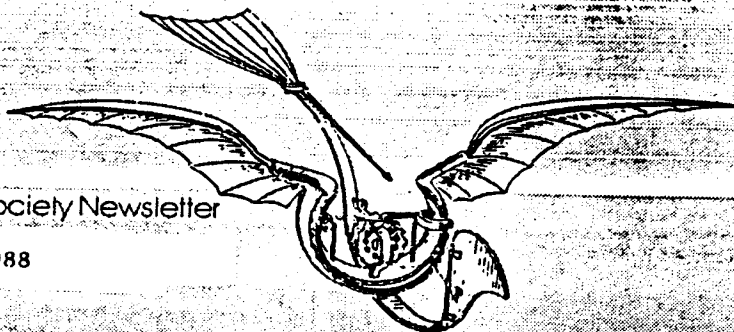


Ornithopter Modeler Society Newsletter

Winter 1988



flapper
facts

PREDICTIONS FOR 1989

GET READY FOR AN EXCITING NEW YEAR TO COME FLYING INTO YOUR LIVES! NEW RECORDS WILL BE SET IN ALL CATEGORIES! AT LEAST THAT IS OUR FORECAST. WE MAY SEEM OVERLY OPTIMISTIC, BUT SEVERAL BUILDERS ARE TRYING NEW METHODS THAT SOUND EXCITING AND WE EXPECT RESULTS. THE TIME TO BUILD YOUR PLANES IS NOW. BEFORE YOU KNOW IT, THE FIRST WEEK OF JUNE WILL BE HERE, AND WITH IT THE CONTEST AT JOHNSON CITY, TENNESSEE. THERE IS ONE THING I CAN PROMISE YOU, WE WILL HAVE A LOT OF FUN TRYING TO SET NEW RECORDS. IT WILL BE GREAT TO SEE MODEL AIRPLANE FLIERS FROM ALL OVER THE COUNTRY AND SHARE IDEAS. DON'T FORGET THE OUTDOOR CONTEST TO BE HELD THE WEEK OF JUNE 18 AT LAWRENCEVILLE, INDIANA. TONY ITALIANO HAS ASKED US TO HOST THE ORNITHOPTER EVENT. I WILL ARRANGE FOR THE TROPHIES, BUT BECAUSE OF PRIOR COMMITMENTS, I WILL BE UNABLE TO ATTEND. PLEASE HELP BY VOLUNTEERING TO FOR THIS HONOR. CALL OR WRITE AS SOON AS POSSIBLE, SO THAT WE CAN MAKE THIS EVENT SUCCESSFUL.

NATE CHRONISTER HAS BEEN DOING SOME RESEARCH LATELY. AND HE FINALLY HAS A LOT OF INFORMATION GATHERED TOGETHER ON NATURAL FLIGHT. BY TAPING WILDLIFE SHOWS WITH HIS VCR AND PLAYING BACK IN SLO-MOTION; BY CATCHING, WEIGHING AND MEASURING WILD BIRDS; AND BY GOING TO THE LIBRARY. DESPITE WHAT THEY ALWAYS SAY, THIS HASN'T TAKEN AWAY ANY OF HIS FASCINATION WITH THE SUBJECT. HE HAS FOUND OUT QUITE A LOT ABOUT THE FLIGHT OF BIRDS AND HE PLANS TO APPLY THIS TO ORNITHOPTER DESIGN SOON.

HE WRITES, "MY FIRST PROJECT WILL BE TO DUPLICATE A REAL SPARROW AS CLOSELY AS IS POSSIBLE WITH RUBBER-POWER. THAT INCLUDES A MULTI-JOINTED WING, WHICH SHOULD GREATLY IMPROVE PERFORMANCE. AFTER THAT, I HOPE TO USE MY ACQUIRED INFORMATION ON NATURAL FLIGHT TO CHOOSE A TYPE OF BIRD THAT COULD BE DUPLICATED UNDER ELECTRIC POWER. THE END RESULT, WHICH I HOPE TO ACHIEVE WITHIN THIS CENTURY, IS AN ELECTRIC R/C ORNITHOPTER, WITH WINGS MADE OF ARTIFICIAL FEATHERS, SO THEY CAN FOLD COMPLETELY IN."

"AS AN INDOOR FLYER, YOU PROBABLY DON'T LIKE THESE IDEAS IN PARTICULAR, BUT SUCH DEVELOPMENTS WILL CERTAINLY BROADEN THE SCOPE OF ORNITHOPTER MODELING. KEEP IN MIND THAT MUCH LARGER ORNITHOPTERS HAVE FLOWN SUCCESSFULLY IN THE PAST. AS EARLY AS THE 1930'S, A 50 POUND CO-2 POWERED ORNITHOPTER WAS FLOWN IN ITALY, AND EVEN LARGER ONES HAVE FLOWN SINCE THEN. I'M GOING TO TRY FOR NOTHING MORE THAN AN 8-POUND BALD EAGLE, IF I CAN FIND A POWERFUL ENOUGH MOTOR THAT WEIGHS ONLY 2 POUNDS."

HE HAS ENCLOSED ROUGH PLANS FOR A NICE ORNITHOPTER THAT HE DOESN'T HAVE TIME TO BUILD. PERHAPS SOME OF YOU MAY WANT TO TRY IT. IT'S NOT ONE OF THESE "HEAVY MODELS", JUST A HUGE (BUT LIGHT) CAT. IV INDOOR ORNITHOPTER POWERED BY A SMALL ELECTRIC MOTOR. ITS FLAPPING MECHANISM, WHICH HE URGES YOU TO TRY IN YOUR NEXT RUBBER-POWERED DESIGN, IS REALLY GREAT. HE SUSPECTS THAT THIS MODEL, WITH THE RIGHT BATTERY (LITHIUM 9-VOLT), COULD POSSIBLY FLY A WHOLE HOUR OR LONGER.

NEXT, WE HEAR FROM DAN GARFINKEL. HE WRITES:
"ENCLOSED IS A PICTURE OF MY FIRST GAS POWERED FLAPPER. IT HAS NOT YET BEEN FLOWN. I'VE GOT THE WINGS FLAPPING, BUT NOT FAST ENOUGH YET. I'M STILL WORKING ON IT, AND A VERY SIMILAR LIGHTER VERSION. THE BIG PROBLEM IS IN THE POWER TRANSMISSION. I NEED THE MACHINE SHOP THAT I DO NOT HAVE. AT FIRST, I USED RUBBER WHEELS FOR THE SPEED REDUCTION, BUT AS THE FLAPPING RATE GOT BETTER (CLOSE TO FLYING) THE WHEELS BECAME A PROBLEM TO KEEP FROM SLIPPING. I AM SOON GOING TO TRY A COMBINATION OF GEARS AND WHEELS. I'LL LET YOU KNOW WHAT HAPPENS"

"IT'S 37" WINGSPAN, 6" CHORD, 33" LONG, STABILIZER 20" X 5 1/2" TAPERING TO 3 L/4" AT THE TIPS, RUDDER 3" HIGH AND 5 1/2" WIDE, THE FUSELAGE IS ABOUT 17" LONG WITH A PIVOTING BOOM ABOUT 17" LONG. TRIKE GEARS, PIVOTING ENGINE MOUNT, 1/2" A COX ENGINE. BALSA & PLYWOOD CONSTRUCTION SILKSPAN COVERED, THE STAB IS FOAM WITH SKYSAIL COVERING, RUDDER THE SAME, THE WINGS ARE MYLAR, WITH DOWEL LEADING EDGES AND BALSA RIBS AND BRACES. THE CONNECTING RODS ARE DOWELS WITH METAL TUBING ENDS TOP AND BOTTOM. THE ENGINE PIVOTS FOR STARTING AND IS SPRING LOADED TO ACT AS A CLUTCH. THE BEST FLAPPING RATE TO DATE HAS HAD IT ROLLING ALONG AT A FAIR RATE."

"I WOULD LOVE TO HEAR FROM ANYONE WHO HAS OR IS EXPERIMENTING WITH GAS POWERED FLAPPERS. I ALSO HAVE A 23" RUBBER FLAPPER THAT HAS FLOWN FAIRLY WELL OUTDOORS, 23" SPAN, 4" CHORD, 21" LONG, 9" LONG 4 STRAND MOTOR, STAB 10 1/2 X 2 1/2 NO RUDDER, BALSA W/LENS TISSUE WINGS, FOAM OUTLINE STAB W/TISSUE, THEN FLAT ALUM CORRECTING RODS."

"I'LL SEND PLANS & PHOTOS AS SOON AS I CAN. PROBABLY AFTER I GET THE GAS POWERED ONE TO FLY, I WILL TRY AN R/C VERSION. (I'LL KEEP HOPING ANYWAY)".

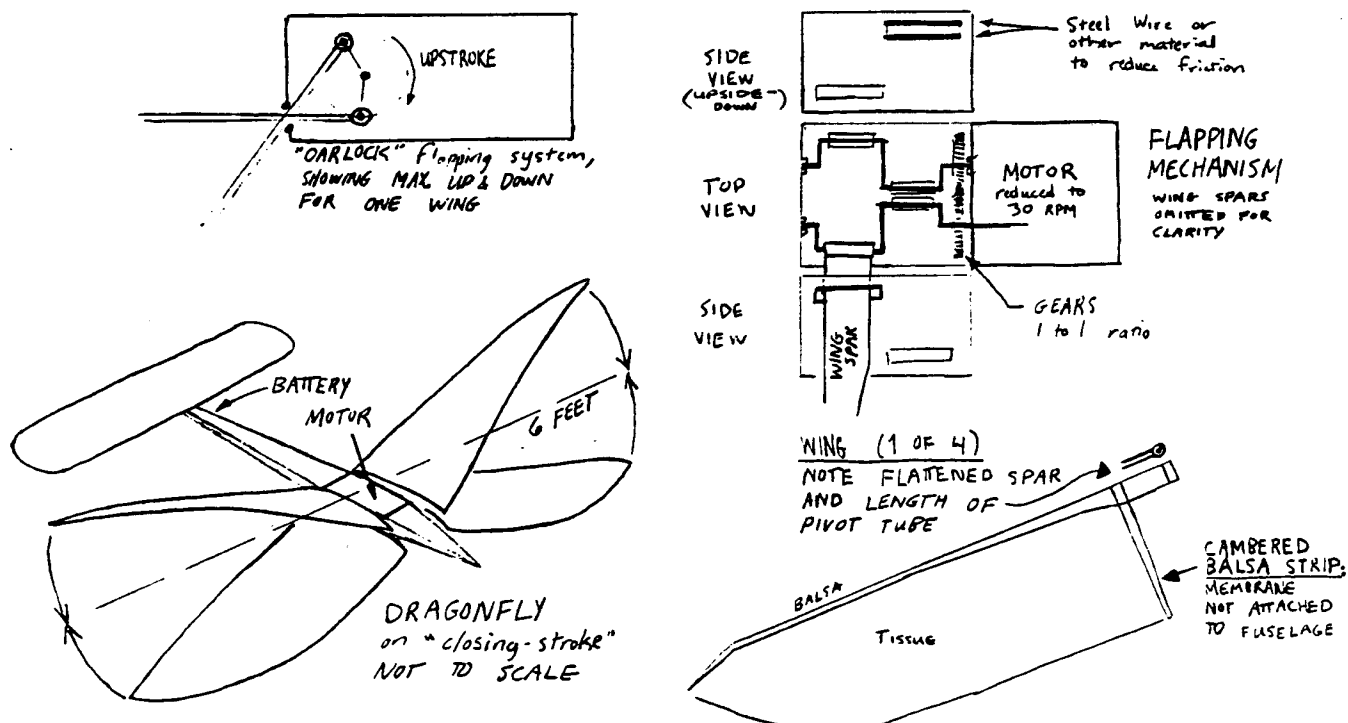
FRANK KEISER HAS GRACIOUSLY AGREED TO HELP WITH THE NEWSLETTER. HE WILL ASSUME THE DUTIES OF EDITOR. PLEASE SEND ALL FUTURE INPUT DIRECTLY TO FRANK KEISER AT 402 WEATHERSTONE DR., FAOLI, PA 19301. I WILL CONTINUE TO ACT AS CORRESPONDING SECRETARY AND TREASURER BY COLLECTING DUES AND PRINTING AND MAILING "FLAPPER FACTS".

DRAGONFLY electric ornithopter
by Nate Chronister, New Paltz, NY

This very unique design, which I call the DF, includes several features which could be easily used in rubber-powered models. It has no cabane because the flapping mechanism is greatly simplified and improved. The wing spars are attached directly to the crank and are drawn thru special holes in the side of the model, like oars. This arrangement increases output force on the downstroke. Friction is not increased; this system is easier to build and use than the former technique.

A 9-volt battery is the recommended power supply. The flapping mechanism could be driven by a geared-reduction motor or a 79¢ Radio Shack electric motor with a gear system added. A servo, modified to run in complete circles on direct current, would be ideal. The frequency should be about 30 beats per minute.

Other necessary information is provided on the accompanying diagrams. The wing size is an approximate figure. They must be very large because of the low frequency. The DF will weigh over 4 ounces, but its wing loading is still very light; it is not intended as a break from traditional indoor ornithoptics, but as a contribution. It should be capable of flight times several times longer than what is currently possible. Although I do not plan to build the DF, I would like to present it as a project which may interest other OMS members. I have tested the flapping mechanism used here with great success. I am currently working on an actual-size (full weight), rubber-powered sparrow model which will fly at 25 miles per hour for short distances, using a jointed wing like that of a real bird.



THIS ORNITHOPTER HASN'T YET BEEN BUILT; THEREFORE DIMENSIONS ARE NOT AVAILABLE.
GOOD LUCK!

STEPHEN FULLEN OF CANADA HAS A KEEN INTEREST IN HUMAN-POWERED FLIGHT AND HAS SENT US THE FOLLOWING REFERENCES OF HUMAN POWERED ORNITHOPTER PROJECTS:

1. THE UPENICKS HUMAN POWERED ORNITHOPTER BUILT IN PERTH, AUSTRALIA. 1971 FOR WHICH I HAVE OBTAINED AN AERONAUTICAL JOURNAL. OCT. 1973 REFERENCE.
2. "PROPOSAL FOR AN EXPERIMENTAL PROGRAMME LEADING TO A MAN-POWERED ORNITHOPTER" BY JOHN S. ELLIOT, 1962. I HAVE BEEN UNABLE TO OBTAIN A COPY OF THIS DOCUMENT IN SPITE OF CONSIDERABLE EFFORT TO DO SO. TO MY KNOWLEDGE, ONLY THE ROYAL AERONAUTICAL SOCIETY LIBRARY IN LONDON, ENGLAND HAS A COPY THAT IS NOT AVAILABLE FOR LOAN OR PHOTOCOPYING. IF ANY OF YOU HAVE A COPY, OR KNOW WHERE WE CAN GET ONE, PLEASE LET US KNOW.

ARTICLES ON THE AERODYNAMICS OF ORNITHOPTERS:

BETTERIDGE, D.S. AND ARCHER, R.D., "A STUDY OF THE MECHANICS OF FLAPPING WINGS". AERONAUTICAL QUARTERLY, VOL. XXV, PART 2, MAY, 1974.

CURRY, D.V. "THE PROPULSION OF A MAN-POWERED VARIABLE GEOMETRY ORNITHOPTER:", PROD. MAN-POWERED AIRCRAFT GROUP SYMPOSIUM. R. EARS, LONDON, 1975.

SHERWIN, KEITH, "MAN-POWERED FLIGHT", MODEL & ALFRED PUBLICATIONS, 1971, PP. 154-160.

REAY, D.A. "THE HISTORY OF MAN-POWERED FLIGHT", PERGAMAN PRESS, 1971, PP. 276-279.

ARTICLES ON BIRD FLIGHT:

STORER, JOHN H. "THE FLIGHT OF BIRDS: ANALYSED THROUGH SLOW-MOTION PHOTOGRAPHY", CRANBROOK INSTITUTE OF SERANCE, BULLETIN NO. 28, 1948.

RUPPELL, GEORG. "BIRD FLIGHT". VAN NOSTRAND REINHOLD CO., NEW YORK, 1977.

FLAPPINGLY YOURS,

A handwritten signature in cursive script, appearing to read 'Roy', is written in dark ink.