

Building an Enhanced Flight Mill for the Study of Tethered Insect Flight

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jove.com/video/62171

Materials

Name	Company	Catalog Number	Comments
180 Ω Resistor	E-Projects	10EP514180R	Carbon film; stiff 24 gauge lead.
19 Gauge Non-Magnetic Hypodermic Steel Tubing	MicroGroup	304H19RW	
2.2 k Ω Resistor	Adafruit	2782	Carbon film; stiff 24 gauge lead.
3D Printer	FlashForge	700355100638	
3D Printer Filament	FlashForge	700355100638	Diameter 1.75 mm; 1kg/roll.
3D Printing Slicing Software	FlashPrint	4.4.0	
Acrylic Plastic Sheets	Blick Art Supplies	28945-1006	
Aluminum Foil	Target	253-01-0860	
Breadboard Power Supply	HandsOn Tech	MDU1025	Can take 6.5V to 12V input and can produce 3.3V and 5V.
DI-1100 USB Data Logger	DATAQ Instruments	DI-1100	Has 4 differential armored analog inputs.
Electrical Wires	Striveday	B077HWS5XV	24 gauge solid wire.
Entomological Pins	BioQuip	1208S2	Size 2; diameter 0.45 mm.
Filtered 20 μ L Pipette Tip	Fisher Scientific	21-402-550	
Hot Glue Gun with Hot Glue	Joann Fabrics	17366956	
IR Sensor	Adafruit	2167	This is the 3 mm IR version; works up to 25 cm.
Large Clear Vinyl Tubing	Home Depot	T10007008	Inner diameter 3/8 in; outer diameter 1/2 in; length 20 ft.
Large Magnets	Bunting	EP654	Low-friction N42 neodymium; diameter 0.394 in; length 0.157 in; holding force 4.9 lb.
Laser Cutter	Universal Laser Systems	PLS6.75	
M5 Hex Nut	Home Depot	204274112	Thread pitch 0.8 mm; screw length 20 mm; diameter 5 mm.
M5 Long Iron Screws	Home Depot	204283784	Phillips pan head; thread pitch 0.8 mm; screw length 20 mm; diameter 5 mm.

M5 Short Iron Screws	Home Depot	203540129	Philips pan head; thread pitch 0.8 mm; screw length 10 mm; diameter 5 mm.
Neoprene Rubber Sheet	Grainger	60DC16	Length 12 in; width 12 in; depth 1/8in.
Online 3D Modeling Software	Autodesk	2019_10_14	Tinkercad.com offers a free account.
Power Adaptor	Adafruit	63	9 VDC 1000mA regulated switching; input voltage DC 3.3V 5V.
Small Clear Vinyl Tubing	Home Depot	T10007005	Inner diameter 1/4 in; outer diameter 3/8 in; 20 ft long.
Small Magnets	Bunting	N42P120060	Low-friction N42 neodymium; diameter 0.120 in; length 0.060 in; holding force 0.5 lb.
Solderless MB-102 Breadboard	Adafruit	239	830 tie points; length 17 cm; width 5.5 cm; input voltage, DC 3.3 V 5 V.
Sophisticated Finishes Iron Metallic Surfacers	Blick Art Supplies	27105-2584	
Wire Cutters	Target	84-031W	