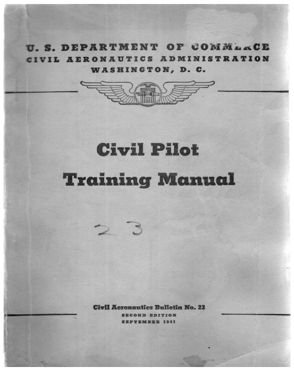
March 2009

The Oil Report

BLACKSTONE LABORATORIES

“Oil the News That’s Fit to Print!”



Blackstone is getting a new look! Well, our website is, at least. Same great info, same great humor, only fewer problems with the forms and an updated look. Stay tuned for an email alert.

Aviation Training in the Days of Yore

By Jim Stark & the CAA

I stumbled across a couple of old training manuals at a garage sale. One is about basic airmanship training as it was practiced at the time, and the second is on flying and navigation in the blind. Both were printed in September 1941 and issued by the CAA three months prior to the infamous Pearl Harbor raids.

A lot has in changed flight training since then, but much hasn’t since flying and the basics of aerodynamics had been around more than 30 years. They had a pretty good grasp on how things worked and how to teach flying, but the liability issues of modern times were not a factor back then. As airplanes were then, the J-3 Cub would be a modern ship.

Aviation training involved complicated formulas for calculating things such as drag and glide speeds and charts that may be used in test flying schools or aeronautical engineering but aren’t something found in a typical flight school’s agenda. Phugoid oscillations are discussed at length in more than one section. Instructions on hand-propping are emphasized, and parachute operation and packing are part of the training. You can learn all about taxiing with a tail-skid in one section, and the manual points out that though it may be embarrassing with people looking on, there are times it is best to just get out of the cockpit and lift the tail around to the desired direction.

Following is a section that has to do with spiral training that eventually is used for spiraling to a dead-stick landing. I can see where perhaps glider pilots may use this maneuver in their training, but I can’t see my local flight school asking a fledging pilot to start a tight spiral at 2,000 ft. above ground, under any circumstances. Here’s a quote from the training manual:

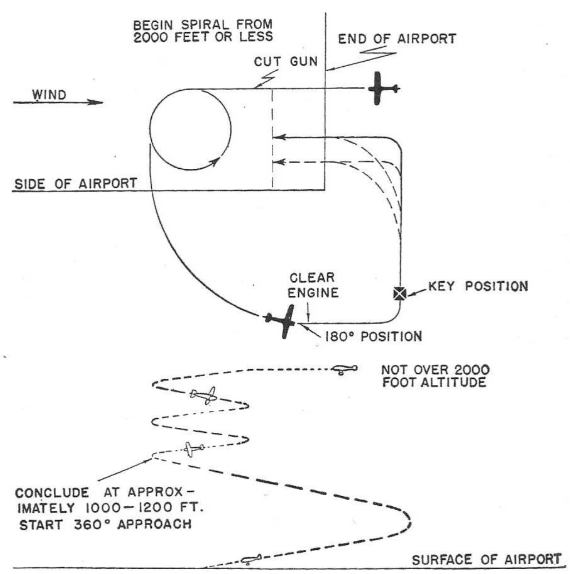


Figure 101.—Spiral approach precision landing.

Spirals

The chief value of this maneuver is in improvising power-off turns, teaching orientation, and eliminating possible tendencies in the student toward vertigo or dizziness. The practice of spirals also aids in the teaching of normal recovery from steep gliding turns and corrects the faults of stalling or diving out of such a turn—dangerous errors close to the ground.

Another purpose of introducing the spiral at this point is that the maneuver is involved in the spiral approach for landing, to be discussed next.

Plenty of altitude must be obtained before starting this maneuver in order that the spiral may be continued through a long series of turns, since it will be found that the student probably will exhibit no difficulty in the first two or three turns. It is only when it is prolonged that the student is prone to let the ship get away from him, become dizzy, or lose his sense of position. This maneuver should not be continued below 1,000 feet. No judgment of drift or altitude is necessary at fist, except to see that the recovery altitude is sufficiently high. The objectives are a constant gliding speed and a constant degree of bank. Later, a ground object should be used as a center and due allowance made for drift.

The student should start on spirals from glides, using the medium bank and then, in successive practice, gradually increase the bank for each spiral until the 60 bank required for a tight spiral is attained and held throughout this maneuver.

Slipping, skidding, and vertical variations of the nose are, of course, not permissible, just as in any other turning maneuver.

A constant speed and a constant bank are very important. Since this is not necessarily a maximum performance maneuver, a speed of from 10 to 15 miles per hour above that in a normal gliding turn of equal bank may be used, but it should not be more.

Particular attention must be given to the recovery. Smoothness must be attained and the controls must be coordinated so that no increase or decrease of speed results when the straight glide is resumed. Considerable practice will be required by most students before this can be accomplished consistently from a 60 spiral held through six or more complete turns.

As proficiency is acquired, the student should endeavor to make precision recoveries toward an object on the ground. He then should select such a point before starting the maneuver, execute a predetermined number of turns, and come out on the point. The greater the number of turns, the more difficult it will be for the average student to retain his orientation.

Such practice will be of great value as a preliminary to the spiral approach precision landing and advanced maneuvers requiring a high degree of orientation, such as lazy eights and chandelles.

Since there are no new features involved in its execution, it is not considered necessary to break this maneuver down into the customary divisions.

I enjoy all things aeronautical though my bride-to-be thinks I may have a screw loose to spend time rumbling around in aviation's dusty attic. If you think this type information is interesting, let us know and we will revisit it in a future newsletter.

Report of the Month

Something's amiss in this IO-360-ES engine. What's wrong? Take a guess, then look at the caption below to see if you're right.

(To learn where the various elements might be coming from, click here.)

Elements in Parts Per Million

		UNIT/ LOCATION AVERAGES					UNIVERSAL AVERAGES
MI/HR ON OIL	42		40	47			
MI/HR ON UNIT	219		177	126			
SAMPLE DATE	2/21/09		5/26/08	12/1/07			
ALUMINUM	10	10	**11**	9			6
CHROMIUM	24	21	24	14			7
IRON	317	254	**273**	**171**			49
COPPER	14	14	16	11			7
LEAD	5124	5837	**6081**	**6306**			4457
TIN	5	5	5	4			1
MOLYBDENUM	14	13	14	10			0
NICKEL	47	39	44	27			7
POTASSIUM	0	1	0	2			0
BORON	1	1	0	1			0
SILICON	5	7	7	9			5
SODIUM	2	1	1	0			1
CALCIUM	6	5	5	3			9
MAGNESIUM	2	4	7	2			2
PHOSPHORUS	735	793	969	674			694
ZINC	15	13	14	10			9
BARIUM	0	0	0	0			0

PROPERTIES

		Values Should Be				
SUS Viscosity @ 210	100.4	89-105	99.0	90.9		
cST Viscosity @ 100C	20.46	17.7-21.8	20.13	18.20		
Flashpoint	440	>445	4755	505		
Fuel %	TR	<1.0	<0.5	<0.5		
Antifreeze %	-	-	-	-	-	-
Water %	0.0	0.0	0.0	0.0		
Insolubles %	**0.5**	<0.5	0.5	0.5		

We thought corrosion might be contributing to the metals, though we don't usually see this much metal unless there's a problem going on. Then: a discovery! The owner contacted us when he found the tachometer shaft had worn down significantly. It was changed right before the February 2009 oil change. This may indeed have been the source of a lot of the iron, chrome, and nickel, so we will be looking for a nice improvement in wear next time.

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