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Pake News

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It is impossible to give more than one or two highlights of a somewhat spectacular character of what has, nevertheless, been a painstaking investigation. Behind all the work you will see there have been hours of routine work in the laboratories and workshops, in the statistical, computing, metallurgical, chemical, mechanical and photographic sections none of it very dramatic but all of it an essential part of such investigations.

When this investigation was started, little of the wreckage of the aircraft which met disaster near Elba had been recovered, and it was not known how much of the wreckage would prove to be recoverable. A series of technical investigations of the properties of the aircraft were therefore initiated and proceeded simultaneously with the examination of the wreckage as it was received.

While the wreckage examination was proceeding, a series of investigations in the laboratories and the air proceeded simultaneously.

Most of you will have seen the film "No Highway" and will appreciate that much attention has been given recently to the fatigue life of Civil Aircraft. At this Establishment we have conducted routine fatigue tests of new Civil Aircraft as a routine measure, whenever a specimen became available, and the original Comet prototype was brought here for such testing. For the Comet Investigations we devised a much more sophisticated rig which simulated the effect of gust loads on the wings and pressure loads in the fuselage at the same time.

The water tank is 112 feet long, 20 feet wide and 16 feet high. It holds 200,000 gallons and it has a small reservoir specially built nearby from which it is filled.

The fuselage of Comet G-ALYU was placed in it with seals at the point where the wings projected on either side. The internal pressure was raised to place the same strain on the fuselage as is experienced in normal cruising flight.

Automatically controlled jacks under the wings at the same time placed an artificial load on the wings and caused a series of "bumps". A total of about 5,000 "flights" were made, each taking 5 minutes and being equivalent to a real 3 hour flight.

It was this fuselage which broke near the windows because of metal fatigue.

The stresses on various parts of the Comet were measured in flight tests in G-ALAV which has been subjected to perhaps the most thorough flight testing ever given to a Civil Aircraft. Thorough that is in the range of tests conducted. As you all know, Civil Aircraft are subjected to prolonged proving trials. We were looking for things outside the normal range of such tests.

Rarely if ever can there have been such a heavily instrumented aircraft. Examples of the items covered are :-

- (1) High frequency vibrations to the engine efflux
- (2) Low frequency vibrations which might be caused by buffeting, mechanical excitation or flutter
- (3) Loads and stresses occurring in the airframe due to turbulence, buffeting or landing - to check our design assumptions for our fatigue tests
- (4) Loads and stresses in steady flight - again to check our design assumptions
- (5) Temperatures of the structure
- (6) Aircraft and pilot's response in manoeuvres and turbulent air
- (7) Fuel leakage

and many more, some of which were added to the programme as time went by to

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check the work going on, on the ground. So far we have done 70 flights in this aircraft.

Other aspects of the investigation covered the possibility of loss of control due to either the aerodynamic characteristics of the aircraft or to malfunctioning of the automatic pilot and power control system.