

Introduction to Aeromodeling

By Bob Aberle

The Basics

This is the start of a new series which has the sole purpose of attracting people to the hobby and sport of model aviation. Notice that I wrote “hobby” and “sport”; the hobby aspect involves building and assembling model aircraft, and the sport part involves the flying. As you will quickly learn, you don’t have to be a builder to be a flier! But as time goes along, I hope you will want to learn to do both.

Throughout this series it is our intention to explain all facets of model aviation. Monthly articles geared toward the beginner and the intermediate will become a regular from now on. Sometimes a single subject will be presented, and at other times you may see several subjects in a single month.

Magazine issues tend to get lost or misplaced. Unless you faithfully make your own scrapbook of information, data retrieval becomes a problem. The Academy of Model Aeronautics (AMA) has every intention of making this series available on CD-ROM and on a dedicated Web site. In both cases, the idea is to make all the information accessible and easy to locate for as long as you need it.

In addition to monthly articles, it is also hoped to publish key questions readers ask. These FAQs (Frequently-Asked Questions) will be cataloged by subject matter and placed on CD-ROM and in Web-site format for the aid of the beginners.

Where to Start? You might be out driving on a summer day and pass by a model-aircraft flying field. You see a model in the sky maneuvering much like a full-scale airplane. At first you might think it is a full-scale airplane. You stop and watch, then think “I’d like to try that.” But how do you take that first step?

That is the purpose of this series: to tell you how to get started, how to learn about model aviation, and how to learn to build/assemble and fly these airplanes. Even if you are already into model aviation, it is hoped that this series might open the door to areas you were not previously familiar with.

You have seen your first model airplane in flight. What next? The best place to start is to attend a few flying sessions at a local flying field and initially just watch what is going on. Most local flying fields are operated by clubs which are chartered by AMA—the organization that, among other things, publishes *Model Aviation*.

Besides observing, you will have modelers to talk to and you can ask some basic questions as a starting point. Being referred to this magazine and this “beginner series” is a good first step. There are other magazines available with different types of model-aircraft specialties, books for beginners, Internet digests and chat groups, hobby trade shows in different parts of the country, and even instructional videotapes, all of which can prove extremely helpful. AMA can provide lists of all this supporting material.

After a visit or two to the flying field, ask where the local club meets and if it takes on new members. If the answer is yes, find the location and time and attend a meeting to see what it is like. Learning to build and fly model aircraft is best done with the help of experienced modelers. You could learn on your own, especially if you live in a remote location, but it will take much more time.

You may have been “introduced” to model aviation by reading magazine and catalog advertisements. Catalogs placed in the seat pockets of various airlines often advertise Ready-to-

Fly (RTF) models. Your children may have even seen these ads or heard others talk about the hobby, and now you want to know more.

Another excellent and basic way to get started in model aviation is to visit a local hobby shop. The AMA Web site has a button on the front page—"Hobby Shop Locator"—that will help you find one. Hobby shops are owned and staffed by modelers. They can easily inform you of local flying fields and local model-aircraft clubs. Again we are back to "fields" and "clubs."

The local hobby dealer can also outline for you what it will take to get started. There will certainly be an initial outlay of money to buy the necessary equipment. Certain decisions must be made at the start to guide you in the right direction. Again, that is the purpose of this series.

Different Types of Planes

What is Available? Model aviation today is *greatly* involved with radio-controlled flying. The idea is that a pilot holds a control device known as a transmitter. Coded radio wave signals are broadcast to the model airplane, where they are decoded and result in discrete flying commands (instructions) that control the model while in flight.

Although Radio Control (RC) is the primary interest in our hobby, it is not the only interest. As this series expands, you will learn more about the different facets of the hobby. There are free-flying (Free Flight [FF]) models that operate without the help of radio control; models that fly in circles, attached by steel wires to a control handle held by the pilot (Control Line [CL]); models without engines (sailplanes); and a long list of specialty aircraft that make this hobby so interesting and entertaining for *every* family member.

What Do You Really Need? RC is one of the easier ways to enter the hobby, allowing you to quickly make that first solo flight, much like a full-scale pilot.

At the minimum, you will need a basic RC system, which will cost approximately \$200. The details of all this will be explained as we move along in this series. The purchase of that first RC system is essentially a nonrecurring cost. That same radio can be transferred from model to model, year after year. I fly with two different systems I have owned for more than 10 years, and they still work like new.



Photo 1



Photo 2

This GWS RC transmitter is a simple beginner-type unit. It has only the basic four flight-control channels. (Photo 1) The JR Remote Control of Japan transmitter is a good advanced, microprocessor, programmable-type unit. (Photo 2)



Photo 3

This is the complete Hitec Laser 6 RC system. It is a six-channel unit that can expand with your abilities. (Photo 3)

The next item, which is probably as important as the RC system, is your choice of model aircraft. There are several options available. If your time is limited and the most important thing for you is to get out and fly, an RTF model might be best for you.

This is a rather new concept in our hobby so the choices are few, but it is possible to purchase a model already built with a RC system and motor already installed. All that's left is an hour or so of final adjustments, to charge the batteries, then you're headed for the field. RTFs can be purchased at modest prices that might surprise you. Replacement parts are offered in case you damage your model in the course of learning to fly (and you *will* crash on occasion!).



Photo 4 Photo 5

The FunTec Sky Scooter Pro-II is a Ready-to-Fly (RTF) electric model. It comes assembled and includes the RC gear. (Photo 4) TheBantam Bipe from SR Batteries is a good example of an electric park-flyer model. It's light and maneuverable. (Photo 5)

A second option is an Almost Ready-to-Fly (ARF) model. As the name implies, these aircraft are essentially constructed and covered, but they require more final assembly than RTFs. In most cases you will have to install your own RC system and the motor or engine. This Sig CAP 231EX is an Almost-Ready-to-Fly (ARF). These models typically take only a few hours to assemble. (Photo 6)



Photo 6

At this point I should explain that in our hobby an “engine” is what we call an internal-combustion power plant that requires fuel. A “motor” is electric and runs off a battery.

Types of Planes (cont.)

The advantage of ARFs is that there are literally hundreds available in all sizes, types, and prices. They are available from basic trainers up through the most complicated advanced aerobatic models. For the most part, final assembly will only require a few days of your time. After that, you can head out to the flying field. Indoor or micro RC is a recent, popular development. Extremely light models can fly at slow speeds in confined areas. (Photo 7) Although it's still moderately expensive, turbine power offers realistic jet flight sound and performance. (Photo 8) A fine Radio Control Scale model of any type of model can be built and flown successfully. (Photo 9) A good place to start in RC is a simple, rugged, and reliable trainer will teach you the necessary fundamentals on which to build. (Photo 10)



Photo 7



Photo 8



Photo 9



Photo 10

The third possibility is to build your own model from a kit or from purchased raw materials (known as “scratch building”). Constructing your own airplane takes the most time and requires that you develop the necessary skills to do so. You have to learn construction techniques, how to use various cements, how to cover and paint the model. All of this takes time, and if done improperly it can only make the flying aspect more difficult. Virtually any type of full-scale airplane can be replicated as a Scale model in a variety of sizes. This Scale Aerobatics model is on display at a trade show. (Photo 11)



Photo 11

I design most of my own models; therefore, they are all scratch built. But I also have time constraints, so I supplement my “fleet” of models with several ARF designs. I enjoy those ARFs as much as my own airplanes; there is nothing wrong going that route.

However, I suggest that everyone eventually try to construct a model or two from kits, even if you regularly fly ARFs. The lessons you learn from doing that will provide extra experience when you are assembling and repairing your ARFs. As you gain building experience, you might want to consider expanding to other areas of model aviation, such as FF, CL, rubber power, hand-launched gliders, and other models that do not require radio control. (Plans are to have specialized articles covering all aspects of model construction as this series progresses.)

Types of Power Sources

After you have an idea about the RC system and the model itself, the next consideration is the power source. The primary choice today is glow-fueled engines or electric motors/batteries. Each has advantages and disadvantages. We will get into that in due time.

The size of your engine or motor must take into account the size and estimated weight of your model. This is where an experienced modeler can help you the best. Generally the ARF or kit you buy will provide the proper recommendations.

Depending on your choice of engine or motor, you will have to purchase field-support equipment. For the engine you will need fuel, a fuel pump to get the fuel from the container to the aircraft tank, a starter motor to help flip the propeller, propellers (of the correct size), wrenches, and a glow-plug lighter (or igniter). For electric power you must purchase extra battery packs and a suitable field type rapid charger.

Today the choice of glow fuel or electric power is roughly equal. Fueled engines are reliable and basically easy to operate. However, there is a lot of fuel residue to clean up after a flying session, and the engines do make a great deal of noise, even with the use of standard mufflers. Electric power is clean and quiet but requires more power management to obtain the best results.

Either way you go, it is advisable to get some sort of field kit or box, preferably one that has

brackets on top to hold your model. This box should include a variety of tools necessary to support the flight of your model. If you have to travel a long distance to a flying field then you realize you forgot an essential item, you will quickly learn to take inventory and prepare a good checklist. A field-support kit outfitted for your particular type of flying is essential. This is an Electric modeler's flight box, complete with twin battery chargers. (Photo 12)



Photo 12

Now that you have the RC system, the model airplane, the engine/motor, and all the supporting equipment, you are ready for that first flight.

Flying and Flight Safety

Flying: Remember this suggestion: *get help!* Don't try to do it on your own because you may never make that first flight. I don't want you to walk away from this wonderful hobby/sport without having at least accomplished the basic goal of solo flight. Anyone can do it, although it can take time *and* patience.

As we progress in this series, you will learn firsthand the tricks necessary to enjoy radio-controlled flight. We will introduce you to RC simulators, which are really quite effective, to self-stabilizing devices which maintain a level model attitude, and to trainer cables that allow you *and* your instructor to have access to the same transmitter controls.

Radio Control Pylon Racing is an exciting form of flying. Things happen fast, so good reflexes and reliable equipment are musts. (Photo 13) If competition is your thing, there are dozens of meets for each type of flying every year. This is a sailplane contest. (Photo 14)



Photo 13



Photo 14

Flight Safety: Before the conclusion of this first installment, the beginner must understand several important safety rules regarding flying radio-controlled models. All of these rules can be found in the *AMA Membership Manual*, which you receive when you join the organization.

The most important thing you must understand is that two RC systems on the same channel (or frequency) will interfere with one another. We have 50 channels made available to us by the FCC (Federal Communications Commission) that operate between 72 and 73 MHz. These channels are expressly for the control of model aircraft. There are 30 additional channels appropriated on the 75 MHz band for what we call the control of "surface vehicles" (such as RC cars, boats, robots, etc.).

At any flying field you will see a form of frequency or channel control in effect. When you arrive at that field for the first time, have a member or local flier fill you in on the control procedure for that particular site. It often involves the use of frequency or channel clips or clothespins.

All 50 pins may be displayed on a board. When you want to fly, you take the pin designating your particular RC channel off the board and clip it to your transmitter antenna. If anyone comes up to the board after you and sees that the clip is gone, he/she must wait for you to return it. This is basic stuff but most necessary.

Another important safety rule involves flying in close proximity to other flying fields. AMA has determined that it is unsafe to have two adjacent model flying fields closer than three miles apart. You must make sure, as a beginner, that you don't attempt to fly on your own too close to an existing flying field. If you do and you are on the same channel as another modeler, either one or both of you could crash. Always be alert and concerned about where the other person is flying.

That concludes part one. Any comments, questions, and suggestions you have as this series develops are welcome. The whole idea of this is to allow our hobby to maintain itself and hopefully to grow! Each item mentioned in this article will be greatly expanded upon in the next few months so that you gain the proper experience to fully enjoy the hobby and sport of model aviation. Please help make it a success.

