

Flight Replicas **PA-11 Cub Special** And **Wagner Twin Cub**

For Microsoft FSX *plus* Acceleration



This package contains seven models:

- Early production version on wheels, skis and Edo 1320 floats.
- Late production version on wheels, wheel-skis and Edo 2000 floats.
- The Wagner Twin Cub.

To get full enjoyment of this aircraft, please read this manual carefully.

Warning: This Manual and FSX model must not be used for real flight training purposes.

Introduction

Considered by many to be the ultimate Cub, the Cub Special was effectively an intermediate stage between the famous J-3 and the equally famous PA-18 Super Cub. Featuring greater horsepower than the J-3, the Cub Special was known for its high performance, without sacrificing the light-weight simplicity of the J-3 airframe. Principle changes from the J-3 were an enclosed cowling over the more powerful engine, with the engine thrust angle canted downwards 4 degrees; the fuel tank was increased in capacity to 17 gallons and relocated to the port wing; the wing struts were redesigned; the windscreen was also re-designed, to be more aerodynamic; the seats were re-designed, with square backs that provided more support; and the cross bracing between the instrument panel and the firewall removed the tubes from the instrument panel to between the rudder pedals which give a little more foot room in the front. The PA-11 is also flown most often from the front seat, unlike the J-3, although it can in fact be soloed from either seat.

The PA-11 was first flown in 1945, and a total of 1323 were built before the PA-18 Super Cub took over.

Wagner Twin Cub

In 1952, Mr. Harold Wagner, of the Wagner Aircraft Co., at Troh's Skyport, Portland, Oregon, wanted to develop a simple aircraft that would give the performance of a twin-engined aircraft at low cost. Among his experiments was the Wagner Twin Cub, which effectively was two PA-11 Cub Special's joined together. The resulting aircraft was so unconventional that Mr. Wagner called it "The Thing". It flew well, however, for a couple of years, despite the unsynchronized engines and overlapping prop arcs, although wing loading allowed only one of the two fuselages to carry any people or payload. Not finding any commercial success, the aircraft was eventually reverted back to two separate Pa-11s.

Notes:

Instrument Panel:

The PA-11 had a standard factory instrument panel, consisting of Tachometer, Airspeed, Compass, Altimeter and dual Oil Pressure and Oil Temperature gauges.

The aircraft in this package have two different sets: one old, and one new, although the functions are the same. The RPM gauge in the modern set has a working hour meter, plus there is an additional turn and slip indicator.

In the old style cockpit, of particular note is the Altimeter: Once you have pressed "B" to set the barometric pressure, the knob is used to set the "0" under the needle. The needle will also move very little, as it is calibrated to a hundred of feet per 'tick' mark.

Radios:

PA-11's did not come with radios. In the older style models model, we have assumed that a hand-held 'com' radio is the method of choice, as if very common in the real world. Modern versions have a permanent radio and transponder installed.

*For simulator communications and navigation, all models have three pop-up gauges, activated **by Shift/1, Shift/2, and Shift/3: Hand-held radio, GPS and Transponder** (for flying through control zones).*

Engines:

The standard PA-11 was equipped with a Continental 90hp four-cylinder engine. This was not equipped with mixture control, as it was not thought that the aircraft would ever fly high enough to require this.

Night Lighting:

There was no night-lighting, inside or out, on PA-11's, as they were not intended for night flight.

Flight Dynamics:

The flight dynamics of the PA-11 are well represented in this package. Published handling and factory acceptance requirements are met.

Sound:

Sounds are those of the default FSX Piper Cub, as they are excellent and fully suited to the PA-11.

Paint Kit:

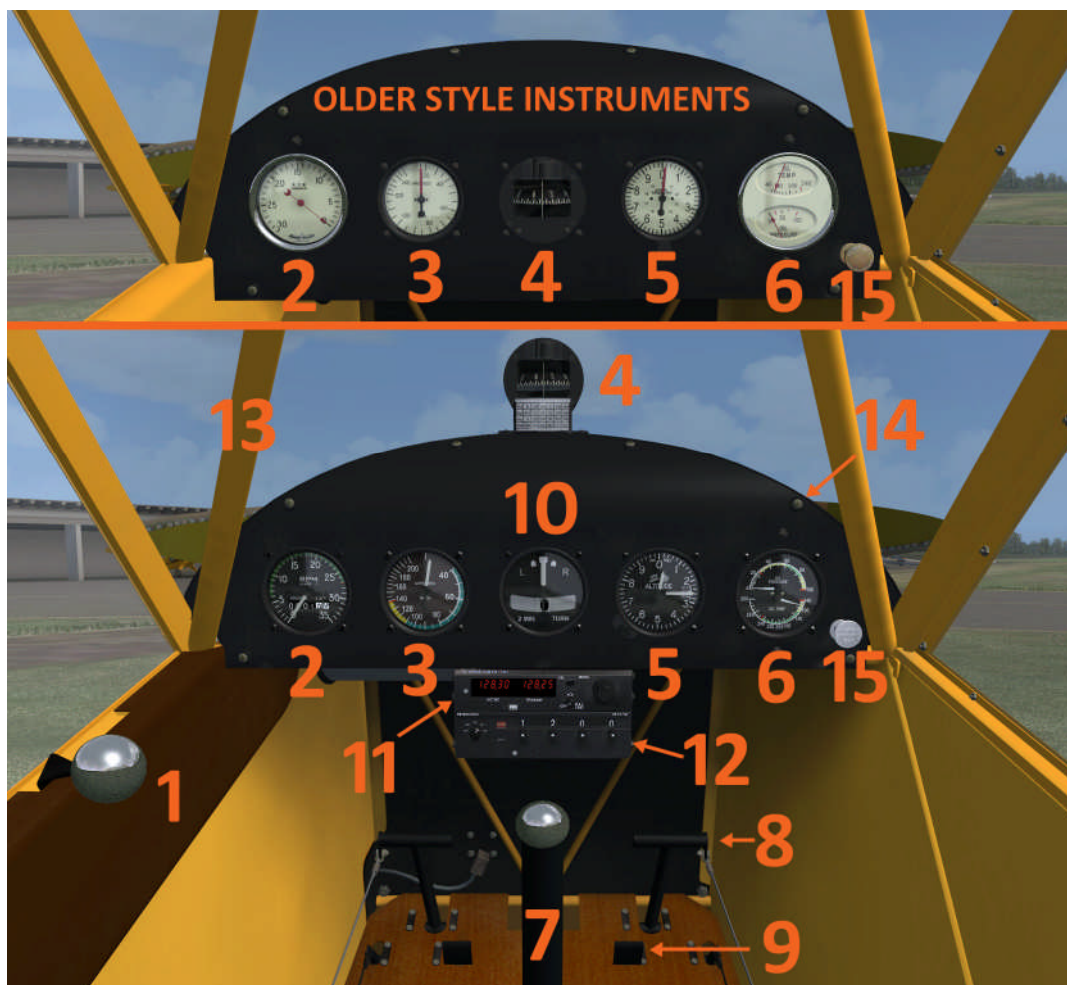
A paint kit is included with this package. The PA-11 models have *many* small parts, some of which may not be easy to identify on the .psd files: if you need help locating their position, don't hesitate to get in touch via the support email address.



A Tour of Your 'Cub Special' Cockpit:

Make sure you are familiar with all controls before going on to flying instructions!

Main Instrument Panel:



- | | | |
|----------------------------------|-------------------|------------------------------------|
| 1. Throttle | 7. Control stick | 13. Click spot to remove pilot |
| 2. Tachometer (RPM) | 8. Rudder pedals | 14. Click spot to remove passenger |
| 3. Airspeed | 9. Brake pedals | 15. Primer pump |
| 4. Compass | 10. Turn and Slip | |
| 5. Altimeter | 11. Radio | |
| 6. Oil Temperature & Temperature | 12. Transponder | |

Cockpit Left:



Cockpit Right:



Water Rudder Handle (Up = Rudder raised)



Camera View:



Flying the PA-11:

(Notes on Float and Ski operations follow afterwards)

Pre-Flight Check:

1. Check fuel quantity by observing the length of the gauge rod extending from the fuel filler cap in front on windshield. The rod becomes shorter as fuel is used up.
2. Ignition switch "OFF."
3. Throttle "CLOSED."
4. Fuel supply on/off control "OFF."
5. Carburetor heat control "OFF."
6. Trim control indicator button to centre.
7. Altimeter set to zero.

Starting Engine:

1. Fuel supply on/off control to "ON."
2. Prime engine by pulling primer knob out, then pumping slowly three or four times.
3. Throttle open $\frac{1}{4}$ inch.
4. Turn ignition switch to "BOTH."
5. Heels on brakes.
6. Turn ignition switch past "BOTH" to start engine (no hand-propping in the simulator!).

Engine Warm-up:

1. Maintain 700 rpm for at least 3 to 5 minutes, while checking oil pressure and temperature carefully.
2. Check operation of magnetos separately. The normal drop when switching from "BOTH" to "L" or "R" is 50 rpm. Do not operate engine on one magneto for more than 30 seconds at a time.

Taxiing:

1. Release brakes and open throttle until airplane is in motion then gradually reduce power until correct taxi speed is reached.
2. Taxi speed should not exceed that of a brisk walk.
3. Turn the aircraft using the rudder alone, where possible.

Take-Off:

1. Position the aircraft with heading into the wind.
2. Run up power as much as possible for 10 seconds and check individual magnetos.
3. Check oil pressure and temperature.
4. Start take-off by using full throttle, and raise tail as speed increases.
5. When flying speed is reached, pull back stick to lift off.
6. Achieve and maintain 55 mph.

Climb:

Best angle of climb:	50 mph	(43.44 kt)
Best rate of climb:	55 mph	(47.80 kt)

Flight:

1. Trim aircraft for level flight. Cruise speed is 100 mph.
2. If at any time there is an un-commanded drop in rpm, pull carburetor heat control knob to "ON." Return to "OFF" as soon as conditions permit.
3. Oil temperature should be approximately 120F.

Approach and Landing:

1. Pull carburetor control knob to "ON."
2. Glide at between 60 mph and 50 mph, with the throttle slightly open.
3. At 600' altitude, ensure you are heading into wind as much as possible.
4. At 10' to 15' above the ground, break the glide with slight back-pressure on the stick, and close the throttle to idle.
5. Level off, and ease stick back as airplane settles.

Go-Around:

1. As the throttle has been left slightly open during approach, the engine will take full-throttle as needed.

Stopping the engine after landing:

1. Engine to idle.
2. Switch magneto to either "L" or "R" for 30 seconds, to allow engine to cool gradually. This prevents heating of the plug insulators so that "after-firing" will not occur. Lubrication on the cylinder walls is also left in a cool condition and will not drain away too rapidly.
3. Fuel supply control to "OFF".
4. Throttle closed.

5. Magnetos to "OFF."
6. Carburetor heat control "OFF."
7. Cabin heat control knob "OFF."

Limiting and Recommended Airspeeds

VX (best angle of climb)	50 mph
VY (best rate of climb)	55 mph
VNO (max structural cruise)	100 mph
VNE (never exceed)	226 mph
VR (rotation)	39 mph
VS1 (stall, clean)	40 mph

Best range/fuel consumption is at 75% power, which equates to 2100 rpm

Float planes:

To taxi on the water, you will need to lower the water rudder via the handle in the cockpit (see image). In FS, the water rudder only becomes effective at a fairly high speed, so be careful.

Land and take-off with water rudder in the **up** position.

The water rudder steers using the standard rudder pedals.

As it is harder to judge height above water due to the lack of nearby physical objects with which to judge scale, your final approach for a water landing should be carefully held to the landing speeds and correct aircraft attitude. Do not worry about last-second flare – get things set up, make a stable approach, and let the aircraft fly itself gently onto the water.

If you decide to beach the aircraft, give yourself plenty of time to slow down.

Ski-only plane:

Flying a ski-equipped aircraft in FSX is not that much different than the wheeled version. The important thing to remember is that there are **no brakes**, which will effect landing distances and the turning radius. Turning is done using rudder only, with a careful blast of throttle to help bring the tail around only **if needed**.

Solo rear or front?

PA-11's can be soloed from both seats, although most are flown from the front. You **can** change the viewpoint in the cockpit to whichever seat you choose, however, by going to the "aircraft.cfg", in any of the L-4 folders, and changing the numbers:

Front seat:

[Views]
eyepoint = -0.0, 0.000, 1.35

Rear seat:

[Views]
eyepoint = -2.3, 0.000, 1.13

(Note: These viewpoints were chosen on the basis of accurate pilot perspective, not from where the "eyeballs" would physically be.)

For added realism, when flying you can also change the weight distribution in the aircraft, by pressing **ALT**, then selection the **Aircraft** menu, and changing the weights in the **Fuel and Payload** section.



Wagner Twin Cub

There do not appear to be any published performance figures for the Wagner Twin Cub, and so handling and speeds, etc., are best estimates. Expect good Cub handling, but with much higher speeds! Flight procedures are the same as for the standard PA-11, but with added care needed to manage the two engines.

Thanks

Big round of thanks go to Wozza (Warwick Carter), Chet Two Wolves, and GJ, for all their help.

Support:

Flight-Replicas@hotmail.com

All requests for support must be accompanied by **all** the following information:

1. Place/website where the PA-11 was purchased;
2. Order number;
3. Name used when purchasing; and
4. Date of purchase.

No support will be forthcoming without this information.

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