



GWS Slow Stick

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The GWS SLOW STICK is, by name definition, a slow flying airplane with a "stick" type fuselage. It is designed to fly slowly and will let both inexperienced and experienced fliers taste the joys of remote controlled flight without maxing out their credit cards. There is little requirement for model building skills such as carving and painting. It is more a matter of assembling and aligning the parts as per the instructions. The review model was supplied with a radio system and speed controller for the electric motor. GWS also provided an 8-cell flight pack battery.

CONTENTS



Photo 1

The very colorful manual for this airplane can be found on-line at the GWS website at http://www.masportaviator.com/redirect.asp?website=ArticleLink_GWS_SlowStick

The printed instructions go so far as to include an application form to join the AMA. It is worth mentioning that there is now a less expensive park flier level of membership available to the general public.

The GWS Slow Stick is another fine addition to their line of Ready-To-Fly ([RTF](#)), semi-scale Park Pilot-type aircraft models. Others include the P-51 Mustang (every manufacturer/distributors has to have one of these!) a Spitfire and its German counterpart, the FW-190. The model can be

assembled (and charged) in less than 1 hour by anyone with any modeling experience. Though it is a scale model of a training aircraft, this airplane should *not* be considered as a first-time aircraft. Anyone who has mastered R/C flight with any other rudder/elevator/throttle aircraft could graduate to this model as their first “aileron trainer”.

The GWS Slow Stick meets all the aircraft requirements of the Academy of Model Aeronautics' (AMA) Park Pilot Program. The aircraft weighs less than 2 pounds (the Program's upper weight limit) and has a level top speed under 60 mph (the Program's upper speed limit). For complete Park Pilot aircraft details, [follow this link](#).

The AMA Park Pilot Program offers non-AMA members the opportunity to become AMA members at a much reduced cost. Park Pilot membership includes a great magazine “Park Pilot”, \$500,000 personal liability insurance, \$2.5 million liability insurance for the flying field owner ([see insurance details](#)) and membership in the world's largest sport aviation association – the AMA. For complete information and details about Park Pilot membership, just [click here](#).

To join the Park Pilot Program, [follow this link](#).



Photo 2

The box-lid shows a very good representation of what you will eventually end up with after you assemble the airplane. This is an easy to assemble and exceptionally easy to fly aircraft. The photo tells the story and it doesn't lie.



Photo 3

Two of the three things that you will need to put the SLOW STICK together, are rubber bands and the supplied GWS glue. The third item is clear adhesive tape that is actually supplied as part of the decal sheet.



Photo 4



Photo 5

At first, you might think that you only got half of a wing in the box. Closer examination will reveal that it is folded in half.



Photo 6



Photo 7

The wing has an open bottom to the wing-section, which provides the great, slow handling characteristics of this model. Just unfold the wing as directed.



Photo 8



Photo 9

The wing is shown here fully opened out. The finished version will have leading and trailing edge stiffeners that are taped in place to give it more strength. Notice that the bottom of the wing is curved inwards. This is called an "Under Cambered" airfoil. Such airfoils have a lot of drag and do not respond well at high speeds. But for an airplane in this class, there is no better airfoil for extra lift, slow flight and great handling.



Photo 10

The fin and stabilizer are one piece of skinned foam each.



Photo 11



Photo 12

The hinge line is a simple cut in the surface of the material. Clear “decal-tape” provides additional hinge support. Simply scoring along the control surface lines creates the hinge line.



Photo 13

The very lightweight wire landing gear is both functional and very strong.



Photo 14



Photo 15

The main pre-formed parts that create the supports for the wing, the landing gear and the electric motor are made of a hard plastic that attaches well with Cyanoacrylate (CAA) adhesives. DO NOT use regular CAA on the foam parts. If repairs become necessary, use only Foam-Safe CAA.



Photo 16



Photo 17

The “long parts” do not photograph very well and are out of scale in the picture. For example, the black square rod is the complete length of the fuselage.



Photo 18

All the nuts and bolts that you need are included.

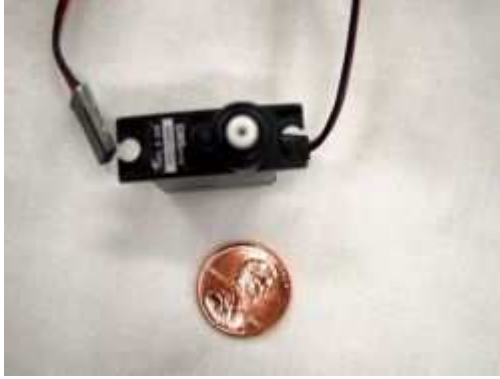


Photo 19



Photo 20

The radio system is not included in this ARF kit. We used the inexpensive GWS system that matches the airplane perfectly. The GWS servos are small, but do the job very well. The servos centered well and had more than enough power to handle the Slow Stick.

The GWS receiver is designed with indoor flying in mind. It is extremely small and very light weight. However, its outdoor range is limited to about 200 yards so, be careful if you are using the Slow Stick for outdoor flying. Keep the airplane closer in than would normally be the case. But then, 200 yards is a *long* way out for a 46 in. wingspan Park Pilot airplane.

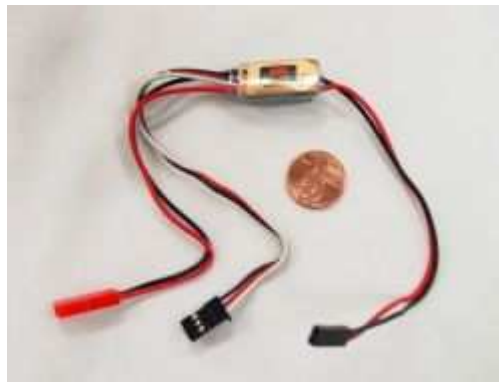


Photo 21

The GWS speed controller was simple to use and was up to the task for the SLOW STICK.



Photo 22

A pre-wired, ~400 size, motor and geared propeller output were part of the kit. Spare GWS propellers are available at just about any hobby shop. It might be an idea to purchase an extra one when you take your new Slow Stick home; just in case.

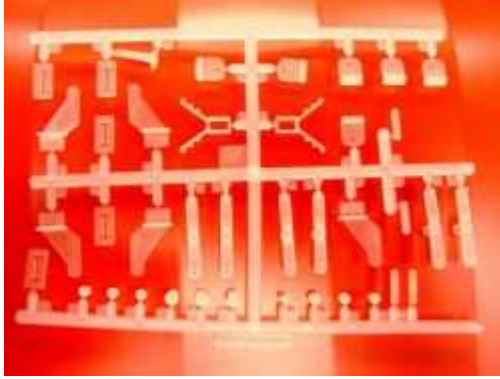


Photo 23



Photo 24

There is a collection of semi transparent plastic/nylon parts that come on what is commonly referred to as a “Christmas tree”. This is where you find items such as the clevises, horns, and the ends to retain the landing gear wheels, etc. The decal sheet not only contains decoration for the SLOW STICK, but functional sections of control surface hinge tape for the construction process.

CONSTRUCTION:

The manual has very clear pictures in bright colors. The captions are, however, a little tricky to follow. As long as you stay in sequence they will work well.



Photo 25

To begin building the wing, you first unfold the panels that are joined at the center. Do not let them split apart. Then you use the tape strips from the decals to seal the joint along the center section.



Photo 26



Photo 27

Hard plastic rods are then taped to the leading and trailing edges to stop the wing from bending too much. A tougher cap strip is added to the leading edge to provide protection from the rubber bands that will be used to hold on the wings.



Photo 28



Photo 29

The elevator and rudder are hinged with adhesive tape from the decal set. The stab and fin are glued to the fuselage rod using the GWS supplied glue.

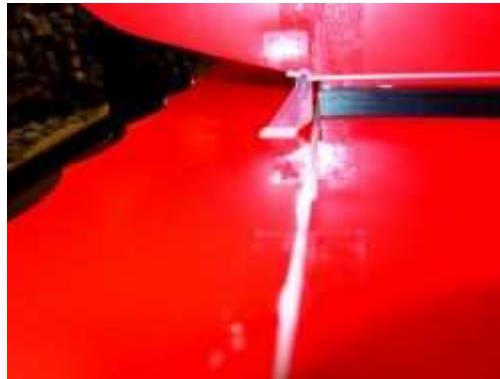


Photo 30

Here is a picture of the small nylon control horns that are used to move both the elevator and the rudder.

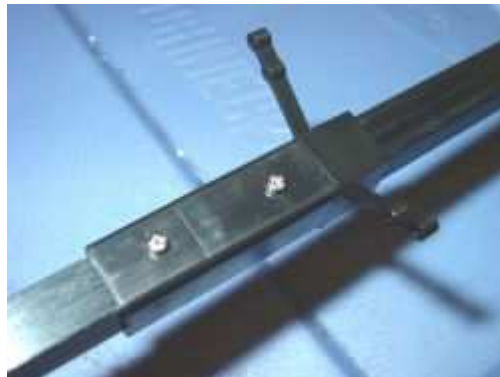


Photo 31

The pushrods that run from the servos to the control horns are supported by this guide (photo 31), which slides onto the “stick” part of the fuselage. The retaining screws are added after the radio has been installed and all of the control-rod runs lined up.

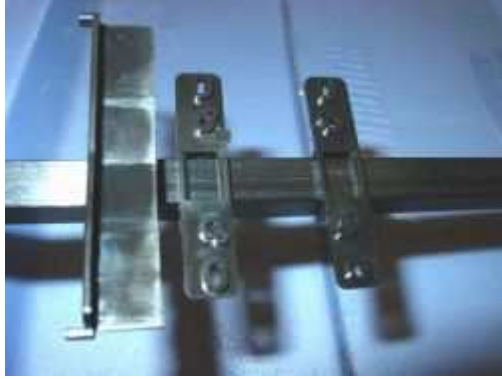


Photo 32



Photo 33

The servos are mounted on these brackets on either side of the carbon fiber main fuselage "stick". The bracket in front of that is where the leading edge of the wing will rest. None of these items are fixed in place until the motor and battery are installed. This will let you move the wing back and forth to establish the correct/specified center of gravity.

The servo installation is quick and easy. It is a simple matter of a few screws. Just remember that the pushrods need to be threaded through their guides before the Z-bends bends are made at the ends.

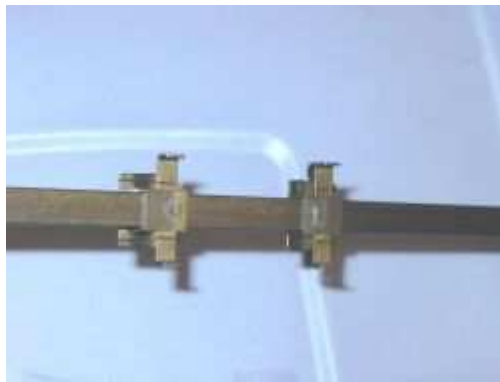


Photo 34

This is the bracket that holds the battery under the fuselage. It uses rubber bands to do the job and can handle many different physical sizes of batteries. The airplane was flown using an 8-cell AAA pack and a 2-cell LiPo pack. The Center of Gravity (CG) did not change with either battery.

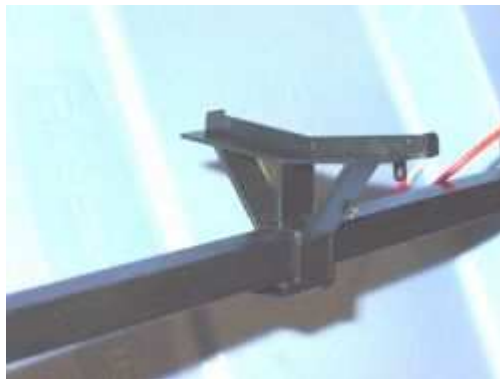


Photo 35

The wing support brackets have little knobs on them that hook the rubber bands and prevent their slipping off.



Photo 36

Photo 37

The electric motor comes pre-assembled with a reduction gearbox. It is attached to the front of the fuselage with one bolt.



Photo 38



Photo 39

One snag that had to be resolved was that the supplied motor did not have a matching plug with the Electronic Speed Controller (ESC), so a spare “JST” plug was soldered in place. This allows for the motor or ESC to be easily removed if necessary.

RADIO INSTALLATION

Radio installation is very simple. The receiver fits under the wing just behind the servos. The GWS receiver was replaced with a JR700 receiver and a JR for outdoor flight. Plug one servo into the channel and one into the elevator channel.

You do have an alternative option where you could plug the rudder servo into the aileron channel. This will make the airplane feel like it has ailerons and let you fly it with the right hand stick, only. *(Ed. Note: Actually this is not so much an option as a requirement. Always plug the rudder servo of a non-aileron equipped airplane into the aileron channel so that it works off the “right” control stick. The airplane’s controls therefore will function just like the control stick on a full-size, and on all model, aircraft.)*

The throttle channel is where you plug in the speed controller-servo-lead. It provides power to the receiver and servos as well as to the motor. The speed controller will shut the electric motor down when the voltage gets low, but will still provide electricity to the radio. This gives you time to land before all of the electricity is gone.

You will also notice a loss of performance prior to that event. This is the best time to decide to make a landing.

BUILDING SUMMARY

The GWS SLOW STICK is pretty simple to assemble. The instructions are clear and easy to follow. It really is more a process of assembly than building. All of the parts go together as instructed. A person with little or no modeling experience should be able to put this airplane together.

FLYING TIME



Photo 40



Photo 41

The GWS SLOW STICK sits well on the ground. The landing gear is flexible and absorbs the shock of landing. The tail is kept well clear of the ground by the tail skid.



Photo 42

The propeller is well clear of the ground. This allows taking off from the ground or grass and avoids the need to perform any hand launches. It also saves buying too many additional propellers on those occasional "arrival" type landings.



The Slow-Stick is a surprisingly attractive airplane once it is all together. True, it has a “face” (exposed geared motor) that only an “Ugly Stik” Fan could love. But the scalloped trailing edges and antique, 1910 looks give the airplane an old-timer charm that is hard to resist.

The flight testing was performed in two places. The first test flights were performed outdoors on a nice calm day. Then the SLOW STICK was taken to an indoor facility and flown in the evening under artificial lighting.

OUTDOOR (see video for flight shots)

The airplane was flown outdoors first because it was unknown how tightly it would turn or how responsive it would be to the rudder. The ground take-off from short grass was easy. Once the throttle stick was advanced, the electric motor came immediately to life. The SLOW STICK just jumped into the air. The first flight was very short due to lack of battery power. It was determined that the 8-cell NiMH AAA cell packs provided just did not have enough capacity for the needs of the geared motor and speed controller.

A 2-Cell 800mAh E-Flite Lithium Polymer (Li-Po) battery was substituted. The CG did not change due to the location of the battery pack. The performance did change quite remarkably; there was a bit more pep, and loops could easily be performed. The GWS supplied ESC adapted to the Li-Po battery very well.

Later investigation proved that the 8-cell Ni-MH battery pack had been damaged during the charge process. A second, identical pack was tried and that proved far more successful. Flight times were about 7 minutes. However, the heavier battery did reduce the aircraft's performance somewhat. Loops were difficult to fly; the airplane usually rolled out at the top due to slow airspeed.

At first, the turn radii were quite large. The throws on the rudder were increased to their maximum and much quicker roll response was obtained. The elevator was just right and allowed really tight turns to be performed. Sometimes a little bottom rudder was needed to keep the nose down in the faster turns. Otherwise, there were no other vices exhibited during the rigors of test flying.

The 2-cell 800 mAh LIPO pack provided about 15 minutes of flight time. The GWS radio system is really an indoor system. So, a JR FM 700 receiver was substituted and a 72 MHz JR 8103 transmitter employed to complete the outdoor job. After that, the range was as far as you could see the airplane.

Here is a caution about outdoor flying in the wind. On calm days, this airplane is a great basic trainer; stable, slow, easy to predict and very simple to fly. In winds above 5 mph, the Slow Stick is a good advanced trainer as the pilot will be working hard controlling aircraft position, available energy and thinking far ahead of the airplane. In winds above 10 mph, the Slow Stick is that type of airplane best left in the hangar until things calm down a little.

INDOOR

Flying indoors with an airplane this size (46.3 in. wingspan) is a little bit more challenging than outdoors. However, with the maximum rudder movement it was relatively easy to turn within the confines of the sports facility. I would say that it would be difficult to fly in a space as small as a basketball court due to the space needed to turn. In expert hands it could be done, but it would not be advisable for a beginner to attempt it.



Photo 45

Flying inside an indoor winter soccer facility the GWS SLOW STICK makes a “color coordinated” pass in front of our flag. Note the other aircraft, a “Foamie” in the lower right section of the flag.



Photo 46

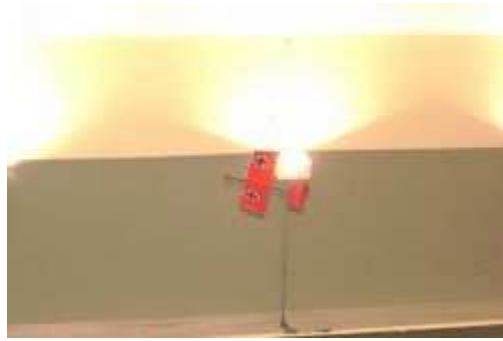


Photo 47

The indoor facility had great lighting for flying but the lighting did not lend itself well to taking photographs.

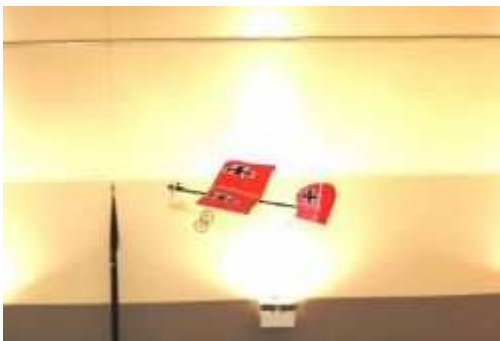


Photo 48

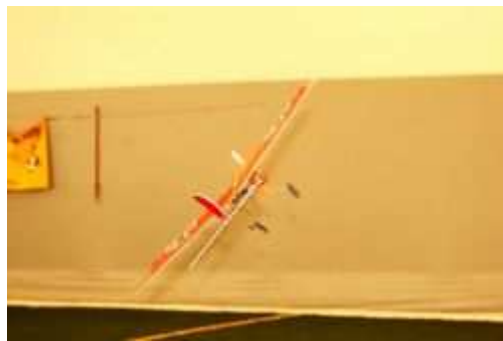


Photo 49

The red GWS SLOW STICK is easy to see and turned on a dime. The rudder has almost the same effect as ailerons. As your experience grows, the more rudder movement you can get, the better.

FLIGHT SUMMARY

The landings and take-offs were easier than with a trainer. This is because you just line up on the runway and cut back the electric power. The airplane sinks steadily when slowed down. The rudder and elevator work all the way to the landing.

The flight tests included only one aerobatic maneuver—inside loops, which the SLOW STICK handled very well. Inverted flight was not tried with the SLOW STICK. A respectable stall-turn can be done with the application of rudder. Rolls could not be easily achieved with the throws selected during assembly.

Overall, the GWS SLOW STICK was very easy to fly and land. The recommended control surface rates were very good and flew the big red wing like a glow powered trainer. This airplane will float and is hard to stall. If you go really, really slow, it can still be stalled. The stall is gentle and will lose only about five feet of altitude.

OBSERVATIONS OF THE GWS SLOW STICK AS A TRAINER

This airplane could be a first R/C airplane. It will almost fly by itself and gives the pilot plenty of time to react to changes in attitude. Just cutting the motor will cause a landing. But have an experienced RC Pilot make the first flight attempts to trim the airplane and to adjust the control sensitivities to match the new pilot's skills.

For more information about the nearly self-teaching basic trainer, go to:

http://www.masportaviator.com/activedit/./redirect.asp?website=ArticleLink_GWS_SlowStick

→

Specifications

Manufacturer: GWS
46.3 in.

Wingspan:

Length: 36.7 in.

Radio: JR 8103 / R700

Wing Area: 506 sq. in.

Servos: 2 GWS Micro

Wing Loading: 4.0 oz. /sq. ft.

Motor: EPS 400C

Weight: 14.2 oz.

Airfoil: Under-Cambered

Special Airframe Features: Very Simple to Build ARF. Looks like a 1910 airplane.

Notable Positives

The way it flew
Easy construction
Pre-built foam wing/tail
Fiber rod - very serviceable
Easy to see
Lands and takes off from short grass
Good landing gear

Notable Negatives

Flies better with Li-Poly battery
GWS Radio indoor only