VIPER XXL PRO

The VIPER XXL by Skymaster

The 1/2.5 VIPER produced by Skymaster is the result of years of R&D work and excessive testing. We are proud that you have decided to buy the best ARF ViperXXL in the market today. We hope you enjoy your jet! Please note that the photos show certain views from the prototypes. Some modifications and upgrades might have taken place by the release of the model. Many scale options are included with your model include, speed brakes and lights. This manual describes the assembling of " PRO" model. Speed brakes, landing gear and doors are factory installed. Before you start building and setting-up your aircraft, please make sure you have read this instruction manual, and understood it. If you have any questions, please don't hesitate to contact us. Below are the contact details:

Office Taiwan:
No.15, Min-San 3rd Street, Ren-Wu Area, Kaohsiung, 814, Taiwan, R.O.C.
TEL: +886 9 3299 7923
FAX: + 886 7373 1215
http://www.skymasterjet.com
Sales : skymaste@skymasterjet.com
Technical support : morne.m@pixie.co.za

Index:

INTRODUCTION

Thank you for purchasing Skymaster arf pro VIPER ! We have put a lot of effort and time into this model. We at Skymaster strive to be a market leader in the ARF— jet market. We were the first company to produce ARF—jets in the world and we would like to continue being amongst the best. Although we have made every effort that this model was fit for shipping, we would like you to inspect the contends and call your nearest dealer immediately if any defects or missing parts are spotted! This manual will allow you to duplicate the factory prototypes.

LIABILITY

You have acquired a kit, which can be assembled into a fully working R/C model when fitted out with suitable accessories, as described in the instruction manual with the kit. However, as manufacturers, we at Skymaster are not in a position to influence the way you build and operate your model, and we have no control over the methods you use to install, operate and maintain the radio control system components. For this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect application and operation of our products, or which are connected with such operation in any way. Unless otherwise prescribed by binding law, the obligation of the Skymaster company to pay compensation is excluded, regardless of the legal argument employed. This applies to personal injury, death, damage to buildings, loss of turnover and business, interruption of business or other direct and indirect consequent damages. In all circumstances our total liability is limited to the amount which you actually paid for this model.

BY OPERATING THIS MODEL YOU ASSUME FULL RESPONSIBILITY FOR YOUR ACTIONS.

It is important to understand that Skymaster, is unable to monitor whether you follow the instructions contained in this instruction manual regarding the construction, operation and maintenance of the aircraft, nor whether you install and use the radio control system correctly. For this reason we at Skymaster are unable to guarantee, or provide, a contractual agreement with any individual or company that the model you have made will function correctly and safely. You, as operator of the model, must rely upon your own expertise and judgment in acquiring and operating this model.

WARNING

This ‘jet’ aircraft is a high-end product and can create an enormous risk for both pilot and spectators, if not handled with care, and used according to the instructions. Make sure that you operate your jet according to the AMA rules, or those laws and regulations governing model flying in the country of use. The engine, landing gear, servos, linkages and control surfaces have to be attached properly. Please use only the recommended servos and accessories. Make sure that the ‘Centre of Gravity’ is located in the recommended place. Use the nose heavy end of the CG range for your first flights. A tail heavy plane can be an enormous danger for you and all spectators. Fix any weights, and heavy items like batteries, very securely into the plane. Make sure that the plane is secured properly when you start the engine. Have a helper hold your plane from the nose before you start the engine. Make sure that all spectators are far behind, or far in front, of the aircraft when running up the engine. Make sure that you range check your R/C system thoroughly before the 1st flight. It is absolutely necessary to range check your complete R/C installation first WITHOUT the engine running. Leave the transmitter antenna retracted, and check the distance you can walk before ‘fail-safe’ occurs. Then start the engine, run at about half throttle and repeat this range check. Make sure that there is no range reduction before ‘fail-safe’ occurs. If the range with engine running is less then with the engine off, please DON’T FLY at that time. Make sure that your wing spar tube is not damaged. Check that the anti-rotation dowels for the wings are not loose. Check that the wing, stab, fin and nose retaining bolts are tight. Please don’t ignore our warnings, or those provided by other manufacturers. They refer to things and processes which, if ignored, could result in permanent damage or fatal injury. Secure the plane before starting engine.

ARF Paint

The color finish on your Skymaster VIPER arf pro model was applied out of the mold. We have used only the highest standard automotive paints to finish your model.

Should you damage the finish, Skymaster stock the color paint and hardener required for the repair. A good automotive spray painter should also be able to mix and supply the correct samples for repair.

If you have no experience in the use of these paints, it will be best to seek assistance.

Do not leave your model unprotected in the sun! always cover your model or park it in the shade. Extreme temperatures will damage the paint!

Finishing Your All White VIPER XXL ARF PRO

It is always best to fully assemble the model before painting. By doing so no damage or glue prints will ruin the paint.

The all white model will have some release agent on the surfaces.

Use #1000 wet and dry paper to sand the entire model. Mold lines can be sanded and filled using normal automotive fillers.

Please be extra careful when sanding near the hinge line! The hinges can easily be damaged. When masking and painting please make sure the control surfaces are not bend past 90—180 degrees extensively. This will cause the hinges to crack and may cause flutter.

The clear canopy are not installed. It is best to install these components after painting was done.

HANDLING & TRANSPORTING

Composite models are very light but strong. These characteristics do have a down side! It is brittle.

Take care when handling your model. DO NOT ATTEMPT TO PICK UP AN FULLY FUELED MODEL BY THE LEADING EDGE BY YOURSELF! The leading edges will crack and delaminate. Full size jets have specially marked access points for the hooks of cranes!

Inspect your model before and after a rough landing. Make sure all parts are safe and sound.

Inspect model before and after transport. A sudden stop can easily cause an unnoticed dent!

We recommend to REMOVE the rear fuselage and wing tips for transport. It will only take a couple of seconds.

The wings and tails are very flight worthy structures. They are light and extremely strong , however, they will dent if mishandled. Always support these structures on clean soft foam rubber.

Tools and Adhesives
Tools etc:

This is a fairly quick and easy plane to build, for a jet model, not requiring difficult techniques or special equipment, but even the building of Skymaster aircraft requires some suitable tools! You will probably have all these tools in your workshop anyway, but if not, they are available in all good hobby shops, or hardware stores like "Home Depot" or similar.

1. Sharp knife (X-Acto or similar)
2. Allen key set **(metric)** 2.5mm, 3mm & 5mm
3. Sharp scissors, curved type for canopy
4. Pliers (various types)
5. Wrenches **(metric)**
6. Slotted and Phillips screwdrivers (various sizes)
7. Drills of various sizes
8. Battery drill and Dremel tool (or similar) with cutting discs, sanding tools and mills
9. Sandpaper (various grits), and/or Permagrit sanding tools.
10. Carpet, bubble wrap or soft cloth to cover your work bench (most important !)
11. Car wax polish (clear)
12. Paper masking tape
13. Denaturized alcohol, Acetone, or similar (for cleaning)

Adhesives:

Not all types of glues are suited to working with composite parts. Here is a selection of what we normally use, and what we can truly recommend. Please don't use inferior quality glues - you will end up with an inferior quality plane, that is not so strong or safe. Jet models require good gluing techniques, due to the higher flying speeds, and hence higher loads on many of the joints. We highly recommend that you use a slow cured epoxy for gluing highly stressed joints, like control horns, into position. The most commonly used is 'Aeropoxy'. The self-mixing nozzles make it easy to apply. It takes about 1 - 2 hours to start to harden so it also gives plenty of time for accurate assembly. Finally it gives a superb bond on all fiberglass and wood surfaces.

1. CA glue 'Thin' and 'Thick' types. We recommend ZAP, as this is a very high quality.
2. ZAP-O or Plasti-ZAP, odorless (for gluing the clear canopy)
3. 30 minute epoxy (stressed joints must be glued with 30 min and NOT 5 min epoxy).
4. Aeropoxy/Loctite Hysol 3462 or equivalent (optional, but highly recommended)
5. Epoxy laminating resin (12 - 24 hr. cure) with hardener.
6. Milled glass fiber, for adding to slow epoxy for stronger joints.
7. Micro-balloons, for adding to epoxy for lightweight filling.
8. Thread-locking compound (Loctite, or equivalent)

At Skymaster we try our best to offer you a high quality kit, with outstanding value-for money, and as complete as possible. However, if you feel that some additional or different hardware should be included, please feel free to let us know.

HEALTH

Use a mask (available at auto paint stores) to protect from inhaling the glass or carbon fiber dust. Use this mask whenever you are sanding or cutting fiberglass or carbon fiber materials. Use a charcoal filter paint mask (available at auto paint supply stores) when spraying any primer or paint. Spray out of doors or in a properly vented spray booth. Use safety glasses any time rotary tools, such as Dremel cut-off disc or Perma-Grit cutters, are being used.

GENERAL ASSEMBLY TECHNIQUES

We recommend to wax the model before assembling. This will help protect the finish from an epoxy finger print. Wax will not help for CA glues!
Extra glue, extra paint, extra resin will add up to a heavy model. Plan before you glue!
The glass cloth side of parts to glue, should be sanded with #80 grit paper for best glue adhesion.

Support the fuselage on foam pads.

Skymaster makes every attempt to insure that the parts fit. However, due to manufacturing tolerances, some parts may fit a little tight. Always trial fit parts and adjust if needed.

Only use high quality adhesives such as the ZAP products from Pacer Technology.

For extremely high stress areas we recommend “Aeropoxy.” It is the strongest and best gripping adhesive we have found.

If fuel or grease are on the surface, first clean with acetone or thinners.

Clean off all excess glue—excess glue is excess weight.

Always check the outside skin of the model to look for any glue residue and remove it with Acetone before it cures. “Aeropoxy” is tough to remove once it has thoroughly cured.

Radio equipment

Failure to use the recommended servos, output arms, extensions, and hardware may result in a loss of control!

Throughout this manual we make use of various types of servos and radio equipment!
The prototype was flown using MKS servos with powerbox bus system!
If you make use of another manufacturer, please use equipment with similar specifications! For JR we recommend DS8911HV servos.
The VIPER will require extension leads! Please use high quality extension leads. Make use of ceramic non ferrite cores if leads exceeds 1 meter. We recommend using X-bus system. This will eliminate long power leads.
Use dual battery management systems and dual RX equipment. With the introduction of 2.4 GHz even quad RX systems are considered as normal for a jet model.
Always center and install the correct output arms while on the bench, once the servo is in the aircraft access to the servo arm screw is sometimes limited.
Do not save any money when buying radio equipment. The price of servo's are far from the price of replacing the entire model.

REMEMBER: The best equipment is only as good as the weakest link. Ask yourself if this servo or link or lead etc is worthy of my trust to protect my very large investment…

Accessories

1. 2 MKS 9910servo's for the elevator.
2. 2 MKS9910for flaps
3. 2 MKS9910 for ailerons
4. 1 MKS9910 for rudder
5. 1 MKS9910 for steering servo.
6. 2 x 2way valve + 1 x 1way valves
   sequencer for landing gear + doors + brakes
7. 1 x 2 way valve for speed brake
8. Powerbox Royal with X-Bus support SRS
9. Pneumatic support set for landing gear
10. 1 x Turbine motors, with thrust range between 21Kg to 31kg, with accessories.
14. Fuel tubing, Hopper tank, festo fittings, fuel filters, fuel tube etc
15. Cable ties in various lengths.
16. Radio system with S-bus or X-bus technology (will simplify the radio installation)

Did you understand everything in this manual completely?
Then, and only then, let's start assembling your VIPER. If not, please read it again before you start the assembly.

Kit Contents

Picture A

VIPER XXL ARF PRO Contents:

Picture A
- Fuselage front, middle and rear section + hatches
- Fin + Rudder & tail cone.
- Nose gear + Main gear + doors installed
- Wings centre section + flaps + winglets
- Wing tips left and right + Ailerons
- Fuselage strakes
- Elevator
- Canopy assembly + glass

OPTIONAL PARTS

3 x Air Tanks
1 x Retract Valve
2 x Filler & 2 x Pressure Gauges
1 x Electronic Brake Valve
5 x Air Tubing, 10 x Quick Disconnect

Photo 1

Photo 2

Fuel Tank

Accessory Set

Photo 3

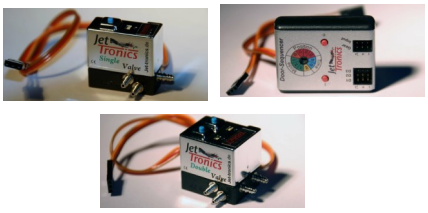

Photo 4

Jettronic 2way & 1 way valve & Sequencer

Control Brake, Gear and Doors

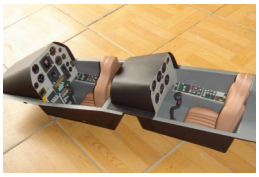

Photo 5

Stainless Tail Pipe

Cockpit + Pilot

Photo 6

Photo 7

L/G hydrolic set

Photo 8

Metal horns

Tank Hardware

Photo 9

Photo 10

Photo 11

LG Set + UAT

Photo 12

Photo 13

Wing bag

WINGS

NOTE: Make sure to have some sort of protective foam on the work bench. This will protect the paint surface from unwanted dents. Assemble both wings simultaneously. Mark √ each step.

The VIPER XXL have a 3 piece wing. Centre wing bolted to fuselage and holds the landing gear, flaps. The tips hold ailerons and are removable for transport.

FLAPS & AILERONS:

Photo 14

Photo 15

Photo 16

- ☐ Fit large servo metal horns to MKS9920 servos. Repeat for all 4 servos.
- ☐ Mark location of flap pushrod and cut slot in trailing edge.
- ☐ Secure the 2 servos and pushrods to flap brackets.
- ☐ Draw a line perpendicular across the hinge line and mark location for dual carbon horns for flaps—check that flap pushrods aeembly move free into slot.
- ☐ Dremel slot. Make sure the horns are supported by balsa inside flap.
- ☐ **Glue 2 horns parallel each other with 5 minute epoxy.** Width must be same as bearing link for tight fit.
- ☐ Fit 2 aileron servos to wing tips. Mark location for aileron horns and cut slot in skin.
- ☐ Install the pushrods with bearing link.
- ☐ Draw a line perpendicular across the hinge line and dremel slot for dual carbon horns.
- ☐ **Glue with 5minute epoxy. Make sure balsa block installed into aileron**

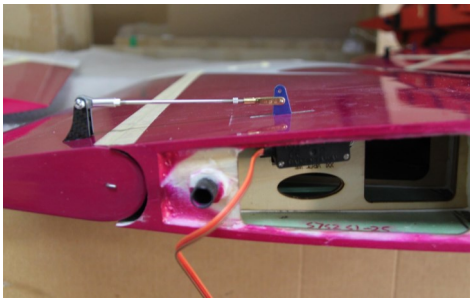

Photo 17

- ☐ Cut the servo & pushrod cover and screw in position.
- ☐ Install the tips and check operation of all surfaces. Route wires through centre wing.

FIN & RUDDER

NOTE: Make sure to have some sort of protective foam on the work bench. This will protect the paint surface from unwanted dents. No play must be present. Mark √ each step.

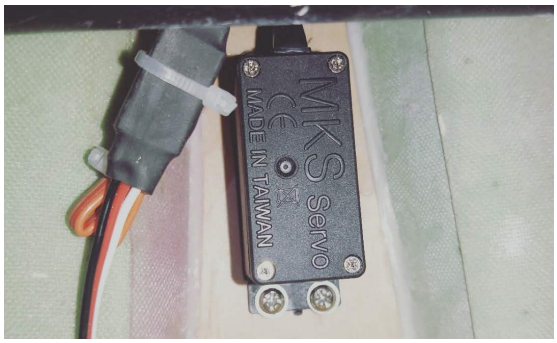

Photo 18

Photo 19

- ☐ Fit horn to servo and centre servo. Remove horn.
- ☐ Fit servo to bracket.
- ☐ Make up servo horn assembly. Use Loctite to secure horn.
- ☐ Install horn through skin and make sure free movement. Sand skin if needed.
- ☐ Trial fit the rudder to fin by inserting hinge pin.
- ☐ Trial fit servo horn into rudder slot. Check that you have no play.
- ☐ Check left and right deflection. If happy secure fin. Route servo wires away tailpipe.
- ☐ Note—Rudder and fin must be fitted before tailpipe.

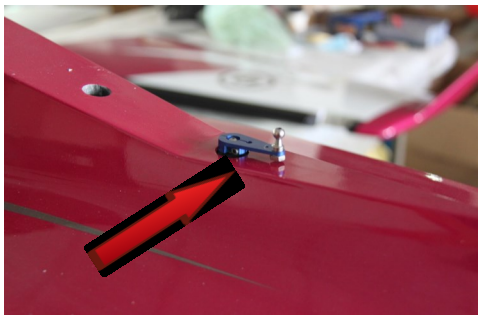

Photo 20

Photo 21

ELEVATOR

NOTE: Use some protective foam on the work bench to protect the paint surface from unwanted dents. Mark √ each step.

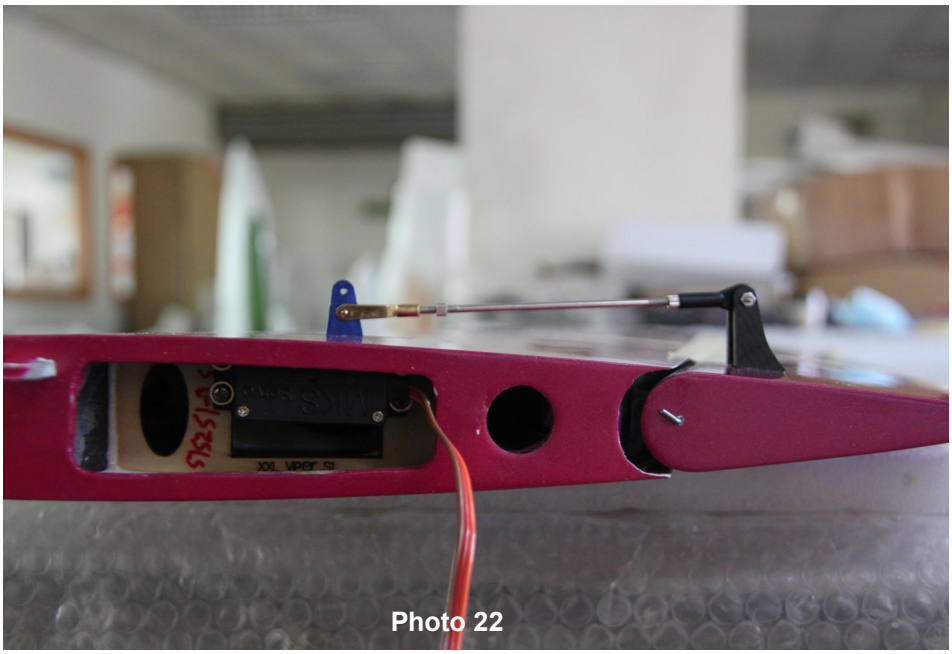

Photo 22

- ☐ Fit elevator to stab by hinge pin. **Check operation and no play**. Sand if needed.
- ☐ Fit metal servo horn and center servo using radio. Synchronize the servos.
- ☐ Fit servo to stab brackets. Mark location of horn in skin. Cut slot with dremel.
- ☐ Draw a line perpendicular across the hinge line and mark location for dual carbon horns for elevators—check that elevator pushrods aeembly move free into slot.
- ☐ Dremel slot. **Make sure the horns are supported by balsa inside elevator**
- ☐ **Glue 2 horns parallel each other with 5 minute epoxy.** Width must be same as bearing link for tight fit.
- ☐ Check operation and movement of elevator.
- ☐ Make up 2 elevator pushrod bearing mounts. Same length. Install pushrods.
- ☐ Run servo wires away from tailpipe.
- ☐ Connect to temporarily to radio and check operation of elevator.

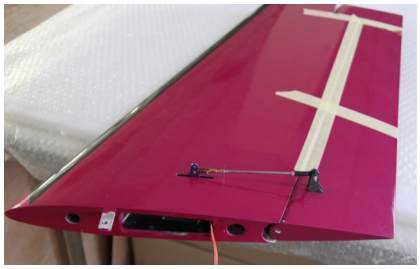

Photo 23

FUSELAGE REAR

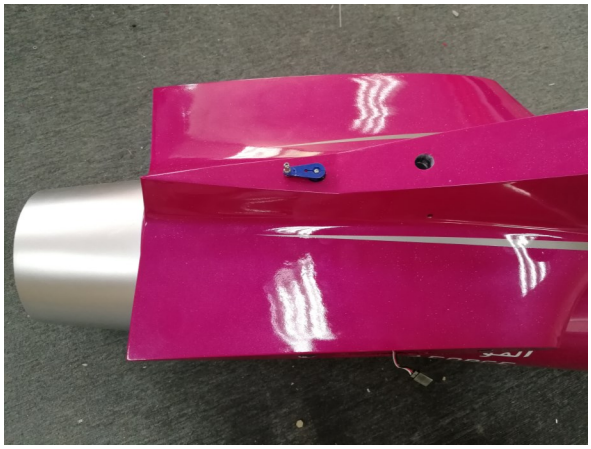

Photo 24

- Before joining the fuselage it is necessary to tidy up the servo wires. Make sure wires are secure and will not touch the tailpipe.
- Use quick disconnects between front and rear fuselage.
- Check operation of rudder and elevator
- Install the ventral fins below fuselage with bead of silicon.

NOSE STEERING

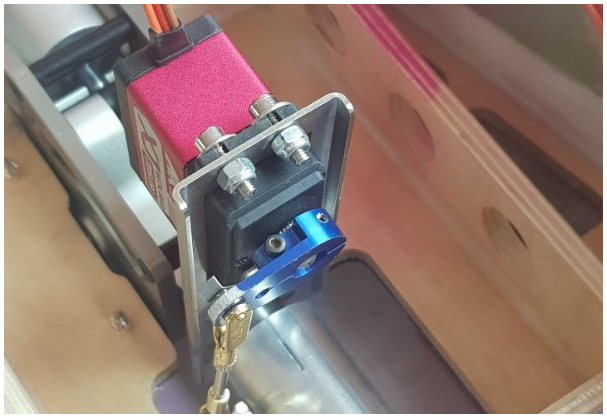

Photo 25

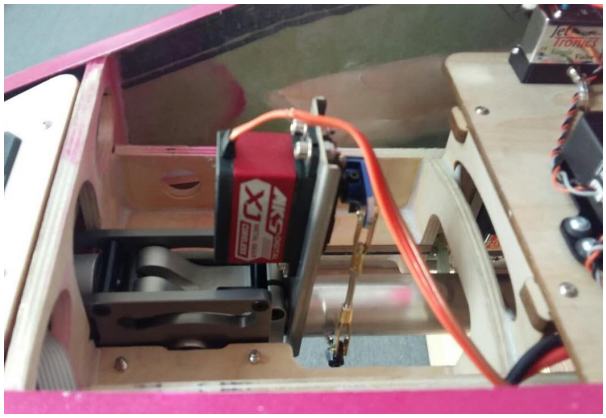

Photo 26

- Fit steering servo.
- Check operation of nose LG & doors.

LANDING GEAR

Photo 27

Photo 28

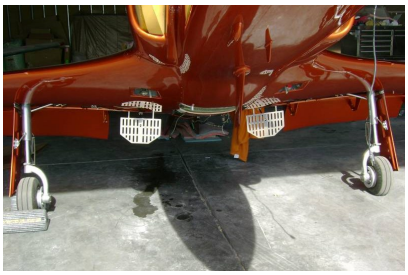

Photo 29

- Gear is part of centre wing section.
- Check operation of main gear and doors. All factory fitted. Root all air pipes and servo wires neatly to front of fuselage. Use quick disconnects.
- With gear in centre wing it makes it easy to assemble at flying field. Centre section can be left on fuselage.

NOTE: Real Viper has no gear doors in fuselage.

FUEL CELLS

NOTE: Bad plumbing lead to flame outs. This will destroy your model. Please take your time and do a good job.

- Make sure clunk moves freely and reaches all corners of inside of tanks.
- Fit to main tank. Mark pipes for “inlet” and “outlet”.
- Secure tank in position. The main tank will feed UAT.
- Plumb tank using diagram on next page. Fill tank and check for leaks.
- Drain tank with turbine fuel pump and check no air. Bubbles in system until last drop is drained. A good plumbing will secure good turbine operation.

Photo 30

FUEL CELL DIAGRAM

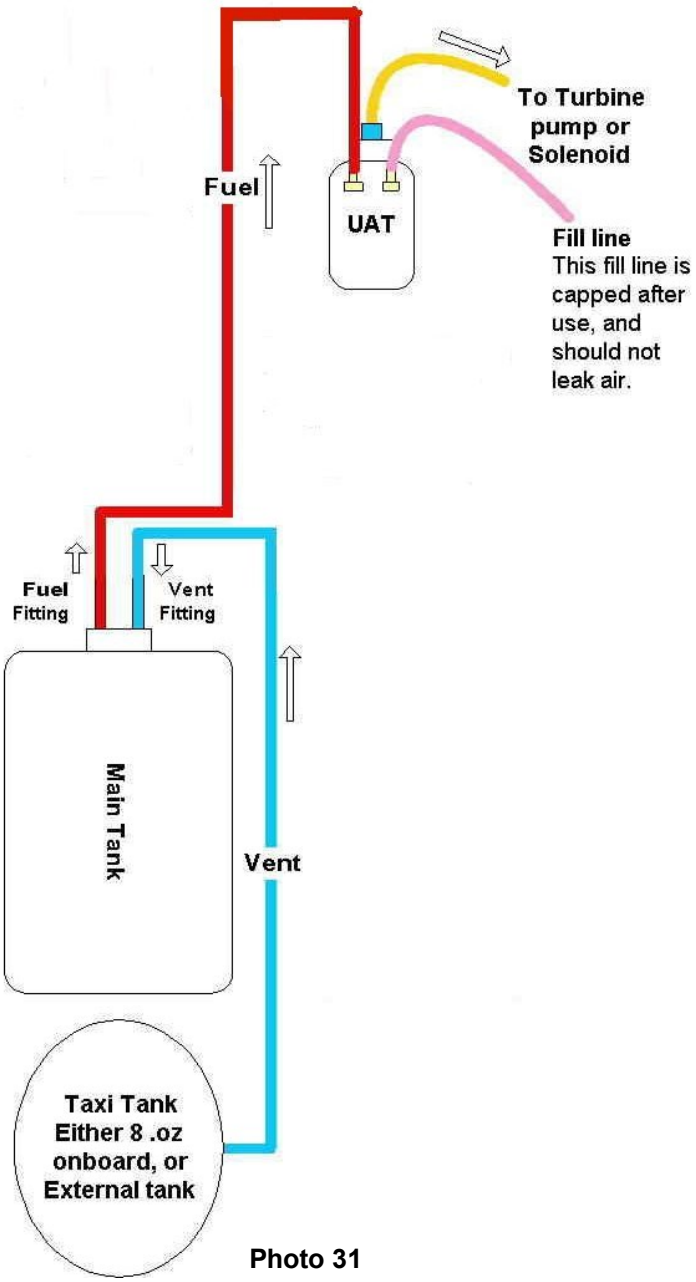

Photo 31

AIR SYSTEM:

You will need 2 x 2way and 1x 1way + sequencer for doors and brakes. You will need 1 x 2 way for operating speed brake. All work done at factory.

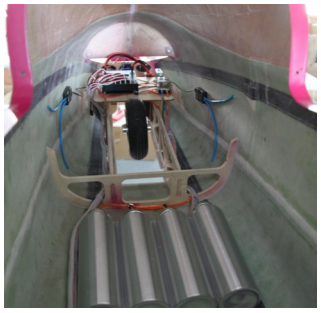

Photo 32

- Glue the air tanks (4) with silicon
- Use quick connectors on fuselage joints to help with break up of model.
- Fit the 3 filler valves and 3 pressure gauges onto tray in nose
- Plumb the landing gear, door and brake system by using color air tubing. T all same color tubing together until a single pipe emerge.
- Fit electronic valves + sequencers on tray.
- Secure 1 x 2way valve to operate speed brake.
- Air leaks can damage your model! Please do a thorough check for air leaks. Make sure the system can hold pressure for at least an hour in the up and down position.
- Do not rush this installation.

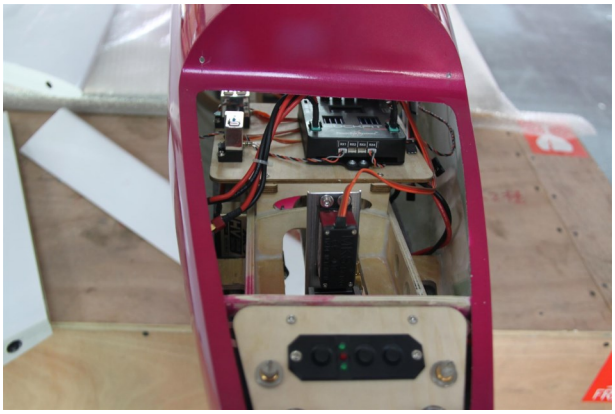

Photo 33

- For scale functions such as speed brake you will require additional 2 way electronic valves.

Photo 34

AIR DIAGRAM

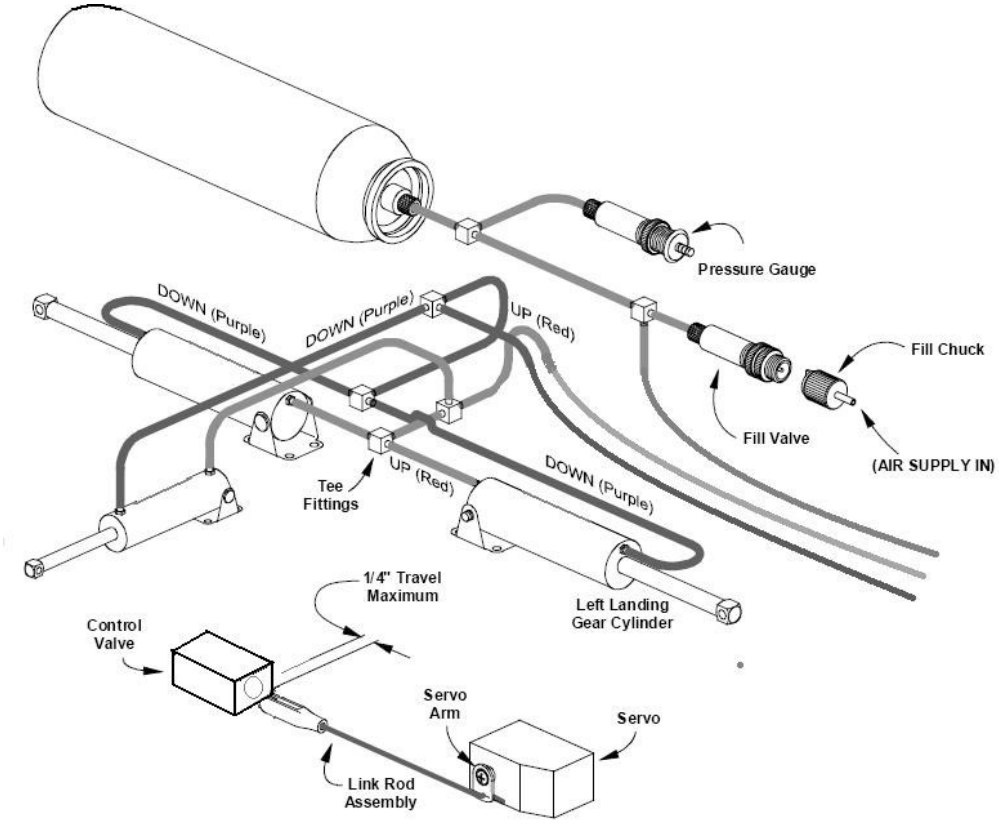

Photo 35

TURBINE AND TAIL PIPE INSTALLATION

NOTE: Use the manufacturer recommendations when installing your turbine. We have used a Kingtech K310G2 turbine with a thrust of 31Kg.

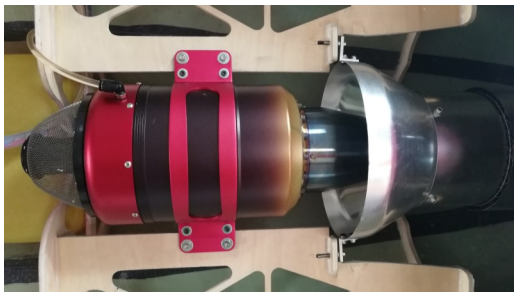

Photo 36

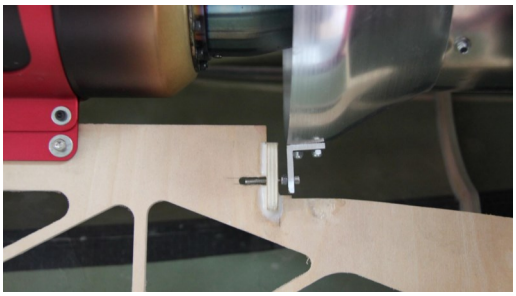

Photo 37

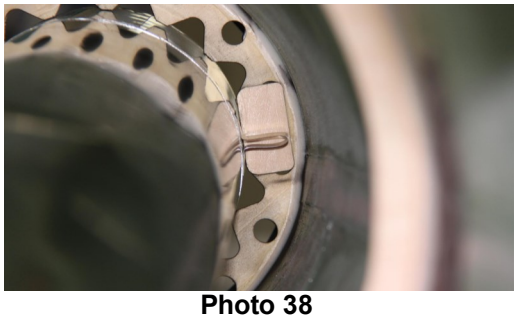

Photo 38

Photo 39

- Please follow the instructions supplied with your turbine.
- Use FOD screens. Secure all wires and cables and pipes. We recommend to make use of a mechanical shut off valve as well.
- Silicon glue bell mouth to pipe.
- Secure L-Brackets to bell mouth and secure to turbine rail. NOTE: For transport we recommend to remove rear of fuselage. Pipe must be removable to do this.
- The tail cone will twist and lock to decure pipe.

Photo 40

COCKPIT AND CANOPY (after painting)

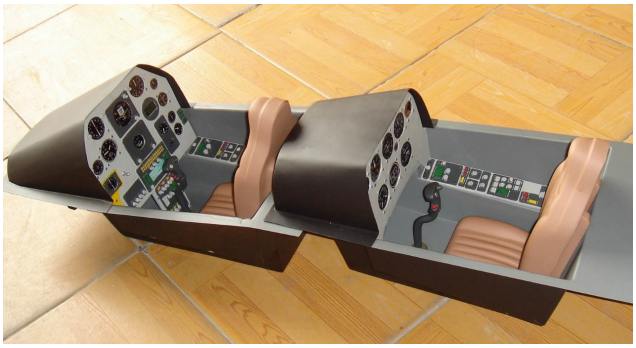

Photo 41

Photo 42

NOTE : PRO kit will have cockpit installed.

- Cut cockpit to fit fuselage and front nose gear.
- Secure rear of cockpit with 2 screws.
- Check that canopy clear the cockpit. Trim if needed.
- Install the pilots.

EQUIPMENT INSTALLATION INTO VIPER

- Equipment installation is a personal venture. There is one golden rule: Do it as neat and logical as possible! This will make fault finding and service of components easier. The Viper basically consist of 7 circuits!

1. Servo wires
2. Power cables
3. Data cables
4. Pneumatic pipes
5. Air pipes
6. Fuel pipes
7. RX cable / Satellite Receivers

Please try and separate these circuits as far as possible. It is advisable not to run RX cables near any kind of electrical fields. Make all switches and filler valves and charging sockets easy accessible. If you use S-bus technology it will simplify installation.

- The VIPER will come out tail heavy if you do not plan installation. It is very important to install all equipment as far forward as possible.
- Removable nose hatch make access to radio gear easy.
- I have installed all batteries in nose.

.

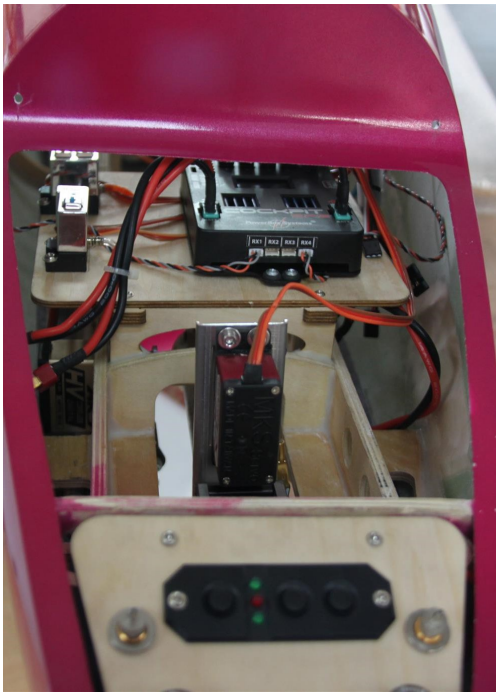

Photo 43

BEFORE YOU FLY

It is assumed that the builder of this kit has acquired the basic skills and knowledge necessary to make a safe and functional radio control installation into a model. Therefore, these notes are intended only to assist that experience.

TRAVEL MAX SETTINGS:

1. Elevator +35 mm/ -35 mm
2. Rudder +40 mm /-40 mm
3. Aileron 30 mm down / 35 mm up
4. Flaps 100 mm landing / 50 mm take off

Do not change location of CG unless you are experience and have some feel of model before!

CG: 160 mm from root at outer wing panel

- **Set the max speed to 150mph! The prototype was tested with a K310G2 turbine.**
- **The VIPER XXL was fitted with the longer scale wings. Weight was saved via new construction techniques. Please do not use this jet for high G maneuvers and high speed flying. This jet was designed for scale flying and not high performance sport jet.**

Photo 44

Take-Off

Do some taxi tests before your flight! Make sure you are familiar with all settings and make sure the model track straight on the ground without rudder input.

Choose a fine day for the maiden flight. Select take off flap or flight mode 1 and open throttle. Gently pull back on stick 30m down the runway. Raise the flaps and gear at safe altitude. If the ailerons feel sluggish—select higher rate. Land and adjust to fit your need.

Slow Flight

Most of the first flight should be utilized to get familiar with the slow speed flight characteristics. Select the flaps to the takeoff position; there should be no pitch change. Extend the gear and select full landing flaps; adjust the power to maintain level flight and a speed of about 60—70mph. Climb to a safe altitude and slow the model to the edge of a stall to know where that edge is.

Landing

Fly a complete circuit before landing. Approach from the downwind side and lower the LG. Fly a complete circuit getting use to the power required. On the next circuit lower the flaps. It is very important to get the nose above horizon for landing as the viper will float and you may land deap. Do a go around and land again. The wing loading is very good and slow landings is easy once your skill level is good. Use elevator to get nose up and throttle to change altitude. You will need to work out a glide slope to fit your run way. Just before touch down—pull more elevator to flare model. Do not pull to much elevator in glide slope as you may snap the airframe. There is fine line between just right and too much. Do not use speed brakes for landing on maiden. Let the model roll out and apply brakes.

We at Skymaster wish you many happy flights with your VIPER XXL! Add some landing lights and smoke to make a good show plane.

Anton Lin and Skymaster Team!