

# V1.4

## Motorised Drive Introduced

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### PURPOSE

- Motorised drive system
  - Motor mount design and integration
  - External gear drive from motor to eccentric shaft
  - Battery powered operation
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### HOUSING

**Print Quality:** 8/10

**Issues:** No new issues — consistent with V1.2

**Rating:** 8/10

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### ROTOR

**Print Quality:** 8/10

**Issues:** No new issues — consistent with V1.2

**Rating:** 8/10

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### INTERNAL GEARS

**Mesh Quality:** Good — consistent with V1.2

**Backlash:** Minimal

**Binding:** None

**Rating:** 6/10

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### MOTOR DRIVE GEARS

**Motor Gear:** 10 teeth, module 0.80, 2.5mm bore

**Output Gear:** 50 teeth, module 0.80

**Ratio:** 5:1 reduction

**Issues:** 2mm bore failed to print — reprinted at 2.5mm successfully

**Rating:** 6/10

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### MOTOR

**Spec:** YM2707 4.5VDC 100g/cm

**Power Supply:** 3x AA batteries

**Issues:** Cannot self-start directly from Arduino pin — insufficient current. Runs correctly on direct battery power. L298N driver ordered.

**Rating:** 6/10

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## MOTOR MOUNT

**Bore:** 24.5mm friction fit

**Issues:** Grub screw hole too large, insufficient gear clearance

**Rating:** 5/10

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## MOTION TEST

**Rotor Rotates:** Yes

**Full Orbit:** Yes

**Smoothness:** 8/10

**Notes:** Silicon grease on all moving parts

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## LESSONS LEARNED

- Small bores under 2mm do not print reliably at 0.4mm nozzle — upsize to 2.5mm minimum
  - Arduino pins cannot supply enough current to drive motor directly — motor driver required
  - Silicon grease better suited to PLA than metal grease
  - Motor mount tolerance testing by printing multiple bore sizes saves time
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## CHANGES FOR NEXT VERSION

- Redesign motor mount with correct grub screw hole size
  - Remove material from mount wall for gear clearance
  - Increase mount wall thickness around bore for M5 grub screw strength
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## LOCKED PARAMETERS — CARRIED FORWARD

Generating Radius (R)	28mm
Eccentricity (e)	4mm
K Ratio	7 — RX-7 Proportion
Housing Width	64mm
Housing Height	48.7mm
Gear Module	0.80
Fixed Gear Teeth	20
Rotor Gear Teeth	30
Gear Ratio	3:2
Eccentric Shaft Offset	4mm

Drive Gear Module	0.80
Motor Gear Teeth	10
Output Gear Teeth	50
Drive Gear Ratio	5:1
Motor	YM2707 4.5VDC 100g/cm
Motor Mount Bore	24.5mm