

## COCKPIT TEST REPORT

IT'S easy if you watch the ducks.

Flying from water, that is. Waterfowl, pilots have learned, are your best guide to wind direction when you're swinging low over a secluded lake miles from a wind sock. Even though low-level turbulence caused by the wind flowing over surrounding hills, trees and other objects can cause distortion of wave action and other indications, you can trust the birds to take off directly up wind.

Just land in the exact direction they're taking off as you drag the lake to be sure it is clear of obstacles, and you will be all right.

When we dragged Fox Lake, Ill., with the Colonial Skimmer on a SCIENCE AND MECHANICS test flight and came about the first time to put it in the water, we had plenty of ducks (it was Oct. 24). But beyond that, frankly, I wasn't sure what to expect.

Because this little plane, up to that point, had demonstrated itself to be remarkably satisfactory in the air and on the ground. Here, in the water, it could win or lose.

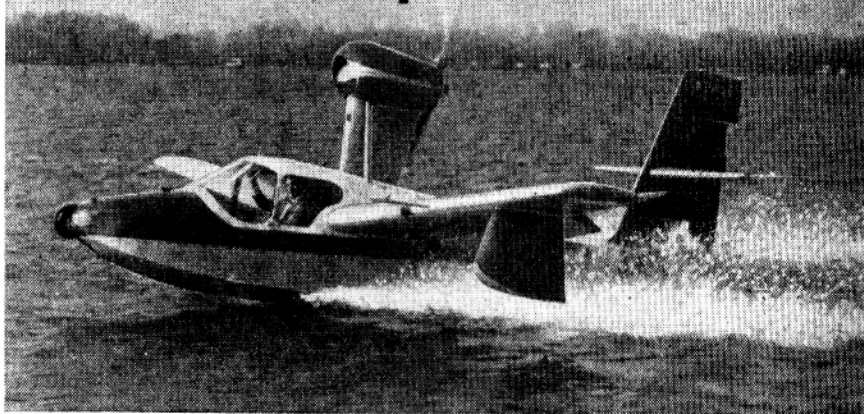
It won. But more about that later.

The Skimmer, first, is the first moderately-priced (\$15,750), single-engine amphibian to reach the public market since the discontinuance of the SeaBee more than five years ago.

Unlike the SeaBee, a cumbersome craft whose stalling and cruising speeds are alarmingly close together, the Skimmer is trim and tractable. It cruises easily above 110 and stalls—gently—just above 50. While a SeaBee, even in top shape (and few remain so today), will scare

Ray Whitman, aviation editor of SCIENCE AND MECHANICS, checking out the Skimmer before taking off for test flights he reports in this article. That's the throttle control Ray has his right hand on. The prop pitch control is just behind it, and the fuel selector control is behind Ray on the rear cabin wall but within reach. A private pilot and newspaperman of more than 20 years' experience, he will continue to present first-hand reports on new planes and developments in aviation in forthcoming issues.

# Flying the World's Newest Amphibian



Nearing takeoff speed, Colonial Skimmer is riding on step, outriggers ride clear to reduce drag; all control is now in normal flying control surfaces.

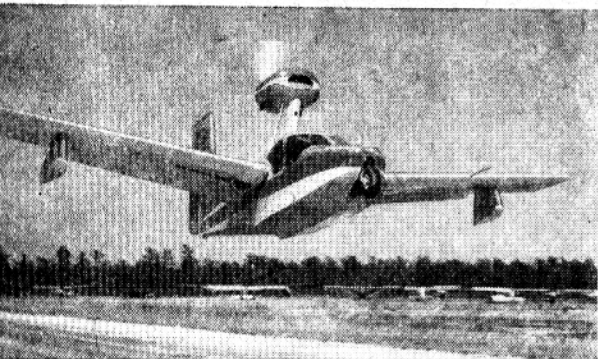
By RAY WHITMAN

Aviation Editor

the trousers off the most experienced pilot the moment a few hundred rpm are taken off the power, the Skimmer on the other hand gives you the sensation after only a few minutes at the controls that you can fly it like a Cub. You can.

And aside from used SeaBees and float planes, at this writing we know of nothing for the sportsman or commuter who wants an amphibious craft until you get close to the \$100,000 class. Of course, there are float planes, but these can be mighty tricky on the water. Riding high above the surface on a small platform, anything above a light breeze makes a downwind turn dangerous if not impossible; you head into the wind and sail backward to go downwind, and

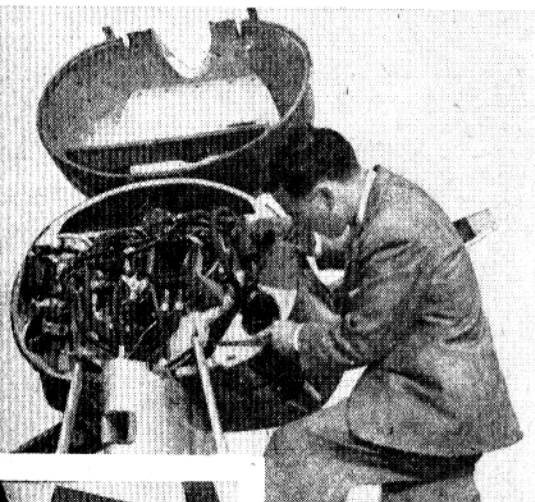




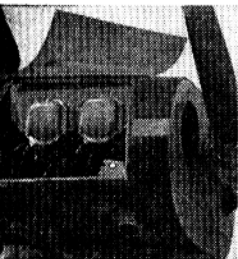
Takeoff is smooth and quick in the Skimmer, though in-flight characteristics have some unique characteristics which pilot Whitman notes in the text.

#### SPECIFICATIONS

Model: Colonial Skimmer, Type Certificate 1A13, Production No. 3  
 Wingspan: 34' Length: 23'6" Over-all Height (on ground): 8'10"  
 Cockpit: Width of cockpit, 41½"; leg room (front of seat back to rudder pedals) 36" to 39" (pedal play varies)  
 Engine: Lycoming O-320 rated at 150 hp @ 2700 rpm, four-cylinder opposed with cross-over manifolds  
 Propeller: Hartzell constant speed, 74" diameter (controllable but not reversible pitch)  
 Weights: Empty: 1,450 lbs. Maximum gross: 2,150 lbs.  
 Useful Load: 700 lbs.  
 Fuel: Maximum 39 gals. (234 lbs.). Average operating, 30 gals. (180 lbs.)  
 Useful load above fuel: 466 to 520 lbs. (3 average people, or 2 average people and up to 200 lbs. of baggage)  
 Standard equipment: Basic pyro flight panel, enameled exterior with anti-corrosion treatment, stall warning, locking doors, ashtray and lighter  
 Optional equipment: Radio, heater, special instruments, landing lights, heated pitot tube  
 Price: \$15,750



Front of nacelle hinges up for complete accessibility of all electric, hydraulic components, usually hard to get at in most aircraft. Inset shows how side panel hinges up for access to plugs, rocker arm caps. Unscrewable lower panels give access to manifolds.



this, certainly, takes a bit of practice.

The Skimmer, then, is virtually without competition in its class. Let's look at it closely.

It's a mid-wing, flying boat type with retractable tricycle gear, incorporating many unusual new design features. It will carry three average people, two at the dual controls side by side on a broad front seat, and one sitting sideways in the luggage area behind, or two average people and 200 lbs. of baggage.

It is powered by a highly trusted engine—the Lycoming O-320, which delivers 150 hp at 2700 rpm for takeoff. It is the same engine which powers the Piper Super Cub, the popular Piper Tri-Pacer (close to the Skimmer in weight and performance) and the light twin Piper Apache; according to Nov. 1, 1956 figures, Piper has used more than 5,300 of these engines.

The engine, driving a Hartzell constant speed propeller in pusher conformation, rides on a pedestal amidships which has been stressed for 20 G's.

Control surfaces are large (flaps occupy 80% of the wing span) and elevators are high on the tall tail, both to keep them properly positioned in the prop blast and to keep them out of the water.

But let's get it off the ground.

The one-piece curved windshield which wraps around almost behind the pilot is split in the middle and opens forward from both sides to form the doors. A single outside step and a leg-over puts you in. (Girls should wear slacks, or, if the conformation is adequate, shorts.)

From a standing position in the cockpit you can reach into forward compartments for the anchor and mooring rope and still control the plane.

With the doors secured and the engine wound up, you immediately notice the lower noise level resulting from engine position. Taxiing, the broad gear gives extreme stability. While the nose wheel is not steerable, the new Goodrich "expanding donut" brakes (controllable from left seat only) are sensitive, will turn you with the inside wheel describing a 3 foot circle without locking it. Parking brakes are adequate for standard run-up procedure.

The wheel is small and right in your hand atop floor pedestals close to the seat; the throttle, carburetor heat and pitch control are overhead; you are comfortable and right at home, and you can see the great wide world from your position above and well ahead of the wing.

Center the trim (elevator trim only), lower the flaps (they're hydraulic, as is the gear, powered by an automatic electric pump plus an emergency hand pump), pour on the coal, apply a gentle back pressure and you're airborne—in our case, in just 15 seconds with about three-fifths of the plane's maximum load. Takeoff is

smooth and quick.

It has only a few tricks of its own. First, the unaccustomed position of the engine brings about two results. Since the point of torque application is so far from the longitudinal center of balance, torque effect is minimized, with the bulk of the plane itself providing leverage against it. Second, and tricky for the beginner until he learns to deal with it, is the fact that from any power setting an increase of power forces the nose down, and a decrease permits it to come up, just the reverse of the normally-expected forces.

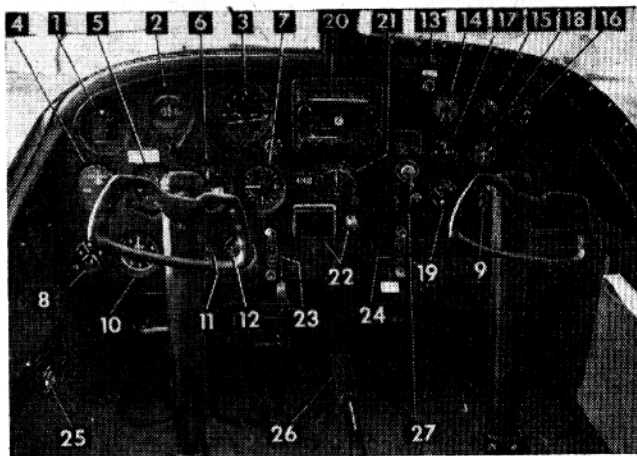
This may mean that the Skimmer is perhaps not the plane for the truly green beginner; on the other hand, any reasonably apt student should get the hang of it with a reasonable check-out.

But climbing out of the pattern, even with the engine fire-walled and turning up well past its red-lined 2,700 rpm, the minimum torque encountered made well-coordinated turns possible on the first try. A climb rate of 700 ft./min. was immediately verified at just under 90 mph. Leveling into a slow climb toward the lakes region, the plane was easy to trim (from a central wheel in the floor), and straight flight required just a light rudder pressure.

The only disturbing factor to a light plane pilot used to leveling by wing attitude is the pronounced dihedral of this wing conformation, which rises from a point just below your shoulders as you fly to, at the tips, a point a bit above your head. The artificial horizon, of course, solves the problem instantly (the Skimmer comes with a primary gyro panel as standard equipment), and you quickly have enough of the feel of the ship not to need it.

High over the northern Illinois lakes we tried a few maneuvers with the Skimmer giving the stable sensation of a much larger craft throughout. With and without flaps and gear, stalls were gentle, straight ahead and with plenty of advance warning though with a minimum of vibration. (The stall warning indicator on the model we flew was set too high, coming in a good 6 to 8 mph ahead of the stall; we thought it was hardly a needed instrument on the plane.)

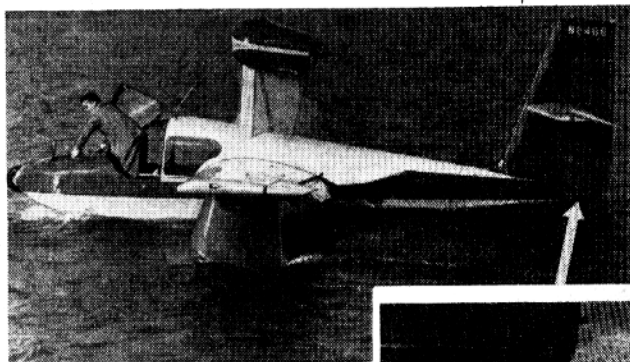
Tight turns, even into lazy 8's, showed no bad handling characteristics, and the constant speed prop kept power adjustments to a mini-



The Skimmer panel groups flight instruments at left, operating (engine) instruments at right and radio in the center. Note in the left group, (1) magnetic compass, (2) gyro compass, (3) artificial horizon, (4) air speed indicator, (5) sensitive altimeter, (6) needle-ball, (7) rate of climb, (8) clock, (9) tachometer, (10) manifold pressure and (11) fuel pressure. At right are (12) cowl ventilator control, (13) instrument vacuum gage, (14) fuel gage, (15) stall warning indicator, (16) hydraulic pressure, (17) ammeter, (18) oil pressure, and (19) temperature. Others are: (20) VHF and LF receiver and VHF transmitter, (21) VOR (VHF Omnidirectional Range), (22) ashtray and cigaret lighter (standard equipment!), (23) gear control and indicators and (24) flap control and indicators. The sea rudder is lowered by lever marked (25), and handle at center (26) is emergency booster pump for hydraulic system; switch group (27) includes (from top down) hydraulic-pump switches; main engine switch; fuel-pump switch and starter. Circuit breakers (exceptional feature for small plane) behind panel (lower right).

mum. The plane (which had earlier been flown "hands off" for some time in level flight) showed itself inherently stable in moderately banked turns, holding them "hands off" after a coordinated entry and returning very slowly to level flight without loss of altitude in either direction.

We tried rudder-only turns too, releasing pressure after the turns were initiated. The plane responded more quickly but without jerk, com-



At rest or low speed in water, Skimmer outriggers ride in water for stability. Pilot can stand to reach anchor and rope compartment while controlling ship with feet. Sea rudder folds out of air rudder as shown in the inset photo at right.

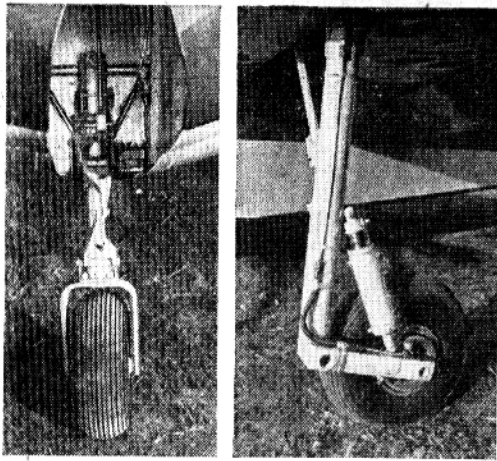


Fig. 7. Free-swiveling nose wheel is controlled by single shaft (center), retracts to form nose bumper in water, as Fig. 6 shows. Fig. 8. Shock strut mounted outboard of landing wheel permits servicing without jacking plane. Retraction accomplished by single rod connection at left.

#### PERFORMANCE TEST DATA

Manufacturer's specified figures are based on U. S. Standard Atmosphere, 59°, 29.97 in. hg. in still air. S&M tests were made as follows: Ground tests: Palwaukee Airport, Wheeling, Ill.; altitude 642'; blacktop runway, direction 115°; temperature 59°; humidity 67%; barometer 30.25; wind, east 10 mph. Water tests: Fox Lake, Ill., altitude 690'; surface slightly choppy; temperature 57°; barometer 30.21; wind, east 13 mph.

S&M test conditions, while fairly approximating U. S. Standard Atmosphere, give slight edge in direction of shorter takeoff run. Plane was flown at gross weight of about 1900 lbs.

|                         | S & M Test  | Manufacturer's Statement |
|-------------------------|---|--------------------------|
| Stalling Speed:         | 52 mph  | 50 mph                   |
| Cruising Speed:         | 112 mph @ 1000-3000 ft.,<br>23" man. pres., 2400 rpm*   | Up to 123 mph            |
| Climb Rate (sea level): | 700 ft./min.  | 700 ft./min.             |
| Takeoff Run             |   |                          |
| Land:                   | 463 ft.** ±   | 690 ft.                  |
| Water:                  | 631 ft.** ±   | 1500 ft.                 |
| Fuel Consumption:       | From 8 gals./hr. at 55% power (18" manifold pressure, 2650 rpm) to 13.8 gals./hr. at 100% power at sea level (29" man. pres., 2650 rpm). At typical cruise settings, between 9 and 10 gals./hr. |                          |

\*Would tend to confirm manufacturer's statement when equalized for optimum cruising altitude.

\*\*Mfr's. statement based on max. gross weight and no-wind condition.

the highest chop of water; you hold it off a moment longer; a quite respectable splash, and you're down, and down to walking speed in just an instant as the water takes hold of the hull.

You drop the sea rudder from its recessed position in the air rudder, with which it turns, and then the surprises start. With its hull and outriggers providing complete stability and the rudder well down in the water, you have about the same control at the same speed as in a good motorboat. We cut circles in the lake despite the wind, now up to about 13, with perfect control, even turning downwind with the engine at idle, a hitherto-unheard-of performance.

With a little power, and with the water-ski bottomed outriggers helping, she rises quickly onto the step and planes smoothly; with full power, the outriggers rise clear and you're out of the water and flying again.

There are a few drawbacks. A reinforced step over the prow for alighting from water and one on the wings for engine servicing should definitely be added.

Near takeoff speed in choppy water, you will take some over the prow. It is then you discover that the windshield molding isn't cut just right, and a little water joins you inside. Don't try a takeoff with the cowl vent open unless you want a bath.

Cold water on the windshield will cause condensation inside. While the ventilator can clear it, adding cabin air exhaust vents would speed up the process.

Elevator pressures are on the light side for positive control "feel."

Even with power at full idle, prop flat and upwind, it taxis too fast in the water for comfortable approach to a pier. With the nose wheel retracting to form a nose bumper, it's probably safe, but we wouldn't want to push over a light pier; we should be able to slow it down a bit more.

Although the rudder pedals are adjustable and with enough throw to compensate for varying leg lengths, the seat is stationary. An adjustable one would give the small pilot a better position for visibility.

The throttle control handle is stiff and ill-formed and rough for comfortable handling. A few weld points could be smoothed up a bit too. But most of these drawbacks will probably smooth out as production gets under way. According to Colonial president David Thurston, elevator pressure is going to be modified and aileron trim is being considered.

The 38-year-old Thurston was in charge of missile design and production for Grumman from 1947 to '53 and later was in charge of primary design for all propeller-driven Grumman aircraft before resigning to form Colonial. He has been called a design genius, and when you view such Skimmer features as main gear shocks mounted outboard for servicing without jacking up the plane and control members applied with piano hinges, you believe it.

ing first into a coordinated mild turn and then leveling, again without loss of altitude.

Finally, we put it in the water at Fox Lake.

With gear and flaps down and the approach speed held to 90, the Skimmer comes down without power at rather a sharp angle for a light plane, and landing to a point is rather easy.

Most Navy-trained pilots might like to add power in the last phase of final approach before flare-out, "painting it on" with the fullest of control. This is especially desirable in open-sea landings, where you are trying to pick out the wave crest you want to put it on. In the Skimmer and on inland water or on land, with its good visibility and sensitive reactions, a power-off landing is almost equally easy.

There's the slightest of bumps as you touch