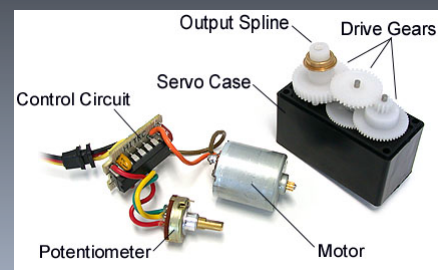


# Introduction to Mechanisms and Machines for the Kinetic Art Tinkerer

Hobby servo + linkages

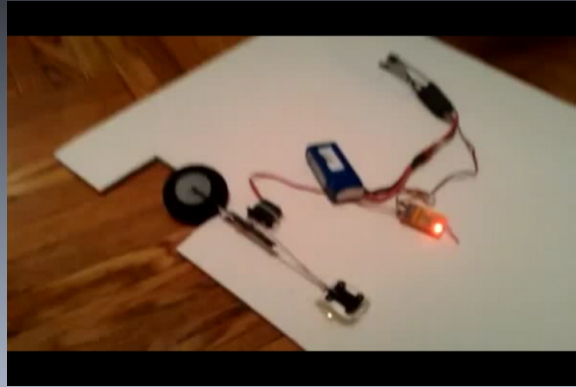




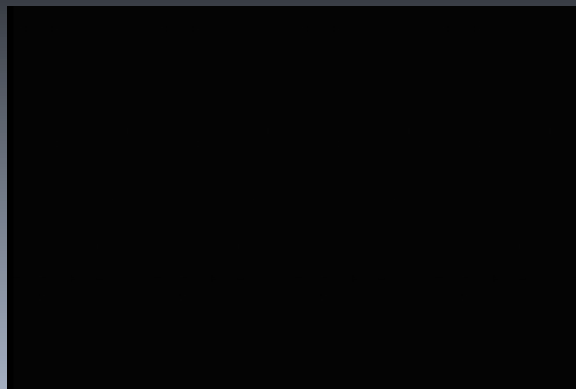
Linkages can be simple like a wire or cable



Or direct linkages to other pre built objects

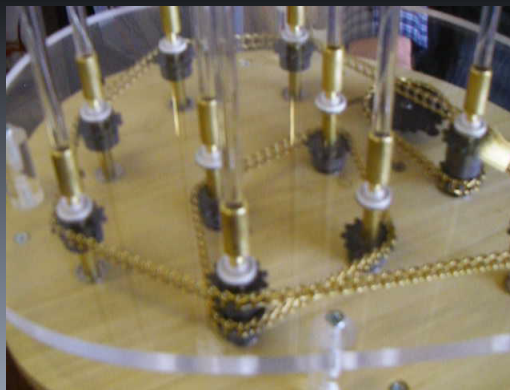
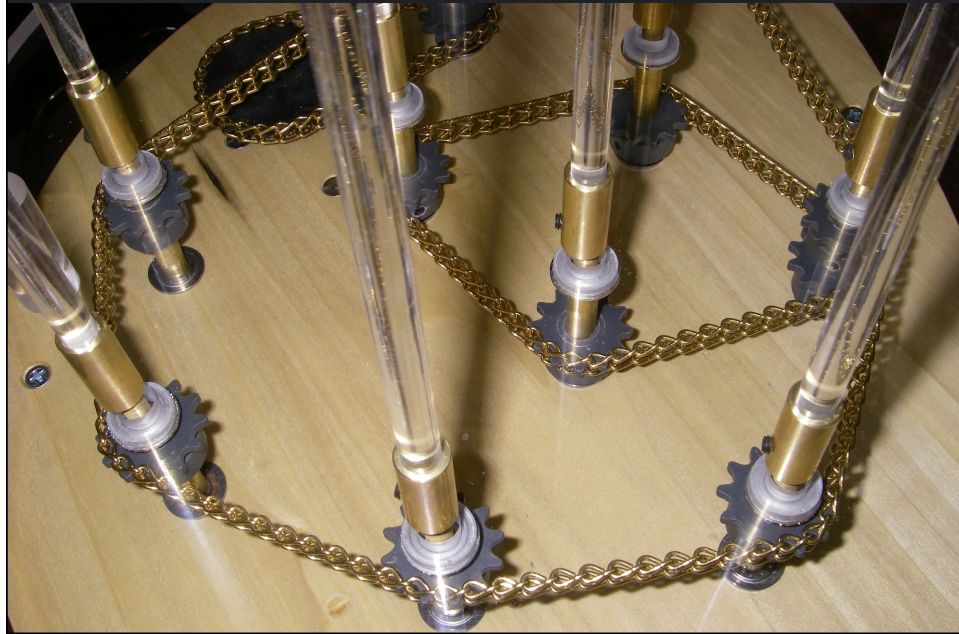


There is a whole range of devices for remote control planes that interface to a servo



Linkages can be visual art just through their design

## Gears, cogs, sprockets



Kinetic artwork  
Tom Hartvigsen

Example of sprockets and chain

Properties: Chain moves all in the same direction, speed can be changed by increasing/decreasing size of sprocket



Example of cog and toothed belt  
Properties: like chain and sprockets but quieter



Example of flat belt  
Properties: like chain and sprockets but less efficient



Example of friction drive

Properties: reverses direction, works like a set of gears but without the teeth(not as good as teeth but easier to make)

## Machine with Concrete

Arther Ganson

Example of gears in almost all varieties, spur gears, worm gears and helical gears

Properties: each gear to gear contact reverses direction, speed is determined by ratio of gear sizes, with worm gears it is the number of starts on the worm.

With gears the lasercutter and/or waterjet is your best friend



Some odd shaped gears in action



Putting everything together  
example 1



Putting everything together  
example 2

#### **Sources**

##### **American Science and Surplus**

3605 Howard Street, Skokie, IL 60076

(847) 982-0870 / FAX (800) 934-0722

<http://www.sciplus.com>

Description: Mostly toys, the catalog is entertaining for the first year, then they quickly fill your recycling bin. Occasionally they have mechanical or electronic components, but the prices are often too high.

##### **Surplus Center**

1015 West "O" Street, PO Box 82209, Lincoln, NE 68501-2209

(402) 474-4055 / FAX (402) 474-5167

<http://www.surpluscenter.com/>

Description: BIG items, If you are interested in hydraulics, this catalog has excellent findings; there are also usually some good motor deals, and assorted mechanical components.

##### **Herbach and Rademan (H & R) Co.**

16 Roland AVE. Mt. Laurel, NJ 08054-1012

(800) 848-8001

(609) 802-0465 / FAX (609) 802-0422

<http://www.herbach.com>

Description: excellent source for motors, pneumatics, and electromechanical components. Be wary of "new" items mixed in with the surplus, however.



**Marlin P. Jones & Assoc. inc.**

PO Box 12685 Lake Park, Florida 33403-0685

(800) 652-6733 / FAX (800) 432-9937

(561) 848-8236 / FAX (561) 844-8764

<http://www.maja.com>

Description: primarily an electronics surplus dealer, but you can find some good deals on small motors.

**Alltronics**

2300 Zanker Road, San Jose; CA 95131

(408) 943-9773 / fax (408) 943-9776

<http://www.alltronics.com>

Description: mostly electronics, but some motors and mechanical parts.

**Allelectronics**

<http://www.allelectronics.com/>

Description: mostly electronics, but some motors and mechanical parts.

**MECI**

<http://www.meci.com/>

Description: mostly electronics, but some motors and mechanical parts.

**B.G. Micro**

<http://www.bgmicro.com/>

Description: mostly electronics, but some motors and mechanical parts.

**The Electronic Goldmine**

<http://www.goldmine-elec.com/default.htm>

Description: mostly electronics, but some motors and mechanical parts.

**Images SI Inc**

<http://www.imagesco.com/>

Mostly new items related to robot building.

**Acroname**

<http://www.acroname.com/index.html>

Mostly new items for robot building, good source for sensors.

**Radio Shack**

Chances are there is one near where you live.

(800) the-shack

Description: If you are going to make mechanical/electronic sculpture you will find Radio Shack essential, they do not have the most extensive product line but the essential items you will need are here.

**Jameco**

1355 Shoreway Road, Belmont, CA 94002-4100

(650) 592-8079/ FAX (650) 592-2503

<http://www.jameco.com>

Description: good Bay Area source of electronic components. Be warned, they do not do walk in sales, you must mail order or call/fax in pick up orders.

**Digi-key**

701 Brooks Ave., South Thief River Falls: MN 56701-0677

(800) 344-4539/ FAX (218) 681-3380 [www.digikey.com](http://www.digikey.com)

Description: good source of electronic components, easy on-line ordering.

**Newark**

(800) 463-9275 <http://www.newark.com>

Description: giant catalog

**Sparkfun**

<https://www.sparkfun.com/>

Description: great source, will answer technical questions

**Adafruit**

<http://www.adafruit.com/>

Description: great source, will answer technical questions

**Mechanical Suppliers**

**Stock Drive**

2101 Jericho Turnpike, Box 5416, New Hyde Park, NY 11042-5416

(516) 328-3300/ FAX (516) 326-8827 <http://www.sdp-si.com/>

Description: If you need just one gear or sprocket, etc. to complete a project this is a great source, but it will cost you plenty.

**Grainger**

350 stores nationwide [www.grainger.com](http://www.grainger.com)

Description: sells just about everything for industrial maintenance, including motors, drive components and belts. There are two problems, first Grainger does not sell to individuals, only organizations with business licenses. Usually what I will do is go in, get a catalog, find what I need and order item(s) by say that I am with SFSU and that wish to make a cash purchase. The other problem with Grainger is that it is quite expensive.

**MSC**

(800)645-7270/FAX (800) 255-5067 <http://www.mscdirect.com/>

Description: Another industrial supply company, mail order only; 3500 page catalog high prices.

**McMaster-Carr**

<http://www.mcmaster.com>

Description: Another industrial supply company, somewhat high prices.