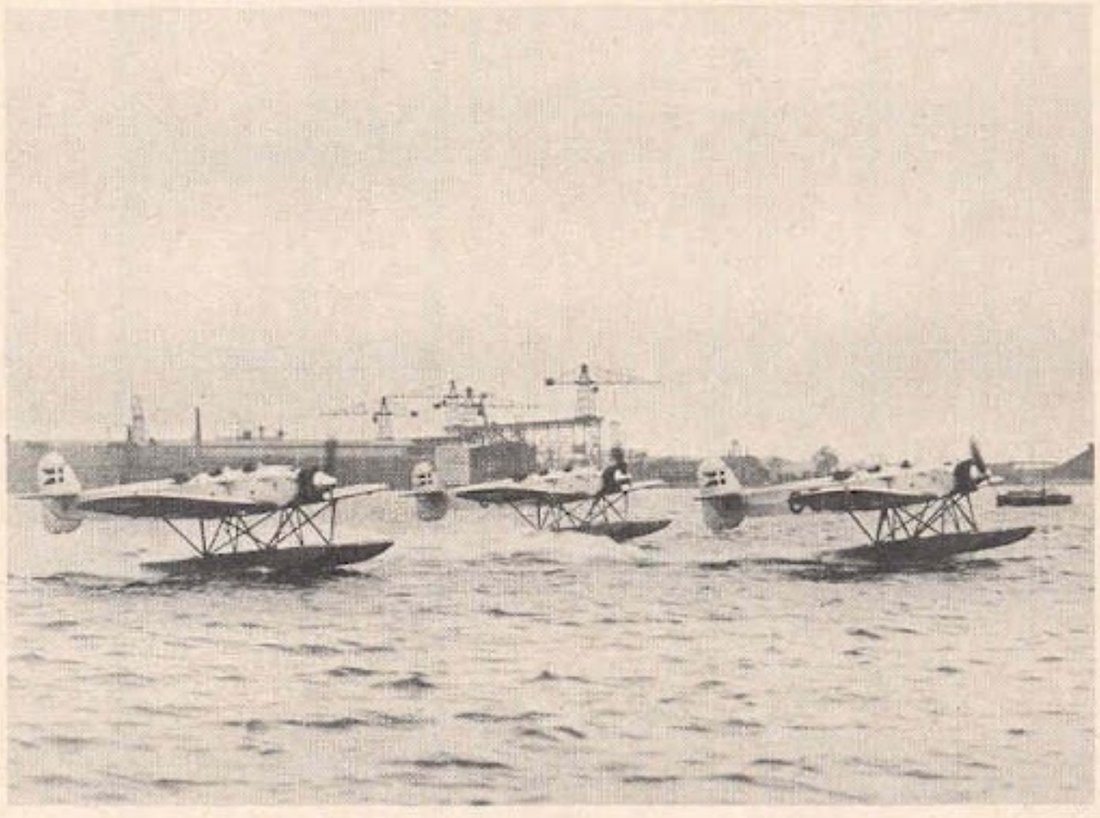

ABOVE LEFT: VFR on top, a formation of Danish HM-II's in flight. The aircraft are in their original light gray finish. ABOVE RIGHT: On the step, the same trio of HM-II's race for a formation take-off from Copenhagen harbor. Photos via J. Hultman.

would certainly fly with a .29 or .35 size engine, we feel that a .40 engine is the ideal size for best performance.

To sum up this review; the Saker is a fine kit that flies as well as it looks. It will perform all the usual pattern maneuvers in a commendable fashion. If you are contemplating building a new sport or novice pattern aircraft, the Saker is well worth your serious consideration. □

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to 8-10 knots. In winds higher than 12-15 knots, the surface chop becomes the limiting factor, forcing curtailment of operation except in extremely sheltered waters.

When water taxiing, always hold full up elevator to minimize propeller spray ingestion. Turning downwind can most expeditiously be accomplished by a brief application of power coupled with full rudder. As with real floatplanes, sailing one is an art in itself, that is perfected only with continued practice. But it is an art that once mastered, provides its own special sense of accomplishment that is limited to but a relative few when one considers the ratio between land and seaplanes. But no sight can match that of a floatplane flaring gracefully, then gently touching down on a mirror-smooth lake amidst a splash of spray.

This particular Danish HM-II modeled, Number 87, was embarked aboard the Royal Greenland Trade Department ship Gustav Holm. A barkentine with auxiliary steam propulsion, the Gustav Holm sailed for Greenland on 15 June, 1932, with the colorful red-orange

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Number 87 securely fastened to its aft platform. Thus began the first summer of an epic, six year odyssey that saw the HM-II's accumulate a total of 1114 hours of arctic flying over the desolate Greenland terrain, reaching as far north as 81° North Latitude, or to within 540 nautical miles of the Geographic North Pole. And 43 years later, another, although perhaps somewhat less historic HM-II would make an appearance in Greenland. For it was in the Spring and Summer of 1975 at Sondrestrom, above the Arctic Circle on Greenland's mountainous west coast, that this unique model was designed and built. □