

**ANNEX A.2f**  
**FEDERATION AERONAUTIQUE INTERNATIONALE**

**NOMINATION FORM**

**THE ANTONOV DIPLOMA**

(for technical innovation(s))

From NAC: Germany \_\_\_\_\_

Date: November 7<sup>th</sup>, 2012 \_\_\_\_\_

Address: Deutscher Aero Club e.V. \_\_\_\_\_

Country: Germany \_\_\_\_\_

Hermann-Blenk-Straße 38 \_\_\_\_\_

38108 Braunschweig \_\_\_\_\_

(Only one person from a country may  
be nominated annually by that  
candidate's National Airport Control.)

Name of Nominee: Michael RAMEL \_\_\_\_\_

Address: Lilienstraße 44 \_\_\_\_\_

D - 81669 München \_\_\_\_\_

Deutschland \_\_\_\_\_

**DESCRIPTION OF TECHNICAL INNOVATION(S) - Please Print**

**Contra Rotation Drive for F3A**

In 1999, Michael Ramel developed the first F3A RC Aerobatic Model Aircraft driven by an electric motor. To comply with the maximum weight of 5 kg, he not only had to get the right motors and batteries – he had to design new, lighter models as well. The kits he made for his "E-Factor" have been sold all over the world, mainly to the USA. In the meantime, many F3A pilots fly an electric drive.

In order to take full advantage of that drive, in 2006 Michael Ramel designed a contra drive in combination with the electric motor. A planet gear box spins two propellers, both turning contra each other rotating in the opposite direction. That "Contra Drive" cancels all asymmetric blade effects, any effect of torque and subsequently any trim changes as airspeed changes. F3A pilots' workload is greatly reduced, and even downline braking is improved because of motor-generator effect and the propeller surface area doubled. Main problem are the propellers, as they mustn't have the same pitch.

During the 2011 F3A World Championships, the new drive has been used already by a few pilots. One of them was the German Robin Trumpp. 17 year old Robin Trumpp was second at the 2011 German F3A Championship and made the German Team in the year before. At the World Championship he became 16<sup>th</sup> among 81 seniors, proving the quality of Michael Ramels new Contra Drive.

NAC Signature \_\_\_\_\_



President DAcC

President or Secretary General of nominating FAI National Airport Control

(must be submitted to the FAI Office by November 15)

