

Cross Winds and Tailwheel Aircraft
 By Tom Rogers, NAFI Master CFI

The internet and video watching applications are great for aviation. There are a lot of them that are very accurate and informative. Occasionally I run across one that I frankly disagree with. Recently I watched a video produced by a famous, better looking than me, celebrity pilot that produced both pause and disagreement. This is a very accomplished pilot, how could you or I disagree? With that, I am going to dive into crosswind landings for tailwheel aircraft.

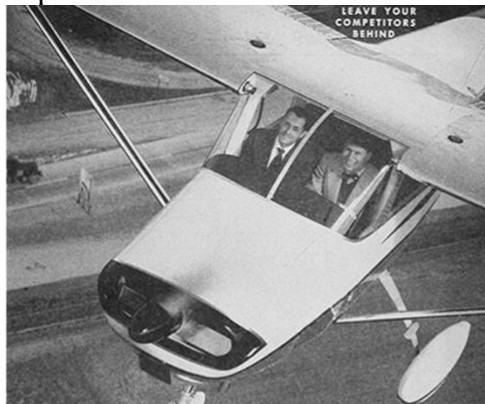
If you took an aerial survey of some 12,000 airports in the US, you would find that most have a cross runway. Many of these have been decommissioned, but all airports built in the 1930's through the 1950's had cross runways because the primary aircraft of the day could not land in a crosswind. The Army Air Corp pilot's handbook of the PT17 Stearman written in the 1940s instruct the pilot not to land with a crosswind. The CAA, to become the FAA, designated tailwheel aircraft as the "Conventional" gear aircraft. These days they are anything but conventional.

**PILOT'S HANDBOOK
 FOR
 STEARMAN AIRPLANES
 MODELS N2S-1, N2S-2, AND N2S-3**

REPORT NO. A75NI-9001
 JANUARY 20, 1941

15. Approach, Landing and Cross-Wind.
 a. Approach.- No unusual procedure need be followed during the approach for landing.
 b. Cross-Wind Landing.- Avoid cross-wind landing whenever practicable. Exercise care to avoid ground loop.

In 1958 Cessna began selling the first 150. It was a tailwheel 140 with a nose gear and fowler flaps. It was first named the "Land-O-Matic" later to become the Commuter. The tricycle



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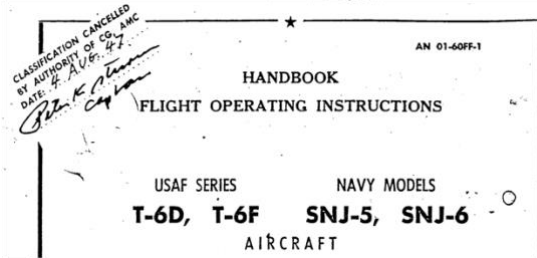
1. Place hands on the 2. This Cessna's an 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

Cessna

revolution began. The simple design of putting the center of gravity ahead of the main gear made the plane hugely stable on the runway and capable of nearly twice the crosswind as conventional gear aircraft. Who Knew? In the 1960's up to the present most all pilots trained on tricycles. The need for cross runways waned. To save money airport managements began to close cross runways. In the case of my home field KPWT, they turned it into a revenue maker, drag racing strip. Pilots trained in this manner, initially were qualified to fly a "conventional" airplane. When they began to kill themselves at a great rate in the 1970s and 80s, the FAA made a new rule. In 1989, 14 CFR 61.31(i) at first merely required pilots to "Obtain instruction on operation of conventional gear aircraft". Today the same rule requires the CFI to provide instruction

- regarding:
- a. Normal and crosswind takeoffs and landings.
 - b. Wheel Landings.
 - c. Go-around procedures.

This is not to say all conventional gear aircraft could not land in a crosswind, it was mixed bag in “the ‘ol days”. Newer low wing monoplanes could perform crosswind landings, but most biplanes and light high wing planes had recommendations against the practice. Few operation manuals existed for aircraft designed before 1954. They really were not required in the plane until 1979. The ones we are left with are usually created for military pilots or read like a sales brochure. The important rule of thumb came about during the era before flight manuals. Pilots found that in crosswinds exceeding 20% of the landing stall speed, the pilot ran out of rudder and aileron to control the aircraft during landing. In virtually every conventional gear aircraft I have flown, including newer ones with a POH, this calculation matches flight test demonstrations. The “demonstrated” crosswind limit might be 3 to 5 knots more, but remember it was a test pilot, with many hours in the craft, in optimal conditions.



b. LANDING.

(1) GENERAL.—Having turned into the field and lowered the flaps, adjust elevator trim tabs to maintain a correct gliding speed. Having stopped after landing, raise flaps before taxiing. Unlock the tail wheel for parking or towing.

(2) CROSS-WIND LANDING.—As this airplane has a landing gear of normal tread, cross-wind landings may be negotiated safely. Keep one wing down, into the wind, to counteract drift.

I do not intend to be controversial however here goes. In the era before flight manuals, crosswind landings were done in the three-point landing attitude with one main wheel down with the tailwheel. As the plane decelerated the other main was placed down. Many internet videos these days have advised to use the wheel landing in such cases. I began flying tailwheels in the 1970s. I did do wheel landings for strong gusty winds. It wasn't until the late 2000s when I got back into GA flying after my military and airline careers, that I even heard of crosswind wheel landings.

The theory behind wheel landing and crosswinds is that you fly faster, making the crosswind lesser percentage of your overall speed perhaps giving you more control. Here's the thing; when you do a wheel landing in a crosswind you are only putting one wheel on the runway. The drag created causes a lot of flight control actions at that point and if not done precisely that wheel becomes a pivot point. Any number of issues can cause unexpected control issues such as gyroscopic effect, p-factor, and torque. Two ground loops have occurred publicly (video on internet) in the last two years using this technique. Landing in the 3-point attitude allows better directional control with at least two wheels on the runway.

A Petaluma police spokesperson said the pilot told officers that his plane was altered by a gust of wind prior to landing at the airport, located on Sky Ranch Drive. The pilot said he made a correction before the plane bounced, turned off the runway, struck a concrete building structure and a tetrahedron, which houses the wind speed and direction indicator, or wind sock, before flipping the 1942 Stearman biplane upside down.



General Aviation has 5 ground loops a week on average over the last 20 years (Aviation Safety Magazine) a large portion of these occur using the wheel landing crosswind technique. How



many, I don't know accident data is not that informative. Some tailwheel aircraft have as the tailwheel unlock mechanism, a push forward on the stick. Recently a P-51 pilot



attempted a crosswind landing, with one wheel down he pushed forward like many Cessna, and other GA tailwheel craft do in a wheel landing to plant themselves on the runway. The problem was he unlocked the tailwheel to swivel and when he did touch the tail down, he destroyed a perfectly fine craft in a hair-raising ground loop.

I do teach wheel landings, but only for strong and gusty headwinds on landing. Here is a summary of my thoughts on tailwheel aircraft and crosswinds.

First evaluate the wind. If the direct crosswind component is more than 20% of your landing configuration stall speed, find another place to land into the wind. When planning a cross country always plan to airports with a cross runway of more than 45 degrees or with a close alternate with a runway at least 45 degrees from your destination runway direction.

Once again, I use the three-point attitude, with wing into the wind, I strive to touch down the upwind main gear and tail wheel together. Now with two wheels on the ground the plane is less susceptible to drift, the tailwheel helps with directional control, and there isn't any of the gyroscopic, torque, and P-factor turning tendencies the wheel landing encounters. As the plane slows, I can lower the downwind wing to the runway.

My dad learned on J3 Cubs in the late 1940s. He shared this with me in the 1970s. For 50 years it has worked for me flying J3 Cubs, Super Cubs, Fairchild 24, Cessnas, Great Lake, Citabrias, Stinsons, Stearmans, and the T6. But what do I know, I'm not famous.