



Mini Super Cub RTF Trainer

Author: Bob Aberle | 6/2/2009



I get asked by many people and local club members for my recommendations for a good RC trainer aircraft. I've obviously had some favorites over the years. But every once in a while something new will come along that catches my attention. This is one of those cases and it involves a Ready-To-Fly (RTF), electric powered trainer aircraft sold by Horizon Hobby under their Hobbyzone brand label. The specific aircraft is their new Mini-Super Cub (catalog number HBZ4800).

The Mini-Super Cub 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](#).

Mark, the above links are the usual Park Pilot qualifying paragraph links.



Photo 1

Horizon advertisements state that with this design, you can "Tech Yourself to Fly". The reason for this claim is that the Mini-Super Cub features a special control system referred to as ACT or Anti-Crash

Technology. This is a self-stabilizing control system that can prevent a rank beginner from crashing the aircraft during the learning process. I'll talk more about this shortly.

One of the things I wanted to mention up front is that this very sophisticated RC trainer aircraft can be purchased complete, ready to fly, for just \$99.99.



Photo 2

Everything is included; there is absolutely nothing else to buy. No tools are necessary, no cements are necessary. You can literally be out flying this model aircraft in just the time it takes to view a supplied training DVD, read the manual and charge the single aircraft battery.

WHAT YOU GET:

When you open the well-protected kit box you will be surprised to see a model aircraft that has been totally built for you.



Photo 3



Photo 4

Before doing anything, play the supplied DVD titled, "Learn to Fly" and read the excellent instruction manual (49 pages but easy reading!). The wing is one piece and fully assembled. The tail surfaces are installed on the fuselage. Even the electric motor is mounted to the firewall and enclosed with a vacuum-form plastic cowl. The entire radio system is installed along with all the control linkages.

THE AIRCRAFT STRUCTURE

The entire aircraft structure is made from molded Styrofoam.



Photo 5

This is the way the two major components come out of the box. The wing and tailpieces are made from smooth-surfaced foam; while the fuselage is more of the expanded bead type foam. The surfaces come with factory-applied decals that add a degree of "Piper Cub" scale realism. The rudder and elevator control surfaces are already hinged. These controls are hooked up from the servo output arms to the control horns on the surfaces. The only thing you have to do is insert the main landing into a slot on the bottom/forward side of the fuselage and slide the tail wheel assembly into a slot at the rear.



Photo 6



Photo 7



Photo 8



Photo 9

As already indicated, no tools or cement are necessary.



Photo 10

The wing is attached to the top of the fuselage with a total of six supplied rubber bands.

ABOUT THE RADIO SYSTEM



Photo 11

The radio is a three-channel system that operates on 27 MHz FM. This transmitter is on Channel 3.



Photo 12



Photo 13

The transmitter needs a total of four (4) AA size alkaline (non-rechargeable) batteries, which are supplied. All you need do is open the rear battery compartment cover, insert the four battery cells observing the proper polarity and then replace the cover.



Photo 14

When you turn the power switch on, a red LED will glow on the front of the transmitter.

As received, the transmitter's antenna is almost fully collapsed for storage purposes. Before flying this antenna must be fully extended to its 43-inch maximum length. There are two control sticks on the front of the transmitter. With the selection switch set for MODE-2, the right control stick will give you left and right rudder and up and down elevator. Mode 2 is the most common control setup in the U.S.

This is a fully proportional control meaning that as you gradually move the rudder control stick to the right, the rudder on the aircraft also moves gradually for a right turn. The throttle or motor control is operated by the left side control stick. Unlike most RC transmitters today, this throttle stick is in the neutral position and is also self centering with a spring. Your entire motor control varies from off (in the center, to full power when the stick is in its upper most position. When you let go of the throttle stick it will move to the center position and your motor will stop.

By the way, in case you wondered what would happen if you selected the MODE-1 switch position you would end up with rudder and throttle control on the right stick and elevator by itself on the left stick. This is the more common way to fly RC aircraft in other parts of the world, not here. In the U.S. you are better off staying with the more common, MODE-2 control stick configuration.

Inside the aircraft you will be greeted by something new in our hobby. Instead of separate RC components, like the receiver, servos and Electronic Speed Controller (known as an ESC), the Mini-Super Cub has what is known as a "Brick".



Photo 15

All the major components, except for the battery pack, are placed on a single printed circuit board. Doing it this way eliminates much of the interconnecting wiring, which saves weight and makes for a more compact RC installation.

The rudder and elevator controls utilize wire running inside plastic tubing. The wire rods go from the two servo output arms on the "Brick", back out the rear of the fuselage, where the rods are connected to control horns attached to the rudder and elevator.

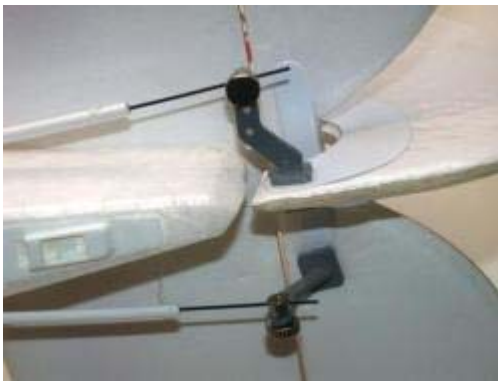


Photo 16



Photo 17

Adjustment screws on both horns will allow you to set the neutral control positions for both the rudder and elevator. In my case, the factory settings were right on!

ELECTRIC POWER SYSTEM

The electric motor provided is a geared "180" brushed type that is rated at approximately 25 to 30 watts input power. Using the supplied 2-cell, 300 mA Li-poly battery pack and a [7 X 3.5 in.](#) propeller (also supplied), this particular motor ran at 3.02 amps current with a power input of 21 watts. An extra propeller is supplied with the aircraft.

When I first went to try running the motor, with both the transmitter and aircraft battery connected, advancing the throttle stick did nothing. I didn't find anything in the instructions on this but quickly

discovered that you must momentarily move the transmitter throttle stick all the way down. When you do that you will hear one short audible beep. After that, the motor circuit is armed. Advancing the throttle stick (above the neutral position) now runs the motor. The more you advance the stick, the faster the motor will run. But remember, when you let go of the throttle stick the motor will stop running. In affect this arming procedure is a safety feature that precludes any premature or inadvertent motor start up.

BATTERY and CHARGER

A Hobbyzone 2-cell, 300 mA Li-poly battery is supplied with the Mini-Super Cub. That pack has a node (white) connector that you attach to the supplied charger, which will permit what is known as “balanced” charging.



Photo 18

What that means is that the two cells in the battery pack are charged separately so that both cells will reach the same voltage at full charge. When that happens, the cells are said to be “balanced”. Balanced cells will provide better capacity and longer service life, so this is a good thing. The supplied charger can be operated from a 12-volt battery, like your car battery or it can be operated from an AC power converter that you can use in your home or shop.



Photo 19

Although you could plug the charger into your 12 volt accessory jack inside your car. It is considered safer to do your charging outside of the passenger compartment of your vehicle. Horizon sells an adapter cable that clips on to the battery terminals under the hood of your car. The other end of this cable accepts the Balanced Charger plug.



Photo 20

I prefer this method. It is also advisable (and is mandatory at most flying fields) that the Li-Poly battery pack be removed from the aircraft every time it is recharged. Access to that battery is very easy so there is no reason not to follow that rule. Photos 21 and 22 illustrate removing and charging the battery.



Photo 21



Photo 22

In most cases, the battery will provide a 6-minute motor run and possibly up to 8 minutes, if you throttle back a lot during your flight (doing that saves power!). Horizon sells this particular battery pack for \$14.99. So having a second pack can extend your flying time since one pack can be on charge while you are flying with the other. For information, the supplied charger has an output of 300 mA current. At that rate, a fully discharged pack can be recharged back to full capacity in about one hour.

POWERING UP THE FIRST TIME

This is covered in the manual, but it is important and I wanted to say it in my own words. When you go to operate (fly) this system, always turn the transmitter power on first. After doing that, you plug the battery into the Mini-Super Cub. You are then set to fly! Moving the right side transmitter control stick will cause movement to the rudder and elevator located at the rear of the aircraft. I've already discussed how you "arm" the motor circuit. When you power up the first time, check to make sure that both the rudder and elevator are in their neutral or level positions. If they are not, you can loosen the adjustment screw on the control horn, level the surface and then retighten the screw. In my case, both surfaces were perfectly level and nothing else needed to be done. Just for information, the control throws established at the factory provided 1/4 inch either side of neutral for the elevator and 3/8 inch either side for the rudder movement. This worked out just fine!

Next, you are advised to run a radio system range check. You do this by extending the transmitter antenna fully. Then have someone walk out with the transmitter, while operating one of the controls (like the rudder). Observe that the rudder moves smoothly and is not erratic in any way. You should be able to separate the transmitter and aircraft by 100 paces without noting any loss of control in any way. If the control is solid, you can proceed to the flying field. When powering down the RC system, always

disconnect the aircraft battery first and turn the transmitter power off last. Failure to follow this sequence could prompt one or both servos to drive to their control limit and possibly damage the servo gears or motor.

BALANCE POINT or CENTER of GRAVITY (CG)

Since the aircraft was factory assembled, it shouldn't surprise you that it balances properly. You can still verify that point, because you will be doing that on every new aircraft that you attempt to fly in the future. The balance point on this Mini-Super Cub is 1 3/8 inches back from the wing leading edge.

ANTI-CRASH TECHNOLOGY (ACT)

The ATC system provided in the Mini-Super Cub is essentially a self-stabilizing circuit that will level the aircraft if it gets into an inappropriate attitude (for example like when diving into the ground!). There are two optical sensors installed on the Mini-Super Cub.

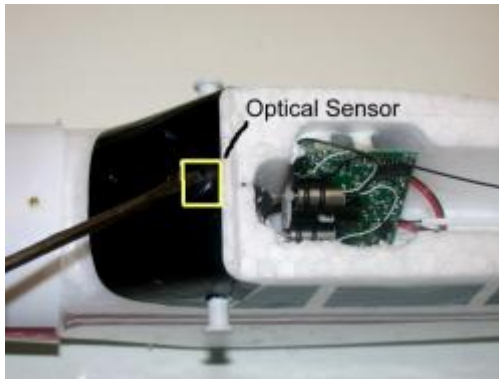


Photo 23



Photo 24

One is on top of the fuselage just in front of the wing leading edge and the other on the lower side of the fuselage just behind the battery compartment. In normal, level flight the top sensor will see sky and the bottom sensor will see the ground. But should the plane get into a dive the sensors and the ACT software will correct the flight path by introducing some up elevator, while at the same time cutting the power. These type interruptions will only occur in extreme situations. You are also cautioned that to provide time for the ACT to work properly meaning that you should be at least at an altitude of 200 feet.

When the ACT is activated, there are times when you are attempting some kind of maneuver, like a loop, that the ACT might try to force you into level flight. So to cope with situations like this, you are able to turn off or inhibit the ACT system while the aircraft is in flight. To do that, just momentarily press down on the right transmitter control stick. As soon as the ACT is deactivated the RED LED will begin to flash. Controls will then feel normal, without any interruption. If you want to re-activate the ACT, push down on the right control stick again. The RED LED will glow steady, indicating that ACT is back in operation.

FREQUENCY CONTROL AT THE FLYING FIELD

(Taken from page 27, paragraph 2 of the instruction manual)

As noted, this particular radio system operates on the 27 MHz RC band of which there are six available channels. My review radio happens to be on Ch-03 (27.095 MHz). But it could have been on any one of the six channels designated by the FCC for RC operation on the 27 MHz band. Although 27 MHz is likely to have the least amount of RC activity these days, there still is a possibility that someone else might be at your flying field, attempting to operate on the very same channel. So be advised, if you see others flying at the same field to introduce yourself and find out what channels they are flying on. If an organized club operates the flying field, they may have a channel control system in place. If they do, find out what the system is and how you can participate. Failure to take a responsible position in this matter might end up with two planes being on the same channel, with a resulting crash almost inevitable.

LOCATING A FLYING FIELD

The small size and lightweight of the Mini-Super Cub lends itself to a small flying field. A baseball or soccer field should provide enough room. But always use common sense. Make sure that the aircraft can't come in contact with adjacent trees and buildings. In many cases local model clubs maintain a flying field. These fields can be best located with the help of your local hobby dealer. The Academy of Model Aeronautics website (<http://www.modelaircraft.org/>) can provide the location of hobby shops, clubs and flying fields based on your local postal zip code.

FLYING



Photo 25

Here is the Mini-Super Cub, pictured with the RC transmitter, ready for flight! It is a very attractive first airplane. Instead of a boxy trainer, it has the look and feel of the famous Super Cub (*Your editor's favorite light aircraft*) while flying like a trainer with extra protection from the AC R system.



Photo 26

The combination of the DVD showing action videos of the Mini-Super Cub in flight, along with written instructions in the manual contribute significantly to learning to fly RC; even by yourself. Instructions are given for both hand launching as well as ground liftoff. The Horizon website states that the minimum age to fly this aircraft is 14. My honest opinion is that my two 11-year-old grandsons could easily master RC flight with the Mini-Super Cub. But because of their remote location to me, I haven't had a chance to prove that statement. With the help of the ACT system, I do believe that a rank beginner could learn to fly

this aircraft on his or her own! Of course, if you do get an experienced RC pilot to initially help, you will learn at a much faster pace.

Don't forget that the airplane will most likely not be trimmed for level flight from the very start. An experienced pilot/instructor will be able to trim the airplane for you and demonstrate simple control functions and ACT recovery techniques. Even if you decide you want to learn on your own, never the best solution, get an experienced pilot to make the first trim flights.

The next series of flight photos were taken by fellow club member, Ray Juschkus, who is also our AMA District-II AVP for the Long Island area. These photos were taken at the SEFLI/Wingnutz Flying field at Calverton on the east end of Long Island. This first photo shows me hand launching the Mini-Super Cub on a flight.



Photo 27

The next series of photos are all flight shots taken at various times during our first flying session.



Photo 28



Photo 29

HOW REALLY GOOD WAS THE ACT?

The ACT system worked, but it took me a little while to realize just how it operated and what to expect. Since I'm an experienced pilot, it is obvious that my reaction to this system would be different than that of a beginner. That having been said, I did deliberately attempt to dive and even spiral dive the Cub into the ground. At each attempt the ACT did recover the aircraft. Could a beginner still have problems? Possibly. But my feeling is that the ACT can help prevent crashes. So learning to fly by yourself is certainly possible, if not recommended, with this Mini-Super Cub.



Photo 30



Photo 31

COMMENT ON THE TRANSMITTER THROTTLE STICK

The one thing that tended to make flying a little “unusual” for me was the fact that the throttle control stick was in the mid range position and it was spring loaded to return always to that position if you let go of that stick. All transmitters I have used up until now had the throttle control stick operate from one extreme idle or off to the other extreme or full power. The stick always remains where you left it. I can see the logic of this Mini-Super Cub and have to agree that if a beginner let’s go of the throttle stick the motor will stop instantly.



Photo 32

But you must remember that to keep the motor running you must hold the stick at its forward position. Since the stick only operates over half of its normal travel you do tend to get low or high power and not much in between. Of course, the nice thing about the mid-range throttle stick is that when you power up the system, you must move the stick all the way to the bottom. Once you hear a single beep, the motor is armed and will operate once the throttle stick is moved above the middle position. I hope I made this all clear!

SUMMARY



Photo 33

After this experience I'd have to say that the Hobbyzone Mini-Super Cub will be my choice as a first time RC model aircraft, until someone comes up with something better. It does everything you might want in a trainer aircraft. The foam construction is very resilient to damage that might result from a student pilot crashing the plane. Spare parts are easily available to repair crash damage. Of course the very best part of this Mini-Super Cub RC trainer is the fact that it comes already built and assembled -- completely -- for just \$99.99.



Photo 34

What's NEXT?

Well, if you enjoy the Mini-Super Cub and do successfully learn to fly RC with it, the next step up might be the big brother to this aircraft, namely the larger Hobbyzone SUPER CUB with a 48-inch wingspan, a weight of 28 ounces (about four times more than the "Mini") and with a 480-size electric motor. The larger Super Cub also offers several accessory features like "X-Port" expandability. These accessories include: a sonic combat module, an aerial drop module that allows you to drop streamer bombs or a parachutist and a night flight module that provides a nighttime flying experience. This is all covered on the Horizon Hobby website.

Specifications

Manufacturer: HobbyZone	Length: 21 in.
Cost: \$100.00	Wingspan: 32 in.
Radio: Incl. 3-channel 27 MHz	Wing Area: 145 sq. in.
Servos: combination	Wing Loading: 7.9 oz./sq. ft.
Engine: Geared, brushed 180	Weight: 7.9 oz..Airfoil: Flat Bottom

Special Airframe Features: Foam construction; completely built

Electric Power Specifications

Prop: 7 x 3.5 in.
Max Watts: 21 W
Power Loading: 43 W / Lb.
Max Voltage: 7.23 V
Motor Current: 3.02 Amps
Motor Run Time: 6-8 minutes

Distributor:

Horizon Hobby
4105 Fieldstone Road
Champaign, IL 61822
Website: <http://www.horizonhobby.com/Products/Default.aspx?ProdID=HBZ4800>

Items included in the indicated selling price:

Brushed/geared 180 size electric motor (factory installed)
RC system: Three proportional channels (rudder, elevator and motor throttle) on 27 MHz FM. The receiver, two servos and ESC are contained on a single printed circuit board referred to as a "Brick" (factory installed)
Battery – Hobbyzone 2 cell 300 mAh (catalog No. HBZ1017) with a balance node connector (0.74 ounce) (extra battery packs sell for \$14.99)
Charger –Balanced type with connector, operating from 12 volts input (via AC supply of 12 volt car battery) with 300 mA output that is capable of recharging battery in approx. one hour
Four AA size alkaline batteries for the RC transmitter (which is supplied)
Prop– 7-inch diameter X 3.5-inch pitch (extra supplied)
Main landing gear with wheels and a fixed tail wheel
All control surface items factory installed including hinges, clevises and horns.

Item that still needs to be purchased:

None