September 27, 1989
From: Jukka Tervamäki, Helsinki, Finland

Mr. Jack Cox
Editor-in-Chief
EAA AVIATION CENTER
Oshkosh, Wisconsin 54903-3086
USA

Dear Mr. Cox:
I am writing this personal letter to you in the hope that EAA could do something on the matter I feel is important for the safety of experimental Gyro-copter pilots everywhere in the world. I do not mean that you should publish this letter as it is but to make an investigation on the matter with a possible help of some EAA members at FAA and/or helicopter industry. The details of my proposals will follow later.
The reason I am writing to you now is that recently an Norwegian-American pilot was killed in Finland when flying a Ken Brock KB-3 gyro-copter. What happened was so called "porpoising flight" resulting in a negative-g condition with blades hitting the tail and propeller. A report of this accident is enclosed with some xerocopies of photos of the crashed aircraft.
A similar accident happened in Finland about 20 years ago with a Bensen B-8M gyro-copter. You propably know that a lot of these accidents have happened during the past 30 years in US and elswhere, the peak periods were propably the sixties and seventies. And those accidents continue to happen to day unless something is done for it.

The matter is very sensitive because of the strong opinion Bensen and Brock have on the experimental gyro-copter (or autogyro) design in USA. Therefore, I dont expect any changes in the attitudes unless an independent study is made on the subject. I tried to inform the gyro-copter community already 18 years ago with no results. I feel like the air space engineer who tried to stop the Challenger take off before the illfated accident. Then there are thoseAmerican product liability laws which make the case even more sensitive.And the purpose is not to hurt anyone.
Personally I have no economic interests on the matter. I am not advertising or selling autogyro kits. I designed, built and flew autogyros a lot from 1960 to 1974 but since then I have flown my JT-6 motorglider (now 1050 hrs total time). However, I still do some training of the new autogyro pilots who have built a JT-5 machine.
In both cases of a fatal gyro-copter accidents (one Bensen and one Brock machine) in Finland the Finnish board of civil aviation has asked me for the investigation committee. To see the wreckages and the sad stories certainly is depressing.

In short, my message is that the most popular American gyrocopter types (Bensen, Ken Brock and the like) are dangerous for normal fixed wing pilots especially without carefull training. However, I belive they could be improved to be more forgiving by installing a horizontal stabilizer on them. You can read my detail opinions on the report and letter to FAA and their answer. The FAA has no requirements on the stability of experimental aircraft (rotorcraft included) and seems not to be worried of the gyro-copter safety.

What we could do is as follows step by step:

Step 1. Collect gyro-copter accident data from the past 30 years. Perhaps there are some EAA members among the FAA people or other willing members in Washington D.C. to dig out the statistics to get answers to following questions:

- How many gyro-copter accidents in total so far and per year?
- How many fatal accidents due to "porpoising"?
- What was the pilots flying experience at the time of porpoising accident?
- How much gyrocopter time was accumulated before a fatal porpoising accident?
- etc. Perhaps a computer could help to sort out the answers we need?

Step 2: Professional computer analysis of the gyrocopter stability with and without a horizontal stabilizer. There must be a good computer program for rotorcraft stability somewhere in the US, either in helicopter industry, technical institute or at NASA. Bell helicopters are made with teetering two blade rotors basically similar as in most gyro-copters. If you only could find a helpfull EAA member somewhere to input gyro-copter data (rotor and fuselage mass and aerodynamic data in autorotation plus propeller thrust) into such a program and run a comparative analysis of longitudinal stability and control sensitivity with and without a horizontal stabilizer at

different speeds.
However, stability derivatives do not tell very much to the normal gyro-copter pilot. It would help a lot to see the results presented by a simulation program in a graphical form or, even better, using computer/video animation if possible.

Step 3: If you after this have enough data you could publish all the accident statistics and stability analysis in a complete story in Sport Aviation (using possibly the drawings and photos of my letter to you. I am willing to send the original photos , which are included here as xerocopies, if you need them).

Step 4. If, after these 3 steps, still considered necessary and economically possible, conduct flight testing with and without a horizontal stabilizer:

- in a full scale wind tunnel, or
- with a radio controlled full scale gyro-copter with recovery parachute and measuring instrumentation, or
- by a brave pilot at 10000 ft with a personal parachute and recovery parachute for the aircraft plus measuring instrumentation. What I have seen, the rotor never hits the pilot in the air when its disintegrates after hitting the tail and propeller.

So, these were my proposals. If you feel this far too much for the problem in question, remember the Henry Migne´s Flying Flea story (which has been published also in Sport Aviation):

-A splendid idea, a lot of enthusiasm, Migne wrote a book for construction and a lot Fleas were built.
- Then followed a lot of accidents due to an unrecoverable flying condition.
- A French FAA testing in a full scale wind tunnel followed and Fleas weak point was found.
- Result: The Flea was prohibited.
- To day modernized Fleas again fly with the shortcomings being eliminated during the sixties and seventies.

I think we could improve the gyro-copter, which has got a bad reputation in many countries for a good reason. This does not mean that Bensen (or Brock) should be blamed. Bensen is the father of one of the most common experimental machines of to day. But we should improve safety of his design if possible.

I am looking forward to your comments on these proposals.

Sincerely:

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