

EasyStar



RTF
Ready To Fly!

RTF-Modell	40 MHz	#	1 3200
RTF-Modell	41 MHz	#	1 3201
RTF-Modell	35 MHz	#	1 3202
RTF-Modell	72 MHz	#	1 3203

MULTIPLEX[®]

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D Sicherheitshinweise

- ☺ Prüfen Sie vor jedem Start den festen Sitz des Motors und der Luftschrauben - insbesondere nach dem Transport, härteren Landungen sowie Abstürzen. Prüfen Sie ebenfalls vor jedem Start den festen Sitz und die richtige Position der Tragflächen auf dem Rumpf.
- ☺ Akku erst einstecken, wenn Ihr Sender eingeschaltet ist und Sie sicher sind, daß das Bedienelement für die Motorsteuerung auf "AUS" steht.
- ☺ Im startbereiten Zustand nicht in den Bereich der Luftschraube greifen. Vorsicht in der Luftschraubendrehebene - auch Zuschauer zur Seite bitten!
- ☺ Zwischen den Flügeln die Motortemperatur durch vorsichtige Fingerprobe prüfen und vor einem Neustart den Motor ausreichend abkühlen lassen. Die Temperatur ist richtig, wenn Sie den Motor problemlos berühren können. Insbesondere bei hohen Außentemperaturen kann dieses bis zu 15 Minuten dauern.
- ☺ Denken Sie immer daran: Niemals auf Personen und Tiere zufliegen.

F Conseils de sécurité

- ☺ Avant chaque décollage, vérifiez la fixation du moteur et de l'hélice, notamment après le transport, après les atterrissages violents et après un "Crash". Vérifiez également, avant chaque décollage la fixation ainsi que le positionnement de l'aile par rapport au fuselage.
- ☺ Ne branchez l'accu de propulsion que si vous êtes sûr que votre émetteur est allumé et que l'élément de commande moteur est en position "ARRET".
- ☺ Ne mettez pas vos doigts dans l'hélice! Attention à la mise en marche, demandez également aux spectateurs de reculer.
- ☺ Entre deux vols, vérifiez en posant un doigt dessus, la température du moteur, laissezle refroidir suffisamment avant le prochain décollage. La température est correcte si vous pouvez maintenir votre doigt ou votre main sur le moteur. Le temps de refroidissement peut varier jusqu'à 15 minutes s'il fait particulièrement chaud.
- ☺ Pensez-y toujours: ne volez jamais vers ou au-dessus des personnes ou des animaux.

GB 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.

I Note di sicurezza

- ☺ Prima di ogni decollo controllare che il motore e la eliche siano fissati stabilmente - specialmente dopo il trasporto, atterraggi duri e se il modello è precipitato. Controllare prima del decollo anche il fissaggio e la posizione corretta delle ali sulla fusoliera.
- ☺ Collegare la batteria solo quando la radio è inserita ed il comando del motore è sicuramente in posizione "SPENTO".
- ☺ Prima del decollo non avvicinarsi al campo di rotazione della eliche. Attenzione alla eliche in movimento - pregare che eventuali spettatori si portino alla dovuta distanza di sicurezza!
- ☺ Tra un volo e l'altro controllare cautamente con le dita la temperatura del motore e farli raffreddare sufficientemente prima di ogni nuovo decollo. La temperatura è giusta se si possono toccare senza problemi. Specialmente con una temperatura esterna alta questo può durare fino a 15 minuti.
- ☺ Fare attenzione: Non volare mai nella direzione di persone ed animali.

E Advertencias de seguridad

- ☺ Compruebe antes de cada despegue que el motor y la hélice estén fuertemente sujetos, sobretodo después de haberlo transportado, de aterrizajes más fuertes así como después de una caída. Compruebe igualmente antes de cada despegue que las alas estén bien sujetas y bien colocadas en el fuselaje.
- ☺ Conectar la batería, cuando la emisora esté encendida y Usted esté seguro que el elemento de mando para el motor esté en "OFF".
- ☺ No meter la mano en la zona inmediata a la hélice cuando el avión esté a punto de despegar. ¡Cuidado con la zona de la hélice! ¡Pedir a los espectadores que se aparten!
- ☺ Entre los vuelos hay que comprobar cuidadosamente la temperatura del motor con el dedo y dejar que el motor se enfríe antes de volver a despegar. La temperatura es correcta, si puede tocar el motor sin problemas. Sobretodo en el caso de temperaturas del ambiente muy altas, esto puede tardar unos 15 minutos.
- ☺ Recuerde: No volar nunca hacia personas o animales.

1. Examine your kit carefully!

MULTIPLEX model kits are subject to constant quality checks throughout the production process, and we sincerely hope that you are (very) happy with the contents of your kit. However, we would ask you to check all the parts **before** you start construction, as **we cannot exchange components which you have already worked on**. If you find any part is not acceptable for any reason, we will readily correct or exchange it. Just send the component to our Model Department. Please be **sure** to include a brief description of the fault.

We are constantly working on improving our models, and for this reason we must reserve the right to change the kit contents in terms of shape or dimensions of parts, technology, materials and fittings, without prior notification. Please understand that we cannot entertain claims against us if the kit contents do not agree in every respect with the instructions and the illustrations.

Caution!

Radio-controlled models, and especially model aircraft, are by no means playthings. Building and operating them safely requires a certain level of technical competence and manual skill, together with discipline and a responsible attitude at the flying field. Errors and carelessness in building and flying the model can result in serious personal injury and damage to property. Since we, as manufacturers, have no control over the construction, maintenance and operation of our products, we are obliged to take this opportunity to point out these hazards and to emphasise your personal responsibility.

Additional items required: 8 AA-size dry or rechargeable cells for the transmitter power supply

Second flight pack for even more fun:

MULTIPLEX NiCd flight pack

6 / 500 mAh

Order No. 15 5545

Tools:

Allen key, 1.5 mm A/F, included in accessory pack.

Specification:

Wingspan		1370 mm
Overall length		917 mm
Fuselage length		870 mm
All-up weight	400 motor / 6 x AA cells approx.	680 g
Wing area	approx.	24 dm ²
Wing loading	approx.	28 g/ dm ²
RC functions	Aileron, elevator and motor	

Important note - repairs:

This model is not made of styrofoam™, and it is not possible to glue the material using white glue or epoxy. Please be sure to use cyano-acrylate glue exclusively, preferably in conjunction with cyano activator (kicker). We recommend medium-viscosity cyano. This is the procedure: spray cyano activator on one face of the Elapor®; allow it to air-dry, then apply cyano adhesive to the other face. Join the parts, immediately position them accurately, and wait a few seconds for the glue to cure.

Please take care when handling cyano-acrylate adhesives. These materials harden in seconds, so don't get them on your fingers or other parts of the body. We strongly recommend the use of goggles to protect your eyes. Keep the adhesive out of the reach of children.

1. Before final assembly

Check the contents of your kit.

You will find the parts list helpful here.

2. Final assembly

The tailplane and fin are attached to the fuselage using the double-sided tape provided. However, you must first run the wire pushrods through the pushrod connectors fitted to the rudder and elevator horns. Peel the backing paper from the tape and place the tailplane on the model, taking care to position it at right-angles to the fuselage. Don't press the parts together firmly initially. Check alignment carefully, then press down firmly. Repeat the procedure with the fin.

3. Adjusting the servo linkages

Set the servos and the control surfaces to “neutral” (centre), then tighten the screws in the pushrod connectors to secure the wire pushrods.

4. Checking the installation

All components should be installed in the stated positions and secured using Velcro (hook-and-loop) tape:

The flight pack should be fitted in the extreme nose, with the receiver behind it. Even at this early stage it is a good to check the Centre of Gravity as stated in Point 6. Apply the Velcro tape (“loop” side) to the inside of the fuselage floor at the flight pack and receiver positions. If the Velcro tape does not seem to stick strongly enough, apply a little cyano to the joints.

The final position of the flight pack cannot be determined until the model is complete and you are able to set the final CG position. Ensure that the Velcro tape for the battery is securely fixed to the model.

Check that the battery is held in place firmly before each flight.

Temporarily connect the receiving system as described in the instructions supplied with the RC system.

Don't connect the flight battery to the speed controller until you have switched on the transmitter and checked that the motor control (throttle) is at the “OFF” position.

The model is supplied as standard with a BEC speed controller, i.e. it draws current for the receiving system from the flight pack itself. This means that a separate receiver battery is not required.

Hold the model securely and switch the motor on briefly, so that you can check the direction of rotation of the propeller. Before you do this remove any loose, lightweight objects from the area behind the model before the propeller does it for you.

Caution: even small motors and propellers are capable of inflicting injury.

5. Gilding the lily - applying the decals

The kit is supplied with a multi-colour decal sheet. Cut out the individual name placards and emblems and apply them to the model in the position shown in the kit box illustration, or in an arrangement which you find pleasing. The cabin can be coloured using a black waterproof felt-tip pen, continuing the colour down to the edge.

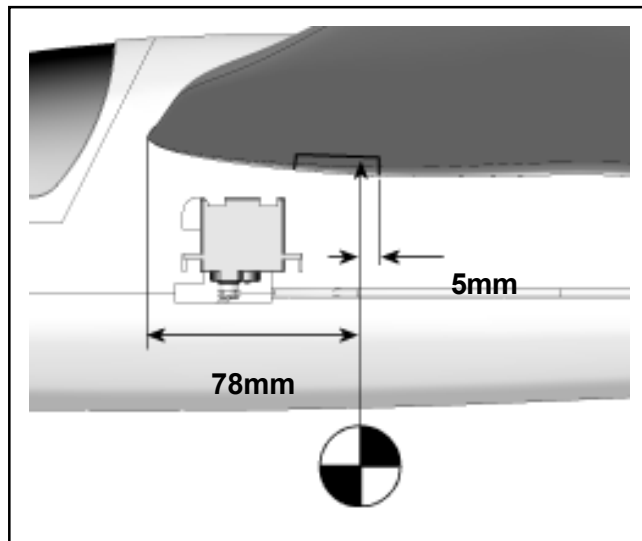
6. Balancing

The EasyStar, like any other aircraft, must be balanced at a particular point in order to achieve stable flying characteristics. Assemble your model ready to fly, and install the flight battery.

The Centre of Gravity (CG) should be about 5 mm from the rear edge of the spar cover. Mark this point.

This setting corresponds to about 78 mm from the root leading edge, measured on both sides of the fuselage.

Support the model at this point on two fingertips and it should balance level. If not, you can move the flight battery forward or aft to correct the balance point. Once the correct position is found, mark the position of the battery inside the model to ensure that the pack is always replaced in the same position.



7. Preparing for the first flight

For the first flight wait for a day with as little breeze as possible. The early evening is often a good time.

Be sure to carry out a range check before the first flight.

Just before the flight, charge up the transmitter battery and the flight pack using the recommended procedures. Ensure that “your” channel is not already in use before you switch on the transmitter.

Ask your assistant to walk away from the model, holding the transmitter. The aerial should be fitted but completely collapsed.

Your assistant should operate one of the functions constantly while you watch the servos. The non-controlled servo should stay motionless up to a range of about 60 m, and the controlled one should follow the stick movements smoothly and without any delay. Please note that this check can only give reliable results if the radio band is clear of interference, and if no other radio control transmitters are in use - even on different channels. If the range check is successful, repeat it **with the motor running**. There should be only a very slight reduction in effective radio range with the motor turning. If you are not sure about anything, please don't risk a flight. Send the whole system (including battery, switch harness and servos) to the service department of your RC system manufacturer and ask them to check it.

The first flight ...

Don't try unpowered test-glides with this model!

The EasyStar is designed for hand-launching, and should always be launched exactly into any wind.

If you are a beginner to model flying we strongly recommend that you ask an experienced model pilot to help you for the first few flights.

Allow the model to climb to a safe height, then adjust the trim sliders on the transmitter until it flies in a perfectly straight line "hands off".

While the model is still at a safe altitude, switch off the motor and try out the controls on the glide. Carry out a "dry run" landing approach at a safe height so that you are prepared for the real landing when the battery runs flat.

Don't try any tight turns at first, and especially not on the landing approach at low altitude. It is always better to land safely at some distance from you, than to force the model back to your feet and risk a heavy landing.

8. Safety

Safety is the First Commandment when flying any model aircraft. Third party insurance should be considered a basic essential. If you join a model club suitable cover will usually be available through the organisation. It is your personal responsibility to ensure that your insurance is adequate (i.e. that its cover includes powered model aircraft).

Make it your job to keep your models and your radio control system in perfect order at all times. Check the

correct charging procedure for the NC batteries you are using. Make use of all sensible safety systems and precautions which are advised for your system. An excellent source of practical accessories is the MULTIPLEX main catalogue, as our products are designed and manufactured exclusively by practising modellers for other practising modellers.

Always fly with a responsible attitude. You may think that flying low over other people's heads is proof of your piloting skill; others know better. The real expert does not need to prove himself in such childish ways. Let other pilots know that this is what you think too. Always fly in such a way that you do not endanger yourself or others. Bear in mind that even the best RC system in the world is subject to outside interference. No matter how many years of accident-free flying you have under your belt, you have no idea what will happen in the next minute.

We - the MULTIPLEX team - hope you have many hours of pleasure building and flying your new model.

MULTIPLEX Modellsport GmbH & Co. KG
Product development and maintenance


Klaus Michler

Parts list for the EasyStar RTF model



1 3200 to # 1 3203

Part No.	No. off	Description
1	1	Building instructions
2	1	Decal set
3	1	Fuselage with factory-fitted power system, receiver, 2 servos, speed controller and canopy; 6/600 mAh flight battery
4	1	Wing set; factory-fitted spar holder
5	1	Tailplane and elevator; factory-fitted horn
6	1	Fin and rudder; factory-fitted horn
7	1	Wing joiner tube
8	1	Transmitter
9	1	Battery charger
10	1	Allen key, 1.5 mm A/F

Quick Charger CG-72

1. Connect the Charger to 12V source battery (automobile is recommended).
2. Connect Nicad battery pack to charger.
3. Set the charger timer at 30 min. (600 mA battery)
4. Green light (LED) will be lit while it is being charged.
5. LED will go out when it is fully charged.

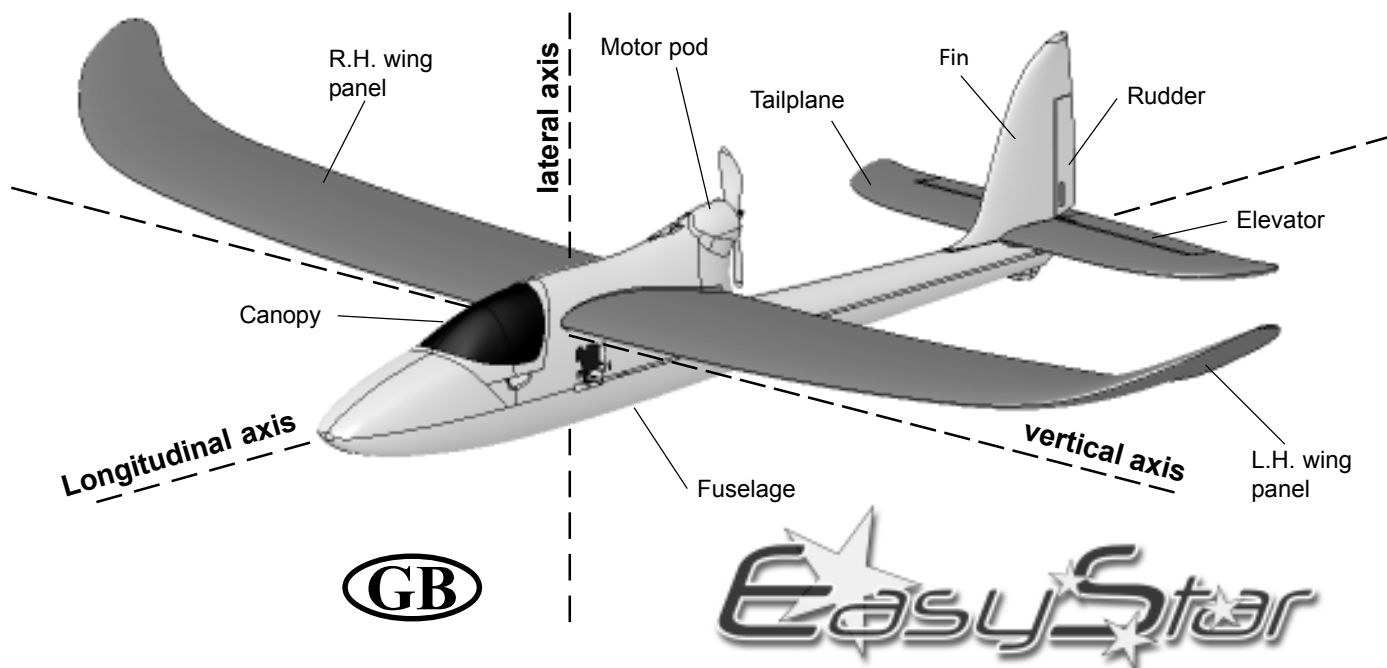
Battery Care Tips

- Do not have the motor of your car running when you are charging the Nicad Battery. This may cause overcharging of your battery (Note: 600mA Nicad battery pack should not be charged over 30 minutes).
- Heat is the number one cause of battery failure.
- The motor battery should never become so hot during the charge process that you are unable to handle it.
- The motor battery will become warm during the flight; wait until the battery is cool to the touch before re-charging it.
- Discharge remaining power in Nicad battery by operating propeller after landing.
- The Nicad battery can go bad over prolonged usage; replace it if the flying time gets considerably shorter over time.
- Never charge the battery while battery is installed in the plane.

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.

Speed Controller MULTicont X-08 # 7 2270



These operating instructions are an integral part of the product, and contain important information and safety notes. They should therefore be kept accessible at all times, and must be passed on to the new owner if you ever dispose of the product.

1. Specification

MULTicont X-08	# 7 2270
Cell count battery voltage	5-10 / ~4,7 – 15 V
Continuous current (with good cooling)	8 A (max. 11A)
Pulse frequency	~ 6 kHz
Receiver power supply (BEC):	
BEC voltage	5 V
BEC current	max. 1 A
Dissipated power of BEC regulator (with 8 cells max 5 W)	max. 11 W
Dimensions (w/o wires)	10x21x6 mm
Weight without / with wires	2/17 g

2. Safety Notes

- **Read the instructions before using the unit**
- **Avoid heat build-up:** Do not restrict air circulation
- **Do not connect the flight battery with reversed polarity: Connecting a battery incorrectly immediately wrecks the controller.**

For this reason: • red wire to POSITIVE (+) terminal,
• black wire to NEGATIVE (-) terminal

We recommend to use the green MPX-plugs # 85213/85214 for ESC/Battery and Motor/ESC as long as the motor is not soldered to the motor directly.

- **When soldering or otherwise working on the motor or controller:** Always disconnect the battery first (short-circuit / injury hazard)
- **Please note when running or test-running the power system:** Do not run the motor holding it in your hand; secure the model well. Check that there is space all round for the propeller to rotate. Remove any objects (clothing, small items, paper, etc.) from the vicinity of the propeller which could be sucked into it or blown away by it. Never stand in front of, or in line with the rotational plane of the propeller (injury hazard).

3. Special Characteristics

- **BEC with low-voltage cut-off** (recommended up to max.8 cells) with automatic cell count detection
- **Power-on guard:** the controller stays in the disarmed state when you connect the flight battery. The motor cannot be switched on until you first move the throttle stick briefly to the idle position.
- **Overload-/overheat-protection:** When the temperature rises, the voltage rises also. When the voltage is too high, the controller will switch off the motor and the LED will flash. To activate the motor again, the battery must be disconnected from the controller and connected again.
- **Over-Cell-protection** – The controller will switch off at 16V

4. Mounting the controller on the motor

Note: in most cases soldering is required to install the controller. Soldering calls for a certain amount of care, as the correct operation and reliability of the power system are dependent upon these joints.

- Use only cored solder designed for electronic soldering
- Do not use an acid-based soldering flux
- Parts to be soldered must be heated to the correct temperature, but must not be overheated
- If you have not soldered before, ask an experienced modeller for help.

1. **Motor suppression:** if the motor you wish to use is not suppressed as standard, we strongly recommend the use of the suppressor set # 8 5020, to avoid potential problems with interference to the receiving system.
2. **Solder the motor leads attached to the controller to the motor** Solder the motor power leads these wires to the drive motor terminals as follows:

Generally with direct-drive motors: yellow → “+”; blue → “-“

3. **Check the direction of motor rotation**
If the direction of rotation is not correct (e.g. when using a geared motor), correct this by swapping over the leads at the motor terminals (re-solder the joints).

5. Using the power system for the first time

1. **Connect the receiver lead on the controller (REC) to the receiver.**

With MPX RC-systems: channel 4 = throttle/motor

2. If you own a programmable transmitter: set **servo travel for throttle / motor to 100% on both sides.**

3. **Move the throttle stick** (and the associated trim slider) **fully to the desired idle /motor STOP position.**

4. **Switch on the transmitter**

5. **Connect the flight battery to the speed controller**

Caution: reverse polarity will wreck the controller instantly!

If the LED flashes, the controller is in **power-on guard** mode.

→ Disconnect the flight battery from the controller, reverse the throttle channel at the transmitter (servo reverse) and connect the flight battery again → Ready.

Important:

- **Always switch transmitter ON first, then connect the flight battery.** If you now see the LED flashing, the controller is in **power-on guard** mode. → Move the throttle stick to idle → the controller is ready for use!
- **First disconnect the flight battery from the controller, then switch the transmitter OFF.**

6. BEC = Battery Eliminating Circuit

BEC means: receiver and servos draw current from the flight battery. Do not use a separate receiver battery.

Note: please remember that the BEC system of the MULTicont X-08 can only supply its maximum 1 A current briefly. In practice this means: With 7 cells Connect not more than 3, with 8 cells not more than 2 servos to the receiver! Don't use BEC with more than 8 cells!

Servo current drain varies according to the power class of the servos, the frequency of control commands, and the freedom of movement of the control surface linkages (!). If you cannot measure the BEC current: Carry out a check “on the ground” by operating the servos constantly until the low-voltage cut-off is triggered (= flat flight battery). At this point the speed controller should be no more than warm to the touch, and the servos should operate correctly during the entire period.

If your model is fitted with more servos than the controller can cope with, the BEC power supply must be disabled and a separate receiver battery used. This is done by locating the red (+) wire in the receiver lead attached to the controller, and cutting it through.

7. Low battery cut-off

The low battery cut-off of the MULTicont X-08 is designed to switch off the motor when the flight battery is almost discharged. This ensures that there is still sufficient energy in the pack to power the BEC system for a safe landing. When the battery is nearly flat, you will also notice the motor's power output (propeller speed) declining rapidly. This is the time to start preparing for the landing approach.

When voltage less 4.7 V is reached than the controller switches off the motor. The power system can be switched on again for a brief period if required by moving the throttle stick momentarily to the idle / motor STOP position.

- I. Introduction
- II. Features and Specifications
- III. System Layout
- IV. Setting and Operation



HITEC
touch your dreams

1. Transmitter

- a. Loading Batteries
- b. Reading the LED Battery Indicators
- c. Recharging Nicad Batteries
- d. Changing Crystals

2. Installation of Receiver and Servos

3. Transmitter, Receiver and Servo Settings

- a. Checking Operation of the Servo
- b. Elevator and Rudder Servo Trim Settings
 - Trim Setting before Flight
 - Trim Setting during Flight
- c. Adjustable Traveling Volume

RANGER III

start using the radio.

II. Features and Specifications

A Transmitter

- 3 Channel FM proportional radio control system
- 3 LED battery status indicators
- Charging jack for 3rd party Nicad battery
- Servo reversing for channel 1 and 2
- Current drain: 180mA
- V-tail or Elevon mixing function
- Proportional 3rd channel slide switch
- ATV for channel 1 and 2

B Receiver

- Narrow Band 4 channel FM receiver
- changeable crystals

C Servo

- 2 lightweight Tiny-S-Servos

D Speed-controller

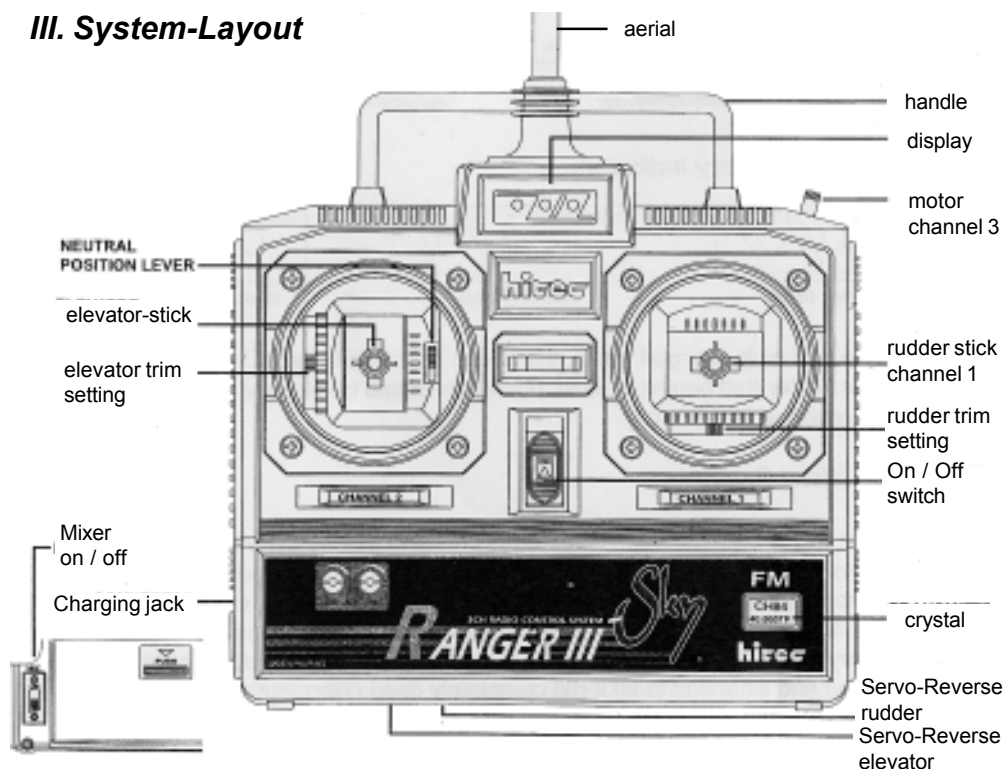
- small, lightweight ESC MULTIcont X-08

I. Introduction

The Ranger 3 FM Sky radio is part of the EasyStar RTF-Set. The Ranger 3 FM Sky will prepare you to use radio with more advanced features as your skill level and desire for greater challenges evolve.

Please read the following instruction carefully before you

III. System-Layout



1. Transmitter

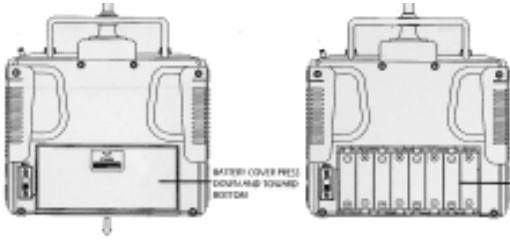
a. Loading Batteries

You may use either Alkaline "AA" size batteries or 3rd party Nicad batteries.

- Push the bottom battery cover in the direction of the

arrow then lift up the cover

- Load 8 AA batteries (Be sure the polarity is correct)
- Reinstall battery case with installed AA batteries.
- Nicad should be charged before use



b. Reading the LED Battery Indicators

With new alkaline or freshly charged Nicad, the Green light should be lit. With use, the Green light will turn to Amber. If the Red begins to flash, operation should be stopped and the batteries should be recharged or replaced immediately.

c. Recharging Nicad Batteries

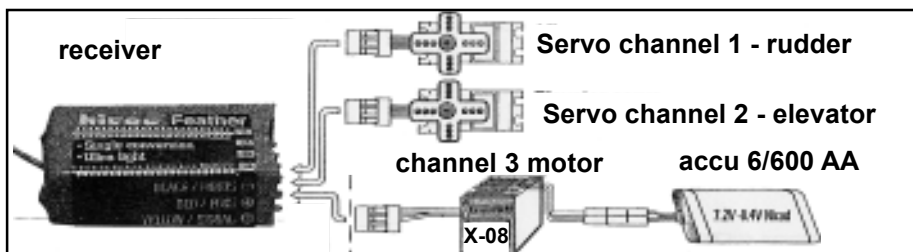
The Ranger 3 FM Sky is equipped with an external charging jack so there is no need to remove the Nicad batteries from the transmitter. The Hitec CG-22A is made to charge these type of batteries overnight or for approximately 12 - 15 hours. Please refer to the following diagram; check to see that the charge lights are lit after the connection is complete. It is advisable to cycle your Nicad batteries at least once every 5 or 6 charges. This can be done by simply turning your transmitter on with the antenna connected and extended to let it run completely dead. (Warning!!! Always extend your antenna as not to overload the circuitry when radio is on.), then follow the charging method and repeat this 3 times, this will remove the memory that the battery has stored up if you just simply charge a half dead pack.

d. Changing Crystals

Changing crystal to avoid conflicts with other aircraft is possible where permitted. (You must check your local rules before doing so. If you are allowed to change crystals, both the transmitter and receiver crystals must be changed together. You must change within the same band. Use only Hitec crystals when changing frequencies.

2. Installation of Receiver and Servos

After connecting the receiver and servos as below illustration, turn on the power to the transmitter first then turn the receiver on. (Always turn the transmitter ON first and OFF last.) This will prevent the receiver from picking up stray signals and going out of control. Now move the controls to see if the servos are moving properly. If not, check your wiring or crystals if the servos do not move at all.



Transmitter, Receiver and Servo Settings

Now we come to the critical part as proper installation of these components are essential.

a. Checking Operation of the Servo

After installation of the servo and receiver into your model is complete, turn the power "ON" the transmitter (fully extend the antenna) now turn on the receiver.

Check to see if all servos are working properly. If not, check the connections and/or make sure the main battery pack is charged.

Check to see that the servos are moving in the correct direction. If not, change the servo direction with the reversing switches located on the bottom of the radio. The 3rd channel of the Ranger 3 FM Sky is not reversible.

If everything checks out then turn the receiver "OFF" first, then the transmitter.

The Ranger 3 FM Sky offers an internal electronic mix for channels 1 and 2 to deliver an Elevon or V-tail mix for those aircraft requiring those specific functions. (Not used in your EasyStar)

Always remembers to never have the receiver "ON" without the transmitter being "ON". This means when turning your model "ON" always turn the transmitter "ON" first and "OFF" last.

(Note: Please makes sure to fold the transmitter antenna after use so as not to get damaged or poke someone in the eyes.)

Warning!!! : Do not shorten the length of the receiver antenna by cutting off any excess wire. This will severely affect the operating range and could result in injury to yourself and others.

b. Elevator and Aileron Servo Trim Settings

- Trim Setting before Flight

The servo trim enables minor adjustment of the servo neutral position so that the plane will fly straight when the stick is in the center position. Before adjusting the servo trim, please make sure that when both the stick and the servo trim is in it's center position (1) the servo arm is perpendicular to the push rods, and (2) the elevator and aileron of the plane is flush with the tail wing.

- Trim Setting during Flight

You may perform some minor trim adjustment during flight if the plane nose up or down (Elevator Trim) or sideways (Aileron Trim) when the stick is in the center position. However please keep in mind that trim adjustment is only for minor adjustment and major adjustment should still be done through push rod (linkage) adjustment at the model.

(Note: There is no trim adjustment on the 3rd channel of the Ranger 3 FM Sky)

c. Adjustable Traveling Volume

You may use this volume to adjust servo traveling according to the characteristics of your model. The servo travel can be adjusted from 50% to 100% of the total travel range by turning each ATV knob on the transmitter. Turning clockwise will increase servo travel and counter clockwise will decrease servo travel.

