

For a given amount of servo movement, the closer the hinge point (where the wire is connected to the arm) is to the servo shaft the less the amount of linear movement of the wire. This causes the semaphore or crossing gate to move less.

Using a Servo to Move Roundhouse Doors:

The small size, flexibility and low cost of modern servos make them ideal for animation. Figure 5 shows a servo setup to open and close a set of roundhouse doors.

Additional Information:

There are several Tech Talk videos on Team Digital's web site that demonstrate ways to install servos for a variety of applications including - Turnouts, Semaphores and Roundhouse doors. They supplement instructions in this manual and provide more detail with a visual element that is difficult to capture on paper.

Servo specifications:

Actual specifications may vary from these.

- Torque: ~ 17.2 oz/in (1.17 kg. cm) @ 4.8V
- Speed: ~ .12 sec/60 deg @ 4.8V
- Dimensions: ~ (L x W x H): .90 x .45 x .94 in (23 x 12 x 24 mm)
- Weight: ~ .26 oz (7.5 g)

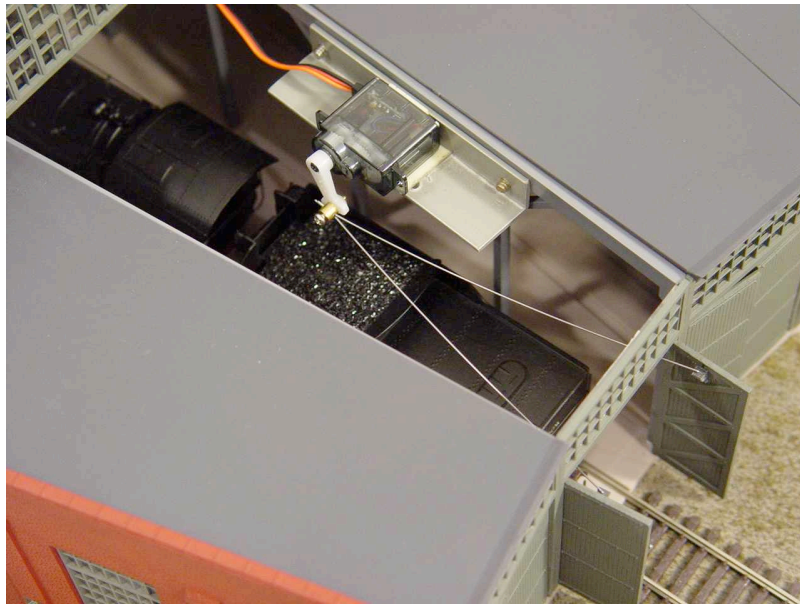


Figure 5

WARNING: This product contains a chemical known to the state of California to cause cancer, birth defects or other reproductive harm.



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SMC4 Servo Package

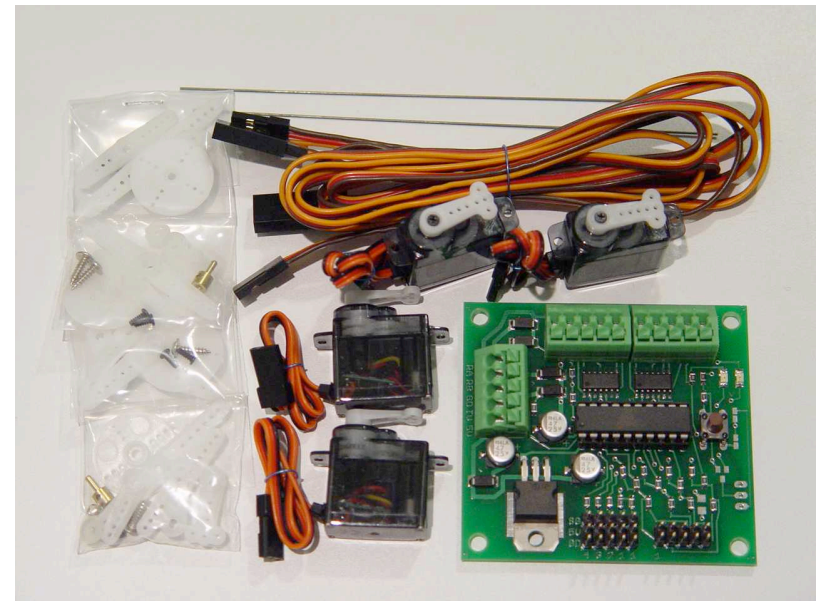
Small servos are excellent devices for animating:

- > Turnouts (Switches)
- > Semaphores
- > Crossing Gates
- > Roundhouse doors

Included in the package are:

- 1 SMC4
- 4 small servos
- 2 36" servo extension cables
- Hardware & linkage for 4 servos

Note: Servo and hardware may vary from pictures



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General Information:

A hardware package is included with each servo that facilitates connecting linkage to the servo. This includes several types of arms or (horns) and a couple of pieces of music wire that can be cut to the desired length or used as is. The linkage is typically used to change the rotation of the servo shaft into linear movement.

The arms (horns) fit on the servo shaft in only one direction. Mating splines on the shaft and arm keep the arm from slipping on the shaft. This also provides for coarse positioning of the arm. The arm is secured to the shaft by a small screw.

If a servo is located farther away from the SMC4 than it's cable length, then one or both of the 36" extension cables can be used.

Using a servo as a switch machine:

Steps to prepare the servo for use as a switch machine.

1. Cut one of the pieces of music wire in half or the length needed for the turnout.
2. Bend about 3/8" of the end of that wire at a right angle.
3. Drill a 1/16" hole in the servo arm (horn) as shown in figure 1.
4. Insert the screw in the end of swivel screw connector and put the wire through the swivel hole.
5. Insert the swivel screw connector shaft in the hole in the servo arm.
6. Press the retainer on the swivel connector shaft as in figure 2.
7. Press the arm on the servo and rotate the servo shaft to it's center position. Then remove the arm.
8. Press the arm on the servo so it is in the correct position when the servo is mounted. In this case perpendicular to the mounting surface. Now secure it with a screw as shown in figure 2.

There are several ways of mounting a servo as a switch machine. One way is to just screw the servo to the wood under the turnout. The large headed screws keep the servo in place. See figure 3A. Another way is to cut a piece of a paint stir stick and drill two over size holes in it. The over size holes allow the servo to be moved once it is in place. The servo is stuck to the paint stick with double sided foam. See figure 3B. Double sided form could also be used to stick the servo directly to the bench work.

Using a servo as a semaphore or crossing gate machine:

Figure 4 shows a couple of ways the wire controlling a semaphore can be connected to the servo arm (horn). Whenever the swivel screw connector is used there must be a 1/16" diameter hole drilled into one of the holes in the servo arm (horn) so it's shaft will fit. The servo arm must be positioned in the center of the servo rotation as discussed above. In this case it would be positioned parallel to the mounting surface. **Note:** The screw in the swivel screw connector will not tighten on a wire of size of .02" or smaller.

For a given servo speed, the closer the hinge point (where the wire is connected to the arm) is to the servo shaft the slower the linear movement of the wire. This causes the semaphore or crossing gate to move slower.

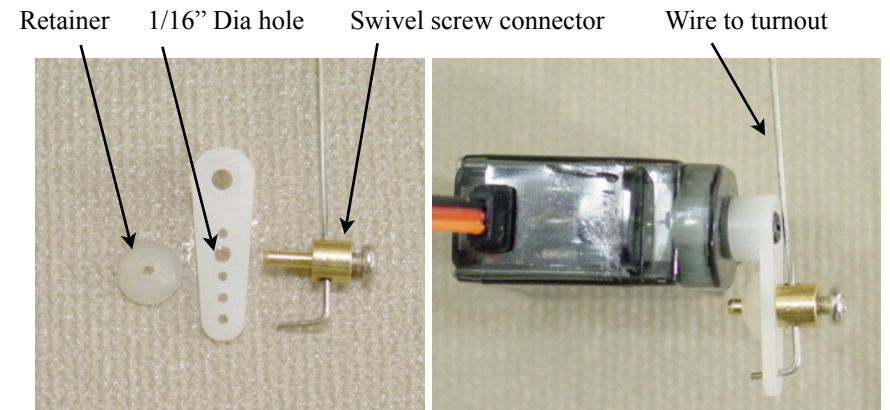


Figure 1
Hardware and linkage used
for turnouts

Figure 2
Arm (horn) with swivel screw connector
and spring wire attached to a servo

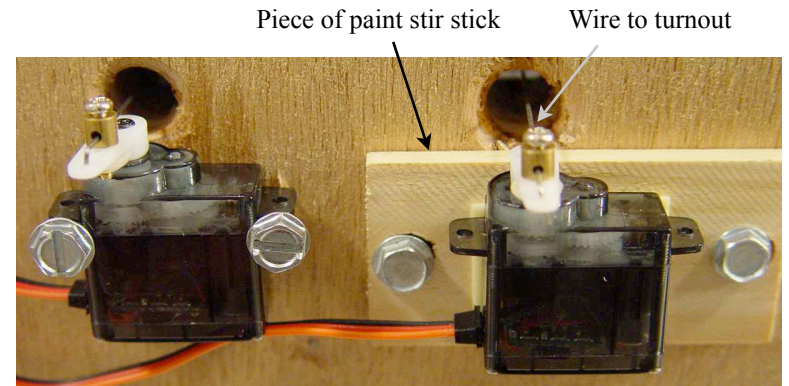


Figure 3A

Figure 3B

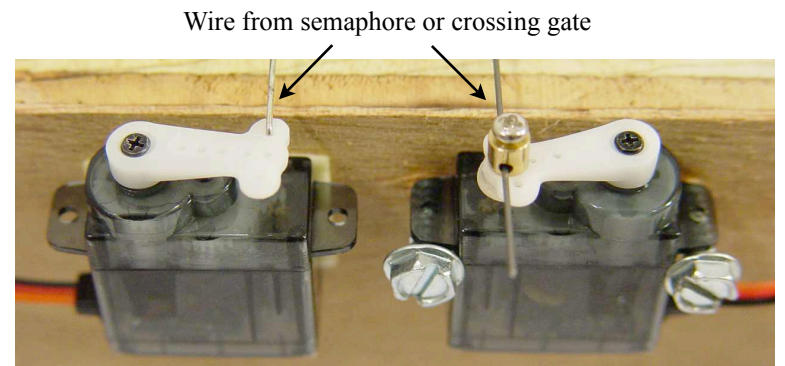


Figure 4