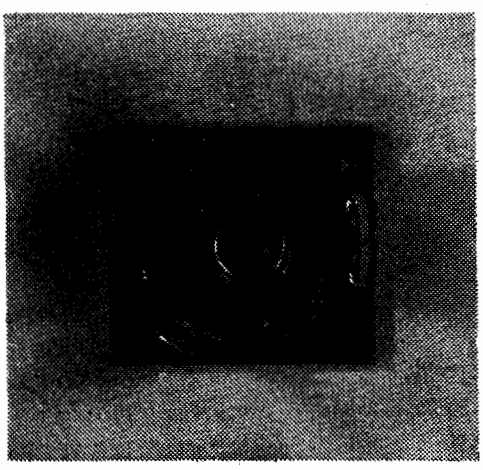
Instruction Manual

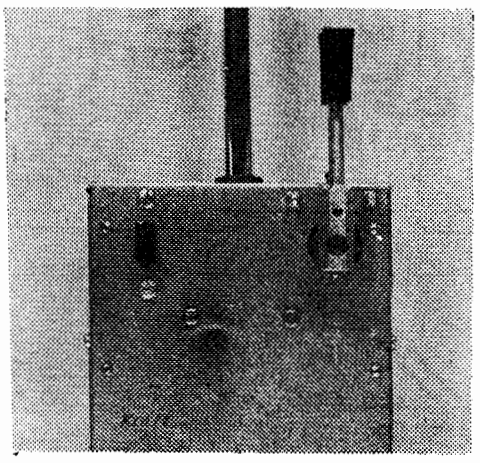
FOR YOUR

ACE COMMANDER

TRANSMITTER-PULSER

Conversion Kit





Ace R/C Inc.

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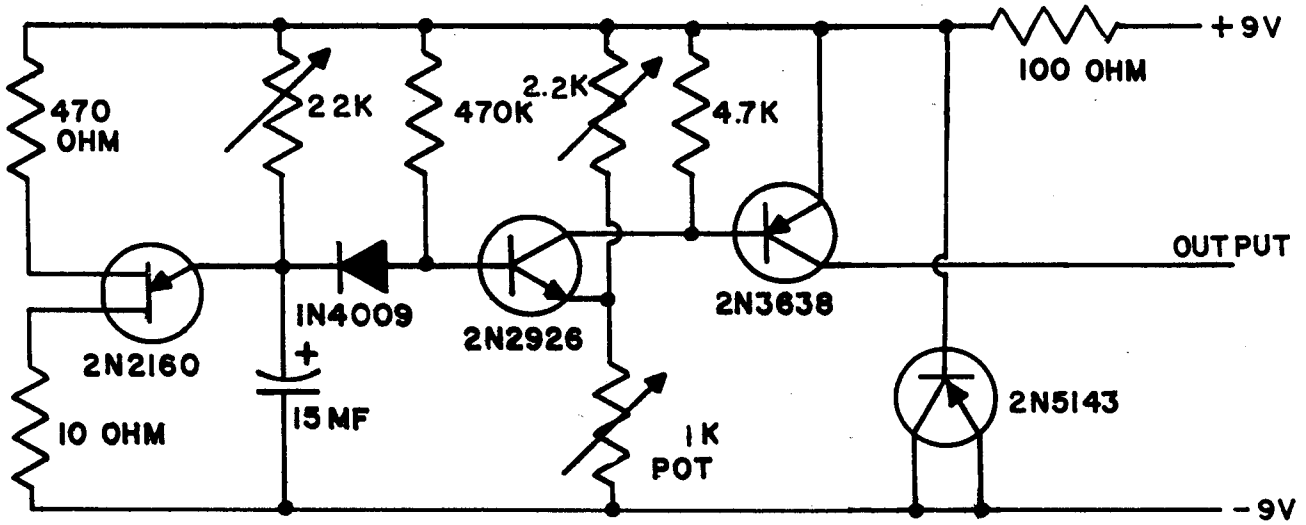
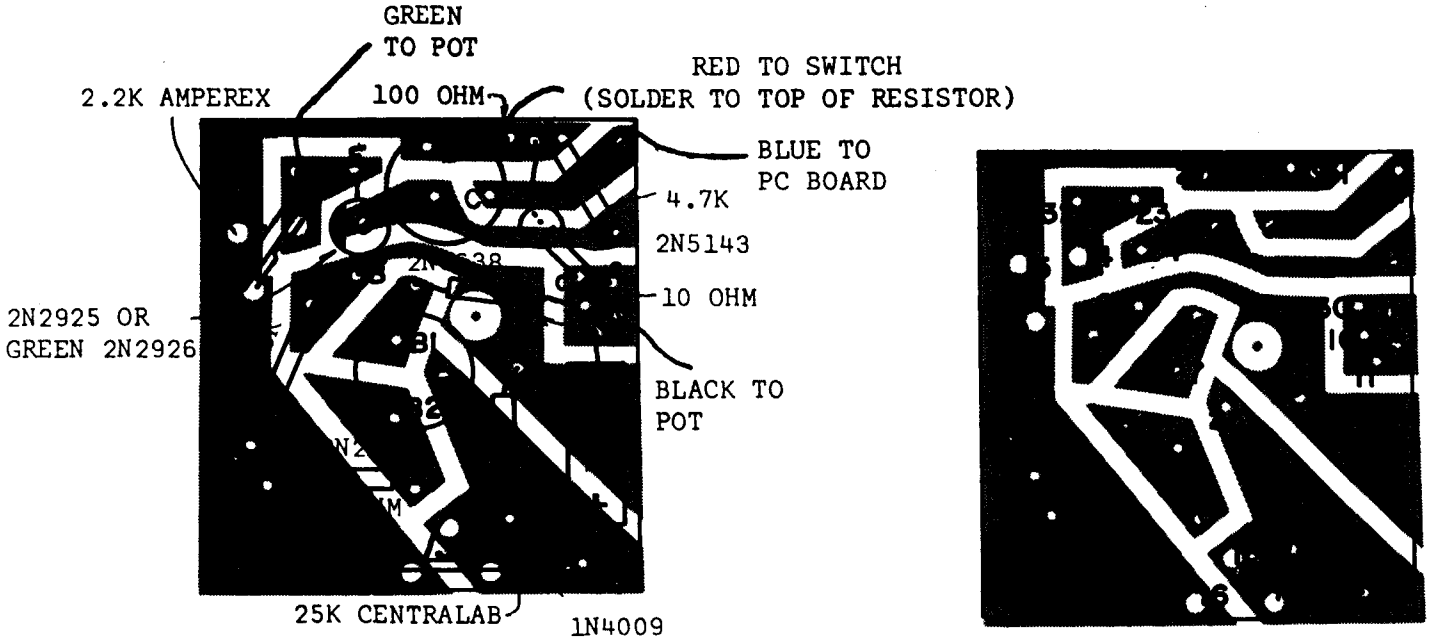
Revised 6/69

PARTS LIST

( )	2	3/8" large lock washers
( )	1	Control stick
( )	1	Centering spring
( )	2	2/56 X 1/4 bolts
( )	1	4/40 X 1/4 bolts
( )	2	2/56 nuts
( )	1	4/40 nut
( )	1	Commander pulser PC base
( )	1	15 mf AL capacitor
( )	1	1N4009 diode
( )	1	2N3638 transistor
( )	1	2N2160 unijunction
( )	1	2N2926 transistor
( )	1	2N5143 transistor
( )	1	4.7K 1/4 watt resistor
( )	1	10 ohm 1/4 watt resistor
( )	1	470 ohm 1/4 watt resistor
( )	1	470K 1/4 watt resistor
( )	1	100 ohm 1/4 watt resistor
( )	1	2.2K trim pot
( )	1	25K trim pot
( )	1	1K pot
( )		3" green hookup wire
( )		5" black hookup wire
( )		12" solder
( )	1	set of instructions
( )		2" double sided tape





INTRODUCTION

The Ace Commander Rudder Only Pulser Kit will enable you to convert your Commander transmitter to achieve Rudder only proportional control with many of the existing actuators available.

Simple Rudder Only proportional control is probably most easily obtained with the use of the Adams series of actuators--the size depends on your aircraft or other type of installation. These may be used with any good relayless receiver to which an Ace AOSK (Add On Switcher Kit) has been added, along with one set of Nickel Cadmium batteries for the entire power source. The Ace 12K1 Commander DE is doubleended and works from one set of batteries at 2.4 volts, and is highly recommended.

The use of motorized actuators such as the Rand HR-1 or HR-2 may be used for larger installations. These must be used with a relay type of receiver and a separate source of power for actuators, or a receiver which is especially adapted for relayless output into a switcher. (Such a combination would be the Citizenship SSH-P along with the Rand switcher--either in kit form which is #6070, or in completely assembled form which is #6072.) This latter combination allows the use of one set of batteries. Other combinations are also possible.

Mention has been made of using nickel cadmium batteries. This is quite deliberate, since you will have several strikes against you if you attempt flying pulse proportional with ordinary pen cells or even alkaline cells. With pulse proportional you are putting a drain on the batteries constantly and the nickel cadmium batteries of the 225 or 500 mah sizes are most highly recommended as the best insurance for flying satisfaction.

There are exceptions to the use of nickel cadmiums but ONLY when using the new series of Adams actuators known as the AR units. These are available in either the regular Baby or the Twin Baby. With these the current drain is held very low so that small size alkaline or silver oxide cells may be used. Life will be short, but these actuators are generally used in planes of extremly small size where weight is a vital factor. Because the AR series of actuators are low drain, they also provide less power and cannot be used with planes of larger than .020 or weak .049 size for the twin.

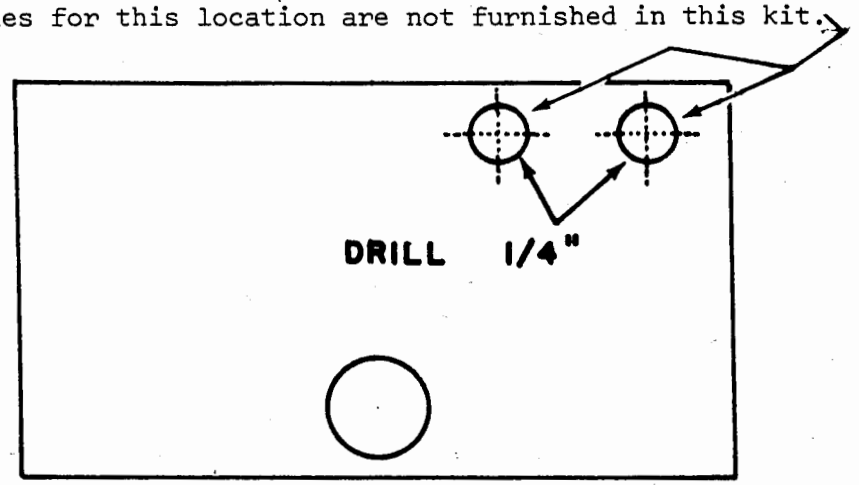
These instructions presume that you have your Commander transmitter in good working order. First, loosen the PC board by removing the four 2-56 bolts and spacers. Then unsolder the leads going to the push switch and remove switch from the transmitter case. Using the template provided, center punch and drill the two 3/32" holes and the one 1/8" hole for the centering spring bolts. Install a 2-56 x 1/4" nut and bolt in the outer two holes and a 4-40 x 1/4" bolt and nut in the center hole, leaving the bolts extending out from the case. The middle bolt is for the centering spring on which to center. The two outside bolts are the stop limits.

Put one of the large 3/8" lock washers on the 1K pot. Insert pot into the hole formerly occupied by the push switch from the inside of the case. Align the pot lugs to the center of the case as shown in the drawing. Put the other large 3/8" lock washer on the 1K pot from the outside of the case. Center this washer over the push switch hole and secure tightly with the 3/8" pot nut provided. Leave the control stick and spring off for now. You will need to adjust the pot for proper rudder throw later.

Also turn on your receiver and actuator and note the movement of the actuator. A magnetic actuator should be bouncing back and forth between the stops equally when the control stick is neutral. A motorized actuator should be pulsing at neutral. You want to obtain maximum left and right movement of the actuator when the control stick is moved to the stops. If you need more ratio (if the actuator doesn't move to maximum deflection) turn the 2.2K trim pot so less and less tone is heard. Re-neutralize the control pot, and try again. Continue adjustment until you obtain the desired ratio. If less ratio is needed, the 2.2K trim pot is rotated in the opposite direction. The control pot will always have to be re-neutralized when the width ratio pot is adjusted. A motorized actuator should move to one side or the other when the control stick is moved but not "cycle-through" at the extremes. A magnetic actuator should move all the way to one side and just barely bounce at the stop when full control is given. (Always follow manufacturer's instructions for installing stops when using a magnetic actuator.)

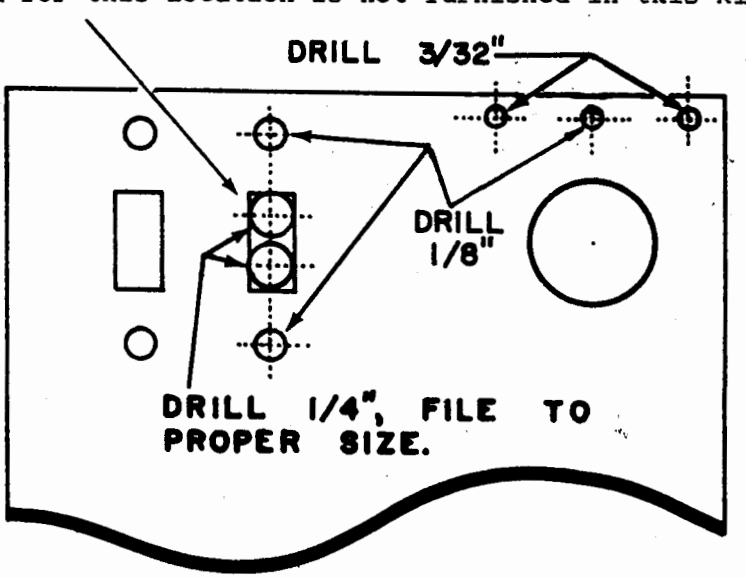
When the equipment is installed in the airplane, check and see if right stick command gives right rudder. If not, you can either reverse the outer leads on the actuator or move the two leads soldered to lug H on the control pot to lug F.

Switches for this location are not furnished in this kit.

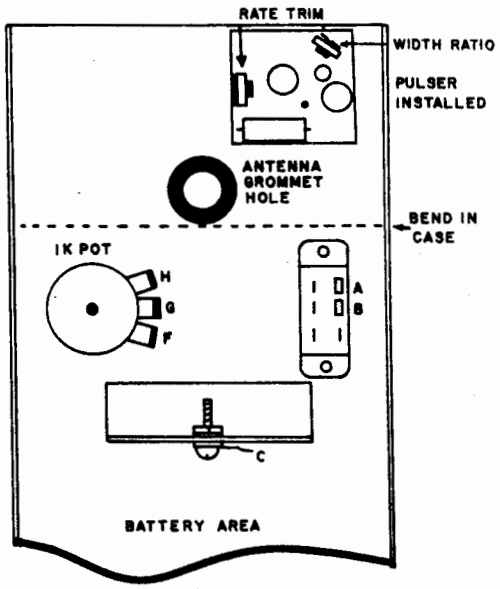


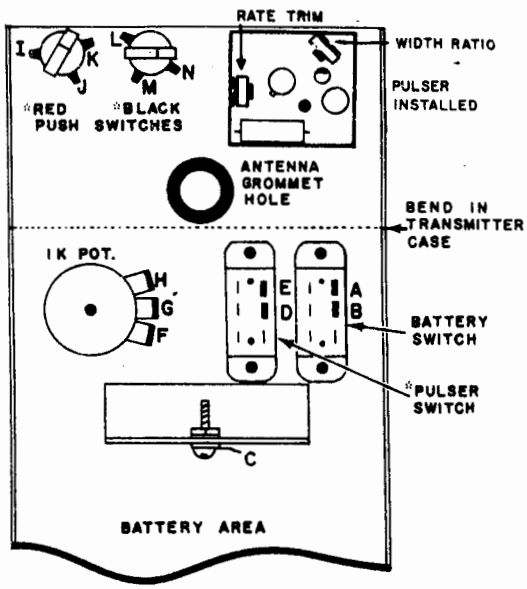
TOP OF CASE

Switch for this location is not furnished in this kit.



FRONT OF CASE





*These three switches not furnished.

OPTIONS

The four following diagrams indicate some optional additions you can make to your converted Commander transmitter to make it more versatile.

A.--HPR Switch. This shows how to wire in an extra capacitor and push switch so you can have a burst of High Pulse Rate for motor control. Your airborne unit will need the addition of either a Ken's Motor Control or Ace's High Pulse Rate Detector and a servo. Generally these motor control units are used with magnetic actuators only.

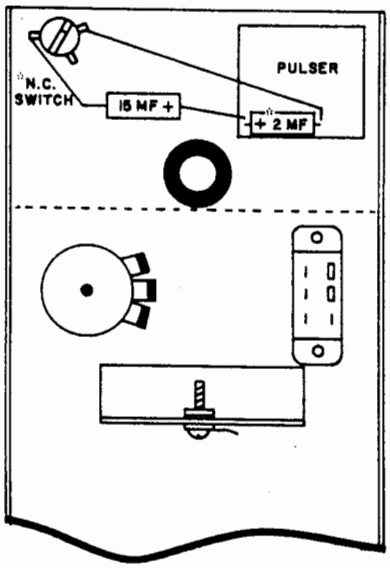
B.--Full off and Full on. With the addition of two push switches (N.C. and N.O.) you can have full tone on and full tone off for motor control function when using motorized servos.

C.--Full on with pulser on-off switch. An extra SPST slide switch and a push switch can allow you to still use your escapement. You merely turn off the pulser and use the push switch as a key; so you have a single channel transmitter and a single channel pulse transmitter in one.

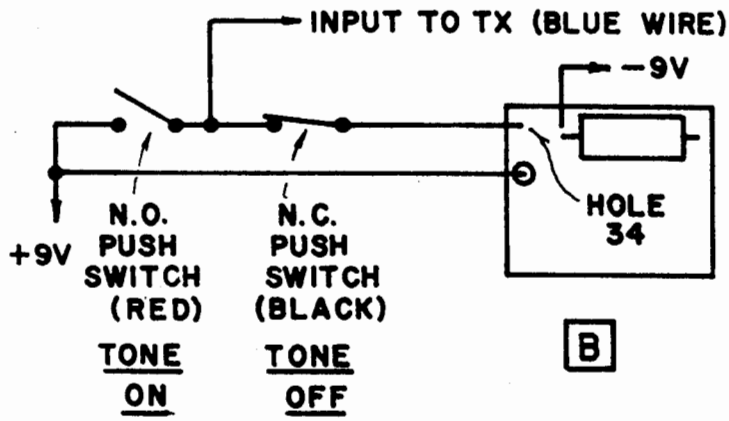
D.--Full on-off with pulser switch. Following this diagram you can have rudder-only, rudder and motor (with motorized servos), and still use your escapement by turning off the pulser and using the full on switch.

E.--With a combination of A and C, you can have both a single channel pulse transmitter with motor control (for magnetic actuators) and a single channel transmitter for escapement use.

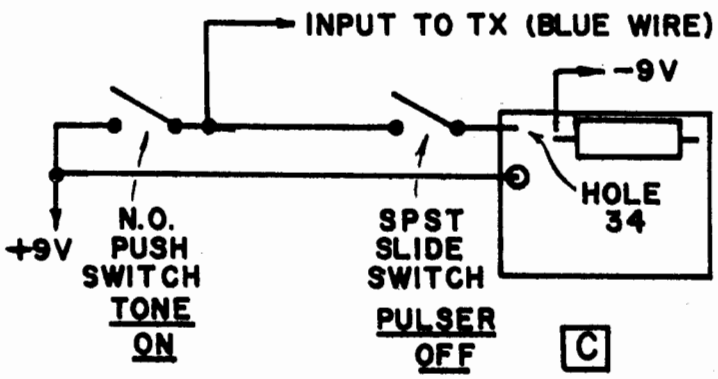
(PARTS FOR OPTIONS FOREGOING ARE NOT SUPPLIED.)



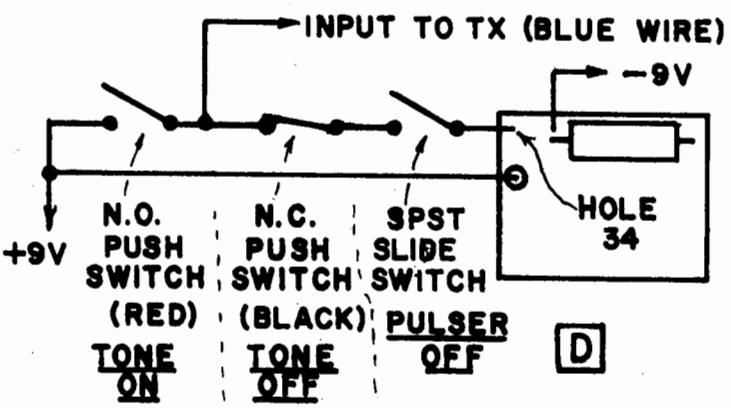
A



B



C



D

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