OPERATING INSTRUCTIONS

DELTRON 109

Since Radio Control as a hobby was made available to the public a few years ago by allocation of the "citizens bands," great strides have been made in adapting equipment to the specialized requirements of the hobbyist.

Early R/C receivers were heavy, bulky, and required an assortment of large batteries. Range was often limited and operation undependable.

Model builders yearned for a small, lightweight, ultra sensitive radio that could be operated from a single sub-miniature battery—one with long range and dependability under the exacting conditions of the hobby.

All of these goals have been achieved in the DELTRON R109. An all-transistor receiver that requires no filament batteries or high-voltage "B" supply, its advantages over conventional types of radios are too numerous to chronical in these pages, but they include extra long range, freedom from the effects of vibration, practically unlimited life expectancy and "crash proof" construction.

WIRING AND INSTALLATION

You will find the R109 easy to wire and install, even if you have had no electrical experience. All receiver leads are color coded for easy identification, and a single 22½ volt hearing aid battery is its only current requirement. Using the Burgess Y15, which will last for many flights, the total receiver-battery weight is just 2½ ounces! For more economical operation, the slightly larger U15 can be used.

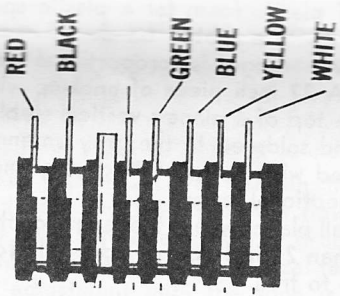
The wiring diagram on pages 6-7 should be studied carefully before wiring is begun.

First step is to solder the receiver leads to the plug in the order shown. To prevent short circuits, it's a good idea to slip one inch lengths of "spaghetti" over the leads before soldering. Push them down over the ends of the plug and bind the leads together with tape just above the plug, for a good strong assembly.

Note that the #3 terminal is not used with this receiver. Just leave it bank.

Next the terminal board is wired to the receiver and actuator batteries, and to the actuators (escapements, servos, etc.). You will need a small "on-off" switch in the receiver battery circuit (see diagram). It should be located where it is accessible from the outside of your model.

A piece of hook-up wire should be soldered to the landing gear and attached to the "plus" terminal of the receiver battery. This will add effective length to the antenna and materially increase your receiving range. If your landing gear is removable, run the wire instead from the battery "plus" to an engine mount or metal gas tank.



The terminal board can be anchored with #2 screws, or left floating, but be sure it is located where no metal can touch it or you will have a short circuit.

Wiring of actuators varies. The hook-up shown —a compound escapement or "VariComp" with quick beep motor control—is just one of many control systems. Instructions you receive with your actuators will show how they are wired to the receiver relay.

BE SURE THE RECEIVER BATTERY POLARITY IS CORRECT as shown in the diagram. Reverse polarity may damage transistors.

The totally enclosed construction of the R109 makes it easy to shock mount. Just wrap it in a piece of plastic foam (or a plastic sponge) and anchor it with a rubber band.

Receiver range is proportional to antenna length. A 27 inch piece of hook-up wire running from the top of a plane's vertical stablizer to the cabin and soldered to the grey antenna lead (or connected with a tight-fitting plug and jack) will give exceptional range.

In small planes where the length of the fuselage is less than 27 inches, it is advisable to allow the antenna to trail.

Shorter antennas will work, but remember that your range will be reduced proportionally.

Do not attempt to increase antenna length by "doubling back." The parallel sections will cancel each other out and you will end up with a shorter effective length. The same applies to tapping a lead from the center section of an aerial located, perhaps, across the full span of the wing.

TUNING

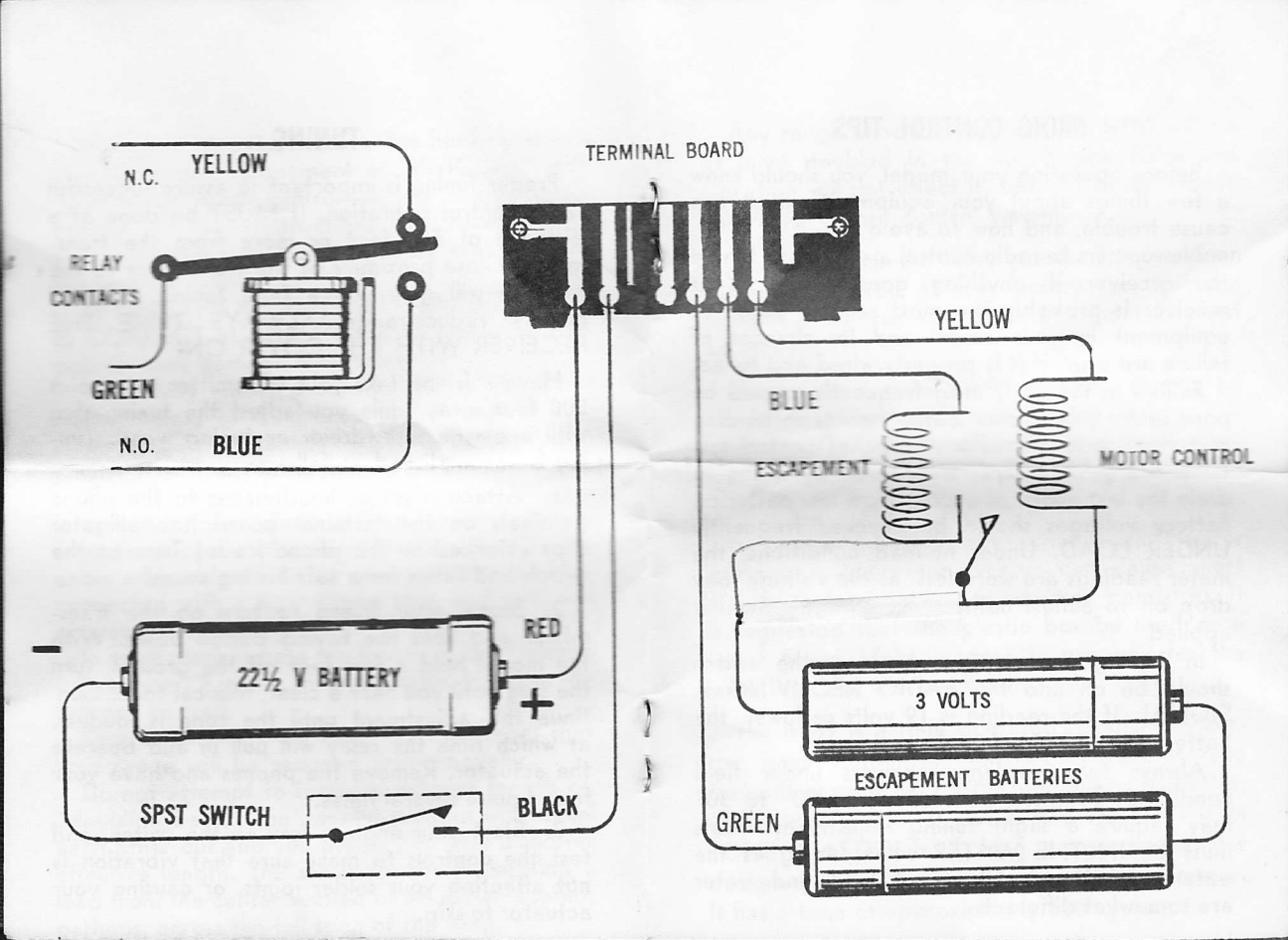
Proper tuning is important to assure successful radio control operation. It MUST be done at a distance of 500 feet or more from the transmitter. Close proximity of the transmitter to the receiver will give you a false tuning that will greatly reduce range. ALWAYS TUNE THE RECEIVER WITH THE COVER ON!

Have a friend take your transmitter to a point 500 feet away while you adjust the tuning slug with a plastic screwdriver or tuning wand. Tuning is accomplished as follows:

1. Attach a set of headphones to the phone terminals on the terminal board (use alligator clips attached to the phone leads.) Turn on the switch and listen for a soft hissing sound.

2. Signal your friend to turn on the transmitter and hold the keying button down. With the model held a few feet off the ground, turn the slug until you hear a clear, musical tone. Continue this adjustment until the tone is loudest, at which time the relay will pull in and operate the actuator. Remove the phones and have your friend pulse several times.

3. Start your engine; turn on the switch, and test the controls to make sure that vibration is not effecting your solder joints, or causing your actuator to skip.


N.C.
YELLOW
RELAY
CONTACTS
GREEN
N.O.
BLUE
TERMINAL BOARD
YELLOW
BLUE
ESCAPEMENT
MOTOR CONTROL
RED
22½ V BATTERY
3 VOLTS
ESCAPEMENT BATTERIES
SPST SWITCH
BLACK
GREEN

RADIO CONTROL TIPS

Before operating your model, you should know a few things about your equipment—what can cause trouble, and how to avoid it.

Newcomers to radio control are quick to blame the receiver if anything goes wrong. Your receiver is probably the most reliable piece of equipment in your model and its chances of failure are small if it is properly wired and tuned.

Failure in the air is most frequently caused by poor solder joints; poor battery contact; binding of torque rods, or malfunctioning of control systems. Many "flyaways" are caused by trying to drain the last ounce of energy from low batteries. Battery voltages should be checked frequently UNDER LOAD. Under no-load conditions, the meter readings are worthless, as the voltage may drop off to almost nothing the minute a load is applied.

In testing the receiver battery, the switch should be on and the RADIO RECEIVING A SIGNAL. If the reading is 19 volts or lower, the battery should be replaced.

Always tune airplane receivers under field conditions. Temperature changes of 20° to 30° may require a slight tuning adjustment. Boats must be IN THE WATER when tuning as the water capacitance effects of land and water are somewhat different.

Any range at which you tune the R109 will be at least doubled in the air. Engine noise and vibration will not effect it, but can cause trouble elsewhere in your control system.

Don't readjust the relay points. They've been carefully adjusted at the factory for optimum operation. All you can do is get them OUT of adjustment.

If you use a pulse control system, it may be necessary to tighten the relay spring slightly. This is accomplished by carefully bending the bottom loop of the spring in toward the relay frame. DO NOT BEND THE SPRING TAB.

In boat installations, protection against water damage is important. Water can cause short circuits that may burn out relays or transistors. It is suggested that the plastic box be used as a water cover. Make a notch in one end for the leads and seal the crack with scotch tape.

The R109 is a tone operated receiver. A carrier wave transmitter will not operate it. The transmitter must have 90% modulation or better, with a tone of 600 to 1000 cycles. The DELTRON TONE MASTER is a long range transmitter designed especially for operation of this receiver. It has a tone of approximately 800 cycles.

A very strong carrier wave close to the receiver may cause "blocking" and relay pull in. It is best to test your set to determine where this effect occurs, if at all. Blocking can be minimized or eliminated completely by tuning the receiver "on the nose."

Holding your hand on the transmitter antenna will reduce radiation and eliminate any blocking tendency which may remain after tuning. This is a good practice when hand launching or for R.O.G. takeoffs. Let go of the antenna when your model is 10 or 12 feet away.

Both the receiver and transmitter switch should be off at all times when not actually in use. This not only saves batteries, but prevents interference with others using the same frequency. If you should be flying your plane very close to the transmitter, hold the antenna until your ship is out of the blocking range.

If you use servo motors in your control system, be sure that there is a condenser of at least .01 mf capacity across the brushes, as commutator arcing can be picked up by a radio receiver and the signal may be strong enough to cause relay chatter. The same applies to electric motors used to power boats.

DO NOT TRY TO MODIFY THE CIRCUIT OF THIS RECEIVER. Transistor circuits require special soldering techniques and can be easily damaged by ordinary soldering methods. The guarantee covering this receiver is void if the circuit has been tampered with in any way.

CHECK YOUR HOBBY DEALER FOR OTHER DELTRON PRODUCTS. THEY'RE AVAILABLE WHEREVER QUALITY RADIO CONTROL EQUIPMENT IS SOLD.

THE DELTRON LABEL SIGNIFIES THAT YOU OWN THE FINEST SET IT IS POSSIBLE TO BUY, BACKED BY AN UNCONDITIONAL GUARANTEE. EVERY DELTRON PRODUCT IS THOROUGHLY TESTED AND ADJUSTED AT THE FACTORY AND COMES TO YOU READY TO OPERATE.

GUARANTEE POLICY

DELTRON

This receiver is unconditionally guaranteed by the factory to be free from defects in parts and workmanship. High quality components and selected transistors have been used throughout.

Should any trouble develop, or should you damage your set in any way, DO NOT RETURN IT TO THE DEALER. Prompt, reasonable service by electronics experts is provided by DELTRON. Return the set to DELTRON COMPANY, 1940 CONQUISTA AVENUE, LONG BEACH 15, CALIFORNIA with $1.50 for service, testing and return postage.

Damaged relays or transistors will be replaced at $3.00 for each unit. No charge will be made for other components found necessary to replace. If you wish your receiver returned via airmail, add 50c to the service charge.

DELTRON

DELTRON

DELTRON