RECEIVER TUNING PROCEDURE

Properly locate receiver, switch and all wiring in your airplane. Locate your antenna so that it is approximately the same position relative to wiring, servos, etc., as when the airplane is ready for flight.

Set your transmitter on the ground with its antenna removed. Use a rubber band to hold the elevator stick in the "down" position and move the throttle control stick to the low speed position. Turn on your transmitter and receiver and bring the model close to the transmitter and note that the elevator servo moves to the "down" position. During the tuning procedure be sure to keep your body and hands as far as possible from the antenna and receiver as this will effect the tuning. Slowly back away from the transmitter with the model until the controls become quiet; i.e., fail-safe position. Now step in closer until the servos start to chatter and the elevator servo tries to move to the down position.

Slowly and carefully turn the antenna slug with hex tuning wand supplied, right or left, while watching the elevator servo. The antenna slug should not have to be rotated more than one turn in either direction. Tune for maximum "down". If it should become solid "down", back away slowly until it again fail-safes. Move closer until elevator servo chatters toward down elevator and again tune for maximum "down". Repeat the above until tuning is extremely sharp and there is no further increase in range. The antenna now is properly tuned.

The "chatter" of the servos is caused by electrical noise from the servo motors getting into the receiver under extremely weak signal condition. To explain the action that has been observed during the tuning procedure, the following brief explanation will be helpful:

The servo has only 3 modes of operation: 1) it moves toward command position only upon receipt of proper command information, 2) it moves to fail-safe position after one second of continuous absence of correct command information, and 3) it remains stationary.

The receiver is capable of accepting only correct information and preventing incorrect information from getting into the servo. Each sequence of command information is examined by a counter and reset generator for the correct number of pulses; i.e., any extra pulses because of noise or any pulses missing because of interference. Working in connection with this error detection circuit are two other circuits we call lock-out and fail-safe. The purpose of lock-out is to prevent incorrect information from getting to the servo. The purpose of fail-safe is to drive the servo to a neutral position after the receiver has been in continuous lock-out for one second. If at any time during lock-out, or during fail-safe, a correct sequence of command is received, this information will be passed on to the servo. After a correct sequence of command information, the fail-safe circuit will not operate for another full second of absence of correct command signal.

RECEIVER TUNING PROCEDURE

Relating the above information back to the tuning sequence, the chatter can now be understood as a condition in which a servo is receiving only correct information during a relatively small period of time. The remaining time being lock-out; i.e., the servo remains stationary and will wait for more correct commands or be switched to fail-safe. So you can see that if the servo receives several bits of command information it will move toward the command position but while on the way to command position it may be interrupted, thus causing the servo to stop while awaiting further command. Further command may be in the form of "no command signal" for one second and go to fail-safe, or sporadic bits of good information may be received which jogs the servo toward its command position. This chatter, or gray zone area, enables the operator TO RETAIN CONTROL EVEN THOUGH A VERY SMALL PERCENTAGE OF CORRECT INFORMATION IS BEING RECEIVED.