



Roots of the Future – Materials, techniques and the preservation of France's aeronautical heritage.

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Abstract : The aircraft of the period 1910 to 1940 present particular problems in the modern aeronautical context. This aeronautical world has become very distant from the computer aided design and composites of today. It was dominated by aircraft made of wood : ash, poplar, and above all spruce and saw the increasingly sophisticated use of plywood. From the late 1920s, structures made of wood were giving ground rapidly to aluminium and magnesium alloys. The simple wire braced framed structures with the doped linen and cotton coverings of the pioneers were replaced by structures of increasing sophistication. Asbestos was still used for fire walls; primitive plastics were introduced through the 1930s, beginning with Bakelite and red fibre. Natural rubbers were replaced by sythetics for tyres, flexible pipes, pump diaphragms and joints. The evolution of the use of these materials was reflected by the availability and evolution of craft skills, production techniques and of workshop equipment and organisation and was paralleled by similar evolutions of instrument, undercarriage and flight control systems.

Many of these materials and the craft skills that they require are becoming increasingly difficult to obtain. Material standards, metal sections, quality standards, tyre sizes and fuel formulations have all changed. A simple off the shelf item of 1930 can be a project in itself today, with a budget to match. The designs of these aircraft were prepared by hand and the drawings so created often left much to the interpretation of skilled shop floor personnel. These ancient aircraft were often extremely ingenious and their reconstruction requires much patient research before practical work can be safely and accurately undertaken. This is not a world of quick results. A typical restoration can cost thousands of hours of preparation, and then thousands of hours more in the workshop before flight is possible. The difficulties don't stop there : the pilotage skills of former times are essential and modern aerodromes create problems for aircraft that were designed to be flown into wind. But the effort is worthwhile : the skills heritage is preserved and the public can see and hear the reality of their aviation past.

Biosketch : Aviation history enthusiast since boyhood, Frédéric Collinot is a graduate of the Air France maintenance training school at Villegénis and trained as a qualified Flight Instructor at the Ecole Nationale de l'Aviation Civile. In 2007 he founded the Cercle des Machines Volantes, an association devoted to the preservation of France's aeronautical heritage for the period before 1940. The association, now based in its own premises on the grass airfield at Margny-lès-Compiègne, focuses on the accurate restoration or reproduction of period aircraft as closely as possible to their original as new condition.