



June 2021 M2 Update

History of M2 Tail Flight Testing

We have finally eliminated that vexing flutter of the outboard rudders! This was one of the most challenging engineering issues which Sport Copter has ever tackled.

original single rudder: Although decently effective in turns, it oddly required a lot of right rudder at speed, and conversely much left rudder during idle/dead-stick landings. While a good pilot could work around those characteristics, we insist that the M2 have more neutral handling qualities.

single rudder with slotted vertical stabilizer: Next, we slotted the vertical stab which evened out the strong propwash effect during high-power flight. This mostly nulled out the power:rudder coupling, but Jim felt that the single rudder didn't provide *quite* the snappy response expected from a mustering gyro. (As we've previously pointed out, many 2-seat gyros are significantly undertailed, and risk "swapping ends".)

triple rudder: Having designed such for our SCII (and it works marvelously), we wanted to avoid the weight, complexity, and expense of an M2 triple rudder. But, after months of testing the previous tails, we had no choice but to transform the outboard vertical stabilizers into rudders (a possibility contemplated during the tail's original design). However, as reported last month: "*We immediately got the enhanced maneuverability we sought, but with some unexpected tail buffeting at 50+ mph.*"

While earlier aerodynamic modifications did increase the airspeed of its *onset* to 90+ mph, the flutter refused to be eliminated thereafter. We could not accept a high-speed flutter, even near/at V_{NE} .

After relentless flight-testing, by making careful changes in steps, the solution was found at last in a special combination of slight modifications (which can easily be incorporated in production). We realize that this took much longer than we ever dreamed, but we want you have an M2 which has no vices and no surprises.

GYRO FIRST: pre-preg Carbon-fiber Triple Rudder Tail

In gyro tails, what's common is wet-layup fiberglass. Next, is wet-layup carbon-fiber. Sport Copter, however, uses all pre-preg carbon-fiber for its M2 tail, and our V-Spar™ technology does away with heavy foam and phenolics. Nothing is stronger among gyroplanes. AND, we've the smaller 2-place industry first of a triple rudder!

M2 Rotorhead and center-mounted Bendix/flexshaft

Also unique in the industry, the M2 rotorhead balances the lateral loads on the airframe, and the prerotator flexshaft being newly centered negates much of the former torque on the control stick during take-offs. You'll really notice the M2 difference!

Jim Vanek Interview (June 2021), 35 minutes

We were recently contacted by the videographer of www.Skywagons.com who was keen to visit Sport Copter, see our new M2, and do some filming. While the timing wasn't quite right last Saturday for flight videoing, Jim gave a great [interview](#) to discuss our designs and show off the M2.

Below are links to within the video, by subject matter:

Sport Copter M2-AM (with the 1.5 liter Aeromomentum AM15-HP)

https://youtu.be/g_uhmG9GcBQ?t=640 (at 10:40)

Sport Copter Vortex M912

https://youtu.be/g_uhmG9GcBQ?t=933 (at 15:33)

Recovery from Unusual Attitudes (bunts and slips)

https://youtu.be/g_uhmG9GcBQ?t=1263 (at 21:03)

Sport Copter M2 overview

https://youtu.be/g_uhmG9GcBQ?t=1322 (at 22:02)

Sport Copter M2 take-off procedure

https://youtu.be/g_uhmG9GcBQ?t=1519 (at 25:19)

Sport Copter M2 single control stick

https://youtu.be/g_uhmG9GcBQ?t=1647 (at 27:47)

Sport Copter M2 doors

https://youtu.be/g_uhmG9GcBQ?t=1793 (at 29:53)

Sport Copter M2 flying solo vs. with pax

https://youtu.be/g_uhmG9GcBQ?t=1827 (at 30:27)

Sport Copter M2 rotorhead and prerotator reversibility per engine

https://youtu.be/g_uhmG9GcBQ?t=1857 (at 30:57)

Sport Copter M2 cowl scoops

https://youtu.be/g_uhmG9GcBQ?t=1904 (at 31:44)

Sport Copter M2 toe brakes, adjustable rudder pedals

https://youtu.be/g_uhmG9GcBQ?t=1933 (at 32:13)

Sport Copter M2 detachable rudder cables and tail boom

https://youtu.be/g_uhmG9GcBQ?t=1950 (at 32:40)



We'll have some new flight videos soon, and . . .

We are starting full production this Summer!

Safe flying!



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“REMEMBER: WE BUILD THE BEST BECAUSE WE WILL ONLY FLY THE BEST!!!”