Model Aviation's Sport Aviator
The e-zine for the new model pilot
www.MASportAviator.com

Hangar 9

PNP Piper Cub RTF

by Dave Vannieuwland

Hop into your time machine and go back 10 years or so to check out a hobby shop. Gee, the landscape has really changed since then hasn't it? No longer are the shelves stacked with small slender boxes of airplane kits holding a set of plans, instructions, and a bunch of sticks as it was only a decade ago. Now the shelves, and even the floors, are filled with Almost-Ready to-Fly airplanes (ARF) packed in large, sometimes gargantuan, boxes.

In the past, we could strap our new airplane kit to the back of our bicycle. Now we need to figure out how to fit the huge box into our SUV! Weeks, or months, of work to get your new airplane in the air have been reduced to a few days. To make things even easier, Ready-To-Fly (RTF) airplanes have recently appeared. These airplanes can be assembled and flying in an hour or less (after charging the batteries). Where can we go from here?

RTF aircraft offer a great way to start flying RC for those without any RC equipment. But, with the notable exception of the Hangar 9 Mustang PTS RTF basic trainer which features a JR 421 computer transmitter, almost all RTF aircraft are supplied with a very basic 4-channel transmitter and a minimal receiver. Great for a first radio system but somewhat lacking as the pilot progresses in the sport.

Now, Hanger 9 has come up with a new "class" of model aircraft kits, the "*Plug-N-Play*" (PNP) concept. The Plug-N-Play concept can be best described as an RTF airplane *without* the receiver and transmitter typically included with an RTF. At first you may scratch your head and say, "why would you do that"? After some thought, the concept makes a whole lot of sense.

One great thing about RTF aircraft is that they include a transmitter and a receiver. The bad thing about RTF's is that they include a transmitter and a receiver. Getting a receiver and transmitter is a great benefit for many folks, especially for those just entering the hobby. For those of us that have upgraded to a better transmitter or have multiple airplanes on the same frequency, an additional basic transmitter on a frequency we may not fly isn't very appealing. Especially if we have no choice but to pay for them anyway.

The Plug-N-Play concept offers another option. Said simply, the PNP concept is a Ready-To-Fly airplane where you install your own receiver and use your own transmitter. Looking through the Hanger 9 catalog, the Plug-N-Play products are mostly all advanced aircraft, targeting pilots that already have an advanced transmitter. But one of *Hanger 9's* PNP aircraft is the PNP J-3 40-sized Piper Cub. Personally I really love Piper Cubs. Flying one in the late evening when the wind is calm, the sun is setting and glinting off of the wing just melts any stress of the day away.

Photo 1 Photo 2

Opening the box, which is always like opening a present to me, revealed a very well packed product. The packing in critical areas like the cowl (already mounted on the airplane) had wooden reinforcements glued to the packing material. Everything in the box was damage free. Something else that stood out is the wonderful covering job. On top of the nice cub yellow Ultracote finish, there wasn't a wrinkle in the covering… not anywhere. No wrinkles appeared even after being exposed to temperatures of hot and humid 90F degree weather or cool 60 F degree dry weather. Wrinkles may appear when the airplane is exposed to direct sunlight. We will wait and see how it does at the field.

Photo 3 Photo 3A

Now for a closer first look. The airplane comes with an *Evolution .46 NT* engine already installed. The cutouts of the cowl that fit around the engine parts are suburb. JR 537 servos, ball -bearing supported, are installed for all of the control surfaces and the throttle.

Photo 4

Solid control rods are used for all of the controls using nylon clevises at the control surface end and bent wire hooks with nylon keepers at the servos. The elevator is a split elevator with the control rods connecting to the servo via a hardwood dowel. The quality of the covering, decals, and all of the finish details are wonderful. Although not included with the kit, there is plenty of room and mounting area in the fuselage to add a pilot if desired. The cowl is exceptional and is something that adds some intangible "wow factor" to the airplane. The finish, design and fit around the engine are impressive.

After getting past the table of contents, parts list, and other typical beginning pages of the photo-illustrated instruction manual, the actual pages dedicated to the Cub's assembly total only seven. Of these seven pages, the majority are filled with photos. There are just five assembly steps:

1. Install the receiver.

2. Install the pre-assembled landing gear.

3. Install the propeller

4. Install the stabilizer.

5. Install the struts and associated strut hardware to the wing. There isn't very much hardware that needs to be installed as can be seen in photo 1.

Photo 5

The first step; install the receiver. A minimum of a four-channel receiver is required, 1 each for the aileron, elevator, rudder, and throttle. A JR RS-600 receiver was selected. The RS-600 is a great, 6-channel sport receiver that supports both negative and positive shift transmitters (supports JR, Futaba, Hitec) by simply moving a jumper wire.


Photo 6 Photo 7

The most difficult part of installing the receiver is installing the antenna. Like most airplanes, the PNP cub has a plastic antenna tube that runs down the length of the fuselage. Threading that pesky antenna wire through the tube can be very frustrating. A method that works great is using a piece of pull-pull wire also used as “rigging wire”. The pull-pull wire is a thin flexible but stiff wire used for pull-pull rudder systems rather than using control rods.

This wire can also be used to securing wings, stabilizers, and fins to the fuselage. Many old time airplanes used this type of rigging to support these surfaces. The PNP Cub for example, uses flying wire on the tail between the stabilizer, fin, and fuselage. To install the antenna, thread the pull-pull wire through the antenna tube. Cut a VERY short piece of electrical tape to wrap around the flying wire and the antenna 1-1/2 – 2 times. A careful pull and viola`! The antenna is through. (*Ed. Note: another way to do this is to use 1/16 in. heat shrink tubing instead of electrical tape. The tubing has a strong hold when shrunk yet can easily be removed. The thin tubing fits easily into the nylon antennae tube.)*

Installing the receiver was straightforward but a bit cumbersome trying to fit a hand inside the fuselage. Installing the receiver would be easier if the windshield wasn’t already glued in. However, there would then be the added work of installing the windshield so this is a bit of a trade off. After connecting the servos and battery to the receiver, both are inserted into the supplied pre-cut foam and hooked to the switch.

A ‘Y’ cable is supplied for the ailerons but since the receiver choice is yours, a receiver with additional channels can be installed allowing for separate aileron channels. Another benefit of the Plug and Play concept! Having separate channels for the ailerons and a computer transmitter allows the option of having flaperons and the ability to correct adverse yaw by using aileron differential. Additional information on adverse yaw can be found in this article at Sport Aviator http://www.masportaviator.com/defs.asp


Photo 8 Photo 9

Step 2; the landing gear: The landing gear is 100% complete including the installation of the wheels. The landing gear is made of steel rod that is formed (bent) to make the familiar triangular side-view landing gear shape. The gear is attached to the fuselage using the typical nylon straps. Although not noted in the instructions, the screws to mount the landing gear were already inserted into the fuselage at the factory.

Just remove them and reinforce the holes with some thin CA. This makes the threads much stronger. This procedure was done with all screws on the model including the aileron hatches and cowl.

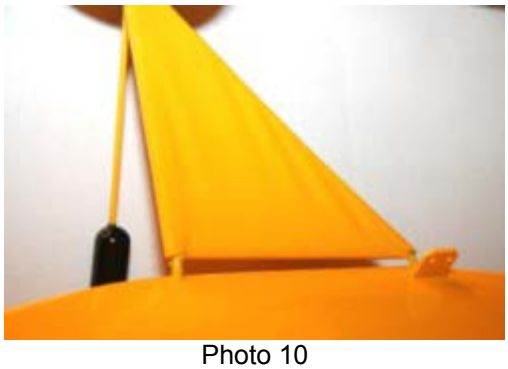

Photo 10

A minor problem was encountered when installing the landing gear. The landing gear did not fit exactly into the pre-cut slots. To make it fit, the gear just needed to be stretched a little so that the front and back mounts fit into the slots. This wasn't difficult but once this was done, the Ultracote covering on the landing gear became wrinkled (photo 10). A quick hit with the heat gun removed the wrinkles.

Photo 11

The third step is installing the propeller. The propeller is installed just like any other; on the front of the engine. However, a propeller is not included. The propeller is probably not included since there is a vast amount of propellers available and many people have their own favorite personal choice. However, being "almost an RTF", it would be nice to see one included.

The manual recommends an APC 10X6 prop and this is the propeller that was installed along with the recommended ¼" x 28 acorn safety nut. It's recommended that propeller installation be delayed until after our final inspection is completed. If not, we will be taking the propeller off again later. We will discuss the inspection in a little bit. (*Ed. Note: Dan used the APC 10 x 6 in. APC propeller because it was specified in the instructions. We have extensive experience with the Evolution .46, a truly great sport engine by the way, and can safely recommend using an APC 11 x 6 in. propeller instead. With the 10 x 6 propeller, the engine turns over 14,500 rpm. That is too fast for true Cub-like flight and the noise is distracting. The 11 x 6 in. propeller revolves around 12,000 rpm and makes for more realistic, and quieter, flight with plenty of vertical performance.)*


Photo 12 Photo 13

Step four; install the stabilizer. The stabilizer is supplied in two halves. One half has two metal pins that slide into the other half (photo 12). Each half is attached to the airplane using two socket head bolts that screw into pre-installed brackets with blind nuts (photo 13). It took a minute or two to get everything to line up with the pre-drilled holes to attach the bolts. Everything lined up great. As recommended in the manual, thread locker was applied to the socket head bolts.

Photo 14 Photo 15

To complete the installation, the flying wires already attached to the vertical fin and fuselage need to be attached to the stabilizer. These rigging wires have plastic clevises on the ends that attach to pre-installed 'L' brackets on the stabilizer. The manual mentions the wires will be "very tight". Indeed the wires were very tight. When trying to install the plastic pin on the clevis into the pre-installed bracket, it would keep bending. It was very difficult to insert the clevis pin into the hole and secure it. This was the most difficult part of the assembly. That said, this "most difficult part" took only 10 minutes to complete (gee that actually sounds easy!). If metal clevises were used, installation would probably be much easier and look much better than the white plastic clevises. (*Ed. Note: You can always buy metal clevises at the local hobby shop for a few dollars. I like the locking brass ones myself as they look great and have a metal locking pin that can't come loose.)*

Photo 16

The final step is installing the wing hardware and attaching the wing to the fuselage. Installing the hardware was easy but it was the most time consuming part of the assembly. There are two pairs of mounting brackets that attach to each wing. The instructions state these mounting brackets need to be attached to the wing but the wings came with these brackets already pre-installed. I won't argue with that! All of the wing strut hardware is attached using socket head bolts and nylon nuts.

The wing struts are made from aluminum and are aerodynamically shaped with a leading and trailing edge. The hardware finish looks great. The struts and hardware have a very thick coating of paint providing a nice uniform finish. Care needs to be taken when assembling the wing (including at the field) to avoid chipping paint at the mounting points with a wandering wrench or ball driver. An important note; the wing struts are required since they are integral to the support of the wing. *Do not fly the airplane without the struts properly attached.*

The wing halves are attached to the fuselage with a ½" aluminum wing tube and nylon "wing nut" bolts. No tools are required to attach the wing to the fuselage (tools are needed for the struts). The nylon wing nuts used to attach the wing to the fuselage are very convenient; something nice since installing the wing struts at the field will take a few minutes. The wing struts for each wing half are attached to the fuselage with two socket head bolts and nylon nuts. There are quite a few bolts and nylon nuts used for mounting the struts. It would be a good idea to keep some spares in your field box.

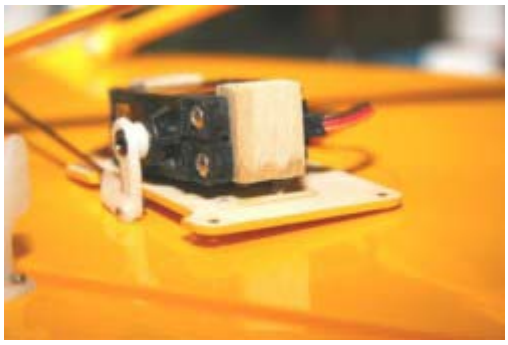

Photo 17

There are times you may want to make some personal adjustments or additions to an ARF. One of my preferences is to add a screw to the aileron mounting blocks when the servos are mounted using wood blocks attached to the cover of the aileron servo hatch. Many ARF and RTF models that use two servos employ this mounting method. I know it is safe but I can't help myself, I want the extra security a screw supplies.

Just as a test, I pulled a little on the wood servo mount block and it came free. I was probably applying more pressure than would the flight loads at the time. My recommendation is that you always put a screw though the bottom cover plate and into the mounting block on every airplane using this system.

The block was re-glued to the hatch. For all four aileron mounting blocks, a 1/16 in. hole was drilled through the hatch and into the mounting block. A small screw (a servo mounting screw) was inserted and the threads hardened with CA as described earlier. (*Ed. Note: I agree with Dan about reinforcing the glue joint here with a screw. Especially on an airplane like this that you know you will be flying often and forever. Instead of a silver servo mounting screw, you may want to us a #2 brass screw. It holds just as well but looks a whole lot better.)*

Assembling the Cub didn't take long at all; about one hour without taking photos, two hours with. I really like this PNP concept. It provides an attractive scale airplane that is just about ready to fly but still lets me use my own higher-grade radio equipment for better performance.

Preflight Check

The airplane balanced perfectly with the CG at the prescribed 3½ inches back from the leading edge. ALWAYS check the balance before your first flight. Wood density and other factors can vary from model

to model and it is possible your airplane may need some nose or tail weight added. But this Cub was balanced right out of the box.

Before considering the model “done” it’s always good to perform a very thorough preflight inspection. Many of the checks you should perform are outlined in the Sport Aviator article, “RTF…Maybe”. Always perform these checks whether you have an ARF, an RTF, or you built your airplane from a kit. It’s better to find problems on the ground rather than wondering why the airplane cr**hed! (*Ed. Note: Dan should know better, we do not use such profanity as the “C” word in a family publication like Sport Aviator. He really meant that it was better to find a problem before taking off rather than experiencing severe ground management difficulties while in flight.)*

Starting with the wings, the ailerons were pulled hard to make sure they were securely attached to the wing. The aileron servos were checked to make sure the mounting screws were tight and the blocks were securely fastened to the hatch (yes this was checked twice again). The control surfaces for the rudder and stabilizer were also pulled hard to ensure they were secure.

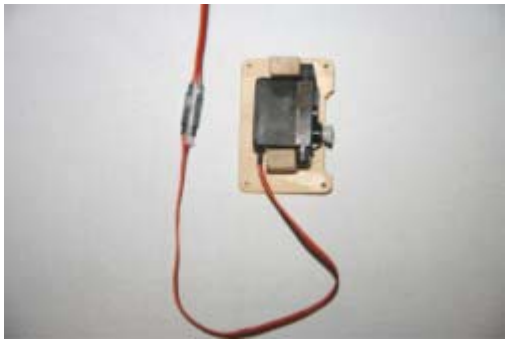

Photo 18

The servo wires were pulled out of the wing to check the connection inside the wing. Some fishing line was attached to the servo wire before it was removed. The servo wire can then be easily reinstalled by pulling the fishing line. The connections were fine and as a pleasant surprise, the connectors had been tied together at the factory as seen in the photo. It’s always a good idea to tie or use servo connector clips for this connection in the wing.

Moving to the fuselage, all of the hardware was checked and everything was found nice and tight. The engine cowl was removed and the hardware was checked. Again all of the mounting hardware was solid and tight.

Photo 19 Photo 20

A cable tie holds the fuel tank in the nose of the airplane. The fuel tank was removed and inspected. A small piece of plastic was found in the tank and a piece of flash was found attached in the neck of the fuel tank. Small pieces of plastic can be found in nearly every new fuel tank. It is a god idea to flush out every new fuel tank with denatured alcohol (do not use isopropyl rubbing alcohol as it contains water).

This piece was small enough to probably make it into the fuel tubing and might have been something that could have caused engine problems that just couldn't be figured out. The flashing was removed and fuel tank washed, dried and re-installed into the airplane.

Other checks outlined in the "RFT … Maybe" article were performed including lateral balancing the airplane, checking the fuel lines for holes, tightening the servo mount screws plus checking control surface linkages and movement directions.

The airplane was taken to the field to get ready for the maiden flight. The J-3 Cub had quite a few people drawn to it, it's really is a great looking airplane! I always like to start the engine the first time with the cowl removed since it's easier to get at everything. This also allows us a better look at the engine.

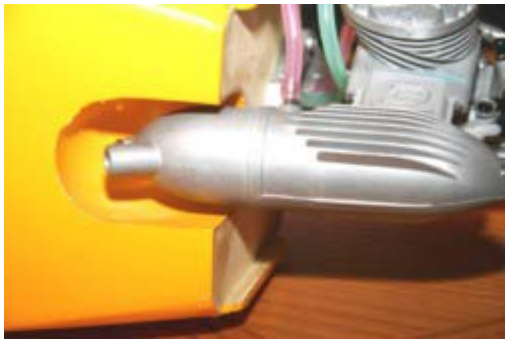

Photo 21 Photo 22

The engine is a .46 cu. in. Evolution 2-stroke. The high and low needles have built in stops limiting the adjustment to about one turn (photo 21). This is a great feature to help prevent running the engine too lean which could damage the engine. As for engine break-in, (also called run-in) the engine manual says there isn't any required since the Evolution .46 is pre-run at the factory.

The engine started easily and was running very rich. It took nearly a full turn of the high needle to get it running from a four-stroke note to a rich 2-stroke. On the low end, the engine wouldn't accelerate well when advancing the throttle. Even when advancing the throttle slowly, the engine would stumble and then stall. Making an adjustment to the low-end screw had a positive and dramatic impact. The engine was running extremely well. Even with the high-speed needle turned all the way in (lean) against the limiter, the engine was still a little rich. Since this was the first flight it was decided to leave the mixture slightly rich. If it remains rich in subsequent flights, the limiter can be readjusted to allow the engine to run leaner.

Photo 23

At the field the PNP Cub looked like, well, it looked like a Cub; stately, attractive and "basic airplane" The fuel tank was topped off, everything checked for fuel leaks and the cowl was reinstalled. The wings were attached and the top hatch was secured to the fuselage. A range check was performed and we were ready to go.

Photo 24

The airplane accelerated cleanly down the center of the runway. Once the tail wheel came off the ground, the airplane steered slightly to the left. A little right rudder to straighten out and the airplane took off beautifully. Once in the air, only a few clicks of elevator and aileron were needed.

Photo 25

The airplane flew beautifully in Cub-like fashion. Since we got in the air later than expected, the sun was already hanging low in the sky. The wind was calm; the sky blue and beginning to turn orange and red. Perfect cub flying conditions! After flying in some big ovals up and down the length of the field, a large loop was tried. The airplane has plenty of power and performed the loop gracefully.

Photo 26 Photo 27

A few rolls were added and again the airplane performed just as expected. It was time for a few low fly-bys over the field to get photos. As the airplane flew low past me the sun glinted through the window, I

banked the airplane slowly to the right at the end of the runway and the sun glistened off of the wing. Just perfect!

Photo 28

The first landing attempt was aborted since the approach was a little fast. The idle was set a little high as it was the first flight on this engine. The second attempt was a perfect wheel landing. With the first flight under the belt it was time to fuel up and get another flight in before dark. Fueling up… that proved more difficult than I had thought.

The first two times the airplane was fueled, the cowl was off of the fuselage. The carburetor's fuel inlet is deep enough inside the cowl that it cannot be removed easily for refueling. I had expected to use a hemostat to put the fuel line back on but that wasn't going to work. Here are a few suggestions. An additional filling line could be added to the fuel tank, the fuel line could be cut and a "T" junction installed, or the line could be cut and an in-line fuel filter installed. The in-line fuel filter option was used since it's a good idea to have a fuel filter anyway.

Photo 29

The airplane again took off as expected and was once again in the air. Piper Cubs have quite a bit of roll coupling. When the rudder is used the airplane will roll making the wing dip, looking very similar to an aileron input. A few sharp turns were tried using the rudder only and the airplane turns dramatically sharper to the right as compared to the left. This would normally seem unusual as engine torque favors a left turn. But the Cub has a lot of right thrust to help the pilot fly straight. The right thrust helps the airplane turn right on rudder only and slows the left rudder turn.

A nice scale looking maneuver to do with a cub is a flat turn. The flat turn is performed by turning the airplane with the rudder and inputting opposite aileron. The result is a turn without the wings tipping. The PNP Cub performed really impressive flat turns.

A few vertical lines were tried and the Evolution engine powered the airplane upwards nicely. The engine leaned out somewhat when doing these vertical up lines. Running a little rich for a new engine is a good

thing by providing additional cooling and lubrication. It's expected the engine will put out even more performance when the high-speed needle valve is leaned a little more a few more flights later into its life cycle. The power, throttle response, and reliability of the engine exceeded expectations, especially for only a second flight.

Photo 30 Photo 31

The cub was lined up for final approach and the idle trim was dropped down a few clicks lower than the first landing. A second great wheel landing with engine running at a slow idle as the airplane slowed to a stop sold me. I like this airplane. The Cub was taxied off of the runway with the engine running like it has flown 50 flights.

When cleaning the airplane, a lot of fuel build up was seen in the muffler "tunnel". There is a seam in the covering where the muffler tunnel and the bottom of the fuselage meet. A short muffler deflector will be added to make clean up a bit easier and make sure fuel doesn't get underneath the seam of the covering. On the topic of the covering, even being out in the sun at the field, the covering still looks excellent and wrinkle free. What an excellent fun, exciting, enjoyable, and relaxing evening of flying.

Next day it was back to the field to take a look at tuning the high-speed needle valve. In the first flights, vertical up lines (nose up maneuvers) would have the engine lean (the rpm's increased) which is an indication the engine is running rich. Another telltale sign the engine was running a bit rich was thicker than usual exhaust smoke. These are good things to look for when flying a new engine. After the engine has some flights on it the needle valves can be set a little leaner thus increasing performance. Typically, the engine manual will recommend the number of required flights before setting the needle valves to their optimum setting.

The engine manual for the *Evolution .46NT* suggests using the "pinch test" to properly set the high-speed needle valve. The pinch test is performed by advancing the throttle to the fully open position. Then, being careful to avoid the propeller, the fuel line is pinched and released to temporarily restrict the fuel flow. The engine manual recommends that the engine should speed up approximately 300 RPM and then die. When the pinch test was performed it sounded like the engine speed increased a lot more than 300 RPM. Rather than using my un-calibrated ear, the tachometer was dug out of the flight box. The tachometer showed the engine speed was indeed increasing much more than 300 RPM.

Since the needle valve was against the limiter and the engine could no longer be leaned, the limiter was bypassed. Bypassing the limiter is a very simple operation. The user manual does state that due to atmospheric, altitude or fuel conditions the needle adjustment may need to be moved passed the limiter. However, this should be done with consideration and caution since damage to your engine can result. This is especially true for a new engine.

The engine was tuned to obtain the maximum rpm of 14,800 using 15% sport fuel with the recommended 10X6 APC propeller. The recommended rpm range for the engine is 2,000 to 12,500 rpm. At this high rpm, the engine is outside its torque curve and is in the "speed zone".

Since a Piper cub doesn't fly at high speeds, a larger 11X6 in. APC propeller was installed. The 11X6 APC prop was a good choice bringing the maximum RPM down to 12,200 RPM. We will probably get a little more out of the engine with this propeller once the engine gets a few more flights on it. The engine

was set at 11,700 RPM (500rpm off peak mixture) and we were back to the skies. The engine ran great with plenty of power and performance.

During the 10th flight there was a problem where the throttle would work only “sort of”. The engine would throttle up but wouldn’t throttle down below ¼ throttle. There was little choice but to fly around until the fuel was gone. The airplane was brought safely to the ground for its first ever dead-stick landing and put on the bench. Once the cowl was removed the problem was quite obvious; the carburetor retainer (drawbar) had come loose in flight and had actually fallen out. This allowed the carburetor to twist in the engine housing. There was no more to do but to pack up and order a new drawbar. All of the hardware on the airplane, including the drawbar, was checked after the fifth flight for tightness, this problem happened on the 10th flight. A little thread locker will be used when the new drawbar is installed.

Photo 32

With a new drawbar installed it was back to the field. But this day happened to be one of those frustrating days we all dread. The day was plagued with constant engine problems. The engine would keep stalling, even on the field bench with the engine running at 5,000 RPM. The engine wouldn’t spit, or sputter, it would just turn off. Whenever the problem was thought to finally be fixed, a minute or two in the air would let us know otherwise as the engine would stall in similar fashion. One dead stick landing after the other was the menu Du Jour.

“Why? Why? Why?” kept going through my head. Nothing I tried seemed to work. It only seemed to make matters worse. But just before quitting and packing up for the day, a keen eye by Frank Granelli found a hole in the fuel tubing right where it attaches to the carburetor. The carburetor’s twisting due to the missing drawbar probably caused the hole in the fuel tubing. A new piece of fuel tubing and another flight had a landing with the engine actually running!

But one thing this “Day of the Dead Sticks” made clear was just how great a handling airplane this is. No matter where the engine quit, the Cub just glided back to the runway as if it all was planned that way. This airplane glides forever and its slow-speed handling is just amazing. Every time I thought this is it, we are going into the brush, the airplane would just keep flying until the runway appeared beneath those giant wings. When it was flying so slowly that I thought it would fall out of the sky, it just slowed some more and kept on gliding. That’s wonderful slow speed handling.

Photo 33

Photo 34

One other unfortunate situation happened, this time with the beautiful wing covering. When enjoying the final flight of the day with the engine running perfectly, there was some unplanned excitement. The top of the right wing covering peeled off from the fuselage to the wing tip. The covering was still attached to the end of the wing and was being dragged behind the airplane, flapping in the wind.

The airplane rolled upside down and luckily it was high enough to roll back upright. It took almost full left aileron and about ¼ left rudder to keep the airplane flying straight and coax it to line up with the runway. Once over the runway it got very interesting when it was time to throttle down to land, the airplane veered sharply to the left. A little throttle management and the Cub's excellent slow-flight capabilities plus that very powerful rudder, got the airplane safely to the ground. This aircraft is so good at slow flight that it only needs half a wing!

The problem with the covering was my own fault. It's always a good idea, even with an ARF or a RTF, to iron the covering seams down. The covering job was so exceptional I decided to bypass the ironing, something I will make sure I always do in the future. I still can't believe that the Cub flew that well missing half the wing. I just re-stretched the covering back in place and ironed it all down. I also re-sealed all the seams. Many later flights have proven that the covering is just fine.

(Ed. Note: I had the same thing happen to me while flying the Dave Patrick Extra 330L's 27th flight. I had neglected to re-seal the covering seams and the right wing top let go in flight. The Extra, while not a Cub, was able to land safely. Always, but always, re-seal the seams on every ARF and RTF airplane before that first flight. Re-sealing all seams is not *optional!)*

Summary

The Hanger 9 Plug-N-Play cub is an exceptional looking airplane from nose to tail. Overall fit and finish are superb and the engine is blended beautifully into the cowl. The wing struts are sturdy and extremely good-looking and are an eye catcher for folks at the field.

Assembly of the airplane is a breeze and can be performed in well under an hour. *Hanger 9's* Plug-N-Play concept is a real pleasure. It's wonderful to be able fly the airplane with my own computer radio, on my frequency and still have the benefits of a Ready-To-Fly airplane. The predictable cub-like flying characteristics and plentiful power fulfill all performance expectations. It would be great if Hanger 9 had a 4-stroke engine option available.

If you are in the market for a really great looking Piper Cub with the benefits of an RTF, great cub-like performance, the flexibility of using your own transmitter, at an excellent value, the *Hanger 9 PNP J-3 40 Piper Cub* is an excellent choice. For just $410, you get five ball bearing servos, a battery pack and switch and a great Evolution 46 NT engine plus a Piper Cub that you couldn't build from a kit for this price. This is a good deal on an excellent airplane.

Since getting the PNP Cub, Hangar 9 has introduced a true ARF version of this airplane. Everything is exactly the same except there is no radio or engine provided. The construction is identical and all servo mounting locations are factory installed. The "builder" will have to cut out the cowling for the engine and a little more work all around is required. But, if you already have a .45-size engine and the radio, you can save $200 and still have a Scale Piper Cub that you will enjoy for endless years and quiet evenings in the air.

Additional Aircraft Specifications

Manufacturer: Hangar 9
Cost: $410.00
Radio: JR 8103 trans.; RS-600 rec.
Servos: 5 x JR 537 included
Engine: Evolution 46 NT
Airfoil: Flat Bottom

Length: 51 in.
Wingspan: 80 in.
Wing Area: 932 sq. in.
Wing Loading: 17.68 oz./sq. ft.
Weight: 7.15 lb.

Special Airframe Features: Ready-To-Fly Construction, Servos and linkages factory installed, Quick, 1-2 hour Assembly.

Notable Positives

Factory pre-built, almost RTF
1-2 hour assembly
Very good looks. Pre-painted dummy engine
Light flying weight; low-wing loading
Good basic trainer and sport performance
Pre-Run, factory-adjusted engine
Terrific scale landing gear factory made

Notable Negatives

Hard to refuel
Recommended propeller too small