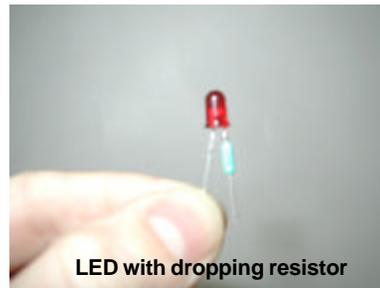


Installation Instructions for the Skid-Steer Mixer

1. Connect the four mixer servo connectors to the RC receiver. Only Futaba, Hitec, and Tower Hobbies receivers have been tested with the mixer although other standard PPM type negative shift systems may work. The connectors are compatible with Futaba radios but can be used as universal servo connectors by trimming off the alignment tab. The connectors are labeled 1 through 4 along with abbreviated function descriptions (ie, aileron, elevator, throttle, rudder). Note that the 'throttle' function (left stick up/down) can be connected to a fifth or sixth channel (on a 4+channel radio) if the 'channel' is switched by a three-position toggle switch with center as neutral. This makes cannon/MG actuation a little easier than moving a stick up and down and back to neutral.
2. *All assembled mixers are functionally tested prior to shipment so this step may be skipped if desired although testing is recommended to ensure radio system compatibility before installation.* The mixer & RC radio system combination can be checked for operation prior to installation in a tank. The simple test requires a 12V source (battery) and the LED with current dropping resistor provided with the mixer. **DO NOT USE ANY OTHER LOAD TO TEST THE MIXER AS DAMAGE TO THE MIXER CAN RESULT. DO NOT TRY TO USE AN LED WITHOUT A CURRENT LIMITING RESISTOR AS THE MIXER OUTPUTS COULD BE DAMAGED DUE TO EXCESSIVE CURRENT.**
 - a. Begin by centering all transmitter sticks, trims, and switches then turn the transmitter ON. The transmitter should always be turned on first as the mixer senses neutral stick/switch positions upon power up.
 - b. Ensure none of the mixer outputs are shorted together or to (+) or (-).
 - c. Apply 12 volts to the positive and negative leads of the mixer. **WATCH THE ORIENTATION.** Do not apply reverse voltage or the mixer will be damaged.
 - d. The LED on the mixer should light indicating the microcontroller is operating. If the LED is not ON, recheck all connections and ensure the 12V source is delivering power. Do not apply less than 12V or more than 14V to the mixer.
 - e. Temporarily connect the LED's cathode pin (opposite the resistor) to (-) ground and connect the resistor on the LED's anode to any of the mixer outputs (LF, LR, RF, RR, TL, TR, Cannon, MG). Move the corresponding transmitter control stick or switch and note when the LED lights. Return the stick or switch to neutral and the LED should extinguish. If so, the mixer is operating properly at this point.
 - f. Carefully remove the 12V source from the mixer.
3. Begin mixer installation by desoldering and removing the decoder IC (PT8A991AP or RS2599) from the Stuart or Abrams receiver board. A low wattage soldering iron and "Solder Wick" or a "Solder Sucker" tool should be used. These items are commonly available at electronics supply stores like Radio Shack.
4. The mixer input wires may now be soldered to the receiver. The mixer outputs are labeled. The wires should be soldered to the corresponding pad on the tank's receiver board. The wires may be installed through the original holes for the decoder pins or soldered on the bottom of the board. Ensure the wires are soldered to the proper pads otherwise the mixer will not operate correctly.
5. Photo 1 shows the location of 12V and Ground on the Stuart and Abrams receiver boards. It is a good idea to verify the power connection orientation if a volt-ohmmeter is available. Carefully solder the power wires to these locations. **ONLY** pick up 12V and ground from this location. **DO NOT CONNECT** the mixer inputs to the connections in Photo 1 or the mixer will be damaged!!!! **ONLY** connect mixer inputs to pins identified in Photos 4 or 5.



6. Recheck all connections. Once satisfied all wires are connected to the proper locations ensure the tank is clear of obstacles and free to move. Power the transmitter ON then power the tank ON. Verify the LED on the mixer is ON (lit).
7. Move the sticks/switches and verify controls function properly. Note that some RC systems may require 'tweaking' of the trims if tank functions do not cease when the sticks/switches are centered.

NOTE: The mixer is equipped with a voltage regulator capable of powering the mixer and a RC receiver when used with a 4 channel RC system. If servos are used along with the mixer in a system with 4+ channels an alternate 5 or 6v source should be supplied to the servos to ensure proper operation. The built-in voltage regulator cannot provide sufficient current for additional servos. The simplest method is to extract the red power pin from the servo's connector and apply 5 or 6 volts directly to the red servo power wires and the black ground wires (photo 3).

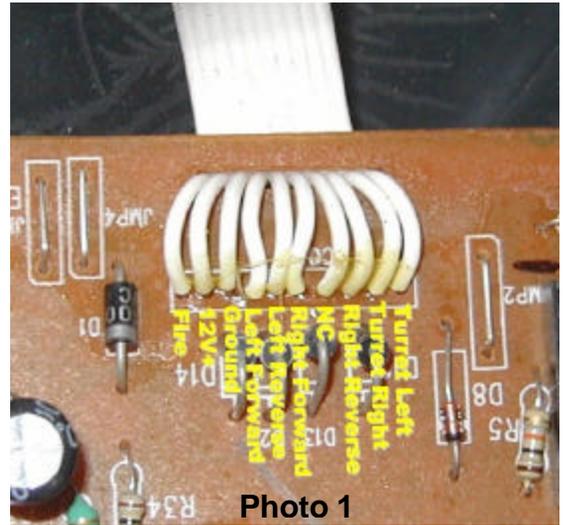


Photo 1

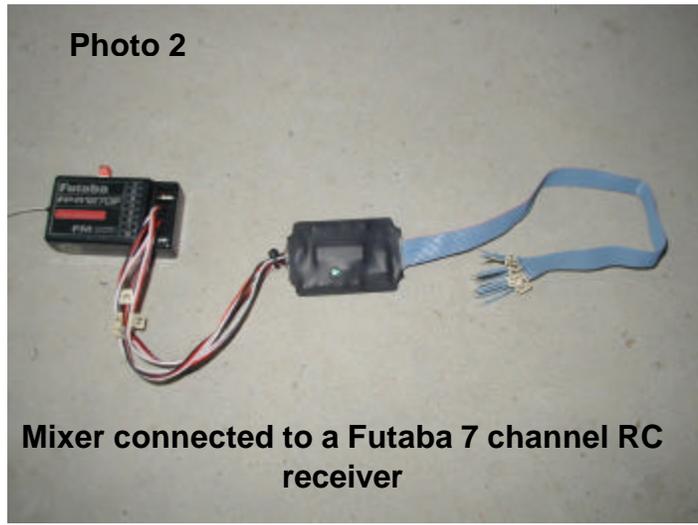
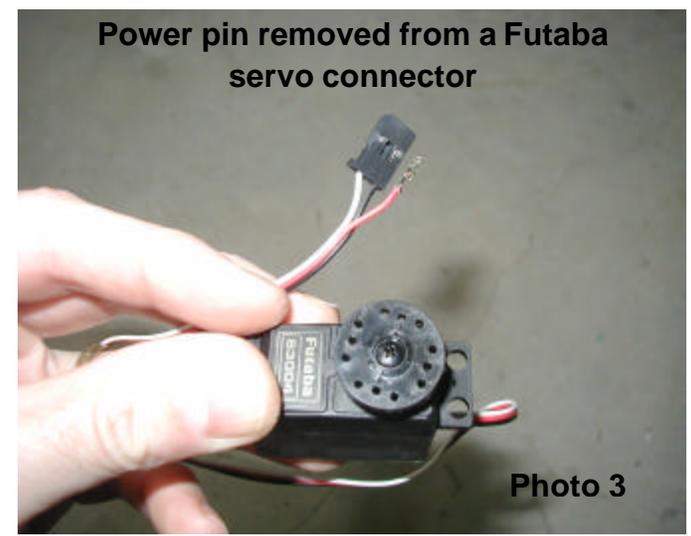


Photo 2

Mixer connected to a Futaba 7 channel RC receiver



Power pin removed from a Futaba servo connector

Photo 3

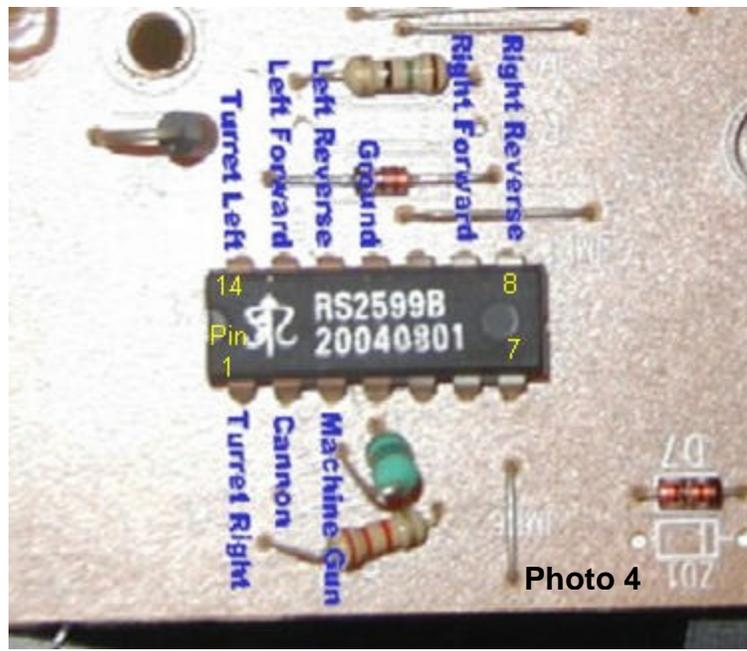


Photo 4

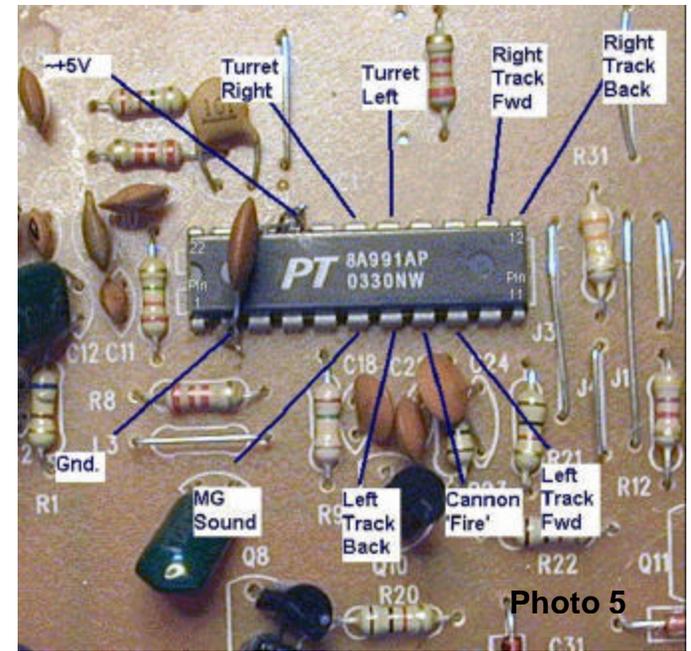


Photo 5