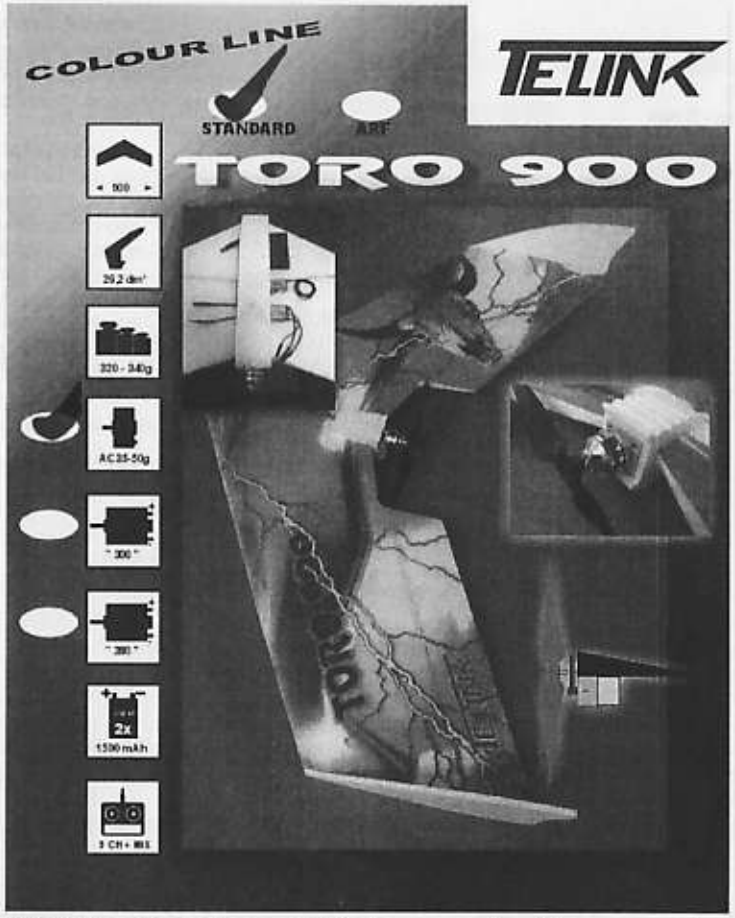


TORO 900 (a model to get crazy with) is the new version of the very popular and in record numbers produced Toro 300. The model was redesigned for the installation of the AC motors and LiPol accumulators. By adding a small fuselage pod the wing centre section was further stiffened and at the same time a safe compartment for the LiPol accumulator batteries was created. This way the battery change is much more comfortable than with the original version.
The model is remarkable by its fine flying qualities - it could be flown almost anywhere and thanks to its expanded (foam) polypropylene (EPP) structure it is virtually indestructible.
Its structure is very simple and the surface finish makes it an eye catcher. It is suitable also for an inexperienced pilot and the assembly (or rather just the installation of the RC equipment) is easiest possible - everybody can do it.
Note: the description of the versions in production with the contents of the kits is on the pages 7-8.

YOU WILL NEED

Transmitter - three-channel one with the delta mixer (you can also use a mixer in the model)

Servos - 2 pcs	e.g. HS 55 (9 g)
Receiver -	e.g.. Jeti Rex 5 MPD (8 g)
Motor -	e.g. Axi 2208/26 (40-50 g)
Controller Brushless -	for a min. 12 Amps current, e.g.. Jeti, MGM.....
Controller Brushed -	for 8 Amps current (motor 300), e.g. Tema SUPRA 8.
Accumulator battery -	2 pcs LiPol 1500-1800 mAh (70-90 g)
Propeller -	8/6

Recommend Brushless Power/control unit :

Hitec 55 (9g) servos, Jeti Rex 5 MPD (8 g) receiver, Jeti Eco 12 (14 g) controller, 2xLiPol 1500 mAh accumulator battery (85 g), Axi 2208/26 SL motor, (45 g), Model Motors rubber ring driver plate, APC 8/6 propeller, G 2mm connectors.
The flight weight of the thusly-equipped model is 316 g.

A list of other necessary material: epoxy glue, medium thick cyanoacrylate glue (we recommend the proven Flash brand), accumulator battery connectors...

A list of necessary tools: modelling knife, pliers....

TERMS USED

Anhedral - transversal inverted V of the wing
Elevon – Tailless aircraft control surface, combining the function of aileron and elevator.
Fin – fixed vertical aerodynamic surface affecting directional behaviour
„Pull" – pull the left control stick back, both elevons move up together
„Push" – push the left control stick forward, both elevons move down together.
„Right bank" - Move the right stick to the right, the starboard elevon moves up, the left one down.
„Left bank" – Move the right stick to left, right elevon moves down, the left one up.

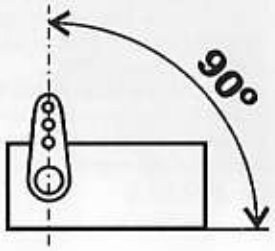
WORK PROCESS

Note: The wing is supplied with the built-in washout. That means the trailing edge of the elevon rises up towards the wingtip. To ensure the model's good flight behaviour, it is necessary to keep the washout as it is!

Readying the RC set: Switch the RC set on, switch on the proper mixer, put the trims to neutral. Install the one-sided arms to the servos.

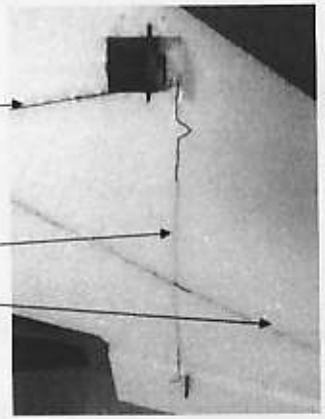
The arm is attached to the servo shaft at right angles to the long axis of the servo housing and points downwards.

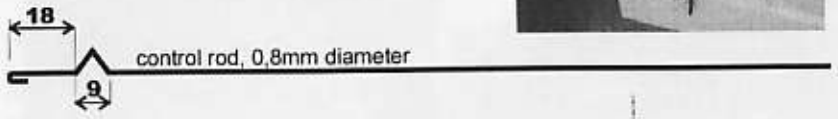
Set the servos arms and the elevon horns to the 1:1 leverage ratio. The well-tried leverage length is about 11 mm.



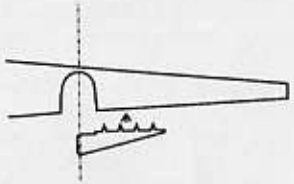
Assembling the wing halves:
The flying wing has an anhedral (negative V) to be set by a mere gluing of wing halves together. The bevels are factory-prepared!
Use epoxy or a medium-thick cyanoacrylate and accelerator.

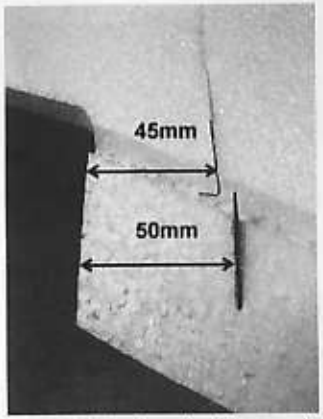
Wing underside:
Insert (do not glue) the fuselage pod on the wing, mark the place to lead the servo cables to. Prepare a slit about 4 mm deep and insert the cables to it.
Place the servos to their respective cutouts and secure in place with a drop of cyanoacrylate glue. Insert the control rods in guide tubes in place and glue the tubes to the wing. Glue the tubes into a slit some 4 mm deep.
The slit some 2mm deep is for the antenna.





Glue the elevon horns in place, with the hole for the control rod in the plane of the rotation axis of the elevon. The spanwise placement of the horn is visible on the photograph.

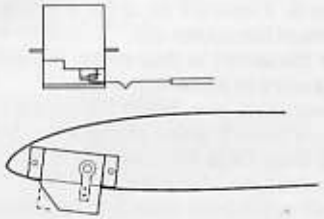




Establish the length of the control rod and bend as appropriate. It is not necessary to secure the control rod.

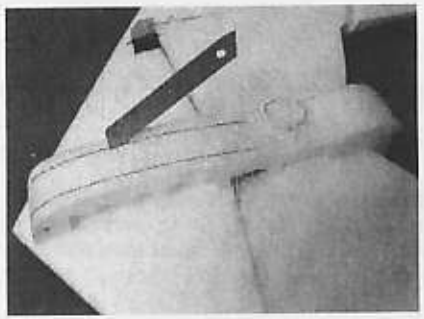
Adjust the neutral position of the elevon by narrowing or widening the V-bend of the control rod

Glue in place the servo arm protector (GRP).

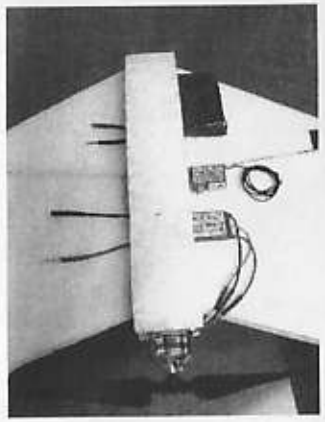


Fuselage stiffening, installation of the brushless motor and controller:

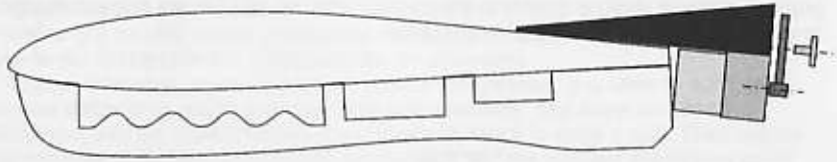
Stiffen the fuselage with the string provided in the kit. Using a steel ruler, cut a slit some 2-3 mm deep, push the string into it, saturate with cyanoacrylate and ensure the string is straight before the glue cures.



Match and drill the motor bearer (plate) with the brushless motor.
Decide where the cables between the motor and controller should run.
Choose either fuselage side or a hole through the fuselage.
Glue the bearer, bolt the motor to it and solder the controller.
Glue the whole assembly to the wing.



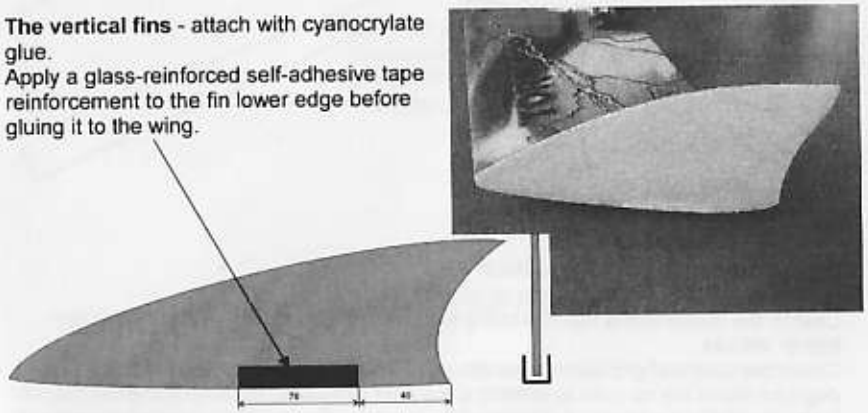
Motor mount assembly (brushed motor): Push the pinion onto the motor shaft and slide the motor into the gearbox body. Assemble with the motor mount and secure with glass filled tape. CA glue the complete assembly on the top wing surface. The back plate of the motor is flush with the fuselage backside.



Connecting the RC set, attaching the propeller:

Connect the receiver. Test the sense of rotation of the motor; if everything is OK, attach the propeller.

The vertical fins - attach with cyanocrylate glue.
Apply a glass-reinforced self-adhesive tape reinforcement to the fin lower edge before gluing it to the wing.



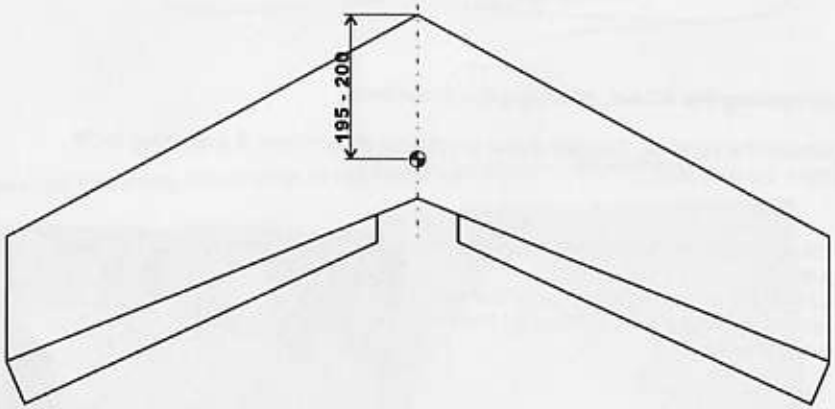
Adjusting the throw: Switch on the RC set. The neutrals should be OK as they were already adjusted during the building process.

Check the sense of displacement of control surfaces and the function of the mixer. If all is OK, set their displacement (throw).

elevator	+/- 15 mm
aileron	+/- 20 mm

measured at the trailing edge of the tip rib of the wing.
We do not recommend to increase the elevator displacement (throw). The model would be then prone to enter a spin easily.

Balancing the model at home. Balance the model (by adding the lead shot into the nose), to have the centre of gravity some 195-200 mm from the centre of the wing leading edge. **Note:** you **must not apply** the **"rule of thumb"** here. The all-wing (flying wing) aircraft are much more sensitive to the position of the centre of gravity than the ordinary aeroplanes.
The more nose-heavy a model is, the more docile it is. A model with the centre of gravity further aft shall be quicker in the control response, but it is not going to pardon even slight errors. This rule applies generally.



Balancing the model at the airfield:
Make the final check of the sense of controls' deflection.
Launch the model into a slight climbing trajectory. Trim and continue climbing into higher altitude.
Check the centre of gravity position this way: Enter a shallow descent at about 30 deg and return the controls to neutral. If the dive steepens, the centre of gravity is too far back. Add some lead to the nose. Is the model pulls out too abruptly, the centre of gravity is too far forward. In such case either remove some ballast (lead shot) from the nose or add (glue) some lead symmetrically as far back as feasible – i.e. into the tips of the wing or into the fins, provided they were fitted.
The ideally balanced model should recover from the descent by itself, but it is here where the pilot's personal preferences regarding the stability apply.
In a strong turbulence a nose-heavier model is definitely the more comfortable to control.

Flying and fine-adjusting the amount of control deflections: First and foremost - remember that all fine-tuning of the controls if useless if the model is not properly balanced in the first place (the C of G is in a wrong position).
The flying wing behaves as an ordinary model controlled by ailerons and elevator.

This means rolling the model using ailerons and making a turn using the elevator. Straightening the curve means to smoothly return the elevator to neutral and to roll back to horizontal by opposite deflection of ailerons.
This all sounds very simply, but there is one factor that plays a major role – the **speed** of the model. In a standard turn, for every speed there is a proper maximum angle of bank; with that angle corresponds the elevator deflection angle. Simply said, at greater speed it is possible to increase the bank and to fly a tighter curve.
Here we get into the matter of adjusting the deflection of the elevons.
The larger rolling (aileron) deflections are an advantage.
The pitch (elevator) control is somewhat more complicated. It is wiser to start with smaller deflections and to increase them only gradually. The throw should be increased until the model, following a violent pull, tends to enter a spin. Then reduce the elevator deflection to the previous safe value and the elevator adjustment could be considered finished.

We wish you the most enjoyable experiences and plenty of victories!
The authors of the model kit

Telink spol. s r.o.
Prusíkova 2493
155 00 Praha 5
www.telink.cz

DESCRIPTION OF AVAILABLE VERSIONS

The models are made both for the AC (brushless) and for the DC (bruhed) motors. They differ mainly in the attachment of the powerplant.
The kits slated for the DC power are already fitted with the complete propulsion unit with the class 280 or 300 motor. For the beginners the less powerful motor of the 280 class is the more suitable one.
There is also a choice available of either a standard or an ARF version. The ARF one has all control horns and control rod guide tubes already glued in place, the grooves for servo and receiver antenna cables cut out, the control rods already pre-bent to shape and the fins having the already attached reinforcing glass tape already attached. To finish the model it suffices to glue together the wing halves, to glue the reinforced fins on the wing-tips and to insert and eventually glue the components of the RC equipment into the pre-cut openings and grooves.

List of parts in the kist:

Toro 900 - brushless
2 x wing half of EPP
1x fuselage pod of EPP
2 vertical fin of EPP
1x motor bearer plate
2x servo arm protector, glass-reinforced plastic (GRP)
2x horn
2x control rod
2x control rod guide tube
1 x string (fuselage stiffening)

Toro 900 ARF - brushless
2 x wing half of EPP
1x fuselage pod of EPP
2 vertical fin of EPP
1x motor bearer plate
2x servo arm protector, glass-reinforced plastic (GRP)
2x control rod
1 x string (fuselage stiffening)

Brushless Power Unite AXI
1*controller JETI ECO 12
1*motor AXI 2208/26 Silver Line
1*Universal Prop Saver Set for AXI 22xx/xx
1*motor mount - motor
1*motor mount UNI – model
2* screw M3*5
4*screw 2,2*8
1*propeller 8/6

Toro 900 - brushed
2 x wing half of EPP
1x fuselage pod of EPP
2 vertical fin of EPP
1x motor bearer plate
2x servo arm protector, glass-reinforced plastic (GRP)
2x horn
2x control rod
2x control rod guide tube
1 x string (fuselage stiffening)

Toro 900 ARF - brushed
2 x wing half of EPP
1x fuselage pod of EPP
2 vertical fin of EPP
1x motor bearer plate
2x servo arm protector, glass-reinforced plastic (GRP)
2x control rod
1 x string (fuselage stiffening)

Brushed power unit
1*motor „280" or „300"
2*capacitor
1*motor mount
1*gearbox 3/1 or 5/1
1*propeller 8/6