CIAM FLYER

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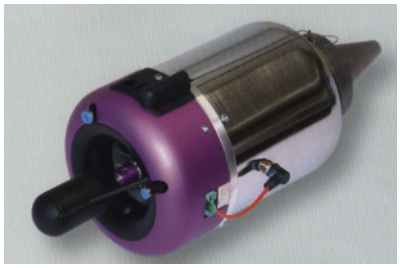
Model Jet Flight

Model Gas Turbines Have Introduced a New Dimension

The dream of building and flying a real model jet plane has been around as long as gas turbine propelled aviation itself – since approximately 1940. Aeromodellers have used all kinds of makeshift propulsion systems to try and make the flying behaviour of their designs as realistically close to that of jet planes as possible. But a breakthrough has only been possible with the real miniature gas turbine.

It Started with the Propeller
Initially, aeromodellers had to make do with ordinary propellers. A more realistic flying behaviour was later achieved by mounting both engine and propeller inside a cylindrical pipe. Early on, this solution was given the name "ducted fan". Cylinders with integrated propellers were fully installed in suitable fuselages, thus enabling model jet aeroplanes to copy the full-size originals much better. This improved appearance, however, was to the detriment of performance as the efficiency of these propulsion systems was poor. Today, ducted fans are continuously being improved and in the course of the tremendous development of electric drives have been increasingly important in the construction of model jet aeroplanes over the past nearly ten years. This will be discussed in more detail in a future CIAM Flyer.



Gas Turbines for Model Aeroplanes
It is reported that Englishman Gerry Jackman successfully flew a model plane with a gas turbine as early as 1983. Two years later, Michel Serrier designed a model turbojet using a turbo impeller which was continuously improved by French company JPX and in 1991 found its way into specialist shops as the world's first series-produced model jet engine. At roughly the same time, Dipl.-Ing. Kurt Schreckling published instructions for a simple self-build of a model turbine called "Feuerdose" (Firebox). With this publication, Kurt Schreckling provided many model aviators with ideas for building their own turbines. The following years saw a rapid development of model gas turbines. Today, these new engines are produced around the world in all sizes and performance categories. Kits for experienced model builders are also available. There is no clear distinction between engines for military or civil drones and for model aeroplanes.

Mostly Electronically Controlled

While managing the start-up phase of model turbojets initially required a fair amount of user experience and skill, the entire start-up procedure as well as power delivery are now fully electronically controlled. Model pilots only have to operate a switch on their radio control unit and an integrated electric motor starts up the turbine, which then fires and finally reaches its normal operating state. Power is also precisely controlled via the radio control unit. Key characteristics such as speed and operating temperature can be read out before and after flying.

Model Jet Flight is Becoming Increasingly Popular

Due to modern, flawlessly working model gas turbines, flying model jets is experiencing a real boom. The very powerful engines and resulting high loads on aircraft have caused wood construction in this category to be mostly replaced by fibre reinforced composite technology. Most model jets are fully constructed from GFRP/CFRP and are commercially available in various stages of fabrication or are designed and built over thousands of hours by very experienced modellers. Installation of turbine, undercarriage and electronics, etc. involves a huge amount of work, even when industrially prefabricated model kits are bought and requires high degrees of experience and craftsmanship. Models are becoming increasingly perfect and seeing them in action on airfields and at flying meets is highly attractive. Visiting these events is well worth it.

Competition Flying

Cracks have the opportunity to compete against each other with their machines. At national and international Championships, aeroplanes are judged based on scale accuracy, compliance with the appearance of the original and realistic flying demonstrations. Competitors have to present the jury with extensive documentation about the original planes. The the FAI World Championships in Category F4C: Flying Scale Model Aircraft (http://www.fai.org/aeromodelling/documents/sc4) are well-known events. Only self-built models compete in these World Championships. Their weight is limited to 15 kg.