



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

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 , superregen.....by BOB ABERLE . . . who was there.

• Anyone for flying Old Time R/C? Yes, I said Old Time R/C! For the past couple of years we have heard and seen a great deal on the subject of Old Time Free Flights which have been flown with modern day radio equipment. But what about some of our original R/C designs and kits which marked the beginning of a new era in modeling?

Although the origin of radio controlled model airplanes dates back to the late 1930's, it wasn't until the early 1950's that R/C became a reality for the average modeler. Around that time, the FCC approved the use of two frequencies which enabled the modeler to fly **R/C** simply by obtaining a permit. Initially a 465 mHz frequency was allocated to the Citizenship Radio Corp., which received an FCC type approval for the manufacture and sale of a small single channel outfit. Many may recall the little transmitter with its characteristic TV type antenna mounted on top of the case. In this same time frame, the 27.255 mHz frequency was also allocated for model control use ... among other things. On this frequency the user was permitted to construct his own R/C equipment. In the early 50's, all of the popular model magazines carried R/C construction articles authored by Dr. Walter Good, Ed Lorenz, and the late Howard McEntee, to name a few.

With the prospects of improved R/C equipment and a definite trend towards simplicity and lower cost, the next sorely needed item was a basic R/C trainer kit. The idea was to design a kit that the average U/control or free flight modeler could build to carry his newly constructed R/C equipment. To meet this need, two model kit manufacturers started producing simple R/C, single channel (rudder only) trainers.

One of the two kits that comes to mind was the Live Wire Trainer designed by Harold DeBolt, and manufactured by his own company in the Buffalo area of New York. The other popular kit was the Trixter Beam, which was designed by Lou Andrews and kitted by the Paul K. Guillow Corp. of Wakefield, Mass. Both of these companies are still in existence today, as you well know by current magazine advertisements.

This should give you an idea of the experience level of some of our modern day kit manufacturers.

I might add that Lou Andrews went on to establish his own kit manufacturing company known as AAMCO, which is responsible for such planes as the Trainermaster, Aero-master, A-Ray, etc.

The Beam happened to be my choice back in 1953 for my first R/C. By today's prices, the Guillow kit was a great buy at \$6.95 for a 50 inch wing span trainer. Almost seems hard to believe. Of course, balsawood prices in those days were only a fraction of what they are today. My particular Beam initially used a McCoy .09 engine which, per Lou Andrews kit plans, called for inverted mounting.



Hand launching, shown by the author, was the accepted method of getting an R/C model into the air. If you had a good throwing arm, you could be the most popular guy at the flying field!



The author "a few years ago" with his first Beam. Note modified rudder and landing ----

The inverted engine tended to blend in better with the deep fuselage profile. Other than that, the inverted engine provided the usual headaches, such as flooding.

For a radio unit I built the then popular Lorenz twin gas tube receiver which was designed by Ed Lorenz and featured in the February 1952 issue of Model Airplane News. A single relay in turn operated a Bonner self-neutralizing escapement.

For those of you not familiar, the



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

escapement was essentially an electromechanical device. The solenoid portion was closed every time the receiver relay operated. A loop of rubber, wound up similar to a small rubber powered model, provided the actual movement of the rudder. These units operated in sequence. When you depressed and held the button at the transmitter you would obtain, say, right rudder. On release of the transmitter button the rudder would neutralize. Press again and you obtained left rudder. And so on; left, neutral, right, neutral, left, etc., (most always in sequence.

The flyer had to be quick on the button, so to speak, since a gradual turn had to be accomplished by hitting small amounts of rudder movement. Remember, the rudder was not proportional, it simply gave you full right or full left. Through most of these early flights you were always in doubt as to which

rudder control was coming up next.

The transmitter that I used, by the way, was designed by the late Howard McEntee. It contained a 180 volt set of batteries (dry, non-rechargeable type) which probably weighed over 10 pounds. These transmitters were simply placed on a car roof and a long extension cord with a switch on the end did all the controlling. My first Beam was as successful as possible under these circumstances of somewhat primitive control. It did, in fact, survive all the way up to 1958 when it was lost O.O.S. on radio failure. Rudder-only planes, by necessity, had to be designed as stable as free flights, so when the radio failed, or more usually, went out of range, it was good-bye airplane.

I remember attending a contest in Woonsocket, Rhode Island, in the fall of 1953. Although the contest itself was strictly free flight, I noticed a group of R/C flyers off to the side of the field. Since I was already flying my Beam, I went over during a break in the contest and watched. To my surprise one of the flyers was Lou Andrews himself. It was quite a thrill for me to see Lou put his original Beam through its paces. If my memory is correct, Lou was using that day a Citizenship Radio on 465 mHz and a cascaded compound escapement system. Compound escapements permitted the following control: One press (key) of the transmitter button provided right rudder, and two provided left. This was not in sequence, so anytime you pressed twice and hit the button you would obtain left rudder. (A little less tricky than the sequential escapements). Then in addition, if you cascaded, or hooked a second compound escapement in series with the first, you pressed three times and held to obtain up elevator and four times and held for down elevator!

And finally, if you can believe all this (If you don't, ask your Editor, wen), Lou had motor control which was activated by a "quick blip" of the transmitter button.

Motor control was also sequenced, either full speed or dead idle. Incredible as it sounds, Lou did some fancy maneuvers that day with his Beam.

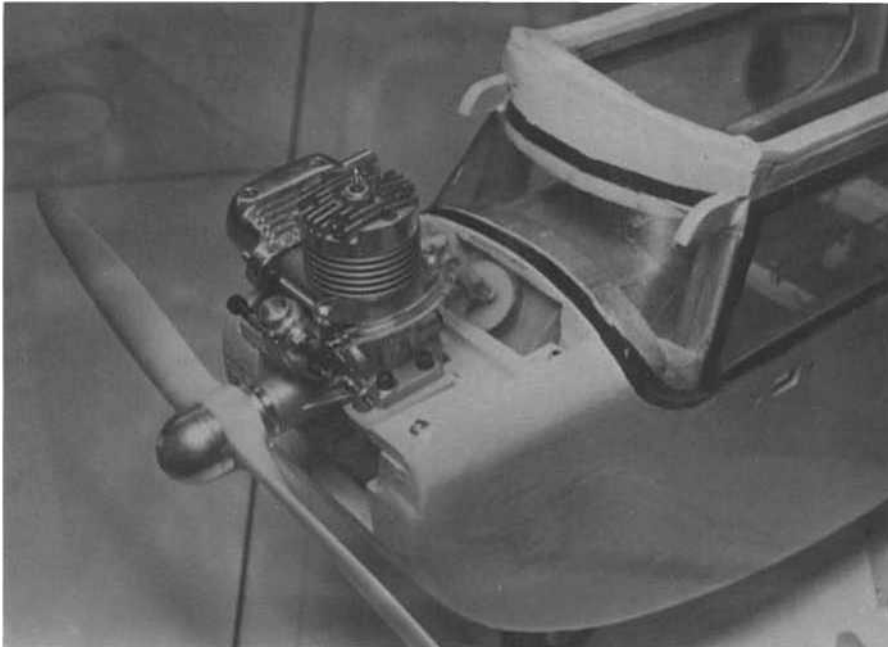
He even flew inverted with this system, which as you can imagine, was quite difficult.



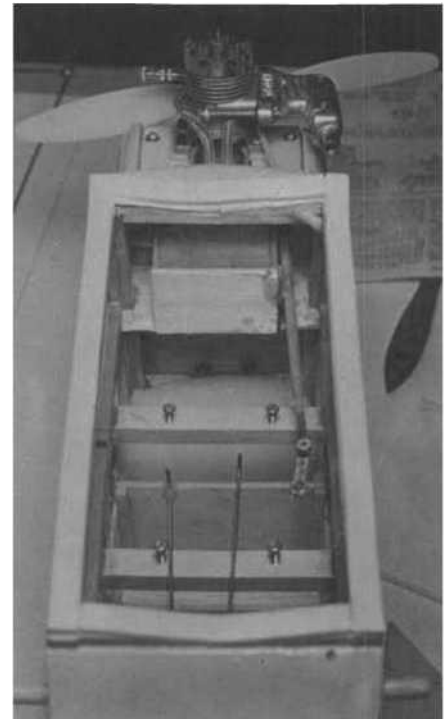
The Beam had the typical force set up of the day .. . high thrust line, low stab. DeBolt's "Live-wire Trainer" had similar set up .. . was equally popular. Good view into the cabin!



Originally, practically all Beams were flown on escapement rudder-only. There simply wasn't anything else available to the average R/Cer of the day. Wanna good scare? Try it sometime!



The author's engine installation. The OS Max 20RC is fed by a 3 oz. Sullivan slant-front tank. Short nose moment calls for some fancy juggling to avoid adding too much dead ballast.



Because you always had to do a lot of fiddlin', the fuselages were designed with plenty of elbow room. Three-across servo tray fits easy.

As a fifteen year old high school student, at die time, I was certainly impressed by this demonstration.

Within a very few years, most of the single channel, escapement operated R/C was replaced first by Galloping Ghost and reed type multi-channel equipment, and finally by our present day digital sets.

Although I progressed through the years with the R/C hobby and presently fly an assortment of stunt, scale and gliders, I still look back at those beginning years of R/C. In early 1970, I attended She WRAM's Trade Show at White Plain, New York. While touring through this show I came upon the AAMCO booth which was being presided over by Lou Andrews. To my surprise, on display, Lou had his original Beam, the very one I had seen fly seventeen years earlier in Rhode Island, I talked with Lou at length that day. It was then that I decided to build another Beam. Unfortunately, Lou did not have a single set of plans remaining, not even a personal copy. After the show, I tried contacting the Paul K. Guillow Co. and again struck out, since they likewise did not have a set of Beam plans. Finally, my good friend and fellow club member, Nick Zirolli, found me a beat up, but usable, set of plans. I was able to put the pieces together and reconstruct a tracing of the original.

That might have been the end of the story, since when finished with the plans I simply filed them away and went back to my low wing stunt plane. In the June 1971 issue of R/C Modeler Magazine I noticed a classified advertisement placed by Dan Reiss of the Valley Flyers R/C Club (Southern California) requesting a set of Beam plans. As a courtesy, I sent Dan a copy of my tracing.

To my surprise, about a month later, I received in the mail a box containing a set of neatly cut out wing ribs for a Beam. Dan had already built his Beam and in the

process, made an extra set of ribs for my use as a return favor. That finally provided the motivation, and with that I started on my own.

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.



Tommy Aberle holds the Beam up in a good 25 mile an hour. Long Island "breeze." The Beam was known for its ability to handle well in the wind.

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, tite 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, wen). 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 Hobbyproxy 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 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 reasons Class I was dropped was the fact that in its dosing 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 A 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 Unking 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 IIIJ 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, wen)

In closing I'd like to express my appreciation to Lou Andrews for all his important contributions to our hob by 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.