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Thunder Tiger Easy Trainer 40 Plus

The First True Almost Ready To Fly Basic Trainer?

by Frank Granelli

Thunder Tiger has long been considered a very imaginative and creative company when it comes to their RC products. You can always count on them to offer products a little bit different from those most companies offer. Thunder Tiger was about the first major company to produce Almost-Ready-to-Fly (ARF) profile aircraft designed for the then new 3-D type of flying.

With giant ailerons and tail control surfaces, the Thunder Tiger Extra and similar models made torque rolls, waterfalls, bug splats and Harrier Landings, all maneuvers with angle of attacks above 60 degrees (high Alpha angles) commonplace. Their retail cost was less than $90, making these unique aircraft affordable, and maybe “expendable” since many 3-D maneuvers are flown close to the ground. These were the first aircraft that opened up the exciting 3-D world to everyone.

Now Thunder Tiger has found a different way to open up the sky to everyone as they did for 3-D flight. This unusual basic trainer flight system is unique and includes items not usually found in other Ready-To-Fly (RTF) aircraft.

Photo 1

Photo 2

The new basic trainer system is called the Easy Trainer 40 Plus. It features a high-performance basic trainer (photo 1) that is not really a true RTF but is far more pre-built than an ARF would be. However, other RTF trainer systems provide just that – a trainer aircraft system. The Easy 40 Plus has all that but also includes all the field equipment the pilot needs (except for fuel) to get airborne. To an old timer like me, the Easy Trainer 40 Plus package recalls the old plastic Cox control line models that were sold with all the field equipment, including fuel, needed to fly.

The field equipment includes a quality hand pump to fuel and de-fuel the airplane. This fueling system includes the bottle cap, a filtered pickup line and a neat coiled fueling line to reach the airplane's fuel inlet. There is a glow plug wrench and an ignitor, with a 120 VAC wall charger, to manage the glow system. To get things started, there is a very good "chicken stick" to turn the propeller over by hand (more on this later). To carry it all, plus a few common tools like screwdrivers, pliers and the like, there is a field box made from corrugated board.

Get only the Easy Trainer 40 Plus package and a gallon of fuel, and that is all you will need to start your RC flying career. An awful large number of control line model pilots got started on those old Cox complete kits. The Easy Trainer 40 Plus should do the same for today's new RC pilots.

Photo 3

The overall package is about the fanciest we have seen in a long time. It is a one piece unit that protects the airplane inside better than any packaging we have seen to date. The graphics are high quality but they also provide great detail about the contents.

Photo 4

Photo 4 shows the aircraft system as is emerges from the box. The Hitec radio system is already installed. All the servos are in and all of the control linkages are connected to the servos. Along with the installed engine, the fuel system is complete and ready to go. However, the propeller and spinner are must be installed by the "builder" as a safety precaution. Why safety? Factory installed propellers can loosen during shipment due to climate changes from China to here and on the open sea. If a new pilot tries to start the engine and the propeller is not tight, the result would be a very unhappy engine and a damaged pilot, or vice versa. In either case, it is a good

idea for the manufacturer to leave the propeller off or for the builder to make sure it is tight if it was factory-installed, which requires spinner removal anyway.

Photo 5

The field support items are shown in photo 5. The Thunder Tiger field box is not completely assembled in this photo to illustrate that it is provided “in the flat”. Like all such “easy folding boxes” it requires the excellent instructions provided to get anywhere near the correct shape. But it is sturdy and should last a season or more.

Wing Assembly

Photo 6 Photo 7

Photo 6 shows the entire wing assembly and the parts required to complete it. The Easy trainer 40 Plus differs from other RTF trainers in that the wing must be glued together using epoxy. Most RTF trainers “bolt” the wing halves together over a metal wing spar. This is a good system but can begin to wear over several hundred flights. An ARF aircraft provides a wooden spar that is usually assembled from three to four identical plywood pieces for extra strength.

This aircraft bridges the gap between the two systems. For added durability, the wing is assembled over a wooden spar laminate. But the spar lamination was done at the factory. All the builder need do is to apply epoxy inside the wing halves’ spar tubes and on one side of the wing center section. There is more work for the builder here than is usual in an RTF, but the end result is stronger, lighter and more durable.

Before assembling any wing, it is a good idea to make sure the spar fits into both wing halves without leaving a center gap. Photo 7 shows that there was a small gap because the spar was slightly too long and prevented the wing halves from touching each other. This is common in many ARF designs, better too long than too short, and is easily fixed.


Photo 8 Photo 9

First measure the spar and mark the exact center (photo 8). Make a vertical line at this center point as in photo 9.


Photo 10 Photo 11

Insert the spar into one wing half. Make a line where it meets the center rib as in photo 10. You can see in photo 10 that the spar's center cannot reach the wing's center rib because of its extra length. Do the same on the other side and your spar will look like the one in photo 11; two lines slightly away from the spar's center point.

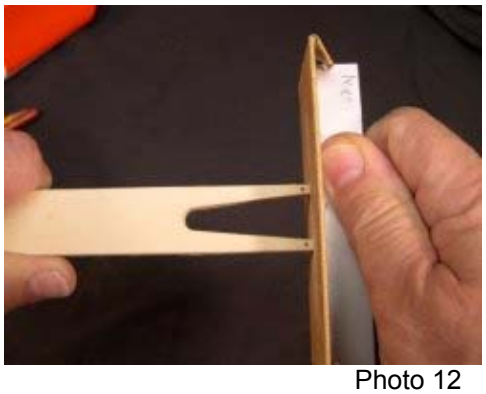


Photo 12 Photo 13

It is important for the spar's center to exactly match the wing's center because the spar determines the wing's dihedral. Photo 11 shows that the spar is too long on both sides by differing amounts. Measure the extra length from the spar center to the wing center mark on one side. Mark that distance on the respective spar end and sand the spar to that point (photo 12). Now just repeat for the other side.

The end result is that the wing halves join in the exact center of the spar, preserving the correct dihedral (photo 13). Reading about this process probably takes almost as long as doing the actual work. A too-long spar is common among most ARF kits since a too-short spar could cause

a wing failure. A new pilot will be using this fix on most of the other ARF aircraft in the future so it is a good idea to practice it now.

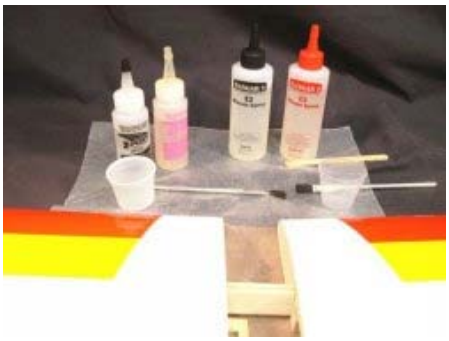

Photo 14

Photo 15

Except for the low-tack masking tape, everything required to join the wing is shown in photo 14. There are differing opinions on the type of epoxy used in this process. The ideal epoxy would be a 1-2 hour dry for maximum strength. The longer the epoxy's dry time, the further the adhesive can penetrate into the wood before curing. But two-hour epoxy requires twenty four hours to truly set and the Easy Trainer 40 Plus can be built in less than four.

The instructions specify 30-minute epoxy and this is the best compromise if the builder is completely certain that the wing halves match exactly and that no manual "hold" will be needed. As I am never that sure or that capable, I compromise. I use 12-minute dry epoxy for the spar and 5-minute for the wing center section. If I have to manually hold the wing halves in alignment, I need do so for only 3-4 minutes. The 12-minute dry time for the spar provides extra working time and strength.

Remove the factory installed aileron servo before joining the wing halves. It gets in the way when trying to position the wing on the building surface. Brush the 12-minute epoxy inside the spar slots in each wing half and on all SIX SIDES of the spar; top, bottom, two sides and both spar ends. Insert the spar into one wing halve, remove any excess epoxy and then brush the 5-minute epoxy onto the other side's center section. Slide this wing half over the spar and secure the assembly with the low tack masking tape (photo 15).

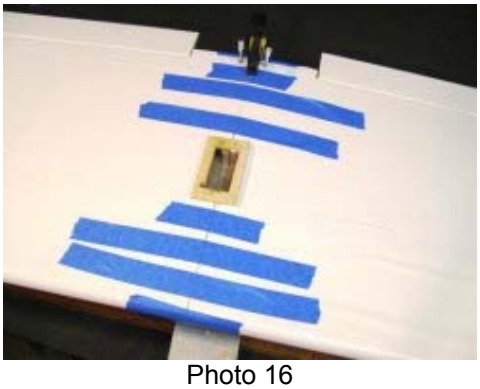

Photo 16

Tape the bottom as well. Look carefully at photos 15 and 16. Note that there is a clamp at the rear of the center joint. This keeps the wing halves properly aligned while the epoxy sets up. Notice also that there is a metal spacer in photo 16 supporting the center section while the wing is inverted.


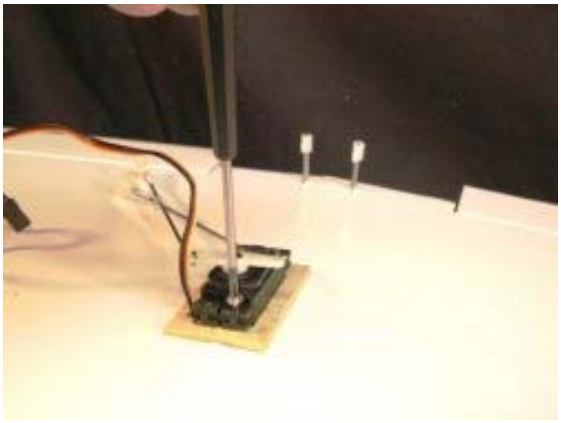

Photo 17 Photo 18

Allow at least ten minutes for the epoxy to set and then move the remove the wing to a safe place. After about 15 minutes more, apply the provided center covering using a modeling heat iron. Very, very few RTF trainers, and also few ARFs, provide covering for the wing center. Thunder Tiger has thought out this aircraft well and provides this extra piece of “quality” to their Easy Trainer 40 Plus. Install the aileron servo and connect the control rods.

The wing is complete. It took about 45 minutes to assemble. The end result is strong and extremely durable. Thunder Tiger did the exacting the work assembling the spar. But since ARF, not RTF, construction was used in this design, the new pilot knows how to assemble *any* ARF wing; trainer, scale or sport.

Fuselage Assembly

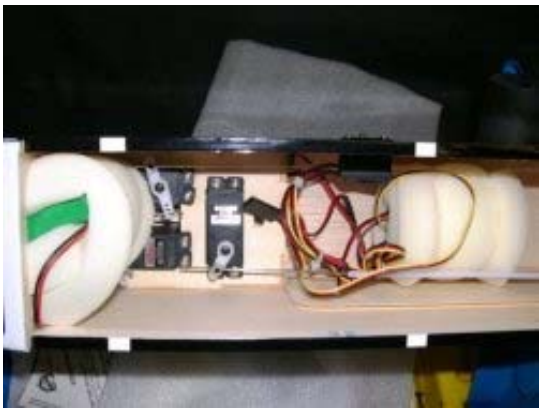

Photo 19

The radio system is factory installed. The battery is not connected; a good idea in case the switch was accidentally turned on during packing or shipping. Connect the battery to the switch and position it in the fuselage just forward of the receiver. It is already wrapped in protective foam.

Photo 20

Photo 21

Radio System Timeout: The 4-channel, analog, FM, Hitec radio system is one step above the basic system usually provided with most RTF trainers. The Laser 4 transmitter's sticks are adjustable for length. As with most transmitters, all four channels are reversible (photo 20).

But the Laser 4 has an added feature not found in other basic analog systems. Photo 21 shows the adjustment screws that allow the amount of movement on the elevator and ailerons to be set by the pilot. This feature is usually found on more expensive computer transmitters. The Laser 4 also has a switch to permit control of elevons, the surfaces found on delta aircraft that control both roll and pitch, or V-tail arrangements like that found on the Beechcraft Bonanza.

The Hitec RCD 3500 receiver is a 7-channel receiver that will grow with the pilot as flying skills improve. Long after the pilot's days of four channel aircraft with just four servos are in the past, the RCD 3500 will still be working in some advanced aircraft in the pilot's inventory.

Hitec HS 322 sport servos provide the muscle the receiver needs to carry out the transmitter's flight commands. These servos provide 42 in. oz. or torque when running on 4.8 volts. This is about double the aircraft's power needs even while performing the most strenuous maneuvers.

Photo 22

Photo 23

Back to Work Building: After positioning the battery, be sure to un-wrap the receiver's antenna. Unlike most RTF, the Easy Trainer 40 Plus's antenna is not extended (photo 22). It must be to fly safely. Use a 1/8 in. drill bit to hand drill a hole inside the "rear window."

Photo 24

Photo 25

Position a small piece of fuel tubing in the hole. Use a scrap piece of servo arm, there are extra provided with the aircraft, to make a strain relief stop. Position the stop on the antenna wire as shown in photo 25. This stop should rest against the inside of the fuselage where the antenna exits. Insert the antenna wire through the fuel tubing and out of the fuselage.

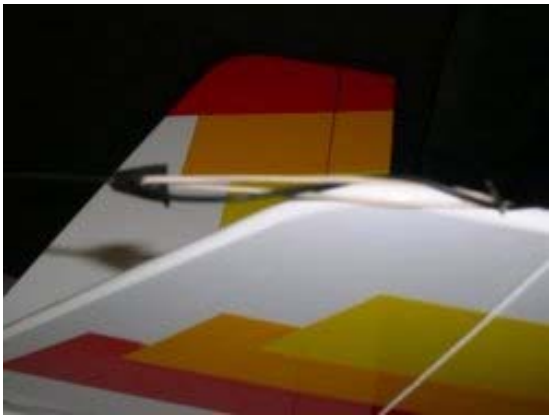

Photo 26

Use a larger piece of scrap servo arm to hold the end of the antenna wire. Cut a slot in the other end of the arm for a rubber band. After the tail is installed, the rubber band will be held in place by a pin in the vertical fin. But extend the antenna wire now to make sure this important step is not overlooked during the final assembly rush.

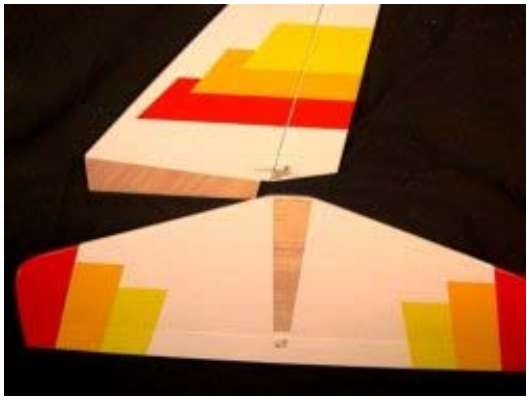

Photo 27

When assembling any ARF aircraft, the builder always has to remove the covering on the tail surfaces in the areas that the adhesive will contact. This is time-consuming and can sometimes be done incorrectly by a new builder. Cut too deeply into the wood when removing the covering and the stabilizer could collapse in flight, making for an interesting first flight. Thunder Tiger solves this problem by removing all the offending covering at the factory.

Very honestly, I was somewhat stunned that they actually did this building step. Such precision work performed during factory building must be very expensive to do. Not only was it done, it was done correctly! The missing covering was exactly 1/32 in. inside all the visible areas once the tail surfaces were installed.

Many RTF trainers just use a few small bolts to hold the tail surfaces in place. This system works for quick and accurate assembly. But eventually, flight stresses and handling to and from the field cause the bolt holes to expand. Usually the pilot ends up gluing these surfaces in place anyway. The easy Trainer 40 Plus teaches the new pilot how to do that at the very start.

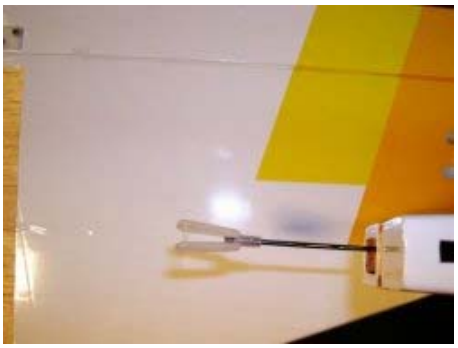

Photo 28

Photo 29

Before installing the horizontal stabilizer, it is a good idea to remove the elevator control rod. This rod exits the fuselage right in the middle (photo 28) and collides with the elevator's control horn. It should do this to work correctly but, with the elevator factory assembled into the stabilizer and the control horn factory attached, the rod is in the way when positioning the stabilizer.

Unscrew the servo output arm screw (photo 28) and remove the servo control arm. Then just push the control rod into the fuselage until it disappears. Place a small piece of masking tape at the rod's rear fuselage exit to prevent it from sliding back out during construction.

Photo 30

Photo 31

Measure and mark the exact center of the horizontal stabilizer (photo 30). Place a pin in the middle of the fuselage just to the rear of where the wing's trailing edge will be (photo 31).

Photo 32

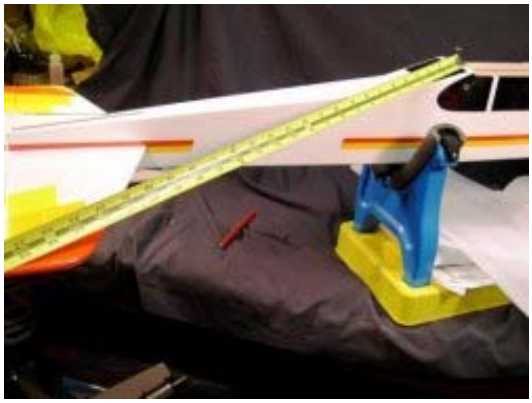

Photo 33

Mark the center of the rear fuselage as shown in photo 32. Test install, no adhesive yet, the stabilizer and position it to match the fuselage rear center mark. Place a pin there to hold the stabilizer in place. Make sure the stabilizer is as far forward as it can go in the fuselage slot. Use a tape rule to measure the distances from the forward fuselage pin to the rear tip of both stabilizer sides, not the elevator sides (photo 33). Move the front of the stabilizer until both distances are equal. Be sure the rear marks is still properly aligned.

Photo 34

Level the fuselage wing saddle, the area where the wing rests on the fuselage. Use a lightweight plastic appliance level to make sure the stabilizer is parallel to the wing saddle. This is important as a stabilizer installed at an angle to the wing's plane will cause the aircraft to roll with elevator input. Having the wing and stabilizer in the same plane is more important than having one tip slightly more forward than the other, so be careful here.

Photo 35

Photo 36

Once everything is aligned, remove the stabilizer. Brush some 30-minute or 12-minute epoxy into the fuselage slots (photo 35). Notice that all the covering over the slots was removed at the factory. This is another task done for the builder. By now, it should be very clear that this aircraft is not an ARF but is an RTF with ARF-style construction for durability. Run a piece of paper towel over the slot so that the towel will remove just the outer 1/32 in. of adhesive from the slot (photo 36).

Reinstall the stabilizer and realign it before the epoxy sets. In photo 34, there is a small red pen that was used as a weight to level the stabilizer. The fuselage slot was cut almost perfectly at the factory. Normally, an ARF will require weights of 6-8 ounces or more to level the stabilizer. Another good job by Thunder Tiger.

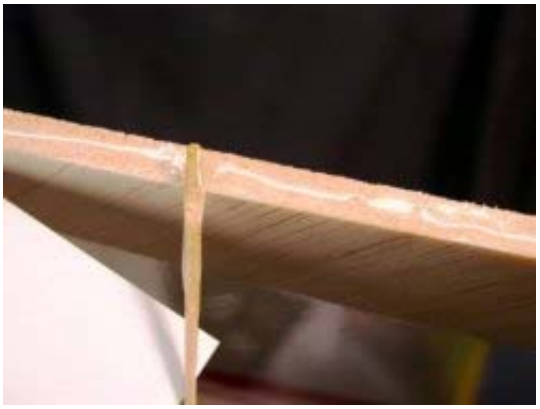

Photo 37 Photo 38

After the stabilizer is set, brush some 12-minute epoxy into the fuselage slot for the vertical fin. Wipe with a cloth as before. Apply additional epoxy to the underside of the fin as well (photo 37). Insert the fin into the fuselage. Use a triangle to keep the fin vertical to the stabilizer as the epoxy sets (photo 38). The fuselage slot was perfectly cut, making sure that the vertical fin was pointed directly into the line of flight. An incorrectly pointed fin will cause the aircraft to yaw left or right requiring rudder trim to correct. But Thunder Tiger did this right too so there was not a problem.

Photo 39

Once everything is dry, remove the masking tape and slide the elevator control rod out of the rear fuselage. Connect it to the elevator control rod as shown in photo 39 and re-install the servo arm; make sure to re-install the servo screw. Photo 39 is a building photo taken for illustration purposes only. The Easy Trainer 40 Plus kit includes small pieces of fuel tubing that are intended as “keepers” to prevent the nylon clevises from accidentally opening during flight. Be sure to use one of these keepers at least on the elevator clevis.

Photo 40

Before moving on to the final “construction” steps, I wanted you to see just one small indication of this aircraft’s quality construction. Look at photo 40 carefully; click on it to enlarge it if necessary. Look at the wires. Notice the two small plastic wire wraps used just to make everything neat and secure? In 5 years of building RTF aircraft, I have never seen that kind of factory forethought. It is just one small indication of this aircraft’s quality.

Another indication of quality forethought, and this one an important one, is also shown in photo 40. The easy to factory install and set adjustable servo connectors are used on the throttle and nose wheel steering. This is good as both controls will need adjusting and this is the best system for that task. But the set screws can sometimes loosen from engine vibration causing a loss of control. Throttle or nose wheel control loss is not fun, but is not critical either. The airplane will come back safely, even if it must be flown until the fuel tank is empty.

Photo 41

But elevator control loss, and to some extent rudder loss, can ruin a good flight. Both elevator and rudder control arms use the fool-proof “Z” bend attachment system. The only way this system can fail is if the servo output arms break and that just will not happen in any 40-size aircraft. Photo 41 shows the strong control rods, fortified with heart shrink tubing, used to power the rear control surfaces. Nope, this linkage system just can’t fail in flight.

I will have to find an excuse other than elevator control failure if I accidentally put this one in the ground on the first flights.

The Home Stretch

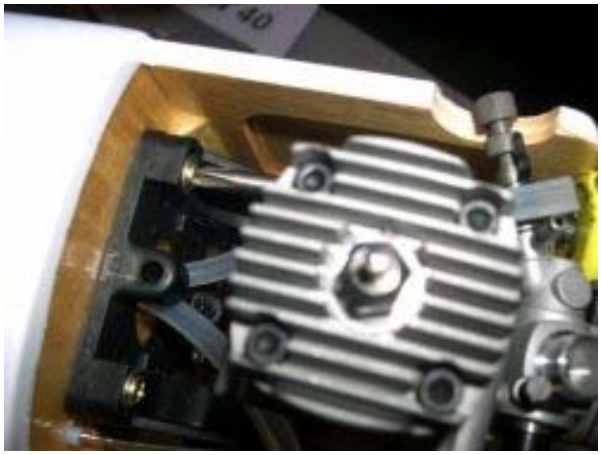

Photo 42

Moving to the front, use a screw driver to make sure each motor mount screw is tight (photo 42). Even better, remove one screw at a time, apply removable thread locking compound, and re-install. This keeps the mount screws in place during extensive flying.

Photo 43

Photo 44

Test the throttle to make sure that it is just fully open when the throttle stick, and the throttle trim lever, are both in the full-on position. Then move the throttle stick only to low throttle. The carburetor barrel should remain open just about 1/16 in. as shown in photo 44. No adjustments were needed on this airplane. Another good sign.

For all the other operations required to make sure an RTF aircraft is flight ready, read Sport Aviator's "Ready-To-Fly…Maybe" article in the Flight-Tech section. For all its near ARF construction, the Thunder Tiger Easy Trainer 40 Plus is much more an RTF airplane than anything else, so follow these pre-flight checks as you would any RTF trainer.

The Easy Trainer 40 Plus engine is one that has earned a reputation for more than reasonable power while being more than reasonably easy to set up and use. The Thunder Tiger GP-42 is known as one of the more powerful engines in its class. But it is more famous for being very tolerant of bad mixture settings and other forms of misuse.

Made in Taiwan, the GP-42 is just not mixture sensitive. It will transition from low to high throttle even if the idle or high-speed mixture settings are set a little too lean or too rich. This is important as most new pilots, and even many of us not-so-new pilots, never seem to get those mixture settings exactly correct. The GP-42's third reputation is for having a steady reliable idle when set right around 2,300 rpm. That's the engine's reputation and this one lived up to all three expectations. As always, no engine is long tolerant if the high-speed mixture is set too lean. The GP-42 is happiest when the high-speed mixture is set 4-500 rpm off from peak.

Photo 45 Photo 46

The engine's muffler is not installed, again for safety purposes. Factory-installed mufflers are usually guaranteed to loosen during the first few flights. So the muffler would have to be removed anyway. Leaving it off saves the builder some extra work. To install the muffler, put thread locking compound into the muffler's bolt holes and onto the ends of the bolts themselves (photo 45). Tighten securely. Yes, the compound will crystallize with heat but that crystallization only seems to increase the compound's locking ability in these installations.

Photo 47 Photo 48

Use a model spanner or metric wrench to secure the reinforced propeller in place over the spinner backplate (photo 46). Make sure the propeller's trailing edge rests firmly against the stop as shown. Attach the spinner cone using the provided screws (photo 47). Make sure the cone is completely against the backplate as shown in photo 48. This is important. You do not want the cone to loosen and fly away because it might fly right at you instead.

Photo 49 Photo 50

The last step is to install the main landing gear. The wire main gear is installed into the fuselage's holes in the bottom gear slot. However, these holes, like all ARF and RTF holes, are drilled round (photo 49) while the landing gear wire must have a curved bend. The result is that the wire will not fit flush into the slot (photo 50). The bend prevents the wire from fully seating in the slot.

Photo 51

Photo 52

The solution is to bevel the interior end of the round hole as shown in photo 51. This allows the wire's curve to nestle nicely into the slot (photo 52). Not only does this look better, but it is stronger as the wire has less leverage applied against the landing blocks since it is closer to them.

Photo 53

The main gear wires are held in place with metal, not nylon, straps. Position the strap over the fuselage slot so that both holes are firmly placed over wood. Drill one hole using a 1/16 in. drill (photo 53). Install one screw and then drill the other hole. Do one at a time to prevent poorly placed mounting holes.

Some Building Thoughts

The Thunder Tiger Easy Trainer 40 Plus is a very high quality aircraft that solves the problems usually found in RTF and ARF models. It does this by being an RTF model with ARF design. RTF models assemble quickly and accurately. But their durability is limited because of their quick, bolt-together construction. Bolt holes sometimes enlarge, including the metal spar's holes in the wing ribs.

Over time, many RTF aircraft become "sloppy" due to flying surfaces that have developed "play" and can move under flight stresses. ARF aircraft solve the durability problem by using adhesives. But ARFs require more time and some building skills new pilots may not yet possess to complete.

What Thunder Tiger did is to take a standard ARF kit, with durable adhesive-style construction, and then performed almost all the work required to get an ARF ready to fly. The only ARF-type

work remaining for the builder is gluing the wing halves together and mounting the tail surfaces. The latter task is eased as all covering has been removed and the control surfaces, complete with installed control horns, are already installed. The radio, engine, fuel system, ailerons and linkage rods are also in place. All the factory work was quality work that an experienced builder would be expected to do.

As I built this aircraft, and slowly became really aware of its features and design, a thought finally found its way into my usually thick skull. This airplane, judging by its design and thoughtfulness, was planned, specified and quality-controlled by one or more very experienced RC modelers. Somehow, that made an old-time builder like me a lot more comfortable about the airplane's capabilities.

To The Field

Photo 54

Photo 55

The easy Trainer 40 Plus is bright and attractive. There were some very favorable comments from the other pilots at the field about its appearance. The topside is colorful and easy to see in the air. But the bottom, like so many RTF and ARF trainers, is all white. A colored stripe under one wing side would have been nice. But the airplane's large 61-inch wingspan and wide 11.25 inch chord (width) do solve visibility problems anyway.

Photo 56

Photo 57

Photo 56 shows all the field equipment that comes with the easy Trainer 40 Plus. Since the fueling and starting systems were included, they were used for all flights. Yes, that included the chicken stick. The hand pump fueler system worked very quickly. Filling the approx. 11-ounce tank required only 28 turns of the handle (photo 57).

Photo 57 also shows the unique fuselage forward construction. The entire top front is a removable hatch held in place by 6 small screws. If the fuel tank ever needs work, removing this "hatch" eases that task.

Photo 58

With the aircraft fueled and the fully-charged glow plug ignitor in place, it was time get things turning using the supplied chicken stick. First, while photo 58 shows the fuel bottle nearby that was done just to show some of the included equipment in the photo. Move the bottle away from the airplane before starting it.

Photo 59

In order to hand start a glow engine, the propeller should be set so that it rests in the four o'clock position when the engine is held against its compression stroke (photo 59). That way, the propeller returns to the ready position after each rotating stroke should the engine not start. This reduces the possibility of the stick's slipping off the propeller blade while allowing each rotation to more quickly follow the previous stroke. A good control line pilot can turn an engine by hand so quickly that the process *almost* resembles an electric starter.

I am *not* an experienced control line flier. Still, my feeble attempts at hand rotating the propeller did resemble an electric starter. Unfortunately, my efforts resembled an electric starter only when it is not connected to a battery. Plus, it has been a long, long time since I tried a hand start.

But try I did. Prime the engine by opening the throttle full, put a finger over the muffler's outlet and turn the propeller over slowly by hand while holding the blade firmly. *Do not have the glow ignitor installed* while doing this and firmly hold the blade. About five rotations should be enough. Reduce the throttle to high idle and attach the ignitor. Use the chicken stick, never your hand or fingers, and flip the propeller over counter-clockwise.

I was very surprised when the engine caught and started on only the seventh propeller flip. Maybe I am not so rusty after all? Actually, I think the easy hand start, and all hand starts so far have been easy, is probably due more to the GP-42's excellent starting abilities than to my technique. Still, I'll take the credit anyway!

Into The Air

Photo 60 Photo 61

Taxing out to the takeoff position proved that the Easy Trainer 40 Plus had excellent ground handling. The wind was about 10 mph and blowing 45 degrees across the runway. I slowly applied throttle and the airplane started to roll over the grass runway. Even before full throttle was achieved, the aircraft jumped off the runway, climbing at about a 40-degree attitude (photo 60). The quick takeoff had caught me by surprise so I was still holding some up elevator. That accounted for the high takeoff angle. It was not the aircraft's fault that the wing loading is light enough and the wing efficient enough that it just wants to fly even at low airspeeds.

However, it was the airplane's fault that it started banking and yawing to the right as soon as it climbed away from the ground (photo 61). The yawing was not difficult to control but it was present. My first thought was that I had somehow screwed up the vertical fin installation. A vertical fin not pointed directly into the airflow will act the same as rudder, causing the airplane to yaw. But the fin had been straight and the construction design just would not allow me to mess up the fin's installation. The yaw was present at all attack angles, even level flight.

It took just a few seconds to trim the airplane for pitch, two clicks down, and for bank, four clicks left aileron. I did not add rudder trim to correct the yaw and just held left rudder instead. It was time to investigate this strange yawing; not yet time to trim it away.

The airplane turned downwind and the throttle was reduced to about half for this leg. Immediately the strange yawing almost disappeared. When the throttle was reduced to high-idle, it did disappear completely. I didn't have to be repeatedly hit over the head to finally realize what was happening. There was just too much right thrust in the engine installation.

Photo 62

But the engine had only 2.5 degrees of right thrust built in (photo 62). 2.5 degrees is usually not considered an excessive thrust correction on a basic trainer. Most such aircraft have a least 2 degrees. The only thought that occurs to me is that the airframe is so well designed that it corrects for the engine thrust using mostly good aerodynamics.

Photo 63

Photo 63A

By putting two 6-32 washers behind the top and bottom right side screws of the engine mount, where it meets the firewall (photo 63 - made during testing phase so has only one washer in the photo), the right thrust was reduced to 1 degree (photo 63A). This proved just about perfect as the airplane would now takeoff and climb at a moderately steep angle, about 30 degrees, without pulling to the right.

Most other trainers require the pilot to hold right rudder on takeoff and in steep climbs to compensate for the propeller's torque trying to pull it to the left. Except for the first part of the ground roll, the Easy Trainer 40 Plus did not need any rudder for straight takeoffs and steep climbs once the adjustment had been made.

Photo 64

With the engine thrust adjusted, it was time to go back flying again. This time, the takeoff was straight with no yawing tendencies. The Easy Trainer 40 Plus climbed out at a steep angle again, on purpose this time, and climbed into the sky in a straight line. Now that it was trimmed, the airplane seemed too easy to fly if that is possible.


Photo 65 Photo 66

The airplane flew so well that an adjustment was made in the usual early flybys. Instead of just the common low passes, the airplane came by the camera held in a full slip (photo 65). Enlarge photo 65 and you can see that all the flight surfaces are hard at work. The left aileron holds the bank attitude toward the camera while right rudder keeps the airplane flying a straight line. A little down elevator was required to stop the airplane's tendency to pull towards the wing in this half-knife edge flight. ALL high-wing aircraft have a pull towards the wing when flying in knife edge.

The Easy Trainer 40 Plus required very little down elevator to correct for the pull. Actually, it used a lot less elevator than most other basic trainers. The wing-low flyby was so easy to fly that we tried it a bit lower (photo 66). On this second pass, it became apparent that less control input was needed to hold straight, banked flight. The first pass had been over-controlled a little. Heck, maybe over-controlled a lot.

Photo 67

Building this airplane had been a pleasant surprise, but flying it was an even better one. Straight inverted flight was stable, using about 30% of the available down elevator to hold attitude. That is less than most basic trainers, a lot less. The thought occurred that maybe an outside loop was possible so one was tried. The airplane required full down elevator and did perform the first half of the outside loop. But the amount of down elevator needed, all of it, left me uncomfortable about the second half of the loop so the attempt was abandoned. Finally, it is nice to know that this airplane was designed by humans after all. It was flying so well, with so little effort, that I was beginning to wonder if some space aliens hadn't worked on the plans when no one was looking.

The outside loop was attempted with the mild trainer elevator movements. On later flights, with additional elevator movement, outside loops were large but not a real problem to fly. But inverted flight is not what this airplane was designed to do. Flying wrong side up is the realm of the Advanced Trainer with its symmetrical airfoil wing. Maybe that is why Thunder Tiger also offers the Easy Trainer 40 Plus Advanced Trainer. The "H" model as it is called, the basic trainer tested here is the "T" model, has a symmetrical airfoil for flying inverted maneuvers.


Photo 68 Photo 69

Loops could be flown large, no lack of climbing power here, and rolls could be slow or fast. The airplane flew right were it was pointed. Spins were impossible, even under power. Snap rolls were too slow and large to hold altitude but nice to look at. OK, aerobatics are fine, but this airplane is a basic trainer. How well does it fulfill its primary role?


Photo 70 Photo 71

It fulfills the training role very well. The aircraft handles low speed flight as if it were born for the slow lane. Even at low airspeeds, those under 35 mph, the airplane will recover to level flight if a student leaves the wings banked after recovering from a turn. Probably because the engine is able to idle so slowly, the airplane does not pick up a lot of airspeed if the student lets the nose drop in the turn. The slowly turning propeller acts like an airbrake in this case. Since it does not gain a lot of airspeed when flown a little nose-low, there is minimal tendency to pitch up when the student finally levels the wing in a descending turn. Turns are difficult to learn but this airplane eases the process a lot.

This aircraft is also capable of flying well at extremely slow airspeeds. In fact, the stall speed of 14 mph is so slow that the ailerons begin to lose effectiveness. This airplane would benefit by using aileron differential. This is easy to setup. To learn how, read Eric Henderson's AeroStar Review in Sport Aviator's "On The Flight Line" Section. The Easy Trainer 40 Plus stalls at a lower airspeed than most other trainers. This is a good insurance feature if the student pilot allows the airplane to slow excessively during landing approaches.

Part of this aircraft's great slow speed performance is due to its light weight, just 5.06 pounds, and the relatively low wing loading of just 16.6 ounces per square foot of wing area. The lighter weight is due, in part, to its ARF-like construction.

Photo 72

Photo 73

Because the slow speed handling is so honest and predictable, those nose high landings like the one in the photos above are easy to fly and pretty to look at. This airplane is extremely honest. The pilot can mistreat it with cross-controlled stalls, excessive up elevator during steep turns, too slow airspeeds and generally fly it around with contempt for the forces of gravity and always get away with it. When finally pushed past all reasonable limits, the Easy Trainer 40 Plus simply drops the nose straight ahead, even in cross-controlled stalls or stalls flown in 60-degree plus bank attitudes, levels its wings , picks up some airspeed and starts flying again.

As a basic trainer, this airplane is a huge success. Its unique ARF/RTF construction is strong, very lightweight and durable. The engine is a perfect fit with more than enough power and excellent handling qualities. The radio system allows for some growth and is one of the major brands so parts and service are never a problem. All the extra field support goodies make it truly air ready. The Thunder Tiger Easy Trainer 40 Plus is a great, complete package featuring a truly excellent, durable basic trainer.

To find out more about this airplane, go to http://www.acehobby.com/ace/TTR4565.htm

Ace Hobby Distributors distribute this excellent airplane and it is available from your local hobby shop. While the full-blown suggested retail cost is $619, the actual “street price” will definitely be lower.

Flight Data Results

***Take Off Speed:**	20 mph
Climb Out Speed	1,200 fpm @ 30 mph
Best Training Speed:	40 mph
Top Speed:	51 mph
Sustained Climb Rate:	.1,600 fpm
Range	15 min.
Dive Speed:	58 mph
Best Glide Speed:	26 mph
Gliding Descent Rate:	-700 ft. /min.
400’ Glide Distance:	1,300 ft.
Level Stall Speed:	14 mph
60-deg. Bank Stall Speed:	20 mph
Landing App. Speed:	26 mph
Touch Down Speed:	20 mph

*All results are an average of 3 flight tests

Aircraft Specifications

Type:	Basic Trainer
Engine Used:	Thunder Tiger GP-42
Propeller:	Supplied 10 x 6 composite
Top RPM:	12,200 rpm
Idle RPM:	2,300 rpm
Test Weight:	5.06 lb.
CG Location:	At Spar

Elevator Movement: 0.44 in. up & down
Aileron Movement: 0.44 in. rt. & left.
Rudder Movement: 0.94 in. rt. & left

Weather Data

Temp	Wind	Alt.
64 deg. F	12 mph	400 ft.

Additional Aircraft Specifications

Manufacturer: Thunder Tiger
Cost: $619
Radio: Hitec Laser 4 4-channel
Servos: 4 x Hitec HS-322
Engine: Thunder Tiger GP-42
Airfoil: Flat Bottom

Length: 50.0 in.
Wingspan: 61 in.
Wing Area: 701 sq. in.
Wing Loading: 16.6 oz./sq. ft.
Weight: 5.06 lb.

Special Airframe Features: Removable Front Hatch Wing, Light Weight, Durable ARF construction in an RTF airplane

Notable Positives

Very low stall speeds
Strong & light ARF construction design
Very attractive color scheme
Light flying weight
Good basic trainer performance
Very reliable engine

Notable Negatives

Too much right engine thrust
Wheels could be larger