

Chippy

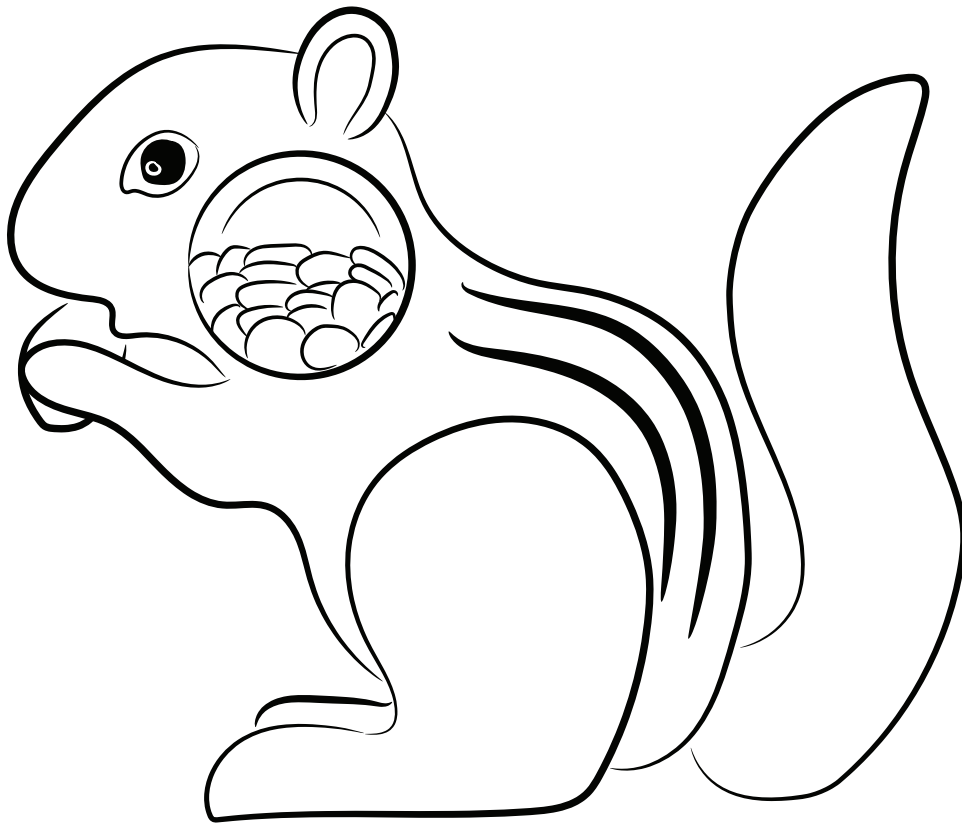
a mechanical coin bank

sample

Important information:

McMaster Carr, a supplier whose part numbers are referenced throughout this document, can only ship within the United States. Builders outside of the U.S. must find an alternate supplier for the required hardware.

Hardware part numbers and availability are subject to change.
Verify that all hardware or equivalents are obtainable prior to purchasing these plans.



design by Derek Hugger

The Basics



WARNING!

Always supervise children interacting with Chippy. The sculpture contains coins and other small parts that could pose a choking hazard. Chippy is heavy and could cause severe injury if it fell on someone; always store Chippy in a safe location where it cannot fall.

Contents

These plans include all the information required to build Chippy. They provide an outline of the build process, tips for an accurate and successful build, lists of required tools and off-the-shelf components, a complete parts list, full scale patterns for all plywood parts, and step-by-step assembly instructions.

Before Building

Read and understand all instructions before building. Failure to do so will lead to increased frustration levels, lengthened build times, wasted material, and other vexing occurrences.

Build Process

Always wear eye protection and any other necessary personal protective gear. Read, understand, and abide by all manufacturer instructions and warnings for all tools used.

1. Use a light duty/general purpose spray adhesive to temporarily bond the patterns to plywood and acrylic. Only apply adhesive to the protective film on the acrylic; never apply adhesive to the acrylic directly. Apply the adhesive evenly and sparingly.
2. Drill the holes first, and then cut out the parts. Hole alignment between parts is critical to proper function, so care must be taken to drill the holes accurately. Take time to cut out the parts accurately. An accurately cut part will require less sanding and less modification later.
3. Remove the patterns from the cut plywood parts, and then sand the parts to remove rough edges and any residual adhesive.
4. Follow the assembly instructions to assemble each component.
5. If desired, fully disassemble components to stain and finish them.

Notes

When printing the patterns, always print at 100% scale. Do not use the “scale to fit page” option.

Using a quality, flat Baltic birch plywood is important. Cheaper, lower quality plywood, such as types often found at stores like Home Depot, can be warped and knotted.

Changing humidity levels can cause wood parts to swell and move. Some binding or changes in performance may occur with changes in humidity. As humidity levels return to normal, so too should the sculpture’s performance.

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Tools

Power Tools

General

Drivers

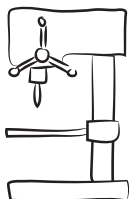
Required



bandsaw



scroll saw



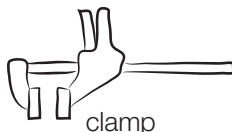
drill press



belt/disc sander



brad point drill bits
1/16", 5/64", 3/32", 3/16", 1/4"



clamp



calipers



phillips #1

Supplies



sandpaper



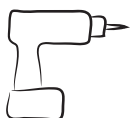
spray adhesive



wood glue

Recommended

(but not required)



drill



cnc router*

* A CNC router is an optional replacement for the bandsaw and scroll saw for cutting the plywood parts.

Tips + Tactics

Pattern Syntax

Patterns are labeled with a part name followed by a thickness dimension.

Example: Rotator 5 is cut from 1/4" plywood.

A hole with a dot in the center indicates a thru hole. Two concentric circles with a dot indicate a hole with a counterbore.

If a hole has a ∇ symbol next to it, that indicates the hole is drilled to a specific depth (not thru).

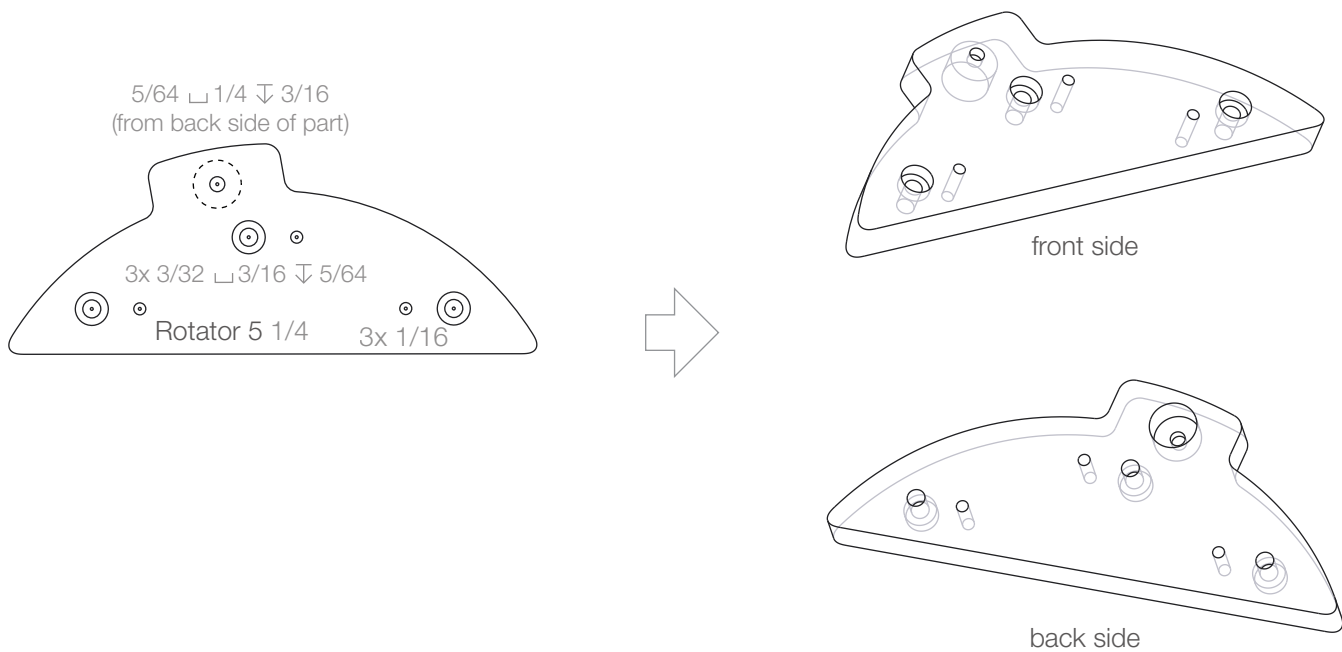
Example 1: Rotator 5 has three 1/16" holes. It also has three 3/32" holes, each with a 3/16" counterbore drilled 5/64" deep.

Example 2 (not shown below): Leg Left has six 1/16" holes that are drilled 3/8" deep.

Two concentric circles with a dotted outer circle indicate a hole with a counterbore drilled from the back side of the part.

The hole callout will also say "(from back side of part)" under it.

Example: Rotator 5 has a 5/64" hole with a back side counterbore: 1/4" diameter, drilled 3/16" deep.



Color Recommendations

Use a black stain (like Minwax True Black 274) or black paint for the 1/8" thick Body parts (Body 2, Body 4A, Body 4B, Body 6), and Eye Black parts.

Use a dark brown stain (like Minwax Honey 272) for the three Nut parts.

Use a white stain (like Minwax White Wash Pickling) or white paint for the Eye White parts.

Use a light brown stain (like Minwax Special Walnut 224) for all other wood parts.

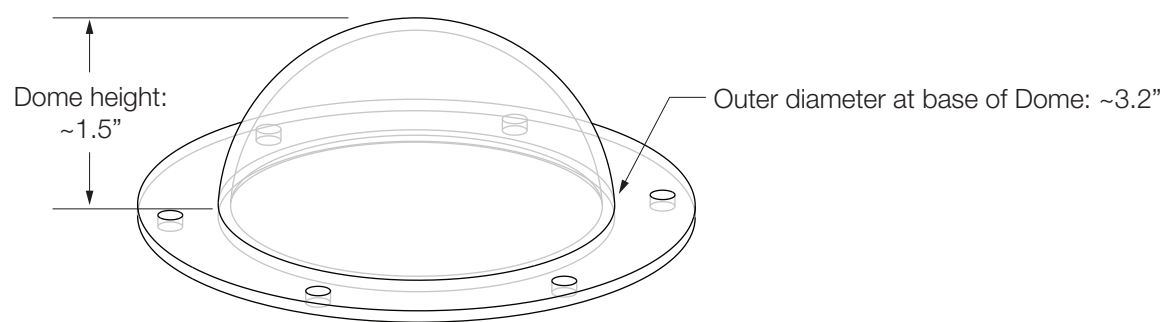
Parts + Assemblies List

Type	Description	Qty	Type	Description	Qty	Type	Description	Qty
Hardware	Magnet 1/4" x 1/4"	2	Plywood 1/8"	Body 2	1	Subassembly	Body 1 Asm	1
Hardware	Magnet 1/4" x 3/16"	2	Plywood 1/8"	Body 4A	1	Subassembly	Body 7 Asm	1
			Plywood 1/8"	Body 4B	1	Subassembly	Body Asm	1
Hardware	Screw #2 x 3/8"	6	Plywood 1/8"	Body 6	1	Subassembly	Leg Asm	1
Hardware	Screw #2 x 3/4"	76	Plywood 1/8"	Ear	2	Subassembly	Nut Asm	1
			Plywood 1/8"	Leg Left Spacer	1	Subassembly	Rotator 5 Asm	2
Hardware	Washer	6*	Plywood 1/8"	Nut Thin	1			
			Plywood 1/8"	Rotator 4	2	Top Level Assembly	Chippy	1
* Quantity will vary depending on wood tolerances.			Plywood 1/4"	Rotator 3	2			
			Plywood 1/4"	Rotator 5	2			
			Plywood 1/2"	Body 1	1			
			Plywood 1/2"	Body 3	1			
			Plywood 1/2"	Body 5	1			
			Plywood 1/2"	Body 7	1			
			Plywood 1/2"	Eye Black	2			
			Plywood 1/2"	Eye White	2			
			Plywood 1/2"	Leg Left	1			
			Plywood 1/2"	Leg Right	1			
			Plywood 1/2"	Nut Thick	2			
			Plywood 1/2"	Rotator 1	4			
			Plywood 1/2"	Rotator 2	2			
			Acrylic <1/8"	Window 1	1			
			Acrylic <1/8"	Window 2	1			
			Acrylic <1/8"	Window 3	1			
			3" Acrylic Dome	Dome	2			

Hardware & Domes

Description	Qty	McMaster P/N *		K&J P/N**
Magnet 1/4" x 3/16" Neodymium, Grade N52	6	5862K109	or	D22-N52
Magnet 1/4" x 1/4" Neodymium, Grade N52	2	5862K116	or	D43-N52
Screw #2 x 3/8" Pan Head Self Tapping Screw	6	92470A097		-
Screw #2 x 3/4" Pan Head Self Tapping Screw	67	92470A103		-
Washer 0.218" OD, 0.094" ID, ~0.02" thick	6***	90618A113		-

Dome SupremeTech 3" Acrylic Dome [check Amazon and eBay for availability]. See relevant approximate dimensions below:



* Part numbers referenced are from www.mcmaster.com.
** Part numbers referenced are from www.kjmagnetics.com.
*** Quantity will depend on wood tolerances.

Scale reference. To measure exactly six inches when printed.



Leg Right 1/2

4x $\frac{3}{32}$ $\sqcap$ $\frac{3}{16}$ $\Downarrow$ $\frac{1}{4}$

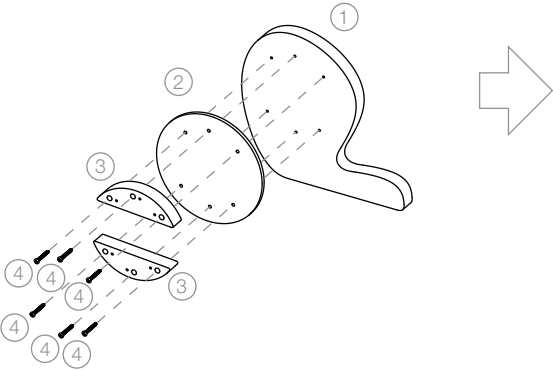


6x $\frac{1}{16}$ $\Downarrow$ $\frac{3}{8}$



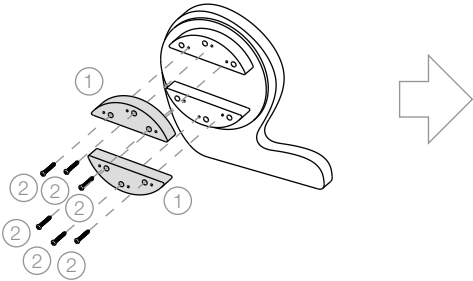
Leg Left 1/2

Leg Asm



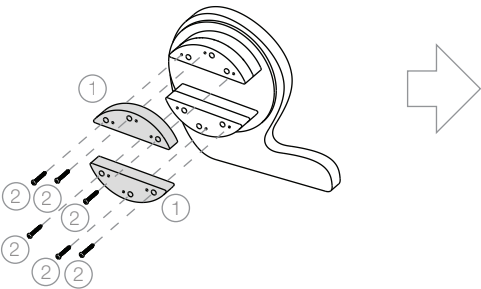
Step 1

- | | | |
|---|-----------------|----|
| 1 | Leg Left | 1x |
| 2 | Leg Left Spacer | 1x |
| 3 | Rotator 1 | 2x |
| 4 | Screw #2 x 3/4" | 6x |



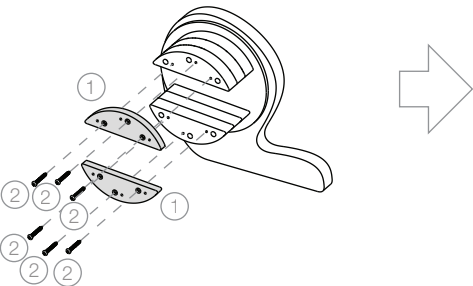
Step 2

- | | | |
|---|-----------------|----|
| 1 | Rotator 2 | 2x |
| 2 | Screw #2 x 3/4" | 6x |



Step 3

- | | | |
|---|-----------------|----|
| 1 | Rotator 1 | 2x |
| 2 | Screw #2 x 3/4" | 6x |

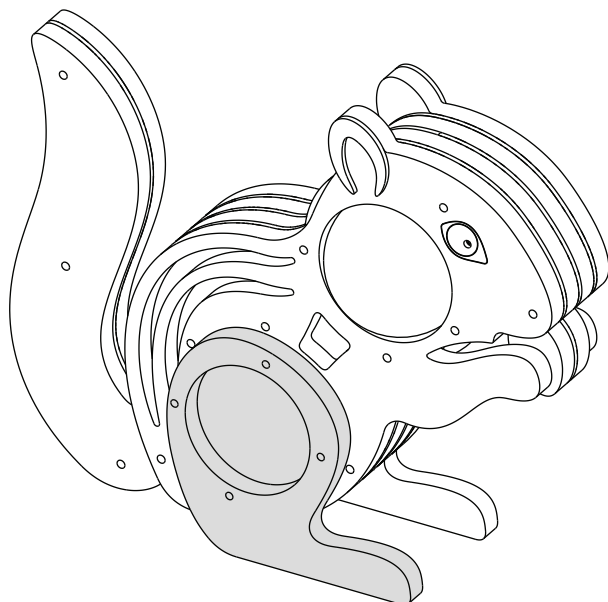
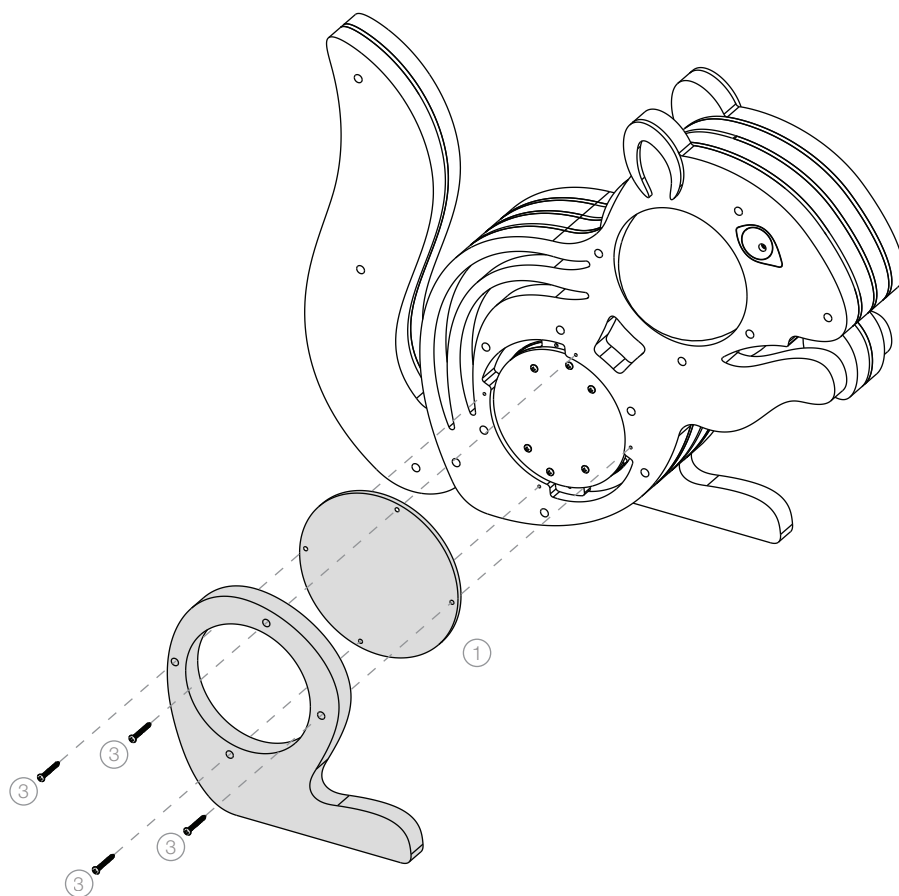


Step 4

- | | | |
|---|-----------------|----|
| 1 | Rotator 3 | 2x |
| 2 | Screw #2 x 3/4" | 6x |

Top Level Assembly

Step 3



- | | | |
|---|-----------------|----|
| 1 | Window 3 | 1x |
| 2 | Leg Right | 1x |
| 3 | Screw #2 x 3/4" | 4x |