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VELOCITY-RC  
**T-33 SHOOTING STAR**

**ELECTRIC DUCTED FAN  
BUILDING INSTRUCTIONS**  
R08-V01

## THE ORIGINAL



The Lockheed P-80 Shooting Star was the first operational jet fighter used by the United States Army Air Forces. As one of the world's first successful turbojet-powered combat aircraft, it helped usher in the "jet age" in the USAF and other air forces worldwide.

The T-33 is a two-seat trainer variant with a longer fuselage. It's first flight was on 22 March 1948, piloted by Tony LeVier. The T-33 remained in production until 1959 and was produced under license in Japan and Canada. The trainer was used by more than 20 different countries. A total of 6,557 T-33s were built and some are still flying.

## SPECIFICATIONS (T-33A)

### GENERAL CHARACTERISTICS

Crew:	2	2
Length:	37 ft 9 in	11.2 m
Wingspan:	38 ft 10.5 in	11.5 m
Height:	11 ft 8 in	3.3 m
Empty weight:	8,300 lb	3'775 kg
Max takeoff weight:	15,100 lb	6'865 kg
Powerplant:	1× Allison J33-A-35	

### PERFORMANCE

Maximum speed:	600 mph	970 km/h
Range:	1,275 miles ferry	2'050 km
Service ceiling:	48,000 ft	14'600 m

## THE MODEL

The T-33 shooting star is a 70 mm EDF class fiberglass composite model jet, comes with a scale panel line fuselage, true to scale intake with factory pre assembled ducting and light weight balsa sheeted foam wings. It's designed to be powered by WM400 impeller fan and Velocity EDF motor while the performance of the model could be determined by the no. of cell application from nice scale speed 4s setup to high speed powered 6s set up. The look of the T-33 could be further enhanced by a pair of scaled fiberglass tip tanks which sold separately.

This is not a plane for beginners, one requires some flying experience to handle this high speed model.

We strongly recommend owner to read at the instruction before they start building the model.

## TECHNICAL SPECIFICATIONS

Fuselage length:	43 in	1090mm
Wingspan:	33.3 in	1125mm
Wing area:	8268 in <sup>2</sup>	21dm <sup>2</sup>
Weight without electronics:	27 ounces	760g
Takeoff weight:	~56 ounces	~1,6kg

## CONTENT OF THE KIT



- Fiber glass fuselage, finished in metallic silver.
  - Intake ducting factory preinstalled.
  - Laser cut formers factory preinstalled
- Fiber glass vertical stabilizer, finished in metallic silver
- Balsa/ply horizontal stabilizer, finished with silver covering film
- Balsa covered foam wings, finished with silver covering film
- WM400 EDF impeller system
- Clear canopy
- All hardware is included

Optional available: Fiberglass wing tanks

**ITEMS NEEDED TO COMPLETE**

4 ch. Computer Radio system w/ 3 servos.  
1 Electronic brushless speed controller  
1 480 size brushless motor  
Lipo polymer battery  
5 and 30 minute epoxy  
CA glue  
Thread locking adhesives  
Velcro

**STANDARD TOOLS:**

Drill or Dremel tool  
Plier/cutter  
Scissor  
Hobby Knife  
Soldering iron

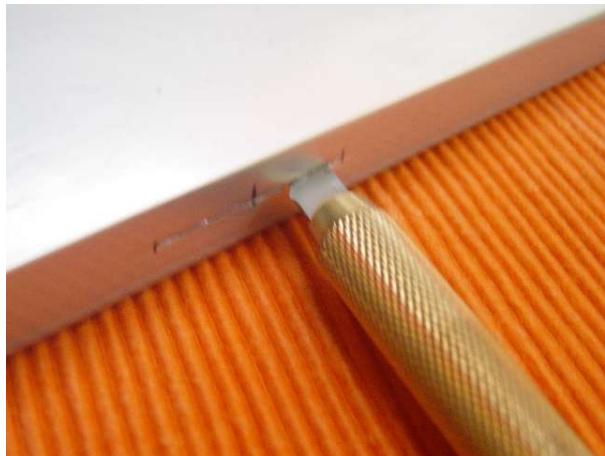
**VERY IMPORTANT GENERAL RULES**

	<p>Always sandpaper and degrease all areas where glue will be applied. Never apply glue direct on covering film nor on painted surfaces. Secure all screws and nuts with thread locking adhesives (e.g. Loctite or similar).</p>
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**CHECKING THE CONTENT OF THE KIT**

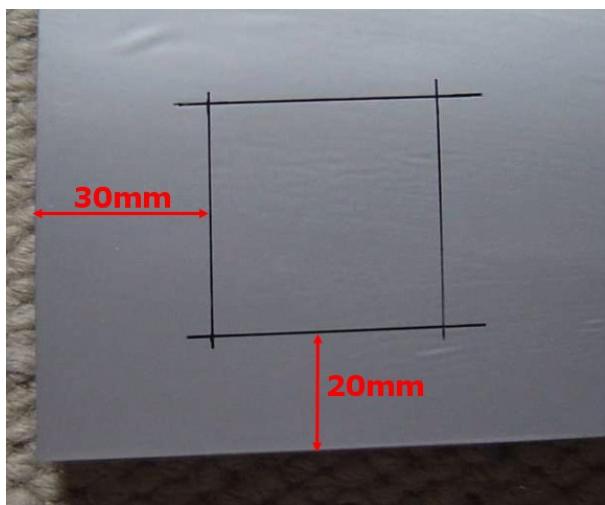
Fiberglass fuselage  
Film covered wings  
Fiberglass fan access door  
Fiberglass vertical stabilizer  
Film covered horizontal stab  
Clear canopy  
Div. hardware accessory  
Decal set

## PREPARING THE WINGS



Mark the position for the four aileron hinges ....

and cut the slots to insert the hinges into wing and aileron.



Slide in the hinges to check for correct position and alignment. Do not glue in the hinges at this time. Remove hinges and ailerons again.

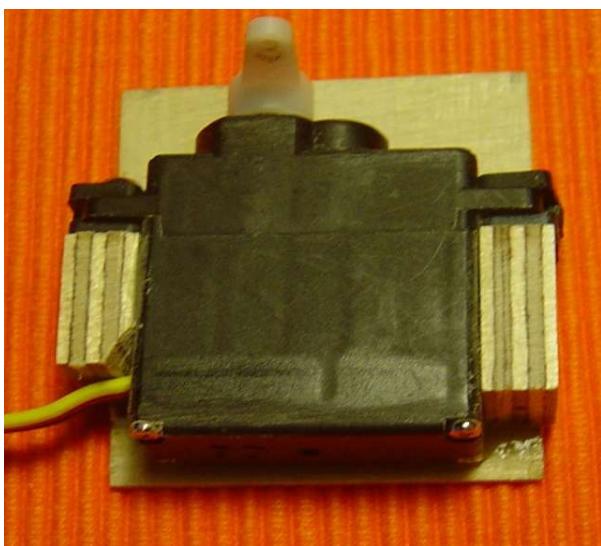
Mark the position for the aileron servo pocket on the top side of the wing. If you plan to install landing gears, you may install the servos from the bottom side. The outline of the pocket is depending of the used servos.



Cut out carefully the pocket for the servo. Remove the foam completely. Take care to the balsa cover. You will need it later to close the servo pocket.

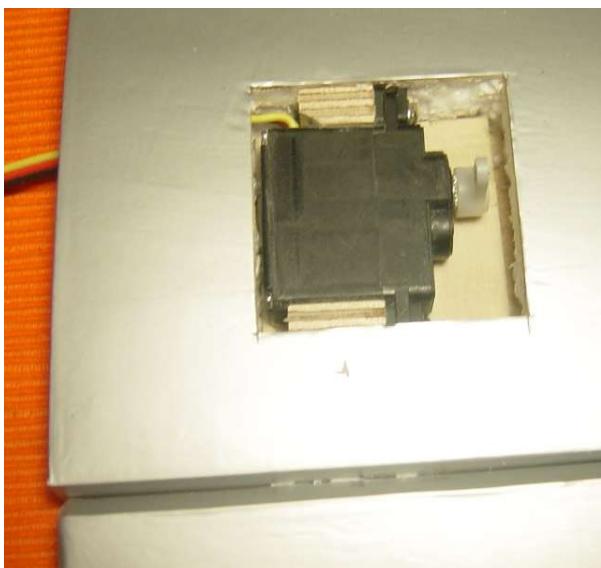


Drill a hole into the root rib of the wing for the servo cable. The hole in the foam can be done with a hot wire.



Prepare a servo bracket for the servo which will fit into the aileron servo pocket.

Adjust the servo arm in the vertical position if the servo is in its neutral position.



The top side of the servo case should be in parallel to the top side of the wing but about 1mm below the surface.



At the end you should be able to place the balsa cover over the servo.



If all parts will fit, glue in the servo bracket with the servo into the wing. Route the servo wires through the root spar. Lengthen the servo cables to 360mm measured from the root rib.

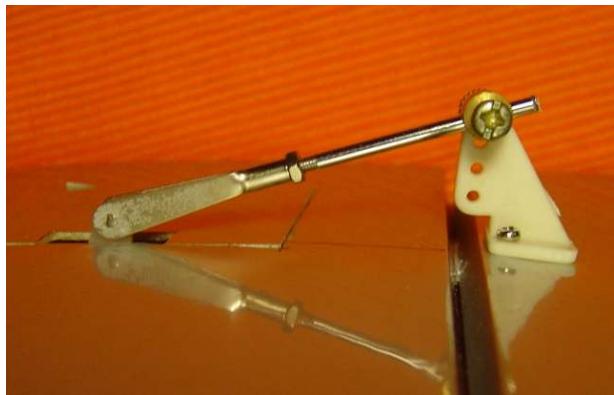
Glue the hinges first in place on the wing side with thin CA glue or – better- with special hinge glue. When the glue has cured fit the aileron and glue in the hinge on this side. Check for free movement of the aileron.

Increase the outer drilling in the control horn to 2mm and install the pushrod connector in the control horn. Secure the nut with some glue so it won't come off when you're flying the plane.

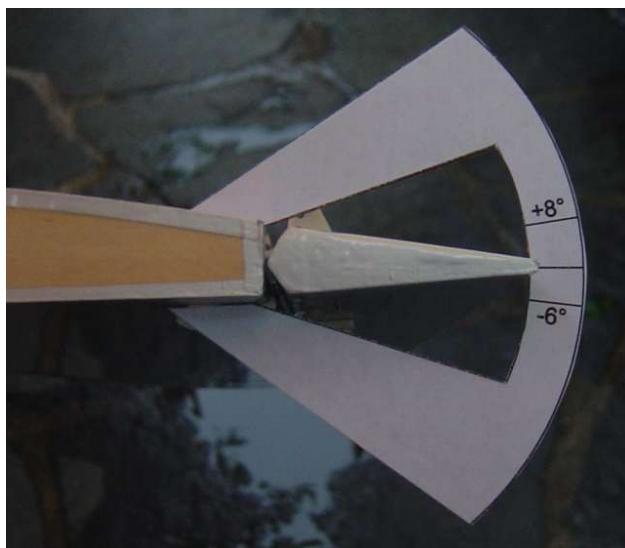


Mark the location of the control horn on the ailerons. Drill two holes (2mm) for the screws to fix the control horn.

Tighten the control horn by using the plate on the bottom side of the aileron.



Prepare the pushrod by tightening up a clevis. Slide in the pushrod into the connector on the control horn and plug in the clevis into the lowest possible drilling in the servo arm (~10mm from axle)



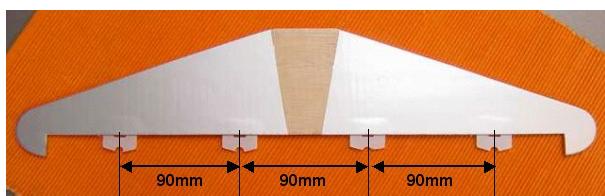
Now you should have already adjusted the aileron movements by using the appended template. Adjust it to 8mm up and 6mm down. Apply about 35% expo to the ailerons.

Repeat the same process for the second wing.

## PREPARING THE HORIZONTAL STAB



Remove the covering film on the horizontal stab in the center section with a hobby cutter and sand the wood surface lightly with a fine grit sand paper before epoxy is being applied on the surface. Repeat the same process at the bottom side of the stab as well.



Mark the position for the four elevator hinges ....



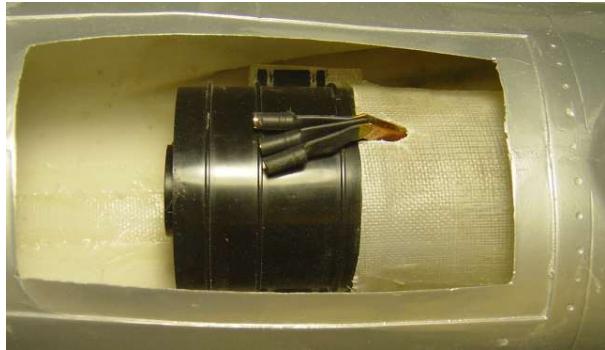
and cut small slots to insert the hinges into stab and elevator.



Slide in the hinges to check for correct position and alignment. Take note to apply CA to all the hinges only at the rudder side.

## PREPARING THE FUSELAGE

First assemble the WM400 Fan according the WM400 Instruction manual



Place the WM400 fan through the fan access door into its position at the end of the intake tube. Cut out the needed place for the motor cables or copper stripes into the intake duct. Check for the correct position of the fan mounts to the flange at the end of the intake duct. Be sure the fan housing is well inserted into the ducting; it should be slotted into the duct snugly.



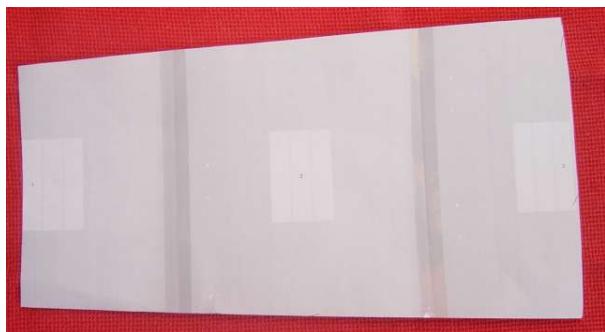
In the kit, there are two semi rounded wood formers that serving both purposes – servo elevator mounting and fan support.

The formers are being installed into the fuselage by having one side of the formers epoxy first then follow by the next former due to the limited space opening hatch design on the fuselage

Picture shows the fully assembled formers for WM400 Fan and elevator servo inside the fuselage.

Just slide this preassembled formers more to the front so they will act as support for the fan. Glue in the former to its final position.

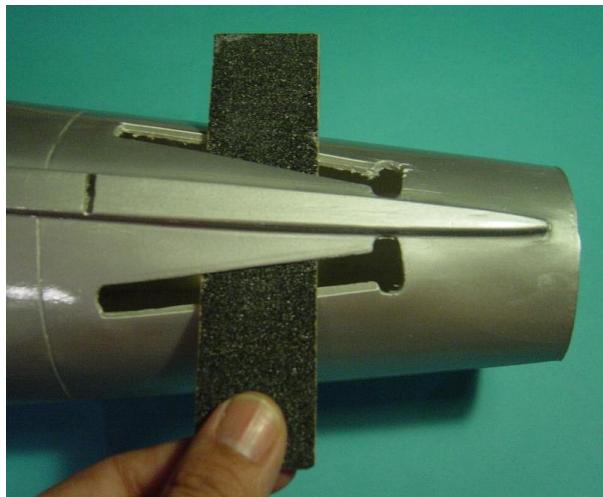
Once epoxy is cured, drill four holes for the screws to allow fan housing to be mounted.



Build a thrust tube from a thin A3 foil. A template at the end of the manual is provided for making a thrust tube mounted at the back of the wm 400. Print out the 3 pages from this template and tape them together. On the foil, let an overlap of 10mm and use 3M tape to fully seal up gap to form up a tube.



Picture shows a nicely done up thrust tube. Be sure to check if the thrust well glue or taped properly to the fan



Sand paper the slot surface with a medium grit sand paper to allow the horizontal stab to slide into place before applying the surface with epoxy.



At this point, you should be able to slide in the horizontal stab without big force. But don't glue in the stab now.

Cut away the rear section to allow easy access of the elevator rudder to be glued together later on.



The next step is to mount the vertical stab wood by inserting it through the vertical stab slot from the fuselage internal.



Glue in the former in the vertical fin area. It may be helpful to reinforce the former temporarily with a horizontal piece of ply. This allows the use of a clamp to hold the former in place firmly while epoxy glue is being cured. Be sure not to over clamp the fuselage, it may damage the fuselage. Once epoxy is cured, remove the reinforcement stick as shown in the picture.



Sand the fuselage and wing root first. Drill a small hole to allow servo wires to go through.

Pre assemble the hardwood wing joiner in the fuselage and wing and see if the wing fits nicely before applying it with epoxy. Be sure the v-shaped side of the wing spar is placed fits into the fuselage side nicely. Repeat same process on other opposite wing.



Start by gluing one wing panel with 30 minute epoxy. First apply some epoxy inside the wing joiner slot in the fuselage. Press the wing spar inside the fuselage.

Remove excess epoxy. Now apply epoxy in the wing spar slot in the wing root and also apply epoxy on the wing root. Slide the wing over the hard wood wing spar and press the wing against the fuselage. Make sure the leading and trailing edge are both aligned to the fuselage. Remove the excess epoxy with a clean cloth and cleaning alcohol. Proceed with the other wing panel the same way.

While glue is curing place fuselage and wings on 4 battens. The battens placed at the wing tips are 10mm larger than the battens on the fuselage / wing joining point.



Once glue is cured, glue in the horizontal stab by using 30 min epoxy. Apply the glue from the inner and outer side of the fuselage. Check for symmetrical and horizontal position.



If the glue is cured, insert the elevator rudder and glue in the 4 hinges



Install the elevator servo and adjust the servo arm in the 90° position if the servo is in its neutral position.

Cut out a small slot at the back of the fuselage as shown to allow the push rod to go through and connect to the elevator servo horn. The rod should straight connecting from the servo to the elevator control horn. Make sure the rod is not bended. Screw up the control horn to its needed position.

Picture shows connecting rod being inserted. Fine tuning adjustment work to the elevator should be done when model is fully assembled. There is a template appended for adjusting the elevator rudder to +/- 10mm.

## INSTALLING THE VERTICAL STAB



First sand down the paint on all places where you will have to apply the glue. Also sand the inner side of the vertical stab to allow the glue to bond firmly.



Glue in the vertical stab former from balsa. Check for correct position. The former may not cross the former from ply.

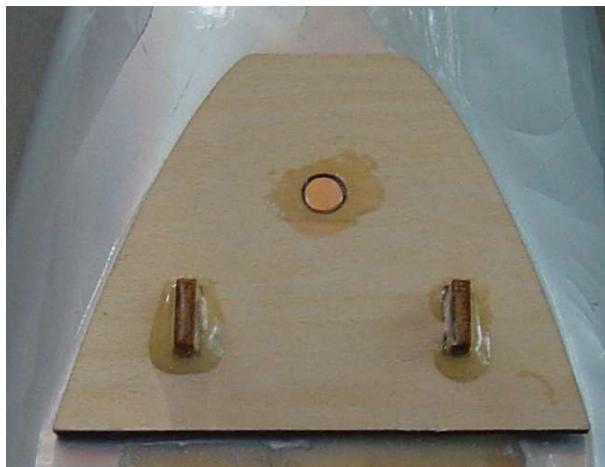
This picture shows the position for the vertical stab former only. Of course it's installed inside the vertical stab.



Apply 30 minute epoxy glue along the adhesion surface area.

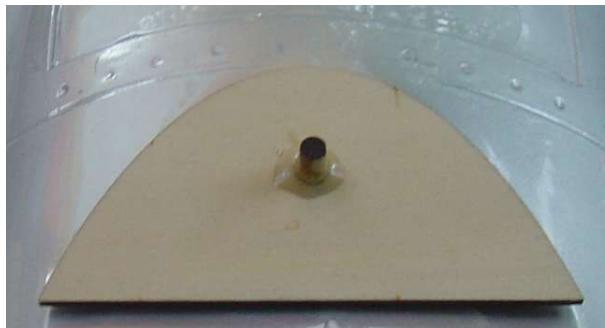
Hold the vertical stab in place with clamps. Adjust it exactly vertical and remove excess epoxy with a clean cloth and cleaning alcohol.

## CANOPY



First check the correct size and position of the hole and the two slots in the front canopy section of the fuselage. Glue in the 2 plywood flaps into the slots from the canopy front plate while the frontplate is fixed on it's place on the fuselage. Avoid gluing the frontplate to the fuselage.

At the same time glue in also the two magnets into frontplate and fuselage respectively. Place a thin foil between the two magnets. It's very important that the magnets will fit absolutely exactly together.



Check also the correct size and position of the hole in the back canopy section. Glue in the wooden dowel stick into the hole from the canopy back plate while the frontplate is fixed on it's place on the fuselage.

Now sand the edges of the canopy front and back plate so that it fits within the outlines of the fuselage and ABS canopy.



The prepared front and back plates for the cockpit.



Trim the plastic along the marked line and check until you have a good fit of the ABS canopy.

Place a piece of thin plastic film over the cockpit area.

Put the canopy front and back plate to it's position on the fuselage, and do some last adjustments to the canopy plates and ABS canopy.

Now you can glue the ABS canopy in place with 5 minute epoxy or better with canopy glue.

While glue is curing hold ABS canopy in place with a tape.

## BUNGEE HOOK



If you are starting the T-33 with a bungee, you have to install now a bungee hook. The position for this is located 55mm behind the air intake. Before inserting the hook, glue in a reinforcement from 3mm ply to the bottom of the fuselage (about 20mm x 50mm).

## INSTALLING THE ELECTRONICS

Now it's time to install all the electronic stuff into the fuselage.

Typically the receiver will be placed in the section behind the fan. This allows short servo cables. Use velcro or double-faced scotch tape to hold the receiver in place.

Best place for the ESC is the room between Fan and cockpit. Use velcro or double-faced scotch tape to hold the ESC on place.

## BATTERIE TRAY AND CG



The CG (center of gravity) will be adjusted with the position of the batterie pack. So this position is depending of the used equipement.

Determine in a first step the approximated position for the batterie pack. To do this, all the parts must be installed into the T-33.

By changing the position of the batterie pack find the CG point which is located 475mm behind the fuselage nose.

Once the approximate position is known, prepare a battery tray which allows an easy replacing of the batterie pack.

The batterie pack must be secured well on its place by using velcro tapes or similar.

## Check Before FIRST FLIGHT

CG	475mm from the nose
Elevator throws	+/- 10mm with 35% exponential
Aileron throws	+8mm / -6mm with 35% exponential

- Check all rudder for correct direction of movements
- Check all screws are tighten and secured
- Do a range check with motor power on
- Never fly if something doesn't work properly

## WARNING

**Although the T-33 is a stable airplane, it is not a trainer or first EDF airplane. This airplane is capable of very high speeds and therefore can cause serious personal injury and property damage. We strongly urge you to seek the help of an AMA approved instructor if this is your first aircraft of this type. Please use common sense.**

**Fly in suitable areas for a high-speed aircraft such as an AMA approved field.**

**Velocity-rc assumes no liability for the operation or performance of this product. It is the responsibility of the operator to use this product in a safe and responsible manner.**