

Bill Good with complete control system: transmitter, receiver, control and antenna

**R**ADIO control of a model plane is a new and fascinating hobby. Every modeler dreams of controlling his own models and at last that dream is a reality. Just imagine landing your own model plane a few feet from the takeoff. That's a real thrill—especially when *you* are doing the controlling.

Proof that radio control is really here comes from all parts of the country, several radio controlled thermal flights of over an hour are reported from Florida. Two Michigan fellows have looped their eight foot radio-guided plane. A lad in the East can spin his plane—and make it recover—another plane has been controlled two miles away. Others have demonstrated the figure-of-eight maneuver and spot landings so close as to almost bowl over the controlling radio transmitter. There's no chasing of models for these fellows!

Probably the first radio controlled flights of gas powered models by model plane builders were made during 1937, so this hobby is not half as old as that of gas jobs. Early radio flights were characterized by the comment of one radio controller, "Well, the plane landed in a different place from what it would have if it hadn't been under control"! Meaning that the path of flight had been diverted but not necessarily as planned. Some of



Walter Good with 8 ft. radio controlled model. Receiver and relay inside fuselage

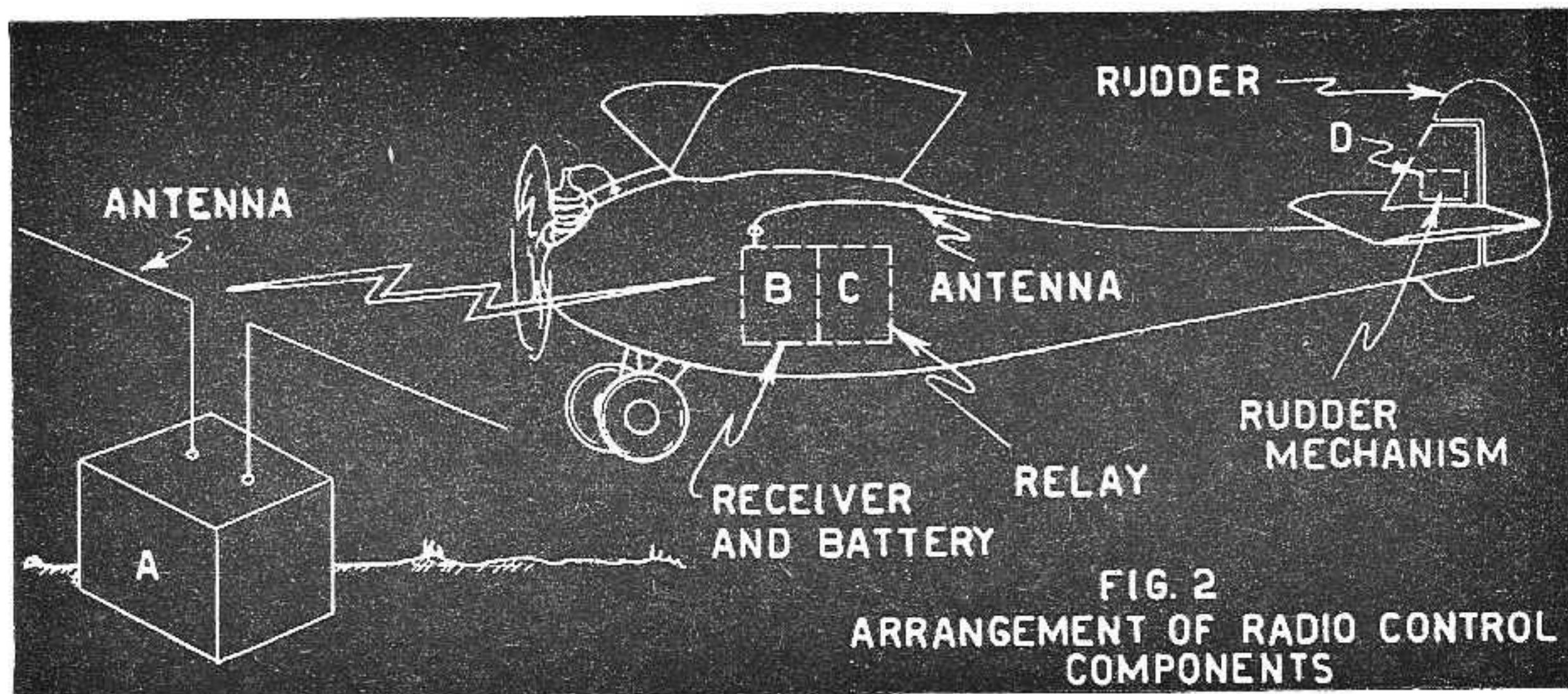


FIG. 2  
ARRANGEMENT OF RADIO CONTROL COMPONENTS

## Fundamentals of RADIO CONTROL

by **BILL and WALTER GOOD**

the present day radio controllers can land their models within a 25 foot radius most of the time. Consequently, the radio control contest of today is judged mainly on the model's maneuvers.

The operation of a radio control system is simple. Fig. 1 shows the basic radio control system. A radio transmitter (A) on the ground sends a radio signal to the receiver (B) in the plane. The receiver causes the sensitive relay (C) (effectively a switch) to close and operate the control (D) which moves the rudder making the model turn. Fig. 2 shows a typical arrangement of these components in the controlled model. The complete radio control equipment usually weighs from one to two pounds, resulting in a ship weighing from five to fifteen pounds.

Almost standard for the receiver (B) is the one-tube superregenerative type built to work on a five-meter wave length. Extremely high sensitivity, broad tuning and freedom from ignition interference are the much desired characteristics of this type of receiver. Radio control builders have developed this receiver to such a high degree that some weigh only three ounces! The radio batteries needed are one 45 volt battery and one or two flashlight cells. Small 45 volt batteries, formerly expensive and difficult to obtain, are now available in a large variety due to the advent of the small portable radio. Battery weights vary from one-half pound to one pound depending upon their capacities.

One of the most critical parts of the radio control plane is the sensitive relay. Success of most present day radio models hinges on its positive action. This relay must function on currents of less than one-thousandth of an ampere! Indeed a stringent requirement considering the fact that it must also be light in weight and unaffected by the ship's vibration. Commercial relays weigh from one to four ounces. Many fellows find that good relays for this purpose can be homemade.

The control mechanism whose duty is to move the rudder flaps, advance the motor or to execute any other operation, appears in numerous forms. Most used is either the small electric motor with a gear train or the rubber band escapement. Both require several flashlight cells for operation. The rubber band escapement is light in weight—as little as one-half ounce—and fast in acting, but must be wound before each flight. The electric motors are slow moving but powerful.

Transmitters are usually of the 5-meter portable variety. The person who operates the transmitter must have an amateur radio license. Therefore most model airplaners have an interested radio amateur assist them. Radio control is more than a one man job. Consequently a radio man and a modeler make an excellent combination. It should be pointed out that wartime restrictions prevent transmitter operation thus disallowing radio control operation. However nothing

(Turn to page 36)

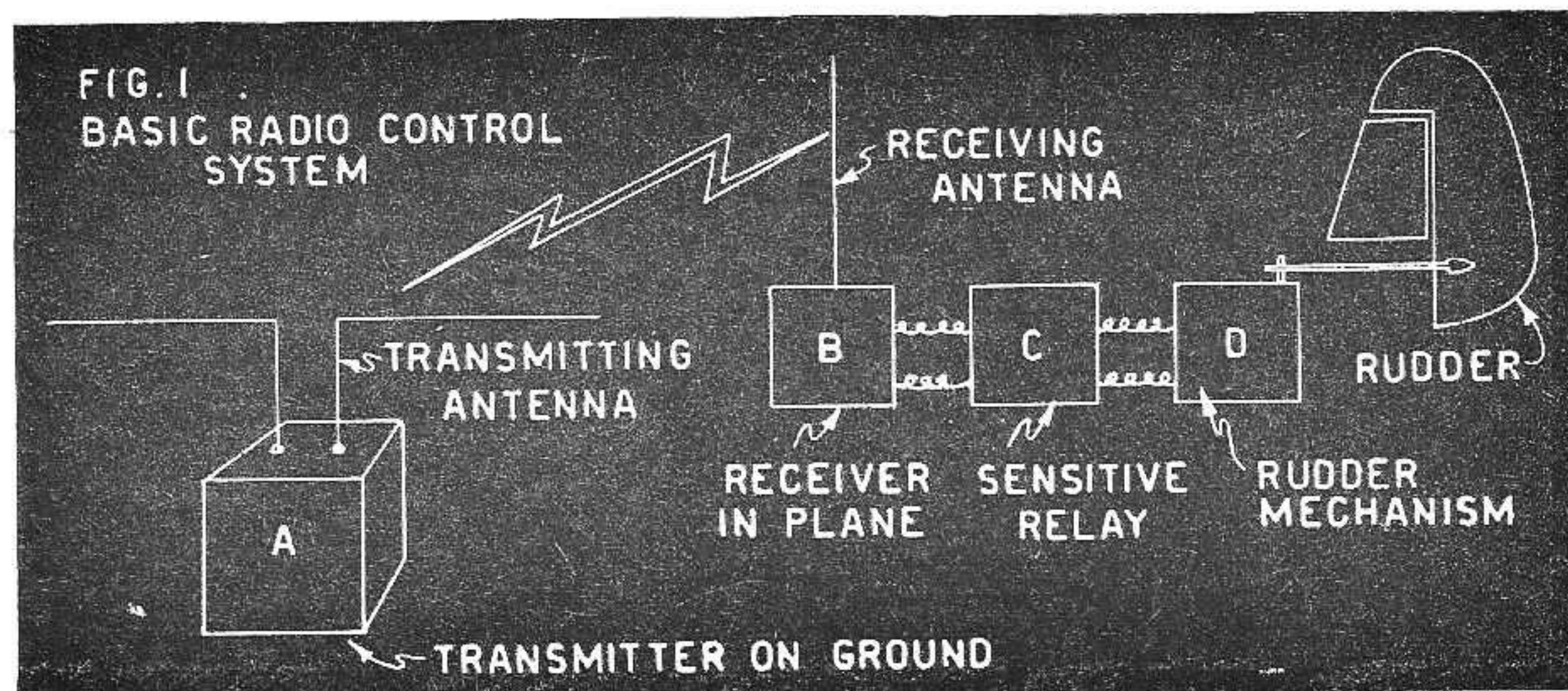


FIG. 1  
BASIC RADIO CONTROL SYSTEM

# Fundamentals of Radio Control

*(Continued from page 23)*

stands in the way of constructing and perfecting the other parts of the equipment.

The control switch on the transmitter may vary from a simple push button to a complete set of controls in a miniature cockpit. A few radio models have several controls consisting of rudder, elevator, motor speed, motor cut-off and even parachute and bomb releases. Naturally more maneuvers can be accomplished with these complicated ships; but experienced radio modelers recommend starting with a simple one, such as with a rudder control alone. It is surprising the number of maneuvers which may be executed with just the rudder control. One radio model has even been made to loop using only a

rudder control!

Radio control has not advanced to the stage where it can be used to test-fly a new and untried model. It has been most successful when applied to models already capable of flying well by themselves.

Most important is the fact that radio ships can be put into dives and spirals which would be fatal to the model if a recovery were not made. Therefore it is necessary for the operator to really "fly" his model. Naturally expertness follows practice. Radio controllers admit that radio control is not a "snap," but boy—it's sure lots of fun.