

F5E 60-91 Semi Scale ARF TIGER II



ASSEMBLY & OPERATIONS MANUAL

Please review this manual thoroughly before assembling or operating this model

Proceeding with assembly and use of this product indicates Agreement With & Acceptance of the following Liability Disclaimer

Model airplanes, model engines, model engine fuel, propellers and related accessories, tools and equipment can be hazardous if improperly used. Be cautious and follow all safety recommendations when using your VMAR model airplane. Keep hands, tools, clothing and all foreign objects well clear of engines when they are operating. Take particular care to safeguard and protect your eyes and fingers and the eyes and fingers of other persons who may be nearby. Use only a good quality propeller that has no cracks or flaws. Stay clear of the propeller and stay clear of the plane of rotation defined by the propeller. The Manufacturer, Distributor, Retailer and/or other

suppliers of this product expressly disclaim any warranties or representations, either expressed or implied, including but not limited to implied warranties of fitness for the purposes of achieving and sustaining remotely controlled flight. In no event will the Manufacturer, Distributor, Retailer and/or other suppliers of this product have any obligation arising from contract or tort, or for loss of revenue or profit, or for indirect, special, incidental, consequential or other damages arising from the use of this product. In purchasing and/or using this product, the user accepts all responsibility for its use and accepts all liability associated with such use.

CAUTION

A Remote Control Model Aircraft is not a toy. It is a flying model that functions much like a full size airplane. If you do not assemble and operate this product properly you can cause injury to yourself and others and damage property. DO NOT FLY this model if you are not qualified.

You are entirely responsible for the mechanical,

aeronautical and electrical integrity of this model and it's structure, control surfaces, hinges, linkages, covering, engine, radio, wiring, battery and all other components. Check all components before and after each flight.

Don't fly until it's right!

VCOTE 2-3DS
3D DETAILING SYSTEM

STAGE 1

INSTALLING THE AILERON SERVOS INTO THE WING

To install the aileron servos into the wing you will need the following items:

- Servos
- Servo mounting screws and grommets as supplied with servos
- Servo control arms as supplied with servos
- Two aileron control rod assemblies supplied with the kit
The assemblies consist of a metal rod with a clevis on each end
- Low tack masking tape
- 2 aileron control horn assemblies

Step 1.1 Turn the wing upside down and locate the aileron servo cavities. See 1B

Step 1.2 Trial fit the aileron servos into their servo mounting cavities. You may have to modify the cavity slightly to provide clearance for the servo and servo wires. Use a hobby knife to modify the cavity as required. Most servos have their output shaft closer to one end than the other. We recommend locating the servo so that the output shaft is as close to the front of the wing as possible. See 1C

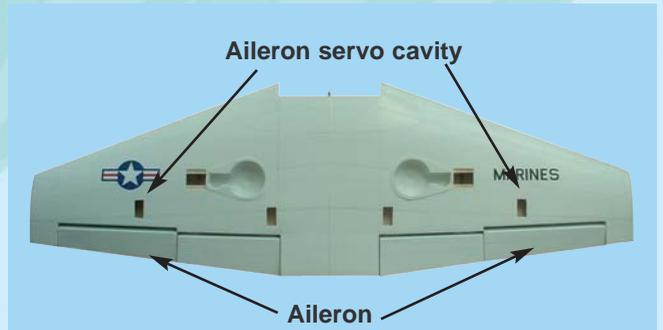
Step 1.3 Screw the servos into place with the screws and grommets supplied. It is important to install the grommets and screws correctly. See the manual that came with your radio for instructions about your particular servo grommets. See 1C

Step 1.4 Fasten the screws down according to the servo manufacturers recommended tightness.

Step 1.5 Repeat this procedure for both wing servos.



1A- Prepare the servos by fitting the rubber grommets & ferrules supplied with your servos



1B- Aileron & aileron servo locations



1C- Mount the aileron servos into the wing

STAGE 2

INSTALLING THE AILERON CONTROL SYSTEM

Step 2.1 Consult your radio instruction manual and center each aileron servo by plugging it into the aileron channel in the receiver. Turn on the transmitter and then the receiver. Center the aileron trim lever on the transmitter. Remove the servo arm mounting screw and the servo arm.

Step 2.2 Mount the servo arm back on the servo. Position the arm to be parallel with the back edge of the wing. Screw the arm into place with the servo arm mounting screw supplied with the servo. Locate the two aileron control rods in the hardware bag. See 2A. Ensure the clevises are screwed well onto the threaded portion of the rod. Rotate and tug aggressively on the clevises and ensure that they are not loose on the rods. Tape the ailerons into their neutral position so that they are even with the trailing edge of the wing and not pointing either up or down.

Step 2.3 Ensure that the aileron control horns are screwed onto the threaded aileron control horn bolts and that both control horns are in approximately the same place on their respective bolts. See 2B

Step 2.4 Connect the aileron servo rods to the aileron control horns. Connect the control rod to the servo output arm using a clevis. See 2C

Step 2.5 Connect the other end of the control rod to the control horn using the second clevis. See 2C

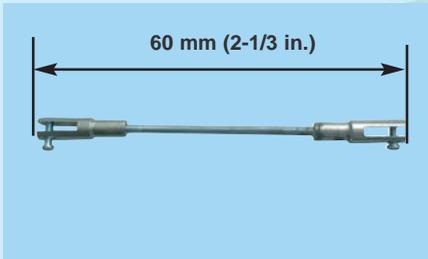
Step 2.6 Remove the masking tape holding the aileron.

Step 2.7 In the case of computer radios couple the servos together electronically by connecting them to the appropriate receiver channels. In the case of analog radios couple the servos together using a Y harness.

Step 2.8 Turn on your radio and activate the ailerons, using the aileron stick and ensure a smooth full motion can be achieved.

Step 2.9 With the wing top side up and viewed from the back, ensure that moving the transmitter aileron stick to the left raises the left aileron and lowers the right aileron. Movement of the stick to the left will roll the aircraft to the left. (Counterclockwise roll of the wing when viewed from the back).

Step 2.10 With the wing top side up and viewed from the back, ensure that moving the transmitter aileron stick to the right raises the right aileron and lowers the left aileron. Movement of the stick to the right will roll the aircraft to the right



2A- Aileron control rod assembly



2B- Aileron control horn installed



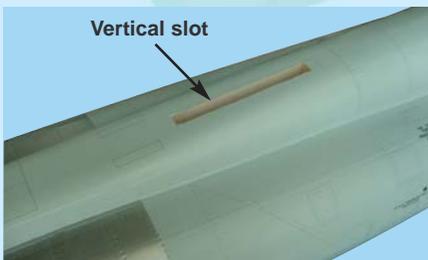
2C- Aileron control rod installed

STAGE 3

REVIEW THE VERTICAL & HORIZONTAL STABILIZERS

To install the stabilizers into the fuselage you will need:

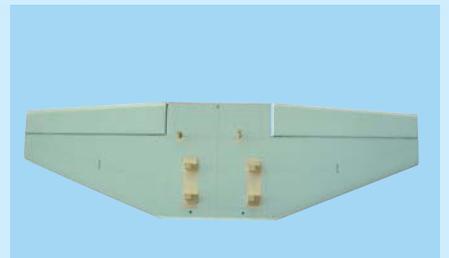
- Fuselage
- Vertical stabilizer with pre-installed rudder and torque rod
- Horizontal stabilizer with pre-installed elevators



3A- The fuselage slot for the vertical stabilizer



3B- Vertical stabilizer with pre-installed rudder and torque rod

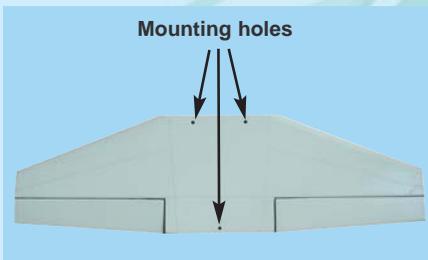


3C- Horizontal stabilizer with pre-installed elevators & servo rails

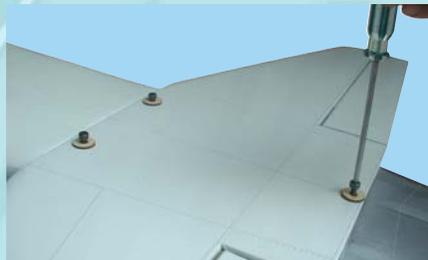
STAGE 4

INSTALL THE HORIZONTAL STABILIZER

Step 4.1 Attach the horizontal stabilizer to the fuselage using three 3 x 40 [mm] hex bolts and three wood washers (supplied). See 4A, 4B and 4C



4A- Horizontal stabilizer bottom face



4B- Install the horizontal stabilizer onto the fuselage by using three 3-40 [mm] hex bolts and three wooden washer



4C- Horizontal stabilizer attached to the fuselage

STAGE 5

INSTALL THE VERTICAL STABILIZER

To install the vertical stabilizer you will need:

- Vertical stabilizer with pre-installed rudder and torque rod
- 30 minute epoxy

Step 5.1 Trial fit the vertical stabilizer into the fuselage slot. See 5A

Step 5.2 Use a water soluble non-permanent marker to outline the area where the vertical stabilizer contacts the top of the fuselage. See 5B

Step 5.3 Use a ruler & sharp hobby knife to cut the covering just inboard of the outline marks. See 5C



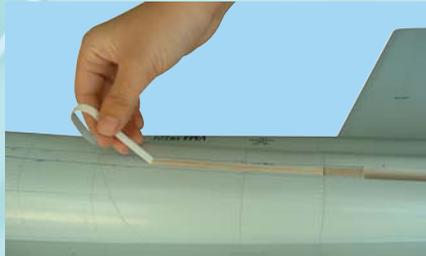
5A- Trial fit the vertical stabilizer to the fuselage



5B- Mark an outline around the area where the vertical stabilizer contacts the top of the fuselage



5C- Use a ruler and sharp hobby knife to cut the covering just inboard of the outline marks



5D- Remove the covering from the fuselage



5E- Apply sufficient 30 minute epoxy to the lower stabilizer tongue. Avoid the control rod

Step 5.4 Peel away the covering from the contact area in preparation for applying 30 minute epoxy. See 5D

Step 5.5 Apply sufficient 30 minute epoxy to the lower stabilizer tongue (See 5E) and the bottom of the vertical stabilizer (see 5F) and to the exposed contact area on the top of the fuselage (See 5D).

Step 5.6 Press the vertical stabilizer into place in the fuselage slot and wipe away any excess epoxy (See 5G).

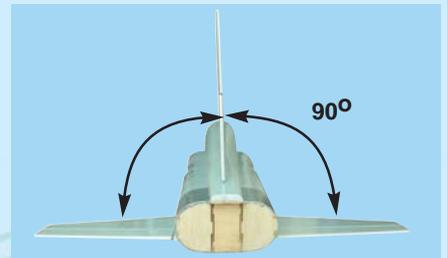
Step 5.7 Align the vertical stabilizer perpendicular (90 degrees) to the horizontal stabilizer and hold in position with low tack masking tape until the epoxy cures (See 5H).



5F- Apply more 30 minute epoxy to the bottom of vertical stabilizer



5G- Carefully press the vertical stabilizer into place and remove any excess epoxy



5H- 90 degree angle between the horizontal and the vertical stabilizer

STAGE 6

INSTALL THE LANDING GEAR

The F5E TIGER II has a tricycle gear configuration (trike gear) using a steerable nose wheel and main landing gear.



STAGE 7

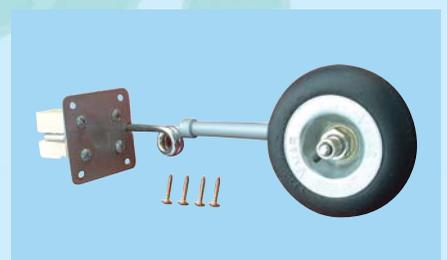
INSTALLING THE MAIN LANDING GEAR

Identify the main landing gear components shown below:

- 2 pre-bent main landing gear sets pre-assembled with struts, wheels and mounting plates.
- 8 sheet metal screws (3x15 mm)

Step 7.1 Turn over the wing to locate the pre-drilled main landing gear mounting cavities. See 7B

Step 7.2 Insert the pre-assembled main landing gear into place. Use 4 of the sheet metal screws to mount each of the main landing gear assemblies to the wing. See 7C and 7D

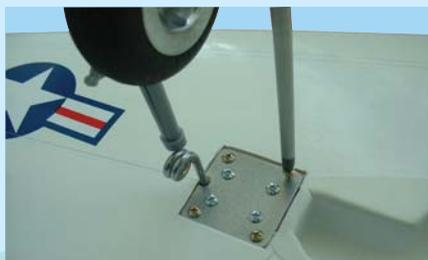


7A- Pre-assembled main landing gear and the sheet metal mounting screws

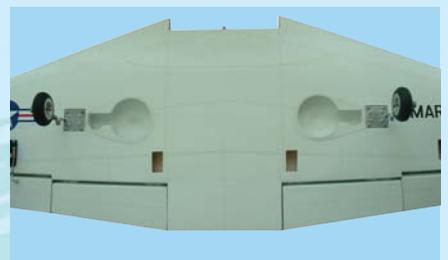


Main landing gear location

7B- Main landing gear location



7C- Mounting the main landing gear to the wing



7D- Main landing gear mounted to both wings

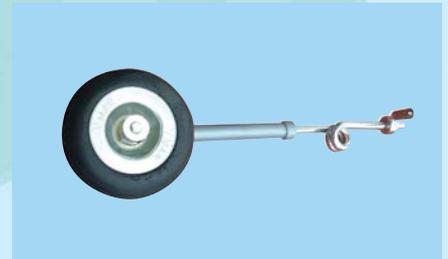
STAGE 8 INSTALLING THE NOSE GEAR

Identify the nose gear components per illustration 8A
 - 1 completed nose gear assembly with strut and wheel
 - 1 steering arm with pre-installed EZ-connector

Step 8.1 Remove the steering arm from the nose gear assembly. Insert the nose gear push rod through the EZ-connector. Do not tighten yet. See 8B

Step 8.2 Slide the nose gear wire through the nose gear bearing in the fuselage, passing the wire through the steering arm. Secure the steering arm to the nose gear wire by tightening the steering arm set screw. See 8C

Step 8.3 Secure the EZ-connector to the nose gear push rod by tightening the EZ-connector set screw. See 8D



8A- Nose gear assembly



8B- Insert the nose gear push rod through the steering arm EZ-connector. Do not tighten yet



8C- Secure the steering arm to the nose gear wire by tightening the steering arm set screw

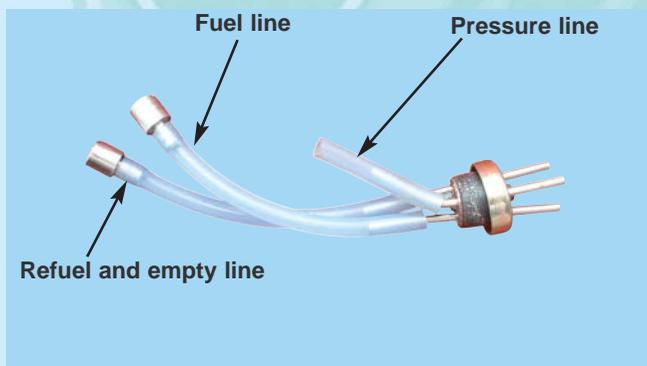


8D- Secure the EZ-connector to the nose gear push rod by tightening the EZ-connector set screw

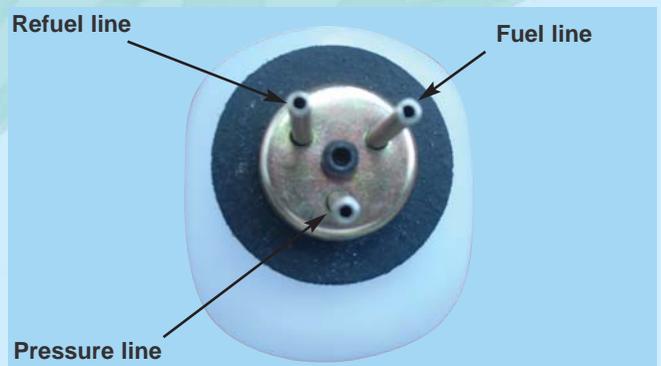
STAGE 9 FITTING THE FUEL TANK

To assemble the fuel tank you will need the following items:

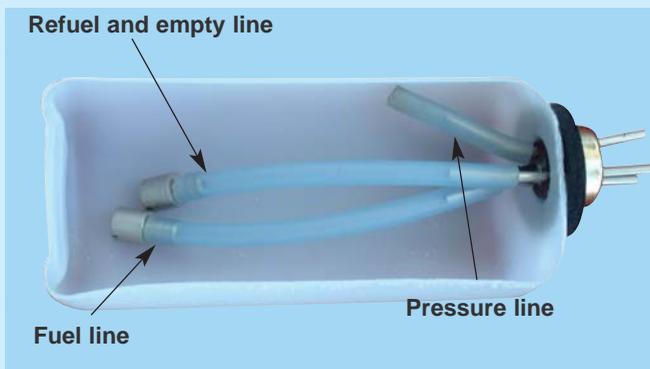
- The fuel tank and fuel stopper assembly (supplied)
- 2 clunks (supplied)
- About 10 in. (25.4 cm) of medium ID silicone fuel line (DUB-197 or DUB-222 or similar)



9A- Use 2 in. (50 mm) for the pressure line and 4 in. (100 mm) for the refuel line



9B- Fuel tank and stopper assembly (front view)



9C- Illustration of fuel line positioning inside cutaway of the tank



9D- Fuel tank installed into the fuselage after adding external fuel lines from tank forward to engine area

STAGE 10 INSTALLING THE ENGINE

The F5E TIGER II is designed for .60 to .90 2 stroke glow engines; 4 stroke and gas engines are not recommended.

Step 10.1 See 10B. Position and align your engine so that it is pointing straight ahead with a 1/16-3/32 in. (1.5-2.5 mm) gap between the spinner backing plate and the front of the fuselage.

Step 10.2 Without shifting the engine, use a pencil to mark the location of the engine mounting holes. See 10C

Step 10.3 Remove the engine, center punch the hole location and drill a 3/32 in. (2.5 mm) hole at right angles to and through the beams. Put a drop of oil in each hole. Use four 4x25 [mm] metal sheet screws (supplied) to mount the engine. See 10D

Step 10.4 Connect the throttle control rod to the engine throttle arm first. Then place the engine back on the beams and align the mounting holes. See 10E

Step 10.5 Attach the engine to the beams using four 4x25 [mm] screws (supplied). See 10F



10A- Pre-installed engine mount



10B- Allow for a gap between the spinner back plate and the fuselage



10C- Mark the location of the engine mounting holes



10D- Drill 3/32 in. (2.5mm) pilot holes at right angles through the beams



11E- Connect the throttle control rod to the engine throttle arm



11F- Attach the engine to beams using four screws (supplied)

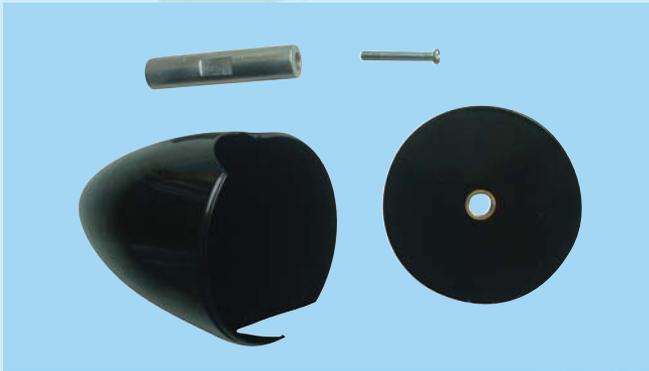
STAGE 11 INSTALL THE PROPELLER AND THE SPINNER

Step 11.1 Consult your engine manual and select a suitable propeller.

Step 11.2 Install the thrust washer, the spinner backing plate, the propeller, the prop washer, and the prop nut. Ensure that they are all firmly attached. See 11B, 11C

Step 11.3 Trial fit the spinner cone and spinner cone retaining screw. If necessary enlarge the cutouts in the spinner cone to allow adequate clearance for the propeller. See 11D

Step 11.4 Double check that the prop nut and spinner cone retaining screw are firmly attached.



11A- Aluminum spinner complete with all hardware (supplied)



11B- Install the spinner backing plate



11C- Install the propeller, the prop washer and the prop nut



11D- Install the spinner cone using the retaining screw. Ensure the retaining screw is tight and secure

STAGE 12 INSTALLING THE ELEVATOR CONTROL SYSTEM

Step 12.1 This model uses two servos for elevator control. See 12F

Step 12.2 The elevator torque rods and servo rails are pre-installed. See 12B & 12C

Step 12.3 Install the elevator servos. See 12D & 12F

Step 12.4 Connect the elevator control rods between the servo arms and the control horns. See 12E

Step 12.5 Adjust the horn positions and control rod lengths to align and synchronize the elevator movements so that they are identical. See 12F



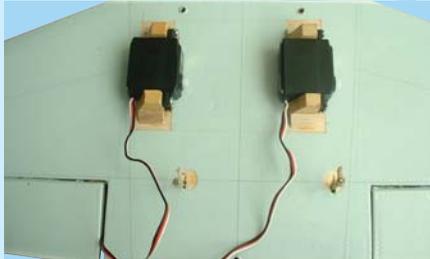
12A- Elevator control rod assembly



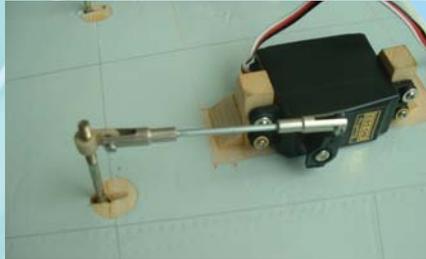
12B- Pre-installed elevator torque rods & servo rails



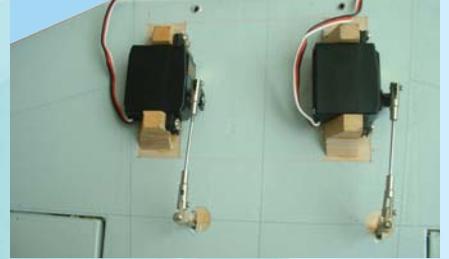
12C- Control horns pre-installed on the elevator torque rods



12D- Mount the servos on the pre-installed servo rails



12E- For each servo, connect the control rod between the servo arm and the control horn



12F- Elevator servos and control rods installed

STAGE 13 INSTALLING THE RUDDER & NOSE WHEEL CONTROL SYSTEM

Step 13.1 Align the rudder with the vertical stabilizer and fuselage using a Bulldog paper clamp.

Step 13.2 With the rudder aligned straight with the fuselage. Turn over the fuselage and install the rudder control horn with the EZ-connector installed. See 13C

Step 13.3 With the rudder aligned straight with the fuselage connect the rudder servo to the receiver and turn on your transmitter. Ensure the rudder servo is centered at neutral.

Step 13.4 Connect the rudder control rod between the rudder servo arm and the rudder control horn EZ-connector. Tighten the EZ-connector set screw firmly and ensure it is secure. Use medium thread locker (Blue). See 13D

Step 13.5 Connect the nose gear steering rod to the opposite side of the rudder servo arm. See 13D



13A- Rudder control horn assembly



13B- Align rudder with Bulldog paper clamp



13C- Rudder control horn installed on the rudder control rod



13D- Rudder control rod installed between the rudder servo and rudder control arm. Nose gear steering rod connected to opposite side of servo arm

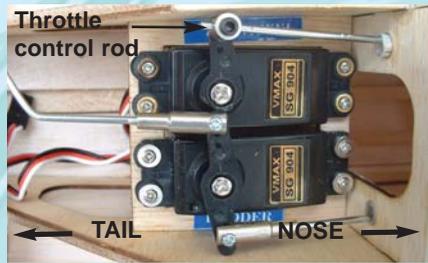
STAGE 14

CONNECTING THE THROTTLE CONTROL

With the throttle control arm connected to the engine throttle arm ensure that the throttle servo moves the throttle barrel from nearly closed to fully open.



14A- Throttle control rod connected to the engine throttle arm



14B- The throttle servo controls the engine throttle using the throttle control rod



14C- Completed engine with throttle control connected and muffler installed

STAGE 15

ADJUST CONTROL SURFACE THROW LIMITS

Adjust the deflection of the control surfaces to match the specifications on page 11. You can reduce the amount of throw by doing either or both of the following:

- From the servo end, move the clevis or EZ connector to a hole in the servo arm that is closer to the servo output shaft.

- From the control horn end, move the horn out further on the threaded bolts. Always confirm that the horn is still thoroughly engaged with the threaded bolt after you have adjusted it.

STAGE 16

FINAL RC SET-UP

Step 16.1 Before starting the final set-up of the model, switch on the radio and ensure that all trims are in their neutral positions. Check that the aileron, elevator and rudder are centered. If any adjustments are needed, do these by uncoupling the relevant clevis and turning it clockwise to shorten the linkage or counter - clockwise to lengthen it. Only when each control surface has been centered

mechanically in this way should you begin adjusting the surface movement (or throw).

Step 16.2 Now confirm that the control surfaces are moving in the correct direction. Use the servo reversing switches on your transmitter to reverse the direction of a servo if necessary.

STAGE 17

INSTALLING THE RECEIVER BATTERY

Step 17.1 Consult your radio manual for instructions about hooking up your receiver battery, receiver and switch harness.

Step 17.2 Wrap the battery pack securely in foam suitable for RC equipment and wrap the foam insulated pack in a plastic bag or cling wrap. Position the battery pack as shown in 18B.

Step 17.3 Thread the battery pack connector forward in preparation for connecting to your switch harness.

Step 17.4 Connect the battery pack connector to your switch harness according to your radio manual.

STAGE 18

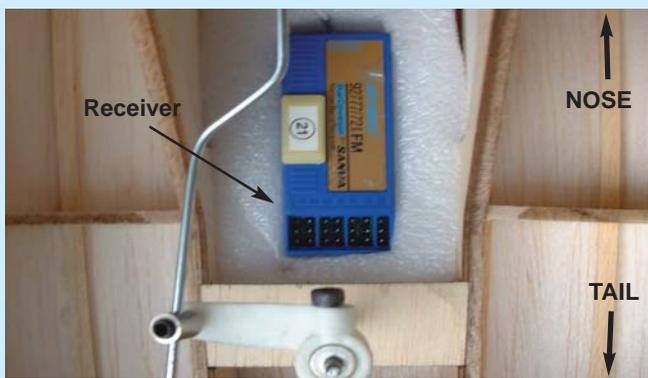
INSTALLING THE RECEIVER

Step 18.1 Consult your radio manual for instructions about hooking up your receiver.

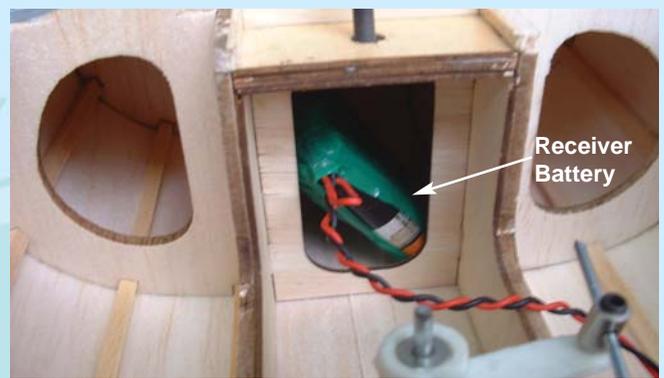
Step 18.2 Plan where you are going to put the receiver with consideration for routing the antenna safely.

Step 18.3 Wrap the receiver securely in foam suitable for RC equipment and wrap the foam insulated receiver in a plastic bag or cling wrap.

Step 18.4 Install your receiver near the aft end of the fuselage as shown in 18B.



18A- Receiver location



18B- Receiver battery location

STAGE 19 CONFIRM RADIO OPERATION

Step 19.1 Consult your radio manual for instructions about testing and operating your radio system.

Step 19.2 Pay particular attention to charging your radio system batteries and range testing the system before and after each flight.

Step 19.3 Check that all controls are working correctly before and after each flight.

STAGE 20 BALANCING THE AIRCRAFT

The CG for your F5E TIGER II is located at 8-7/8 in. to 9 in. (225 - 230 mm) back from the leading edge of the wing when the wing has been attached to the fuselage.

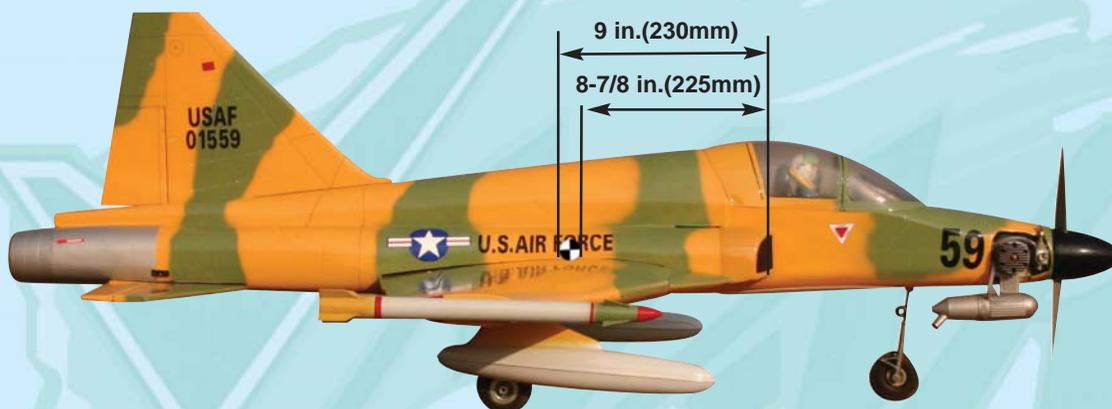
For the initial flight, the CG should be located at 8-7/8 in. (225mm) back from the leading edge of the wing when the wing has been attached to the fuselage.

The CG is measured with the engine, radio gear and all other components installed but WITH NO FUEL IN THE TANK.

It is very important to have the CG correct. Flying your model with the CG too far back will likely lead to loss of control and a crash. If you discover that after you have

assembled your model and installed your radio and engine that the CG of your model is incorrect you must bring the CG to the correct location by doing the following BEFORE FLYING :

- Move the battery pack fore or aft.
- Move other components fore or aft.
- Change engine to a lighter or heavier model.
- Add weight to the nose or tail. If adding weight to the nose, try to make it useful by going to a heavier duty engine or adding a spinner with a heavy metal backing plate. As a last resort, add stick on "dead" weight where appropriate.



STAGE 21 CONFIRM MECHANICAL INTEGRITY

Once you have confirmed that the CG is correct, you should do a thorough review of the entire model before your first flight. Check everything twice! Every hook up, every coupling, everything! Do it twice!!

Before your first flight, have an experienced flyer review your work. Do not fly your model until it has been checked

out by a third party who knows how to fly and how to set up a model aircraft. Do not fly alone. Seek experienced help.

Once you have completed your first flight, get in the habit of checking your model over before and after each flight! Don't fly if you find something that is not right!

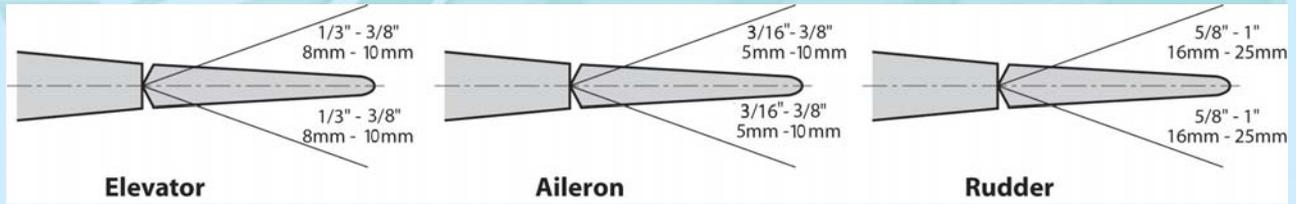
CONTROL SURFACE THROW SPECIFICATIONS:

The throws are measured at the widest part of the control surface. Adjust the position of the pushrods at the control and/or servo horns to control the amount of throw. You may

also use ATV's if your radio has them but the mechanical linkages should still be set so that the ATV's are near 100% for best servo resolution.



	Low rate		High rate
ELEVATOR	1/3 " (8mm) up		3/8" (10 mm) up
	1/3 " (8mm) down		3/8" (10 mm) down
AILERON	3/16" (5 mm) up		3/8" (10 mm) up
	3/16" (5 mm) down		3/8" (10 mm) down
RUDDER	5/8 " (16 mm) right		1" (25 mm) right
	5/8 " (16 mm) left		1" (25 mm) left



STAGE 22 INSTALL LANDING GEAR CAVITY COVERS

The VMAR F5E TIGER II is retract ready. The fixed gear can be replaced with retracts. We have tested with ROBERT #ROB-RB610 nose gear and #ROB-608HD main gear. Please follow instructions that come with the retracts.

If you are NOT installing retracts please do the following:

Step 22.1 Cut out the cavity covers using sharp scissors. See 22A

Step 22.2 Glue the cavity covers into place using CA glue. Use the glue sparingly and do not drip any CA onto the surface. Avoid fingerprints. See 22B and 22C



22A- Cut out the cavity covers using sharp scissors



22B- Glue the main gear cavity covers into place using CA glue



22C- Glue the nose gear cavity cover into place using CA glue

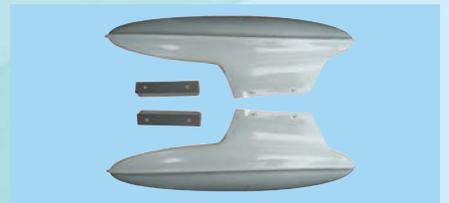
STAGE 23 INSTALL THE DUMMY WING TANKS

The dummy fuel tanks can be mounted to the wings using the following procedure:

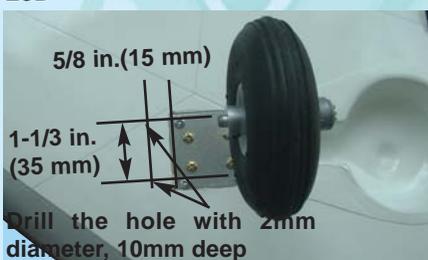
Step 23.1 Review 23B & 23C and mark the location of the mounting holes for the aluminum rack outboard of the main landing gear plates. Drill 5/64 in. (2mm) holes about 3/8 in. (10mm) deep.

Step 23.2 Use sheet metal screws to mount the aluminum rack to the wing. See 23C

Step 23.3 Mount the dummy tanks to the aluminum rails on both wings. See 23D



23A- Dummy wing tanks and mounting rails



23B- Drill the mounting hole



23C- Mount the mounting rails to the wing



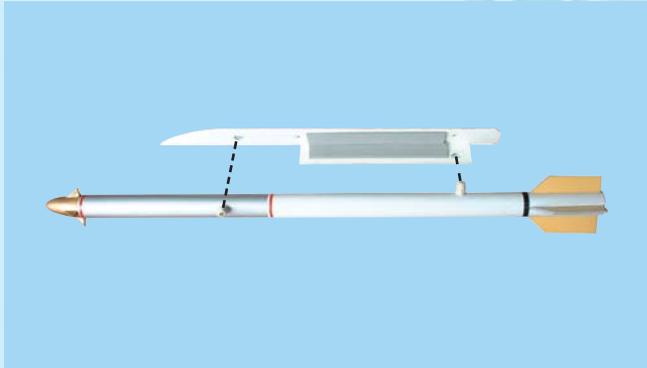
23D- Mount the dummy tanks to the aluminum rails on the wings

STAGE 24

INSTALL THE DUMMY MISSILES

The VMAR F5E TIGER II comes with wing tip dummy missiles. To install the dummy missiles you will need:

- 2 missile mounting racks (1 left and 1 right)
- 2 missiles (1 left and 1 right)
- 8 screws 2x10 [mm]



24A- Dummy missile and mounting rack



24B- Install the mounting rack to the wing tip using 2 screws 2x10 [mm]



24C- Install the dummy missile to the mounting rack



24D- Secure the missile to the mounting rack by using 2 screws, 1 in the top...



24E- ...and 1 in the bottom



24F- Repeat the procedure shown in 23B - 23F for the other missile

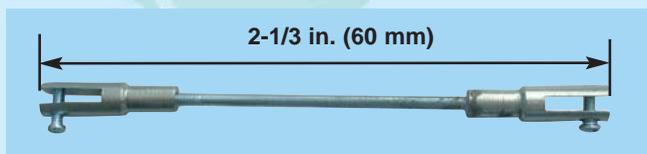
STAGE 25

INSTALLING OPTIONAL FLAPS &/OR AIR BRAKES

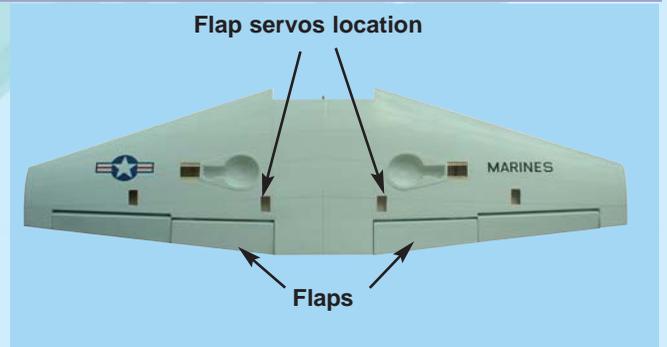
Your model comes with optional flaps that can also be configured as air brakes.

To install the optional flaps &/or air brakes you will need:

- 2 flap/air brake control rods (supplied)
- 2 standard servos (not supplied)



25B- Flap/Air brake control rod

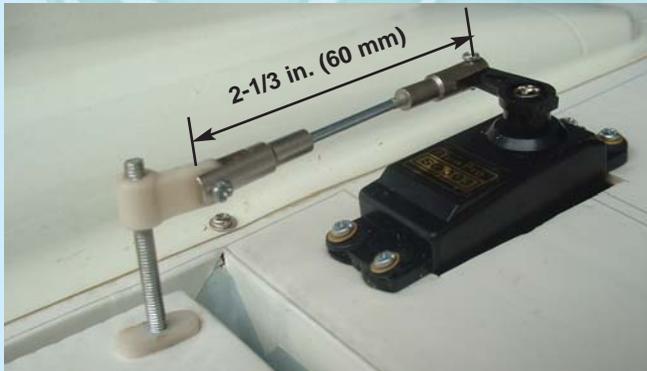


25A- Flap servo locations

The F5E flaps can function as flaps and/or air brakes. Air brakes can be quite useful during touchdown and roll out. Consult an experienced RC pilot before using the air brakes. Do NOT attempt the use of air brakes on first flights.



25C- Install the servos and flap control horns. Connect the flap control rods to the servo arms



25D- For each flap, connect a control rod between the servo arm and the flap control horn



25E- Flap/Air brake normal position



25F- Flap deployed



25G- Air brake deployed

STAGE 26 INSTALL THE WING COVER

After the wing has been attached to the fuselage, install the wing cover plate.



26A- Wing cover



26B- Trim the wing cover plate using sharp scissors. See 26C



26C- Wing cover plate after trimming with sharp scissors



26D- Carefully align the clearance holes in the wing cover plate to ensure access to the wing bolts. Then use CA to attach the cover plate to the wing

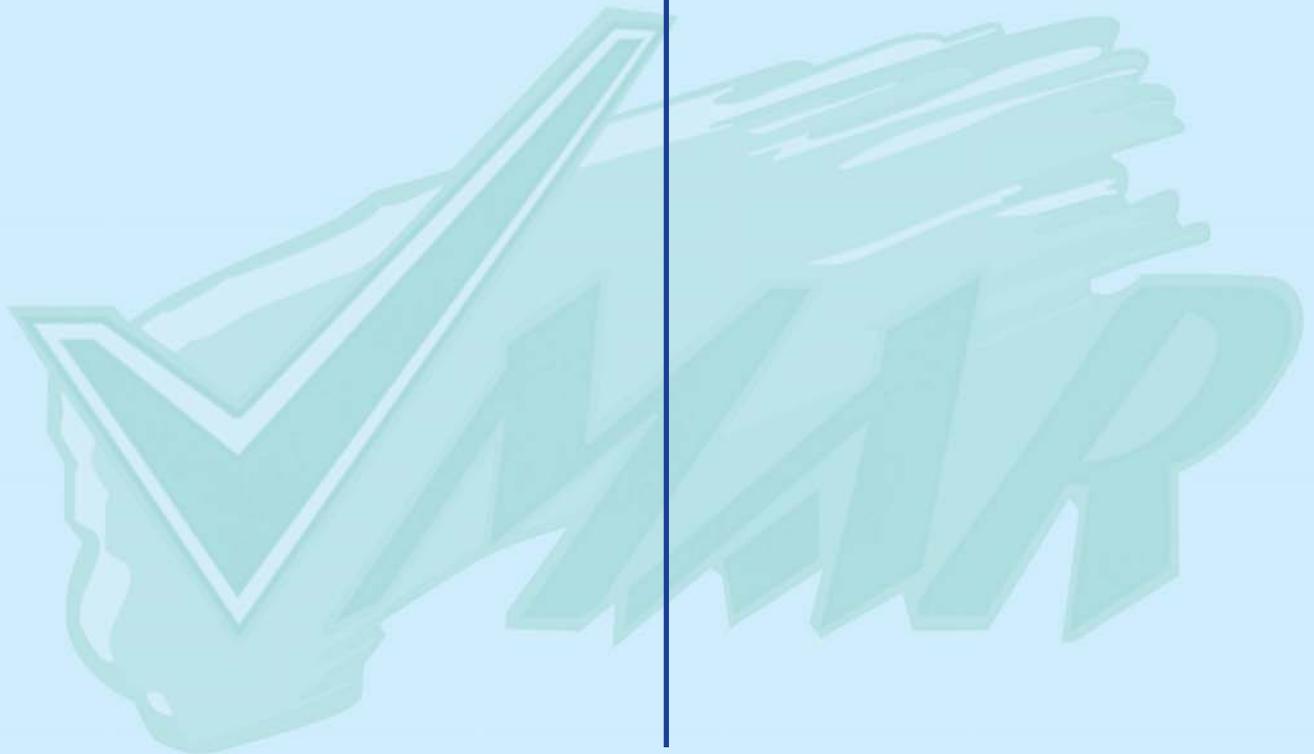


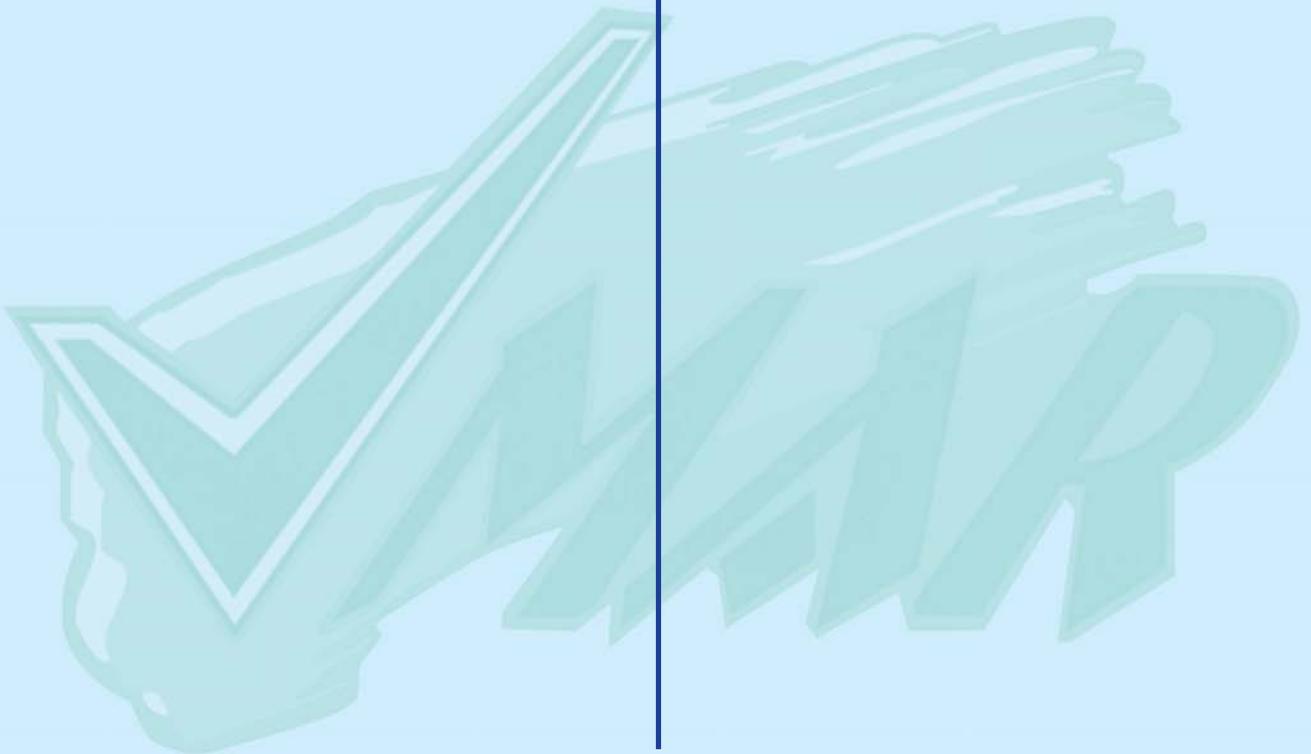
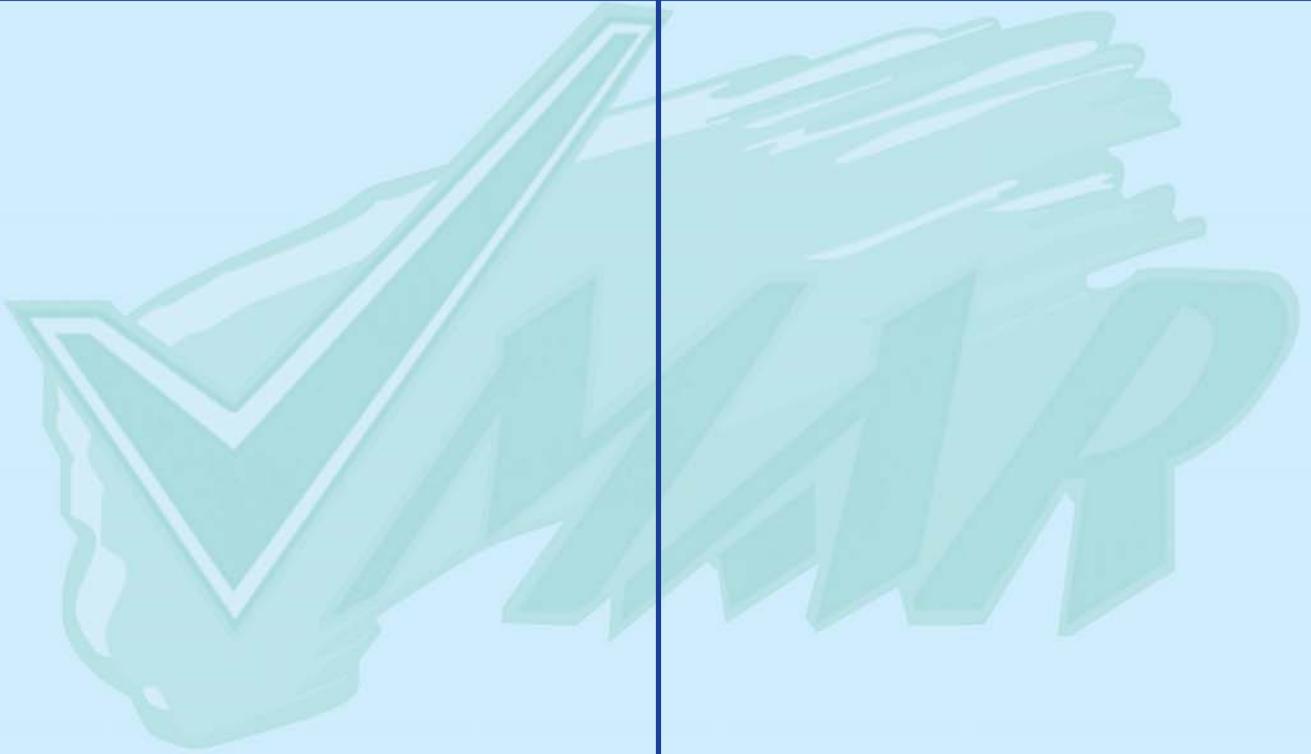
26E- Wing cover plate installed

*For parts and support related to this product please visit us at www.richmondrc.com/support.htm
For more VMAR products please visit us at www.richmondrc.com*

HAPPY FLYING!

Note





Note

