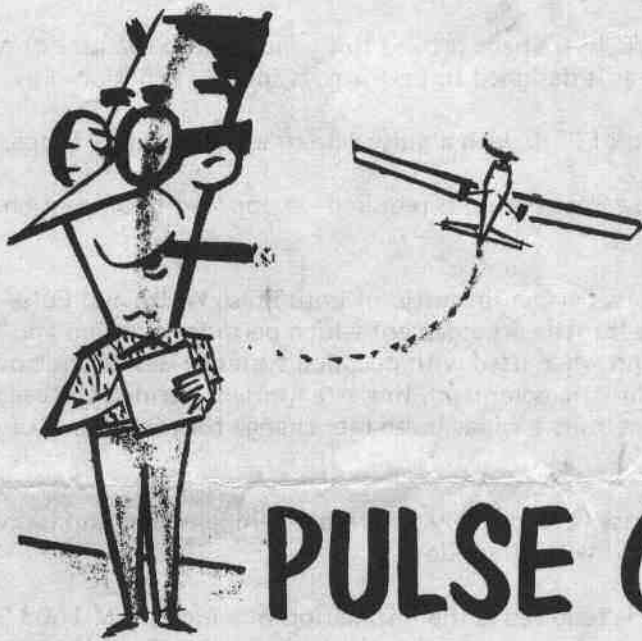
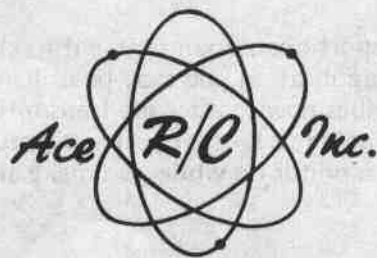


The Ultimate in Pulse Proportional



PULSE COMMANDER

INSTRUCTION MANUAL



HIGGINSVILLE, MO. 64037

INTRODUCTION

The Pulse Commander Transmitter, designed by Don Dickerson, meets the requirements of all forms of pulse proportional radio control. Prime design objectives were high RF output, coupled with reliability, and expandability. These goals have been met.

The exact same RF section is used in all three versions. This output is equal to, and in a number of cases exceeds, the high priced digital units.

For each of the three transmitter versions the pulser is different. Because the requirements of each type of flying is different, it was felt desirable to design a pulser to fit each particular need.

Exhaustive tests in the field by a number of R/C flyers have proved this concept to be valid. For each of the three versions of the transmitter offered, the pulser is designed to perform its specific function only.

R/O (Rudder Only) requires a pulse width ratio of 95/5 with a pulse rate of approximately 6 pps.

For Galloping Ghost a linear change in the Pulse Rate period is required--as opposed to a linear change in Pulse Rate frequency.

For Fast Rate pulse systems, with dual actuators, perfect linearity of both Pulse Width and Pulse Rate functions is required. An additional feature is the throttle arrangement which permits retention and full control of the pulse rate function during throttle command when used with decoded systems. Beside the obvious advantage of retaining elevator control during the throttle command, this arrangement permits the use of stops on the elevator actuator to prevent go-around. This permits a wider pulse rate change for more elevator power to hold the model in outside loops, etc.

The transmitter is housed in a two-tone vinyl case; is especially temperate compensated, and has voltage regulated circuitry. The Rand stick assembly is used with all models.

To make your transmitter operational, all that is required is the installation of a Mallory M-1603 9V battery or equivalent. Make sure the transmitter switch is off before snapping the battery into place. If you wish your battery to be more secure in the case, wedge the battery in with foam rubber cemented to the back of the case.

The pulsing tone signal of the transmitter is factory adjusted to meet the purpose for which you purchased the transmitter. Following are the specifications. Rudder Only: 50/50 PW (Pulse Width) neutral, 95/5-5/95 PW ratio, 5 pps PR (Pulse Rate) neutral; Galloping Ghost: 50/50 PW neutral, 70/30-30/70 PW ratio, 6 pps PR neutral, 4-12 pps PR ratio; Fast Rate: 50/50 PW neutral, 70/30-30/70 PW ratio, 14 pps PR neutral, 8-20 pps PR ratio.

ADJUSTMENT PROCEDURES

Under no circumstances should it be necessary to adjust the Radio Frequency section of your Pulse Commander. It is factory tuned and sealed; any attempt to change the Radio Frequency tuning will void any existing guarantee.

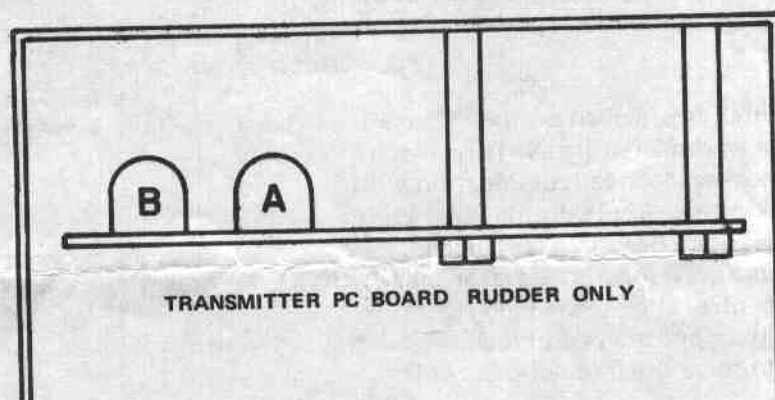
If you have experience in pulse proportional, you may want to change the transmitter's Pulse Width and/or Pulse Rate function to suit a specific application you may be utilizing. Depending upon the model Pulse Commander you have, the following describes how to alter the transmitter's signal. Be sure to make any adjustments in small increments to prevent going so far that you lose proper orientation; also use a wood or plastic fork to prevent shorts. Having a tone monitor on while you make any adjustments is a big help because it allows you to hear what you are doing.

R/O—RUDDER ONLY

There are three variables in the signal transmitted by the R/O transmitter--Pulse Rate neutral, Pulse Width neutral, and Pulse Width ratio. Pulse Rate neutral, or how fast your transmitter is pulsing, is determined by trim pot A; clockwise rotation speeds up the rate and counterclockwise decreased the rate. Your magnetic actuator should bang back and forth from stop to stop fast enough to prevent the airplane from wagging its tail when flying but slow enough so the actuator moves with a positive motion, stop to stop, without drifting or seeking neutral.

Pulse Width neutral is the point where the actuator bangs back and forth equally right and left when the transmitter control stick is neutral. Theoretically, this is when the transmitter is pulsing with a tone that is ON 50% of the time and OFF 50% of the time. (50/50). This point is varied by changing the control pot in the stick assembly. To do so, loosen the set screw in the yoke of the stick assembly and rotate the pot shaft with the aid of the adjustment gear in the stick assembly. When the desired point is reached, tighten the set screw. Minor in-flight change of the pulse width neutral can be accomplished with the external trim lever.

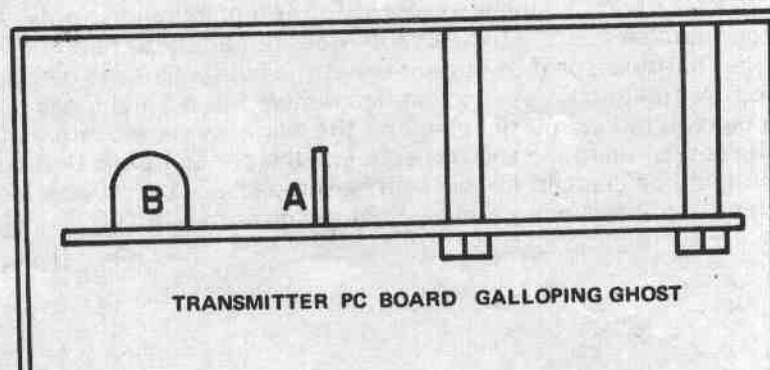
Pulse Width ratio is the amount of width change occurring when the control stick is moved to the extremes. If you wish to change this composition, rotate trim pot B clockwise for more ratio and counterclockwise for less ratio. It will always be necessary to re-neutralize the Pulse Width after trim pot B is rotated.



GALLOPING GHOST

Because Pulse Rate is varied in this system (it is fixed in the R/O version), there is an additional variable in the Galloping Ghost transmitter. This is Pulse Rate ratio, or the amount of Pulse Rate change that occurs at the extreme vertical movement of the stick. Pulse Width neutral, Pulse Rate neutral, and Pulse Width ratio are affected in the same manner and with the same pot designations as described in the R/O adjustment procedures.

Pulse Rate ratio is changed by varying the rate control pot in the stick assembly. To increase the Rate ratio, loosen the set screw for the Rate control pot and, with the adjustment gear, rotate the pot shaft clockwise. Opposite rotation decreases the Rate ratio. Re-neutralize the Pulse Rate with trim pot A.



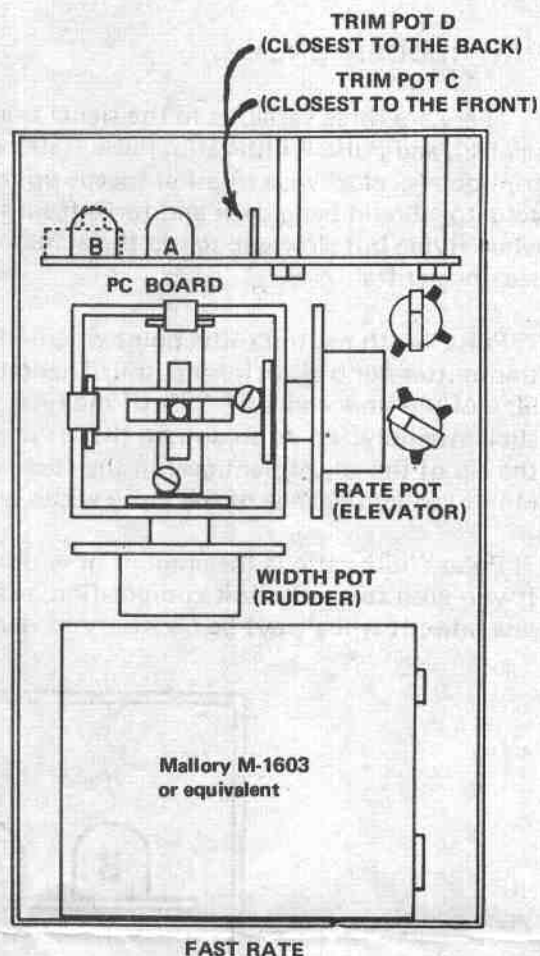
FAST RATE

The Pulse Width neutral, Pulse Rate neutral, Pulse Width ratio, and Pulse Rate ratio are determined in the same manner as in the R/O and Galloping Ghost transmitters. There are two more variables introduced in the Fast Rate transmitter which make it different from any other transmitter on the market today.

Throttle Control. A special throttle control is incorporated in this transmitter which allows full elevator control when the throttle is being advanced or retarded. This is done by allowing just enough signal or lack of signal to be transmitted so the decoder is still functioning; hence, rate or elevator function is maintained. The composition of the signal transmitted when the Red push button is depressed is determined by trim pot C. Clockwise rotation increased the percentage of tone transmitted and counter-clockwise movement decreased the percentage of tone. The same holds true for trim pot D, which determines the composition of the signal when the Black push button is depressed.

Phase Inverter. A switch is provided on the PC board to invert the phase of the transmitted signal. This switch permits the use of any receiver/decoder combination without the elevator interaction that occurs during Pulse Width change whenever the Pulse Rate decoder is triggered by the wrong edge of the pulse waveform. If elevator interaction occurs when the control stick is snapped right or left, move the switch to the opposite position and re-neutralize the width. This will cause the width function to be opposite and should solve the interaction problem.

Both the Galloping Ghost and Fast Rate transmitters can be adjusted to fly a rudder only system by decreasing the Rate neutral and increasing the Width ratio until the desired action occurs.

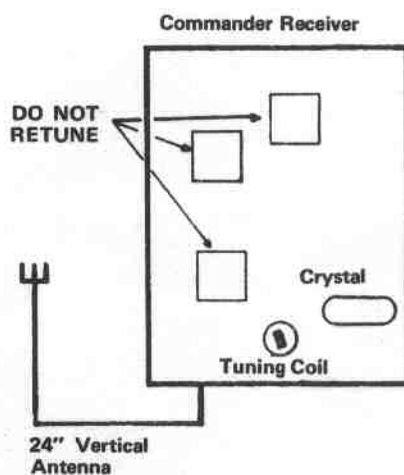


WARRANTY AND SERVICE

The Commander Pulse Proportional series is warranted by Ace Radio Control, Higginsville, Missouri, 64037, to be free from defects in material and workmanship. Any system or unit of the system failing to operate will be repaired or replaced free upon being returned directly to the factory by the owner. A handling fee of \$3.00 is charged. DO NOT RETURN THE UNIT TO YOUR DEALER FOR SERVICE, the warranty is for new merchandise only, and is extended only for 30 days from purchase date. This warranty does not apply to failure of operation due to exhausted or improper batteries, or if in our judgment the equipment has been retuned, tampered with, or received abusive treatment beyond that encountered in normal usage.

Should servicing be required at any time beyond the warranty period, a fee of \$3.00 per unit is required to cover the cost of handling and inspection. All labor and parts that are required to service the damaged unit will be charged for and will be shipped COD. You may also enclose a signed blank check with the amount left open, stating "not good for over \$15.00". This will save you costly COD fees.

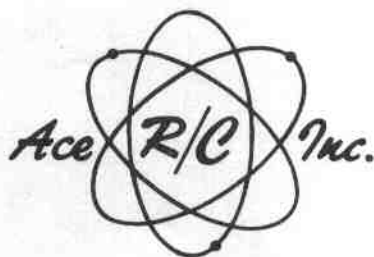
If you have purchased a complete system, there are a few things to keep in mind concerning the airborne unit. The receiver is factory tuned and sealed. The only adjustment that might be necessary is to tune the antenna coil if you changed the length or the type of antenna. Use an insulated tuning wand for this. Do not use a metal screw driver. Under any circumstances **DO NOT** attempt to improve performance by tuning the sealed IF cans; to do so will void any guarantee.



Install your equipment according to the enclosed instructions for your particular unit. Always remember to pack your receiver and batteries in foam rubber, have the batteries in front of the receiver, and run the antenna away from any other metal or wire. A vertical antenna is recommended.

Charge the batteries before using your equipment. If you have a Rudder Only system install a charging plug and jack as shown in the installation instructions. If you have a Galloping Ghost or Fast Rate system, use the enclosed 3 pin polarized male plug on your charger. Charge at the following rates for 12-16 hours after every flying session.

SYSTEM	VOLTAGE	CAPACITY	CHARGE RATE
RUDDER ONLY			
Baby	2.4 V	225 MA	20 MA
Standard	2.4 V	500 MA	50 MA
Stomper	2.4 V	500 MA	50 MA
GALLOPING GHOST	3.6 V	600 MA	60 MA
FAST RATE	3.6 V	1 A	100 MA



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