Piper J3 Cub - Freeware Aircraft & Addons for FS2004

by Claudio "Cloudy" Di Veroli, published in PC FLIGHT,
The Official magazine of the "PC Pilots Ireland", June 2011, pp. 21-24

1. INTRODUCTION

Two sets of freeware Piper J3 Cub models for FS2004 are available online. The first set was produced by Lynn and Bill Lyons, well-known FS aircraft designers, as a payware add-on for FS2002, then repackaged for FS2004. At a later date, the package was released as freeware. It includes four variants of the Piper Cub, as well as a sailboat, a jeep and a small scenery. Freeware third-party additional liveries are also available, some with suitable colour changes in the panel background. [Later, Daniel Nole produced another Piper J3 Cub for FS2004: this was not a full package, but simply a reworked Piper_J3Cub.air and aircraft.cfg for improved flight, followed by quite a few revisions. Once the Lyons' package became freeware, it does no longer make sense to evaluate this much more limited product by Nole.]

One of the difficulties facing the Lyons' product is that the default dynamics for the FS2004 Cub are quite acceptable: in fact, they were already praised in their former FS2000 incarnation in the FlightSim review in http://www.flightsim.com/main/review/j3.htm . The default Piper Cub in FS2004 is actually very well done, one of Microsoft's best efforts, but Lynn & Bill Lyons' Classic Club package one-plus-it with their three additional variations of the Cub that the MSFS team did not include: a Cub with Skis, another one with Floats, and a Clipped-Wing aerobatic model. The Lyons included a new 2D panel and a new 3D virtual panel-cockpit. "This classic aircraft package download has been put together by one our hobby's most accomplished aircraft designers." (Review in http://www.avsim.com/pages/1203/bear/bear.htm). Though reviewers have praised Lyons' designs, as well as the variants produced for the Cub, no review compared them with the FS2004 default in any detail. The goal of the present review is to compare the external model, the panels and the flight dynamics. As regards the 2D cockpit panel, I will also comment on my own "Cloudy panel", which offers realistic features the others do not.

2. DOWNLOAD AND INSTALL

Let me first review in detail the package contents and installation. Lyons' Cub is a 6.7Mb package that can be downloaded in two almost identical versions: from www.avsim.com as **cub4free.zip**, dated 01 Aug 2003, and from www.flightsim.com as **cccub4.zip**, dated 08 Aug 2003. The contents of both files are identical, except that the latter also includes a Roadstaxi4.zip, which "replace the road and taxiway textures in fs2004 if you like older weathered surfaces to match the neat worn runways found in fs2004". The package is meant for the usual manual install: it is organised in folders that the user simply copies to the main FS folder, except for Add-on Scenery where it is better to create a specific subfolder for it. The hard disk space it takes is 20Mb.

Four freeware add-on livery packages are available from www.avsim.com and www.flightsim.com for the Lyons' Piper Cub: j3_bfu.zip, cub_ff1.zip, cub_ff2.zip and cwc_ff1.zip. The user should mind two issues when installing them. First, the add-ons refer to a "Bush" version within a "Model.2" folder. This was for a prior version of the package (in a file cubFS9D.zip, no longer available online). After some scrutiny of the text, it becomes obvious that this is now the "Floats" version, which is no longer simply a different "model" but a different "aircraft", in a separate folder with its individual dynamics. As a consequence, when installing additional liveries and editing the aircraft.cfg file, the user has to ignore the "2" in the lines "model=2" in the install instructions, and for an add-on livery to be installed in the "Bush-Floats" version, the folders and files have to be installed in the "CubF" folder.

The other problem is that every add-on package gives instructions to install each set of textures for each one of Lyons' Cub four variants. The 4 available add-on packages include a total of 9 additional textures. If we install each one on each of the 4 variants, together with Lyons' original textures we end up with a ridiculous total of (9+1)x4= 40 variants of the aircraft! It is certainly better to be selective, for example installing only one add-on texture for each variant, bringing thus their total to 8, a reasonable number. Eventually I reduced that number as well, and ended up using only 11Mb of disk space for all the add-ons. Let us now review each add-on package. The following add-ons are available, each texture with a matching panel.

j3_bfu.zip - The BFU livery, which I installed for the Floats version only.

cub_ff1.zip - This carries three panels (named Cream, Blue and Black) and three textures numbered 3 to 5. I found it better to install the 3-Cream as an improvement over the texture-cum-panel for the Classic Club, leaving the Lyons original for the Classic with Skis. Having tried them, I eventually deleted the very dark Blue and Black versions. Note: the documentation and the examples for aircraft.cfg enclosed in the zip file refer to textures numbered 1 to 5, possibly in some obsolete package, but only 3 to 5 are included. Anyway, the user has to renumber the "[fltsim.X]" in aircraft.cfg starting from 0 as usual.

cub_ff2.zip - This carries yet another single livery meant for the Cub Classic: I decided not to install it.

cwc_ff1.zip - Five liveries specific for the Clipped Wing model: I like the Lyon's light blue original one, and eventually uninstalled all these liveries.

Finally, the following 2D Cockpit panels are freely available from http://cloudy.braybaroque.ie/cloudy_panels/panels_downloads/ (no longer!)

CloudyPanel-138_Piper_Cub_010.zip - for the default Cub. It includes a panel with all the necessary bitmaps and gauges. The technically minded user will find full details in the enclosed Piper_J3Cub_Cloudy-ReadMe file.

CloudyPanel-140 Piper_Cub_Lyons.zip - for the Lyons add-ons. It includes four panels: for the Classic/Skis, same with Cream livery, the Floats with BFU livery and the Clipped Wing (Lyons' original).

3. SCENERY AND FLIGHTS

Let us now proceed with the review of the Lyons's product in practical use. Their package includes test flights for the different Cub variants: they start from different locations in the USA. Even if no document in the package mentions it, a small scenery is included: Bear Canyon West Field, in the centre-South of Washington State, USA. The "Classic Cub Test Flight" starts in the hangar.

The review below suggests some adjustments to aircraft.cfg files: remember first to test fly each model, as the first flight adds some necessary lines to these files.

4. EXTERNAL APPEARANCE

First, let us see how the Lyons' Cub looks: it sports "pros" and "cons" with respect to the FS2004 default.

Piper Cub default and Lyons

Piper Cub engine default and Lyons

CONS (see the pictures in the previous page):

(1) The black zigzag in the fuselage is a lower definition texture, producing some blurries when seen at close range.

(2) The clipped wing model shows a pilot and a passenger, but nobody shows inside the cabin in the other variants [a programming error, because the necessary files exist in the aircraft's \texture folder and are referenced in the Model .mdl files].

DOUBTFUL:

(1) As shown in the above pictures, the propeller is more "realistic" than the default one in the wood texture, but less so in the total shape and other details.

(2) The "Door 1 open" command (Shift-E,1) works as usual. FS2004 allows for opening/closing four "doors", and some advanced models use this feature to open a cargo or engine cover: it is a pity to leave this feature unused.

PROS:

(1): The tires are improved, significantly less blocky than the default: they go a bit too much into the ground at very low speed, but this is a minor detail.
(
2) The cables that move the ailerons are now proper steel cables, rather than simple grey lines, and their attachments to the ailerons move with the latter: a nice touch.

(3) The engine details are slightly improved, with more realistic cylinder covers and exhaust pipes.

(4) The fuselage of the default model looked like a few straight pieces of iron welded together and painted: the result was blocky and untextured. The Lyons model has visibly more surfaces. The "Cream" add-on livery makes them even more visible, with subtle shades, making the appearance more battered and significantly more realistic.

(5) As in other FS2004 models, the identification (in this aircraft painted in large black letters on top of the wings) can be changed by editing the line "atc_id=N-CC1" in the aircraft.cfg file. In the Lyons's models, you can write any 5 or 6 characters instead of "N-CCx", and they will show on the wings, on the tail and also on a lovely small Registration Plate "screwed" to the fuselage just in front of the right door.

(6) The Skis and the Floats behave in a reasonably realistic manner: the Floats with the usual water effects and the Skis with an up-down movement and matched sound.

5. 2D COCKPIT

All the Lyons' models and their add-ons use the same panel: only a number and the background bitmap are changed. The background has the fuselage struts matched to the livery main colour.

Cub

Piper Cub 2D Cockpit default and Lyons

Piper Cub 2D Cockpit by Cloudy

PRO: It was a good decision by the Lyons to merge all the "secondary panels" into one, although in an aircraft with such a reduced number of panel gauges, they should just have used a single main panel.

CONS: (1) I really dislike the reflective-like panel background.

(2) Some of the gauges look from the 50-60's, much too modern: the default FS2004 gauges, even with a slightly low definition, provide a much better historical reproduction of an aircraft launched in 1938.

(3) The new Carb Heat gauge is cut out from view when in the ON position.

(4) The new gauges for Carb Heat and Mixture have their handles at very low definition, showing awful pixels on screen.

(5) In the Clipped Wing model, no button is provided to set on/off the orange smoke effect included (you have to use the keyboard "I").

(6) The fuel indicator (vertical red rod outside the cabin) is simply a drawing in the background panel texture, with no gauge: at the very least, they should have put the default gauge there.

(7) The generic "mini-panel" sports standard, unrelated gauges.

Needless to say, as readers of PC FLIGHT have known for some years, much better than either the default or the Lyons' panel is the above-mentioned "Cloudy" panel, where all the gauges are included in the main panel, with a suitably modified background. Further, the background panel, 1024x768px in the default, Lyons and add-ons) has now an increased resolution of 1600x1200px and includes a Piper badge similar to the one found on the Lyons' fuselage: a new gauge provides the customisable ATC ID. Finally, a custom mini-panel shows the same period gauges as the full panel. For each one of the liveries selected above, a colour-customised panel has been produced.

6. VIRTUAL COCKPIT

Piper Cub Virtual Cockpit, default and Lyons

The Lyons' VC sports some minimal improvements. The aileron "chain" is larger, but the instrument panel has, like the 2D cockpit, a modern look. Even worse, most VC controls are not clickable, while all those in the default Cub are! I find this shortcoming serious enough to suggest using the Lyons package only for the new models (Skis, Floats and Clipped Wing), staying with the good-enough default FS2004.

7. TAXIING AND GROUND LOOPS

Admittedly, the ground handling of the default Cub is terrible: unless you are an expert, it is very easy to end up in a ground loop and crash, in both takeoff and landing. This issue is mentioned in quite a few online forums. Good advice is found in the properly entitled webpage http://forum.avsim.net/topic/29719-piper-cub-is-a-death-trap/ . Indeed, the Cub is difficult in real life, but surely not that much, and the Lyons model resolves the issue. [As reported by users, it is also resolved in the FSX model.]

8. TAKEOFF AND CLIMB

The real aircraft takes of at a very low speed (tail up at 35MPH, rotate at 40MPH, airborne at 50MPH). The default FS2004 model respects those speeds, but feels excessively light: in spite of the large wings, it would be more realistic to require a more decisive stick action to get off the ground something as heavy with a very low powered engine.

The Lyons' "Classic and Skis" model have fully rewritten dynamics, and so differences are to be expected. During takeoff, unfortunately, it shows the opposite problem of the default model: it feels like three times as heavy! I needed the whole Chicago Meigs runway to take off, and then it was VERY difficult to make it climb: a continuous stick action was required. However, I observed that it would eventually climb without slowing down, and things improved a lot by applying considerable elevator trim. The issue is not difficult to mitigate: after a first flight during which some lines are automatically created, in aircraft.cfg find the line "elevator_effectiveness=1.0" and substitute the "1.0" with a "1.4". Find also the line "elevator_trim_effectiveness=1.0" and instead of "1.0" write "2.0" and save the file. The handling during climb and descent is much improved, but you still need positive elevator trim for take-off. Interestingly, the model on Floats has a different flight dynamics and the takeoff trim issue is much less significant. I will refer below separately to the Clipped Wing model

9. LANDING

Landing the default Cub is tricky, with its tendency to bounce and then go into ground loops. The Lyons' model is much easier to land. Once landed, however, the default Cub with some wise application of brakes stops in a relatively short space, while the Lyons Cub has severely underpowered brakes: it took the full Meigs runway to stop it. Again, this is easy to fix in aircraft.cfg: look for the line "toe_brakes_scale=0.335704" and replace the 0.335704 with 0.670000.

10. SOUNDS

The default Cub has a very hollow, "tin can" sound, almost like a model aircraft. On the contrary, the Lyons model sounds like a motorboat, with elaborate details. I do not know which one is nearer to the real aircraft, but certainly the Lyons' sounds seem more realistic. The Skis go up and down with a distinctive "clip", and the Floats version sports a separate sound file with the necessary different landing sounds

11. AEROBATICS ON THE CLIPPED WING MODEL

The traditional Piper Cub is not meant for aerobatics at all. Loops are not easy, and rolls are slow with significant loss of altitude. Luckily, in the 1940's an aerobatic "clipped wing" Cub became immensely popular. The model is still in widespread use, and pictures can be seen online in http://www.clippedcub.com/ and http://www.clippedwingcub.com/ .

The Lyons included this model in their package, probably the best part of it. It is certainly a worthwhile addition to the aerobatics fleet of FS2004: a relatively low-powered aerobatic aircraft. It will easily acquire the 100kts needed for an effortless and fast **loop**: do not try to do a slow loop or else you will stall. The **Immelmann** is tricky: try to start the loop after descending and reaching 110kt of initial speed, because once you have performed the half loop your speed is too low for the final half roll, and in the latter you will lose again all the altitude you had gained in the half loop. The model will **roll** quite fast with no issues. It will also perform perfect **hammerheads**, something very few FS2004 models can do. [It will not fly sideways without fast losing altitude: this is a shortcoming of the FS2004 flying model and no aircraft can overcome it: the rudder does not produce any lift in FS2004]. A nice orange-coloured **smoke** effect is provided.

The Clipped Wing is undoubtedly the most interesting of Lyons variants. It will be even more useful and realistic with the following changes in aircraft.cfg, but only after a first flight during which some lines are automatically created:

empty_weight=950	should be reduced to 900
station_load.0=170, -3.0, -1.5, 0.0	the 170 should be reduced to 160
station_load.1=170, -3.0, -1.5, 0.0	the 170 should be reduced to 140
max_gross_weight=1935.000000	should be reduced to 1800
elevator_effectiveness=2.2	should be increased to 2.4
elevator_trim_effectiveness=1.0	should be increased to 1.5
toe_brakes_scale=00.335704	should be increased to 0.50

For further inspiration go to the Internet and search YouTube for "piper cub aerobatics clipped wing" and you will find quite a few movies of the real stuff.

12. GOODIES (OR SHOULD WE CALL THEM BADIES?)

The **Sailboat** is a nice thing, if somewhat rudimentary. When you move the stick laterally the rudder and wheel move, when you push the throttle it sprays and moves forward. However, the "aileron" controls the visible wheel and rudder, but the direction is controlled by the "rudder" [a bug surely caused by the programmer testing it "coordinated"!]. Further, once moving it works OK for a while, then it starts spinning around until it falls and sinks: at this point the model "crashes".

The **Jeep** is a nice thing to move around in airports. It has two quirks however. One is that, as per the sailboat, you turn by using "rudders", however the front wheels do not move, and to see them move (without turning!), you use the "ailerons" [yet another silly bug caused by the programmer testing "coordinated]". A more serious issue is that it works OK in flat terrain at slow speed, e.g. in a FS2004 airport, but as soon as you go too fast or uphill, it "takes off" and then "crashes" to the ground. Awful.

These issues cannot be fixed by editing configuration files, and they are not worth bothering. I simply deleted the Jeep and the Sailboat sub folders from the Aircraft folder.

13. CONCLUSIONS

Being used to the default Cub and its ground handling quirks, I prefer to stay with it for the classic version. However, I strongly recommend the Lyons package for the other versions: Skis, Floats and the excellent unique Clipped Wing aerobatic model.