Model Aviation's Sport Aviator
The e-zine for the new model pilot

Mini Telemaster ARF

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When Sport Aviator Editor Frank Granelli asked me to do a review of the new “Mini Telemaster”; I said sure. After all, the airplane I learned to fly RC with was a “Telemaster 40”. I loved that airplane. With a wide-chord 73-inch wing and weighing just 6 pounds, the Telemaster 40’s wing loading was about 16 oz. / sq. ft.

My original Telemaster 40, started out with a HP 49 four stroke engine. That combination could barely get off the ground but once in the air it was just the right thing for me. I needed a very slow flying airplane that could stay up a long time. Flights over a half hour, on only an 8 oz. tank, were not uncommon. As I got better and needed to be able to learn how to takeoff, the engine was switched to a K& B 40. Now I could take off easily. Later on I switched again, this time to a K & B 60. What a great combination!

What is really being said is that that airplane was versatile and could fly well with a great range of engines. The Telemaster 40, itself a version of the original Senior Telemaster, was a terrific trainer along with being quite aerobatic with the more powerful engines.

The 94-inch span Senior Telemaster was introduced to the modeling world in the 1970’s. Originally kitted, lots of wooden sticks, the airplane was an instant success. It was aerobatic, one of the best Basic Trainers, could carry a heavy load and looked just right flying by. Like television series spin-offs, a great many Telemaster versions, like my Telemaster 40, appeared practically overnight.

Photo 1

Sport Aviator has just reviewed an even newer version of this exceptional airplane designed just for electric power. The Telemaster Electro ARF is about the size of my old Telemaster 40 but more powerful than my old .49 cu. in. four stroke version. Now Hobby Lobby has just introduced something that seems strange at first, a Mini-Telemaster. After all, the Telemaster made its reputation as a giant among model airplanes and now it is suddenly going to be a “small fry”?

The new Mini-Telemaster is smaller than its larger brethren but it is most assuredly not a small fry. Its wide-for-its-size wing spans 47 inches and has 329 sq. in. of lifting area. The wing loading is about 11.4 oz. / sq. ft., even less than the Telemaster Electro. This version does not have ailerons but Hobby Lobby has just announced that a separate aileron equipped wing will be available for an additional $31.30.

But this version is the 3-channel original Mini-Telemaster. Now onto the “building”

Photo 2

My Telemaster 40 was a kit—that is—a bunch of sticks and planks (die cut) that took me well over a month to put together. This ‘kit’ is an ARF (Almost Ready to Fly) that could be put together in 3 to 4 hours. Much of that time would be spent in waiting for the epoxy glue to dry.

But before we begin assembling, let’s talk about nomenclature: That is, what the parts of an airplane are called.

Most people know what a wing is, so that is taken care of.

The control surfaces in the back of the airplane are the rudder and the elevator. The elevator is connected to the horizontal stabilizer and the rudder is connected to the vertical stabilizer. On this ARF the elevators and the rudder are already connected (hinged) to their respective surfaces.

This airplane does not have ailerons but they would be connected to the wing on other airplanes. The body of the airplane is called the fuselage.

Photo 3 Photo 4

The two sticks in photo 3 become the one-piece dihedral brace shown in photo 4. For you newcomers, the wing is not built flat but in the shape of a “V”. This dihedral provides a self-righting effect and keeps the airplane stable. It also increases the rudder’s effectiveness making turns and rolls possible without ailerons.

Photo 5 Photo 6

First, dry fit the wing halves and dihedral brace together and see how good the fit is. You might need to do a little sanding to make the wing halves fit tightly. This is a must. Mine fit perfectly without any adjustment. The wing, when joined before gluing, showed 2 13/16ths inch dihedral with one wing panel laid flat on the work bench and the other wing panel raised 2 13/16ths of an inch.

Photo 7

Apply the 30-minute epoxy liberally to all surfaces of the dihedral brace, inside the wing dihedral brace socket and to one wing ‘root’. The wing root is the face of the wing where the halves come together. Now the wing halves must be fitted tightly together. The bricks are actually pushing the wing parts together tightly. I usually don’t bother to wipe off any epoxy that oozes out of the joint where it will not be seen when the wing is attached to the fuselage. On the top, just wipe gently and then go back with a tissue that is damp with denatured alcohol or rubbing alcohol.

Photo 8 Photo 9

Photo 8 shows the tools needed to build the Mini-Telemaster. The next few steps require a *sharp* knife. You surgeons out there might consider a fresh scalpel but the rest of us need to buy a hobby razor knife at the local Hobby Shop. Keep a supply of new blades around and change them before they start to tear the wood or plastic film covering.

The covering on the top of the fuselage under the stabilizer needs to be cut away. Temporally mount the horizontal stabilizer (the part that contains the elevator) onto the fuselage top. Mark the fuselage at the front of the stabilizer. Slice away the covering on the rear top of the fuselage.

Photo 10 Photo 11

Temporally remount the stabilizer and pin it to the fuselage. Make sure the stabilizer is square to the fuselage. The easy way to do this is to run a string from the outside tip of both stabilizer sides to the center of the firewall. Both distances must be equal.

Then turn the fuselage over. Mark the underside of the stabilizer where it meets the fuselage, (the side without the white stripe) with the stabilizer pinned to the fuselage. You will remove the covering where the stabilizer contacts the fuselage.

Photo 12

One way to do this is with that very sharp hobby razor knife. A better way is to use a 25 to 40 Watt soldering iron and burn away the covering along the cut line so the rest of the covering can be peeled away. This way there is no chance of putting a score line in the balsa of the horizontal stabilizer. That would weaken the unit. You will also open the holes for the vertical fin—two slots in the horizontal stabilizer

Photo 13

At this point we will epoxy glue the stabilizer onto the fuselage. Spread the 30-minute epoxy onto the fuselage and put some weights on it to hold it in place. You will make sure it is square to the fuselage using the string method used above. In addition you will make sure it is level and even with the fuselage's wing saddle. You will have about 15 minutes before the epoxy gets too stiff and begins to set up. That is plenty of time. No sweat.

Now, for an easy part. Screw the tail wheel assembly to the back bottom of the fuselage.

Look again at photo 9. Those two fuselage slots are where the vertical fin goes. Mark the stabilizer top where the vertical stabilizer goes and with the soldering iron cut a stripe free of covering. We NEVER glue to plastic covering material. Always glue to the underlying balsa or ply.

Photo 14 Photo 15

Before gluing the vertical fin in place, cut a small slot for the tail wheel lever and mount the rudder horn—this is just easier to do before gluing the vertical fin to the fuselage.

Now, glue the vertical stabilizer onto the top of the horizontal stabilizer. In addition, apply some glue to the tail wheel lever in the rudder.

When the glue is dry, the airplane is virtually finished. Now we install the radio equipment and motor with its controls and the battery and it flies!

Photo 16

This is a picture of some metric Allen keys or hex drivers. This particular set has ball ends to make it easier to get at various socket-head screws. Also in the picture is a small tube of thread locking compound. This prevents the screws from coming loose. Use only the removable type of locking compound everywhere there are metal to metal screws, nuts and the like.

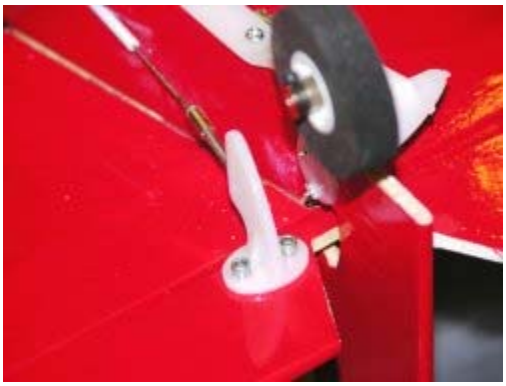


Photo 17 Photo 18

Let's put on the elevator horn and install the pushrods. I always remove the covering under control horns and when they are fitted, use a small amount of thin CAA to doubly secure them.

Photo 19 Photo 20

When fitting the servo tray in the fuselage, trial fit it before gluing and make sure it fits without any stress on it. A little sanding resulted in a perfect fit. Dry fit everything first and get it right before gluing

Photo 21 Photo 22

The servo connectors supplied were slightly oversize for the servo arms. A #49 or 5/64th drill bit opened up the hole in the servo arm so that the connectors were a good, slop-free fit. The screw heads on the easy connectors were 'JIS' not 'Phillips' head. There is a slight difference but you can still use the American common Phillips head screwdrivers. Many ARF's come with JIS screws so if you are going to be in this hobby you might as well bite the bullet and buy a set of JIS screwdrivers.

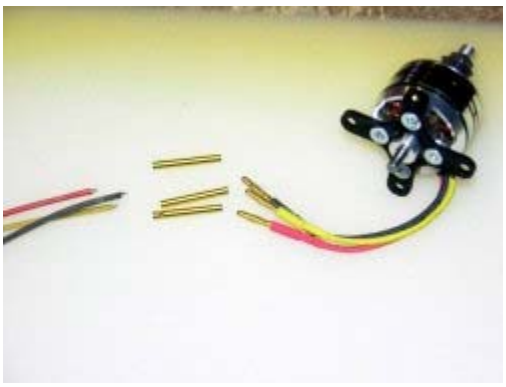


Photo 23 Photo 24

If you are using the HOBBY LOBBY recommended motor and ESC (Electronic Speed Control), follow the directions that come with the components. You will be doing some soldering. If you don't know how to solder and you don't know anyone who does, then look it up on the internet and practice before you do the actual motor connectors. Unfortunately, soldering techniques are beyond the scope of this review. Hobby Lobby recommends and supplies top quality components for this model: The Axi 2208/32 Silver Line motor, the Jeti 12 Amp ESC with Battery Eliminator Circuitry (BET) and all the mounting supplies. This is, I believe, their recommended system. All are good stuff.

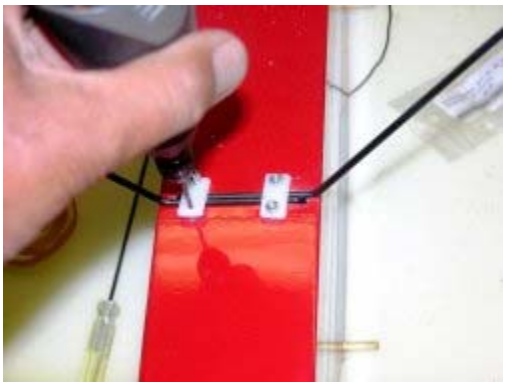
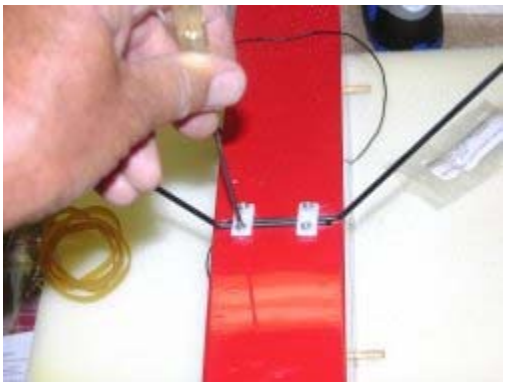


Photo 25 Photo 26

This set of photos shows how to install the landing gear.



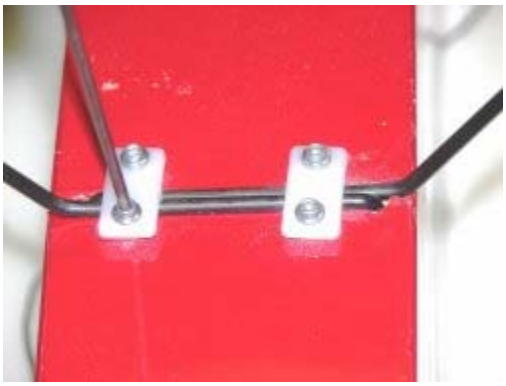


Photo 27 Photo 28

I used hex socket head servo screws instead of the JIS screws supplied. Either can be used, I just think the servo screws are much easier to use. Be sure to use Locktite on the wheel collars.

Photo 29 Photo 30

The 4 mm (about ¼ in.) dowel goes through the fuselage and sticks out equally on both sides. One dowel inserts into the fuselage in front of the wing and one behind. These dowels hold down the wing with the supplied rubber bands.

When you put on the wing be sure to have it square to the fuselage with equal length on both sides. This is very important. It is a good idea to put a small, center pinhole in the fuselage top just in front of and behind the wing. When you mount the wing, line up the wing center joint with the two pinholes and the wing will always be centered.

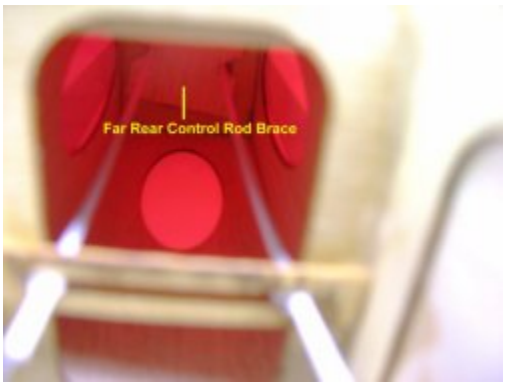


Photo 31 Photo 32

When the radio was installed, I thought that the pushrods might be too flexible. I fashioned a brace to put on the far rear former (photo 31) and another in back of the radio compartment (photo 32). This provided enough bracing to prevent the pushrods from bending.

The directions call for just over 9/16ths inch movement (15mm) of the elevator.

The rudder had more movement, about ¾-inch if you can get it. There are no ailerons on this airplane. The rudder provides banking which controls the turn—with elevator keeping the nose up. (*Ed Note: Hobby Lobby has just announced that an aileron equipped wing is now available for this aircraft. It is part no. HLA114W and costs $31.30.)*

Photo 33

In order to balance the airplane, the 1100 mAh NiMH battery had to be placed as far forward as possible. Even then, the balance point (CG) was about ¼ inch behind the recommended point. I chose to leave it there because adding weight to a small electric airplane is not a good idea. As it is, the airplane came in at 26 ounces. Hobby Lobby specifies 23 ounces. I don't see how I could have spent an extra 3 ounces in building.

FLYING:

Photo 34 Photo 35

First a few beauty shots. It is a quite attractive little airplane.

Photo 36 Photo 37

Then the first launch by Dan Vannieuland and the first flight. (*Ed Note: Dan is another Sport Aviator Reviewer and aspiring Pattern Pilot. BTW – Bob K is also a Pattern pilot competing in the Intermediate Class and has done very well enough to fool most of the judges into giving his flights high scores. Even me)* The Mini-Telemaster did launch quickly and stayed positive under control inputs.

Photo 38 Photo 39

The Mini-Telemaster will loop from level flight. It does NOT like inverted flight but, then it was not designed for that. Even the larger Telemasters are not at their best when the sky and ground switch places in the windshield.

Photo 40

Rolls, like most rudder-only airplanes, are slightly slow and since inverted flight is not the airplane's strongest point, do require pulling the airplane's nose up about 30 degrees first. Even so, some altitude is lost during the roll so start your first few rolls a little higher than normal.

Photo 41 Photo 42

But low passes, slow flight and touch and go's are any Telemaster's strong point and the Mini Telemaster is no exception. The only limitation is that touch and go's don't work well on any except very short grass. The airplane has small wheels.

But how about off the parking lot pavement during lunchtime at work (assuming it is both safe and approved)? Or using a paved runway? Then touch and go landings help keep the pilot sharp and are as much fun as always.

Photo 43 Photo 44

Bring the power down to half and cruse around, enjoy the view and just chill out. The Telemaster line is popular as it is a fun but low-stress airplane to fly. Bring the Mini-Telemaster to work and if it isn't too windy, have your lunch in the park and get in a few flights.

The airplane is a little more than just a slow flyer. It is much lower stress than one of those aerobatic foamies. And it can be safely flown just about anywhere. Even though it has nearly a four foot wing, it fits into anywhere.

Flying low passes and cruise flight, the Mini-Telemaster stays airborne for about 8 to 10 minutes. It might be a good idea to carry an extra battery pack so you can fly on one while the other recharges.

Speaking of batteries, Hobby Lobby recommends the Ni-MH setup as many Mini-Telemasters will be flown by very new pilots or experienced pilots who are new to E-Flight. Neither pilot class should be playing with Li-Poly batteries their very first time into the electric world. It is best to get some experience first on batteries more tolerant of a beginner's abuse.

But if you have some experience with electrics, I bet that a 7.4-volt, 1200 mAh Li-Poly battery pack, and the correct 15-20 Amp speed controller, would really make this airplane come alive. I know this type of conversion has done so for other airplanes. Flight times might also increase but the airplane's performance envelope definitely will. The cost increase would be modest, about $20 each for the battery pack and ESC. The motor can handle either battery type. If you already have a Lithium Polymer charger, you might want to consider this option. Especially do so if you are going to be using the heavier aileron wing.

There is only one thing that bothered me a little and that was the lack of a lifting tail. Having an airfoil stabilizer is the design feature that defines a Telemaster as a "Telemaster". What does a lifting tail do?

Flat bottom wings develop more lift the faster they go. Symmetrical wings do also but, they change their angle of attack and so are more likely to maintain a constant amount of lift.

But as a flat bottom wing goes faster, it climbs more. Motor down thrust can help this situation but, it is a very inefficient way to keep the airplane from flying with increased speed.

An elegant way to achieve a non climb condition with increased speed is to put some lift in the tail. As the speed goes up, the lift from the wing goes up but, so does the lift from the tail. The result is a change in the angle of attack—the tail rises—and the wing's angle of attack goes down and with it its lift. Plus, there is more total airfoil lifting surface. Remember that the horizontal stabilizer and the vertical fin for that matter are both true wings. Airfoil wings just lift better than flat boards.

Having said that, the airspeed-induced pitch change on the Mini-Telemaster is near minimal. The airplane does not have a wide speed envelope. Few small, non-Foamie, models do. The lack of an airfoil stabilizer is more a problem concept for me than a flying one.

But I think the airfoil stabilizer is why I could fly my original Telemaster 40 with such a diverse range of engines. The HP 49 four-stroke had less power than a two stroke '25' all the way to a K& B 60! Yet the airplane handled both equally well.

Small parks and parking lots that can safely handle the Telemaster 40 are rare. But there are thousands in which a pilot can truly enjoy the Mini-Telemaster. Learn more about this Park Flyer Telemaster version at: website

Specifications

Manufacturer: Hangar 9
Cost: $77.00
Radio: Futaba 4EX
Servos: 2 x HiTEC HS 55
Motor: AXI Silver 2208/32 or 34

Length: 32.5 in.
Wingspan: 47 in.
Wing Area: 329 sq. in.
Wing Loading: 11.4 oz./sq. ft.
Weight: 26 oz.Airfoil: Flat Bottom

Special Airframe Features: Easy to build ARF Construction; Very low cost.

Notable Positives
Accurate Prefabrication
Extremely fast assembly
Very good appearance
Low stress slow flyer

Notable Negatives
Doesn't have an airfoil stabilizer
Power response better on Li-Po battery