The Plane That Takes Off 1,000 Feet Up

Pick-a-Back Ship Makes Good

By WAYNE THOMIS

OVER THE QUIET English countryside near Rochester, Kent, drones one of the strangest monsters of aeronautical history. A confusing conglomeration of wings, pontoons, hull, bodies — it should plummet to earth, but instead it soars and banks as gracefully as a gull. Then suddenly it splits in two—a sort of aerial hatching —and becomes two graceful airplanes.

Observers of this historic incident have seen the first separation in flight of the two components of the Mayo composite aircraft, built for Imperial Airways, the British state-subsidized commercial air line, by Short Bros. of Rochester. The composite has become known popularly as the "pick-a-back" airplane because of its design.

For years it has been known that an airplane in flight will carry with all safety a heavier load than it may be able to carry off the earth. The Mayo composite was designed to take advantage of this fact and produce a small high-speed plane capable of flying across the Atlantic ocean with a 1,000-pound load of mail on relatively small horsepower.

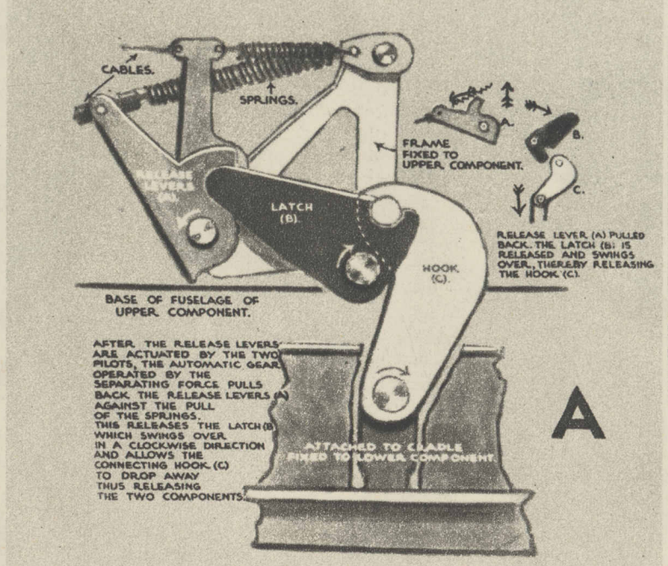
Maj. Robert Mayo, technical expert for Imperial Airways, designed the bottom machine as a large flying boat similar to Imperial's new fleet in general lines. The top machine is the small high-speed, long-range craft, which in this instance is a seaplane with twin floats rather than boat hull.

The two are locked together, the smaller on top of the larger, at a dock. The smaller plane has its gasoline tanks filled with fuel and its mail load aboard. The larger plane carries no load whatever and merely enough fuel for an hour and a half of flying, the idea being that the large, lightly loaded boat can assist the smaller, heavily loaded plane into the air. Once in flight, the smaller ship cuts loose and flies on to its goal.

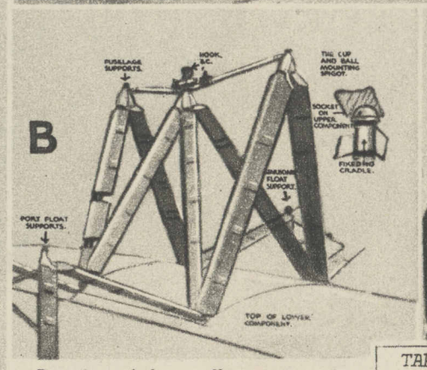
The bottom component has been named Maia, since it is the mother ship. The upper component is the Mercury.

(Associated Press photo.)

At right: The Mayo composite plane a moment before its first successful separation in flight. Letters refer to pictures and drawings below.



Simplified diagram of the hook mechanism, showing how release is effected. In actual practice there are three locks, one for each pilot and one for the automatic pressure recorder.



Drawing of the cradle structure on the larger plane for supporting the smaller ship.

One of the official observers of the test described here (it occurred seven weeks ago) said that the takeoff of the double-decked plane was remarkably quick and the climb rapid. During takeoff and climb both the four-motored planes are controled by the pilot of the Maia, who also controls the throttles of the eight engines.

The composite circled Rochester and the Short factory for half an hour at 1,000 feet, with Lankster Parker, Short Bros.' chief test pilot, at the controls of the Maia, making steep turns which a less maneuverable airplane might have changed into uncontrolable side-slips and eventually a spin.

Then the plane was leveled off at 1,000 feet, headed into the wind at a speed of about 125 miles an hour. Parker fired a Very signal light to indicate that the separation would follow immediately.

"Ten seconds later," says the observer, "and quite suddenly, the Mercury rose smoothly from the back of the Maia straight up, like an elevator. For about fifty feet the Mercury continued to rise. Then it began to gain speed and forge ahead of the bigger and slower Maia."

After landing Parker said he'd been unable to breathe easily until after seeing the Mercury well above him and gradually pulling out in front.

"It felt to me like I'd gotten a good swift kick in the pants," said H. L. Piper, Mercury pilot.

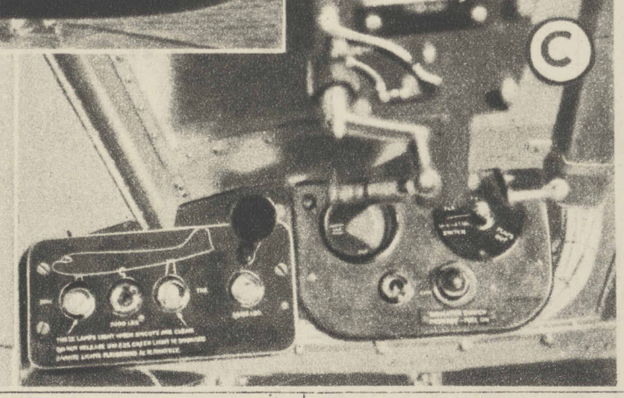
The designers rigged a simple and foolproof gadget for locking the components together and separating them. There are three locks—one for the pilot of the Maia, one for the pilot of the Mercury, and one third lock which automatically opens when the proper forces for separation are present.

The last lock is cunningly devised. The composite is really a biplane, with the short wing of the Mercury directly above the longer, deeper wing of the Maia. When a speed of about 125-130 miles an hour is reached there is a certain pressure built up between the wings by the air flowing between them. When this reaches 5,000 pounds an electrical measuring device records the fact for both pilots.

By telephone the pilots compare notes. Then each in turn releases his lock. If the pressure remains at 5,000 pounds or more the automatic lock is released and the planes fly apart.

The tests made to date are not conclusive, however, for the Mercury has not yet separated from the Maia loaded to the weight which must be carried for an Atlantic flight. At present the Mercury's floats will support only a 12,500-pound load on water. For the Atlantic crossing the Mercury must carry a load, chiefly of gas, which will bring the gross weight up to 20,500 pounds. Once launched, it must continue flying until enough fuel is consumed or dumped to bring the gross weight down to 12,500 pounds.

Below: Closeup of the Maia's safety light panel which indicates when pressure is sufficient for release and when release is complete.



Both the Maia and the Mercury are built entirely of metal. The Mercury has a span of 73 feet, length of 51 feet, and height of 20 feet. The four engines are Napier-Halford Rapiers, 16-cylinder air-cooled in-line, developing 350 horsepower each for takeoff and 255 thereafter for continuous cruising. Alone the Mercury cruises at 180 miles an hour at 10,000 feet.

The Maia has a span of 114 feet, length of 85 feet, and height of 33 feet. The four engines are Bristol Pegasus X 9-cylinder radials, developing 960 horsepower each for takeoff and 850 maximum at 4,000 feet. Flying alone, the Maia has a range of 850 miles and cruises at 165. When flown as a composite the two ships cruise at 167 miles an hour at 7,000 feet, using about 3,000 horsepower of all eight engines. Initial rate of climb is 1,250 feet a minute.

The tests have proved that one airplane can be launched from another, but not that it is better to put long-range, high-speed planes into the air this way than by catapult or by refueling them from a second plane in the air.

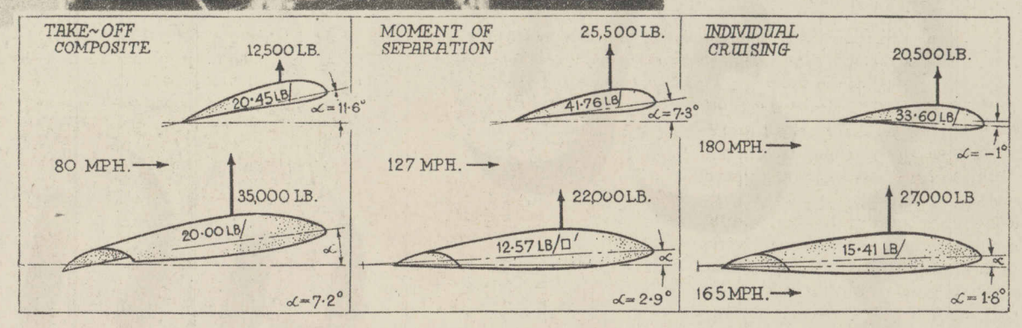


Diagram illustrating the basic idea behind the composite plane. The sketches show how the separating force is derived to lift the Mercury off the Maia. The figures used are not official, but have been worked out for illustrative purposes.

Easter week brides are very stubborn. (You know the old saying, "You can't change the hide of an Easter bride.") This one has come with her mother and girl friend to discuss the wedding music with the church organist. Insists she won't have the "Lohengrin" wedding march, because so many people sing "Here comes the bride, shoe strings untied," etc., etc. And she won't have "Oh, Promise Me," either. The girl friend suggests that "Mad Dogs and Englishmen" might do. A cute tune and march time.

Easter hat. This is the season when many a wife, by threat or cajolery, induces husband dear to put aside the old shapeless lid and buy a brand new pearl gray.

EASTERTIDE

By W. E. Hill

On the ledge of the court window is the Easter plant, one short week after Easter. It didn't like the apartment and quickly wasted away.

The Easter Sunday sightseers (right) out to see the glass of fashion parade on the Avenue. The glass of fashion will probably stay home, but the sightseers won't know that and will have lots of fun.

"Will you kindly move over just the teeniest bit?" asks the Easter Sunday usher. The overflow at the 11 o'clock service must be wedged in somehow. It's an usher's job to make people feel that a little crowding is just a lark.

Easter vacation, showing finishing-school girl wasting a perfectly good morning (which might have been spent looking at evening dresses) at the dentist's.

"This year we decided we'd better tell her the bunnies don't *lay* the Easter eggs, but just *bring* them. We felt she'd have to know some day!"

The stag line. The college boys are home for Easter and are a great help to the local debs. (The boys will tell each other that the champagne tastes like magnesia, and that the debs are a pretty hick lot this year.)