

VINTAGE LITERATURE

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During the decade after World War I, the science of aerodynamics was being expanded and deepened in the research laboratories and workshops of many nations.

Some of the theory developed would be used to refine the shape of the airplane through streamlining. ("Vintage Literature," July 1989.) Much of the research, which would be incorporated in the new wing sections and shapes in the airplanes of the 1930s, was on lift and drag.

Of special importance among the inventions and improvements was the slotted wing. The effect of the slot was discovered independently in Germany by G. V. Lachmann and in England by Handley Page. Lechmann was to join the Handley Page company and the device became known throughout the world as the Handley Page Slot.

The effectiveness of the slots was shown in wind tunnel and flight tests both in Germany and England with the tests showing a 60 percent increase in wing lift at high angles of attack.

Though the results of the invention of the slotted wing aroused immense excitement, it found little use in the 1920s. This was possibly due to the low wing loading of the predominant biplane designs and their slow landing speeds. With the advent of all-metal aircraft and higher wing loading, slots became more useful. An exception was the Royal Air Force which required all new aircraft to have them beginning in 1928.

Thanks to Mr. Clifford C. Jackson of Davison, Michigan, the EAA Aviation Foundation Library recently received some examples of Handley Page company publications on the slotted wing.

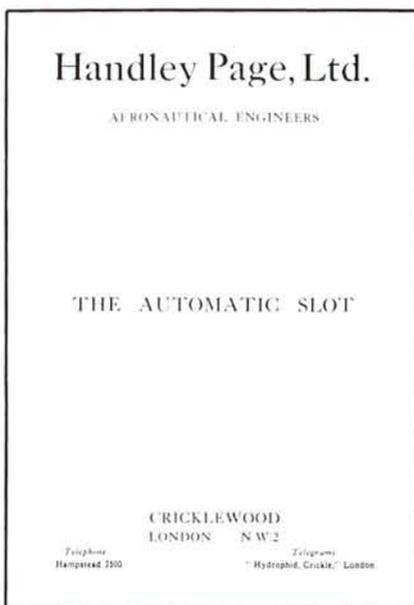
One titled "The Automatic Slot" which appears to have been published in 1930 was a 26-page brochure that gives a general history of the device and how it operates. The brochure carries a very strong message on the slot's

contribution to aviation safety.

The booklet begins with a story called, "The Parable of the Unselfish Husband" which presents as much of a comment on the sensibility of the times as a message on flying safety.

"A certain husband was in the habit of denying himself things in order the better to provide for his beautiful wife's extensive needs and so to retain her affection, he gave up smoking cigars and took to cigarettes; he drank water instead of wine, and he reduced the number of clubs to which he belonged from eight to one, so that a larger part of his income could be devoted to the purchase of clothes, hats, perfumes, and other articles for his wife.

"And when he came to buy an aeroplane, he chose a cheap one, and, being told that the fitting of auto-slots would cost [extra], he refused to have slots fitted. And in due course his aeroplane stalled and spun into the ground, and he was killed."



The Handley-Page "Gugnunc" slotted and flapped biplane was an entry in the 1929 Guggenheim Safe Aircraft Competition.

According to the Handley Page company, the lesson of the story as stated in the parable was:

"The fate of this unselfish and devoted husband should be a warning to all who do not place a sufficient value on their own safety. The experiences of life may be unpleasant, but inasmuch as those of death may be even more unpleasant, it is advisable to fit slots and be secure."

As you can tell — a rather strong message. The rest of the brochure is more technical in nature covering air accidents, the wing slot and controllability and a technical description of the slot in action:

Facts About Slots

"The Handley Page automatic slot is now so widely used that the time is ripe for a recapitulation of some of the chief facts about it. Its history is unique in aeronautics. It has progressed and overcome ignorance and prejudice at an astonishing rate, as will be seen if the course of events is examined."

"First installed as a means of increasing the speed range of an aeroplane by decreasing its landing speed, it was developed to provide at these lower speeds a method of lateral control and stability, then and now so woefully lacking in aircraft with ordinary wings."

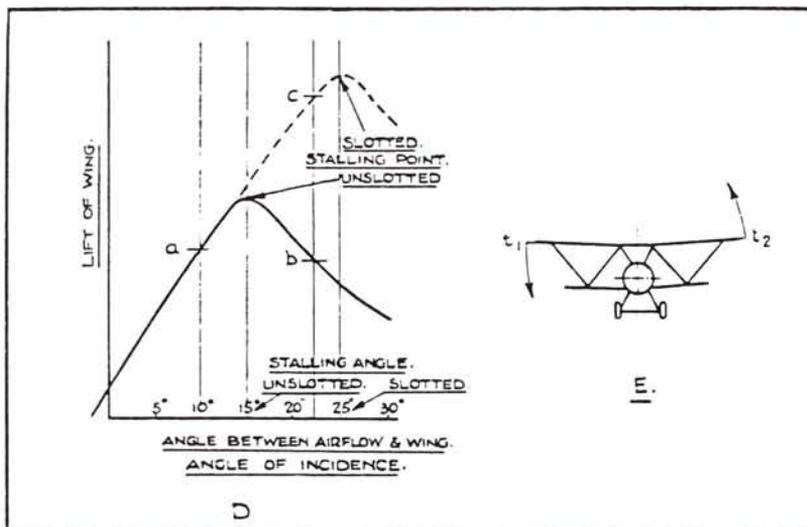
It went on to report that tests of the slots by British government were so successful in the laboratory and on a Bristol fighter that all Bristol fighters in use with the RAF were ordered to have auto-slots.

"A similar rapid development took place in civil aviation. It began when a famous make of light aeroplane was fitted with auto-slots and tested. The results were so conclusive that private aeroplane owners began immediately to stipulate that their machines must

be fitted with auto-slots. Now almost every private aeroplane owner in Great Britain and the Dominions insists on the inclusion of auto-slots in his machine."

The British Government and slots

Another section of the report dealt with the fact that after testing, the British Government bought the rights to the slots for 100,000 Pounds.



"The agreement constitutes a public proclamation first that the best technical brains in Great Britain affirm that slots do what they are claimed to do, and second, that the validity of the patent is unshakable."

In 1928 the Government began to fit some Service aircraft with slots. Every Bristol fighter in the Service was slotted, and steps were then

taken to equip D.H.9s.

It was then decided to fit slots to all Service aircraft.

"In order to check as quickly as possible the wastage of lives and material that was going on owing to the frequency of the stall-and-spin type of air accident, the Air Ministry was prepared to interfere with the works programmes of the various aircraft manufacturers to the extent of insisting that all Royal Air Force machines were to be slotted before being put in service."

"The effects of these decisions are already noticeable. Up to the time of writing no single fatal stall-and-spin accident has happened to a British Service aircraft fitted with slots."

It was noted that prior to the slot installations the RAF was experiencing 20 to 30 fatal stall-and-spin accidents per year.

Safer Civil Flying

After discussing the causes of fatal civil accidents in private or club aircraft (as in the U. S., stall-spins accounted for the largest number), the section concludes:

"The auto-slot is not a 'Gadget.' It is not, that to say, an unessential accessory. It is part of the machine itself, and it improves the machine by increasing the pilot's control over it. Auto-slots not only increase the aeroplane's safety, but also during certain manoeuvres, improve the performance of the machine." ●