SCARY TERRY'S

http://www.scary-terry.com/buckyservo/buckyservo.htm

Installing a Servo In a Bucky Skull

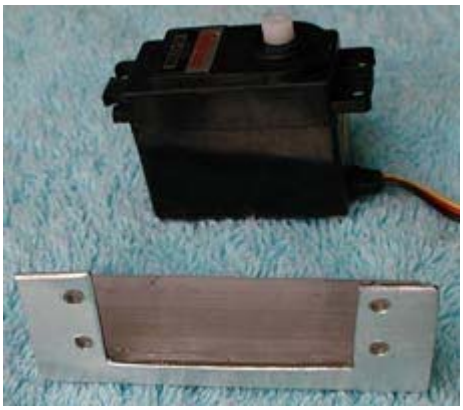
By Scary Terry

Parts Needed:

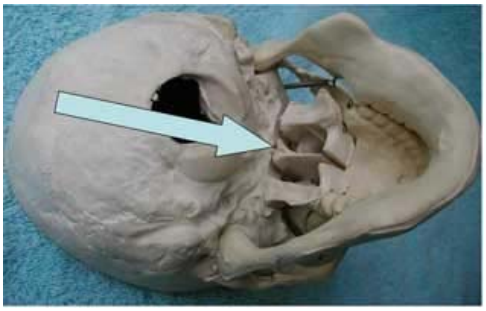
- **Bucky Skull** (see page 2 for details)
- **Standard servo** (HiTec HS-425BB or equiv. See details at ServoCity)
- **2-3/4" long 1"x1"x1/16" angle aluminum** (available at home centers-Home Deopt and Lowes-or hardware stores)
- **0.039" Music wire** (available at most "real" hardware stores and most hobby shops, here's one source, item #597279)
- **1 1/2" #6 screw, nut, washer**
- **Servo mounting hardware** (#4/40 screws and nuts)
- **2-4" Cable ties** (aka: tie wraps, zip ties)

Note: The following procedure has been modified as of 2/2005 to accommodate the newer Bucky skulls, which can be identified by the "Made In China" label on the back. If you have an older Bucky skull, click here for the original instructions.

We need to make a bracket that will allow us to mount a servo on the area marked by the dotted line.

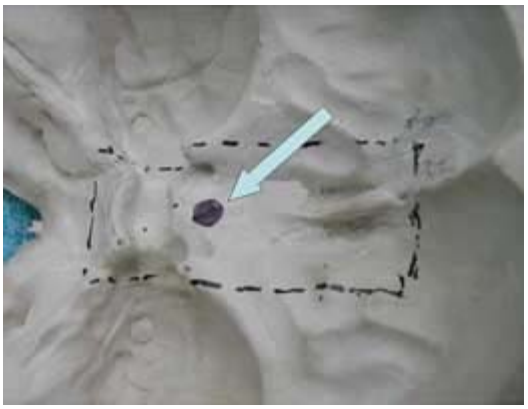


Using the appropriate tools (hack saw, tin snips, file, etc.) cut an opening in one side of the aluminum angle to accommodate the servo. Be sure to leave some of the "angle" to maintain strength. Drill holes to match the servo mount for 4/40 screws. This will be our servo bracket.



To mount the servo bracket in the skull, we'll want to drill a hole that comes out in the nasal cavity. We'll need to cut away part of the bone that divides the nasal cavity (the septum) as shown by the arrow.

Using tin snips or diagonal cutters, snip away the rear portion of that bone. I've found that in most skulls, this piece is loose and after you cut it, it is easily removed. This will leave a nice flat surface (right) to accommodate the nut and washer in the next steps.



On the inside of the skull, right above the flat area shown above right, make a mark. Place the servo bracket where it will be mounted and transfer this mark to the bracket.

Using the appropriate size drill bit for a #6 screw, drill a hole through the bracket and skull where they were marked.

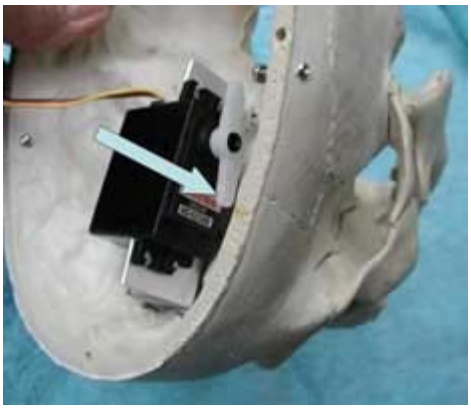
Using the #6 screw, nut and washer, mount the servo bracket in the Bucky skull. Tighten securely but don't over tighten as it might bend the bracket.

Bucky's jaw is held in place by a pair of springs. We need to install a permanent pivot for the jaw and also eliminate the springs because they are too much mechanical resistance for the servo. We'll use the cable ties as our pivot.

Using a drill bit the same size as the cable tie, drill a hole through the jaw and into the skull as shown right. Drill a second hole into just the skull, to the rear of the jaw bone as shown far right.

Insert the cable tie from the inside the skull down into the jaw bone, loop it back into the skull through the second hole (right) and fasten it inside the skull. In fastening the cable tie, tighten it just enough so the jaw won't flap around but still has freedom to move.

Repeat the same for the other side of the jaw then remove the springs and all associated hardware.



The next step is to drill a hole in the skull that will allow us to connect the servo to the jaw using a piece of the music wire. The wire will run from the front of the servo horn (left) to the hole in the left side of the jaw where the spring was originally mounted (right).

While holding the servo in place, make a mark on the skull in line with the two points described above (left). Drill a 1/4" hole in the skull at this mark. If you were really good (lucky?), the hole will line up perfectly between the two points, if not, you'll have to "modify" the hole slightly to be in line.

Next, using a pair of long nose pliers, create an offset bend, as shown left, in one end of a 6" piece of the music wire. Attach it to the outer hole in the servo horn as shown right.

Feed the wire through the hole and install the servo in the bracket using the #4/40 screws and nuts. I find that using just two screws will hold it securely in place.

In preparation for the next step, position the servo horn as shown right.

With the servo horn in the position shown above and the jaw fully closed, bend the music wire at the point adjacent to the hole in the jaw (left). Complete the installation by inserting the wire in the jaw hole, bending it upward and trimming it off as shown right.

At some point, you're probably going to need to adjust the position of the servo horn on the servo. I recommend drilling a small hole in the side of the skull, as shown left, to accommodate a small phillips screwdriver. Be careful when drilling the hole so as not to slip and drill out the center core of the servo (please don't ask me how I know about this).

There are several ways to drive the servo. I've developed a circuit to drive it with a audio source. Click here for details.

*What is a Bucky Skull you ask? It's a very well built plastic skull available from the Anatomical Chart Company. Most haunters use 4th class Buckys available through their Bucky's Boneyard web site for very low prices.