

Something New on the Wing



Predecessor of the latest model is the Burnelli CBY-3 cargo and transport plane above.

A new adaptation of the famous flying wing aircraft is the "lifting fuselage" type now undergoing initial flight tests.

BY GEORGE DANIELS

PREDECESSOR of a line of super cargo and passenger air liners, the newest of the giant Burnelli lifting-fuselage ships is now being test flown at the airport of the Canadian Car & Foundry. Of modified flying wing design, it is one of the roomiest airplanes of its size ever built, and also one of the safest and fastest for the area and horsepower.

Unlike any previous airliner, the 40-passenger Burnelli can be flown as a two-control ship, or even with both rudder and aileron controls locked. Still more incredible, an earlier model, of the type used by Gen. Charles De Gaulle, has actually been flown repeatedly in England without using rudder, ailerons or elevators; control was maintained solely by

the flap at the trailing edge of the wing-like fuselage, and by the use of engine power for directional effect.

In addition to their hitherto unapproached stability, 80 passenger ships of the new 1946 design, as well as special models of those now coming from the production line, are designed to descend on the water with complete safety and travel for days under their own power as full-fledged sea-going boats. This feat is the more remarkable in consideration of the fact that they are strictly land planes.

Under any circumstances necessitating a landing at sea, passengers of this type of ultra modern sky hotel lose none of the comfort and luxury that they enjoyed in the air. [Continued on page 157]

Recent photo of CBY-3 shows its wing-like fuselage which contributes 70% of lift. Plane has proved so stable that it can be flown by flaps alone. (See drawings on following pages.)



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A specially designed mechanism, which cannot be operated in flight, is used to disengage the wings from the fuselage section once the ship is on the water. Once this is done, even a stormy sea holds no terrors for the occupants of the safety-sealed fuselage with its complete set of navigation instruments and its diesel-driven underwater propeller. In short, a landing at sea is not even an emergency for this newest of passenger aircraft.

Also new, but carefully tested, is the system of gearing four engines to two sets of counter-rotating propellers. Secret of the success of this top efficiency airscrew arrangement is the modern constant speed propeller. One of the two engines in each nose nacelle drives the forward co-axial propeller, the other engine drives the rear one. And, although the paired engines drive propellers that literally turn on the same shaft, the engines need not run at the same speed. If one engine develops its full power at a lower r.p.m., the propeller that it drives increases pitch automatically to maintain a constantly even thrust. This permits all engines to turn out peak performance without split-hair synchronization, even though their counter-rotating propellers are only a matter of inches apart.

Of prime importance in reducing the takeoff run to a mere 280 yards is the airfoil section of the broad fuselage. Product of the same brand of engineering that produced a flying automobile showroom, the lifting-fuselage alone can actually support 70% of the total load of the plane in the air. Thus, the wings themselves merely contribute to the lift.

Landings are likewise shortened by the design. The ship now being tested comes to a full stop within 250 yards of the point at which the wheels first touch the ground.

Like all Burnelli ships since 1937, the new job is absolutely spinproof. Deliberately stalled in steep climbing turns, the 13½-ton ship automatically levels off and assumes a normal flight attitude with or without the pilot at the controls. Even greater stability is afforded the new ships by eliminating ailerons entirely in favor of spoilers. Now the job of the older ailerons can be safely done even at stalling speeds.

Owing to the proportions of the fuselage all facilities can be afforded ample space. A complete kitchen has been designed to provide more than adequate working space in which to prepare entire meals for passengers and crew. Supplies carried on the ship will be sufficient to sustain all aboard for several weeks if the need should arise.

Built primarily for extended over-water travel, the new ship was worked out in response to a demand for a large passenger plane embodying an extra safety factor under emergency conditions at sea. The watertight safety-sealed cabin and detachable wings provided the answer, and eliminated the risk and hardship common to rubber boats like that Rickenbacker used.