



No.4321 Mr. Mulligan

- Wing Span: 39.37" (1000mm)
- Length: 26.5" (675mm)
- Wing Area: 217 sq.in. (14dm²)
- Weight: 16.5 oz. (470g)

Warranty

This kit is guaranteed to be free from defects in material and workmanship at the date of purchase. It does not cover any damage caused by use or modification. The warranty does not extend beyond the product itself and is limited only to the original cost of the kit. By the act of building this user-assembled kit, the user accepts all resulting liability for damage caused by the final product. If the buyer is not prepared to accept this liability, it can be returned new and unused to the place of purchase for a refund.

Notice: Adult Supervision Required

This is not a toy. Assembly and flying of this product requires adult supervision. Read through this book completely and become familiar with the assembly and flight of this airplane. Inspect all parts for completeness and damage. Contact Thunder Tiger authorized distributor for help.



INTRODUCTION

All of us at Thunder Tiger want to thank you for choosing the Mr. Mulligan EP park flyer. This kit has been engineered to go together quickly and easily while still providing you with great looks and exceptional flying performance. In order to insure that your assembly process will be as smooth and uneventful as possible, we strongly suggest that you read this assembly manual thoroughly before beginning to assemble this kit. We are confident that you will enjoy flying this Mr. Mulligan and it will provide a lot of rewarding flights.

Modeling Organizations

The Mr. Mulligan EP park flyer is a serious radio-controlled model airplane. You should obtain help with the airplane for preflight and flight training from an experience pilot to insure maximum enjoyment. Many programs are very willing to help, check www.modelaircraft.org . Also, it is recommended that you join one the following organizations. They can help you find a club in your area plus offer insurance programs to protect you.

Academy of Model Aeronautics
5151 East Memorial Dr.
Muncie, IN 47302
800-435-9262
Fax 765-741-0057
www.modelaircraft.org

Sport Flyers of America
POB 7993
Haledon, NJ 07508
800-745-3597
Fax 973-305-6686
www.modelavaiton.com

Table of Contents

Introduction

Pre-Assembly Notes	3
Other Items Required	3
Tools and Supplies Needed.....	3
Part Drawings	4

Assembly

Fuselage	5
Tail	7
Landing Gear.....	8

Cowl.....	9
Servo, ESC, RX & Battery.....	10
Wing	11

First Flights

Balance	12
Operation Checks	12
Flying	14
Repair	16

PRE-ASSEMBLY NOTES

1. Please assemble your model according to this instruction manual. Do not attempt to modify or change your Mr. Mulligan in any way as doing so may adversely change its flying characteristics.
2. For Ready To Fly (Super Combo) version, some assembly steps are finished by factory craftsman. We recommend you to read the manual to familiar with the whole plane as well and just skip the assembled steps.
3. Before you begin please check entire contents of this kit against the parts list and parts drawings to be sure that no parts are missing or damaged. This will also help you to become familiar with each component.
4. If you find that any parts are either missing or damaged, please contact with your dealer immediately for replacement. Note: Your dealer cannot accept kits from return if construction has begun.

Remember we have worked very hard to make this model as easy to assemble as possible while still maintaining our high standard of quality. Your assembly of this model is very important and will determine the final flight capabilities of your Mr. Mulligan, so use extra care and follow the assembly procedure exactly.

OTHER ITEMS REQUIRED

Radio: You will need at least a 3 channel radio control system with 2 micro servos for your Mr. Mulligan. Thunder Tiger provides 3ch single-stick(8304) and dual-stick(8305) for choice.



ACE 8304



ACE 8305

ESC-10: ACE ESC-10 (P/N ACE8015) with BEC for controlling the power of your Mr. Mulligan as well as eliminating the need of a separate radio battery. The BEC(Battery Eliminator Circuitry) in this controller will automatically turn off the power to the motor when the battery reaches a factory present discharge level leaving about 10 minutes of flight time for the radio system.



Battery: We recommend the use of a 7 cell 8.4V 600mAh AAA size NiMH battery (P/N ACE2924)



Charger: You will need a quick charger to charge your power battery. We recommend our economical DC Quick Filed Charger (P/N ACE 2604AC/B).



Super Combo version contains 3CH Radio, ESC-10, Battery and Charger as mentioned above.

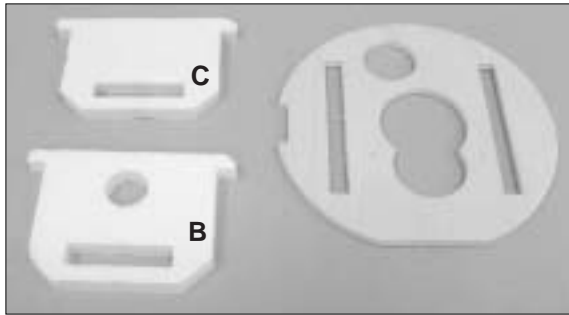
TOOLS AND SUPPLIES NEEDED

- Mixing Stick for Epoxy
- Medium Grit Sandpaper
- Rubbing Alcohol
- Paper Towel
- Hobby Knife
- Drill bit 5/64" (2mm)
- Ruler
- Pen, Pencil or Marker
- Small Screw Drivers
- Scissors
- Needle Nose Pliers

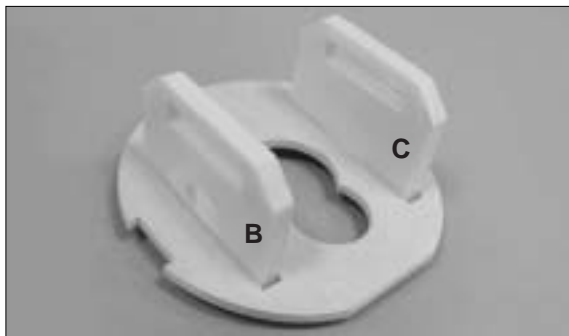
Open the box and check that you have all the parts as shown below. If anything is missing please contact your dealer.

<p>AS6325 Fuselage</p> <p>Landing Gear Retainer (1) Skid (1) Front Wing Mount(1) Rear Wing Mount(1) Board (1) Pushrod Support(1) Firewall(1) Battery Box(1) Fuselage(L/1, R/1) Landing Gear Mount(1) Box Cover(1) A B C Cowling Mount</p>	<p>AS6331 Cowling</p> <p>Cowling (1) Dummy Engine(1) 2x5 mm Wood Screw (3) Wood Block(3)</p>		
<p>AS6326 Main Wing</p> <p>3x30 mm Wood Screw (2) 3x25 mm Wood Screw (2) Main Wing(1) Wing Center Cover (1)</p>	<p>AS6334 Canopy</p> <p>Canopy (1)</p>		
<p>AS6327 Horizontal Tail</p> <p>Elevator Joiner(1) Horizontal Tail/Elevator (1)</p>	<p>AS6328 Vertical Tail</p> <p>Vertical Tail/Rudder (1)</p>	<p>AS6312 Snap on Control Horn</p> <p>Control Horn (2) Locking Plate (2)</p>	
<p>AS6333 Propeller Set</p> <p>Nose Cone (1) Propeller (1) Spinner (1)</p>	<p>AS6314 370 Super Motor</p> <p>370 Super Motor (1)</p>	<p>AS6332 Threaded Landing Gear</p> <p>Plastic Nut(2) Wheel Pant Mount(2) Threaded Landing Gear (1)</p>	<p>AS6336 Wheel</p> <p>Wheel (2)</p>
<p>AS6313 Motor Mount</p> <p>Front Motor Mount (1) Rear Motor Mount (1) Bushing (2) 3x20 mm Self-Tapping Screw (2) 2.6x10 mm Self-Tapping Screw (3) 3x5 mm Machine Screw (2)</p>	<p>AS6335 Wheel Pant</p> <p>2x5 mm Wood Screw (4) Wheel Pant(2) Landing Gear Fairing(2)</p>	<p>AS6330 Pushrod</p> <p>Pushrod (L,1) Pushrod (S,1) Clevis (2)</p>	
<p>AS6329 Wing Strut</p> <p>Tube (L/2) Tube (S/2) Strut Joint Hook Joint (6) Hook PA Clevis (2) Threaded Wire (2)</p>	<p>No.6337 Decal</p> <p>Decal (1)</p>	<p>AS6316 Gear Shaft Set</p> <p>Main Gear/Shaft (1) M3 Nut (2) Pinion Drive Gear (1) Spacer (1)</p>	

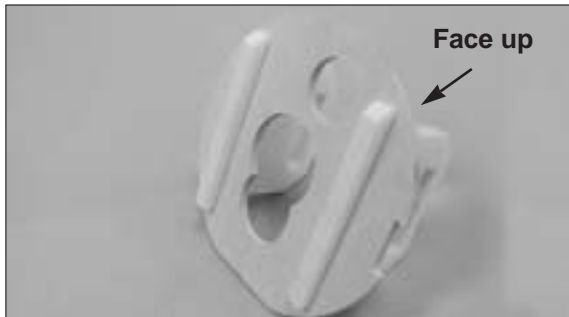
ASSEMBLY / FUSELAGE



1. Locate firewall and cowling mounts B & C.



2. Epoxy the cowling mounts on firewall. Note the cowling mount B is installed near the notch side and use care when inserting the cowling mounts in place or it may damage the foam mounts.

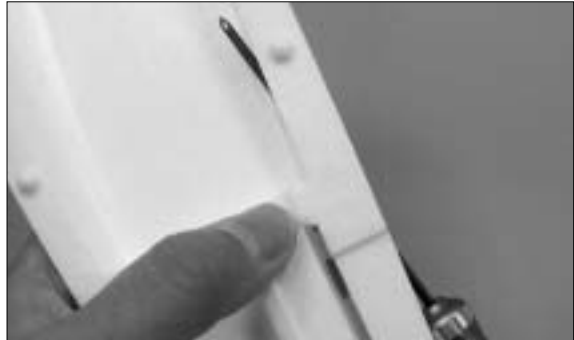


3. Here the back view of the firewall assembly. Note the orientation of the cowling mounts.



4. Trial fit the firewall assembly in right fuselage half,

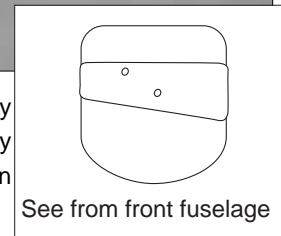
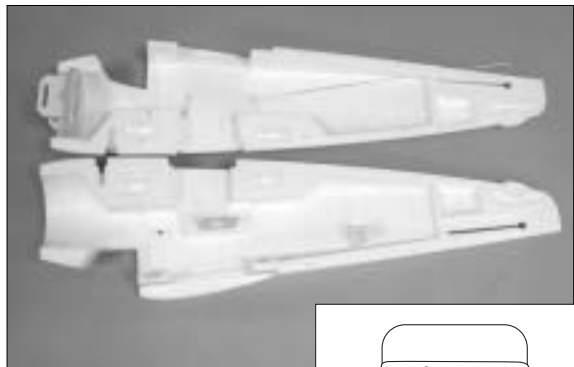
glue it in place with furnished epoxy. Hint: How to tell the left or right of the fuselage? You can imagine you are sitting in the cockpit then the right fuselage is at right side.



5. Drill 3mm rudder pushrod exit hole at the right fuselage tail. A small amount of angle will give best pushrod performance.

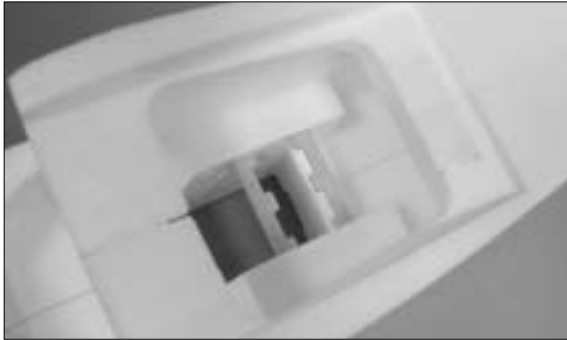


6. Locate the pushrod support and drill 2mm holes on the punch dots.

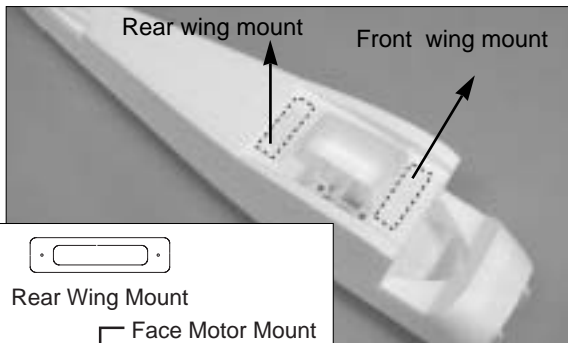


7. Locate the servo tray then epoxy servo tray and pushrod support on left fuselage.

Note the pushrod support orientation as illustrated. You may use right fuselage to help position the servo tray and pushrod support. After it cured then remove the right fuselage carefully.



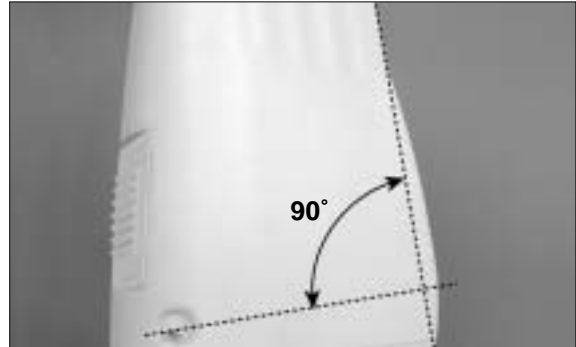
8. Epoxy left and right fuselage halves together. Note the furnished epoxy is 5-min. epoxy and working time is only 3 min., you will have to quickly apply epoxy on left and right fuselage within 3 minutes. There are more different Epoxy available in 12-min. or 30-min. epoxy which allow longer working time that you can buy in any hobby store.



9. Apply masking tape to hold two fuselage halves together until glue has cured. Glue the plywood front and rear wing mount in place underneath the foam as indicated. Pre-Drill 5/64" (2mm) holes on plywood prior installation. This will make it easier for wing installation.



10. Locate the battery box and landing gear mount next epoxy them in place as shown.



11. Note the ring of wing strut mount should be perpendicular to the line as illustrated.



12. Glue the cowling mount A on mounts B and C. Locate three balsa wood blocks then glue them in place as shown.

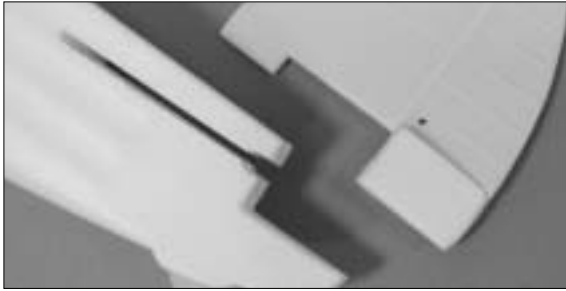


13. Locate the round plywood and glue it in tail bottom slot as a tail skid/wheel.

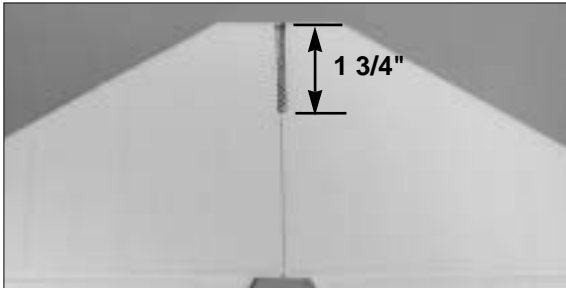


14. Carefully cut off the tail, this portion will be glued on rudder later. Sand the cut area if necessary.

ASSEMBLY / TAILS



15. Glue the cut away portion on rudder as shown. You may trial fit the portion on the rudder first. Note the leading edge of this portion should align with the hinge line of the rudder. You may need to trim the trailing edge to accommodate the rudder and tail.



16. Mark the center line of the horizontal tail and use a hobby knife to cut a 3mm(1/8") wide and 45mm(1 3/4") in length slot as illustrated



17. Cut a slot at the hinge line for installation of elevator joiner.



18. Trial fit the joiner in place next apply epoxy and glue it firmly in place. It will be easier to bend two elevators then slide the joiner on the elevator.



19. Locate elevator pushrod(the short one), insert the pushrod from front fuselage through the pushrod support and exit at the tail. Thread the clevis then snap onto the elevator joiner.



20. Trial fit and center the horizontal tail in place. Make sure the elevator joiner is flush with the tail of fuselage and the Z bent end of pushrod is exactly at the servo output shaft (see step 39). Epoxy the tail when satisfied.

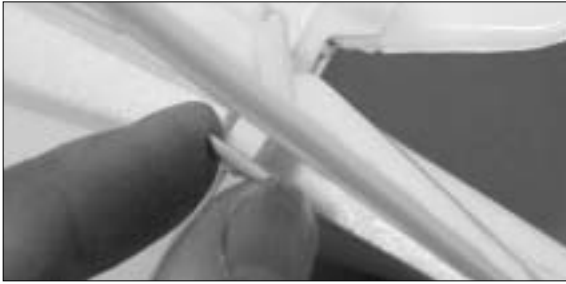


21. Epoxy the vertical fin in place and make sure it is perpendicular to the horizontal tail. Trim the trailing edge of the rudder and fuselage tail if necessary.



22. Same as step 19 install the rudder pushrod from front through the pushrod support and exit at the pushrod exit hole. Then thread the clevis as shown.

ASSEMBLY / LANDING GEAR



23. Install the rudder control horn. Make sure the control horn is installed properly before you press in the locking plate and do not over press the locking plate.



24. Snap on the rudder pushrod.



25. Carefully cut the slots at the bottom fuselage about 10mm(3/8") in depth.



26. Insert the landing gear in the landing gear mount then press the retainer all the way in to secure the landing gear in place. When pressing make sure to support from the inside of fuselage.



27. Trim the wheel pant as shown and drill 4mm holes for wheel axle.



28. Install the wheel pant retainer then the landing gear fairing. Insert the fairing root into the slot you cut in the prior step. The fairing is for scale look it may effect the performance. For better stability, you may trim the fairing narrower.



29. Install the wheel pant and wheel on landing gear next thread the plastic nut. Make sure wheel rotates freely.



30. Secure the wheel pant with two 2x5mm wood screws as shown. Do the same procedure on the other wheel.

ASSEMBLY / COWL



31. Locate the EDS(electric drive system) and remove the spinner and nuts. Note: remove the nose cone by rotating it counter-clockwise about 1/4 turn.



32. Install the power drive unit in place with two 3x20 wood screws. Thread the motor wire through the firewall.



33. Trim the cowling as shown.

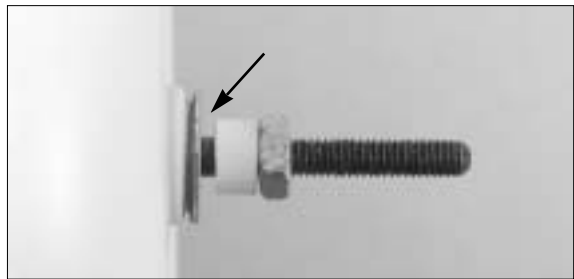


34. Locate the black vacuum form dummy engine and install it in the cowling. You may leave the

engines and trim away the excess. This is to get more air to cool down the hot battery and motor.



35. Secure the cowling on the wood blocks with three 2x5mm wood screws.

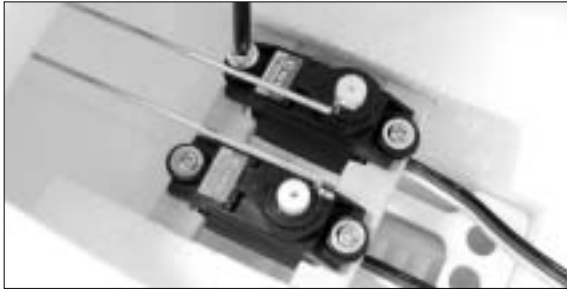


36. Make sure the shaft is a little bit free play when you pull and push. If it is too tight then loose the nut for more space.

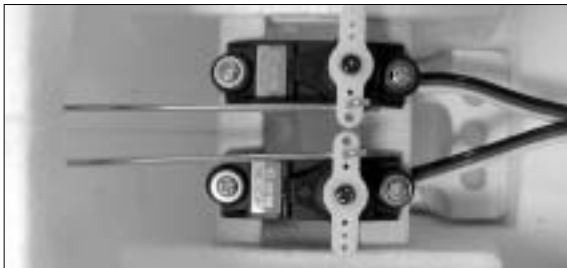


37. Install the propeller and spinner. It is necessary to secure the propeller firmly by a 3mm nut. Always take great care on the motor and swinging propeller as it is dangerous and may cause serious injury, if you are a beginner we recommend you read the manual of radio and speed controller thoroughly to understand how to set up and control the motor.

SERVO, ESC,RX & BATTERY INSTALLATION



38. See the servo manual and install the eyelet and grommet then secure the micro servos in the servo tray with the wood screws that comes with the servo.



39. Connect the servo wire to the receiver and turn on radio then thread the pushrod to the servo horn and secure the servo horn on the servo when servo is in neutral position. See page 13 for servo direction of movement if servo is in opposite direction then check radio manual and reverse the servo.



40. Install the switch of the electric speed controller. (photo shown is Ace ESC-10) Do not over tighten the screw as it may crush the Styrofoam.



41. Use double sided tape to fix the ESC and

Receiver inside the fuselage. Drill a small hole on the fuselage at right side then thread the antenna through the fuselage. Route the antenna to the tail and tape it in place.



42. Locate the sponge then cut two small pieces and use as spacer to keep battery in case firmly.



43. You will have to bow the cover plate to close or pry with finger to remove the cover plate. Note the opening is facing to the tail.



44. Locate the canopy and trim it along with the molded line as shown.



45. Glue it in place with epoxy and note the notch is in line with the wing saddle so the leading edge of the wing could go in.

ASSEMBLY / WING



46. Locate the wing center cover then trim it along the molded line as shown.



47. Glue the wing center cover in place with epoxy.



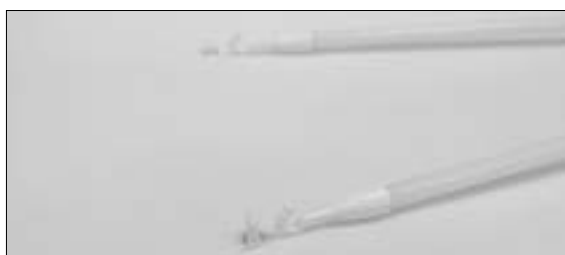
48. Epoxy the wing strut mounts in place note the orientation of the ring.



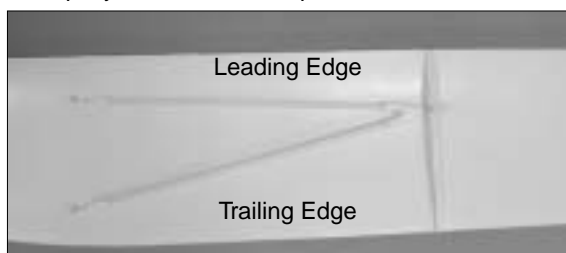
49. Drill 2mm mounting holes on the molded dots. Secure the main wing with two 3x30mm (front wing bolt) and two 3x25mm (rear wing bolt) wood screws.



50. Assemble the wing strut joiner as shown, you will need to thread the threaded rod to the wing strut joiner first then thread the clevis. A needle nose pliers will help thread the rod. Epoxy the two plastic tubes to the joiner; one is long and the other is short.



51. Epoxy the strut hook in place as shown.



52. Wing strut will hook on the wing later. Use the same way and assemble the other wing strut



53. Hook on the wing struts on two wing halves.

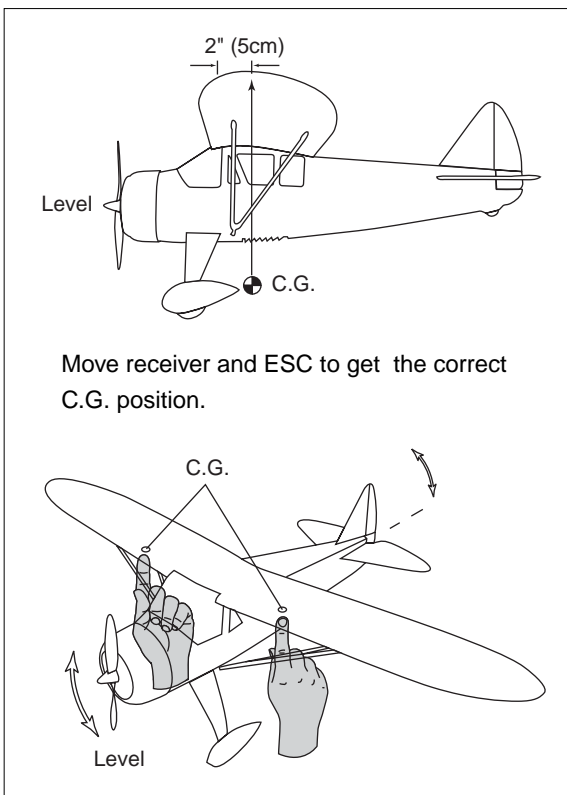


54. Snap on the clevis on the wing strut mount, adjust the clevis if necessary.

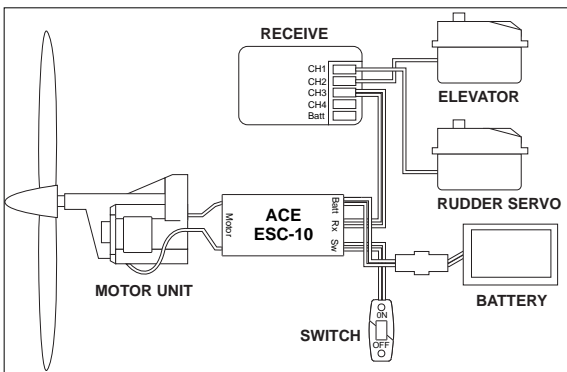


Congratulations! Now you are ready to fly.

BALANCE



OPERATION CHECK



1. Install eight AA batteries in the transmitter, referring to the radio system's instruction manual.
2. Review the illustration to become familiar with your airborne radio components. Following are description of these components:

■ **ESC:** This device controls power to the motor unit. It will cut-off power to motor when voltage starts to drop.

■ **Receiver:** Receives the radio commands from the transmitter and sends them to the servos which converts the command to motion which, in turn, moves the rudder or elevator.

■ **NiMH Battery:** Rechargeable battery pack that provides power to the motor unit and the radio system.

■ **Motor Unit:** Contains a DC electric motor, a gear drive, and a propeller that provides the thrust for the airplane.

3. Turn the transmitter on and then the receiver and refer to illustrations in page 13.

(Always turn transmitter on first then the receiver and turn receiver off first then the transmitter)

■ Move the stick right and make sure rudder moves to the right.

■ Move the stick left and make sure rudder moves left.

■ Move the stick upward and make sure the elevator moves down.

■ Move the stick downward and make sure the elevator moves up.

■ Also check for the proper amount of throw and make sure the rudder and elevator are in neutral when the stick and the trim levers are in the center.

4. Hang on the airplane and throttle up the stick. The motor unit should come on. Make sure the propeller is trying to pull the airplane forward. Throttle down or turn off the switch to stop the motor.

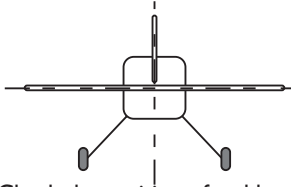
You are now ready to go flying!

CHECK THE RADIO



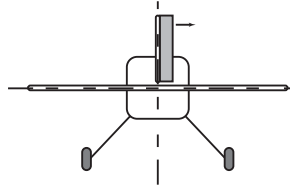
THE DIRECTION OF MOVEMENT (RUDDER AND ELEVATOR)

NEUTRAL

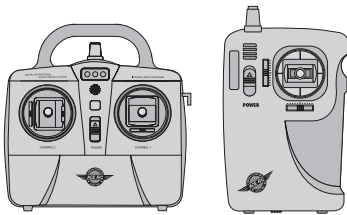
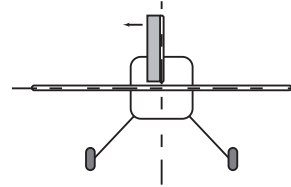


Check the position of rudder and elevator (if these are in neutral).

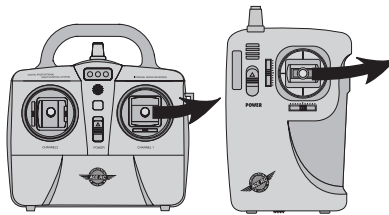
RIGHT TURN



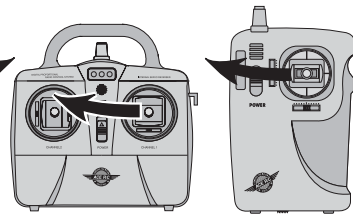
LEFT TURN



Set the trim in neutral position.
Set the sticks in neutral position

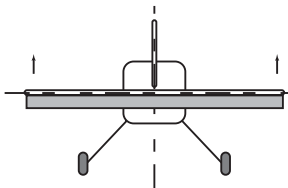


Move the stick to the right.

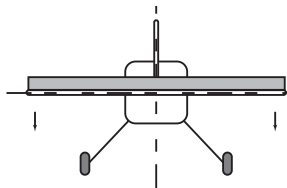


Move the stick to the left.

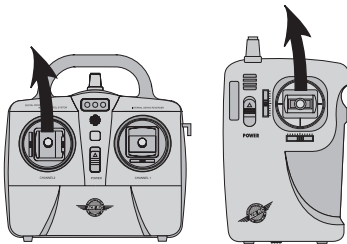
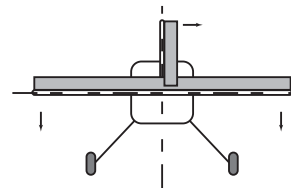
DOWN



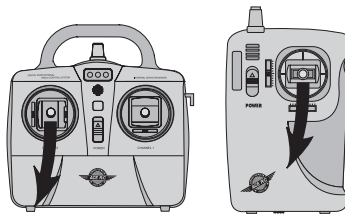
UP



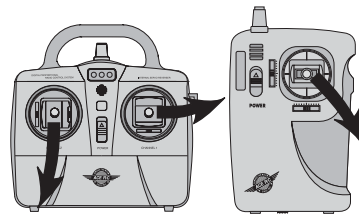
RIGHT AND UP



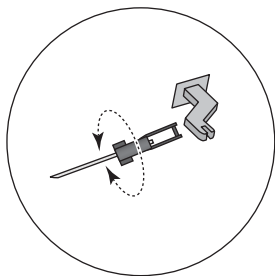
Move the stick up.



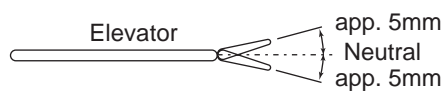
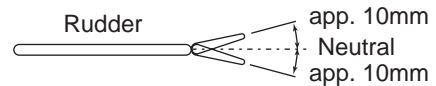
Move the stick down.



Move the stick down and right.



To adjust neutral, unsnap the clevis from the horn and screw in or out



FLYING

You should have a flight instructor to teach you how to fly the Mr. Mulligan. Like a real airplane, you must have an understanding of how to fly the model before launch, or you will probably not be successful. Check at your hobby shop or call the AMA (in the front of this book) for flying clubs in your area.

1.Pre-Flight Checklist

- Choose a calm day for your first flights. Never fly in winds over 10 mph. Also, choose an open field with no obstacles or people.
- Charge the receiver battery.
- Make sure there are no other pilots operating on the same channel (frequency) as you are. If you turn your radio on while others are flying, you will cause them to crash.
- Check your radio for good range (50 ft. with the antenna collapsed) and proper operation.

2.Take-off

- A proper hand-launch of the airplane is necessary for flight. It must be launched into the wind with a firm toss. The airplane must be tossed level or even pointed a little down. It should never be thrown upward, or it will stall and crash.
- When launching the plane, make sure your fingers are behind struts. 2 inches aft the struts is recommended.

3.Flight

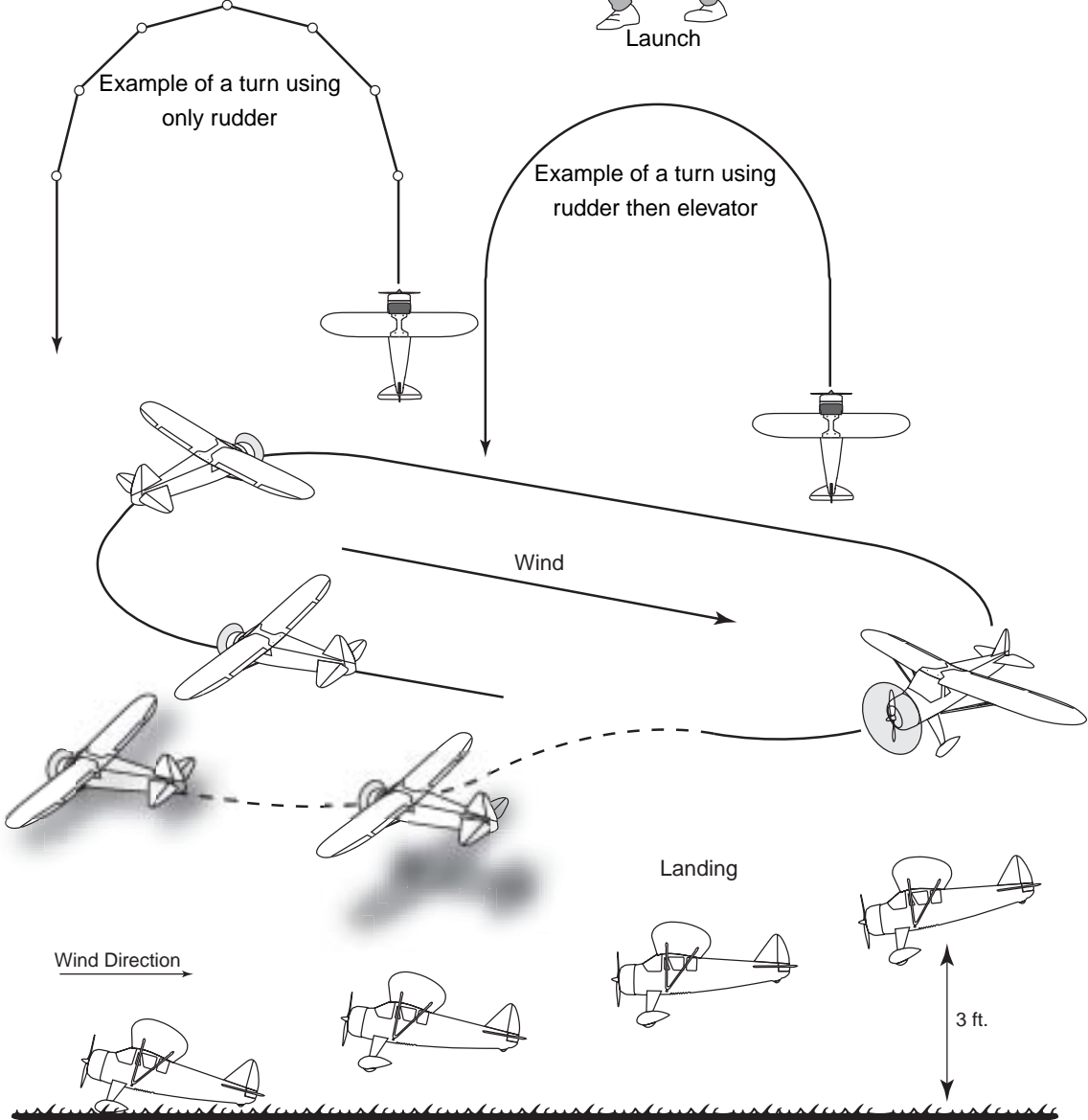
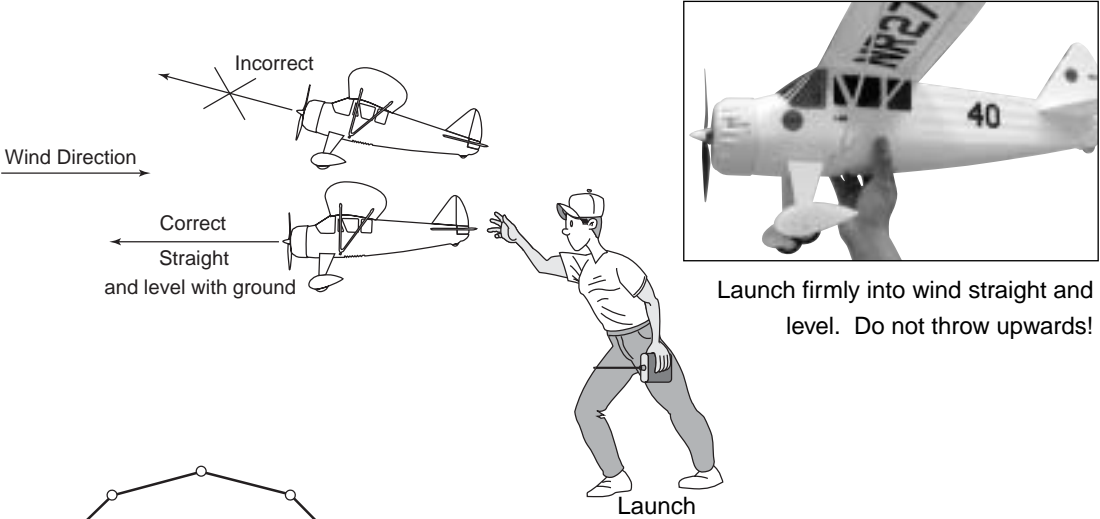
- Steer very gently right and left to keep the wings level. Let the airplane climb out gradually and gently until it reaches a comfortable cruise altitude at full flight speed. Always keep the airplane upwind of yourself and within a reasonable distance so you can see what it is doing. Remember, when the plane is coming toward you, when you move the stick to the right, the airplane will go to the left from your point of view. This is the hardest thing to learn. Initially, you can keep your body pointed in the same direction as the airplane and look over your shoulder. That helps.

- Usually, only small stick movements are required. Try to keep your flying smooth. You can turn the plane by bumping small amounts of rudder and then return to neutral. Use the elevator to keep the airplane at the desired altitude. After awhile, coordinate your turns with the elevator; i.e., bank the plane with a little bit of rudder, then feed in some up elevator to maintain the turn at the same altitude.
- If the plane tends to turn one way or the other use the trim lever on the control stick to neutralize the flight. Same thing applies if the plane wants to climb or dive.
- You can expect 3-4 minutes of "power-on" flight. You should always maintain enough altitude so you can set up a landing approach when the auto-cut off device turns the motor off and you begin the glide.

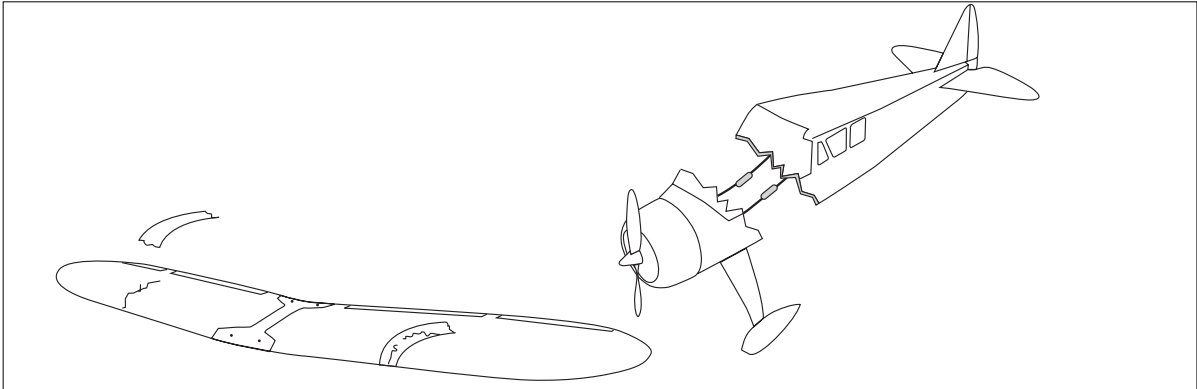
4.Landing

- When the motor cuts-off, set up your landing approach. Always try to land INTO THE WIND. Keep your turns gradual and only use elevator to maintain a gradual glide. Since the motor is off, you can no longer climb and the plane slows down. If you feed in too much up elevator, the plane will stall and may crash.
- Just before touchdown, "flare" the plane by adding up elevator. The plane should slow down even more and come in for a gentle landing. Don't add too much elevator, too soon!
- Walk over to the plane and turn off the switch on the plane, then the transmitter switch.
- Remove the batteries and let them cool off before charging up again.
- Check over the plane to make sure nothing loosened.

FLYING



REPAIR



Crash damage is not covered under the warranty!

If damage occurs, use small amount of furnished 5-min Epoxy to repair broken foam. Clear packing tape will hold the parts together; leave it on patch for added strength. Re-balance the plane after you repaired.

IN CASE OF TROUBLE

1. If motor does not run when Throttle Stick is up, make sure all the wires are well connected. Check and follow the manufacturer's manual of controller.
2. If the radio is erratic(glitches), check that the transmitter and receiver antennas are extended to their full length. Make sure the transmitter batteries are fresh. Make sure no one else is operation on your channel(frequency) in the

immediate vicinity.

3. If the plane does not fly properly, make sure you are being gentle with the control inputs. Make sure the plane is balanced properly. Make sure all the wing and tail surfaces are flat, true, and properly attached and aligned.

If your trouble persists, call authorized dealer for technical help.

CONCLUSION

To defeat the laws of gravity and take to the wing is both challenging and thrilling. We hope you enjoy your entry into the fascination world of R/C flight and make it your hobby for a lifetime. Please let Thunder Tiger be your chosen brand, no matter what direction you progress.



THUNDER TIGER CORPORATION <http://www.thundertiger.com>

JE6690