

THE "BEAM" RETURNS!

One of the true pioneer R/C kit models of the early 1950's, the Beam was a "first" for many R/Cers who can recall first hand, the challenge of escapements, hard tubes, gas tubes, relays, Mighty Midget motors, reed banks, big dry batteries, 465 , superregenby BOB ABERLE . . . who was there.

The updated plans presented with this article follow the original shape and construction with very little overall changes. Almost all of the original Beams, using small engines, such as the McCoy .09, were tail heavy. This becomes obvious when you notice the short, stubby nose. Prior to the loss of my original in 1958, I had switched to a new K&B .15 engine which provided additional nose weight as well as more power. Considering the fact that I would now have a digital set with full throttle control, I decided upon an OS Max .20RC to power the updated version. It is surprising to note that even the new Beam was slightly tail heavy. If you set out to build a Beam yourself, I would now recommend a heavier .19 engine and muffler, such as the Veco .19, or possibly the Webra .20. This extra weight would be helpful.

Another item of consideration was the gas tank. Lou Andrews had used a Walker Pressure Tank and Regulator. These worked great but are no longer available. Room had to be provided for a modern day, plastic, "clunk" tank. The plans show how I literally boxed in a tank directly behind the engine. My present plane uses a 3 oz. Pylon Brand slant type tank. The 3 oz. capacity is a little stingy for a .19. If you choose a larger tank, it's only a matter of enlarging the box enclosure. The key point is that you end up with access only from the front. This way, the box is sealed and no residual fuel can find its way back into the radio compartment.

Certain structural changes were made to increase strength where I felt there was a potential weakness. The original wing structure had a single 3/32 sheet balsa trailing edge. This type of structure depended on silk covering to provide the proper strength. With our present day Super Monokote and Solarfilm covering, the basic wood structure must be strong by itself. To correct this, I simply added a bottom piece of sheet (1/16 was sufficient) to the trailing edge, which now resembles more closely our present day wing construction. It's a good idea to fill in this hollow trailing edge at the center section with balsa, and also wrap fiberglass cloth around it, so that the wing rubber bands don't damage the structure. The horizontal tail never gave us any trouble so we stayed with the original design. We did, however, provide for elevator control,

which was not on the original plans. Remember to select light balsa here to prevent a tail heavy situation.

The fuselage of the original was complicated by an assortment of doublers and triplers which I felt I didn't want to duplicate on the present model. Section views have been provided on the plans to help in the assembly operation. The exact placement of the doubler and some of the spruce support pieces are actually unimportant and can be varied to suit the individual builder.

The engine is actually mounted on a piece of 3/16 inch plywood, which in turn is bolted to 1/2 x 5/8 inch hardwood bearers. The plywood mount is designed to break away during a strong impact, thus saving both the fuselage and the engine (*Many of us used to use 3/32 or 1/8 micarta for breakaway plates. wcn*). This idea, which is quite common today, was called out in Lou Andrews original 1953 plans. It would have been nice to mount the engine inverted, as Lou did in the original, but the addition of a muffler made this somewhat impractical.

No attempt was made to provide a steerable nose gear. You could easily do this if you wanted ground maneuverability. Although not shown on the plans, a small tail skid might be a good idea. Since the horizontal tail is mounted on the bottom of the fuselage, it is quite vulnerable to damage, especially when flying off rough fields. Note also, that for the same reason, the elevator control horn is mounted on the top side of the elevator.

Installation of the R/C equipment was an interesting chore. My original carried hearing-aid type B+ batteries (45 volts), filament batteries (1.5 volts) and escapement batteries (3.0 volts), in addition to the receiver and escapement. Seems hard to believe that we had to have all those batteries. The current installation involved a 1969 vintage Kraft four channel system, of which I chose three channels to operate rudder, motor and elevator. The servos must be mounted as shown on the plans if you want to have any hope of balancing the finished product.

One interesting side light to this design is the rather generous cabin windows. This is the only plane I've flown where I could actually observe the operation of the servos through the side windows. The receiver and 550 mah

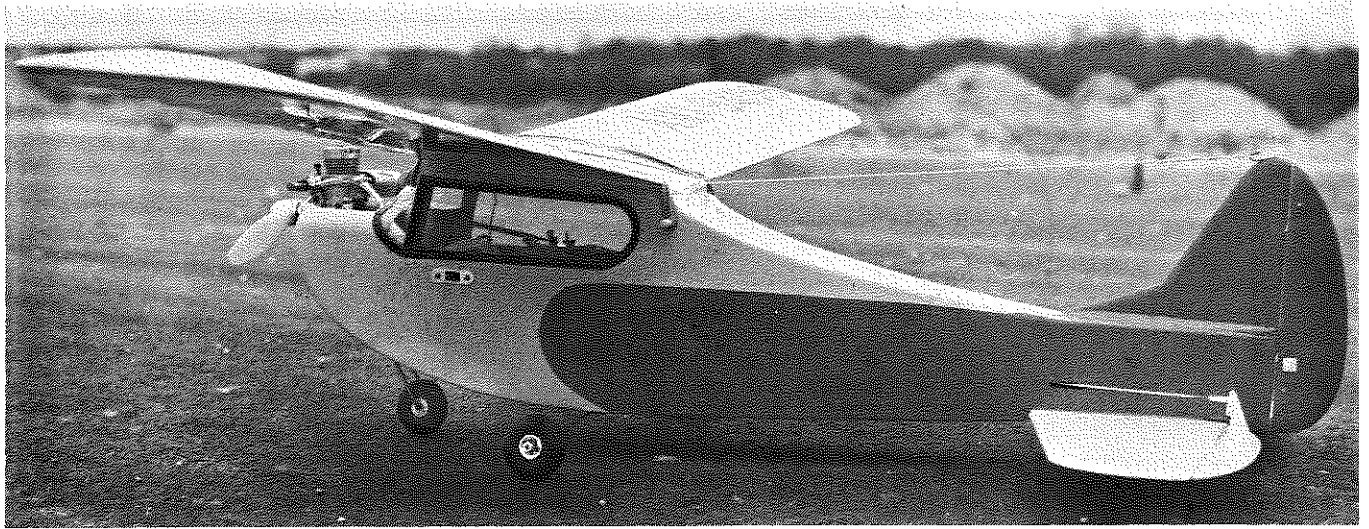
Kraft battery pack were wrapped in foam rubber individually and placed side by side under the fuel tank box. I must admit that my particular radio exhibited poorer than normal range as a result of this somewhat congested equipment layout. It never affected any of my flights, but it was obvious that I didn't have available the maximum range I was accustomed to having. R/C layouts can have a considerable effect on range. This is why a good range check is always important the first time out with a new plane.

One of the final signs of progress was the use of Super Monokote covering on the wing and tail. Who would have believed, twenty years ago, that we would have made such advances in our hobby? The fuselage was finished with Hobbypoxy products, using the brush-on technique. Specifically, I used two coats of clear, two coats of filler thinned 50%, and finally two coats of color.

The all up weight of my new Beam was 3 lbs. 4 oz. with the three channel digital equipment. I honestly can't recall the weight of my original model. I suspect it was in the same category. Possibly the original was a little lighter in weight. At any rate, the wing loading on the current version works out to 20 oz./sq. ft., which provides great trainer performance, especially in conjunction with the flat bottom airfoil.

As noted before, we didn't bother installing a steerable nose gear. All flights to date have been hand launched, exactly as we did in the old days. In fact, most flights have been launched, by myself while holding the transmitter in the other hand. It doesn't take more than a couple of steps to get it in the air. The O.S. MAX .20, of course, has plenty of power for this little plane. The best feature I found with hand launching is that you don't have to be concerned with the condition of the landing strip at your local flying field. Traditionally, our fields on Long Island turn into veritable mud holes during the winter months. As a rule we don't make any attempt to resurface the area until early spring. In most cases I personally wouldn't fly between December and March. But this past winter, thanks to hand launching, I flew quite often. Landings with the Beam are quite slow, which minimizes the possibility of damage while flying off a rough surface.

How did the rudder-only Beam fly



The tubby fuselaged Guillow "Trixter Beam" should bring back fond memories to modelers who "went R/C" in the early 1950's.

twenty years later? Well I have to admit I cheated a little initially. My original radio installation was worth approximately \$50.00 or less. In contrast, my current airborne system is worth over \$200.00. With this in mind I made the first flight using rudder, motor and elevator control. I'm glad I did, since in my case, I needed some nose weight and also down thrust in the engine. Had I not had elevator control I would have likely crashed on the first flight.

After trimming was complete, I unplugged the elevator servo and flew rudder-only, plus throttle. The first several flights were absolutely nerve racking. My years of instinct had me constantly commanding the non-existent elevator. Remember, with rudder only, to get out of a steep climb you must turn the plane. One of the biggest concerns in rudder-only flying is going too far down wind without the ability to penetrate the prevailing winds back up to the launch point. Years ago we lost many planes this way, even though the radio was still working perfectly. Because of this fact it is especially important that you have your name and telephone number affixed to the plane.

Finally, I took the complete plunge and disconnected the throttle servo. Now I was flying true rudder-only. I found it to be very uncomfortable! In fact, I honestly feel that pure rudder-only flying should really be limited strictly to calm weather conditions. With the R/C equipment set up as shown, I can easily select the servos I want to match the prevailing wind conditions. As a guide, I would recommend rudder, motor and elevator for winds above 20 mph, rudder and motor for winds of 5 to 20 mph, and rudder-only when the wind is less than 5 mph, to dead calm.

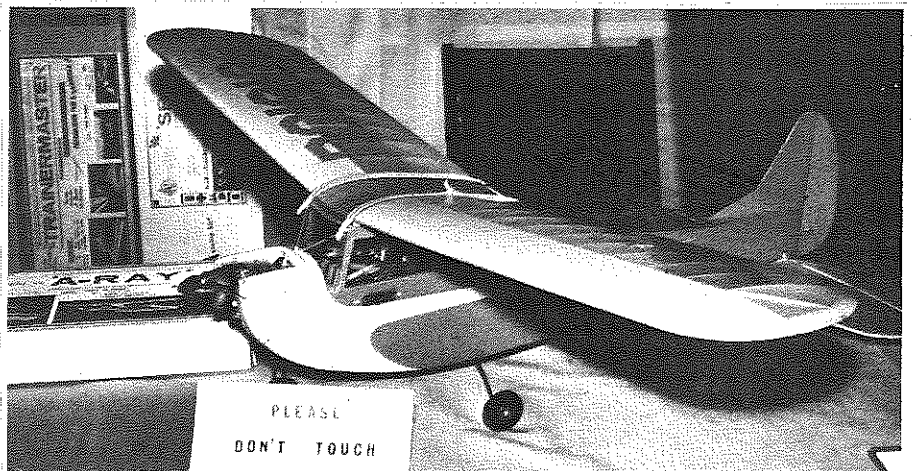
I'm sure many modelers must remember the old Class I R/C rules which called for competition flying using rudder-only plus throttle. With the advent

of reeds, and then multi-channel digital sets, the Class I category was effectively retired around 1965. You have to appreciate the fact that at that time many of us had pursued R/O flying and all its hazards and heartbreaks for many years. The possibility of flying reliable, low wing stunt planes, with simultaneous proportional control of all surfaces, was too good to pass up, and so we literally jumped at the chance. But looking back now I can see that maybe we shouldn't have been so hasty to drop Class I. It takes a very special kind of flying skill and patience to compete in Class I. Spot landing a plane without elevator control, various wind conditions, is a real challenge. Essentially, all of the old Class I flying towards the end of its existence was done with reed equipment, which meant that you commanded a full movement of the rudder with each signal. A gradual turn, as was the case with escapements, was only performed by pulsing the rudder switch on the transmitter. With today's proportional control, and especially with the inexpensive two channel "bricks" now available, rudder only (Class I) competition flying could be a reality again.

(Speaking with our AMA R/C Contest Board hat on, one of the main rea-

sons Class I was dropped was the fact that in its closing days, rudder-only planes had become highly specialized freaks. Planes were big 60 powered monsters with at least 5 degrees up thrust in the engine, and two servos on rudder. With up thrust, the ships flew straight and level at about 1/2 throttle. At full throttle, they would loop directly from level flight. The throttle, in a very large sense, became the plane's missing elevator. By linking two servos, somewhat in parallel, at the rudder, large and small amounts of full rudder could be applied at the proper moments. Finally, with no reclassification system [Today's classes can all be flown with the same plane. Back then, you would have to use different airplanes entirely in Class I, Class II, and Class III] a certain few rudder-only fliers dominated all contests around the country, killing nearly all interest in an event which should have been for those who were breaking into competition. wcn)

In closing I'd like to express my appreciation to Lou Andrews for all his important contributions to our hobby over the years. Additionally, I would like to thank Mr. Earl K. Smith, Executive Vice President of the Paul K. Guillow Co., for granting me permission to do this update on the Beam. ●



Lou Andrews' original Beam, as it appeared in his AAMCO booth during the WRAM's Trade Show in White Plains, N. Y., March 1970.

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