

Rudder Operating Device For Radio Control

by W. H. Butler

THIS device employs the principle that: a cord or cords shortens its overall length as it is twisted, and conversely lengthens as it is untwisted.

It is also evident that two strands of cord twisted parallel-wise gives a gear-reduction effect in the proper range of proportion to use directly in this application.

Referring to the sketch, the motor turning in one direction shortens the cord length and thus pulls the control arm toward the motor. In this action, the rubberband (or coiled spring) on the opposite arm stretches. If you reverse the motor, the cord unwinds and thus lengthens itself, and the rubberband pulls in the opposite control arm, thus keeping the cord taut.

The holes drilled in the control arms provide a handy method of changing the pressure-to-motion ratio to match the need of the particular application. Likewise, the size and length of the cords, and the length and number of the rubber strands will change this ratio.

The device will work even if the tension element and the twisted cords run directly to the control arm without being crossed as the sketch shows. It is better, however, to cross these lines of pull because this method gives more uniform action throughout the arc of arm travel.

Those of you who are building radio controlled models have probably studied practically all the literature on the subject, and this article does not attempt to add anything to the radio lore already published. Just to freshen your memory, however, I shall describe the action of the relay switch I am using. When the transmitter is "on" the motor will turn in one direction; when "off" the motor will turn in the *opposite* direction. The transmitter is provided with a slow-motion keying vibrator, throwing the transmitter on and off in a uniform time mode. Thus the transmitter has three positions: (1) on; (2) intermittent; (3) off.

When the control is applied to the airplane rudder, these three transmitter positions are translated into the following motions of the rudder: (1) right; (2) rudder motion stop; (3) left. The action in position 2 (or lack of action) is accomplished by reversing direction of the motor so rapidly there is no perceptible motion in the control arm.

