Multi Ratio gearboxes 917D, 920D, 927D, 932D

Assembly:

1. **Insert the M3 x 40 screws through holes in one of the brackets. Slide black spacers over the screws. Insert motor. Attach other bracket, screw on and tighten M3 nuts. Press on small motor pinion so that its outer edge is level with the end of the motor shaft.**

2. **Push/tap (carefully!) shafts through orange gearwheels, gear level with the end of the short shaft and desired position on long (output) shaft. Note which way round they go with the central SMALL gear facing OUTWARDS (see illus.). The green gearwheels should be a loose fit on the shafts. Slide on as many green gearwheels onto the shafts as desired (again, small central gear facing outwards).**

3. **Now slide brass spacer tubes over shafts (SHORT tube on SHORT shaft, LONG on LONG shaft) and insert shafts into the brackets. Retain other end of output shaft with the retaining collar. To change ratios, simply pull off retaining collar (no need to pull off orange gears) and withdraw gear clusters out of the brackets. Put a touch of light oil on the gears/shafts for quietest operation.**

4. **Note, this layout is as illustrated with longer output shaft on opposite end to the motor. The output shaft can easily be in the middle, simply swap over the appropriate gears/spacers. You can also leave off up to all the green gears and one of the orange gears to obtain progressively higher r.p.m. of the output shaft (see reduction ratios available).**

REDUCTION RATIOS: (SEE REVERSE FOR ILLUSTRATION)
Each pinion-to-gear ratio is 4:1 so, the reduction ratios are multiples of this so you can get:

4:1 16:1 64:1 256:1 1024:1 4096:1.

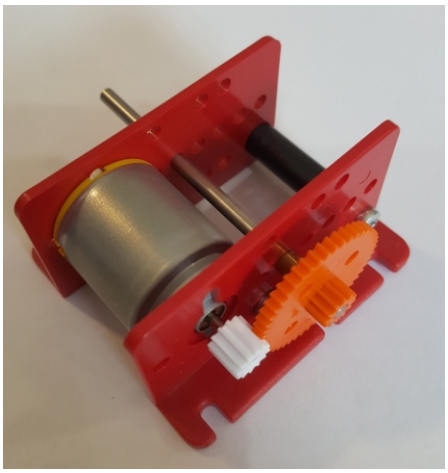
This equates approximately to:
3379 r.p.m 845 r.p.m 211 r.p.m 53 r.p.m 13.2 r.p.m 3.3 r.p.m at 3 volts d.c.,
1.5v will lower these r.p.m. figures by approx 50%.

These r.p.m. figures are for GUIDANCE ONLY and are APPROXIMATE due to variations in power supply, tollerance of motors/gears and are not intended to constitute any contactual obligation on the part of MFA/Como Drills.

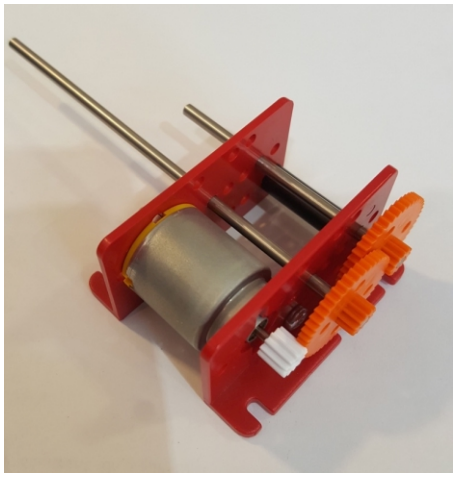
PLEASE NOTE!: Also available are a range of additional attachments for your multi ratio gearbox i.e. couplings, spur gears, worm gears, rack & pinion, chain gear sets. See additional information sheet available from MFA/Como Drills.

Contents:
- **1 pair of brackets**
- **1 motor**
- **1 motor pinion gear**
- **2 orange gearwheels (48/12 teeth)**
- **4 Green gearwheels (48/12 teeth)**
- **1 long shaft (110mm)**
- **1 short shaft (60mm)**
- **1 stop ring**
- **2 screws (M3 x 40)**
- **2 black spacers**
- **2 M3 nuts**
- **1 brass tube (5.5mm long)**
- **1 brass tube (8mm long)**
- **1 instruction sheet**

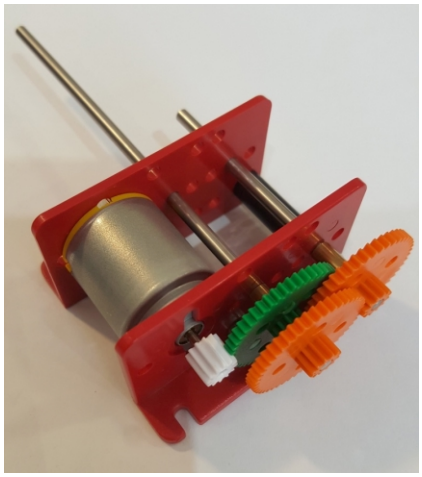
Multi Gearbox Ratios



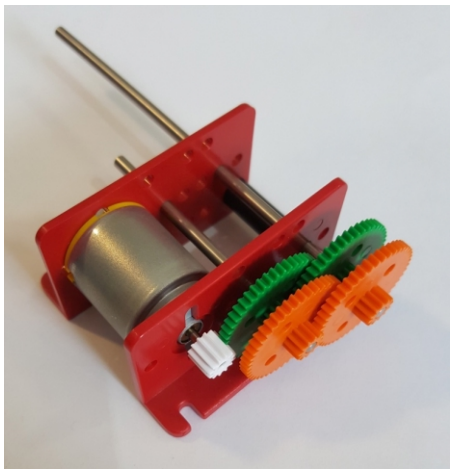
4 : 1



16 : 1



64 : 1



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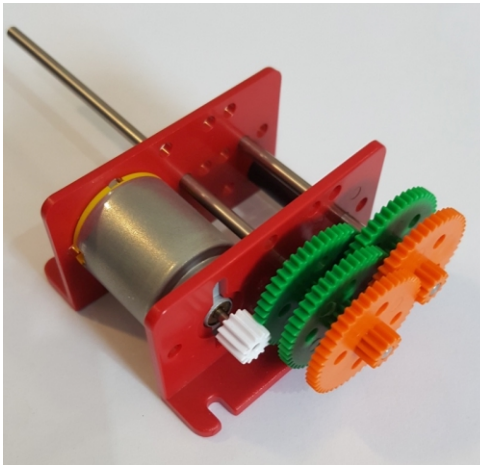

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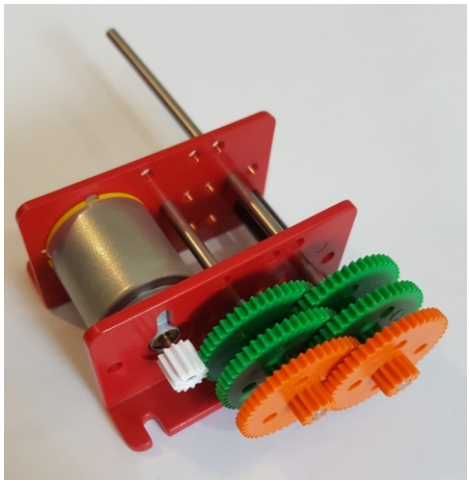

4096 : 1