

# Precision Aero Products

## Precision F3A Drive - PCK-4 (V1)

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### Instruction Manual

Thank you for choosing to purchase a Precision Aero Products Precision F3A Drive PCK-4. This product is proudly designed and manufactured in Australia by Precision Aero Products. The Precision F3A Drive incorporates all our knowledge about belt reduction systems. Particular attention has been paid to the mounting system to provide both stability and quietness.



We strongly believe the PCK system will be the next big thing in F3A. A game changer!

What does PCK stand for you ask? PCK = Precision Contra Killer! Yes, we are just a little cheeky.

The PCK concept was born whilst trying to figure out why a contra drive system brakes so well. The final conclusion was blade area in the rotating disc. That begged the question, why not use a four (4) blade prop on a single propeller setup? That would normally require a smaller diameter propeller which is the norm when going from two blades to three. Then a light bulb lit up! Let's use "front" contra propellers spinning at contra RPM. I could not think of any reason why this theory would not work. The fact is, it did work very well indeed.

We use EGODRIFT motors exclusively in our drives. Based on our testing, we believe EGODRIFT motors are superior. The PCK uses a 550KV 4025HT Beta Series motor. This is the same motor we fit to Adverrun XS contra gearboxes.

The Precision F3A Drive - PCK is comprised of the following items:

- Precision Drive F3A - PCK Assembly (1).
- M4 x 8mm Cap Head SS Screw (4).
- 4mm AC Ply Firewall (1).
- 4mm AC Ply Rear Support Side parts (2).
- Installation Drill Jig (1) 82 and 86mm.
- This Instruction Manual (1).

**In this manual we talk about cutting and or sanding plywood and working with composite materials and adhesives. It is imperative that you use appropriate personal protection equipment (PPE) when working with these materials and chemicals. This includes (but is not limited to) safety glasses, respiratory mask and rubber gloves.**

### Safety Precautions:

- Electric motors can cause serious harm or injury. During initial testing/setup of your drive, we suggest running it without a propeller fitted.
- Only use balanced, undamaged propellers.
- Ensure all loose wiring is safely kept away from the rotating motor and belt drive.
- The propeller nut tightness should be checked after five (5) flights. Some propeller hubs can compress a little causing a loose prop.
- If excessive vibration is detected **stop** and check your propeller and ensure all fasteners are tight. If unsure, ask us for support.

### ESC Types:

The drive has been tested with D3 F3A ESC, JETI Mezon 95 OPTO Light, JETI Spin99, Futaba/OS MC9100A. **We highly recommend the D3 F3A ESC.** The ESC should be capable of handling 100A and 10S batteries.

### ESC Settings:

- Timing 9-15 degrees.
- 10 Poles.
- Ratio 4:1.
- Brake starting point 15%. Adjust as required.

### D3 F3A ESC Specific Settings:

- Timing 15 degrees.
- 10 Poles.
- Ratio 4:1.
- 4,500 RPM.
- Spool-up Speed - Slowest.
- Idle RPM Normal Flight 1,200 RPM\*.
- Idle RPM Landing 5-600 RPM\*.
- Idle RPM Spin 5-600 RPM\*.
- The D3 braking can be quite abrupt and a shock to the drive system. To alleviate this, we recommend a soft throttle cut. This can be achieved by programming a delay into your throttle cut flight mode.
- We also recommend using a telemetry sensor such as the Unisens-E made by SM Modellbau. This will give you very good information on the drive system performance such as Amps, RPM, Capacity used, Volts etc. You can also set alarms to prevent putting a flat battery in your model.

\* Adjust the RPM settings to suit.

### Suggested Propellers:

- PCK-4 (Narrow with in flight RPM 4,500 in vertical up line).
- PCK-4 (Coming Soon).

Note: Propellers are balanced in pairs and should be placed opposite each other on the prop hub. They should also be replaced in pairs.

### Prop Assembly:

The prop hub is precision CNC machined from billet 6061 aluminium in house. Each propeller blade is attached to the hub with an M3 x 20mm Shanked Screw (Custom cut length) and an M3 Nyloc nut.



The propeller blades are balanced in pairs and must be assembled to the hub opposing each other.

It helps to mark the blade pairs with a permanent marker. The blade should be a "neat" fit into the hub. If it seems too tight, a light sanding on each side of the pivot point is ok to do. Sometimes some moulding flash is left behind at the pivot point. Insert the M3 x 20mm Shanked screw from the left (front view). The blade should move reasonably freely on the screw. The fit shouldn't be tight and shouldn't be loose. Movement at the tip should be approximately 10-20mm. Fit the M3 Nyloc nut to the screw and tighten. It only needs to be lightly tightened. Too tight and it will bind up the blade movement.



### Spinner:

Custom cut Falcon Spinners will be available in the near future. In the interim, a Falcon 2B spinner can be easily modified to suit the PCK-4. Two of the PCK blades can go in the existing propeller blade cutouts and then you can cut two extra slots (10mm wide x 21mm long) as pictured below. **If machining carbon with a Dremel, ensure that personal protective equipment (PPE) is used. A vacuum cleaner sucking away the dust is a great idea too!**



### Belt Tension:

The belt tension is adjustable. You don't want the belt to be too tight as it will introduce added drag/friction for no gain. When correctly adjusted you should see 1-2mm of belt deflection. To adjust the tension, loosen the four(4) motor screws and two(2) front motor shaft support plate screws. Then adjust the tension using the fitted adjuster to shift the motor. Then tighten all screws and check the belt deflection. During our testing we have not seen any notable belt stretch at all.



Loosen these six  
(6)screws



Belt tension screw

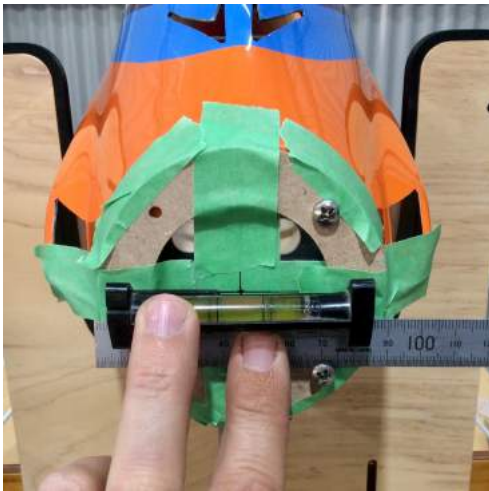
**Installation:**

Included with the drive is an AC Ply Firewall, AC Ply Rear support side parts and an MDF installation drill jig. The jig is used to drill the nose ring of your model and then to align/trim the firewall before gluing it into the Fuselage.

We strongly suggest laminating the inside of your fuselage nose with light weight (120-150g/sqm) carbon cloth. This will improve the strength and rigidity of the nose area. Some models come with carbon in the nose already.



The included drill jig is aligned to the nose ring and taped in position with masking tape. A level can be used to help align the jig as shown. Drill one M4 hole and then fit an M4 screw and nut to hold the jig firmly. Repeat for the remaining three holes.

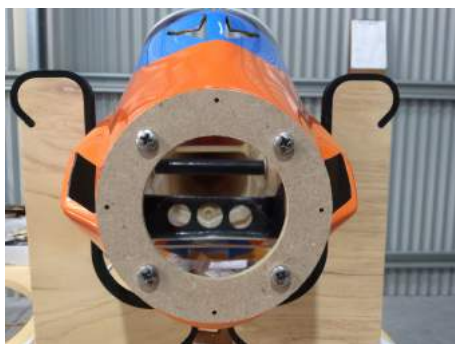


Remove the drill jig. Then open the holes out to 7mm that will allow the jig standoffs to pass through and later the included M4 x 8mm CAP Head mounting screws.





Fit the standoffs to the drill jig and refit this assembly to your nose ring align and tape it into place. The standoffs are now used as a tool to adjust the firewall to fit your fuse.



When trimmed correctly, the firewall should sit flat on all four standoffs and not foul with the fuse sides. Take your time here to get a neat fit. Once happy with the fit, glue the firewall into position with a quality 30 minute epoxy. We use Pacer brand 30 minute epoxy resin. The firewall is held in place by four M4 screws whilst the epoxy cures. As an option, you can run some 12k carbon tow around the circumference of the firewall for extra strength.



With the epoxy cured, you can now remove the M4 screws and remove the jig. The firewall is now done. You can test fit the drive into the model to check spinner clearance. If necessary, the spinner clearance can be adjusted by adding a collar or M8 flat washer behind the prop hub/collet.

The rear support needs to be fitted with the drive fitted into the model. The AC ply rear support side parts can be trimmed with a Dremel to suit your specific fuse. We suggest a patch of carbon cloth on the fuse sides where the rear support side parts are to be glued. Use quality 30 minute epoxy to glue the side parts into position. Afterwards, some strips of carbon cloth either side of the rear support side parts will aid strength.

We also recommend using a small drop of Loctite 243 on all screws.



\*Prototype Drive pictured above.

#### Warranty:

The warranty period is twelve (12) months from the date of purchase. This warranty covers workmanship and materials. Crash damage is not covered nor is obvious misuse or modification to the drive or motor.

If you have any questions in relation to the use of this product, please feel free to contact us at: [sales@precisionaeroproducts.com.au](mailto:sales@precisionaeroproducts.com.au)