# ■Walt Good History of RC Flying

AIR TRAILS DEC 1937

RADIO-CONTROLLED GAS MODEL PART I

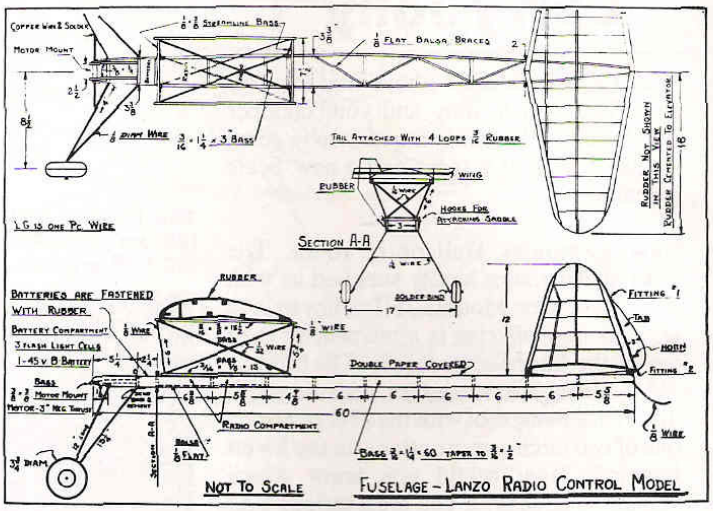
*Detailed plans for duplicating the radio-controlled gas model winner of the National Contest. The 15th Air Trails championship-model presentation*

By Chester Lanzo

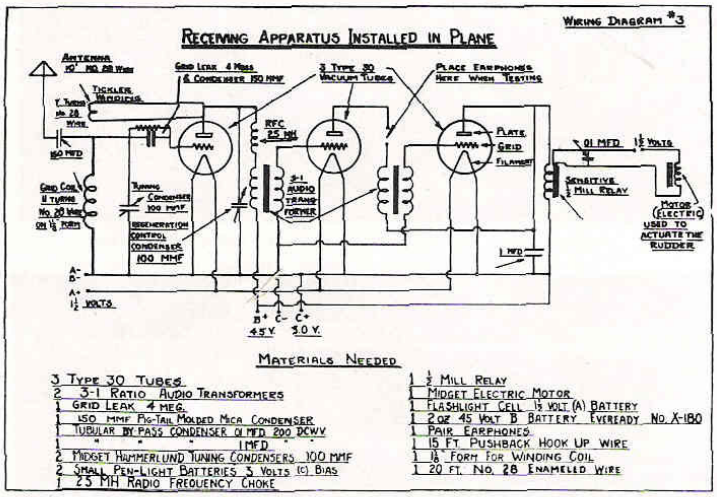
*In collaboration with Gordon S. Light*

Chester Lanzo experimented for 4 years to solve the problems of practical radio control for model planes. The model above is a modification of the actual contest winner.

THE idea of a radio-controlled gas model is practically as old as the gas model itself. For the past five years gas models have been flying successfully. control was not necessary to control a model's flight. In flight the model automatically banked itself in the proper direction when making a turn.



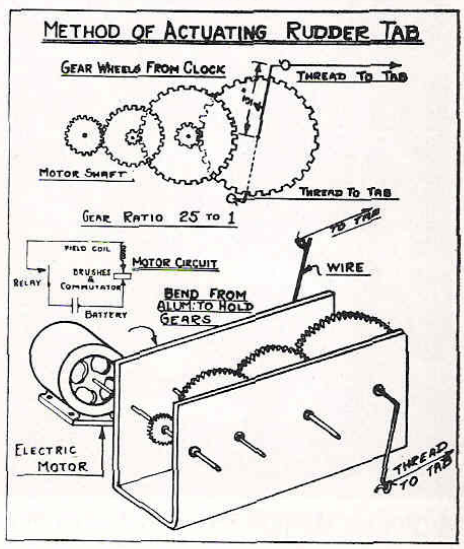

**Left: Chet Lanzo holds the RC model with which he won the 1937 National Contest in this copy from his article in the December 1937 *Air Trails*. A reproduction of this model, done by Lahzo, is on display in the AMA Museum. Right: Drawing of the model—9-ft. span, almost 6 lb.**




**Left: Circuit diagram of Lanzo's three-tube receiver. Right: Lanzo with a 1976 version of his 1934 RC-1 plane. The 1934 radio equipment didn't work, but the plane flies well as an Antique RC with a modern RC system. Below: Drawing of Lanzo's 1937 motorized rudder actuator.**

THIS IS THE STORY of how Radio Control model aircraft got started in the U.S. It tells of the pioneers who developed the RC hobby by combining their knowledge and skills with the related experiences of earlier inventors.

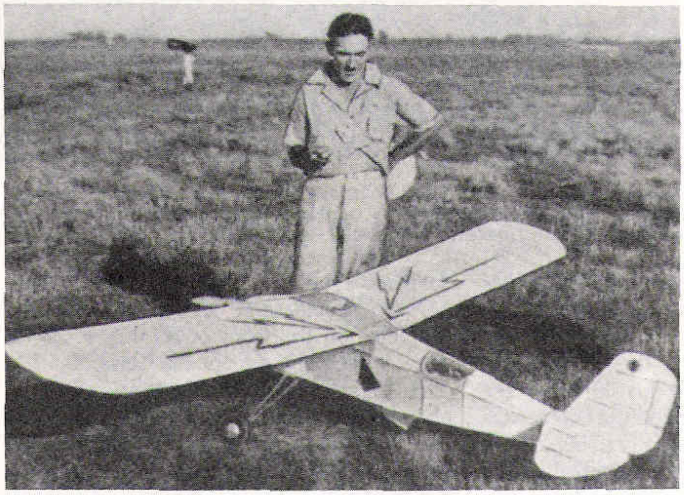
The background prior to the invention of hobby RC was presented in the preceding issue. The gas model and gas engine were two of the essential ingredients which arrived during the early 1930s. Ham radio with its compact homemade receivers and transmitters also came during the same period. Military and commercial interests had demonstrated the feasibility of RC in large boats and aircraft during the 1920s. All the ingredients were there—technically—for clever, dedicated, and inspired modelers to invent hobby RC aircraft.

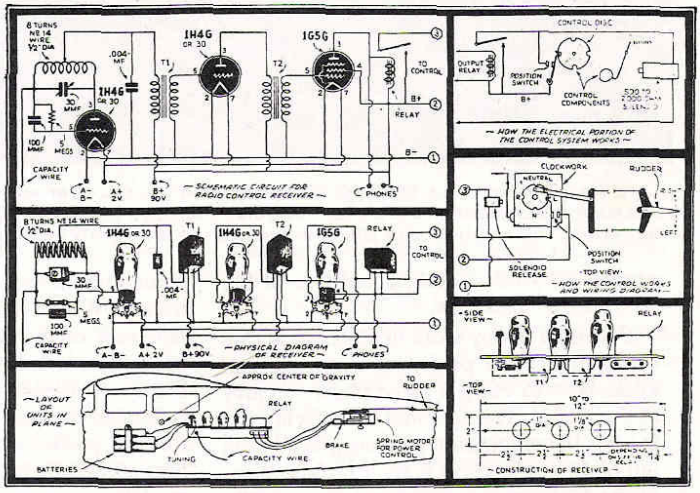



An important stimulation came in June 1936 with the announcement, by the newly-formed AMA, that an RC event would be added to the 1936 National Contest in Detroit. But no RC models made an appearance at this 1936 event! However, rumors were rampant that RC ships were being secretly built.

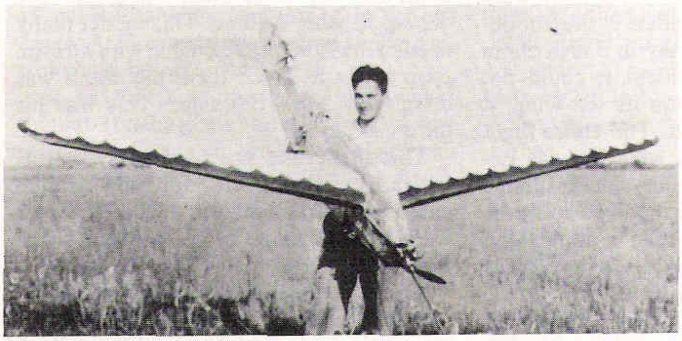
The 1937 AMA Nats was a different story. Six RC models actually appeared, causing great excitement and expectations. The following is an account of the RC event at the 1937 Nats (again in Detroit), the first-ever RC contest in the U.S. (Whether it was the first in the world is not known with certainty. That point may be covered later when more information is available. Perhaps this article will stimulate some foreign responses!)

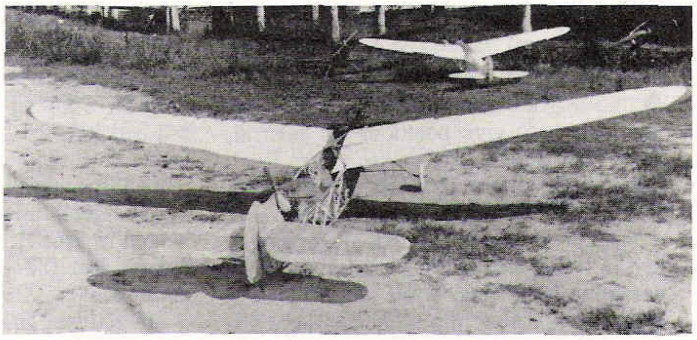
**In the same year as AMA's origin 50 years ago, the National Contest offered a Radio Control event. There were no entries. However, six RC planes showed up for the 1937 Nats. This installment covers that event in detail and has much information about these and other pioneers of the period. Part 2.**






**Left: Pat Sweeney and his 1937 Nats second-place RC plane. It had rudder control, 10-ft. span, and 9-lb. weight. Right: Drawing of Sweeney's RC receiver and actuator as reproduced from the August 1938 *Short Wave and TV Magazine*. His 1937 Nats flight lasted only five seconds.**





**Left: Elmer Wasman holds his 10-lb. RC model which won third place in 1937. It had rudder/aileron and elevator control, also engine cutoff. Right: Rear view of Wasman's plane shows the air-driven four-bladed propeller mounted on front of the fin for power for moving the control surfaces. Photos from Wasman. Below: Jacksonville, FL paper clipping (1937) shows Wasman explaining his White Mystery to students.**

Sunday, July 11, dawned warm and clear at the Detroit Wayne County Airport. There was a promise of afternoon showers. Hundreds of Free Flight modelers, who had been competing most of the week in various events, were already testing their models at the field.

That morning, the six RC models were being assembled in the hangar. A variety of concepts had been converted into reality by these pioneers:

Chester Lanzo, Cleveland, OH
Patrick Sweeney, Chicago, IL
Elmer Wasman, Jacksonville, FL
Walter Good, Kalamazoo, MI
Leo Weiss, Brooklyn, NY
B. Schiffman, New York, NY

With the help of their radiomen, they were tuning and adjusting to ready their machines for the ground demonstrations of control operation by radio for the judges.

The planes ranged from eight to 14 feet in span and weighed from six to 16 pounds.


Mystery of White Mystery Explained

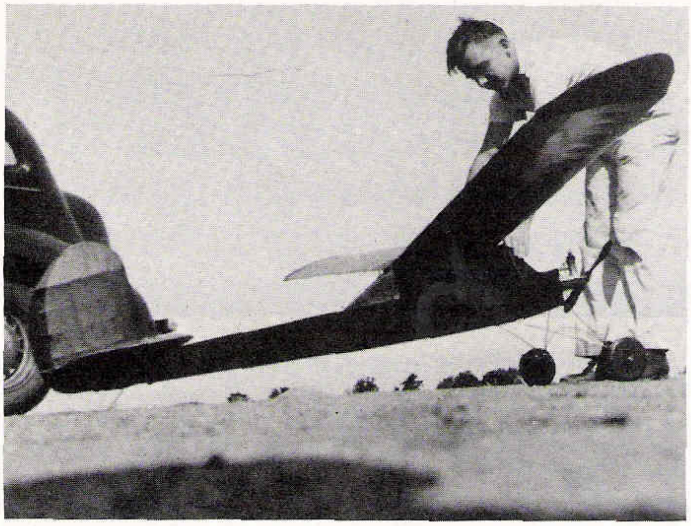
Controls varied from rudder only to full house (rudder, ailerons, elevator, and engine). No two were alike; all were originals.

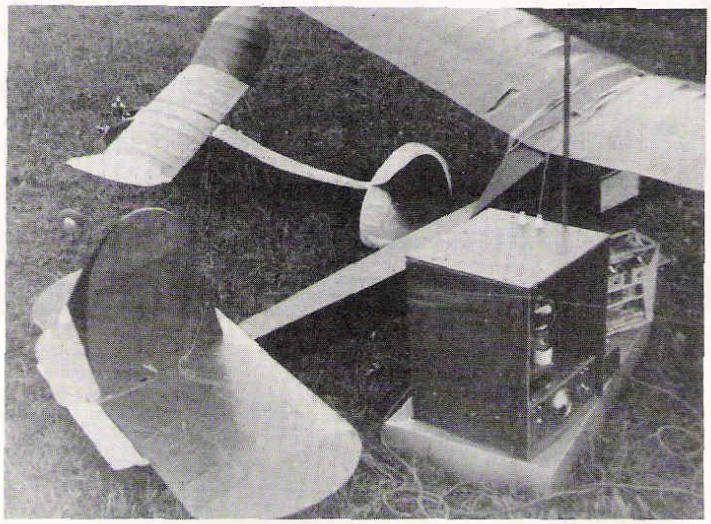
The judges carefully observed each plane as the pilot demonstrated the remote operation of its constrols during the pre-flight ground tests. They made written notes of what they observed. There were no RC regulations then, so the judges were novices and pioneers, too. All six models were accepted as being eligible for the RC category. Official flying attempts were scheduled to commence in the early afternoon.

These attempts are related now in the order of their actual flight sequence. They are based on the magazine reports of the Nats, recent interviews between the author and the living fliers, and (to a small extent) upon the author's memory of that exciting day.

**Patrick J. Sweeney** was the first entrant to attempt a flight. In his late thirties, he was the oldest pilot of the six.

His own-design cabin plane had a 10-ft. span and 18-in. chord. Total weight was 9 lb., of which 3 lb. was the radio gear. Almost 2 lb. were batteries; his system





**Left: Walt Good and his 1936 KG FF model which was converted to RC in 1937. Right: Good's 1937 RC plane (big one) won fourth place at the Nats with rudder and elevator controls. The large box is the 50-watt transmitter, and the small box contains two receivers, relays, and batteries. The small FF Gas plane in the picture is an early version of the Guff. A thunderstorm prevented Good's 1937 Nats flight demo.**

needed 90 volts, which meant two of the 45-volt "B" batteries.

Pat ran a hobby store in Chicago at that time, so he had plenty of materials and know-how to build a large plane to carry this payload. He also had been flying gas models in competition and had placed 17th out of 43 at the 1936 Nats. Leo Vartanian of the Chicago Aeronuts told me recently that Pat competed regularly in those days.

His radioman, Ben F. Porter, came up with a three-tube receiver using a super-regenerative detector on the 5-meter band (56 to 60 MHz). For controlling the rudder, the only control, he used an old spring-wound alarm clock with a four-point cam and switch to give positions for neutral, right, neutral, left, etc., in sequence. Each pulse from the transmitter push button stepped the rudder to the next position. A magazine article stated that they "began and finished their entry in about a month, complete with radio equipment," so it is assumed that they probably had no extra time for pre-contest test flights to trim the plane and shake out any problems.[1]

But back to the meet with Phil Zecchitella's description:[2]

"Finally, Pat Sweeney warmed his engine and signalled that he was ready for an official flight. With a few picked officials, Pat brought his model to a deserted tract of runway and prepared for launching. The transmitter was established at a distant point, and the receiving set in the plane was tested. While this was being done, the newsreel crew moved the camera to the approximate location of the takeoff, and finally Sweeney raised his arms to the radioman to stand by. Soon the engine was roaring, and we were actually to behold the first official flight of a radio-controlled gas model.

"Guiding the model from its wing tip, Pat ran behind it until it started to lift its wheels off the ground. The newsreel men were shooting rapidly. Suddenly the model pointed its nose to the sky in a high climb from which it was evident it could not recover. Slipping over on its left wing, it crashed into the ground. The entire flight lasted five seconds. A wing tip was demolished, and a slight injury was sustained by the motor mount. Insofar as could be judged, it would have been a swell flight except that the center of gravity of the model was too far back."

He did not make another attempt because of the damage. In any event, Pat Sweeney is credited with the first attempted RC flight at a National Contest.

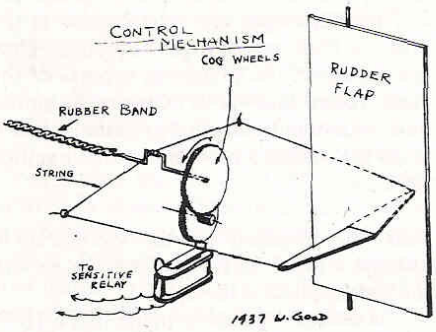
**Elmer Wasman** was next with a well-designed system. It was called the White Mystery because it had a wind-driven propeller on the front of the fin. No one knew what it did except for Elmer.[3]

He had an industrial arts degree and was teaching aeronautics in a Jacksonville junior high school at the time. At 28, he was in the middle group of the entries concerning age.

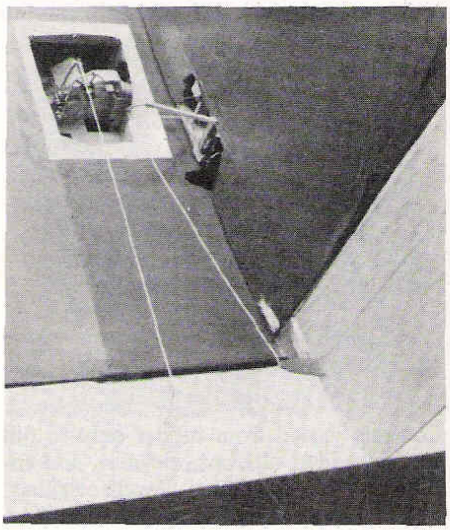
His 11-ft.-span plane with a chord of 18 in. weighed 14 lb. including the radio gear. With 16.5 sq. ft. of area, that gives 13.6 oz./sq. ft. wing loading. This model really needed the Forster .99 engine with a 16-in. prop to fly it. Even then, the climb was marginally slow, but safe.[4] This was his third gas model.

This plane was provided with controls for rudder/aileron, elevator, and ignition cutoff. All of the engines in the RC event were of the ignition type, requiring spark coil and batteries.

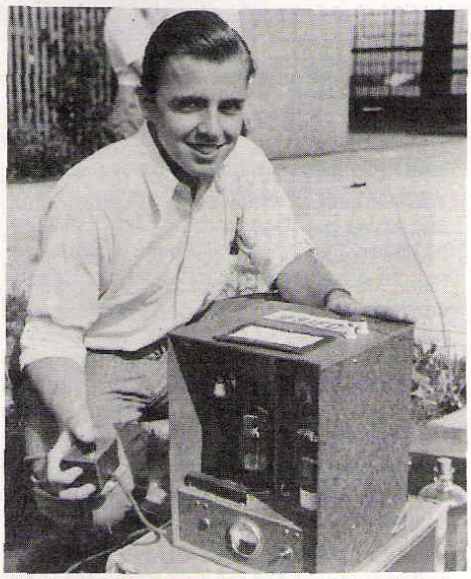
Elmer's control system was most elaborate for those early days. The radio signal went first to the airborne receiver, which



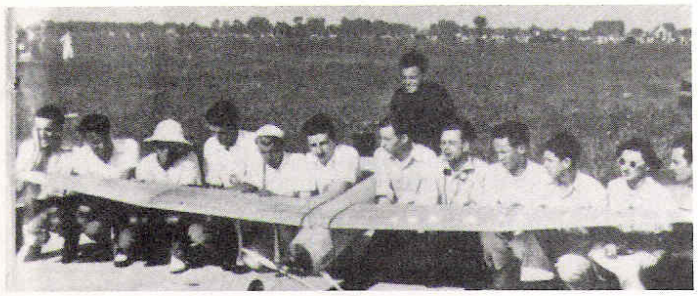

**Schematic drawing of Good's 1937 actuator showing the simple gears and magnet.**



**Rudder and elevator actuators, 1937 model.**



**Bill Good with the 1937 50-watt transmitter, push-button control in his right hand. Note the 110-volt AC power line running back to the hangar in this photo by Glen Peterson.**



**Above: Leo Weiss standing behind his 14-ft. RC plane at the 1937 Nats with 12 kneeling spectators. Model was planked all over. Picture comes from *RC for Model Aircraft*, England, 1944. Right: Leo kneeling behind the tail of this plane. One of the three RC entries not making a flight at the 1937 Nats, it was awarded fifth place.**

closed the relay contact to the selector switch. This sequential switch had five positions to give up or down elevator, left or right rudder, and engine cutoff. Absence of signal gave neutral rudder and elevator—and full engine! A selector contact arm—driven by the air paddle wheel—could be stopped at any one of five contacts by sending the correct number of pulses. Examples: one pulse would give left rudder, two pulses right rudder, three pulses up elevator, and four pulses down elevator. Five pulses would cut off the ignition and stop the engine.

Note that only one control function was available at a time. That control was held as long as needed, then the pilot proceeded to the next control. This is the characteristic of a "sequential" system which does not allow simultaneous operation of the various controls. However, the desired single control could be obtained quickly.

A set of three navigation lights was mounted on the plane and connected so that red was left rudder, green was right, and white was down elevator. Thus he had a visual indication of the activated control.

How did the signal activate the control surface? The selector wiper connected the signal to one of five electromagnets which engaged a rotating shaft to the selected control surface. The rotating shaft was powered by a four-bladed air propeller mounted at the front of the vertical fin. Again, air power was the motive force! Very clever—and complex. Perhaps this is why the plane was called the White Mystery—because very few understood the complicated mechanism.

At the transmitter end he used a simple switch, watching the navigation lights to keep track of the airborne selector position.

The receiver, a three-tube regenerative detector, was on the 5-meter band. The whole control system weighed 3.5 lb., but this big ship carried that easily. A smaller model, powered by a Brown Jr., was used as a test bed to check out the individual components before mounting them in the big plane.

His turn to fly saw a dark thunderstorm approaching, so he tried to hurry things along. Roy Marquardt strained as he launched the giant plane into the gusty air, while Elmer worked busily at the transmitter control. The plane nosed up into a stall and sagged to the ground, ending its flight abruptly—and much too soon to suit Elmer.

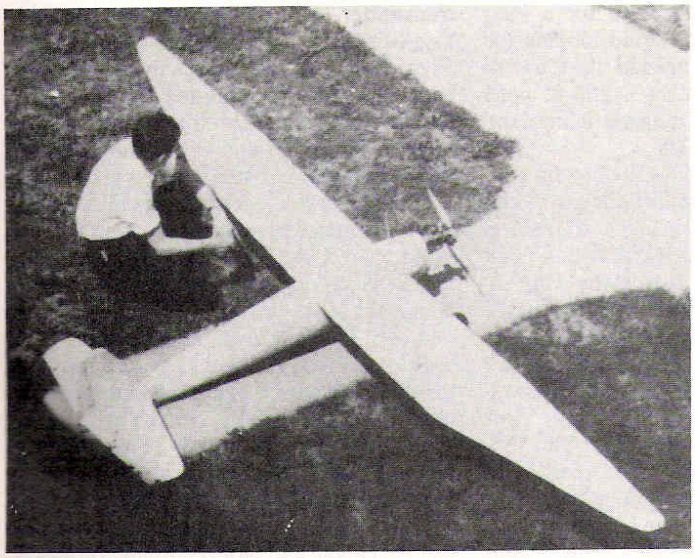
He said, later, that he hadn't had the time to test fly the big ship before the meet. It turned out that it was tail-heavy, which had caused the stall. Such happenings are normal when developing something new! Hindsight, says Elmer, tells him he should have entered a smaller ship with a simpler control for that first meet. He scored third place.

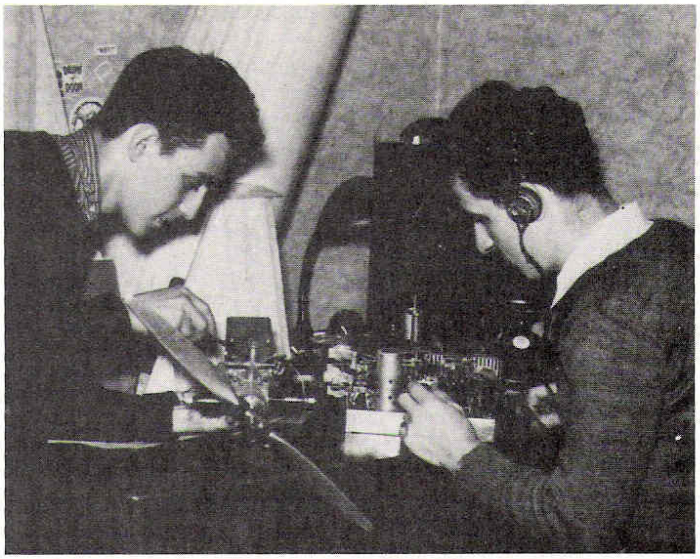
Elmer has been retired for several years, and he divides his time between Florida and Illinois. He still spends many of his hours on Free Flight models as well as RC power and glider models.

**Chester Lanzo** had the lightest plane of the entries. It was just under 6 lb., including 2 lb. of radio gear. He had flown it without the radio several times to obtain the proper balance, tail angle, and engine downthrust. It must fly well by itself before adding the radio, he reasoned. It was a very wise approach.

Design of the plane was basic and functional. The wing had a 9-ft. span, 14-in. chord, and generous dihedral of 13 in. per tip. The body was a 5-ft. "tray" 3 in. wide and 1 in. deep, with a 6-in.-high wire cage to hold the wing well above the body. The radio parts were simply fastened to the "tray" in a location to maintain the proper balance point—and very good accessibility to the parts!

Lanzo told me that he had made a cabin-type gas model in 1934 and experimented with RC using a spark-gap transmitter and a coherer receiver.[5] He said this approach was a failure for an RC plane, as the engine vibration interrupted the radio's functioning. Furthermore, the spark ignition from the engine swamped the nearby receiver/coherer with undesired instructions to the rudder, blocking out the desired signals





**Left: Overhead view of Leo and his 1937 RC plane. It had a Fergusson prototype twin-cylinder engine which Weiss couldn't get started at the Nats. Right: Leo Weiss inspecting the Fergusson engine and John Lopus adjusting the airborne receiver, an early tuned reed system.**

**Left: Leo Weiss (arm in front of the rudder) working on a Denny Radio-Plane at Wright Field in 1939. Right: Ground control unit used to control Culver Cadets and larger RC drones. The GCU also carried communications gear. Leo is shown at the controls of his 1939 design. Below: Oops! Even professional RCers sometimes make a "hard" landing, as we see in this picture of a poor Culver Cadet at Wright Field in 1939.**

from the RC pilot. He called that plane the RC-1, and today he flies a replica of it in Antique RC competitions.

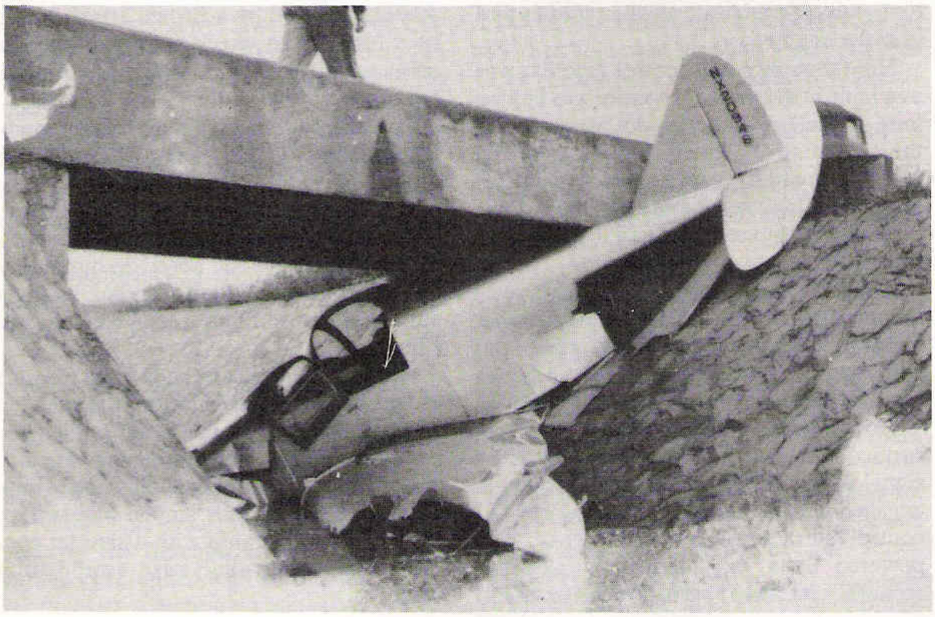
The 1937 radio receiver was home-built using three vacuum tubes in a superregenerative detector circuit. This operated a homemade relay which, in turn, caused a small geared electric train motor to move the rudder, the only control, through a cycle from neutral to right to neutral to left, etc., as long as the transmitter key was held down. Straight flight was obtained in the key-down position because the slowly-responding plane would show only a slight snaking path as the rudder oscillated back and forth.

To make a turn, the key would be released at the moment when there was a full rudder deflection; then the deflected rudder would become effective, and the plane would bank itself into a circling path. It was very simple, but it required piloting practice to develop the skill for precision flight path control.

This scheme had another advantage, Lanzo said. The transmitter could be tuned to the receiver in the air by watching when the rudder wiggled! Such tuning was common in those days.[6]

Batteries were a problem for all of the entrants. They were heavy, costly, and short-lived—especially the 45-volt "B" battery for the vacuum tube plate supply. Chet found a source in Cleveland where a tiny 2-oz. (normal ones were 11 oz.!) battery was made for weather sondes. Its life span was a maximum of two hours, and it had a shelf life of just two weeks! I remember contacting this company back then; they recommended that this battery be ordered at the latest moment and that it be sent by airmail. I stayed with the 11-oz. units.

The two-tube transmitter used 500 volts on the output tube and required a 110-volt AC line at the flying site. The organizers had not anticipated the need for a long extension cord, so we started looking for one (my transmitter needed it, too). A friendly spectator brought a 200-ft. cord from his camper and plugged it into the nearby hangar for our use.



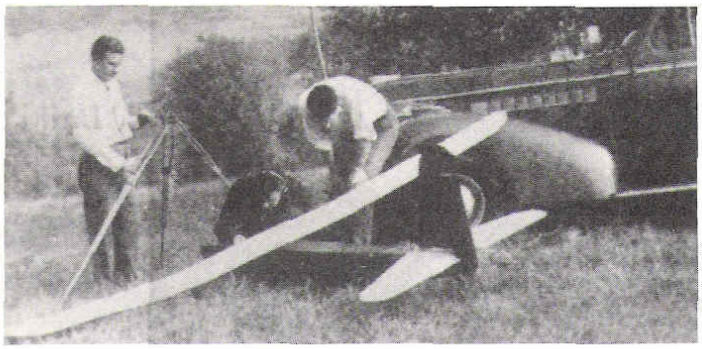
Ready to fly, Lanzo walked off to find the judges when a stray Free Flight gas model spiraled in nearby, causing a frightened spectator to step backwards on Chet's plane, rupturing a few ribs in the wing. A quick repair was made with Pat Sweeney's help, and Lanzo was ready to fly. The weather was getting windier due to the approach of a summer thunderstorm, so he started to hurry.

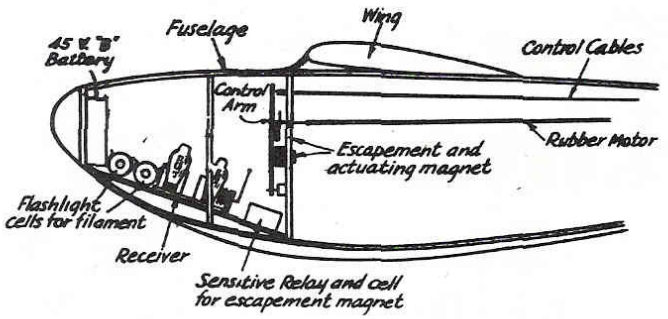
He cranked up the Baby Cyclone engine, set the needle valve for medium speed, and started forward for the launch. Before he could release the plane, the engine slowed. A touch to the needle valve speeded the engine, and off went the plane in a slow-climbing circle while Chet raced back to the transmitter. The plane gently zigged and zagged while the pilot tried to coax it into a Figure 8 maneuver. Suddenly, the engine quit, and the plane glided down into a parking lot at the edge of the airfield. The flight time was around two minutes, but it must have seemed much longer to Chet.

Chester Lanzo used his gas model and Free Flight experience—as well as his radio knowledge—to pull off first place. Thus, he attained the historical honor of being the first winner in the first RC National Contest in the U.S.

Prior to the Nats, he had made a few RC test flights with the plane in Cleveland. In fact, the flights were made in a park next to Dick Korda's house where he ran the AC extension out of Dick's bedroom window to the transmitter.

Lanzo's philosophy of starting with the simplest plane and radio combination was a wise approach, but he would have been even happier with a much longer flight.






**Left: Ross Hull and Byron Goodman in 1937 with a 13-ft. RC glider in West Hartford, CT. Right: Diagram of the radio components installation in the glider. Photo and drawing reproduced from the January 1938 *Model Airplane News*. Hull was editor of the ARRL's *QST* magazine.**

Chet was 23 at the 1937 Nats, and today he is still active with his models, specializing in FF Rubber and Power and RC-assisted Old-Timers. He's retired from NASA but still very busy. One of his recent projects was building a replica of his 1937 RC winner and donating it to the AMA Museum in November 1984. It is complete with the Baby Cyclone, a vintage wing, and a working rudder control.

The first three places were awarded on the basis of flight performance. The placement of the last three entries was based only on the ground demonstration, as they did not attempt to fly.

**Walt Good.** My 8-ft.-span model was build in 1935 as a close copy of the Kovel-Grant KG-8 and powered by a Brown Jr. engine. It flew in many Free Flight Gas meets in 1936 and was well-tuned for stable flight by the end of the season. It was 36th in FF Gas at the 1936 Nats.

Twin brother Bill, just 21 years old and the resident radio ham (W8IFD) in the family, had been thinking about RC for the KG-8 and had even talked me into placing the receiver antenna wires in the wings when they were built in 1935. It was the fall of 1936 when he won approval at Kalamazoo College to take a lab course in the physics department to design an RC system, particularly the transmitter and receiver. Even though the professor was not a specialist in electronics, he offered great encouragement—and three semester hours of credit!

To our surprise, the receiver hurdle was passed quickly when we converted a one-tube superregen circuit to operate a sensitive relay rather than its normal headphones.[7] The trick was in placing a variable resistor in the grid circuit which was then adjusted to give the best current swing to the relay. The first relay was constructed from an inexpensive meter movement. By November, a bread-board system was working on the bench. This system was mounted in the plane, and the RC rudder control was demonstrated at the Kalamazoo College Science Fair in January of 1937.[8]

During May, six flights under radio control were made at the Kalamazoo Airport using only rudder control. The results from these tests showed it was necessary to increase the area of the rudder and its deflection to obtain more effective turns. This was also an indication that spiral stability of the KG was very generous and, therefore, very safe for rudder-only control. Once we had a working RC plane, it was given the name of Guff, a slang word from the college campus. Very loosely translated, it meant "that's a lot of nonsense!"

It's impossible to describe the thrill of those first RC flights. The change of path of the plane from left to right at the touch of a switch caused great shouts to rise. These flights were made at dawn to have still air (and to get us back to school for our eight o'clock class).

It was one of these mornings that the airport manager, Irv Woodhams, awoke just in time to see the Guff glide into a landing. He thought it was a full-size plane landing outside the airport, so he organized a search party to find the lost plane. By then we had packed up and driven back to school. It was several years later before he found out what had really happened. Irv, now in his 80s, lives in Florida, so we recently had the opportunity to meet again and reminisce about those days.

The rudder actuator was a rubberband-driven gear train. A small electromagnet operated by the relay allowed the gears to turn whenever the transmitter key was held down. In fact, the result was similar to Lanzo's cycling system, because the rudder would stop in its current position when the transmitter was off.

Cautious beeps on the push button would inch the rudder toward, or sometimes beyond, the desired position. Looking back, I now realize that this control method was too slow—three seconds from neutral to full-rudder. In addition, the pilot had no knowledge of the rudder position except by watching the action of the plane. But it did work.

The rudder worked well enough to consider adding an elevator control. Bill added another push button and another frequency to the transmitter, then operating on 56 and

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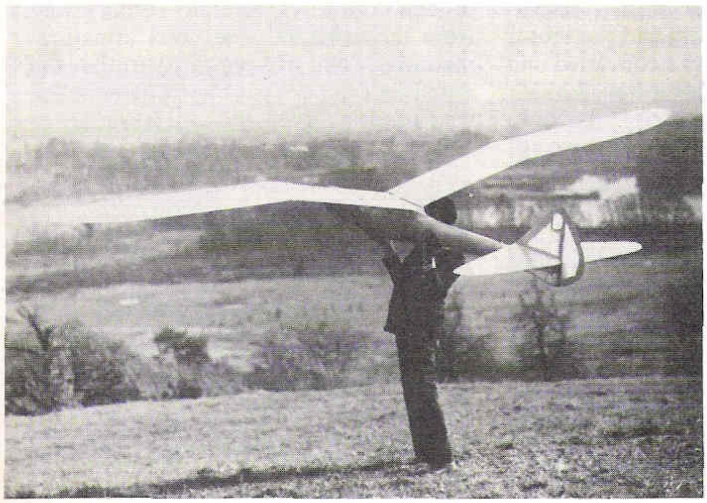

**Left: Hull's second RC glider, an 18-footer, is ready for launching at a slope in this 1938 photo from the ARRL. Right: Hull's restored 1938 RC glider hangs in the museum of the Amateur Radio Relay League headquarters in Newington, CT. This photo was taken in July 1983 during Good's research visit. L-R: Walt Good, Bill Good, Laird Campbell, Joel Kleinman, Byron Goodman, and Pete Reed. Note: Byron Goodman in this picture is the same Byron Goodman shown with Ross Hull in the 1937 photo. Next month: RC at the Nats from 1938 to 1941.**

and has seven channels. A receiver is usually something that you only think about when you install it (and when it gives you problems). I'm very happy to tell you that this one has never given a hint of a glitch.

Airtronics has a wide range of excellent servos, and this system was equipped with 94554s. This servo features ball-bearing-supported output shaft, a coreless motor, 0.4-second transit time for 90°, and 73.5 inch-ounces of output torque. I really like 94554s and have had a lot of luck with them over the years.

So, there you have it. If you're in the market for a new radio, why don't you check the new Airtronics Module 7H out? Let me know what you think. I think it has the capabilities of bringing a new dimension to your Heli-flying.

**New LJMP Hughes 500 fuselage.** Also shown in this month's photos is my new Hughes 500 shell for .50/.60-size mechanics. The fuselage is epoxy-glass, 43 in. long, weighs 19 oz., and is available for D or E (or, for that matter, C) versions. The particular model shown in the photos was built by Jim Brandon (Lakewood, CA) and features GMP Cobra mechanics, an OS .50 FSR-H engine, and a Quest gyro. It weighs 9 lb. ready to fly and is a real hot rod. While this fuselage was designed with Cobra mechanics in mind, it has plenty of room and will take most other kinds, as well.

**Beginners' corner.** One of the most confusing things for the new Heli-flier to set up is the throttle/rudder mixing function on his Helicopter radio. Some Helicopter radios have a very simple rudder/throttle mixing function, consisting of two rate knobs (marked REV and ACC) and a slide switch marked LEFT/OFF/RIGHT.

The task is really very simple and can be dialed in relatively quickly. You must first determine whether you have a left- or right-handed main rotor. Looking at the rotating disc from above: does it rotate clockwise or anti-clockwise? If you have a Schluter, Hirobo, Kalt, or Gorham product, the rotor spins clockwise and is a right-handed rotor. Set the slide switch to the position marked RIGHT. If you have a diffearent-style radio, adjust it for the proper rotor rotation (according to its operating instructions).

The tail-swinging problem that we are trying to overcome occurs because, as power is added to the main rotor, a torque is applied to the fuselage in the opposite direction of the rotation of the main rotor. This causes the fuselage to swing to the left on a machine with a right-handed rotor. The cure is to dial in enough tail-rotor compensation so that the fuselage stays straight. Check the adjustment by holding your machine in a steady hover and giving a quick blip of throttle. If the nose swings to the left, more compensation is necessary. If the nose swings right, the radio is over-compensating, and the radio must be adjusted accordingly.

Once you have the mix set properly, the nose of your Helicopter will stay fairly stationary when making climbs and when descending. Now, with the addition of a gyro, the nose will be so stable that your mother-in-law should be able to handle it. Good luck. I hope this stops some of those twitchy tails.

**This month's three-view.** In 1960, the U.S. Department of Defense issued Technical Specification 153 for a Light Observation Helicopter. Hughes submitted the model 369 (or "flying egg," referring to its shape). The 369 won the competition, and it received its Army designation of OH-6 and was code-named Cayuse. Based on the Allison 250-series turbine engine, the Hughes product seemed ideal for military service from the beginning. Referred to as the Hughes 500 for commercial customers, this little machine has proved tough competition for the Bell Jet Ranger. Featuring a fully-articulated rotor, the Hughes is both nimble and very fast. Because of the 500's unique shape and its appearance on the *Magnum P.I.* TV series, it is probably the second-most-recognized machine right behind the Jet Ranger.

Model 500s are available from Kalt, Schluter, Eberle's, Great Lakes, Graupner, LJMP, and Peka.

**Have a good month,** and think about checking the head screws on your engine once in a while. I recently had a Heli show signs of losing power and found that the head was leaking.

**BCNU**

*Larry Jolly, 5501 W. Como, Santa Ana, CA 92703.*

## RC History/Good

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60 MHz. I built another receiver, relay, and actuator.

By the end of June, six flights had been made with the new dual control system. This was definitely trickier to control, but we had heard that other entries were planning to use dual controls, and we wanted to be prepared.

The Guff's weight was up to 8 lb., including 2 lb. of radio gear. This gave a 13 oz./sq. ft. wing loading, which was not too much considering the thick Grant wing section and the power of the Brown Jr. with its homemade 16-in.-dia. propeller.

At the Nats, the ground control demonstration went well, so I waited for my turn to fly. Bill was not present, since he had already gone to his job as a radio operator at a summer camp. Another amateur, Paul Kreilick (W8QQE), was assisting me.

After watching the first three entries make their attempts, the approaching storm had finally arrived along with the rain, so the judges and I scurried into the hangar for shelter. The flight was not attempted due to

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## RC History/Good

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the rain and the lateness of the day. I was both disappointed and relieved. The Guff was awarded fourth place.

With the background of 12 test flights, I expect that the stable Guff would have come through OK if an official flight had been possible. Looking back, I wish we had stuck to only the rudder control at the beginning for simplicity, but that was to be one of the many learning steps in early RC.

Both Bill and I are now retired and very busy with our hobbies. He is a power boater with a "live aboard" cruiser and an ardent ham radio operator (W2CVI) in Liverpool, NY. I'm living in Port Richey, FL and am active with RC history articles, RC Sailplanes, a few AMA committees, several RC clubs, and some ham radio (W3NPS/4). We talk together at least twice a week on our stations—sometimes about the early RC days. He's part of my memory bank.

**Leo Weiss,** the youngest RC entry at 18, had the largest and most-sophisticated RC plane of all the entries. The 14-ft. wing was planked with sheet balsa, as was the streamlined monocoque body. He even doped both sides of the balsa sheets to stiffen the shell construction. It weighed 16 lb., including the radio gear. How he built that big wing in his college rooming house is hard to imagine. He was a sophomore in aero engineering at the University of Michigan when this happened.[9]

The 6 lb. of high-tech radio gear in Leo's plane, alone, weighed slightly more than Lanzo's complete 9-ft. RC plane! Power came from a prototype two-cylinder Fergusson engine rated at ½ hp.

The radio gear was far ahead of its time for hobby RC. The three control channels for rudder, elevator, and engine were operated by three electric motors. Six tuned reeds selected the desired commands by respondinging to six different audio tones. The reed system later became very popular in the 1950s, so Leo was on the right track.

John Lopus (W8LUS), an electrical engineering student at U of M, was Leo's radio specialist on the project. The 56 MHz transmitter was battery-powered, and the control box had three lever-switches which would cause the selected airborne control to move quickly in the appropriate direction, a true multi-channel system.[4]

How did Leo get so far along in the model hobby at his young age? First of all, he was a seasoned veteran in Free Flight gas models. His RC ship was his fifth gas model. His third model had won the Texaco event at the 1935 St. Louis National Contest, beating Maxwell Bassett by a wide margin. Leo had 64 min. against Maxwell's third-place time of 36 min.

Leo's secret was tuning the Brown Jr. to run over 10 min. per ounce of fuel. That took his plane to 2,000 feet where big thermals floated the plane for many minutes. I was lucky to attend that Nats and be at the field to witness both of these flights (wishing that my KG had been finished in time—which it wasn't).

A few weeks before the 1935 Nats, Leo graduated from high school at age 16. He didn't attend the graduation ceremonies because he was too busy tuning the engine and trying different props!

Back to the 1937 Nats, Leo had assembled his giant model in the hangar. He tried in vain to start the special twin engine. It just wouldn't run, so he had to give up any thought of flying. Later, Leo told me that this beautiful giant plane had never flown, and in the course of several moves after graduation, it became lost.[10] He was scored as fifth place.

It should be mentioned that Leo's first RC concepts originated during his freshman year at MIT where he built his fourth gas model with small electric motors operating the controls via wires. This was intended for tethered, controllable flight.

While still in college, he took up flying and got his pilot's license. After graduating from U of M in 1939 as an aeronautical engineer, he went directly to Wright Field, where his first job was with RC target drones—the well-known Reginald Denny Radio-Plane. Major George Holloman, his new boss, had read one of Leo's RC articles and cautioned him that some of the material that Leo had written "was considered 'top secret' around here!" I guess the RC hobbyists were more advanced than the "professionals" realized.

For a larger, more realistic RC drone, Leo proposed the full-scale Culver Cadet lightplane. The idea was okayed, and a "compact unit" with gyros, RC gear, and servos was strapped in place of a pilot and steered by radio from a ground control unit designed by Leo. Many of the RC Culver Cadets were used as target drones during WW II.

I still remember some Navy shipboard tests of the "proximity fuze" that I helped develop for the anti-aircraft shells. In these tests the guns shot down a number of Culver Cadet drones, proving the effectiveness of the proximity fuze over conventional clock fuzes. This result was not surprising, since the proximity fuze contained a miniature radar which sensed the nearness of the target plane and triggered the explosive. At the time, I didn't know that Leo was involved. He really jumped into professional RC in a hurry.

After WW II, Leo started his own business manufacturing aeronautical instruments. He became very successful. An interesting afterthought: Roy Marquardt, the modeler who launched Elmer Wasman's plane, was later a board member in Leo's company. Leo is now "retired" and is leading an active life in Alexandria, VA writing books and moderating business forums.

**B. Schiffman** entered a plane in the RC event, but, strangely enough, I've found no published words or pictures about it. I believe his first name was Bernie.

Lanzo remembers that, late that Sunday after returning to the RC area from the FF Rubber events, he saw Schiffman's plane standing in the rain with a soaked wing—and water dripping from the bottom as if the bamboo paper covering had not been doped. Further, Chet remembers the large "B" battery sitting in the bottom of the fuselage and was amazed that all the tar had been chipped away from the 30 cells to save weight.

Beyond this meager information, we know very little except that he did not fly his RC plane and was scored as sixth place. Can anyone give us some help with more information on B. Schiffman and his 1937 RC plane? At this writing, he qualifies as the "mystery entry."

**Ross Hull.** Thus far, we have related only the 1937 entries in the first National Contest for RC model planes. What about other pioneers in RC who did not enter the national event? There were probably more of them than we know who experimented with RC without being recorded in the model magazines or even the local newspapers. Without documented accounts, these pioneers may never be known.

However, there was one group, led by Ross Hull in Connecticut, whose contributions were well-documented in 1937. At 35, Hull was the associate editor of *QST* magazine, the journal of the American Radio Relay League (ARRL) and a very skilled radio designer. He was also skilled in model planes from his experiences in Australia, his home country, and in Hartford, CT. In both countries he had published a series on model plane construction in the local newspapers in the late 1920s.

His team consisted of some talented participants. Clinton B. DeSoto was the assistant secretary of the ARRL, while Roland Bourne, Byron Goodman, and Harner Selvidge were all active hams. Hull's team had planned an RC project for a 10-ft.-span gas-powered RC model during the spring of 1937. However, before construction had started, Hull and Bourne attended the Soaring Society of America national sailplane meet in early July 1937 in Elmira, NY.

There they met Carl W. Thompson, Jr. from Wilmington, DE. He was both an active gas model competitor and a pilot of full-scale gliders. Carl had brought a 13-ft. glider to the meet with RC gear built by H.M. Plummer (W3DIA).

It was a simple basic approach with "off" signal giving right rudder and "on" signal left rudder. Hull's *QST* report said: "The ship made several successful hops with the control working, but an untimely crack-up ended the experiment."[11] Perhaps the Thompson/Plummer team deserves recognition for the first public RC glider demonstration. I sure would like to find a more-detailed report on their Elmira demonstrations.

Hull quickly acquired the remains and took them back to Hartford for repair. DeSoto writes about Hull: "In the weeks that followed, he and his group did little but eat, sleep, talk, and build radio-controlled model aircraft. Success was not immediate, but it did come—if the present (1937) system, crude as it is in comparison with the ultimate goal, can be called success."[12]

Near the end of July the first flights started by hand launches down the nearby slope—then madly steering the glider to avoid the trees, and finally landing in the valley below. "Some of the flights have had a duration of several minutes, most of them less . . .."

Guided by simplicity as the keynote, the RC system consisted of a three-tube super-regenerative receiver, a sensitive relay, and a four-spoke escapement with four feet of twisted rubber strands which furnished the power to turn the rudder. The escapement wheel advanced one-quarter turn with each carrier pulse, giving N - L - N - R in sequence. This action was rapid and positive; fortunately, the rudder would cycle so quickly through unwanted positions that the 10-lb. glider barely twitched.

Remembering which position came next was the hard part, so Bourne built a "rudder stick" that automatically sent the correct number of pulses to the rudder and greatly reduced this worry factor for the pilot.

By October the glider had amassed over 100 flights and 15 crashes. The equipment was rebuilt over and over. Some crashes were caused by the escapement getting out of sync with the control stick. This was caused by microphonics in the tubes being excited from the clanking of the escapement which, in turn, gave an extra unwanted pulse.

During 1937 the ARRL group made significant contributions to the invention of RC along with those who had entered the 1937 Nats.

In 1938 a second glider was built with a wingspan of 18 ft. This one had a monocoque body of formed plywood and was demonstrated on the Elmira slopes in the summer of 1938. The story is told that they tried to enter this RC glider in the regular soaring competition—but after a hurried meeting of the rules committee, it was stated that there must be a man in the cockpit![13]

The glider survived several years of RC experimentation, and in 1980 it was rescued from ARRL storage by Laird Campbell (W1CUT), and with the help of Pete Reed (K1ONG), well-known New England modeler, the glider was restored. It now hangs in a prominent position from the ceiling of the ARRL Museum in Newington, CT.

Unfortunately, the ARRL RC project lost Ross Hull to a fatal accident in August 1938 when he contacted 6,000 volts during a television receiver experiment. His contributions to RC had been those of an expert pioneer.

DeSoto carried on the RC efforts, and we will tell about that in the next installment.

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**Summary.** The first RC Nats in 1937 provided a definite step forward in the development of controllable RC planes. All six planes had demonstrated proper control movements by radio in the ground tests. In the air, one of the six showed potential control response during its brief flight. Two others crashed at launch due to tail-heavy trim, which might have been prevented by pre-contest test flights and proper adjustments. At least one of the remaining three had been through a dozen test flights and was stopped by bad weather.

The lessons learned were clear: keep the system simple, get plenty of practice flights, use a stable model, and *keep the system simple!* Reliability and pilot skill are also essential, but it was too early to judge their importance based on the limited flight time at this stage.

In the next section we'll review more RC pioneers in the RC Nats from 1938 through 1941 and watch the RC invention stumble less and grow more.

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## CL Aerobatics/Fancher

*Continued from page 65*

*SB:* "These heroes of mine built and finished their ships with this (appearance points) in mind. I not only wanted to build and finish a plane as well as they could, I also wanted to develop the courage to put it all on the line and learn to fly the AMA pattern with it. The combination of skills necessary to be the best requires one to continually improve. Like a painting or a sculpture, a beautiful model attracts interest. Interest develops questions. Answers develop understanding. Understanding is the basis for participation."

**On the subject** of *Skill Classes at the Nats,* the correspondents had the following to say.

*JT:* "I'm strong against skill classes at the Nats. The Nats is not just another contest, it is an opportunity for every AMA member to see how he stacks up against the best in the country. I can't understand the argument that you shouldn't enter if you can't win."

*TM:* "I have never flown Stunt as a contest pilot (although I think it is the tops in CL). If I have to compete in Open class, as AMA now defines it, I won't; it's that simple."

*RM:* "The initiation of some program to infuse some new blood into our event is absolutely critical to the survival of both Stunt and our organization (PAMPA) . . . The only way to motivate *(a new flier)* is to offer him or her some reasonable expectation of at least some small reward in a reasonable length of time. It can be mind-boggling for a neophyte to attend that first Nats and see what he is really up against . . . we must provide up-and-coming fliers with a forum in which they can showcase their abilities and 'pay their dues.'

"I believe *(however)* it is *not* in our best interest to fly a second class *separate* from the 'Expert' class, because the whole reason for having a second class is to allow less-experienced fliers to get a barometer of their performance relative to the more skilled fliers . . . In addition to some new entries, I think we might see a certain number of the less serious fliers dropping back a class . . . The present format of having the top 20 fliers advance to the "finals" should be maintained at all costs. Making the cut has come to be recognized as an important achievement. I can see no reason why the top two or three advanced fliers could not be carried along . . . One final thought. It has become obvious that trying to initiate rule or format changes by submitting proposals to the *(PAMPA)* membership at large is cumbersome and non-productive. I feel we should select a committee at the '86 Nats and charge them with coming up with a format for '87."

That's it, gang. I have paraphrased comments from all letters I've received as of today (December 29), and although I'll appreciate additional thoughts, I won't be addressing the subject again soon. I urge you all to consider the opinions expressed and to be alert to the possibility of rule changes. It's our event. Let's make it responsive to our needs.

**New subject.** Many of us "Pro Stunters"—including yours truly—tend to get so bogged down on state-of-the-art technical minutia, Nats procedures and judging, scratch-built original-design pieces of art work and the like that we tend to lose sight of the bigger and perhaps more ominous happenings in and about our event. This tunnel vision was brought clearly into focus a month or so ago when I visited my local hobby dealer in search of some info on up-to-date kits available for the budding Control Line