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What's new in Seaplanes?

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THE COOL WORLD OF SEAPLANES

by James Gilbert, associate editor

MOST FLOATPLANES TODAY WORK FOR THEIR LIVING, LIKE THIS CESSNA SKYWAGON ON EDO FLOATS GETTING OFF FROM LONG ISLAND'S SANDS POINT SEAPLANE BASE. BUT FOR SIMPLE PLEASURE, FLOAT FLYING IS HARD TO BEAT. COME ON IN (IF YOU CAN AFFORD IT).

Water flying. A quicksilver lake to rule as your private domain. The sweet waterbird splashdown of your landing, ending in a gentle watery shiver as your bow wave sweeps up from astern and overtakes you. Chug-chug like a motor launch as you taxi to the shore. (Water so clear that last year's leaves lie still visible, motionless, on the bottom.) You hit the bank and the switches together, and are at once overwhelmed by a sudden deafening—silence. Stay all day, stay all year, and the loudest interruption to your peace of mind could be the breeze sighing through the pine needles.

Is this your dream? Of the seaplane as a miraculous device combining the intoxication of flight with all the enchantment of messing about in boats? Of

total independence from airports, landing fees, tiedown fees, surly controllers; of a flying world where most of the landscape over which you fly is, for you, the equivalent of untouched acres of paved private runway? Where an airplane is what it should be, free as a bird, a land-anywhere device?

So how come so many people still land and take off on stupid old *wheels*, for heaven's sake?

There are lots of reasons, but the king reason would seem to be money: floats are just plain expensive. They also slow you down and reduce your load and increase your insurance premiums. And for all that there are lakes and rivers scattered across the land thicker than raisins in fruitcake, there are precious few lakes and rivers free of driftwood, with tieup and gasoline and a coffee shop.

And another powerful reason is simply that almost everybody enters aviation on wheels, and without any effort at all to speak of it is perfectly easy to avoid ever *seeing* a floatplane. Nobody is going to come knocking at your door selling floats. The delights of floatplane flying are very real, but you are going to have to go and search them out yourself, for there's nobody really merchandising them. Which is a real pity, because if you haven't flown off water, you've missed a beautiful experience.

According to the records there would seem to be just under 2,000 seaplanes. In 1959 there were just over 2,000. In 1949 there were probably a few more still. Of today's total, perhaps 200 multi-engine and 800 single-engine water airplanes are active. The statistics are complicated by the fact that many airplanes spend part of their lives on wheels, part on floats and part on skis. But there's no escaping the conclusion that seaplaning is dying a slow death. And how great it used to be!

Remember Howard Hughes' colossal wooden flying boat? The huge British Saro Princess flying boats, weighing 160 tons and with 10 turboprop engines, that were going to criss-cross the Atlantic? The PBY amphibians, now reduced to a handful eking out their old age as water bombers in Canada? The lovely Martin Mars? (Rumor says two of these are serving out their declining days in British Columbia, also as water bombers.) Remember the old Pan American clippers

with their outrigger sponsons, chugging low and slow across the oceans? Remember the bizarre and implausible Dornier Do. X with serried rows of engines along the wings, back and front, like a kind of flying Brooklyn Bridge?

Remember the Schneider Trophy Races, open only to seaplanes? What fantasticly sleek flying sharks they engendered, airplanes that, floats or not, were doing well over 350 knots (400 mph) by the time the British caddishly went and won the thing for the third time running, retiring the trophy.

Where are they now, these water birds of yesteryear? The lucky ones are in museums; the rest, rotting on boatyards, gone to the bottom, or just lost without trace.

And where are today's seaplanes? They're in Canada and Alaska, going onto skis in the winter. They're flitting around the Gulf swamps of Louisiana. And they're skulking about in the Hiawatha woods and lakes of Minnesota. Maine has plenty, New York a few. The seaplane, in effect, is still king where there are no roads, rail tracks or airports, but a burning need to travel and a million lakes or rivers or bayous beckoning.

What are the seaplanes, today? Cessnas on Edo floats, mostly. Plus a handful of old Grumman twins. An occassional dilapidated Sea Bee amphibian, some Beavers and Helios and the like. But single-engine Cessnas, mostly. There's the Lake amphibian, struggling to keep its head above water, and there's an Italian immigrant called the Riviera, full of Mediterranean dash and *élan*, and high hopes of making its fortune in the Brave New World.

You'll find Edo out on Long Island. There you'll see float bottoms being pummeled into shape by a stretch press, aided by two beefy guys armed with old-fashioned rubber hammers. Production is hardly automated, nor is the pace of activity likely to overwhelm you. Edo has 90 percent of the float market, even though it only represents some four percent of its business. Edo is a leader in the more easily profitable activities of Loran and Sonar.

Making floats is small volume business, and in consequence is largely done by hand. They're assembled in jigs much like an aircraft fuselage, the whole thing being knitted up with great rows of rivets. The floats themselves are attached to the airplane by a forest of struts and wires, like something from the biplane era. "Traditional craftsmanship" there may be; modern ideas and mass production techniques there ain't. And the things are correspondingly dear.

We asked Wade Weathers, Edo's vice-president of marketing, what was needed to bring down the very high cost of floats (from $3,500 for a set for a Champ up to $12,500 for floats for a 180). "Volume," he said. "You can automate things like stamping out bulkheads, but the cost is in the labor of assembly. You can't automate that till you get volume." And you won't get volume till you bring the price down. Something will have to budge.

What about plastics? Plastics are to some people the great white hope of float building. They've done well in boats, and it should be possible to build airplane floats of fiberglass filled with polystyrene foam that would never corrode or leak, as well as being cheaper than metal. "We're not persuaded that plastics offer any significant advantages overall," says Wade a little wearily. He perhaps gets asked that question rather often.

"Floats have to be so many things," he says, waxing philosophical. "They have to be efficient in maneuvering on water, and easy to control. Once you start the takeoff, the floats have got to make the transition from a boat to an airplane. Once they're in the air they have to be as drag-free as you can make them.

"You've got to compromise. And we haven't yet found anything to beat aluminum.

"Float flying," says Wade with sadness and nostalgia in his voice, "used to be a sportsman type thing. Nowadays the majority of seaplanes are operated by people who are using them to make money." But Mr. Weathers, sir, surely it is up to the manufacturers to work at promoting a demand for their product? "In the last 10 years we've spent a million dollars on float development. That included the amphibious float.

"We spend annually $12,000 on advertising," he says finally, with the finality of a man to whom $12,000 is a lot to spend annually on advertising. But then, if floats are only four percent of your turnover, and a declining four percent at that, what else can you do?

Up in Vancouver, at the tiny Canadian Aircraft Products, it's different. CAP has just landed a juicy million-dollar contract from de Havilland to supply the floats for the Twin Otter. Canadian Aircraft Products is a press-on guy called Don Cameron, who says: "The areas here that need attention are the dispelling of the myth that float flying is difficult or dangerous, and secondly an attempt must be made to keep the cost of floats within the reach of noncommercial owners."

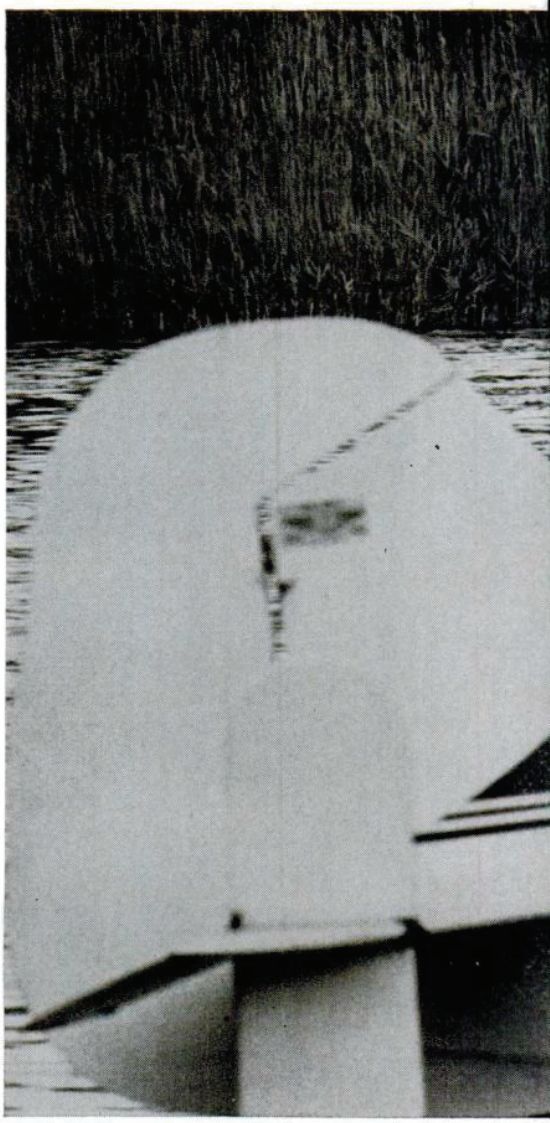
His shop has been bending metal for seven or eight years, turning out some 60 or 70 pairs of floats altogether. "Nobody," he says, "has done much about cleaning up floats. Aerodynamically and hydrodynamically there are advances that can be incorporated into floats that just haven't been."

Don Cameron isn't much impressed with plastics, either. "Fiberglass just is heavier, that's all," he says. "The best strength/weight ratios are still with aluminum. We hope that one day plastics may be the answer. We're sure they're not right now."

From Vancouver we move on to International Falls, Minnesota, home of Pee-Kay Aircraft Products, also struggling away to make both floats and a living. The boss is Tom Kellner.

He started with a metal shop in 1950, went on to repairing floats and later making them. He says very frankly that lack of working capital has held him back, but thinks things are finally getting going. He makes 1500, 1800 and 3500 models (floats are usually model-designated by the weight they will support). "I hesitate," he says, "to say how much our sales have been as it has not been too impressive; however, we are in possession of orders so far this year for more than we sold last year, so we have reason to be optimistic." But it's clearly no way to get rich quick.

Plastics? Well, there are two guys up in Anchorage, Alaska, putting their money on that horse. They are Wesley K. Landes and Al Johnson, and they're having their problems. Said Landes, "We



haven't really got into production yet. We're having problems getting the proper equipment. Aircraft skis are still our main line of business." Plastics? "They can compete in weight. And they should be slightly less in price. They will be tougher than aluminum."

And that is about the size of the aircraft float industry.

Let's get the operator's viewpoint. Lou Haslebeck runs a quietly efficient floatplane operation off the winding Hackensack River over in New Jersey. He'll get you your float rating for around 100 bucks, or even teach you to fly from scratch on floats, then send you down the road to Teterboro to find out how to do it on castors. Actually, learning to fly off floats is probably easier, and certainly very much more fun.

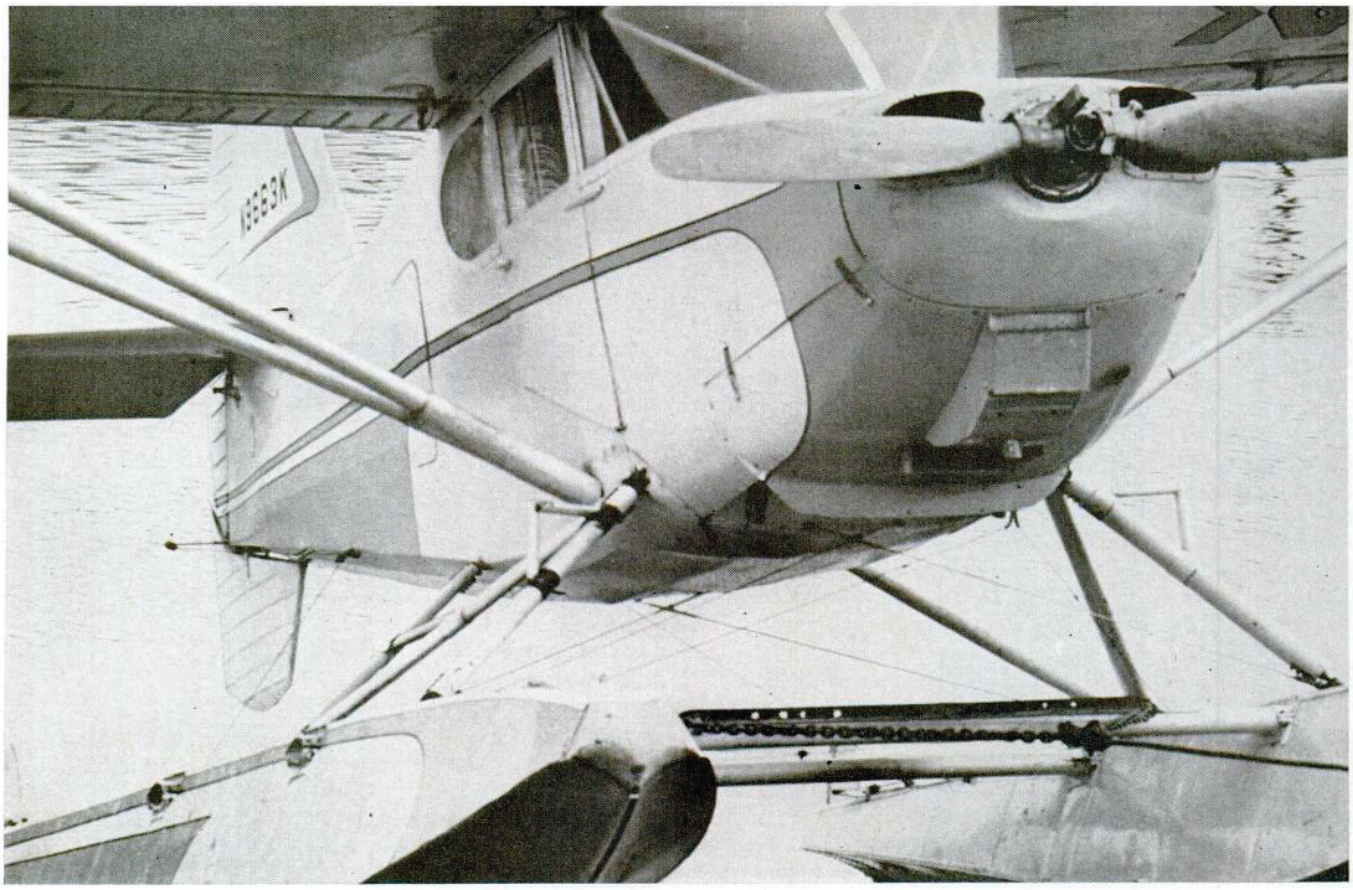
How come it's not more popular, Lou? "A seaplane's a little harder to justify for business use," he replies. "It's mostly diehards that have them. They're slow, more expensive initially, more expensive to maintain, more expensive to insure—six percent against four percent for a landplane." Why are floats so expensive to buy? "The engineering costs and setup costs have to be written off over a limited production." Why is insurance more costly? "If there is a loss, it is normally of a higher valuation. The biggest problem is capsizing floatplanes in a crosswind." Of course. You wreck a landplane, you can pick up the pieces and carry them back to the shop. Do something stupid in a seaplane and you've got to dredge it up afterwards.

And maintenance, Lou tells you, is always more on a floatplane. Operate one off seawater, and it's much higher still, because of the fearsome effects of saltwater corrosion. It's standard practice, after making a saltwater landing, to make a fresh-water one just to wash the salt off, or at very least to give the airplane a thorough hosedown with tap water.

What are the restrictions on where you can land, Lou? "New Jersey is the most highly restricted state; you're not allowed to land anywhere here except at a designated seaplane base. Elsewhere you can still go to any body of water that carries commercial boat traffic. In most other states you can usually land anywhere except reservations or state parks."

(continued)

A TRI-PACER TAXIES SLOWLY DOWNWIND PAST A MOORED AERONCA. POWER RIGHT BACK, AND FULL UP ELEVATOR. THE SCENE? LOU HASLEBECK'S BASE ON NEW JERSEY'S HACKENSACK RIVER.



OLD STINSONS MAKE FINE FLOATPLANES. THE HIGH TAILPLANE CLEARS MOST OF THE SPRAY. NOTE THE VENTRAL FIN, ADDED TO COUNTERBALANCE EXTRA SIDE AREA OF THE FLOATS FORWARD.

If you've never tried water flying, you'll find it very different, though far from difficult. For a start you've got no brakes: stop the engine and you become a sailboat, and what's more a sailboat that always tends to weathercock into wind. For another thing, the floats do not always rest level on the water, but may dig in at the nose or tail, or going crosswind, the downwind float will dig in. But to a landplane pilot probably the most novel thing about float operations is that you must taxi at all times, and even start your takeoff run, with the stick held hard back. Actually you can taxi a floatplane at two speeds only—very slowly (even using carb heat and switching off one mag to reduce power below normal idle) or very fast, planing on the step. This is because in the regime in between, the front of the floats kick up spray all over everything, and propellers churning through spray don't last very long.

You start your takeoff run with the stick hard back in order to raise the bow of the floats and get them "on the step" as soon as possible. As soon as you are on the step, which is when the water stops feeling like treacle, you ease the stick forward to the right takeoff angle for the wing.

Landing is easy, and you just don't bounce. But there are two special types of landing you have to learn: rough-water, when you hold it off as long as possible and drop it in from a low height in a full stall, and glassy water, which is what you must cope with anytime the wind goes calm. Glassy water merges with the sky, so that you lose all visible horizon, and with it depth perception, and must in consequence do a full instrument landing, letting down very slowly for the last 100 feet, nose high and with power, cutting the fan only when you strike the surface. Otherwise, you'll just fly into the water without ever seeing it. Glassy water can fool the best pilots in the world.

Turning downwind after landing is often a case of swinging the nose 45 degrees one way, then applying a burst of power and swinging it back through the wind and on till you are pointing downwind. Then you throttle back to avoid gaining too much speed. To turn upwind for your next takeoff you lose as much speed as you can, and let the plane weathercock into wind. This it will do quite sharply, so much so as to capsize itself if you have too much speed.

Crosswind takeoffs you start by pointing into the wind. As soon as you're on the step you can rudder quite smartly crosswind into the direction you want to go. Here wind and centrifugal force are opposing and balancing each other. Get it?

So to turn into wind when taxiing, just close the throttle. You need do nothing else. To turn out of wind, and hold it there, you will need power. It may sound difficult, but it is really easy, and problems hardly arise until you start getting overconfident.

Engine failure over land? Just pick a field. Chances are you won't even scratch a float. If the grass is wet, you might even be able to take off again when the motor is fixed.

Amphibians handle like seaplanes on water and like landplanes on land. But a word of warning here. Land on *land* with the *wheels* up and you will merely look foolish and be out of pocket. Land on *water* with the wheels *down* and you are through. Because an amphibian with the gear down noses over as soon as it touches the water. This is a mistake you cannot afford to make even once, ever.

With that one proviso, it's all pretty simple. Certainly present-day water planes are a far cry from things like the Schneider Trophy racers, with their handling problems. Here's Wing Commander A. H. Orlebar, A.F.C., describing the takeoff technique needed for the Supermarine S.6. "The aircraft is put well to the right of the wind and held there without yaw while the pilot ensures that he has a clear run into wind. He then applies full right rudder and full elevator control, bends his head well forward and down under the windscreen to shield his goggles, and then opens the throttle full out fairly rapidly. In this way he can go through the first second or two while the airplane is swinging left and the cockpit is covered with spray, and he can get a clear view with clean goggles afterward to apply rudder control as soon as it becomes available.

"At the moment of takeoff the airplane is longitudinally unstable and needs careful handling to keep the nose up and maintain the angle of attack of the wings. This instability is aggravated if the CG is not kept well forward." Phew!

The amphibian is surely the ultimate

in aerial versatility. It is also the ultimate in compromise, so far as design is concerned. And when you start compromising one quality against another, you tend to end up with insufficient of anything, so few amphibians have ever been very successful, in spite of their obvious attractions. They should all have been gold mines; they weren't.

Designing an amphibian must be a real juggling game. You need a real strong hull to withstand the shocks of rough-water landings, and retractable wheel gear and floats if possible, and the weight of all this has to be juggled against payload. To keep spray out of the propeller, you want it as far forward as possible, but then again you want it aft to make docking easy. You want a big hull for buoyancy and stability, but a tiny hull for low aerodynamic drag at cruise. You want a great big wing to get off the water, but a small wing to reduce drag at cruise. Whatever you do, the thing is almost bound to end up costing a king's ransom, and be very slow to boot.

All hail, then, to the designers of the Riviera, a four-seat amphibian that will carry 1,000 pounds of load at 130 knots (150 mph) and only a shade over 11 gallons per hour, and which handles just delightfully, whether on land or sea or in the air. The Riviera is made by the Italian company Siai Marchetti ("See-eye Marketty") and marketed here by the Brooklyn-based North Star Air Parks.

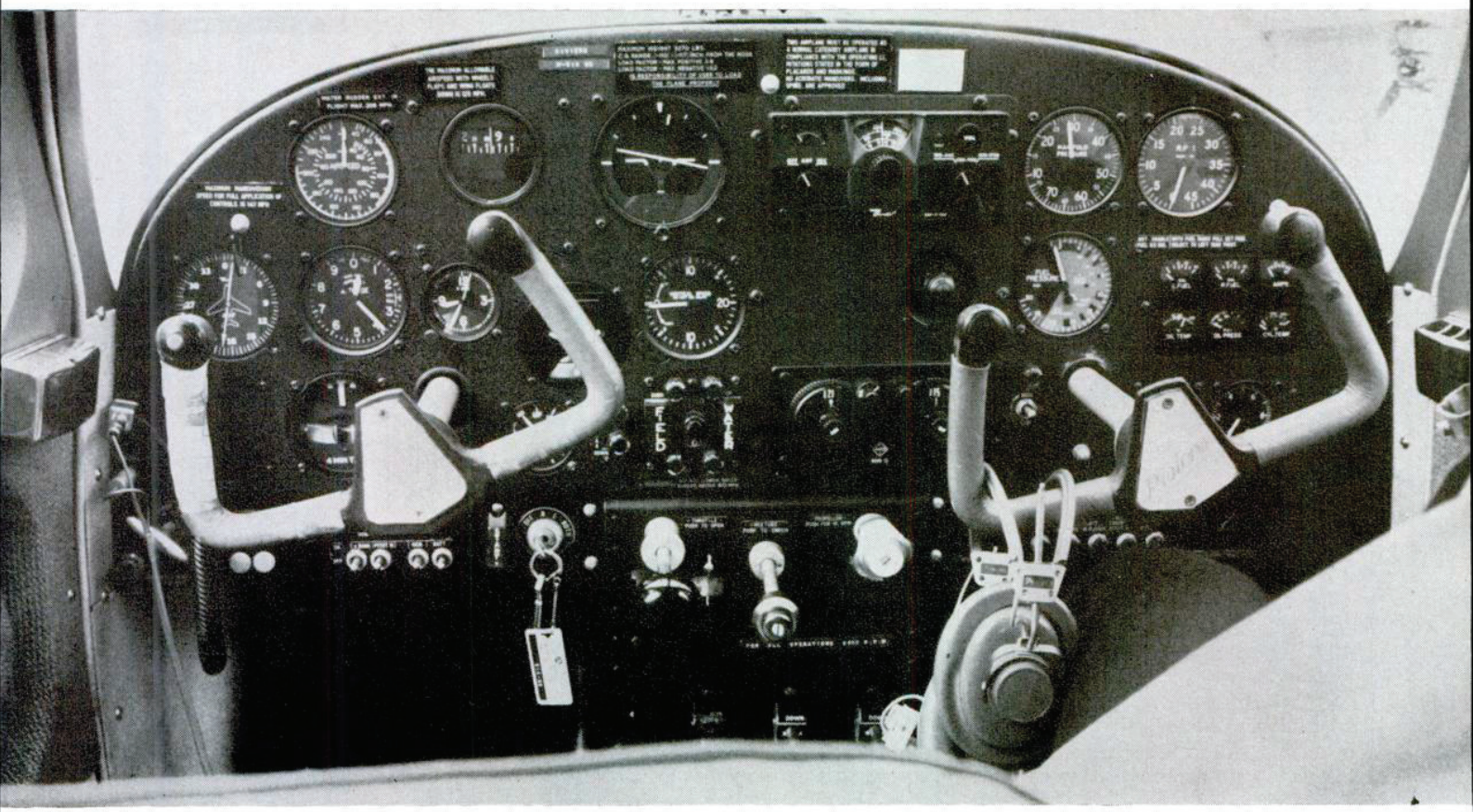
Mind you, something had to give, and in the Riviera's case it is takeoff performance, notably on water, where the run is almost 1,500 feet. To get that 132 knots (152 mph) cruise speed the designers opted for a small wing, highly loaded. Surely this was the right thing to do: runways are getting longer and longer every day, and even on narrow, winding rivers you usually don't have to taxi very far before finding a good long run into wind. That speedy cruise makes the Riviera the first amphibian to be a really practical traveling airplane. But at $35,404 it's still a rich man's toy. It is significant that all four Rivieras sold so far have been to people wealthy enough to own more than one airplane.

Standing on the line at Westchester County Airport in a row of sleek bizjets, the Riviera seems a bulbous-looking brute. But as you walk round on your preflight, you develop an increasing respect for the airplane's designers. They've put the people up front, with superb visibility and no rear CG loading problems, and big doors for easy access and docking. The spray rail doubles as a foot step. Fuselage and wing are smoothly faired together, with the engine concealed in a lump growing out of their junction. Use of a three-bladed propeller reduces the size of the cut-out in which it must turn, and the propeller is reversible and has specially cut tips to reduce wear from spray. The balance floats retract to form low-drag wing tips, and big flaps do what they can to offset the small wing.

The Riviera is easy to get in and out of, and there's plenty of room inside: all the head room you could want, and plenty of elbow room in the front, not quite so much in the back. You can get two suitcases under the back seat.

Everything is hydraulic. Tip floats, flaps, gear. Three levers alongside each other, so you want to know which one you are reaching for. The flaps are big, and go down much more slowly than they go up; you have fast flap dumping, in a word. A great big battery of warning lights, like something from the Strip at Vegas. *Field* on the left, all green, and *Water* on the right, all red. A separate red light in the center that flashes if you have got the configuration wrong; *i.e.*, both wheels *and* floats down, or the throttle reduced but nothing down. Propeller reversing is controlled by an overhead lever that looks like some kind of emergency canopy release; it's away from everything else, so there's no chance of grabbing that one by mistake. Even the water rudder is hydraulically actuated, by a blip-switch on the yoke that you must press to keep the rudder down. No limit speed for the water rud-

THE RIVIERA'S PANEL. NOTE GEAR LIGHTS ABOVE THE THROTTLE: GREEN ON LEFT FOR LAND, RED ON RIGHT FOR WATER. CENTER LIGHT FLASHES WHEN BOTH GEAR *AND* FLOATS ARE SELECTED, OR THROTTLE CLOSED WITH *NEITHER*. SELECTOR LEVERS ARE BELOW POWER CONTROLS, HALF HIDDEN HERE. BUTTON ON PILOT'S YOKE IS WATER RUDDER.



der in the air, though you are not supposed to use it above 35 knots (40 mph) on the water, or you may bend it. Otherwise the knobs and dials are all much what you are used to.

Start the engine and you know it's there. North Star's Mel Hunter told us that 60 percent of the engine noise comes in the rear window, and they have hopes of reducing it in the future.

Taxiing the Riviera even on land has this fun gimmick of reverse power; you can back into that tight spot in the line, or back up to the edge of the hardtop for your run-up. It amuses the guys in the tower, if nothing else.

We are three up, with North Star's Bud Abbott in charge, and we carry about half fuel. Takeoff is curiously reminiscent of a jet, with the feel of that narrow-track undercarriage, no propeller in front, and a fairly long takeoff run. We get a modest 600 fpm at 96 knots (110 mph) after coming back to climb power. Best rate of climb speed is actually 78 knots (90 mph), and later (and lighter by one passenger) we try this at climb power and register 700 fpm.

The controls are beautifully Italian, light and crisp. (European designers have this bizarre idea that ailerons should *roll* an airplane, rather than just disturb the airflow over the wingtips.) The Riviera has that same sort of matched perfection of feel in handling as an Italian sports car. The visibility is excellent, but the noise level could certainly be lower.

Cruise checks. At 3,000 feet, outside air 0 degrees C, 2,300 rpm and 23 inches, which is about 65 percent, gives 120 knots (138 mph) IAS, which is 123 knots (142 mph) TAS. (Seventy-five percent power is 2,400 and 24 inches, and gives 127 knots or 146 mph TAS.) The book figure is 132 knots (152 mph) at 65 percent at best altitude, which we were well below. But even so, the figures we got were a trifle slower than those in the book.

We sit back and slow down for some stalls. From the Riviera's configuration one might expect these to be fearsome, but they aren't. The wing not only has washout, but it also has a leading edge fence to confine the stall inboard, and a turbulator strip to make sure it starts there. There is a slight wing drop with the flaps all the way down. The elevator is markedly more effective with power on; recovery from power-off stalls necessitates pushing the yoke all the way forward and holding it there. Speeds are about 63 knots (73 mph) flaps up, 58 knots (67) flaps down.

Runway landings are simple enough. Bud Abbott recommends keeping at least 87 knots (100 mph) on the clock until you are established on final, even though this seems rather fast. With the Riviera's very big flap, speed dissipation is no problem. After landing, lower the nose carefully, for the nose wheel is quite a long way forward, and you don't want to thump it on the concrete.

Normally you fly down final approach with power on, but the recommended short-field approach is an odd one: they say come in at 102 knots or 118 mph; *i.e.*, faster than usual, but power off, with full flap. This gives a rate of descent approaching that of a brick, but enough speed to flare.

Water landings are similar, though you want to lower floats and flaps early to give yourself plenty of time to check around and be sure you hit the right lever. Remember that touchdown needs to be made a foot or so lower; it's the *hull* you are landing on, not the *wheels*. After landing, don't bring the yoke all the way back, but continue to fly the airplane with it until you run out of speed and fall off the step. Water handling is excellent; turns out of wind are no problem. When weathercocking into wind from downwind taxiing you want to get rid of *all* your speed before the turn, because the buoyancy of the tip floats is limited, and you will find the downwind float vanishing completely under water in any sort of wind.

On takeoff from water, again you do *not* want to pull the yoke all the way back as you would a floatplane. As you first apply power, the entire airplane seems to vanish under a deluge of water; there really is a great deal of spray till you get up on the step.

We are flying from the Hackensack River over in New Jersey. Not a very nice day; curtains of rain sweep across the marshes, and an angry whistling wind is kicking up quite a swell even on this narrow river.

At takeoff speed the wavelets are almost solid under our bows, and the Riviera, Bud and I take quite a shaking. But she rides the bumpy surface well, even though she is taking it green clear over the bows at the start of each run. A guy in a speedboat comes out to watch us, but returns quickly to his mooring, drenched.

The takeoff run seems short enough here, but earlier we were flying off the Hudson near Peekskill, in a lesser wind, and needing all the river we could get. There the hills sweep down to the water in a series of declining crests, and we were hard put to get over the first ridge on one takeoff, and actually had to turn downwind of it on another. Sheer laziness on our part, for if we had taxied all the way downwind we would have had sufficient run. Water takeoffs in the Riviera need planning, distance-wise.

It is with sadness and reluctance that we return to Westchester, and the stern call of other, less enjoyable duties. The ads talk about your being a private pirate in the Riviera, but that's exactly what it makes you feel like: some kind of rollicking, rumbustious pirate.

THE RIVIERA:
PRIVATE PIRATE'S GALLEON.
YO HO HO AND
A CLOUD OF SPRAY—
AT LEAST, UNTIL YOU
ARE UP ON THE STEP.
COME ON IN; IT'S LOVELY.

North Star Riviera

Specifications	Basic price: $35,404
Engine	Continental IO-470-P, 250 hp.
Propeller	Hartzell 3 blade, reversible
Wing span	34.1 ft.
Length	24.3 ft.
Height	10.6 ft.
Wing area	163 sq. ft.
Wing loading	20.05 lb./sq. ft.
Passenger & crew	4
Empty weight	2,270 lbs.
Useful load	1,000 lbs.
Gross weight	3,270 lbs.
Power loading	13.1 lbs./hp.
Fuel capacity	63 gals.
Baggage capacity	300 lbs.
Performance	
Takeoff distance (land)	980 ft.
Takeoff to 50 ft. (land)	1,400 ft.
Takeoff distance (water)	1,440 ft.
Rate of climb	1,220 fpm
Service ceiling	18,500 ft.
Maximum speed	154 kts. (177 mph)
Max cruise (70% power)	142 kts. (164 mph)
Normal cruise (65% power)	132 kts. (152 mph)
Economical cruise (50% power)	119 kts. (137 mph)
Max fuel range (at 60%)	750 nm (865 sm)
Max payload range (at 60%)	486 nm (560 sm)
Stall speed (clean)	63 kts. (73 mph)
Stall speed (gear & flaps down, floats up)	59 kts. (68 mph)
Landing distance (land)	660 ft.
Landing from 50 ft. (land)	1,100 ft.
Landing distance (water)	625 ft.
Flight characteristics	
Control response (cruise)	Excellent
Control response (slow flight)	Good
Hands-off stability	Excellent
Stall recovery	Good
Runway handling	Excellent
Water handling	Good
Pilot utility	
Visibility	Excellent
Seat adjustment & comfort	Good
Accessibility of switches etc.	Excellent
Panel layout	Good
Cabin comfort	
Entry-exit ease	Good
Front seat room	Good
Rear seat room	Fair
Noise level	Fair


N914NS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