R/C has come a long way. The scene here is the 1937 Nationals with Bill Good, Walt's twin brother, assisting the "Big Guff" on its takeoff. The ship was basically a Free-Flight with escapement control of the rudder. The radio and batteries weighed nearly four pounds. This model was one of the first R/C birds to fly in the United States and is now resting in the Smithsonian Institute in Washington, D.C. A moment in our history that stirred the mind. Engine is a Brown.

Maynard Hill's

R.C.Channel Chatter

Honors for Howard

Dated November 10th, 1971, the A.M.A. released the following announcement.

Hall of Fame Award to Howard McEntee

"Howard G. McEntee, 490 Fairfield Avenue, Ridgewood, New Jersey, has been named to the Model Aviation Hall of Fame by the Council of Past Presidents of the Academy of Model Aeronautics. This is the first and only award to be announced by the A.M.A. for 1971.

"Howard G. McEntee was unanimously voted into the Hall of Fame, as a result of a long and brilliant career as a writer, magazine editor, model aircraft and electronic circuit designer, and flyer of remotely controlled miniature aircraft. His career began in High School during the 20's and has continued almost unabated until just this past year when illness has forced a rest and hospital treatment.

"During WWII and up into 1950, Howard McEntee was editor of Model Airplane News and has since been a feature writer for this and many other publications in the model aviation, science and electronic field. He was also a principal reporter of National and World Championships, best known for his radio control expertise, although his interest spans all aspects of model aviation. He and his wife Elinor have been familiar participants on the scene of most major radio control competitions and other events of the last twenty years.

"The 1971 Hall of Fame award is the first to be administered solely by the Academy of Model Aeronautics, a 40,000 member non-profit association headquartered in Washington, D.C."

It would be easy to fill the rest of the pages of this issue with only a partial account of Howard's role in modeling! But it might best be summed up by simply saying that we (this hobby) wouldn't be anywhere near where we are today if it weren't for Howard's long history of contributions and efforts. He's done a lot of outstanding things to help a lot of people. To me, his columns in American Modeler through the 1950's and 1960's stand out as having a greater total impact on the progress of R/C than anything anyone has ever done or ever will do. This immense volume of information stands out profoundly to me personally, because I got a large fraction of my R/C education from it. There are many modelers flying R/C today in all corners of the world who got their education there too.

R/C has grown by leaps and bounds, particularly during the past five years. If you weren't active back there in 1950 to 1965 when you yourself had to do a lot of soldering of the tubes and transistors to be able to fly, you will perhaps have some difficulty in appreciating the significance of my statement that we wouldn't be where we are without Howard's work. Well, all I can say is "things haven't always been like they are know." It took a lot of learning before it was practical and possible for manufacturers to build these elegant miniature reliables we enjoy today. Howard didn't teach them everything they know, but you can be sure that the whole hobby learned a lot faster how to do it better as a result of all the helpful, highly detailed technical info he gathered and published. During those years it was a real miracle if you put in four or five flights in a row. The honor of his being elected to the Hall of Fame is very appropriate indeed!

On Gliders

We've been away from this subject for too long. Ray Smith has recently published an excellent discussion in the ECSS Newsletter about the total weight of gliders. It's worth absorbing, even if you fly power planes.

How Heavy Should It Be?

Lightness seems to be the goal of all glider builders. Whenever I talk to a flyer with a new glider, one of his first comments is either an expression of disappointment because it is too heavy or satisfaction because it is very light.

The high performance Nordic gliders have a wing loading of 4-1/2 ounces per square foot and a water ballast tank capable of adding 200 pounds of additional weight.

There seems to be a psychological problem with glider flyers when it comes to adding weight. I have known flyers who had the C.G. at 70% back from the leading edge because they didn't want to add weight. The result of course was a ship that was extremely difficult to fly and it performed poorly.

Where should the average R/C glider fit in the 4-1/2 ounce to 5-1/2 pound wing loading range? Let's look at some of the factors that must be considered in selecting the type of glider we want, since these factors are related to wing loading.

Want a glider that will soar in light lift and give maximum air time under no-lift conditions from a given altitude? A very lightly loaded glider with a heavy undercambered section would be the answer. Under very low wind and light conditions, this glider would outperform others. But, add a 7 mph breeze and it starts losing out. It takes advantage of the lift better than heavier gliders, but in doing so, it drifts downwind. Such a glider is efficient at one speed only—very slow! They fly under 10 mph. If you drift downwind for a 1,000 feet, chances are you won't make it back to the field. Try to increase the speed by using down trim and the induced drag at the low angle of attack will not permit the glider to gain any real speed. The result will be slightly increased speed and a much higher sink rate. With wind speeds 10 mph and over this type of glider can't be flown, since when headed straight into the wind, it will be flying backwards relative to the ground. So, you see, this glider isn't of much value as an R/C glider since seldom is the wind velocity low enough to permit its inherent efficiency to be utilized.

It is therefore necessary to modify the design to give it greater penetration. The first thing to do is change the airfoil. Use one less undercamber. This will do two things. (1) It will increase the normal flying speed and (2) it will permit flying at a lower angle of attack without developing high drag.

Lee Messick on winch, Bill Gottorf holding. George Durney's model of the "Ellipsoid". A graceful, beautiful and efficient floating machine.

Let's take a look at what happens with a given airplane. Let's assume the glider has been properly adjusted, and wing incidence set to give the best performance. Is there anything else that can be done to increase performance? There may be.

For a given airfoil, flying at a given angle of incidence, the wing will develop more lift if it flies faster. One way to get it flying faster of course, is to decrease drag by cleaning up the whole plane, getting rid of as much drag as possible. You might say—give it down elevator, but that decreases the angle of incidence and we have already established that we have the wing flying the best angle of attack. There is only one way left, increase the weight. This increases the lift, but also has some other detrimental effects. The increased weight causes the plane to tend to sink faster, and the increase in speed tends to increase the drag.

My theory is this: the increased lift generated by the increased weight more than offsets the tendency to increase sink and the tendency to increase drag. As weight is increased, the overall efficiency will increase up to some point where the increased sink and drag overcome the increased lift.

There should be a way to put all this data into a formula and grind it all out before building a glider. I have talked to several aerodynamic types, and it seems to me the formulas involve some numbers which must be assumed and these assumptions make the whole formula questionable.

I have demonstrated to myself that this theory works. The *Osprey 120* which set the altitude record was quite light, having a loading of 8.5 ounces per square foot. One summer day I got to the field quite late in the day. All thermal activity was over and the wind was dead calm. I pulled the Hi-Start back to the same point each time. I launched and flew the ship as smoothly as I could in big circles. For six flights, the total time was within 30 seconds for each flight.

I was getting a little bored and decided to add a heavy piece of lead inside the fuselage at the center of gravity to see what happened. Launching at the same point, the flight time was increased by an average of one minute for a flight lasting six minutes. When I got home, I weighed the load—15 ounces.

I planned to try adding more lead, but like so many things worthwhile, I never got around to it. We can anticipate what would happen however. I would expect the flight time to increase up to some point as weight was added and it would then drop again.

Even if the flight time in dead air didn't increase, there would still be other advantages. I find a heavier glider flies smoother. The ship doesn't get upset as easily by gusts which are normally present when wind is blowing. As weight is increased, the increased performance is a result of the increased speed. There is no question in my mind that the increased weight will be helpful. You can cover a lot more ground in search of the initial thermal. After the glider has drifted downwind in a thermal, it can more quickly be brought back to the field. Even if there is an increased sink rate, on some ships at least, it will be advisable to add the weight to get the increased penetration.

In full scale soaring, pilots are very interested in the "Drag Bucket" as they call it. Full scale glider designers try to get a wide drag bucket. This means, in simple language, that there can be a wide variation in speed with little change in the ship's sink rate. They use the slower speed for circling in a thermal and high speed to get through sinking air fast and get to the next thermal.

Where should increased weight be added? Well, there are certainly better ways than adding a hunk of lead at the center of gravity. The weight is best added to the airplane parts to increase their strength. A fibreglass fuselage is usually heavier than a similar one built out of balsa, but there is no comparison in their relative strength. The best place is to increase the wing's weight from 1.5 to 2 times the weight of a comparable balsa built-up wing. Some of the weight is placed in the structure and some in the finish. A good smooth finish reduces drag and adds to the overall performance.

This is an expression of my feelings and experience on wing loadings. I would appreciate hearing of yours. If any useful data is submitted, it will be published in a future issue... *Raymond F. Smith.*

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