

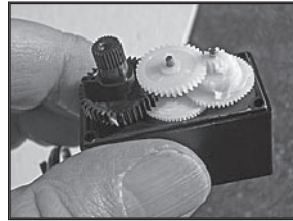
## MODIFICATION OF FUTABA/TOWER/ROBBE PAN SERVO FOR 360° ROTATION

*NOTE: This modification will void the servo's warranty.*

1. Remove servo arm/horn from second servo and discard the horn but save the screw for later. Remove four screws and bottom plate from bottom of servo case. Carefully remove top section of servo case while pressing in on splined drive shaft, leaving all gears in place.

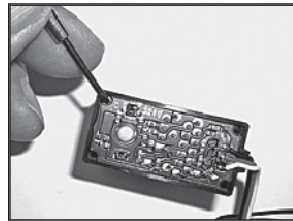
2. Using a knife, diagonal cutters, or rotary tool, remove the drive gear stops from inside the case top.

3. Note the arrangement of the gear train [right] so you'll get them back together correctly. Remove the gears and set all but the main drive gear aside in a clean place.

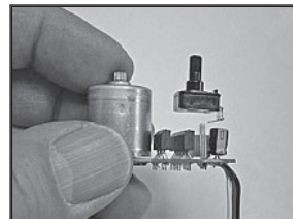


4. Using a knife, diagonal cutters, or rotary tool, remove the single stop on the side of the final drive gear. Test your handiwork by reinserting the spline shaft through the opening in the case top and turn it with your fingers. It should rotate freely and endlessly in the case top in either direction. If it catches, check it again, and remove the plastic stops in the case top if necessary. Set the top and drive gear aside in a clean place.

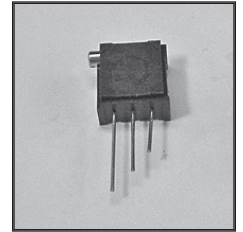
5. Using a very small flat-bladed screwdriver, gently pry the circuit board out of the case, taking care not to chip or break it. Once loosened, it should slide out easily. Set the case aside.



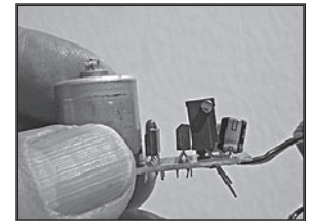
6. Note the large potentiometer (pot) standing above the rest on three wire legs [right]. Using a fine-point soldering iron and desolder braid, carefully remove the solder from where the three legs join the circuit board; remove the pot and discard it.



7. The large pot will be replaced by a 5 kilohm Cermet trimmer with an adjustment screw on the side. The standard internal pot has a range of less than one turn, but the trimmer has a range of about 20 times that, which will allow a much finer adjustment.

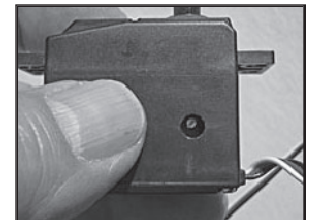


Place the Cermet trimmer into the holes left by the discarded pot, oriented so the adjustment screw is accessible from the side [right]. Gently bend the other components out of the way if necessary, but take care that nothing extends beyond the edges of the circuit board so it will fit back in the case. Solder the trimmer legs into place, taking care not to overflow solder onto other circuitry, and trim the excess leads.



8. Turn on the transmitter and set the pan trim slider for channel 4 to the middle. Plug the pan servo into channel 4 of the receiver and the receiver battery into the receiver. The motor will spin rapidly. Using a flat-bladed jeweler's screwdriver, adjust the trimmer screw one way or the other until the motor stops. The Cermet trimmer has a range of about 16 turns end to end, but you won't feel it stop at either end. If you get no results after a dozen turns, go the other way. If you can't make the motor stop, check your solder joints to be sure nothing is shorted.

9. Drill a 3/16" hole in the side of the servo case to align with the trimmer's adjustment screw, and using the diagonals or rotary tool, clean out the interior of the case enough that the new trimmer will fit inside.



10. Reassemble the servo. Test it again and tweak the adjustment screw as needed. *NOTE: It may be necessary to fine-tune this trimmer occasionally in the field, so it's wise to carry a small screwdriver when you fly.*