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MARCH 2003

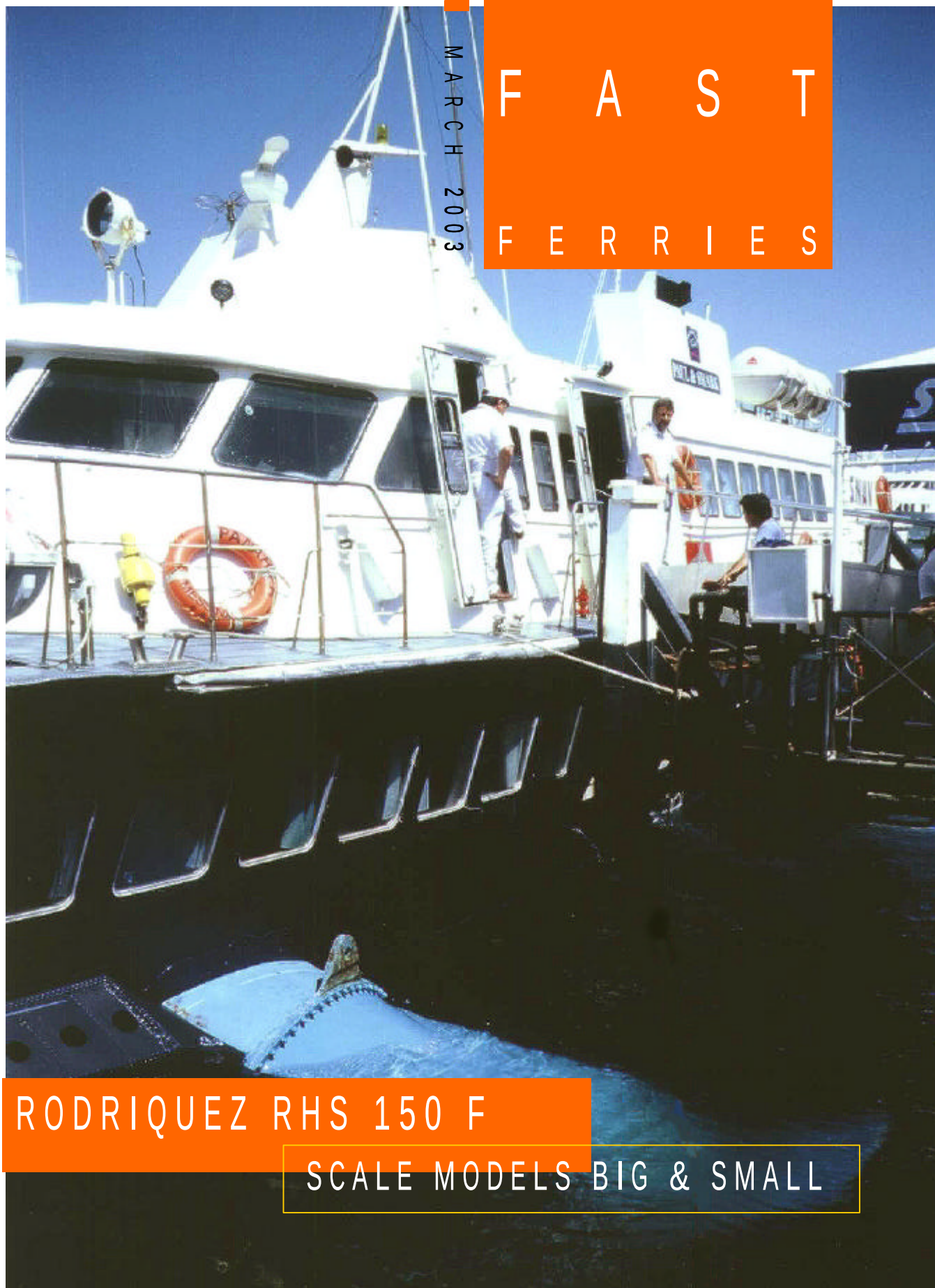
C L A S S I C

F A S T

F E R R I E S

RODRIQUEZ RHS 150 F

SCALE MODELS BIG & SMALL



THE ONLY PERIODICAL ABOUT THE HEYDAY OF PASSENGER HYDROFOILS, HOVERCRAFT & CATAMARANS – AS WELL AS RELEVANT NEWS ■ ISSUED IN PDF FORMAT. PLEASE CHECK OUR SITE ON THE WEB FOR NEXT ISSUE DETAILS:

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COVER PHOTO : RODRIQUEZ RHS 150M PANAREA AT THE NAPOLI MERGELLINA SNAV TERMINAL IN JULY 2001 . STORY STARTS ON PAGE 3 [MATS FINNSEN PHOTO]



[DAVE HOCQUARD photo]

More French Connection

In addition to Condor and Emeraude Lines – see article *The French Connection, The Red & Green Fleet* in the January 2003 CLASSIC FAST FERRIES – a third company, Vedettes Armoricaines, used to operate between France and the Channel Island of Jersey. Initially a 300-passenger 37m monohull, *Jaguar*, constructed of GRP was being used, this was joined in 1987 by a Kometa hydrofoil and later replaced by a W86 catamaran, *Ar Vro*, of similar vintage to the Kometa, acquired from another French operator. The Kometa had been delivered by Sormovo to Vedettes

Armoricaines in 1970 and operated out of Brest in north-west Brittany but had been laid up for a number of years when it was transferred to the St. Malo–St. Helier route.

Both the Westamarian and Kometa were subsequently sold; at least the W86 is still in France but is no longer being operated as a fast ferry (i.e. at less than 25 knots service speed).

No hydrofoils remain in operation to/from the Channel Islands – or elsewhere in France or the UK.

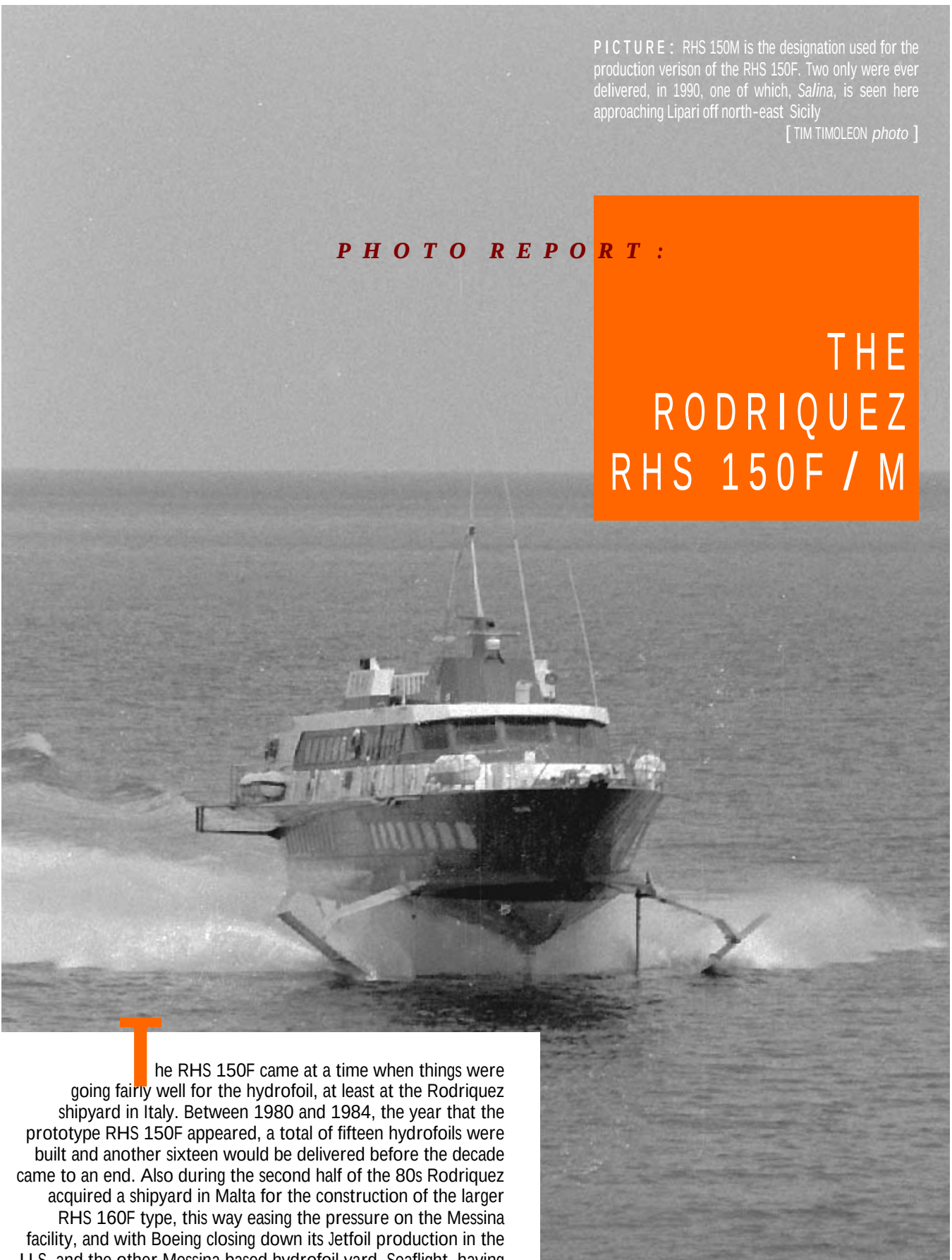
In the above view the Kometa is entering the harbor at St. Malo on August 21st 1988.

PICTURE : RHS 150M is the designation used for the production version of the RHS 150F. Two only were ever delivered, in 1990, one of which, *Salina*, is seen here approaching Lipari off north-east Sicily

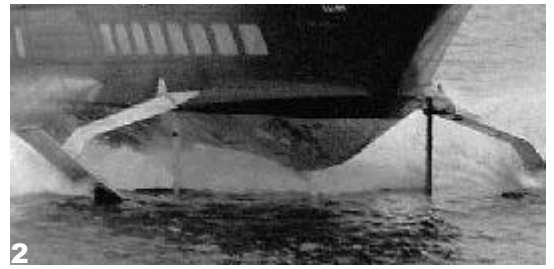
[TIM TIMOLEON photo]

PHOTO REPORT :

THE RODRIQUEZ RHS 150F / M



The RHS 150F came at a time when things were going fairly well for the hydrofoil, at least at the Rodriguez shipyard in Italy. Between 1980 and 1984, the year that the prototype RHS 150F appeared, a total of fifteen hydrofoils were built and another sixteen would be delivered before the decade came to an end. Also during the second half of the 80s Rodriguez acquired a shipyard in Malta for the construction of the larger RHS 160F type, this way easing the pressure on the Messina facility, and with Boeing closing down its Jetfoil production in the U.S. and the other Messina based hydrofoil yard, Seaflight, having passed away before that, Rodriguez pretty much had the field to itself as far as hydrofoil production was concerned outside the Soviet Union.



The RHS 150 series comprises six significantly different designs, the first of which appeared back in 1979, and evolved from the RHS 140, produced between 1971–77. The RHS 150F thus shares the overall dimensions with the RHS 140 but features a greater moulded breadth allowing for up to 180 passengers to be seated in a commuter version as opposed to 125–140 on the latter and cruises at a higher speed – on account of a reduced cruising range of 200 nautical miles compared to 300 NM for the RHS 140. Also, the RHS 150F is a twin-deck design with the wheelhouse being located forward on the main deck rather than in a raised position as on the RHS 140 (as well as on some of the RHS 150 range). The hullborne/foilborne draft of the RHS 150F is 0,4m/0,1m less than on the RHS 140.

The prototype RHS 150F, *Dynasty*, fitted out for 161 passengers, was delivered to Italian operator Aliscaf-SNAV and entered service in the Gulf of Naples and between Napoli and Sicily before being shipped overseas to the US Virgin Islands for a short spell in 1986. It was back in Italy with SNAV less than twelve months later and has remained so ever since, although more recently it has disappeared from the official SNAV fleet list.

Only the one RHS 150F was ever built, but in 1990 two more 161-seat hydrofoils designated RHS 150M, which was the production craft designation, *Salina* and *Panarea*, were delivered to SNAV and put into service in Sicily and the Bay of Naples. These were the last of the RHS 150 series to be built. ■



ABOVE:
Hydrofoil activity
in Vulcano and
(right) *Dynasty*
pausing in the
mid-day heat in
Lipari, Eolie
Islands
[TIM TIMOLEON
photo, both]

Length -overall 28.70m
-waterline 24.10m
Moulded breadth 6.50m
Width across foils 11m
Draft -hullborne
3.10/3.20m
-foilborne 1.40m
Power plant 2 x MTU
12V 396 TE74, 1,260
kW @ 2,000 rpm, each
driving a fixed pitch
propeller via a ZF
BW460 gearbox
Cruising speed 36 knots
Cruising range 200 NM
Passengers 150–180

The hull is of
aluminum alloy,
divided into five
watertight
compartments. Foils,
of the surface-piercing
type, are a hollow
construction of high
tensile steel. The bow
foil is of 'W' design.
Rudders are
incorporated in the
center strut of the bow
foil and the aft foil
struts. Hydraulically
operated flaps to

adjust trim are fitted to
the bow foil.
Passenger
accommodation is in
three saloons; one on
the main deck and
two below forward
and aft of the engine
room. All passenger
areas as well as the
bridge are air-
conditioned

OPPOSITE PAGE: 1 & 2 *Salina* approaching the berth at Lipari in June 1992 and a close-up of the bow foil while underway [TIM TIMOLEON photo, both] **3** *Panarea* sitting in the Rodriguez shipyard [RODRIQUEZ photo] **4 & 5** The prototype RHS 150F *Dynasty* in the Gulf of Naples and *Salina* working an inter-island run in the Eolian Islands off Sicily [TIM TIMOLEON photo, both] **6** *Panarea* reversing from the berth in Ischia in July 2001 [MATS FINNSEN photo]

The community of hydrofoil scale model builders may not be the biggest in the world. Still, at least two scratch-built and radio controlled models of the biggest commercial hydrofoil in the world, the Supramar PT.150, are known to be in existence. Both built by two Danish hydrofoil modelers, who are also good friends. One of the PT.150s, *Queen of the Waves* built by Søren Struntze, featured in the July/August 2002 *CLASSIC FAST FERRIES* ScaleBox and this time we take a look at the other, *Carton Ondulé* built by Hans Jørgen Hansen.



In addition to the article mentioned above, a comprehensive history of the three ever built full-scale PT.150s appeared in our April 2002 issue and thus will not be repeated here. Suffice to say, all three craft used to operate on the cross-Øresund Malmö, Sweden–Copenhagen, Denmark route during 1972/3–1977, which, at least in part, explains why the two Danish modelers developed a love for these majestic hydrofoils.

The model built by Hans Jørgen Hansen is a semi-scale representation of the Supramar PT.150 Mk III hydrofoil built to a scale of 1:25, developed with reference to *Jane's Surface Skimmers*. While the hull and superstructure are very much based on the PT.150, the foil arrangement is more akin to a Rodriguez RHS 160 or RHS 200. The hull is around 1,520 mm long and 300 mm wide. The model has a mass of 11,520 grams when complete with the set of eight NiCad batteries alone weighing some 2,400 grams, while ballast water in plastic bottles adds a further 3,000 grams. This mass would correspond to

180 tonnes at full load, and brings the model to the waterline Hans Jørgen intended it to operate at. The full loaded displacement reported for the PT.150 is 165 tons so it is apparent the model has no problem operating beyond the scaled weight of its full size counterparts.

In fact *Carton Ondulé* has been ballasted to a total mass as high as 12,000 grams, and even with this substantial weight the model still becomes foilborne. To prevent the model from sinking if it becomes flooded, expanded polystyrene foam is also added inside the hull.

The method of fabrication of the hull is quite unusual in that cardboard is used as the basic building material. In fact, the name of the model reflects this – although with a French rather than Danish touch; the French word for cardboard thus is carton and ondulé means rolling or wavy. This makes sense when you know that while in the Øresund the PT.150s were named *Prince of the Waves*, *Princess of the Waves* and *Queen of the Waves* !

CARDBOARD
OF THE
WAVES

scalebox

by martin grimm

ALL PHOTOS BY **hans jørgen hansen**

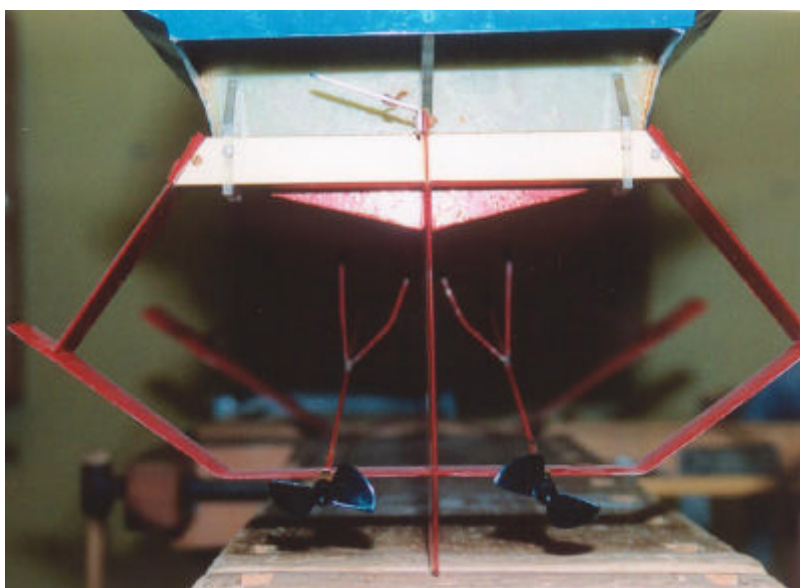
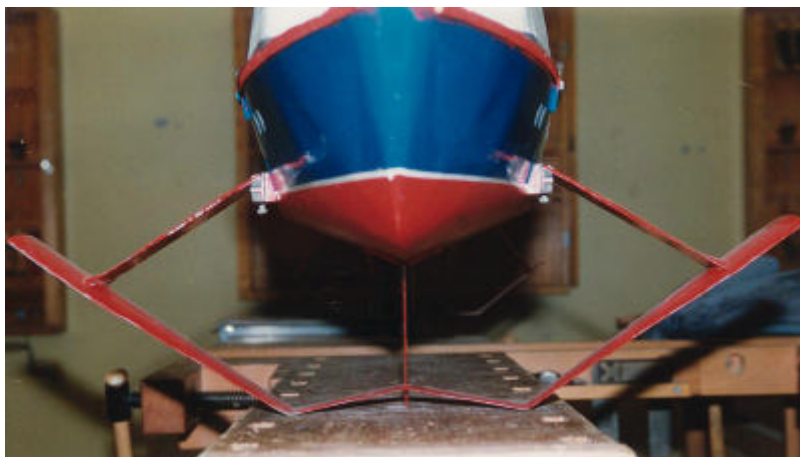
Once the cardboard shell of the hull is assembled and stiffened where necessary, the inside of the hull is coated with fibreglass and polyester resin. In the process, the resin soaks into the cardboard leading to a tough waterproof shell. The exterior can then be lightly sanded to smooth the surface before it is painted. The entire superstructure is likewise constructed of cardboard and can be lifted off the hull to give good access to the battery packs, motors and radio control gear.

The bow foil is of a surface piercing 'W' configuration with an overall span of 640 mm and chord length which originally varied from 46 mm at the centre to 115 mm at the foil tips. When foilborne, the submerged portion of that foil has a span of about 450 mm. This foil provides the main longitudinal and lateral stability for the model.

The stern foil is also of a surface piercing arrangement with a ∇ geometry so this also contributes to the stability of the model when foilborne. This has an overall span of 430 mm and originally had a constant 50 mm chord length. Both the bow and stern foils are manufactured from 3 mm thick solid aluminium alloy strips filed back to form streamlined hydrofoil profiles. In recent years, Hans Jørgen has experimented with reducing the chord length of both the bow and stern foils with the aim of reducing frictional resistance and hence increasing maximum speed. The bow foil chord has therefore been reduced to 20 mm over its centre portion increasing to 80 mm further outboard. Likewise, the stern foil chord has been reduced to 23 mm at its base increasing to 35 mm near the tips. With these modifications, the model can travel at about 15 knots.

The bow foil is attached to the hull via three alloy struts. The outboard struts are rigidly connected to the hull while the centreline strut is simply bracketed to the keel of the hull without being fastened to it. This strut therefore simply helps to support the hull weight while the model is foilborne.

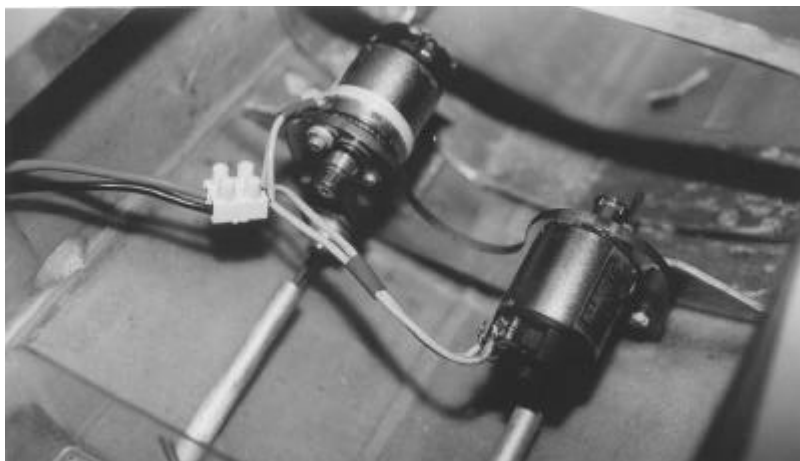
The bow foil assembly was originally intended to have an adjustable incidence angle, which could be controlled by a motor driven actuator. This was subsequently found to be an unnecessary complication and so the bow foil incidence angle is maintained by a simple fixed link between a control horn attached to the bow foil and a bracket inside the hull. This



T O P : The bow foil of *Carton Ondulé* showing a 'W' layout similar to that on the Rodriguez RHS 160 and RHS 200 series hydrofoils and ...

A B O V E : ... the stern foil showing a fairly typical Supramar/Rodriquez layout but unlike that of the PT.150 which had a fully submerged aft foil (for comparison, see cover picture of the April 2002 *CLASSIC FAST FERRIES*)

BELOW : The motors and gearing used on *Carton Ondulé* showing the originally fitted Tamiya RX540VZ Technigold motors



arrangement also serves as a weak link that will fail should the model run aground.

The stern foil assembly is connected to the hull via an aluminium rectangular hollow section cross beam. The two outboard struts fabricated of polycarbonate are connected to the port and starboard ends of this beam. A single centreline polycarbonate rudder also transmits the hull weight into the aft foil. The chord length of the rudder has also been reduced in recent years in an effort to increase the speed of the model.

Originally, Hans Jørgen had intended to power the model using a chain saw engine. This proved to be somewhat difficult and so he decided instead for it to be powered by a pair of Tamiya RX540VZ Technigold electric motors. Reduction gears with a toothed belt drive are fitted between the motors and the propeller shafts. The reduction ratio was originally 1:2.66 however this was later modified with new gears to become 1:2.90. The gear wheels were manufactured by Hans Jørgen using his own lathe. More recently the motors have been replaced by LRP V10 type which are double wound with 11 turns (article no. 5711).

The propeller shafts are 3 mm diameter piano wire which is thinner than the scaled dimension of

Each shaft originally drove a two bladed 45 mm diameter Graupner propeller with a high pitch ratio. For the faster model with its modified foils, 42.5 mm diameter Graupner propellers of medium pitch are instead fitted. Four sets of 7.2 Volt Sanyo 1500 mAh NiCad batteries supply power to each of the motors, providing 6 Amps current.

Control of the model is through a two-channel Futaba radio control unit, one channel for speed control the other for steering. This same unit is also used on another, smaller hydrofoil model built by Hans Jørgen. The receiver is a Futaba FP-R102JE type, this being powered by the same battery pack as for propulsion using battery elimination circuitry (BEC).

To cope with the large current flow, each motor has its own electronic speed controller, these being LRP F1 Pro Reverse Digital types (article no. 8336). These controllers each have their own receivers and are fitted with similar crystals. The single servo on board the model controls the rudder through a straightforward pushrod protruding through the transom.

Carton Ondulé was built between 1981 and 1999, though it was largely complete by 1985, and is one of several hydrofoil models that Hans Jørgen



the shafts of a PT.150. This helps to minimise hydrodynamic drag. The shafts are supported at the gear wheels adjacent to the motors, as they pass through the stern tubes, at an A bracket supporting each shaft and at bossings attached to the trailing edge of the stern foil. The shafts run in Teflon bronze bearings manufactured by Hans Jørgen with the aid of his lathe. In way of those supports, the shaft is built up to 4 mm diameter using stainless steel tubing which has been glued to the shafts. Elsewhere the steel shafts are painted to prevent rust.

has either completed or started to work on. It continues to be used from time to time. The model has an endurance of some 45 minutes on the full set of batteries. ■

A modeling career ?

Tell about your experiences with building
scale models of hydrofoils,
hovercraft etc. in

scalebox



Alex is the man

In our *Sydney Special* of June 2002 was a photo of a model of Sydney's first Supramar PT.20 hydrofoil, *Manly*, built by an unknown modeler (page 23).

Well, the gifted model builder is unknown no more; his name is Alex Weismann and the photographer was Andrew Gowanlock, both residing in the great land down under.

The PT.20 was Alex's first attempt at a static scratch-built model. Built to a scale of 1:25, it was completed with internal details such as seats, light fixtures, carpet, timber finish wallpaper – and even a

'vacant' sign on the toilet door. The wheelhouse was also fully detailed and on the port side of the small belvedere saloon, next to the wheelhouse door, there was a cupboard holding miniature life jackets.

Unfortunately, there is also a dark side to this happy story. Being built entirely from balsa the neatly finished model wasn't very sturdy, and it ended its days under some heavy boxes that were dropped on it a couple of years back. However, rather than being put off by this, Alex developed an itch for building more and currently under



construction, he reports, is a new *Manly* as well as the more untraditional *Disco Volante*, the PT.20 hydrofoil-disguised-as-a-luxury-yacht used in the 1965 James Bond release *Thunderball*, and which is blown up toward the end of the movie (the Rodriguez yard has assured the editor of this magazine that it was only a model!).

These models are 1:12 scale and, contrary to the first *Manly*, will be radio controlled. Upon completion the overall length of the two craft will be 1752.5 mm and 2133 mm respectively; *Disco Volante* will feature a true-to-the-prototype detachable 'cocoon' stern. Alex also plans to build the four PT.50s and sole RHS 140 that used to operate on Sydney Harbour. We hope to revert to some of these in future issues of *CFF*.

The pictures show the original *Manly* built by Alex in various stages of construction. For instance, in the top opposite picture and below the white line down the hull sides has yet to be applied. This was the second paint scheme carried by the life-size *Manly*; the original (1965) being a light shade of green. ■



P H O T O S B Y A L E X W E I S M A N N

classic shot



Supramar PT.150 *Queen of the Waves* in Copenhagen on a golden summer's eve some twenty-five plus years ago [OLAV MOEN photo]

There's
something
missing in
the
Kingdom of
Denmark

Further to Hans Jørgen Hansen's scale model of the Supramar PT.150 hydrofoil described in *scalebox* inside this issue, here's a charming classic shot of more than a quarter of a century ago of one of the full-size prototypes bound to bring back memories to HJH and others who happened to be around at the time.

The three ever built PT.150s were constructed by Norwegian Supramar licensee Westermoen Hydrofoil and delivered 1968–70. After some short spells in the Kattegat, the Caribbean, Spain and the Baltic all three eventually ended up working together on the Copenhagen, Denmark–Malmö, Sweden route before being towed across the Atlantic to North America in 1977. While in the Øresund the vessels were owned by Norwegian shipping firm Johs. Presthus and named *Prince of the Waves*, *Princess of the Waves* and *Queen of the Waves* – there was never a *King* . .