

Putting It All Together

By: Frank Granelli



It was long, long ago, but for 3 of my first 4 years flying models, I traveled to the RC flight line with all my worldly flight support possessions in a paper bag. Sure, I had built a field box (photo 1) my first year. It was made from 1/2 in. plywood, used eight giant Ever-Ready® 1.5 volt dry cells, was about the size of a country bar's counter but was much heavier. It was also prone to fall apart at times. (For those interested, the airplane is a Jensen "Das Ugly Stik" designed by Phil Kraft, powered by the original "Max 60 Gold Head" using a nylon propeller and controlled by an MRC F-700 radio. This was *my* trainer airplane and it taught me to fly. It lasted eight years until the stab fell off in flight for the *second* time. The red car is a 426 Hemi powered Road Runner with a "383" hood to make it a sleeper.)



Photo 1



Photo 2

After the first year trying to lug that monster around, I gave up and just threw whatever I needed into the brown sack. Photo 2 shows the infamous sack in the background behind my Top Flite P-39 Aircobra... Also in the background is a very young Richard Landis, now father of Team JR Pattern flyer, Dan Landis, with his Tony Bennetti-designed Troublemaker.

To refuel airplanes, I used a 4 oz. turkey baster with silicone tubing glued in the tip. Glow power was from a single giant Ever-Ready® 1.5 volt cell and engine cranking power came from a "chicken" stick. Refueling was slow as was starting, but it all worked and didn't weigh 2.5 tons like the old box. When the bag fell apart, it was easily replaced unlike the old box.

I finally purchased a fiberglass flight box that weighed less than three pounds empty and used that box for nearly 30 years. The box was continually upgraded with power panels, better batteries, electric starters and fuel pumps. But finally time, limited storage area, and the need for a better appearance in Sport Aviator photos, made replacement necessary. I decided to go out and *buy* a new field box and all new field support equipment.



Photo 3

I looked through the available choices at the hobby shop. There are many fine field box choices available today. Plus, since I was buying this stuff for my own personal use, I had my choice of what to get. Photo 3 shows just about everything I bought (you might want to click on the photo to get a better view). You might want to know that the total cost for all this equipment was \$238.00 plus tax. That is fairly reasonable considering that I only bought heavy duty equipment intended for hard and prolonged use.

We will cover many of the accessory items in smaller stories in the Baggage section later. The topic now is the field box itself and only those accessories absolutely required to get into the air.



Photo 4

There is not a lot of assembly work required to put the Great Planes “Master Caddy” together. Photo 4 shows just how it comes from the box. The only real work happens if the selected power panel does not fit into the large square opening designed for it, (shown on the left small box in the photo). Since there are so many different sized power panels available, Great Planes had to make the hole to fit the smallest sizes. Other than this, the entire box is a straight forward screw and glue project.



Photo 5

Photo 5 shows the only parts used in the portable power panel box. This “power caddy” is the major reason I choose the Master Caddy over other available field boxes. This section contains the power panel and the 7-amp, 12-volt battery that powers everything. Since I fly at many fields, (when invited), I have to

be ready to start my airplane on the flight line as well as in the pits. Some fields prohibit starting in the pits as a safety measure. When I fly at those fields, I can carry the fueled aircraft and the portable power box out to the flight line and leave the heavy box with tools and fuel bottle back in the pits.

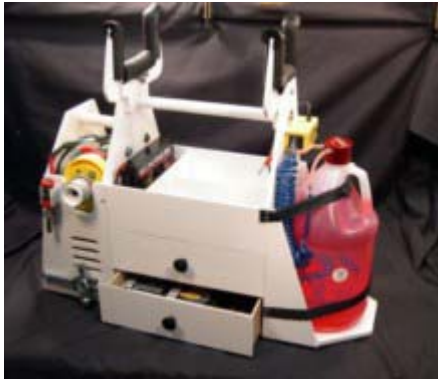


Photo 6



Photo 7

Photos 6 and 7 illustrate the Master Caddy's split personality. The power section rests on two screws attached to the main box. They travel as one unit using the main box's handle. But lifting just the power side alone releases the power section from the main box making it portable. This is a good feature as mentioned.



Photo 7A

Before assembling the power section, check to make sure your power panel fits into the opening. I chose the Hobbico Accu-Glow Mk II power panel for several reasons. This advanced panel automatically adjusts the amount of electrical power delivered to the glow plug based upon need. More power is provided to the glow plug in a "flooded" engine to keep it lit. This auto setting is adjustable but I haven't found any adjustments away from the factory settings to be necessary, so far. The panel also has good/bad and hot/cold plug indicators that keep you from going crazy trying to start an engine with a dead plug.

The Auto Glow setting keeps the power delivered to the glow plug constant even when the starter is used. How many times have you watched the glow plug power meter on your panel drop when you hit the starter's power switch? That can't happen with this panel. And no, this is not just because the panel does not have a glow plug meter. The panel compensates for the starter's current draw by upping the glow plug's power delivery.

The Accu-Glow Mk II also indicates how much energy is left in the field box battery. This lets you know when it is time to recharge *before* you find out, too late, at the field. The panel contains a charging system for rechargeable glow igniters. This is a great feature even if *you* do not use these handy little gadgets. The chances are some of your flying friends do, they are always dead (the igniters, not your friends) and then they borrow your entire box so they can fly. Now you can just charge their igniters for them while you keep control of your field box and stay in the air

The panel has switches for the fuel pump, starter connections and a 7.5 amp fuse. With all this on one panel, you know that it will not fit into that small hole in the power section.



Photo 8



Photo 9

If your power panel also does not fit, mark the proper dimensions on the face of the wooden panel using a straight edge (photo 8). Then take apart a coping saw and reassemble it inside the opening (also photo 8). Carefully cut along the lines you made to enlarge the hole. If you wish to apply the colorful decals to the power section, now is the time. Apply the decals using the [soap and water method](#). When dry, cut out the decal over the hole, insert the power panel and screw in place.



Photo 10

The two wires connected to the power panel go to the main 12-volt battery. The power panel usually includes the clips needed to hook to the battery. If not, they can be found at most electronic and hobby stores. I had some clips already made up. I attached them to the panel's wiring using solder and heat shrink tubing. Yes, when it comes to avoiding field frustration problems, I am a belt and suspenders guy and then add safety pins to make sure. If you enlarge the photo, you can see the 12-volt battery and its square clips nesting comfortably inside the portable section in photo 11.



Photo 11



Photo 12

The side panels are attached using chrome screws. One panel has a cutout for the starter's cone (photo 12). Do not glue the side panels in place. Eventually, the 12-volt battery will need replacement and that means removing the panels for access. The side slots are, of course, there for heat dissipation but the 12-volt battery should *never* get that hot. If it does, something is shorting out.



Photo 13

Photo 13 shows the starter I chose along with the battery and “chicken stick.” This is just personal opinion, but as you can tell from photo 1, this RC flying stuff has been happening around here for a *long* time. In that time, I have come to learn that it is smarter to buy a heavy-duty starter even though the Sullivan Dynatron Heavy Duty, 12-24 volt, starter is twice the price (around \$70) of a regular starter.

Regular starters will reliably turn any two-stroke glow engine up to about .90 cu. in. Above that, starter performance drops off. But the heavy duty starters will start engines up to 1.6 cu. in. on 12-volts and up to 2.35 cu. in. using 18-24 volts. Since most starters last for decades, can you really know you will never own an engine larger than .90 cu. in.? My money says that of course you will, someday. When you do go larger, you will have to buy the big starter anyway so why wait and eventually buy two starters when you really only need one? As I said, just a personal opinion but at least the Master Caddy is big enough to house both starters.

The 12-volt Hobbico battery in photo 13 is rated at 7 amps capacity. There are 9 amp capacity batteries available that last longer under prolonged use. But I was trying to lose some weight here and chose the lighter battery at the expense of more frequent recharges. If you do get a 9-amp battery, make sure it fits into the portable section before purchasing it.

Why the chicken stick? Sometimes the flight box battery fails or was not recharged sufficiently. When this happens, we have a lot in common with full-size J-3 Cub owners. It is time to hand crank the prop or go home. But not literally. Starting by hand was OK during the early days of lower compression engines with more retarded timing than found in today’s power plants. The thin wood and sharp composite propellers used today are more efficient than the old nylon and thick wood propellers of decades ago. But they are also more lethal. A slightly flooded engine, set with today’s advanced timing, and turning a composite propeller WILL KICK BACK (rotate the wrong way against your hand). And when it does, that unbreakable sharp propeller just keeps turning and turning, right through fingers, hands or anything else in its way.

Therefore, the only intelligent way to hand start a glow engine is with some sort of padded rod. The J’Tec “Power Stick” is longer than most other brands and that keeps fingers even further away from the propeller. But many manufacturers make these devices and they all work well. The term “Chicken Stick” may have once been true, but no longer. Today, these devices are really “Smart Sticks” and every glow model pilot needs one.



Photo 14



Photo 15

The rubber feet are screwed into the pre-drilled holes on the bottom of the main box (photo 14). The height difference from the ground, created by these feet, between the main box and the portable section keeps the portable section firmly attached (hung on?) to the main box. Make sure to install these rubber feet or the portable section could pop loose when the box is placed on the ground.

The drawer handles are screwed in place through the pre-drilled drawer holes (photo 15). The drawers arrive completely built except for the handles. They are supposed to hold stuff like Allen ball drivers, tachometers, voltmeters, wrenches, Smart Sticks, etc. and they do. What more can you say about draws, except that there are two of them and they work? Actually the top drawer is divided into three sections (photo 15) while the bottom drawer is undivided for larger tools. The top drawer sections are great for holding a tachometer and a voltmeter.



Photo 16

The next assembly step is to mount the electric fuel pump. I chose the Sullivan “Streamer” 12-volt electric pump. This is the fastest pumping system I know. It fills a 20 ounce fuel tank in about 45-50 seconds. The pump has a directional. On/off switch built in. This might seem redundant since the power panel also has such a switch but really isn't. Placing the pump's switch in the off position is like a safety on a firearm. Even if the panel's pump switch is accidentally turned on while loading the car at home, nothing happens. Without this safety, the constantly running fuel pump keeps re-circulating the fuel until the flight box battery dies just as you arrive at the field.

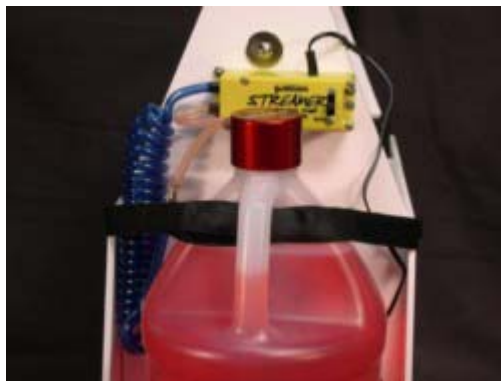


Photo 17



Photo 18

The fuel bottle is attached to the shelf on the side opposite the portable section using two hook and felt straps (photo 17). The real question is where to mount the fuel pump. Mine was mounted just over the fuel bottle. But it could also be mounted on the other side of the wall. But I thought it might get in the way of taking items out of the top storage areas so I didn't do that.

It could also be mounted on the opposite vertical wall over the storage slot but again could cause interference with storage while requiring long fuel lines that could get in the way. Using a brass cup hook, I store the pump's electrical wires as shown in photo 18.

If you enlarge photo 17, you can see that the pump wire is fixed to the box wall by an insulated wire clip. This keeps the power line away from the fuel bottle during fueling; just to be sure there are no sparks to hit the bottle. I know, I know, belt, suspenders and safety pins again, but why not be extra safe? Besides,

the clip protects the wire from accidentally being pulled out of the pump when you step on it while loading or unloading.

The Slimline Pro Connection fuel cap in photo 16 is made from aluminum and lasts forever. It may be a luxury considering its \$15 cost is four times more expensive than plastic caps. But I have learned to trust it to keep the fuel fresh and spill proof. Besides it looks cool and I just wanted to treat myself to one luxury in this project.



Photo 19



Photo 20

Final assembly of the Master Caddy is to attach the airplane “stands” to the box. These padded stands are for aircraft assembly only, not for starting or running the engine. There is no mechanism to hold the aircraft in place while the motor is running. Instead, use the portable section, on the ground, to start (photo 21).



Photo 21

As shown in photo 19, the stands are pre-painted and nearly assembled. When assembled over the two vertical walls (photo 18), these stands make a firm, but adjustable, airplane holder. Cut the padding to the sizes specified in the instructions and don't forget the notches (photo 20). Then just put the padding in place using CAA to hold the padding in place. Both edges of the padding are glued on the vertical sides of the airplane stands, but only one edge is glued on the sliding bottoms. This allows the stands to open or close to accommodate the fuselage's girth.

If you enlarge photo 21, you can see that a Du-Bro long glow plug wrench and a spare glow igniter have been mounted on the side of the portable section. In fact, the igniter was being charged on the power panel when this photo was taken. It is sometimes a good idea to keep all the tools you might need to start an engine or change a glow plug right there on the flight line with you. This prevents running back to the pits to get a tool or extra plug if there are starting problems.

Assembling the Master Caddy takes only one evening or maybe two, about 4-5 hours. But those few hours lets you put everything you need at the field in one spot for years to come. Having a quality, fully equipped field box takes much of the frustration out of this sport and puts a lot of the fun back into it.



Photo 22

Having a field box that also holds the aircraft during assembly is a safety feature as well. Putting the fuselage on the stands let you study the inside close up, before you close it up. Checking the servos, connections, antenna wire, battery and receiver before each flying session is easier when the airplane is up off the ground. Transporting the model to and from the field keeping it in the stand reduces “hangar rash.”



Photo 23

Fueling is also easier when the airplane is raised some off the ground. If you enlarge photo 23, you will see an extra (blue) fuel line running from the airplane’s overflow line back to the fuel bottle. This return line prevents squirting excess fuel onto the ground, instead putting it back in the bottle for later use. While I can’t claim to do this all the time, I try. This process not only saves the lives of thousands of blades of grass, but saves some fuel as well.

The only troublesome part of the Master Caddy is due to its versatility. It can be a hassle to connect and then disconnect the electric fuel pump every time the portable box is removed. But this is a small inconvenience compared to the remote starting ability the Master Caddy affords and I am learning to live with it.

For less than \$70, the Master Caddy offers one of the best field boxes available plus remote starting. That is a hard combination to beat. It makes a day at the field more enjoyable. (I still love that neat, red-anodized aluminum Slimline fuel cap.)

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