







## Safety notes

 Pensez-y toujours: ne volez jamais vers ou au-dessus des personnes ou des animaux.



### Safety notes

-  Before every flight check that the motor and propeller are in place and secure - especially after transporting the model, and after hard landings and crashes. Check also that the wing is correctly located and firmly secured on the fuselage before each flight.
-  Don't plug in the battery until you have switched on the transmitter, and you are sure that the motor control on the transmitter is set to "OFF".
-  When the model is switched on, ready to fly, take care not to touch the propeller. Keep well clear of the propeller disc too, and ask spectators to stay back.
-  Allow the motor to cool down after each flight. You can check this by carefully touching the motor case with your finger. The temperature is correct when you can hold your finger on the case without any problem. On hot days this may take up to 15 minutes.
-  Please keep in mind at all times: don't fly towards people or animals.

### Familiarise yourself with the kit!

MULTIPLEX model kits are subject to continuous material monitoring during production. We hope that you will be happy with the contents of the model kit. However, we ask you to check all parts (against the parts list) **before** using them, as **processed parts are non exchangeable**. If a part should not function, we will be happy, after checking the problem, to repair or replace the part. In such a case, please send the part to our model construction department and **do not forget** to enclose proof of purchase and a short description of the fault. We are continuously working on the technical improvement of our models. We reserve the right to modify the contents of the kit with regard to shape, size, technology, material and features at any time and without notification. Please understand that information and figures in these instructions cannot form the basis for a legal claim.

**Warning! Remotely controlled models, in particular aircraft models, are not toys in the conventional sense. Their construction and operation requires technical understanding, at least some practical ability and care as well as discipline and self-confidence. Faults and carelessness during construction and operation can result in injury to people and damage to property. Because the manufacturer has no influence over the correct assembly, maintenance and operation we expressly draw these hazards to your attention.**

### Additional Products Required for Assembly :

#### Remote control system

When ordering in North and South America add an "M" in front of the part number

|    |                                         |          |           |        |
|----|-----------------------------------------|----------|-----------|--------|
|    | MULTIPLEX receiver <i>PiCO 5/6</i> UNI  | 35 MHz A | order no. | 5 5920 |
|    |                                         | 40 MHz A | order no. | 5 5921 |
|    |                                         | 72 MHz   | order no. | 5 5954 |
| or | MULTIPLEX receiver <i>Micro IPD</i> UNI | 35 MHz A | order no. | 5 5971 |
|    |                                         | 40 MHz A | order no. | 5 5972 |
|    |                                         | 72 MHz   | order no. | 5 5973 |

|                                                     |                   |           |         |
|-----------------------------------------------------|-------------------|-----------|---------|
| MULTIPLEX <i>Servo Tiny S</i> UNI (required<br>2 x) | elevator / rudder | order no. | 6 5121  |
| MULTIPLEX PiCO- 400 round UNI                       | motor controller  | order no. | 7 2292  |
| <b>Drive Battery:</b>                               |                   |           |         |
| MULTIPLEX drive battery NiCd                        | 6 / 500 mAh       | order no. | 15 5545 |
| or MULTIPLEX drive battery Permabatt<br>NiMh        | 6 / 1500 mAh      | order no. | 15 6019 |
| or MULTIPLEX drive battery NiCd                     | 7 / 500 mAh       | order no. | 15 5648 |
| <b>Charging unit:</b>                               |                   |           |         |
| MULTIcharger 4010 DC                                |                   | order no. | 9 2527  |
| <b>Glue:</b>                                        |                   |           |         |
| MULTIPLEX „Zacki leicht verdickt“                   |                   | order no. | 59 2720 |
| MULTIPLEX „Zacki Aktivator“                         |                   | order no. | 59 2824 |

Alternatively, a similar superglue (cyanoacrylate glue) can be used, but do not use a superglue for polystyrene.

Epoxy glues initially provide reasonable adhesion, but if loaded, the hard glue will crack off. The adhesion is only superficial.

**Tools:** Scissors, craft knife, combination pliers, Ø 4-5 mm spike or small round file

#### **Technical data:**

wingspan 1370 mm  
total length 917 mm  
fuselage length 870 mm  
weight during flight 400 motor series / 6 AA cells approx. 680 g  
wing size approx. 24 dm<sup>2</sup>  
wing load approx. 28 g/dm<sup>2</sup>  
RC functions rudder, elevator and motor control

**Note:** Remove the pages with the illustrations from the middle of the instructions for assembly!

**Important information** This model is not made from polystyrene foam. For this reason it is not possible to use white glue or epoxy glue. Please only use a cyanoacrylate glue, preferably one which is used in conjunction with an activator (kicker). Please use a cyanoacrylate glue (superglue) of medium viscosity such as „ZACKi leicht verdickt“ With Elapor®, always spray one side with the activator (kicker) – leave it to dry and cover the other side with the cyanoacrylate glue (ZACKi). Join the parts together and fix their position immediately.

***Take care when working with cyanoacrylate glues. These glues harden within seconds. Therefore do not touch with the fingers or allow contact to other***

***parts of the body. Wear protective goggles to protect the eyes! Keep out of the reach of children!***

### **1. Before assembly**

Check the contents of the construction kit.

**Fig. 1+2** and the parts list will help you with this.

**RTF\*** : Parts marked like this are not part of the EasyStar # 214192 construction kit!  
RTF = Ready To Fly!

### **2. Assembly of fuselage and motor** Start with the left-hand side of the fuselage **3**. A suitable glue for all connections is a CA glue in conjunction with an activator. **Fig. 3**

The enclosed motor **41** is already fitted with an interference suppressor – this is adequate if the PiCO-Control 400 round UNI # 7 2292 control is used. Solder the controller # 7 2292 to the connection tags at the motor. Even at this stage ensure that the motor runs clockwise (when looking at the motor shaft / if it does not, swap over the motor tags). Glue the motor **41** into the half of the fuselage **3**, making it protrude by approx. 3 mm as is illustrated in **fig. 4**. Ensure that no glue gets into the motor or covers the cooling vents! Now lay the cables to the drive battery and the receiver at the front in the corresponding grooves in the half of the fuselage **3**. The cable must be entirely covered by the foam. **Fig. 3**

If you intend to use a different controller, you should improve the motor interference suppressor in order to be on the safe side. For this purpose, a suitable suppressor set # 8 5020 is available. If doing this, solder on a 47 nF capacitor between the motor connection and the motor housing and another, also of 47 nF, between the motor connections.

Now the two halves of the fuselage **3** and **4** are glued to each other – test first without the glue that this is possible without difficulty – if necessary, correct any problems first. Cover the gluing point on the half of the fuselage **3** with viscous glue (cyanoacrylate) – fuselage half **4** must already have been sprayed with activator and allowed to dry – now carefully join parts **3** and **4** and align them! The fuselage joint must be straight and must not be bent! **Fig. 5**

**3. Installation of the canopy lock** Install locking plates **22** for the fasteners for the canopy lock so that the locking pin **23** can later lock between plate **22** and the fuselage wall. To do this, spray the „nests“ in the fuselage with the activator and allow to dry. Then cover the locking plates with superglue and insert without delay

in the correct position. If necessary, improve the glued connection later. **Fig. 6**

#### **4. Attaching the rudder horns and connections for the linkage to the elevator and the rudder**

Shorten the T-shaped part of one of the rudder horns **24** to 2.5 mm as shown in **fig. 8**. Insert the linkage connections **25** into the outer holes in the rudder horns **24** and fasten them using washer **26** and nut **27**. **Warning:** Observe the direction of installation, 1x left-hand direction, 1x right-hand direction. Tighten the nuts (but do not over-tighten them) and then secure them with a spot (needle) of superglue. Pre-inst all the hexagon-socket worm screw **28** in the linkage connection **25** using the Allan key **29**. **Fig. 8+9**

Glue the rudder horns **24** into the nests in the rudders **10** and **11** which have already been wetted with activator

– with the row of holes pointing towards the hinge line.

**Fig. 8+9**

**5. Gluing in the elevator and the rudder**The elevator **10** and the rudder **11** are glued together at a 90° angle. Please check this, for example by means of a set-square. **Fig. 10**

#### **6. Gluing the rudder and the elevator to the fuselage**

Test-fit the elevator and the rudder, without using glue, to the fuselage and check the fit. Observe in particular whether the elevator **10** lies flush in the fuselage and is parallel to the wing seat on the front of the fuselage.

**Fig. 11** To do this, the spar connector **34** is placed across the wing seat as an aid.

Now look from the nose of the fuselage over the spar connector and align the elevator in this way. After aligning the elevator and the rudder in the way described, glue them to the fuselage – check the alignment again and make sure that there are no gaps!

#### **7. Installation of the servo motors into the fuselage**

Using the remote control, switch the servo motors to „neutral“ and mount the servo motor control horns on the motor in such a way that in the neutral position they stick out at the sides at a 90° angle – 1x on the left-hand side, 1x on the right-hand side. Now test-fit the servo motors into the fuselage. Depending on the servo motor type used, some small adaptations may be necessary. Press out the holes for the servo motor cables using the round file or a spike and pull the cables into the fuselage. Shrink-fit the servo motors into the shrink installation hose or wrap them with adhesive tape and then glue in. **Note:** Never omit the adhesive tape or the shrink hose. Otherwise glue might get into the servo motor and destroy it. **Fig. 12**

#### **8. Rudder linkage installation into the fuselage**

The rudder linkage for the elevator and the rudder consists of the external sleeve for the Bowden pull wire **31**, the internal Bowden pull wire sleeve **33** and the steel

wire with Z-bend **30** . These are fitted together and hooked using the Z-bend to the servo motor lever **fig.**

**13.** The distance to the fulcrum from the servo motor lever should be approx. 10 mm.

The other ends of the steel wires **30** are pushed through the transverse holes for the linkage connectors **25**. Embed the Bowden pull wires into the fuselage and fix the shorter external sleeve **31** as shown in **fig. 13 -fig.**

**16.** If necessary, the steel wire **30** is bent with pliers at the rudder horn **fig. 16**. The external Bowden pull wire sleeves **31** are now adhered to the fuselage along their entire length. This much increases the stability of the rudder support. Ensure that the Bowden pull wires run easily and that no glue can enter into the Bowden pull wire sleeve. Finally, the servo motors are set to the neutral position and the hexagon-socket worm screws **28** are tightened at the linkage connections **25**.

### **9. Antenna installation to the bottom of the fuselage**

The connection to the antenna for the receiver is led to the bottom of the fuselage and inserted into the plastic tube **32**. For this, a hole must be pierced from the beginning of the groove along the bottom of the groove to the inside of the fuselage, then push the antenna through from the inside and insert into the tube **32**. This is most easily done with a pointed steel wire. It is then pushed along tube **32** and stuck into the end of the antenna insulation. It may be helpful to secure the end with a spot of superglue. At the end of the fuselage, the antenna tube is inserted into the spike and secured along its entire length by means of adhesive tape.

Warning: Do not bend the fuselage while doing this.

**Fig. 17**

**10. Gluing in the locking pin for the canopy** Pairs of locking pins **23** are inserted into the canopy **5**. The pins should point towards the inside! Apply "ZACKi leicht verdickt" to the toothed part, but without activator! Then insert half of the locking pins into the slots of the canopy. Immediately allow the canopy to be locked by the locking pins in the locking plates **22** and then align without delay. Wait for approx. 1 minute and then open the canopy carefully. Spray activator onto the gluing points of the locking pins. **Fig. 18**

### **11. Attaching the propeller**

Detach the propeller from the (black) spinner, turn over the propeller (the embossed writing will now point to the rear) and then re-insert the spinner. Pierce the spinner with a needle from the rear to the front. This allows the air to escape during the later installation. The propeller is then glued onto the motor shaft using 5-minute-resin or using Endfest 300 (UHU). **Fig. 19 Do not use superglue here!!! It may cause the material to become brittle and shatter then the spinner will detach!**

**12. Inserting the wings** The spar covers **8** and **9** must be carefully glued into the

wings **6** and **7**. Take care not to allow any glue to touch the surfaces which will later be inserted into the spar connectors **34**. First try out the spar connectors **34**, when you are certain that there is no active glue inside the hole, the spar is to be inserted. Otherwise it might happen that you will be unable to ever dismantle the model again. **Fig. 20**

### **13. Checking the plug-in connection**

Now assemble the model by means of the spar connector **34**. When doing this, check the correct attachment of the wings **6 + 7** in the fuselage. If necessary re-work carefully. **Fig. 21**

### **14. Installing flight battery and receiver**

The installation of the flight battery and the receiver is as follows: The flight battery is located in the front of fuselage nose, and behind it is the receiver. While positioning these elements, pay attention to the location at which the center of gravity should eventually lie according to point **17**. Glue the Velcro tape (knobbly side) to the positions on the fuselage floor where the flight battery and the receiver are to be installed. The adhesive backing of the Velcro tape is not sufficient for this purpose; use additional superglue. The final position of the flight battery is determined when the center of gravity is determined. Ensure that the Velcro tape makes good contact with the battery. If you are not working carefully here, you might lose your battery in-flight.

### **Each time before take-off check that the battery is securely attached!**

Test-install all the connections following the instructions for the remote control.

**Insert the battery / motor controller connection plug only after switching on your transmitter and if you are certain that the transmitter throttle control is set to the off position.**

Insert the servo motor plug into the receiver. Switch on the transmitter and connect the drive battery to the controller and the controller to the receiver. Your controller must be equipped with a battery eliminator circuit (BEC, this powers the receiver and servos directly from the flight battery.). Now briefly switch the motor on and re-check the direction of rotation of the propeller. (Hold the model firmly during the test run, remove loose, light objects from behind the model.)

**Caution, even with small motors and propellers there is the danger of injury!**

### **15. Adjustment of the elevator and the rudder movement**

In order to make the model follow commands smoothly, the travel of the rudder and elevator movement must be adjusted correctly.

The elevator upwards (pull control stick) approx. 5 mm and downwards (push control stick) approx. 4 mm. The rudder 10 mm to both the left-hand

**side and the right-hand side**; measure at the lowest point of the rudder on either side.

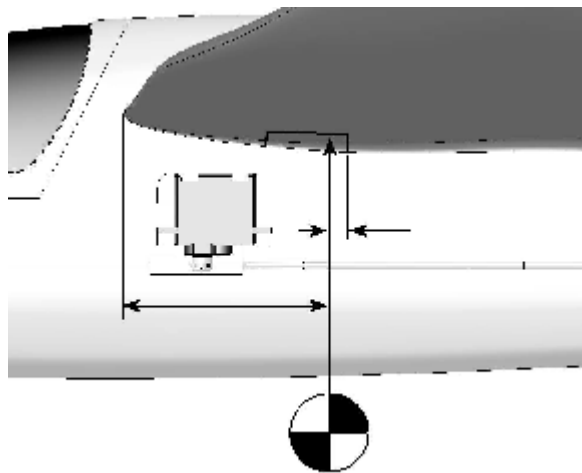
If your remote control does not allow this movement, you will have to adjust your linkage connector.

**16. Decoration** For decoration, a multi-color decoration sheet **2** is enclosed. The individual words and symbols are cut out and applied either according to our suggestion (picture on the construction kit) or according to your own ideas. Blacken the canopy **5** to its edge using a water-proof felt tip pen.

### **17. Finding the center of gravity**

In order to achieve stable flying characteristics, your EasyStar must balance at one particular point, just like any other aircraft. Set up your model so that it is ready to fly and insert the flight battery .

**The center of gravity is marked and then adjusted to approx. 5mm in front of the rear edge of the spar cover. This adjustment is equivalent to approx. 78 mm behind the front edge of the wing if measured at the fuselage.** If it is supported at this point by your fingers, the model should balance horizontally. Corrections are possible by shifting the flight battery . Once the correct position is found, make a mark inside the fuselage so that the battery can always be located in the same position. **Fig. 22**



### **18. Preparation for the first flight**

Wait for a calm day for the first flight. Often the evening hours are particularly favourable.

**Before the first flight, do a radio range check!**

A range check will confirm that your radio system is working properly. Transmitter batteries and flight batteries must be freshly charged up and in accordance with the instructions. Check before switching on the transmitter, that the channel to be used is available and not being used by another modeler. A helper walks away with the transmitter with the antenna completely pushed down. While the helper is walking away, activate a control function. Observe the servo motors. The non-activated servo motor should remain still up to a distance of approx. 35 m or 100 feet and the controlled one must follow the control movements without delay. This test can only be carried out successfully when the radio channel is free of interference. This test must be repeated while the **motor is running**. This should lead to no more than a minor reduction in the reach. If you are in any doubt, do not fly the aircraft. Have the system checked by a knowledgeable modeler or a radio service facility. Hand the entire system (with drive battery, switch cable, servo motors) to the service department of the manufacturer of these appliances for checking.

### **First flight ....**

#### **Do not attempt to launch your Easy Star without the motor running !**

The model is launched with a gentle toss into the wind.

#### **During the first flight it is best to have the support of an experienced helper.**

This is the most important advice in this entire instruction manual. If at all possible have an experienced R/C pilot put the first flight on your new model. They will trim your Easy Star so that it will fly "hands off" allowing you to learn to fly with a stable, controllable airplane. If this is not possible, double check to make sure all your controls function correctly and in the proper direction. While holding the model with the wings level at shoulder height, turn on the motor to full power and gently toss the plane into the wind. Your model should climb out and directly away from you at a shallow angle with the wings level. Resist the urge to "over control" the model with large control stick movements, After a safe height has been reached, adjust the rudder and the elevator with the trims on your transmitter, so that the model flies straight and wings level.

At a sufficient height, familiarise yourself with the reaction of the model when the motor is switched off. Simulate landing approaches at high altitude, so that you are prepared when the drive battery runs low. At the beginning, do not try any forced turns close to the ground in during the landing procedure. Land safely. It is better to walk some distance to retrieve your plane than to risk crashing the model.

### **19. Safety**

Safety is the most important rule during flying aircraft models. It is suggested you obtain liability insurance through the Modeling Association in your Country. If you join a club or association you will be able to join an insurance program there. Take care to be adequately insured (for model aircraft with motor). Always maintain the



model and remote control in good working condition. Find out about the charging technology available for the batteries you use. Make use of all the sensible safety equipment that you are offered. Get information from our main catalogue; MULTIPLEX products have been constructed by model aircraft pilots from their practical experience for practical use. Fly conscientiously! To fly closely above the heads of other people is not a sign of ability. Real experts do not need to show off in this way. Point this out to other pilots for our common interest. . Always fly in such a way that neither you nor others are endangered. Always remember that even the best remote control can be disturbed by external influences. Even many years of flying without an accident are no guarantee for the next minute of flying. We, the MULTIPLEX team, wish you fun and success with the construction and flying of your Easy Star.

MULTIPLEX Modellsport GmbH & Co. KG Product care and development



Klaus Michler

**Parts list  
BK**

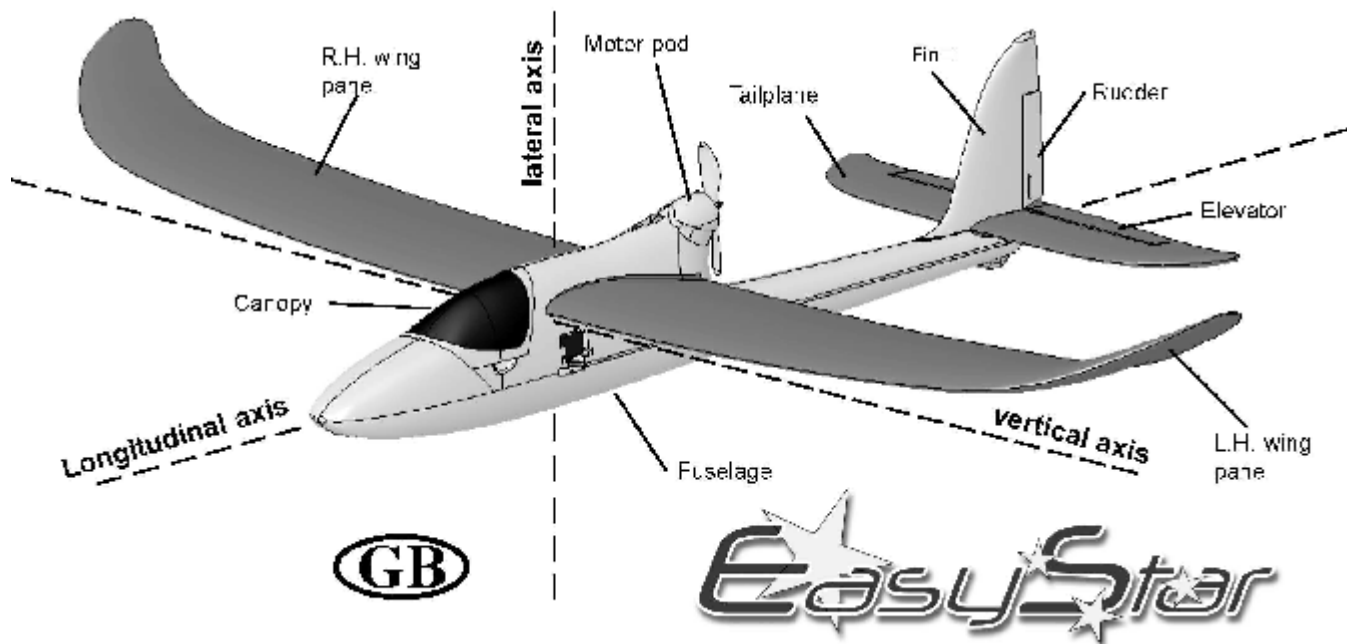
**# 21 4192**

| <b>Serial pce</b>  | <b>Designation</b>              | <b>Material</b>          | <b>Dimensions</b> |
|--------------------|---------------------------------|--------------------------|-------------------|
| 1                  | 1 construction instructions     | A4                       |                   |
| 2                  | 1 decoration sheet              | printed adhesive film    | 350 x 500 mm      |
| 3                  | 1 left-hand side fuselage half  | foam Elapor              | complete part     |
| 4                  | 1 right-hand side fuselage half | foam Elapor              | complete part     |
| 5                  | 1 canopy                        | foam Elapor              | complete part     |
| 6                  | 1 left-hand wing                | foam Elapor              | complete part     |
| 7                  | 1 right-hand wing               | foam Elapor              | complete part     |
| 8                  | 1 left-hand spar cover          | foam Elapor              | complete part     |
| 9                  | 1 right-hand spar cover         | foam Elapor              | complete part     |
| 10                 | 1 elevator                      | foam Elapor              | complete part     |
| 11                 | 1 rudder                        | foam Elapor              | complete part     |
| <b>Small parts</b> |                                 |                          |                   |
| 20                 | 3 Velcro knobs                  | plastic                  | 25 x 60 mm        |
| 21                 | 3 Velcro loops                  | plastic                  | 25 x 60 mm        |
| 22                 | 2 locking plate                 | injection-molded plastic | complete part     |
| 23                 | 2 locking pin                   | injection-molded plastic | complete part     |

|                    |   |                                                             |                             |                     |
|--------------------|---|-------------------------------------------------------------|-----------------------------|---------------------|
| <b>24</b>          | 2 | glue in rudder horn                                         | injection-molded plastic    | complete part       |
| <b>25</b>          | 2 | linkage connector                                           | metal                       | complete part Ø 6mm |
| <b>26</b>          | 2 | washer                                                      | metal                       | M2                  |
| <b>27</b>          | 2 | nut                                                         | metal                       | M2                  |
| <b>28</b>          | 2 | hexagon-socket worm screw<br>for connecting the linkage     | metal                       | M3                  |
| <b>29</b>          | 1 | Allan key                                                   | metal                       | size 1.5            |
| <b>Wire kit</b>    |   |                                                             |                             |                     |
| <b>30</b>          | 2 | steel wire for elevator and<br>rudder with Z-bend           | metal                       | Ø 0.8 x 613 mm      |
| <b>31</b>          | 2 | external Bowden pull wire<br>sleeve for elevator and rudder | plastic                     | Ø 3/2 x 515 mm      |
| <b>32</b>          | 1 | external Bowden for the antenna                             | plastic                     | Ø 3/2 x 640 mm      |
| <b>33</b>          | 2 | internal Bowden pull wire sleeve<br>for elevator and rudder | plastic                     | Ø 2/1 x 550 mm      |
| <b>34</b>          | 1 | spar connector                                              | glass fibre reinforced tube | Ø 8 x 1 x 495 mm    |
| <b>Driving set</b> |   |                                                             |                             |                     |
| <b>40</b>          | 1 | propeller                                                   | plastic                     | 125 x 110 mm        |
| <b>41</b>          | 1 | drive motor                                                 | Permax 400 6V               | complete part       |

#### Basic information relating to model aircraft

Any aircraft, whether full-size or model, can be controlled around the three primary axes: vertical (yaw), lateral (pitch) and longitudinal (roll). When you operate the elevator, the model's attitude alters around the lateral axis. If you apply a rudder command, the model swings around the vertical axis. If you move the aileron stick, the model rolls around its longitudinal axis. As our EasyStar has considerable wing dihedral, ailerons are not required for roll control. In this case the rudder is used both to turn the model around the vertical axis, and also to roll it (longitudinal axis). External influences such as air turbulence may cause the model to deviate from its intended flight path, and when this happens the pilot must control the model in such a way that it returns to the required direction. The basic method of controlling the model's height (altitude) is to vary motor speed (motor and propeller). The rotational speed of the motor is usually altered by means of a speed controller. Applying up-elevator also causes the model to gain height, but at the same time it loses speed, and this can only be continued until the model reaches its minimum airspeed and stalls. The maximum climb angle varies according to the power available from the motor.



#### Wing section

The wing features a cambered airfoil section over which the air flows when the model is flying. In a given period of time the air flowing over the top surface of the wing has to cover a greater distance than the air flowing under it. This causes a reduction in pressure on the top surface, which in turn creates a lifting force which keeps the aircraft in the air. **Fig. A**

#### Centre of Gravity (CG)

To achieve stable flying characteristics your model aircraft must balance at a particular point, just like any other aircraft. It is absolutely essential to check and set the correct CG position before flying the model for the first time. The CG position is stated as a distance which is measured aft from the wing root leading edge, i.e. close to the fuselage. Support the model at this point on two fingertips (or - better use the MPX CG gauge, # 69 3054); the model should now hang level. **Fig. B** If the model does not balance level, the installed components (e.g. flight battery) can be re-positioned inside the fuselage. If this is still not sufficient, attach the appropriate quantity of trim ballast (lead or plasticene) to the fuselage nose or tail and secure it carefully. If the model is tail-heavy, fix the ballast at the fuselage nose; if the model is tail-heavy, attach the ballast at the tail end of the fuselage.

The **longitudinal dihedral** is the difference in degrees between the angle of incidence of the wing and of the tail. Provided that you work carefully and attach the wing and tailplane to the fuselage without gaps, the longitudinal dihedral will be correct automatically.

If you are sure that both these settings (CG and longitudinal dihedral) are correct, you can be confident that there will be no major problems when you test-fly the model. **Fig. C**

#### Control surfaces, control surface travels

The model will only fly safely, reliably and accurately if the control surfaces move freely and smoothly, follow the stick movements in the correct "sense", and move to the stated maximum travels. The travels stated in these instructions have been established during the test-flying programme, and we strongly recommend that you keep to them initially. You can always adjust them to meet your personal preferences later on.

### **Transmitter controls**

The transmitter features two main sticks which the pilot moves to control the servos in the model, which in turn operate the control surfaces. The functions are assigned according to Mode A, although other stick modes are possible.

The transmitter controls the control surfaces as follows: Rudder (left / right) **Fig. D** Elevator (up / down) **Fig. E** Throttle (motor off / on) **Fig. F** Unlike the other controls, the throttle stick must not return to the neutral position automatically. Instead it features a ratchet so that it stays wherever you put it. Please read the instructions supplied with your radio control system for the method of setting up and adjusting the transmitter and receiving system.

