Robot Hardware
MOTOR OPTIONS

Faulhaber 141:1
- 6V, 11Ω coil
- 13,400 RPM no-load motor speed
- 141:1 gearbox
- 3mm D shaft
- 2-56 face screws (0.43” spacing)
- HES164A encoder (2 line)

Pololu metal gearmotor
- 6V nominal
- 1.6A stall current
- ~30,000 RPM no-load motor speed
- 150:1 gearbox
- 3mm D shaft
- M1.6-0.35 (9.00mm spacing)
- 1mm extended motor shaft (some models)
Optical Encoder

Quadrature Encoding

second ring
90 degree phase shift
edge triggering
mx_encoder_zero(channel)
reset the encoder counter for the specified channel (1 or 2)

result = mx_encoder(channel)
read the specified encoder channel (1 or 2)
mechanical interface elements
<table>
<thead>
<tr>
<th>Poles</th>
<th>Number of Circuits</th>
<th>SP (single pole)</th>
<th>DP (double pole)</th>
<th>MP (multi pole)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throws</td>
<td>Number of Possible Circuits</td>
<td>ST (single throw)</td>
<td>DT (double throw)</td>
<td>MT (multi throw)</td>
</tr>
</tbody>
</table>

- **SPST**
- **DPST**
- **SPDT**
- **DPDT**
<table>
<thead>
<tr>
<th>Momentary</th>
<th>switch holds state while depressed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NO</strong></td>
<td>normally open momentary</td>
</tr>
<tr>
<td><strong>NC</strong></td>
<td>normally closed momentary</td>
</tr>
<tr>
<td><strong>toggle</strong></td>
<td>two stable positions</td>
</tr>
<tr>
<td><strong>slide</strong></td>
<td>linear motion</td>
</tr>
<tr>
<td><strong>rotary</strong></td>
<td>dial motion</td>
</tr>
</tbody>
</table>
robot construction
Common Sheet Materials

Acrylic

MDF
The Venerable Standoff

THREAD OPTIONS:
4-40 (through hole = 0.120”)
6-32 (through hole = 0.145”)

COMMON BODY LENGTHS:
1/4”, 3/8”, 1/2”, 3/4”, 1”