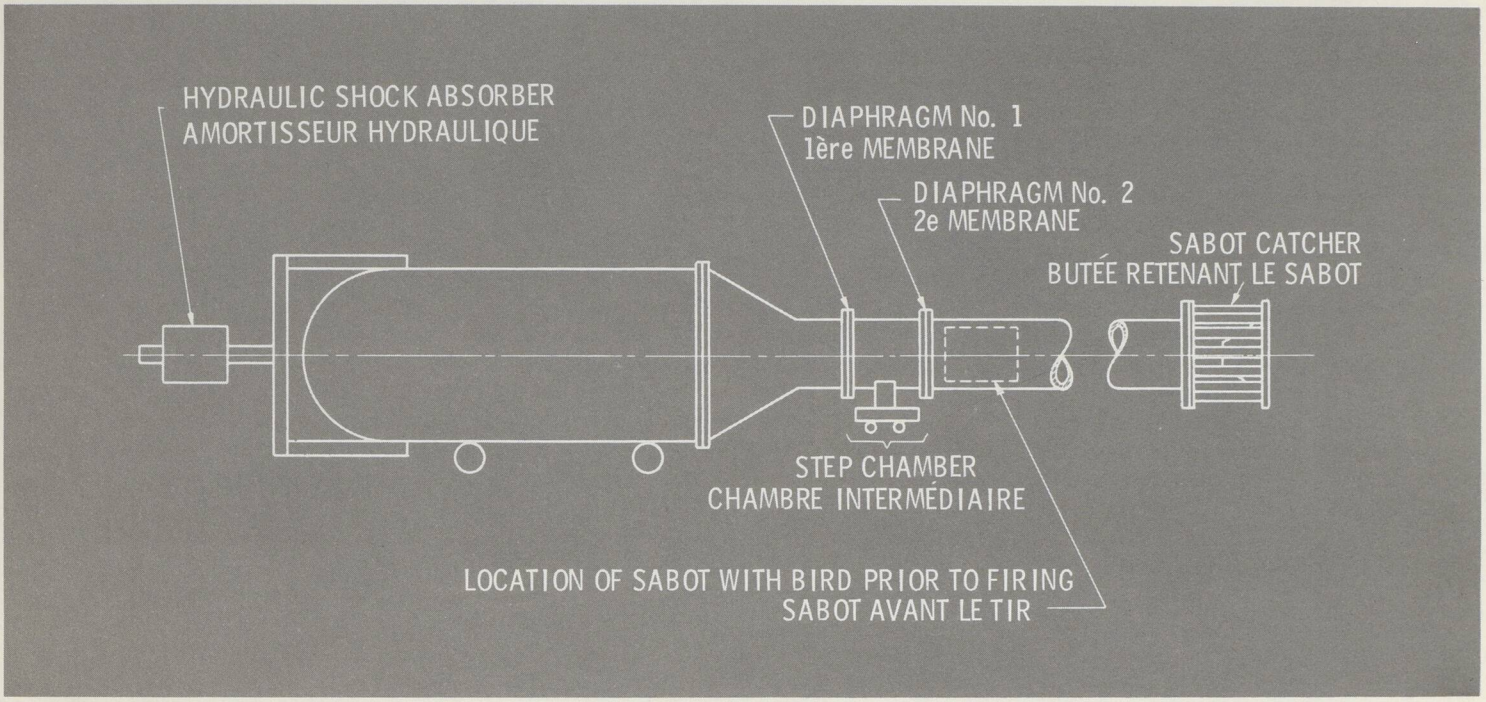

A Canadian Pacific Boeing 737 aircraft, carrying a full passenger load, was coming in for a night landing at Winnipeg's International Airport in April, 1969. Travelling at 335 miles an hour at an altitude of 3,000 feet it ran into a flock of northward-migrating geese.

Seven of the 10- to 12-pound geese struck the aircraft. The fuselage was penetrated near the pilot's windshield. Both engine cowlings took bird strikes and there was impact damage on the fuselage and on the starboard wing slots.

This bird-plane encounter had a happy ending in that no vulnerable parts were damaged and the pilot was able to bring his aircraft down safely. However, there are incidents where bird strikes have triggered air disasters.

The 1969 World Conference on Bird Hazards to Aircraft received reports indicating that, while a significant decrease in bird incidents involving aircraft in the vicinity of airports had been achieved through bird clearing programs, the incidence of enroute bird strikes showed signs of being on the increase. The Conference was held in Kingston, Ont., and was sponsored by the National Research Council of Canada.

Aviation experts are of the opinion that the only measures offering any real assurance of reducing this type of danger is to "birdproof" aircraft. Birdproofing consists of increasing the strength and energy absorbing capabilities of vulnerable parts of the aircraft that are likely to be subjected to bird impacts. Areas considered vulnerable are the windshields, the leading edges of tail assembly (empennage) sections and openings where ingestion into the engine can occur. Wing structures are generally considered to have sufficient depth to sustain a bird strike without suffering serious damage.

In an effort to find ways to reduce this hazard to aircraft, the National Research Council of Canada is currently engaged in a birdproofing research program. The main piece of equipment being used in this research is a pneumatic cannon that fires chicken carcasses and simulated birds at speeds up to 620 miles an hour.

The cannon forms the core of a flight impact simulator designed and operated by the Structures and Materials Laboratory of NRC's National Aeronautical Establishment. It has been used for birdproofing studies on tail assembly sections and windshields, employing real and simulated bird carcasses in the four- and eight-pound weight sizes.

The simulator is about 70 feet long, consisting of a 60 cubic-foot reservoir, a transition section, and a pressure step chamber that also functions as the breech. It has a 40-foot barrel with a 10-inch diameter. Attached to the muzzle end is a "sabot catcher."

The firing reservoir and step chamber are pressurized in the ratio of 2:1 to the required charge pressure. Diaphrams of polyester film are ruptured successively when pressure is bled off from the step chamber. The sabot carries the bird down the barrel and is arrested by the catcher at the muzzle, allowing the bird to travel to the target.

International airworthiness codes have established a four-pound bird as a standard weight for impact tests on windshields. Recently the United States Federal Aviation Administration adopted the eight-pound bird as standard weight for empennage impact tests. The sabot allows bird sizes over this range to be used.

Real birds used in the tests are electrocuted, packed in a cotton bag and stored in a deep freeze unit until required for use. The birds are withdrawn 24 hours before use to allow them to reach room temperature. The synthetic birds are made from a stable

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