HOBBICO

SUPERSTAR-EP

(ARF ELECTRIC POWERED RC MODEL AIRCRAFT)

By Bob Aberle, Technical Editor (Model Aviation)

WHAT IS IT ALL ABOUT?

The purpose of this article is to tell you how you can go about purchasing, assembling and flying your very first radio controlled model aircraft. The assumption is that you never did this before and possibly have never seen an RC model aircraft in flight. The aircraft chosen for this first time project, the SuperStar-EP (referred to as SS) is available from Tower Hobbies (www.towerhobbies.com) as well as from many local hobby shops. This aircraft was chosen for it's overall simplicity in assembling and operation and because it has flight characteristics that make it a perfect first time R/C "learning tool". The SuperStar-EP has proven to be one of the easiest planes to use while so you may quickly progress to your first "solo flight".

TYPES OF MODEL AIRCRAFT

As your acquire experience in the RC model aircraft hobby you will learn that aircraft can be purchased in several ways. The very easiest approach is what we call a "READY-TO-FLY" (or RTF) model. This is especially helpful for a beginner because the aircraft comes fully assembled with the motor, radio system and battery all factory installed. Only a small amount of assembly work is necessary. Just about as fast as you can charge the batteries, you can be off to the flying field for that first flight.

A second and very popular form of model aircraft is what we call the "ALMOST-READY-TO-FLY" (or ARF) type. It typically will require a few hours of major component assembly. You will have to install your RC system into the aircraft and in some cases, the power system as well. ARF models are more readily available and are less expensive than an RTF model.

Also available on the various hobby markets are complete model aircraft kits. In other words you obtain pre-cut parts, plans and covering material and the entire construction/assembly effort is up to you. Since most new pilots want to first enjoy the experience of RC flight, the RTF or ARF concept allows them to get flying the fastest possible way. You can always later learn how to build from kits, or from published plans, (called "scratch building") (*Editor's Note: Check out Sport Aviator's* "A & E Manual" *Section*).

AIRCRAFT POWER

Although engines that burn fuel to produce power pull most model trainers, these engines do have some drawbacks. Model engines produce noise, even when muffled, and leave an oily residue on the plane that must be cleaned. If not properly adjusted, these engines may also quit in flight causing an early landing.

Recently, electric power has started to become a popular alternative power system for trainers. Although in existence for some thirty years, recent improvements in motor, battery and speed controller technology have made this form of power practical. Electric power is ideal for

trainers for several reasons. The motor will essentially never quit on you, until you run out of battery power. It is clean and very quiet! The quiet operation of an electric motor makes it much easier to acquire local flying fields and at the same time not bother local residents. Electric motors have very low vibration levels, extending both radio and airframe life. For these reasons I prefer electric power for the RC beginner.

SUPERSTAR-EP (ARF)

Just about everything needed to obtain that first flight is included. The only two things you must still purchase are the RC system and a charger.

The Tower Hobbies catalog number for the SS is TH2538 and the cost is $99.95 plus shipping. The best way to start is to tell you what comes with the ARF version of this aircraft. First of all, the basic structure is already built out of balsa wood and plywood. The entire structure is pre-covered with a plastic film material (Monokote®). So you will not have to concern yourself initially with any of the covering process. The ARF includes colored trim and simulated license numbers to add realism (photo 1).

Aircraft comes essentially pre-built requiring only some nominal final assembly work. You can be ready to fly in less than a day of effort. Total weight was 46.4 ounces.

To further enhance assembly, the rudder that steers the plane and the elevator that changes the pitch angle of the plane in flight, are pre-hinged. Even more convenient, the electric motor is not only provided, but comes already mounted. A propeller is provided which has been selected to be optimum with this motor. To control the motor, Hobbico provides an electric speed controller (ESC) as well as a battery that powers both the electric motor and RC system. Details will be explained, as we get further into this article.

Besides these basic components, the $99.95 price tag also gets you a set of wheels and a pre-formed landing gear. All control system hardware is included. This hardware package consists of control rod wires that connect between the radio system servos and the control surfaces, landing gear and mounting straps plus control fittings. The wing is held in place on the top of the fuselage using rubber bands that are attached to protruding dowels. This allows you to remove the wing while transporting the plane.

WHAT YOU STILL NEED!

For the ARF version of the SS you will still need to purchase an RC system and a battery charger. Non-rechargeable AA size alkaline batteries power some of the inexpensive RC system transmitters. If that was your choice for an RC system you will also need to buy a set of eight (8) AA size alkaline batteries.

Other tools you will need are small regular and Phillips type screwdrivers, a small adjustable open end wrench, an X-Acto type modeling knife with a No. 11 blade, a small pair of needle nose pliers and two drills (1/32 inch and 3/32 inch diameter). Because of the excellent engineering of this SS aircraft you won't need any cement, except possibly for one area that I will explain in a few moments.

RC SYSTEM

There are so many RC systems on the market that the choice for a beginner could pose a real dilemma. The RTF version of the SS, as already explained, comes with a Futaba three channel RC system. I have no objection to using a similar three-channel radio on this ARF version. But I do like to plan for the eventuality that you will want to grow in the RC model aircraft hobby. For that reason I chose a four-channel RC system whose transmitter has two separate dual axis control sticks. With this arrangement you grip the transmitter case with both hands, such that your thumbs and index fingers (on both hands) either rest on top of each control stick or actually grip the sticks. Your right hand then rocks the right side control stick in a side-to-side motion, providing right or left rudder on the aircraft for steering purposes. That same hand can also move the same control stick fore and aft causing the elevator on the aircraft to move up and down for what we call pitch control. The left hand operates the third channel function, which varies the motor speed from full off to full top speed. When this throttle control stick is in the mid range position, the motor is essentially at half power. The motor speed follows the motion of the throttle control stick in a linear manner. The available fourth channel, for now, will not be used.

On the aircraft end, the signal from the transmitter is received at the RC receiver via a long antenna wire. That wire is usually routed out the back end of the model. The receiver signal is processed, then sent to two small servo actuator devices. One servo operates the rudder, while the second operates the elevator. As you move the control stick on the transmitter, the output arms on the servos will rotate in the same degree or proportion. Small diameter wires to the rear of the plane connect the two servo output arms, via control horns, to the rudder and elevator. When you move the right hand control stick on the transmitter, you are at the same moment moving the control surfaces on the aircraft.

While this is going on you can use your left hand to move the motor throttle control (up and down) for high and low power settings (like high power to take off, 3/4 throttle to cruise around and idle or off to land). The electric motor speed controller (ESC) is the device that controls the motor speed while also diverting some electrical power to run the receiver and servos.

In this aircraft I used these specific RC system components for this article: Hitec ECLIPSE transmitter, Hitec Super Slim FM receiver and two Hitec HS-81 servos. These Hitec components can all be purchased from Tower Hobbies; who also offers comparable RC equipment produced by Futaba, Airtronics and their own Tower Hobbies house brand. Any one of these, or other 3 channel or more RC systems, would be perfectly suitable to fly the SS!

ELECTRIC POWER SYSTEM

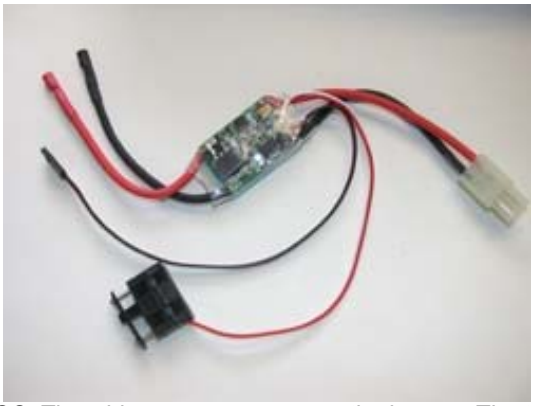
Hobbico installed their ElectriFly T-601 electric motor (photo 2). This motor is basically what we identify in the industry as a SPEED-600 variety ferrite canned motor. By canned we mean it is sealed in a can and is not repairable. But not to worry, because this type of motor is very inexpensive. When the brushes wear out, the motor is discarded in favor of a new one.

The SPEED-600 ferrite electric motor of approx. 150 watt rating, is not only supplied with the SS but is already mounted to a fuselage former, known as the “firewall”.

To provide the correct amount of thrust to fly the SS, Hobbico supplies a 9-inch diameter, 5.5-inch pitch propeller. It is important as you go through your learning experience that you use only this prop. Changing to some other size could easily damage your motor. I might also suggest that you order several extra props from Tower Hobbies since they may be broken. Also note that Hobbico has provided a prop adapter, which you must first install on the motor shaft. The prop goes on next, held in place with a washer and nut. When you tighten up on the nuts, your also lock the adapter to the motor shaft at the same time.

The battery is another part of this power system that is exactly tailored for the SS. This pack consisting of seven rechargeable nickel-cadmium cells, each with a capacity of 2100 milliampere-hours (which is written as mAh). These seven cells will produce a nominal voltage of 8.4. The motor draws 22 amps, consuming 163 watts at 8,600 rpm.

The final item in the electric power system is the ESC (photo 3). This motor speed controller is placed between the battery and the electric motor terminals. There is a third cable that exits the ESC and plugs into the throttle port in your RC receiver. This ESC has what is known as a battery eliminator circuit (BEC). The BEC takes part of the battery power, regulates it down to 5.0 volts, and applies it to the RC receiver and servos. In other words that one big battery shares power to both the electric motor as well as to the RC system. There is also a circuit within the ESC that automatically cuts off the electric motor when the battery wears down. This is a safety device. When the motor stops in flight, you still have enough reserve power left in the battery to operate the RC system and to bring the aircraft in for a safe landing.



A close up of the supplied ESC. The white connector goes to the battery. The two red and black leads go to the motor. Make sure you connect red to red and black to black; otherwise your motor will run backwards. Another cable goes to the throttle port (connector) on your RC receiver. The main power switch mounts on the side of the fuselage, so it is accessible from the outside.

The entire SS-EP electrical system.

CHARGER

One of the most important aspects of electric powered flight is to have a reliable battery charger. As the SS is designed for new pilots, Hobbico recommends a basic charger. The charger employs only a timer to regulate the amount of charge put into the battery. You dial up 15 or 20 minutes and the battery is charged. The problem with using just a timer is that you don't really know how much charge is left in the battery. You might have had a shorter than normal flight and proceeded to dial in a 15 minute charge period. But after 10 minutes the battery might be fully charged. Continued charging causes the battery to over-charge and overheat.

Overheating shortens battery life and can cause severe battery damage. I'm not happy with that and have found two other chargers that are available from Tower Hobbies that I would prefer you to use. Both of these chargers are called, "PEAK DETECT". All nickel-cadmium and nickel-metal-hydride batteries reach a peak voltage that coincides with the full-charge point. The circuitry in these chargers senses this peak voltage and terminates the charge automatically. No timer has to be set and how much charge was initially in the battery is unimportant.

The simplest peak detect charger is the Piranha Model DTXP4002 DC which sells for $29.95. This charger only operates from a 12 volt DC source, such as a car battery. It has a fixed output of 4 amps and can fully recharge this 7 cell 2100 mah battery in approx. 30 minutes. It is" peak detect" regulated and will only put back into the battery what is needed to achieve a full charge.

My personal recommendation for a charger is one that is slightly more expensive, but will have a lot more value if you get more into electric powered flight. This is the Piranha Model DTXP4005 AC/DC Digital Peak device. It currently sells for $44.99 and will charge up to 8 cells. The charge rate is adjustable from 0.1 to 5.0 amps. It can be powered from an AC house current line or from a 12-volt car battery. It is peak detect and has trickle charge (or low level) rates of 0.1 or 0.2 amps.

Adjustable rate chargers are best since electric power batteries should be charged overnight at the rate of CAPACITY (C) divided by 10. In this case the 2100 mAh, or 2.1 amp/hr, battery would be charged at 2100 divided by 10 or 210 mA (same as 0.21 amps). You go out to the flying field with this charge and make your first flight. For each succeeding flight of that day you use this same charger to FAST charge the battery at a 2 or 3C rate (4.2 to 6.3 amps). In this case I would go for the maximum available of 5.0 amps, which will fully recharge the battery in about 20-25 minutes. You just received a "crash course" in battery charging. There is much more to learn, but for now this will get you safely and quickly flying.

OVERALL ASSEMBLY TIPS

I would be wasting publication space if I repeated everything that is contained in the very excellent 20 page SS instruction manual. The manual includes many detailed and super clear photographs. I will try to supplement those photos with many that I took during my own assembly. My personal ground rule for this article was to do it the way it is described and not to take any short cuts that might result from my 52 years of aeromodeling experience.

One thing I immediately noticed on opening the ARF box is that much of the covering material had gone "limp" during the shipping process. I suspect this resulted from a lot of our below freezing weather here in the northeast (in December). It was a little too loose so I applied heat from an iron-on covering iron, to shrink out a lot of the wrinkles (photo 6). You don't have to do this, but it will look nicer.

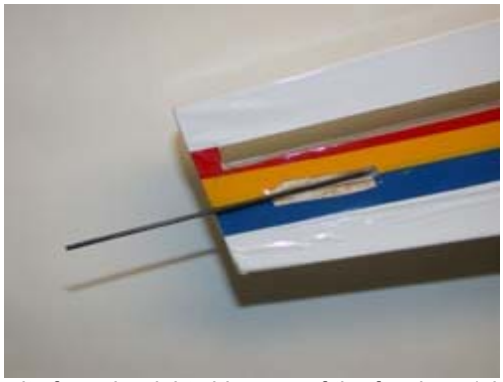
If you don't have this kind of iron as yet, you soon will need one. I would recommend the Tower Hobbies Custom Sealing Iron, Catalog no. TH3248 for only $12.99. To be on the safe side, and not damage any of the covering material, I would set the iron temperature to the middle heat setting!

No cement is really necessary. Because the plane goes together so quickly you might want to take Hobbico's advice and begin charging the 7 cell airborne battery pack, as well as the transmitter's battery pack. This way the batteries will be charged when you are ready to run out to the flying field. However, since the plane builds so quickly, better charge the batteries the night *before* you begin assembly.

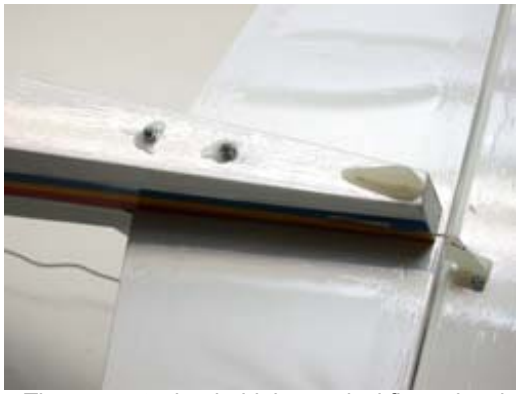
The wing panels are joined with a metal rod (photos 7 and 8) and held in place with a length of tape – a no brainer!

Next the stab fits into a rear slot, then the vertical fin is inserted down from the top, through the stab such that the two retainer threaded rods exit out the bottom. Add two washers and nuts, tighten up and the entire tail surface assembly is anchored in place.

The rudder control rod wire exits at this point on the top, left side of the fuselage (looking from the rear forward).

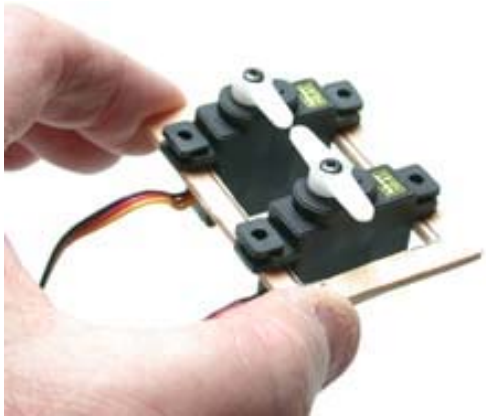


The elevator control rod wire exits from the right side, rear of the fuselage (also look from the rear forward).



The rear fuselage underside. The two nuts that hold the vertical fin and stab in place can be seen in this photo. Also shown are the tail skid and the elevator control horn.

My only necessary deviation from the manual was the fact that my servos were a different size than those recommended. Hobbico must have guessed this would happen and included a plywood tray to hold smaller servos (photo 12). My servos were Hitec HS-81, which turned out to be slightly larger than the plywood insert provided. I had to do some trimming of the plywood with the X-Acto knife to get the two servos to fit. Once trimmed, it was a matter of screwing each servo to the plywood and then installing the plywood tray on top of where the larger servos might have gone (photo 13). When I had the tray with the servos in place I added a little 5-minute epoxy cement to hold everything in place.

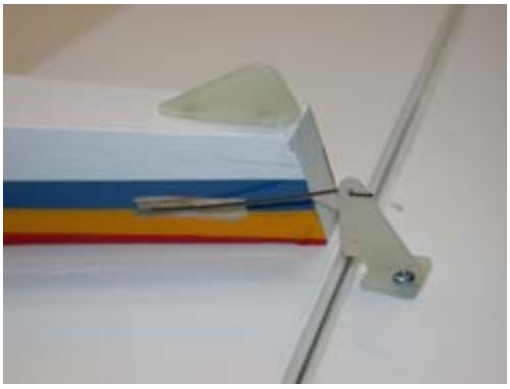


Here the two Hitec HS-81 micro servos are being attached to a supplied plywood tray. This tray then, in turn, fits over the larger servo opening already inside the aircraft. The white pieces on the top of each servo are what we call “servo output arms”!

Looking into the RC compartment, under the wing, before any of the equipment is installed. That big square hole at the right is where the two servos are mounted. The tray with the smaller servos fit neatly into this larger hole.

The next part of the assembly process can probably take more time than anything else. It involves the mechanical connections between the two servo output arms and the aft mounted rudder and elevator control surfaces. Hobbico provided two brass fittings that get inserted into the servo output arm with a press-on retainer on the opposite side (photo 14). You will have to use a 1/32-inch diameter drill to enlarge the holes on the servo output arms. Since there are usually multiple holes on the servo arm, you are advised in the instruction to select the hole that is 3/8 inch from the center mounting screw. When you have this retainer in place, add the small screw into the top hole.

First, insert the control rod wires into the rear holes (one for the elevator and one for the rudder). Pass the control rod wires forward, keeping the “Z” bend on the tail end. Insert the “Z” bend into the top hole on each control horn and then mount the control horns using the backing plate and the screws provided (photo 15).



The front end of the control rod passes through the hole in the retainer, which sits on top of the servo output arm. It is at this point that you position the control surfaces to neutral and

tighten the adjustment screw. Your servos arms should both be at their center, neutral positions when you do this. In actual practice, when you power up the RC system the first time the servo arms may move to other than the neutral, center position. If this happens, just remove the servo output arm screw, lift up the arm, reposition it on the spline gear, and press it back down in place. Then apply the screw to the center of the servo output arm to hold it in place. Don't forget that screw! Because if the arm falls off during a flight, that's the end of your control.

The remaining step includes mounting the ESC with the hook and fastener tape provided. I attached the RC receiver to the fuselage side with double-sided tape. The servos are plugged into their respective receiver slots. The receiver lead from the ESC is plugged into the throttle port on the receiver. Last steps involve routing the RC receiver antenna wire out the top of the fuselage just aft of the wing (photo 18) and on out to the top of the vertical fin (photo 19). Leave the excess just hanging out!

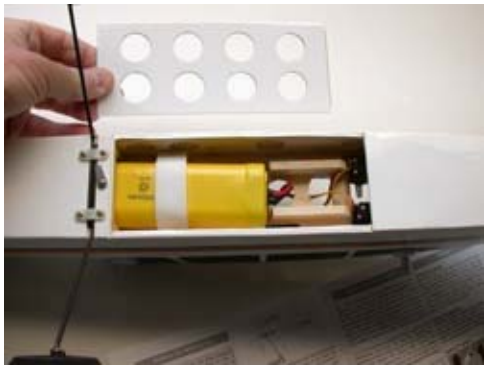
All components installed inside the fuselage in the area under the wing. The white connector, just to the right of center, is the battery connector that goes to the ESC.

The rear portion of the RC compartment showing the rudder and elevator servos plus the receiver wire antenna. Keep the antenna away from the servos as they may interfere with radio command reception.

This is where the antenna wire exits from the top of the fuselage and then heads back to the top of the vertical fin.

The long receiver antenna wire is passed through two small holes in the top of the vertical fin. The excess wire just hangs off the rear of the aircraft.

The battery pack is housed in a compartment accessible from the bottom of the fuselage. It is always advisable to remove the battery pack from the aircraft when charging the battery. There are holes provided for air circulation on the battery hatch cover. The plastic film covering masked these air holes. You must use your knife and cut away the covering over these holes to provide the necessary airflow over the battery (photo 20). Keeping that battery cool is important to getting a long service life. (*Editor's Note: These holes are precut on the RTF version.)*



You can mount the landing gear struts, install the wheels and add the tailskid at this point. That just about completes construction. Now we get to final check out and operation.

CHECKING OUT THE RC SYSTEM

With both your transmitter battery charged, or with fresh alkaline cells in place, and the airborne battery at full charge it is time to check out the RC system. **AS A SAFETY PRECAUTION, *REMOVE THE PROPELLER*!** If that motor starts up accidentally in your shop, you **will** get hurt. At the minimum, your shop will look like it had experienced a tornado.

Always turn on your transmitter power first. With the battery plugged into your SS, turn on the power switch located on the left side of the fuselage. I always set my switches for ON=FORWARD --- OFF=REARWARD! The very first time you do this your servos may immediately drive to some position other than neutral. If that happens, remove the servo output arm and re-locate it so that the arm is neutral. Then adjust the retainer screw on top of that arm, if necessary, to get the control surface perfectly level in the neutral position. Make sure all transmitter trim levers are in the middle.

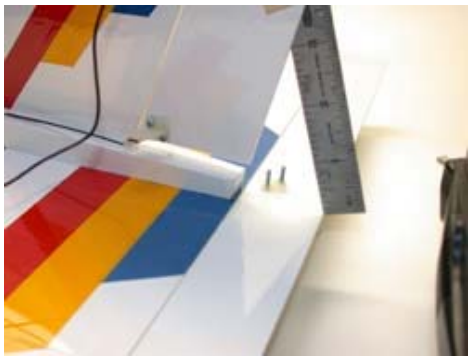
Next, stand behind the airplane and move the right side transmitter control stick to the right and see if the rudder moves to the right. Almost every RC transmitter has servo reversing switches that allow you to change the servo direction of rotation. Repeat for the elevator servo. It is also possible that your throttle stick on the left side might be reversed. You want high at the top position of the stick and low at the bottom.

The Hitec ECLIPSE RC transmitter can actually provide all four basic flight controls. But for this first time application only rudder and elevator (on the right control stick) and throttle control (on the left stick) have been employed. As you progress, the right stick will have ailerons and elevator, while the left stick will have rudder and throttle.

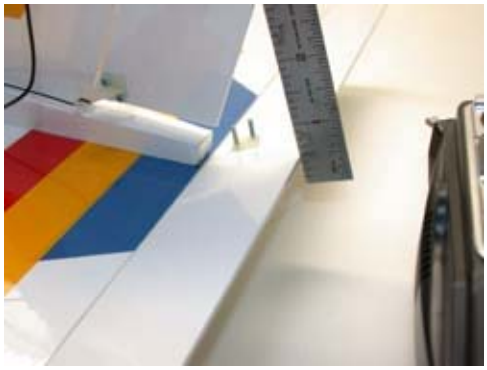
There is a procedure you must go through with respect to the motor operation every time you turn on your RC system. It is actually a unique safety device. No matter what the position of your throttle control stick on the transmitter, when you first turn on before each flight, the electric motor will not operate. You must advance the throttle stick to “FULL” (top position) wait about 5 seconds, and then return the control stick to the very bottom (idle or off position). Once you have done that the motor circuit is “armed” and ready to go. As you slowly advance the throttle the motor will begin to run and will go faster and faster as you move the stick from the bottom to the top position.

With everything operating you should check the amount of control throw that both the rudder and elevators move when you have the control stick hard over (full control). Hobbico sells a gauge that can help you measure the amount of throw. I use a small metal scale and attach it with a clothespin. I can measure the amount of control as I displace the Transmitter control stick (photo 22). Using the top control horn hole and the control rod retainer location recommended in the manual, I was able to get very close to the control throws established by Hobbico. These

throws were rudder: 5/8 inch on either side of the neutral position and elevator: 7/16 inch either side of neutral.



Using a small metal scale or ruler to check the amount of control throw of the elevator. Here the elevator is in the neutral position.



In this photo the elevator is at it's maximum control throw position (full up elevator) of 7/16 inch.

BALANCE POINT (Center of Gravity!)

The balance point or center of gravity (CG) of any model aircraft is most important and must always be verified and/or corrected prior to that first flight. The instruction manual indicates that the balance point should be in the range of 2 1/2 to 2 7/8 inches back from the leading edge of the wing. You will be pleased to know that with the battery pack positioned exactly as shown in the manual, my SS balanced right in the middle of the suggested range at 2 11/16 inches back from the leading edge (photo 24).

True, my servos were lighter in weight than those recommended with the Futaba three channel system. It is possible that with the heavier servos the final CG point might be closer to the aft location of 2 7/8 inches back from the leading edge. But anything in this range is going to be OK. *(Editor's Note: The RTF, with the larger servo, balanced at 2 7/8 inches)*

FINAL WEIGHT

The specification called for a final weight of 43.5 ounces. My SS came out to 46.4 ounces and that was with servos that weighed a total of 2.0 ounces less than the ones specified. But quite honestly the difference of several ounces in this case is of little concern. The final wing loading, which takes into account the wing area and weight of the model, was 16.7oz/sq. ft. This is a modest wing loading and is perfect for a training type aircraft.

Another term you will learn about flying electric R/C is WATTS/POUND. In this expression, motor power in WATTS (163 in this case!) is divided by model weight in pounds (46.4/16 = 2.9 lbs.). The SS featured 56.2 WATTS/LB. Anything around 50 WATTS/LB will produce, what we call in electric flying, a comfortable flight! Again the Hobbico designers were right on in their choice of model size, total weight, motor, prop and battery size.

FIRST TIME AT THE FLYING FIELD

You are finally ready for the flying field. It probably took you longer to read this article than it did to assemble the SS. *(Editor's Note: The RTF version required 17minutes for complete assembly)* In real time, I received my SS ARF kit on a Wednesday afternoon. I read over the instructions that night. On the next day (Thursday) I completely assembled the SS, making it ready for the flying field. That day also included the taking of about 100 photos and a lot of notes for this article. The next morning Tom Hunt and I traveled out to the east end of Long Island, town of Calverton, and made the first series of flights on the SS. This included our flight photographs. So basically two days elapsed time from kit box to flying field --- not bad!

As a beginner, it is very important that you *seek help* for at least your first dozen or so flying sessions. Hobbico provides a brief VHS videotape of their SS-EP going through a first flight session. I would watch that tape before making that first trip to the field. In that tape they definitely recommend that you seek help. The best way to do this is to locate an RC club in your area that maintains their own flying field. Your local hobby dealer can usually put you on to a club, provide directions to the field and possibly connect you up with a club member/instructor who can meet you when you arrive.

The instructor pilot will first go over your aircraft making a full safety inspection to make sure you didn't miss anything. He will pull on the control surface hinges, make sure the prop is on tight, and also make sure the retainers on the top of both servo output arms are tight as they can be. The 7 cell 2100 mAh Ni-CD battery pack should have been charged at home on AC (household) power the night before. The instructor will also check your balance point. It is a good idea to have the Hobbico instruction manual with you since your instructor may have to verify certain technical points about your SS.

Before turning your transmitter on for the first time have your instructor fill you in on the frequency control system used at the field. Generally there is a big board (frequency board) that contains 60 channel numbers, one for every channel on the 72-73 MHz RC band). Your transmitter should have a frequency placard mounted on the antenna containing the two digit channel number. If your transmitter operates on CH-18, the antenna placard will have the numerals "1" and "8" ("18").

Some fields require you to provide, and place on the board, a clothespin marker with your name and channel number on it. Other clubs require you *take* a channel pin from the frequency board. Whichever system is used, you must follow this safety procedure carefully, because two model airplanes cannot fly on the same channel at the same time!

Now you can finally turn on your transmitter for the first time at the flying field. Since this will be your first flight on this model you will also have to verify that the RC system range is appropriate for the task. Most of these systems will work at least a half-mile away, like almost out of sight! To simplify the verification process you are advised to retract the transmitter's antenna as much as possible, leaving only a short length sticking up from the case top. With both the transmitter and receiver turned on, have someone walk away from your aircraft, holding the transmitter. While doing this have the person keep pulsing one control hard over, like full right rudder. The instructions for your RC system will generally recommend a separation distance between the transmitter and receiver where the system must work perfectly. Usually this distance may be something like 50, 100 or 150 feet. If at this prescribed distance the control works in a

solid manner (not jittery) then it is assumed you radio is fine and has adequate range. You should get used to doing this type of range check every month or so.

FIRST FLIGHT

You best have your instructor take your SS off the very first time. Since this is almost a three-pound model, it is wise to let it take off the ground. The alternative would be to hand launch. Taking off the ground with the SS turned out to be very easy. Just advance the throttle to full, and then steer it right or left if necessary until you get up some flying speed. The SS is so agile that it will just about lift off when it wants to, maybe with just a little up elevator (photo 25). Your instructor will quickly gain some altitude. The more altitude you have, the safer the plane can be recovered by the instructor should you get into trouble.

There are several instructing techniques available to help the student pilot. The most widely used involves the use of a trainer cable (buddy cord) that couples two RC transmitters of similar manufacture. The instructor holds one TX while the student holds the other. The instructor has a master transmitter switch. Using the switch allows the instructor to take command of the aircraft the instant the student develops a problem.

The SS lifting off for the first time, taken at Bob's SEFLI (Silent Electric Flyers of LI) club flying field in Calverton, NY. This is the club that sponsors the largest electric powered fun-fly gathering in the world, every September, in upstate New York at the Peaceful Valley Campgrounds, Downsville, NY.

One of the most difficult things you must master as a new RC pilot is the fact that you are in control of the aircraft, but you are not sitting in it. If your were in the cockpit, like in a real plane, your left is left and your right is right. But when you stand on the ground holding the transmitter controlling the aircraft, as the model is going away from you, right is right and left is left. But say you get out a couple of hundred feet and want to bring the aircraft back close in. You make a 180-degree turn and head back. But now with the aircraft coming at you, your left is right and your right is left. In other words the steering controls are reversed when the model approaches you. By whatever means you must master this situation early on or you will never, ever be a comfortable RC pilot. Your instructor will be able to show you tricks on how you can relate to the reversed direction control in flight. Make this your number one priority.

After learning the turning scenario, the next most important aspect of RC flight for a beginner is landing the aircraft. This will simply take time. Initially your instructor will make several landings for you and then try to coach you down to the runway. As you gain experience, you will be landing in the center of the runway with coaching. Then finally, you will be released to try your first solo flight without any help from the instructor.

Most RC beginners learn fast. A lot has to do with the frequency of your flying lesson. If you can only get out for a single day each weekend, it might take two months or more to solo comfortably. On the other hand if you get out three of four times in a week to fly, you might be a "solo" pilot in a matter of just a couple of weeks. I hate to use the pun, but practice makes perfect.

As you go about your learning process you are surely going to have your share of crashes. Fortunately, Hobbico sells a variety of replacement parts for the SS. As already mentioned, make sure you purchase a few extra propellers at the onset. You might even contemplate buying a second battery pack, to increase your flying time. By that I mean you can be flying with one pack, while the second pack is on charge.

Also as a learning tool, several of the hobby distributors offer very elaborate RC training simulators, which operate off a PC. These devices have been greatly improved in recent times and can give you some valuable training time while sitting in your home shop.

THE EDITOR FLIES THE SUPERSTAR-EP

(By The Editor)

This 4-foot wingspan plane is a beginner's delight to fly. Due to the plane's electric power and small size, we did not install the Eagle Tree Flight Data Recorder. However, this plane has all the right flying characteristics of a perfect trainer.

Take-off from the ground required just 25 feet, while hand launching was easy with a simple toss. Climb out was gentle but firm (photo 27). The plane maintains straight, level flight with authority (photo 28) and looks good in the air. Turns require just a small amount of up elevator to stay level (photo 29). One note, as do all airplanes that use rudder only for turning (no ailerons), the SS requires that some rudder input be maintained during the turn. If not, the plane rolls back to level flight on it's own.

This is opposite the control inputs used on aileron-equipped aircraft, which require the aileron be released after the bank is established. Fortunately, this is an easy adjustment to make while transitioning from a rudder controlled plane, like the SS, to one with ailerons.

In the air, the SS could easily fly 30 ft. diameter loops and perform impressive stall turns. Rolls were possible as long as down elevator, while inverted to keep the nose pointed above the horizon, was not added. Adding down elevator when inverted locked the plane into inverted flight, again a common rudder-only controlled characteristic. The SS continued the roll as soon as the elevator was released.

The best rolling technique with this type aircraft is to raise the nose 45 degrees above the horizon and then roll without adding elevator. Rolling in this manner, the SS always completed the roll straight and level.

All flight parameters were slow enough for the student to plan ahead, yet fast enough to be considered responsive. The average flight time was 5-6 minutes. Landing approaches were not steep, yet the plane maintained a good flying speed (photo 30). Most approaches were flown at less than 20 mph with touchdown speeds around 15 mph (photo 31). Landing was basically a "non-event"; it was too easy.

One last comment. Your editor is somewhat new to electric flying. While different from engine power, it has its own charms. One I especially enjoyed was turning the motor off in flight, gliding

around, and then turning the power back on. I especially liked doing "touch and goes" this way. This is a fun plane to fly.

SUMMARY

(By Bob Aberle)

The SS proved an excellent and easy to fly RC aircraft. I was most impressed and feel this is one of the best choices for a first time RC model that I have come across in a long time. It is also very economical! Keep in mind that long after this SS is retired, you still have the radio, motor, ESC, battery and the charger. They are what we call, non-recurring costs. Just transfer the components into your next model.

This was only the beginning of what we hope for you will be a hobby that you will enjoy for years to come and also share with your family members. RC model aircraft has truly become a sport as much as a hobby. A final suggestion is that you join our national model aircraft organization that was created back in 1936, known as the "Academy of Model Aeronautics". This same organization brings you the monthly magazine, MODEL AVIATION, this new on-line magazine, SPORT AVIATOR and provides a very important liability supplement insurance program. All of this at a modest cost to you! Enjoy – there is much more to come!

(Editor's Note: In a soon- to-be published feature article, Bob Aberle will be illustrating how to improve the performance of most electric planes. He'll be using the SuperStar-EP as the test bed for these modifications.)

Aircraft Specifications

Manufacturer: Hobbico
Cost: $100 (ARF)-200 (RTF)
Radio: HiTec Eclipse (ARF)
Futaba SKYSPORT 3FR (RTF)
Servos: 2 x HiTec HS-81 (ARF)
2 x Futaba S3003 (RTF)
Engine: Electri-Fly T601 Motor
Airfoil: Flat Bottom
Special Airframe Features: Good battery and motor cooling

Length: 36 in.
Wingspan: 48.5 in.
Wing Area: 400 sq. in.
Wing Loading: 16.7 oz./sq. ft.
Weight: 2.9 lb.
Prop: 9 x 5.5
Top RPM: 8,600

Notable Positives

Excellent slow flight abilities
Very, very fast assembly
Factory installed motor
Excellent speed controller with extra safety features
Great trainer handling

Notable Negatives

Honestly?
NONE
Really, there were none!

This is Sidebar 1 for insertion above.

RTF SuperStar–EP Select

This excellent trainer aircraft is also available in a true Ready-To-Fly version. The RTF is called the SuperStar – EP Select. The Tower Hobbies order number is HCAA14** and the price is $199.99. The higher cost buys you a completely installed Futaba SKYSPORT 3T3FR-AM 3-channel transmitter, a 3-4 channel R114F micro receiver and two installed S3003 Futaba servos.

Insert photo SB-1 here,

Left side and wrap text around to

right and then under photo and place caption under the photo, above the wrapped text.

This is the way the RTF SS comes, fully complete with all components installed. The 3-channel SKYSPORT is also included.

How can a receiver be both 3 *and* 4 channels? Good question, it works this way. There are four receiver ports. If the plane is an electric and has a throttle control with BEC, it then plugs into the throttle servo port and provides power to the entire on-board receiver/servo system. All four receiver ports can be used to control "servo" functions. If there is no BEC, or the plane is engine powered, then a receiver battery must be plugged into one of the receiver ports. This leaves just three ports for servo control. Since the supplied transmitter is just 3-channel, it can only utilize three functions. However, the T3FR can be set to control elevons on a V-Tail. In this form, it will work four servos, but still only operate three flight controls.

The RTF version took just *17 minutes* to be completely assembled and ready to fly. The only wait was to charge the battery. The SKYSPORT transmitter uses 8 AA alkaline batteries so there is no transmitter charging required.

Insert photo SB-2 here on the right side with text wrapped on top, left side and bottom below caption

T3FR-AM Transmitter. Slide switch on left is the throttle. Very natural once you have used it.

Total weight for the RTF was 47.5 oz. (almost 3 lb.). This was only 1.1 oz. heavier than Bob's ARF SS with the micro servos. Even with a plane this size, wood density can mean a 1-3 oz. weight difference. It is obvious that this particular RTF must have had light wood.