X-VIPERJET arf

Assembly and Operational Instructions Manual



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INTRODUCTION

Thank you for purchasing Skymaster arf Viperjet! 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 judgement 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 Viper 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 'failsafe' 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 model was applied in or out of the mould. 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 ARF

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. Mould 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.





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 FUELLED 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!

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.

LIVE HINGE

Skymaster utilize this system of hinging control surfaces because it is a very strong hinge system and is accomplished at the factory.

Occasionally, because of climatic changes, the bottom surfaces may "catch" or interfere with control travel surface actuation. Should this happen, use a fine abrasive strip to further bevel the L.E. of the control surface.

CAUTIONS: Do not apply any primer or paint to the underside of the main surface trailing edge.

Prior to each flight, check that the ailerons and elevators actuate properly, up and down.





TOOL LIST

- 1. Perma-Grit sanding blocks
- 2. Perma-Grit small files
- 3. X-Acto Razor Saw
- 4. X-Acto hobby knife
- 5. Carbide Cutters (5/pk)
- 6. Set of ball end hex wrenches
- 7. Dremel Drum Sander
- 8. Dremel cut-off discs and mandrel
- 9. Dremel tool
- 10. A good set of small Phillips and slot end screwdrivers
- 11. Steel ruler
- 12. Pin vise to hold 1/16" drill bit
- 13. Soldering Iron
- 14. Solder
- 15. Cable ties
- 16. ZAP CA, epoxy, Aeropoxy
- 17. Microballoons
- 18. Resin mix
- 19. Polyester putty
- 20. Aeropoxy





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! We have used JR equipment during the installation process. If you make use of another manufacturer, please use equipment with similar specifications!

The Viper will require extension leads! Please use high quality extension leads. Make use of ceramic non ferrite cores if leads exceeds 1 meter.

The trend nowadays is to 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. The JR Matchbox or Powerbox Royal makes this task very easy without using the complete radio system on the work bench.

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...





COMPOSITE PARTS



Photo 1

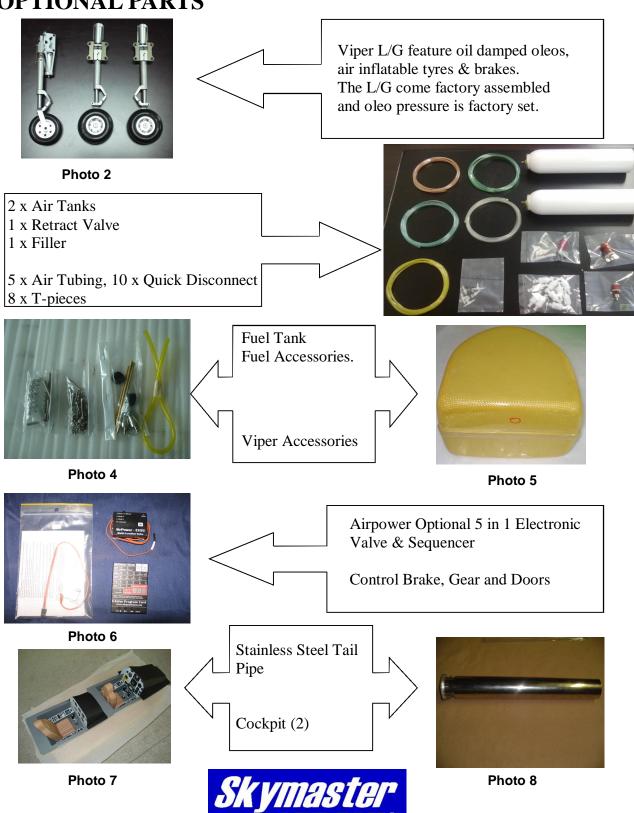
- 1. Rear fuselage including hatch
- 2. Nosecone including landing gear and door
- 3. Canopy
- 4. Left wing including landing gear and doors
- 5. Right wing including landing gear and doors
- 6. Left stab
- 7. Right stab
- 8. Fin
- 9. Rudder
- 10. Winglets (pr)
- 11. Ventral fins (pr)



X-VIPERJET arf

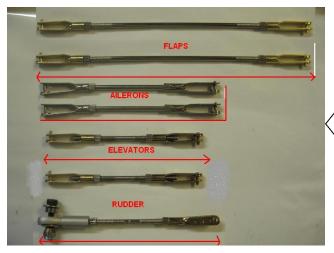
Assembly & Operation Manual

OPTIONAL PARTS





CONTROL LINKAGES



Flaps: 98mm

Aileron: 88mm

Elevator: 70mm

Rudder: 68mm

Steering: Cable

Photo 9

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. The Arf Pro kit feature factory installed landing gears with doors. Please check operation of landing gear. Check all nuts and bolts and screws. We may have missed something. Mark $\sqrt{\ }$ each step.

- Use Aeropoxy to glue LG blocks and LG ribs to skin of wing or carbon cloth and resin if you want to reinforce this area for possible "not so good arrivals". For normal tarmac landings it is strong enough.
- Check servo mounts. Use CA to glue plywood if needed.
- ☐ Check operation of Flaps and Ailerons.
- Trim if needed. Make sure surfaces move freely.

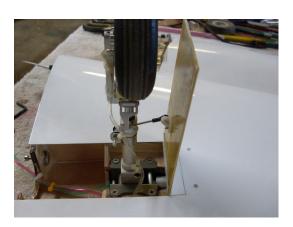


Photo 10



X-VIPERJET arf

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Fit 2 L-shape servo brackets to 2 x JR DS8411.

The 2 servo's must be mounted back to back with servo horns opposite each other.

Secure servo horns and centre servo's with TX.

Secure 2 x extension wires. Use safety clips on joint.

Photo 11

- Feed wire through ribs.
- Secure servo's to wing. Use 8 servo screws.
- Draw a line perpendicular to hinge line.
- Use masking tape to mask off area around control horns. This will help with inserting glue in slots.
- Mark location of horns. Make sure pivot point is directly above hinge line.
- Use Dremel to cut slot for control horns.
- Use 30 minute epoxy to glue control horns
- After epoxy cured, insert pushrods.



Photo 14

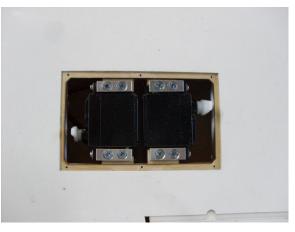


Photo 12

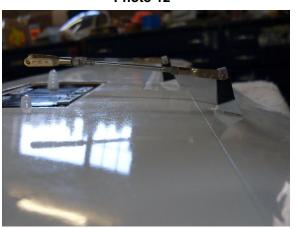


Photo 13





Cut slots in servo cover to clear servo horns.

 \square Secure servo covers with 6, 1mm set screws.

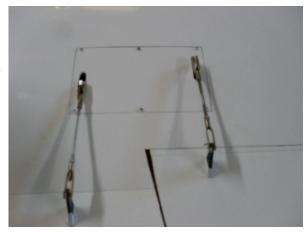


Photo 15

- Fit and glue winglets to wing tips. (do this after painting)
- Trail fit both wings to fuselage. Bolt in position and check operation of LG. Trim fuselage if needed!
- Repeat for other wing.



Photo 16





STABILIZERS

<u>NOTE:</u> Make sure to have some sort of protective foam on the work bench. This will protect the paint surface from unwanted dents. Assemble both stabilizers simultaneously. Mark $\sqrt{\ }$ each step.



- Inspect the hinge line and make sure elevator operates freely.
- Locate 2 x DS3301 servos and secure long HD plastic servo horn to servo.
- Connect both servos to RX and set up TX for dual elevators. Centre both servos.

Photo 17

- Mark location of servo horn. (Put servo on top of skin and mark location)
- Cut hole in skin. Check servo horn moves freely. Draw line perpendicular across hinge line.



- U Cut slot in root of elevator and fuselage to clear servo. Note that servo horns must closets to TE.
- Secure servos to plywood mounts. The back of servo will exit stab root. Therefore a opening must be cut in fuselage.
- Cut slot for elevator horn and glue in position. Make sure pivot point on horn is direct in line with hinge line.

Photo 18

- Run extension wires in harness and secure to formers. Note: It is very important that wires do not touch tail pipe. Use protective sleeve if you feel like it, although the prototype did not have.
- If using Sullivan clevises you need to drill servo horn. (standard holes will be too big and flutter will occur. Use bearing links for best results)

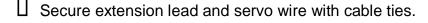




Photo 19







Insert stabilizer spars & bolt stabs in position.

Fit pushrod.

Photo 20

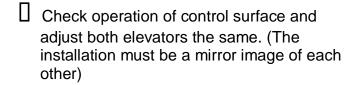




Photo 21

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. Mark $\sqrt{\ }$ each step.



- Mark location for servo horn on skin of fin.
- Cut slot with Dremel tool.
- Trial fit servo into fin & make sure all clear servo.
- Mark location of rudder horn. Mask off area.
- Cut slot for rudder horn and glue in position. Check for free operation.

Photo 22

Install long servo horn and centre servo.

Secure extension wires inside fuselage. Make sure no wires do touch tail pipe.

Trial fit fin and rudder. If happy glue rudder hinges and rudder in position



Photo 23







☐ Fit pushrod.

Check operation of control surface and adjust rudder pushrod for centre.

Slide fin in position and secure with bolt.

Photo 24

VENTRAL FINS

NOTE: Make sure to have some sort of protective foam on the work bench. This will protect the paint surface from unwanted dents. Mark $\sqrt{\ }$ each step.

- Dril 4 2mm pilot holes for ventral fins
- Use aeropoxy and glue 2.5mm steel pins in position.
- ☐ Mark locations for pins onto ventral fins.
- Drill 4 2mm pilot holes into ventral fins.



Photo 25

- Trial fit fins. Note the fins are shaped to fit fuselage. Make sure it aligns with the panel line drawn on fuselage.
- Mask off area both sides of each ventral fin. This will help not to get glue onto unwanted areas.



When happy use silicon glue and glue fins in position. Align fins with turbine hatch. Make sure both fins sit at same angle. (Note: If model unpainted do this after painting)

Photo 26





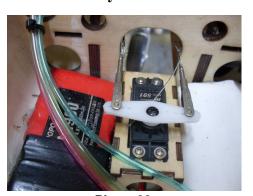
FUSELAGE

Make sure you have a good stand for fuselage. Once the nose wheel and ventral fins are installed it is very difficult to handle on a flat surface. You will need to assemble the rest of the Viper on this stand. Note: Arf pro nosegear and doors are factory installed.



Photo 27





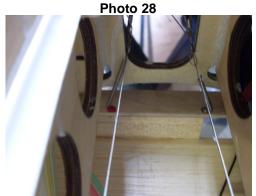


Photo 30

- Locate the 4 x M5 bolts and washers for fuselage.
- Align fuselage and secure with 4 bolts. Check fit of canopy once the fuselage halves are joined.
- Route all loose servo wires to nose. Secure wires with cable ties to formers. Also install 2 x Aileron and 2 x Flap extension wires.
- ☐ Install JR DS8411 steering servo.
- ☐ Centre servo and install push-pull cable system.
- Install springs or elastic bands to tension cable. This will help pull cable out of way when noseleg is retracting.
- Retract unit and check for clearance all around wheel.







Check operation of nose door and main doors in fuselage.

Photo 31

TAIL PIPE

- Dril holes in bellmouth of tail pipe.
- Slide tail pipe in position. Note: The rear of pipe must just exit the rear former by 10mm.
- ☐ Mark location of screws on bellmouth mount.
- Dril pilot holes for self tap screws.



- \square Secure pipe in position and glue end of pipe with silicon glue to former.
- Glue bellmouth with silicon glue.



Photo 33





FUEL CELLS

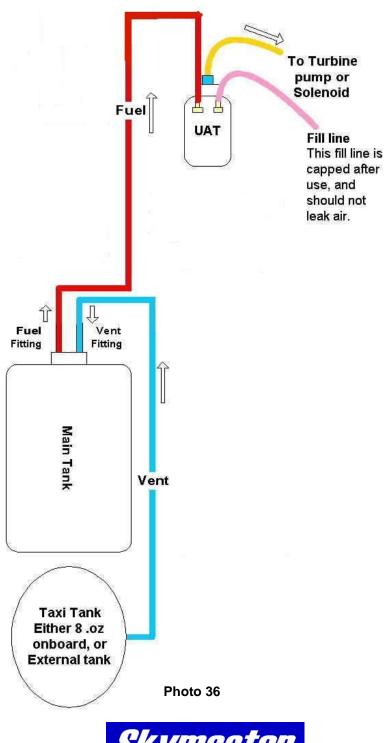
The fuel system is very important. A good installation will ensure trouble free operation and no flame outs due to air bubbles. Make use of an air trap. We recommend BVM UAT.

1			Rinse tank and make sure no to manufacturing process stayed. Do a pressure test and see if to on seam lines. Mark the top of tank. Also drawn and the standard see if the seam lines.	behind in tank. ank is secure no cracks		
	Photo 34		of flow.			
	Make up fuel fittings.	. M	ake sure clunk will reach all cor	ners of tank.		
	When you cut coppe for better operation.	t copper pipe, make sure to ream ends				
	•	tank. Tighten bolt and do an air test. Make aks are present. Do not over tighten bolt.				
	Silicon glue bottom tank to bottom of fuselage and inlet duct. Install UAT on bottom of fuselage in front of bottom tank.					
	Plumb tanks with tyg	gon	tubing.	Photo 35		
	Fill and drain tanks! Check that no air are trapped in tanks. UAT must drain last and stay full of fuel all the time during draining.					



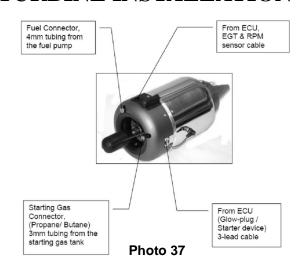


FUEL CELL DIAGRAM





TURBINE INSTALLATION



- Please follow the instructions supplied with your turbine.
- Secure turbine to turbine rail via hatch at bottom of fuselage. Leave gap of 25mm between NGV and tailpipe.
- Run all turbine wires and power cables on opposite side of servo wires.
- Always secure all wires in harness. I would suggest you install a FOD. This will save you money in the long run.
- Install fuel pump close to UAT. We recommend to make use of a mechanical shut off valve as well.
- Secure all Festo pipes with cable ties. Make sure fuel filter and gas canister are mounted vertical.
- Install NiCad or LiPo battery in nose next to LG. I always put a fuse holder inline with power cable.
- Locate 6 x 2mm screws to hold turbine cover in position.

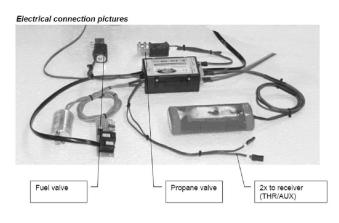




Photo 38 Photo 39



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AIR SYSTEM

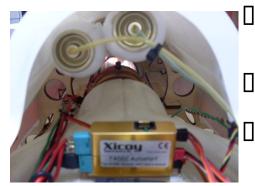


Photo 40

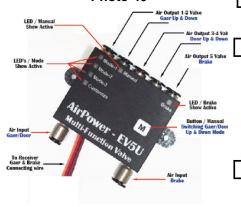
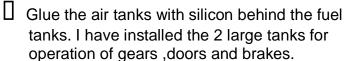




Photo 41



Photo 42



Fit the 2 filler valves and 2 pressure gauges onto accessory tray.

Plumb the landing gear, door and brake system by using color air tubing. T all same color tubing together until a single pipe emerge.

Route all 5 pipes to the accessory tray in front of fuselage.

The air system will consist of:
Air up, Air down retracts (2)
Air up, Air down doors (2)
Air out brakes (1)
Air in (2)
Total of 7 pipes

There are 2 options available for the air system:
Mechanical Valves or Electronic Valves

For mechanical valves you will need 2 x 2 way valves and 1 x 1way valve with 3 servos and sequencer.

The electronic EV5U will do all the above in a single unit. This will make installation much simpler and save space.

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.





For scale door installation the Viper require additional 2 way electronic valves. The main doors in the fuselage will stay close before and after retraction. This can easily be programmed with EV5U.



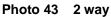




Photo 44 1 way

AIR DIAGRAM

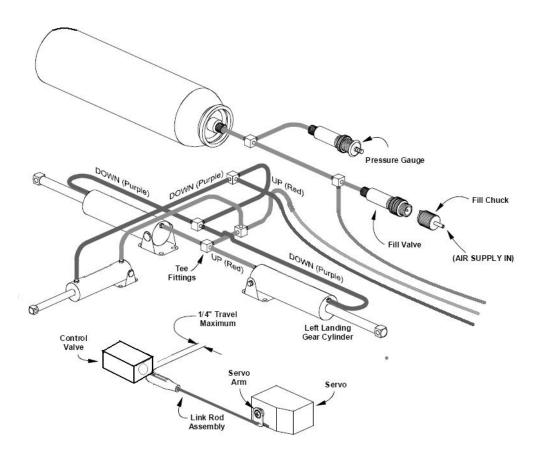


Photo 45 Diagram for retracts





COCKPIT AND CANOPY



Paint inside of frame black or grey for

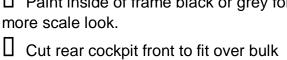


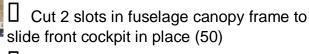


Photo 46

Cut rear cockpit to clear upper tank fittings. (48)

head. (47)

Photo 47



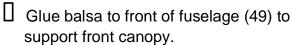




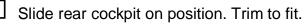
Photo 48

Slide front canopy in position.

Photo 49



Photo 50



Use small 2mm self tap screws to secure cockpits in position.



Photo 51



Photo 52





EQUIPMENT INSTALLATION INTO VIPERJET

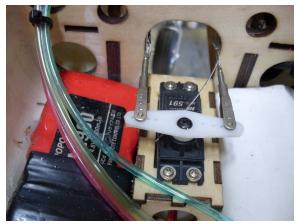


Photo 66



Photo 67

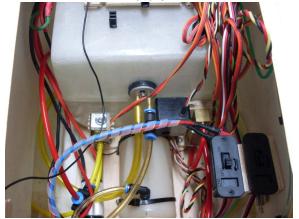


Photo 68

- Equipment installation is a personal venture. There is one golden rule: Do it as neat and logical as possible! This will make faultfinding and service of components easier. The Viper basically consist of 6 circuits!
- 1. Servo wires
- 2. Power cables
- 3. Data cables
- 4. Pneumatic pipes
- 5. Fuel pipes
- 6. RX cable

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.





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 adjust measured at root.					
2. 3. 4.	Elevator Rudder Aileron Flaps take off Flaps landing	20 mm 25 mm 20 mm 35 mm 65 mm				
NOTE: Make sure flaps travel same. Use Powerbox or Matchbox to match travel. Flaps should be deployed in landing circuit only below 90mph						
	CG	25mm in front of main spar. This is slight nose heavy position for maiden and strong winds. CG on main spar for experience pilots only and windless days. Empty tanks, UAT full and wheels down.				
	Weight	Dry weight will be between 20 and 24 lbs depending equipment.				
	PSI	80—100 psi for pneumatic system				
	Power	Depends on your radio system. Make sure you have at least double the amp required for a normal flight. Use a Hangar 9 meter to check idle currents and extreme currents.				
	TX RX	Do a complete range check before flight. Do this with turbine running. Follow manufacturers instructions.				
	Speed	Set the maximum speed to 180mph! The prototype were tested with Jetcat P-80 and Kingtech K80E. More powerful turbines require extra care and extra reinforcing.				
	Timer	A timer can safe your model. Get into the habit of programming the timer.				





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. Do not force a maiden flight! Select take off flap or flight mode 1 and open throttle. Gently pull back on stick 40m down the runway. The Viper will rotate gently and have no bad habits. Raise the flaps and gear at safe altitude and let the model sit on rails.

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 80—90mph.

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. If you have a headwind be very careful not to get below the power curve on the downwind side.

Align the model and use throttle to control the descent! The elevators will stay very active even at low speed. Flare the model just before touch down. Let the model roll out and apply brakes. The Viper is an extremely forgiving jet to fly. The long wings and good profile make it almost to easy. But it is still a 22lbs model and if it stalls it will make a large hole in the ground.

Taxi back and do necessary adjustments to customize Viper for your need!

We at Skymaster wish you many happy flights with your Viper! Put some smoke and landing lights and you will be centre of attention at your next air show!

Regards,

Anton Lin and Skymaster Team!

