

# GWS38 Build and Review

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## Setup

- 2x GWS BL2208 motors
- 2x GWS 8x4.3 props
- 2x 25A eRC ESC
- 1x 3S 2200 mAh lipo
- 3x GWS Nano servos
- Spektrum AR400 RX
- Spektrum DX8 TX

## Pros

- Straight forward build
- GWS glue included
- GWS motors and recommended prop included
- Easy flying plane
- It's a P-38, she looks impressive on the ground and even more impressive in the air

## Cons

- Instruction manual pictures are not clear
- No rudders
- Screws hold the canopy on
- Instruction manual still references NiCD battery technology, feels like Lipo battery setup was thrown in as an addendum/late change
- Fixed landing gear

## Unboxing



When the box showed up at my door I was surprised by how large the shipping box was. No damage by the shipping company, so that was a good sign. I cut open the box to find.....another brown box. Except this second brown box was a smidgen smaller and had labels. So I cut the tape and pulled back the flaps. To my surprise on top was a GWS hat, pack of 4 GWS servos, plastic parts tree, and the fixed landing gear. All this was placed on a layer of cardboard in order to protect the foam parts underneath. Pulled back the cardboard and there was all the foam parts. I received the green version, which to my surprise the green was darker than I was expecting. Each foam piece was wrapped individually in bags with bubble wrap filling the bottom of the box. A quick inspection of the foam pieces showed no signs of damage. After the inspection I made my list of items needed to complete the build: two ESCs, battery to ESC y cable, y cable for ailerons, additional battery packs.

## Build

The first thing I had to do was order the parts needed. After much Googling, I ended up with two 25A eRC ESC from Hobby Express (formerly known as Hobby Lobby). The cables and batteries I ordered from Heads Up RC. Within the week the parts were here and ready for building. At the time my building availability was limited to 4-5 hours in the week. Given this availability it took me a month to put this plane together.

The instructions were nicely done; color photos, glossy paper, and each step has its small picture. The biggest issue I had with the manual was the pictures. The pictures were of the plain, all white foam from the NPS version on a white background. This made it insanely hard to see the details

and locations of some things. The white background and small images also made it insanely hard to see where to cut the clear plastic pieces. Sometimes the order of doing things according to the manual didn't make sense to me. To clarify, I grew up helping my dad build his balsa planes and I built two balsa planes with his help so I picked up on building tips. For example, the GWS38 manual has you glue the nose cone on early; doing so takes away an option to hide nose weight if it's needed. They also have you glue on the super charger covers before attaching the booms to the wings. Doing so makes it where you're unable to access the nut to apply Loctite to secure the bolt in place. Creating hinge slots is not explained in the manual; fortunately I have the experience and knew what to do. If you are a new builder, it may be unclear how to cut hinge slots and get a straight line without doing some Googling first.

Using the supplied GWS glue was a different experience for me. I equate the glue to like using epoxy, in that once it's on your fingers it gets on everything your fingers come close to. This in turn means the glue spider webs and strings, which falls/lays on everything. Growing up building the small plastic models I learned glue joints on top of paint don't work well. Nowhere in the manual did it refer to sanding the paint down at glue joints. I proceeded to do this to ensure a better glue joint.

The wing saddle areas on the booms weren't the flattest/smoothest after boom assembly, so I sanded the areas smooth. In my opinion a key step not mentioned in the manual that helps ensure a better wing fit.

The ailerons leading edge and wing trailing edges have some scale indentions that help indicate where the hinges went. However, the elevator and horizontal stab don't have such markings and there is no mention in the manual as to where to put the four hinges. Again, I had to rely on my previous building knowledge to figure out where to put the hinges.

If you've been in the hobby for any amount of time and looked at inexpensive ARFs, kits, etc... then you'll know many times the manual's translation to English is a bit rough. I will say this manual is one of the better translations I've worked with, thus making the build go a bit easier.

One thing that was obvious when it came time to wire up electronics, the supplied channels in the foam are not wide enough or deep enough. This started with the motor wires through the booms where I had to cut the channels wider and deeper to allow the wires to slide through. This was done assuming at some time in the future I may need to replace the wires. The channels for the fiberglass spars on the wing and down the booms were short, so I had to cut an extension for them. The same is true for the channels on the wings for the servo and motor wires. These wing channels are the most obviously under sized channels as it's tough to get a single wire to fit in this channel.

After using the manual to progress through the wings, booms, fuse, and stab I admittedly put the manual aside and occasionally referenced them during servo install. I didn't feel the five gun hole on the canopy provides enough airflow through the fuse to cool two ESCs and a battery sufficiently. My wires were a bit short to put the ESCs in the fuse, so the ESCs are connected with double sided tape to the sides of the fuselage.

The kit comes with fixed landing gear with nose gear being steerable via the rudder channel on your RX. I'm not a fan of fixed landing gear on warbirds and fly off grass at the AMA sanctioned club I'm a member of. Everything I read on this kit dating back to 2006 to 2008 stated it really needed a smooth surface for ROG. So I opted not to install the LG and just do hand launches. If you choose to install the LG, plastic boxes are glued in using GWS glue to the foam, and then the LG is attached into the boxes.

After getting everything together and setting up control throws I was concerned about the slop on control rods; both ailerons and especially the elevator. The elevator servo is a pull-pull configuration and this has proven to work well. The Ez-connector screws would work loose. The push rods needed a flat spot filed/sanded on them where they go into the Ez-connector and a drop of blue Loctite applied to the Ez-connector screws solved the problem. To me, this was a key step/tip missed by the manual. While installing the Ez-connectors to the servo arms, I found I had to drill out holes on the servo arms. I also found one of the four GWS Nano servos didn't work out of the box. Since I was not going to need the steerable nose wheel servo, I swapped out servos. I also felt the servos were a little loose/had too much play while in motion, so I slapped some tape across the aileron servos and built a column out of double sided tape for the elevator servo to sit on. These modifications helped reduce play/movement by the servos.

Balancing the plane was straight forward. I measured the recommended CG location and made two marks on the plane with where the CG is to be. With a 3S lipo as far back in the cockpit as possible, and the way I had to attach the ESCs, the plane balances on the marks. But there's very little wiggle room in the CG, a slight movement of my fingers and she'd go nose or tail heavy.

I dropped a Spektrum AR400 RX in the plane. The cockpit has a deep cavity that is ample for dropping the RX in and housing all the wires. In my opinion it's not deep enough to hold two ESCs (not to mention the concern I have with cooling the cockpit) and everything else. But for my setup it was ample. I programmed my Spektrum DX8 to use a 5 minute countdown timer based on throttle input.

The other modification I did was to slap packing tape on the bottom of the plane where it would skid on landings. The goal here is to protect the paint and foam during belling landings.

The kit goes together nicely, and if you have longer blocks of time for building you could get this plane assembled in just a few days.

## **Painting**

I received the green version from GWS. My hope was not having to paint the foam. But after the first glue job using blue painter's tape to hold things together, it became very obvious I would have to paint the plane to cover up missing green sections. Being my first foam aircraft, I did a lot of research and asking around about paints and when to paint. I borrowed some acrylic Behr paint my friend bought from Home Depot. He had taken his ParkZone Spitfire into Home Depot and had sample size containers custom made to match the green and grey of the plane. I tested the green paint on the green foam; it

was a bit lighter and would be obvious where touch up was done. So I had to paint the entire plane. Prior to painting I did an extensive full scale color scheme research. I chose to do a hodge-podge of common markings/colors from various green and green/grey camo color schemes. Being I don't have an airbrush setup, I hand painted my plane. Two coats of grey were applied and only one coat of green was needed. The large white triangles on the vertical fins were hand painted using Testors acrylic gloss white paint, four coats was needed. The manual did not mention a good time to paint so after I had gotten the wings glued together; it was recommended I paint, so I did.

The clear plastic pieces (nose cone, super charger covers, cooling pods, canopy, and cowls) also needed painting. To help protect the paint I painted the insides of these pieces. This worked great for the nose cone, cooling pods, and cowls. However, I had to scrape off the paint from the canopy and super charger insides as there was too much area needing glue applied. My tail markings and nose art was done by making clear stickers using a laser printer, packing tape, and a bowl of water.

## Flight Report



Before the first flight I made sure to get the control surfaces setup as neutral as possible. I did a range check at home without issue, and at the field before the first flight I did a longer range test. At the

field the front of the canopy was not sitting flat as it should. After several attempts, with no progress I slapped a piece of tape on the front. My friend held the plane up; another quick test of the controls to confirm proper functionality and quick test of the power plants. Once satisfied throttle was raised to 100% and he gave it a light toss into the wind, winds were minimal to maybe 5mph at the time. It was obvious on the get go that 30\* deflection on the elevator was too much. Fortunately I had setup triple rates on my Spektrum DX8, so after I gained altitude, I flipped down to middle rates for both ailerons and elevator. She calmed down and was flying smoothly. I was cruising around at 80-90% throttle, which is a bit higher than I'd like. Stock, the GWS P-38 is adequately powered. Turns need to be a bit wider than most planes because of not having rudders to help point the nose around, too tight of a turn and the GWS P-38 will almost tip stall, she'll come around but on the verge of a stall. After getting comfortable flying circuits I climbed up to test the stall characteristics of the plane. Once 4 mistakes high I reduced power and held up elevator until she stalled. The stall was unexciting as she just kind of nosed over a little then leveled out and started a gradual decent. After watching the full scale P-38 training video I found on Zenon Warbirds, the GWS P-38 stall was scale. As the battery died off, I found myself increasing the throttle needed to stay in level flight. I decided to try a split-s. Unfortunately I ran out of up elevator and did an impromptu landing. Post inspection showed the weakest part of the vertical fin was damaged. Fortunately I had tape with me, slapped on the tape and she was ready for another sortie. I was not surprised by this event as the P-38 on Real Flight behaves the same way, and the full scale P-38 was known to have an ineffective elevator when in a high speed dive (this was later found to be caused by compressibility and is why all modern fighter jets have full moving horizontal stabs).

**Flight #2:** My friend launched it again for me. I had a fellow club member taking hi-res photos of the P-38 in flight, so the majority of the flight consisted of level flight and trying to do passes showing different angles of the plane. This time I landed on purpose and was a nice smooth landing when my timer alerted me to 1 minute left.

**Flight #3:** Again, my friend launched. This time later on in the flight I tried a loop. At the top of the loop she rolled out on her own. I did attempt an aileron roll, she rolled through it, but I felt the power was lacking (combination of stock power plants and trying it late in the flight) and I wasn't comfortable. Not to mention it messes with your head seeing a twin boom plane with not much of a fuselage do a roll. After these attempts I returned to flying circuits to calm my nerves.

The center pod gives a nice hand hold area and I do not expect hand launches to give me any issues. P-38s are rare to see at the local field, so it was a hit with my fellow club members. Even the spectating kids came up saying it was the coolest plane at the field, beating a 42% Raven and very large scale turbine powered jet. The spinners popped off each time on landing when the props hit resistance. The cones just push onto the prop shaft threads, a piece or two of tape to the back plate should prevent them from popping off on belly landings.

### **Aerobatics**

Not having rudders really limits the aerobatics this bird can do. Hammerheads/stall turns, knife edge, photo passes, coordinated turns, snap rolls, etc... are all out of the question. Loop,

immelman, split-s, aileron rolls are possible. I like to fly my warbirds scale, so extended inverted flight is out of my repertoire as the full scale P-38 could not sustain inverted flight longer than 10 seconds (so it was clearly stated in the training film).



## **Conclusion**

The GWS P-38 is a solid airframe. The kit goes together well as long as you have building experience or have an experienced builder helping you. Stock power system is adequate; it won't be setting any speed records at the field. The recommended throws without expo are bit much, but with an experienced pilot at the controls, are manageable on a maiden flight. I affectionately call my GWS P-38 a Sunday flyer with the stock setup, just an easy flying plane with no bad tendencies out of the norm for a P-38.

## **Recommendation**

I will recommend to anyone with building experience or who has an experienced builder helping them to buy the NPS (no power system) version and use your own choice of motors and props. Doing so will let you have a very stable flyer with the potential for a more scale performance when it comes to speed.

## **Modifications to Consider**

- Working rudders OR differential thrust
- Counter rotating props for the cool scale factor
- Magnets to hold the canopy on