



30% EXTRA 300sp ARF



Instruction Manual

Congratulations and thank you for purchasing the Performance Aircraft Unlimited 30% Extra 300sp. The Extra is arguably one of the most renowned aerobatic aircraft ever produced. Walter Extra who originally designed the Extra, named his aircraft by the horsepower rating of the motor placed in them. The Extra 300sp is one of the Newest releases in full scale and now R/C use.

Our aircraft was designed with 1,420 sq inches of wing area while keep the total weight to a minimum. Whether you want an aircraft precise enough to compete in IMAC or 3d until your airsick, we believe our Extra fits the bill. It's light weight gives you the stability in high-alpha to take it to the extremes of the flight envelope. If tumbling maneuvers are your thing, our Extra 300sp will deliver with picture perfect waterfalls and blistering tip spins that are not for the faint of heart.

We believe you will find this to be one of the finest flying scale Extra's on the market. Most modelers will find assembly of this aircraft simple and straightforward. We recommend the builder follow the step-by-step instructions to achieve the best performance and to ensure nothing was over looked. This manual also includes tip sections throughout that may help you in key areas during assembly. Please familiarize yourself with this manual before assembly.

This aircraft is fairly large for a 50cc aircraft so users are cautioned of adding unnecessary accessories can add to the aircrafts total weight. A little here and a little there, it all adds up! Keep it simple, keep it light!

This manual is broken down into ten chapters for simplicity:

- Chapter 1** - Parts Inventory
- Chapter 2** - Preparation for Assembly
- Chapter 3** - Landing Gear and Tail Wheel Assemblies
- Chapter 4** - Canopy and Fuselage Hatch
- Chapter 5** - Engine Installation
- Chapter 6** - Cowling installation
- Chapter 7** - Rudder Installation
- Chapter 8** - Hardware Installation
- Chapter 9** - Radio and Control Surface Setup
- Chapter 10** - Final Inspection and Pre-Flight

Additional items needed to complete this aircraft, which are not included:

- An engine, within the recommend range, and propeller
- 8 channel computer radio and receiver recommended
- Batteries and switches (with regulators if using Ion batteries)
- Two aileron servos rated at least at 130oz of torque
- Two elevator servos rated at least at 130oz of torque each
- One or two rudder servo rated at least at 150oz of torque
- One throttle servo with push rod and links
- Optional choke servo with push rod and links
- One fueling dot or fueling device
- 3 to 4 feet of fuel tubing
- Foam rubber
- 4 inch spinner
- 30 to 45 minute epoxy
- A bottle of thin CA
- Covering iron
- Various modeling tools for assembly
- ½ inch low tack masking tape

Chapter 1 Parts inventory

Place an “x” to ensure your kit is complete:

- 1 Fuselage
- 1 Fuselage access hatch
- 2 Wing panels (1 right and 1 left)

- 2 Horizontal stabilizers (1 right and 1 left)
- 1 Rudder
- 1 Fiberglass Cowl
- 1 CF landing gear
- 1 Pair wheel pants and cuffs
- 1 Pair of Dubro Light wheels
- 1 CF Tail wheel and tiller assembly
- 1 Carbon fiber wing tube
- 1 Carbon fiber stabilizer tube
- 2 Nylon wing retention bolts
- 4 H9 titanium pushrods/turnbuckles
- 1 set of Dubro wheel collars
- 1 pair of Dubro wheel axels
- 1 HD Dubro pull-pull cable
- 1 Set of aluminum control horn assemblies
- 1 20oz Dubro fuel tank
- 6 HD 4/40 Dubro ball links
- 1 Set of additional various marked hardware
- 1 Vinyl graphics package



If any of these parts are missing immediately contact PAU.

If you need more information you can visit our support forum at: www.flyinggiants.com

This manual is strict property of Performance Aircraft Unlimited.

Chapter 2

Preparation for Assembly

Professionals utilizing premium Ultracote covering carefully covered your model. Due to climate changes since shipping, the models covering may have loosened and/or wrinkled. It's a good habit to go over your model with a covering iron to ensure all joints, seams, and edges are properly sealed.

Ultracote is a lower temperature film that seals and shrinks at lower temperatures. Make sure you set your iron on a **low temperature** initially to get a feel for the correct temperature setting and adjust accordingly. Higher temperatures will cause your covering to over shrink and distort. Also, use a sock over your iron to ensure a scratch free finish.

Place an "X" to ensure task completion:

- ❑ Go over you model as necessary with a covering iron to insure all joints, seams, and corners are sealed properly. **Use extra care not to touch the side windows with the iron!**
- ❑ Use your iron to ensure the areas where cutouts are needed for your hardware are located and sealed down, such as servos; tubes, and control horn mounting locations.



Next, we'll need to cut out the covering at the locations for hardware and final assembly. Make sure you use a sharp hobby knife so your cuts will be clean and straight.

- ❑ Start with the fuselage, Locate and cut out the servo and stabilizer and wing tube locations.
- ❑ Locate and cut the location for the anti-rotation pins and mounting holes for the stabilizers and wings.
- ❑ Locate and cut the two mounting bolt locations for the canopy and the two pull-pull exits.
- ❑ Locate and cut the servo mounting locations for each wing half.



Chapter 3

Landing Gear and Tail Wheel Assemblies

Now that we're ready for assembly, we are going to start with the main landing gear first. You will need to locate the following parts to begin assembly. We tried to keep the landing gear in a scale location while providing a canister tunnel.

Place an "X" to ensure task completion:

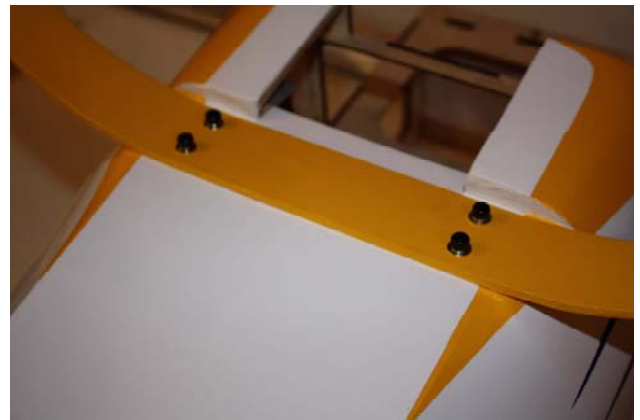
- What you will need in this chapter for the main gear:
 - ✓ Carbon fiber main gear
 - ✓ One pair of 3.5 inch wheels
 - ✓ One pair of Dubro axles
 - ✓ Four wheel collars
 - ✓ Hardware pack marked "main wheels"
 - ✓ Fuselage
 - ✓ Rudder
 - ✓ Tail wheel assembly

Not Provided:

- ✓ 1/2" and a 9/16" inch wrench
 - ✓ Blue loc-tite
 - ✓ Allen wrench for wheel collars
- Use a small soldering iron and open the holes for the main gear bolts.
- Install the landing gear to the fuselage using the four 8/32 bolts, spring washers, and flat washers, and compression nuts.

If you wish to install the optional cuffs, please go to page 15 of this manual first for instructions prior to installing the axels.

- Fasten the axles to the main landing gear with the lock nuts.
- Using your four wheel collars and wheels, center you wheels on the axles. Place the collars as close to the wheels as possible but ensure the wheels still rotate freely. Again, we don't want the wheel to move from side to side and contact the wheel pants. Also, we recommend the use of loc-tite on the setscrews of the wheel collars to prevent them from vibrating loose.



Now lets get the tail wheel assembly installed.

- Install the bracket with the three 6/32 bolts provided with blue loc-tite.
- Use loc-tite and place on all the setscrews of the collars securing the tail wheel and wheel assembly.



Tip#2 Set aside your two tiller springs, we will install those later after the rudder is mounted.

- Cut out the center wheel opening on the wheel pants on the side with the wood-mounting block.
- With the aircraft resting on the landing gear, we are going to need to set the right angle for the wheel pants. We used a standard servo and placed it at the end of the pant resting the end on the rubber grommets of the servo. Mark the drilling location for the 4/40 bolts.
- Drill the holes for the 4/40 bolts in the wheel pants at the locations you've marked.



- ❑ Apply some white wood or epoxy glue to the inner side of the four 4/40 blind nuts and install the blind nuts to the inside of the wheel pants.
- ❑ Now you can install the wheel pants with the 4/40 bolts and washers. Don't forget to use loc-tite here again. Wheel pants tend to take the most vibration.



Chapter 4

Canopy and Fuselage Hatch

Not much to cover installing the canopy as it's pretty much done. Keep in mind if you are doing any repairs to the canopy to use epoxy, RC56, or odorless CA. Regular CA will fog the canopy.

Place an "X" to ensure task completion:

- ❑ Gather the following for canopy and hatch installation:
 - ✓ Fuselage and Access Hatch
 - ✓ Two 6/32 bolts with two sealing washers
- ❑ Use your small soldering iron and open the two canopy hatch holes in the fuse.
- ❑ Install the hatch on the fuselage using two 6/32 bolts with the self-sealing washers.



Chapter 5

Engine Installation

Your firewall is pre-mounted but our customers can select from a wide variety of engine choices. It is nearly impossible to cover every engine installation choice in this manual. Your aircraft was designed around the 50cc to 60cc gas motors. Also, we have provided a canister tunnel on your Extra for those desire quieter operation. Please consult the manufacturer for the installation of optional canister.

We will cover the installation of the DA 50cc motor. Follow your engine manufactures instructions for any additional guidance. Lets get started!

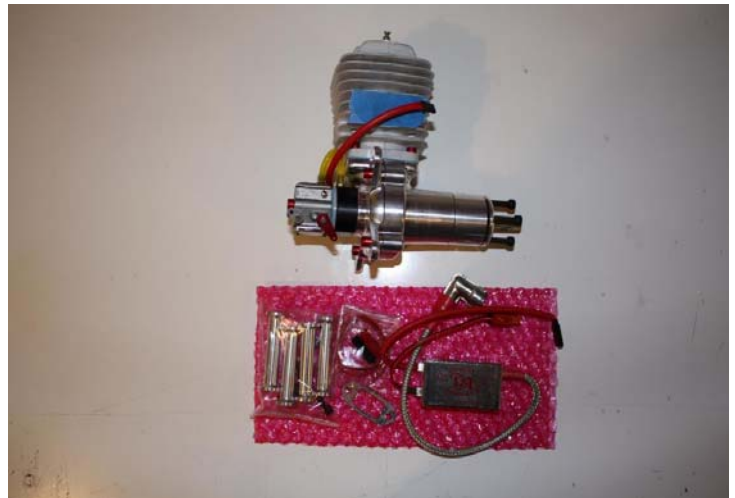
Place an “x” to ensure task completion:

What you will need in this chapter:

A DA-50 mounting template found in the back of this manual.

Not Provided:

- ✓ **3” standoffs for the DA-50**
- ✓ **Four ¼-20 bolts for the DA-50**
- ✓ Four lock or compression nut with fender washers
- ✓ An engine in the recommend size range
- ✓ 4 inch spinner
- ✓ Propeller
- ✓ A drill and drill bits
- ✓ Center punch
- ✓ Scotch tape for template



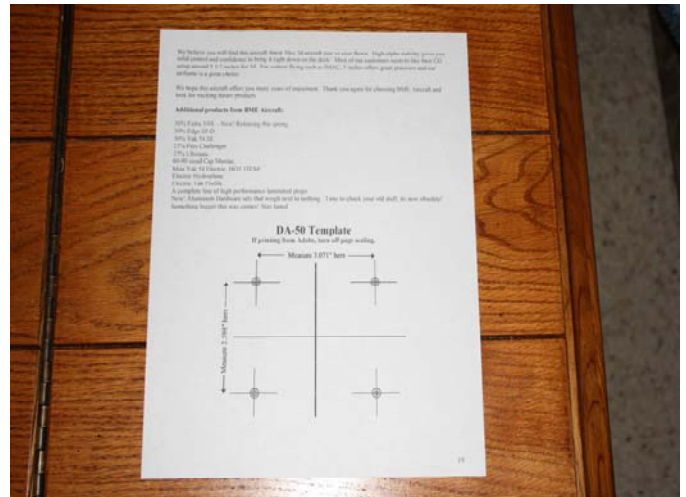
Also with the engine is installed, you will want the spinner back plate at lease 1/8th of an inch off the cowl for proper engine placement. You may need to add a washer or two to achieve the correct distance.

DA-50 installation

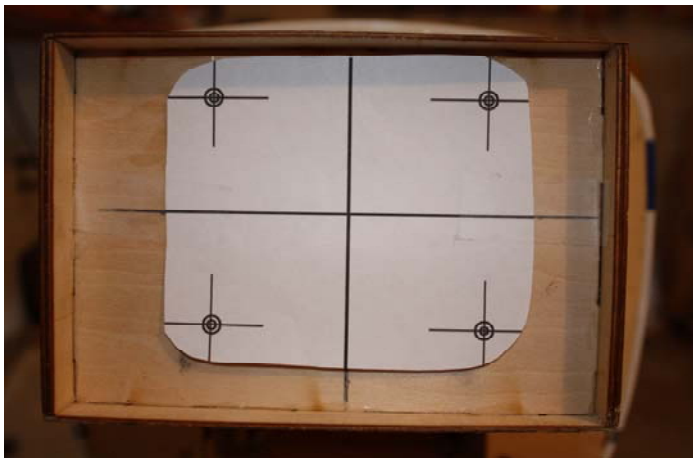
- ❑ The firewall is pre-marked so you'll just need to center your motor in the "+". Take a ruler and draw a line across the entire firewall for the thrust line and offset centerline.



- ❑ **DA-50 users only.** If using the DA template provided on the last page of this manual, check the measurements on the template and ensure the holes are correct. Cut the paper template to the size needed to tape it to the firewall using your thrust line and offset centerline as a guide. Mark the drilling locations and drill holes for 1/4-20 bolts.
- ❑ Mount the motor using 3" standoffs for the DA-50, and four 1/4-20 bolts.



- ❑ Now that you have the motor mounted, mark the locations for the fuel line and throttle push rod remove motor and drill those locations and reinstall motor.



We recommend 4/40 push rods for throttle and/or optional choke servo. Also ensure there is no metal-to-metal contact from the throttle/choke to the servos. 2/56 Ball links for 4/40 rod (not included) will prevent the aforementioned metal-to-metal contact and will bolt to nicely to your motors carburetor.

Depending on your engine and prop selection you may want to add another .5 degrees of right thrust. We've found that a 23x8 propeller seems to give us the best performance.

Chapter 6

Cowling installation

Place an “X” to ensure task completion:

- ❑ What you will need in this chapter:
 - ✓ Fuselage and cowling
 - ✓ 4 6/32 bolts with spring and lock washers

Not Provided:

- ✓ A 4 inch spinner
- ✓ A Dremel tool
- ✓ A facemask and eye protection
- ✓ Pencil or dry erase marker

Always wear a mask and eye protection while cutting fiberglass. Take your time while installing the cowl. With care you will end up with a professional installation that will make an impression at the field.

Close the choke and place a piece of tape over the carburetor inlet and exhaust outlet to keep out any dust while setting up your cowl. Since the cowl is preset and uses a ring to mount, there will not be much to do here.

- ❑ First, measure and cut out the muffler area. Make sure that the back of your spinner back plate is at least a 1/8th of an inch from the front of the cowl.
- ❑ Test fit the cowl to see where the cut is going to need to be made for the engine head. Measure the distance and cut an opening just enough to get the cowl mounted. We will return to fine trim it later.
- ❑ Now we are ready to do some fine trimming. We will want to cut at least an extra ½ inch cut around any of the engine components that protrude. Mark any additional areas that may require trimming to include if necessary, the spark plug.
- ❑ Remove the cowling and cut out the remaining areas to be trimmed. Re-install the spark plug and mount the cowl.



Chapter 7

Rudder Installation

Place an “X” to ensure task completion:

- ❑ What you will need in this chapter:
 - ✓ Rudder and fuse
 - ✓ Pull-pull hardware

Not Provided:

- ✓ 30 to 45 minute epoxy
 - ✓ Two cycle oil
- ❑ Next, we will install the hardware on the rudder before installing it. Find the pre-drilled hard point, remove the covering and insert the longer 4” aluminum rod in your hardware package.
 - ❑ There is an extra M4 bolt provided with your hardware set. This is used to tap the nylon insert in the center of the horns. Run this bolt several times in and out of the horn. Do not use a tap as this will cut away too much material leave slop in the horn. Failure to use this bolt prior to mounting your horns could cause the horn to seize and rendering it useless.
 - ❑ Install the cone shaped fasteners to the rod. **You must loc-tite as shown.**
 - ❑ Now add the control horns placing them at 1.5” from the hinge line.
 - ❑ Now were going to prep the hinges for installation. Take a small drop of oil and place it in each of the pivot points of your hinges. The oil prevents excess epoxy from bonding the joint.
 - ❑ Apply epoxy into the trailing edge holes of the vertical stabilizer. Now apply epoxy to the hinges.
 - ❑ Carefully insert the control surface into the stabilizer and butt the two surfaces together. Move the surface back and forth a couple of times to make sure all the hinges are aligned correctly and the desired throw is attained. You will want at least 45 degrees.
 - ❑ Use some masking tape to hold the surfaces together and let cure for at least eight hours.



Chapter 8

Hardware Installation

We provide high quality aluminum control horn assemblies included with our latest generation of PAU aircraft kits. We believe these lightweight assemblies are the best available and can also be purchased separately from PAU. Many pictures in this section are that of our Sukhoi as the assembly in this section is identical to the PAU Extra 300SP

Place an “x” to ensure task completion:

- What you will need in this chapter:
 - ✓ The entire airframe
 - ✓ Four H9 titanium push rods
 - ✓ Six sets of aluminum control horn assemblies
 - ✓ Four aluminum posts
 - ✓ Six HD Dubro ball links
 - ✓ One 20oz Du-bro fuel tank

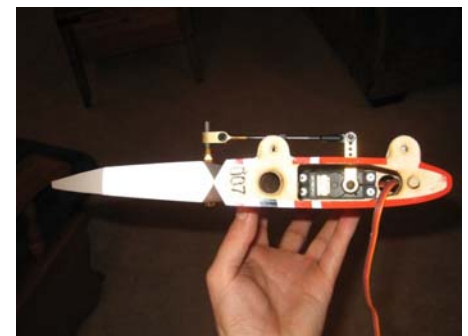
Not Provided:

- ✓ Four 130oz or better servos for ailerons
- ✓ Two 130oz or better servos for elevators
- ✓ One servo for rudder at least 150oz (200oz or more preferred)
- ✓ One throttle servo 70oz or better
- ✓ Four 1.5” aluminum servo arms
- ✓ One 4” offset rudder servo arm
- ✓ One Fuel dot or other fueling device
- ✓ Some foam rubber for mounting receiver, ignition module, and fuel tank



Install all your flight control servos with the output shaft closest to the control surface.

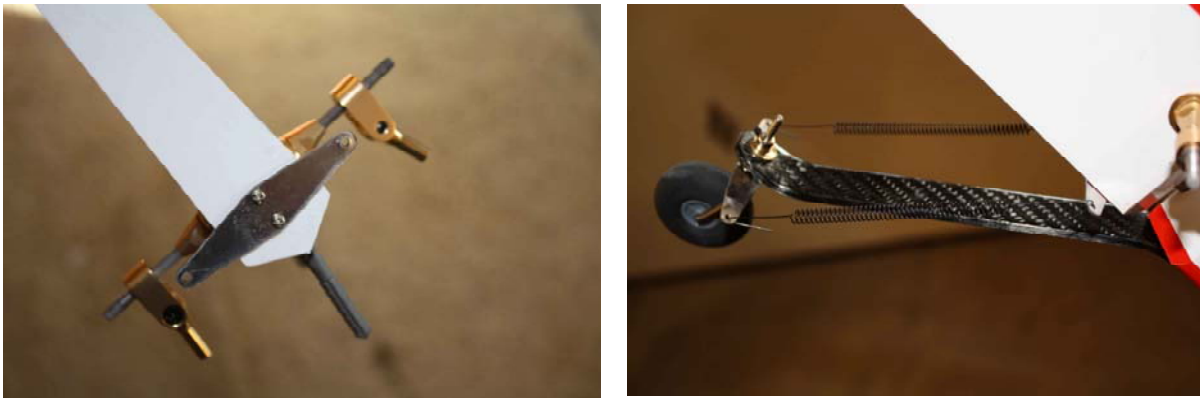
- Install 130oz or better servos for the ailerons in the servo trays located in the bottom of the wings.
- Install 130oz or better servos for the elevators in the servo trays located in the bottom of the horizontal stabilizers.
- Install one or two equaling 150oz or better servos for the rudder in the servo tray inside the fuselage.
- Install your throttle and or choke servos in the forward bays provided.
- First you need to find the pre-drilled holes for the steel posts. Install the aluminum control horn assemblies to each surface with the M4 bolt in the down position. You must blue loc-tite on the aluminum cone shaped base to ensure the bolt does not try to back out under vibration. Screw on the horns on to the posts. **Do not use loc-tite installing the horn.**



- Make sure your elevator servos are centered and mount your servo arms at 90 degrees to the hinge line.
- Take some masking tape and tape the elevator counter balances to the stabilizers so that they are in a center position.
- Screw in your two HD ball links onto the counterclockwise ends of the 2.5" H9 push rods and screw the other end into the control horn. Ensure everything is still centered. Don't forget to add locknuts to the 4/40 bolts attaching the ball link to the arm.
- Ensure aileron servos are centered and mount your arms parallel to the hinge line.
- Screw in four HD ball links onto the counterclockwise ends of the 3" H9 push rods and screw the other end into the control horn. Ensure everything is still centered. Don't forget to add locknuts to the 4/40 bolts attaching the ball links to the arms.



- Ensure your rudder servo is centered and mount your rudder servo arm.
- Install your pull-pull cable your remaining pull-pull hardware. Cables should be **not** crossed to avoid any rubbing on the exits. It is normal for the non-pulling side of the cable to slacken a little when the rudder is deflected.
- Install your tiller springs you set aside earlier.



- Assemble the fuel tank according to the directions provided on the package. You will need to decide whether you want a two or three-line setup. With a two-line setup you will need an additional "T" fitting in the carburetor line that connects to your fuel dot or fueling device. Make sure you use Tygon fuel tubing inside the tank for the clunk as well.

- ❑ Install the fuel tank just in front of the wing tube using zip-ties or hook and latch (Vetico) straps. Place a loop in the vent line over the top of the tank to prevent fuel loss during flight and improve flight times. Take small zip-ties or fuel line clamps and fasten to all the points where the fuels lines connect.



- ❑ Mount your battery switches in the side of the fuse. We mounted our switches on the black strip of the fuse thus hiding them from view.
- ❑ Install the fuel-filling device in a location of your choice. In this case, we installed it just behind the ignition switch.
- ❑ Install your throttle push rod. Again as mentioned earlier, we do not want metal-to-metal contact at the attachment point on the engine. Use a 4/40-rod with a 2/56 ball link for 4/40 rod to attach the push rod to the motor.
- ❑ Once satisfied with your throttle setup, mount the cowl using the five 4/40 bolts provided and attach the prop and spinner.
- ❑ Install the horizontal stabilizers at this time. Install the carbon fiber stabilizer tube. Slide in each half and secure them with the four 4/40 retention bolts and bonded washers.
- ❑ Lets install the wings at this time and check our center of gravity (CG). Install the carbon fiber wing tube. Slide in each wing panel and secure them with the four nylon wing retention bolts.



Tip#8 *If the wing is tight you can coat the tube with a little baby powder to aid the insertion of the wing panels.*

Tip#9 *For added protection in case the wing retention bolts back out during flight; you can add hitch pins to the anti-rotation pins of the wing. With the wings installed, mark the anti-rotation pins 1/4 inch from the fuselage side. Remove the wings and drill a small hole in the anti-rotation pins. You can find appropriate sized hitch pins at most local hardware stores. Re-install wings and insert the hitch pins for added protection.*

Now we're ready to check the CG and install your remaining hardware. The CG range is 5-3/4 to 7 inches back as measured where the wing meets the fuselage. We recommend 6" inches for initial flights.

- ❑ Check CG at this time and place your batteries and remaining hardware in locations to attain the desired CG. If satisfied mount your remaining hardware.

Congratulations! You have just completed assembly of your Extra 300sp. Now would be a good time to install the optional vinyl graphics included with your kit.

Tip# Optional step. Now would be a good time to seal all of your hinge gaps prior to installing you hardware. This can provide you with a better flying aircraft by increasing control surface performance and preventing possible flutter. We have provided matching covering material can be ironed in place to fill any gaps on the bottom of your control surfaces.

Take approximately a one-inch strip of covering the length of your surface. Fold it in half while placing into the gap with the control surface fully deflected up and iron it in place. Check to make sure you still have full surface travel once you have completed (figure 78,79, and 80).



Installing the optional landing gear cuffs.

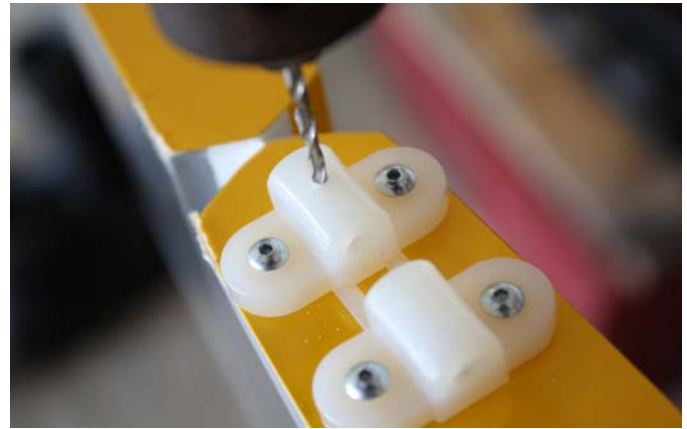
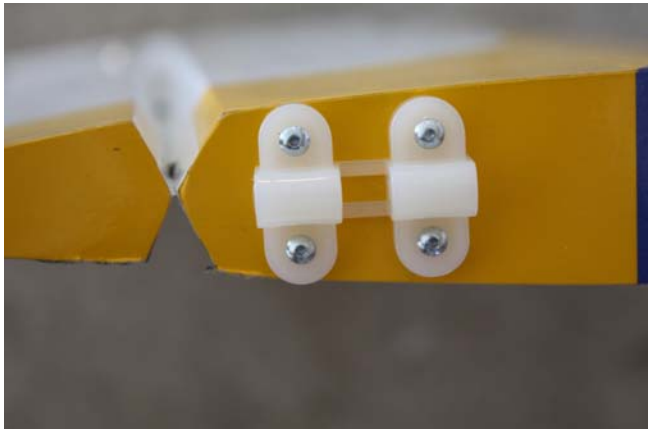
Slice open some fuel tubing or other suitable tubing and fit it to the base of the cuffs and glue in place.

Next, use silicone based RTV to attach it the landing gear so the landing gear can be moved for maintenance without having to remove the cuffs.



Installing the optional aerobatic attitude indicators.

- ❑ Locate the indicators and mounting bracket hardware.
- ❑ Install the brackets towards the trailing edge of the wings like shown.
- ❑ Drill and tap the center of the rear bracket on each side (towards the trailing edge) for the two 4/40 bolts provided.
- ❑ Install the indicator locking it in with 4/40 bolt. Do not over tighten, as it will crush the carbon fiber rod.



This adds a nice scale touch to the Extra 300sp for a small weight penalty.

Chapter 9

Radio and Control Surface Setup

Now we are ready to setup your aircraft for flying. Included in this manual are templates for measuring surface throw you may use if desired. We recommend that you setup your aircraft on low rates for initial flights until you become familiar with the aircraft and its capabilities.

The recommended low rates for this aircraft are:

25 degrees for ailerons with 0 to 20% expo
 15 degrees for elevators with 0 to 20% expo
 30 degrees for rudder with 0 to 20% expo

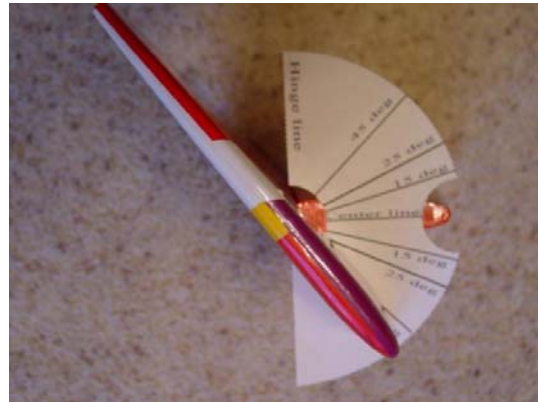
The recommended high rates for this aircraft are:

35 degrees for ailerons with 40 to 70% expo
 45 degrees for elevators with 40 to 70% expo
 45 degrees for rudder with 30 to 70% expo
or as much as you can stand for hardcore flyers.

CG Range is 5-3/4 to 7 inches.

Place an "x" to ensure task completion:

- What you will need in this chapter:
 - ✓ Completed airframe
 - ✓ Radio
 - ✓ Throw templates or meter
- Cut out the templates for surface throw. These should be located on the last page of this manual.
- Tape each one in place using the horizontal line as a reference point to each stabilizer at the counter balance and at the inside of the wings where the ailerons meet.
- Set your throws accordingly. Double check to make sure nothing is binding to include the throttle and or choke servos and their linkages. Also, ensure all surfaces and controls are moving in the proper directions.



Chapter 10

Final Inspection and Pre-Flight

Welcome to the final chapter prior to your maiden flight. We hope you have enjoyed building your Sukhoi 26M.

Lets go over the airframe and perform a pre-flight to make sure everything is in order.

- Inspect the airframe for any visible damage and loose covering that may have occurred during the build.
- Inspect the main landing gear and tail wheel assembly. Ensure all mounting hardware and collars are fastened properly.
- Inspect your motor installation and cowl to ensure all bolts are tight and the muffler is firmly mounted in place. Check the motor and muffler for possible contact with the cowl. Inspect ignition module and spark plug wire for proper mounting. Check propeller and spinner to ensure they are both secure.
- Inspect the inside of the fuselage to ensure your batteries, switches, regulators (if equipped), fuel tank and lines are securely fastened. Check nylon wing bolts to ensure they are in place and secured.
- Inspect all control surfaces and control surface hardware. Gently tug on each surface to make sure the hinges are properly bonded. Check the four 4/40 horizontal stabilizer fasteners and ensure they're in place and secured.
- Check all servos for mounting screws. Check servo arm mounting screws and inspect that the 4/40 links have been secured with lock nuts.
- Fill fuel tank and inspect for any leaks.
- Check your batteries in both your aircraft and radio to ensure they are fully charged
- Turn on radio to inspect all controls for binding, proper direction and throw while on high rates.
- Re-check CG. It should be anywhere from 5-3/4 to 7 inches depending on your flying style.
- Secure aircraft using a buddy or hold down and start motor according to manufacturers guidelines. Don't forget to lower your throttle prior to ignition.
- Perform a proper range check with the motor running using your radio manufacturers instructions.
- Make sure you go back to low rates for your maiden takeoff and enjoy!

This concludes your pre-flight checks. After your maiden flight, repeat these steps to perform a post flight to ensure nothing has loosened. It's always a good habit to use a checklist like this one to go over your aircraft prior to the first flight of the day.

Many hours went into developing this Extra 300sp keeping the scale appearance while still having unbelievable flight performance. For contest flying such as IMAC or 3d, the CG at 6" or the center of the wing tube offers great precision and 3d performance.



Every airplane has structural limits, and the larger the plane is, the more critical it is to understand and respect these limits. This is particularly true for 3D aerobatic planes, since by design, these planes are light weight, are over powered, and have oversized control surfaces.

Pilots need to use proper throttle management, and avoid high speed when executing high stress maneuvers such as Walls, Parachutes and Blenders. As a general rule, the throttle must be at idle position whenever the nose is pointed down (whether at 90 degrees or 45 degrees down line).

Planes must be inspected frequently, looking for any loosening screws, bolts and glue joints. Servos and linkages must be free of play or "slop", as this is a major cause of flutter (and crashes).

Understanding and applying these few safety and maintenance guidelines will help you get many enjoyable and rewarding flights with your Giant Scale Plane.

We hope this aircraft offers you many years of enjoyment. Thank you again for choosing PAU and look for exciting future products.

Additional products from PAU:

43% Edge 540.

36% Edge 540.

30% Edge III-D.

30% Sukhoi 26m.

27% Pitts Challenger.

27% Pitts Bulldog.

37% Ultimate.

60-90 sized Cap Maniac.

Mini Yak 54 Electric, HOT ITEM!

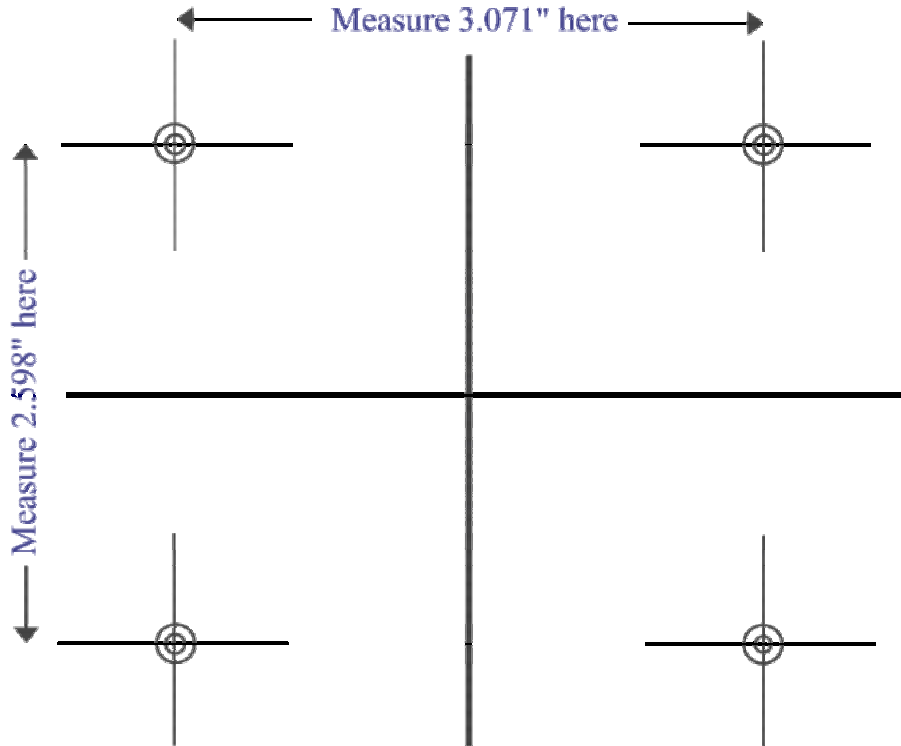
A complete line of high performance laminated props

New! Aluminum Hardware sets that weigh next to nothing. Time to chuck your old stuff, its now obsolete!

Something bigger this way comes! Stay tuned.

DA-50 Template

If printing from Adobe, turn off page scaling.



Throw Template

If printing from Adobe, turn off page scaling.
Cut out around all the dotted lines.

