Racing Sparrow 1000 3D RC Yacht
Materials suppliers: racingsparrow.co.nz/materials

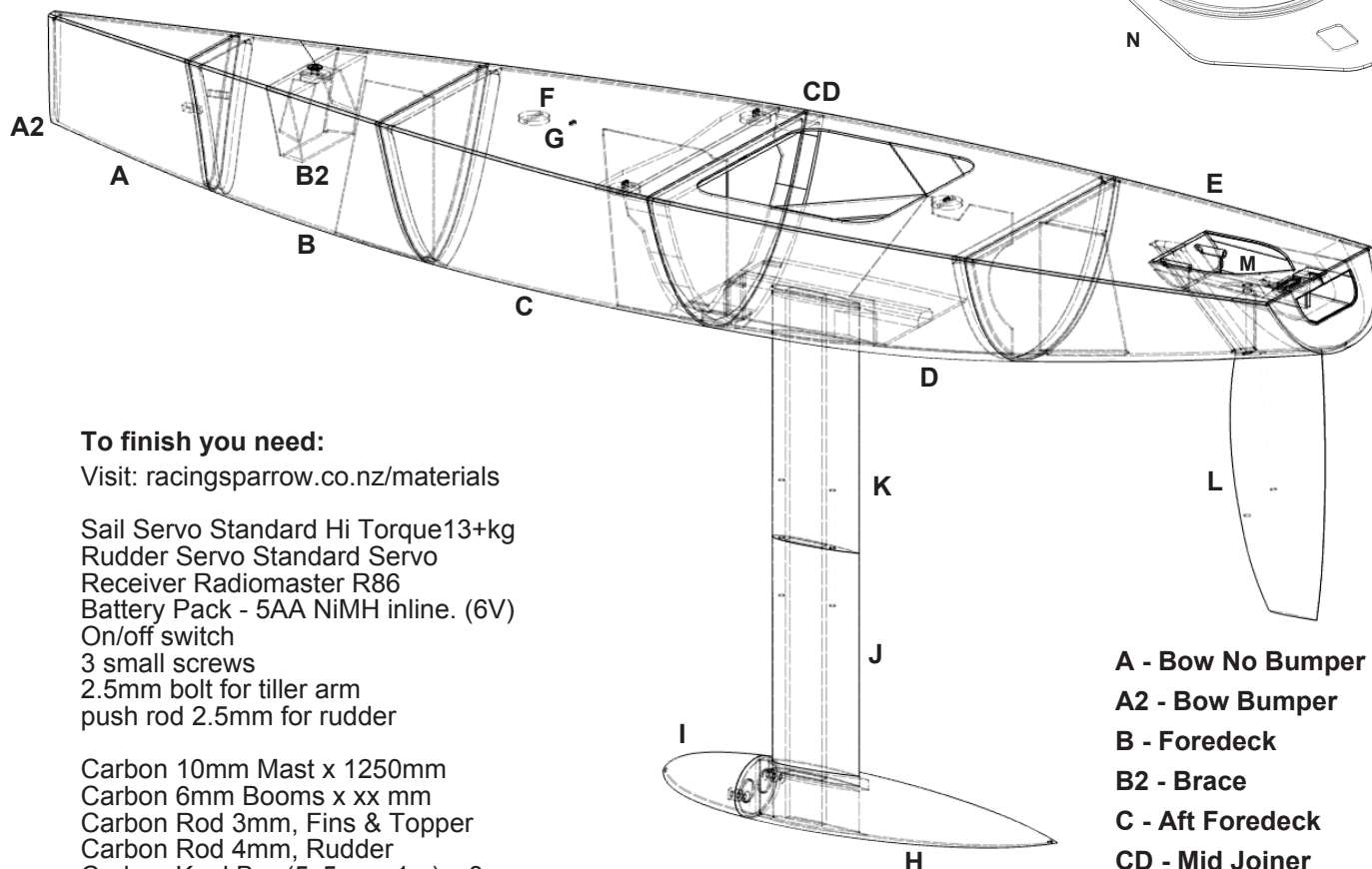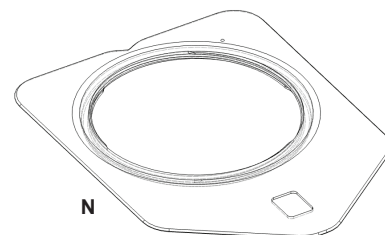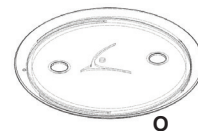Lead shot filled keel ballast 2000g
Mast 1250mm carbon 10mm
Booms 6mm carbon
Carbon 5x5mm internal keel slot
Rudder printed with carbon rod 3mm insert and 4mm stock
Water tight twist hatch.
All rig fittings - printed parts

O

N

A2

A

B2

F
G

CD

E

M

B

C

D

K

L

J

I

H

To finish you need:
Visit: racingsparrow.co.nz/materials

Sail Servo Standard Hi Torque13+kg
Rudder Servo Standard Servo
Receiver Radiomaster R86
Battery Pack - 5AA NiMH inline. (6V)
On/off switch
3 small screws
2.5mm bolt for tiller arm
push rod 2.5mm for rudder

Carbon 10mm Mast x 1250mm
Carbon 6mm Booms x xx mm
Carbon Rod 3mm, Fins & Topper
Carbon Rod 4mm, Rudder
Carbon Keel Bar (5x5mmx1m) x 3,

Mylar Sail Material 0.8x1.3m
Sail Repair Tape
Fishing Braid line, swivels & clips
Coated Fishing Wire & Crimps Pack.
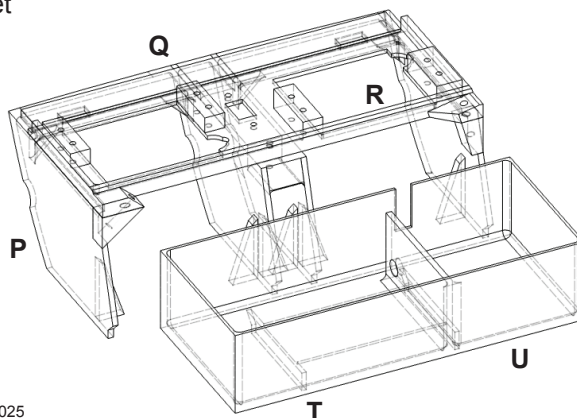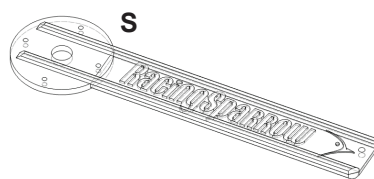2000g Lead Shot - Gun Shop
Split Pins 25mm Stainless x 5

Super Glue
Araldite Epoxy
Resin Epoxy - just add turpentine.

Transmitter - Radiomaster Pocket
(Authors Favourite)

S

Q

R

P

U

T

A - Bow No Bumper

A2 - Bow Bumper

B - Foredeck

B2 - Brace

C - Aft Foredeck

CD - Mid Joiner

D - Mid Ships

E - Stern

F - Anchor Disks x 5

G - Stay Washer x 5

H - Keel Bulb Main

I - Keel Bulb Nose

J - Keel Bottom

K - Keel Top

L - Rudder Medium

L2 - Rudder Small

M - Tiller Arm 4mm

N - Hatch Deck Plate

O - Hatch Lid

P - Servo Bracket

Q - Servo Bracket Top Tab

R - Servo Bracket Top Plate

S - Sail Arm

T - Battery Box Bracket

U - Battery Box Body

V - Battery Box Lid

**Racing Sparrow 1000 3D
RC Yacht**

racingsparrow.co.nz

Mast 1250mm Carbon 10mm
Booms 6mm Carbon
Printed Gooseneck
Printed Crane & Stay Points -
with 3mm carbon inner
Printed Spreaders
Printed Boom Attachments
Printed Sail Battens
Printed Sail & Tiller Arms

Spreader Inverted Rake Smaller

RIG D

RIG E

**RIG I
RIG J
RIG K
RIG L
RIG M**

RIG C - Mast Topper

**RIG C with 3mm
carbon insert**

330

130

RIG O - Head Batten

RIG N - Main Sail Battens

1152 tall Main sail

735 tall Jib

85

90

145

220

860

2 part mast joiner
RIG B - Mast Joiner - Inner
RIG B2 - Mast Joiner - Outer Sleeve
3mm carbon internal insert

10mm carbon
pultruded tube

296

300

40

220

315

295

45

170

6mm
carbon
tube

RIG A

RIG G

RIG F

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Steps to Build the Racing Sparrow 1000 3D RC Yacht

Printing / Prep

Print Files - see print settings next page.
Clean up parts with craftknife & file.

Hull

CA Glue in B2 - Brace into B - Foredeck section.
Make and CA Glue in 5 split pin anchors, all the same.
CA Glue CD - Mid Joiner to hull part D - Mid Ships. You may need to glue/weld with CA in place.
Now join part D into part C - Aft Foredeck combined with part CD with CA Glue.
Join other hull parts together with plenty of CA glue.
Cut/remove hatch print supports.
CA Glue the Q - Servo Top Tab onto the bracket.
Test fit and screw in servo tray. (Maintainable).
CA Glue P - Servo Bracket into Hull.
CA Glue in part T - Battery Box Bracket.
CA Glue in part U - Battery Box Body with lid attached to gauge space needed.

Electrics

Install electrics on R - Servo Bracket Top Plate outside of the hull.
Install servo plate loaded with servos and screw into place.
Install rudder & push rod with z-bends, attached to servo.
Glue the Sail Arm to servo horn. CA glue and PLA+ work well.
Glue 5mm copper tube into mainsheet sheath - see photos.
Tie Main Sheet to arm and install out the back and tie to fishing swivel - see photos.
Super Glue Hatch Plate into deck cutout.

Keel & Rudder

Super Glue keel halves with 3mm rods.
Super Glue keel into main bulb slot.
Epoxy in place carbon centre 5x5mm square rod. 5 in a row.
Fill bulb Main and Nose with lead & runny resin using printed funnel.
Epoxy Bulb Nose in place with 3mm carbon locator lugs.
Araldite keel into hull - hull upside down, leave to sit 24hrs for max strength.
Super Glue carbon into rudder holes.

Rigging

Glue mast step in place with CA Glue.
Join mast pieces with inner and outer sleeve. 3mm insert internal.
Cut booms to length.
Cut and glue 3mm rod into the stay topper.
Prep mast, measure & sand glue areas.
Super Glue in place attachment points & fittings.
Rig wires/stays crimping in place.

Sails

Cut sails, transfer dimensions from plans.
Spinnaker Tape sail corners and triangle attachment points.
Cut small holes through triangles for braid with craftknife.
Use small eyelets from a craftshop in the main corners.
Tie sail tie points. - See images.
Tie & super glue knots to mast / trim ends.
Rig braid lines

Final Prep

Tune: Jib trailing edge to match side stays. Main sail centred.
Sail: test range, tighten hatch, relax!

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Printing Guide

The Racing Sparrow 3D 1000 is designed to be printed from PLA+. Two rolls of filament should be enough to print the hull parts, keel, bulb, rudder, and rig parts. The 3d model has been designed so that no part is too large making this easily printable on most home 3d printers.

Simply load the STL files into the slicer software, orient them on the print bed, and start printing.

The settings the author used on a Creality K1 Max Printer were:

Nozzle 0.4,Wall count of 3: top 4, bottom 4 layers
Brim inside and out for adhesion for hull skins.
230°C Nozzle,
67°C Bed
30°C Chamber
35% infill @ 300mm/s speed

Carbon Fibre Tips

Before gluing any carbon it's best to sand off the glossy outer coating of the spar. These coatings are just thin layers added to the carbon by manufacturers. When gluing this will add much better bond of carbon and PLA+. It's easiest to sand these with a dremel or it can be done by hand with sand paper. Wear gloves to avoid itchy hands from the cut carbon particles. Carbon glues well with both CA and epoxy glues.

Rig Notes

Note that the top spreader is intentionally inverted. This helps keep the mast straight when the backstay is tensioned.
Take note the boom dimensions are shorter than the sails. Tie the sails tight to the attachment points for optimal sail tuning settings. Set and forget!

Electrics

The batteries used for this model are a 5 cell AA eneloop pack with a JR plug. It is a 6V battery setup. This gives the servos more power than a 4 pack. Sail time was quite long on one battery while testing boats.

The prototype used inexpensive standard-size servos. The sail arm servo needs to be a hi torque servo with at least 13kg of pull. More power is better if you can afford a better servo. The sails are powerful and need a bit of torque when under load to get the sails completely in-board.

Sail Materials

You can use a number of different materials for making sails. I use foil mylar for my prototype boats as it's very cheap. For my final models I prefer to use architectural drafting film. You can also use rip stop nylon and sew the edges. For sail tape I use spinnaker repair tape.
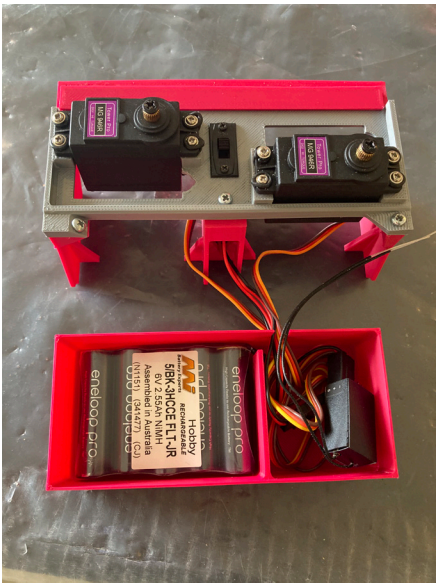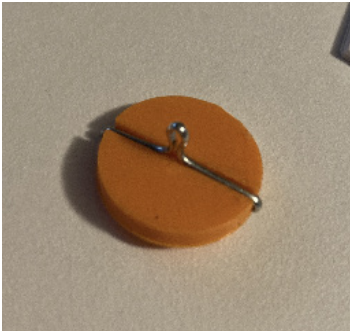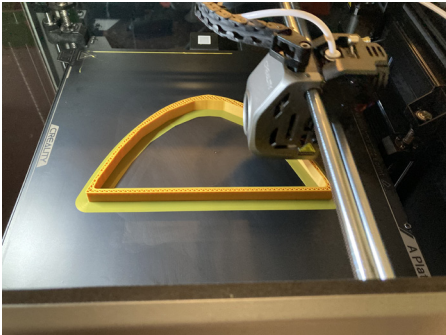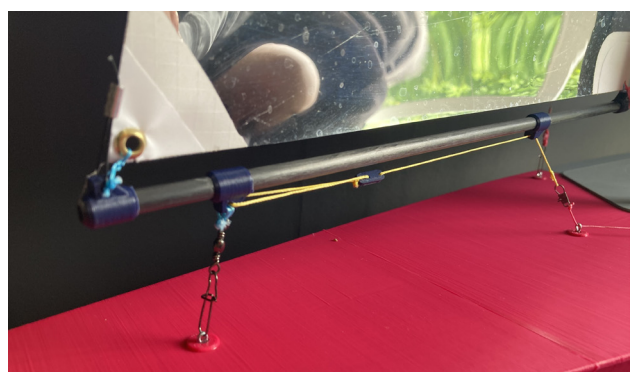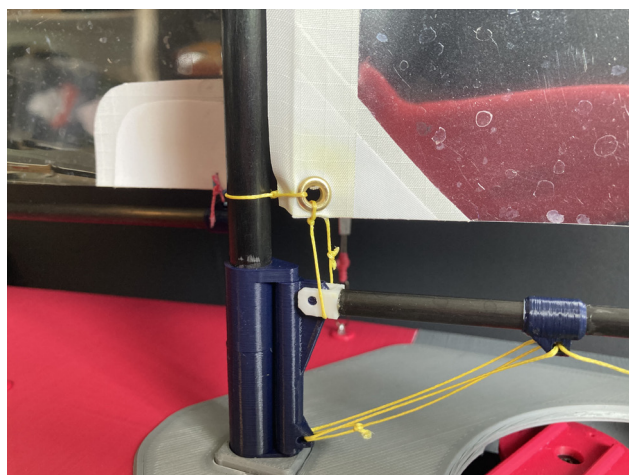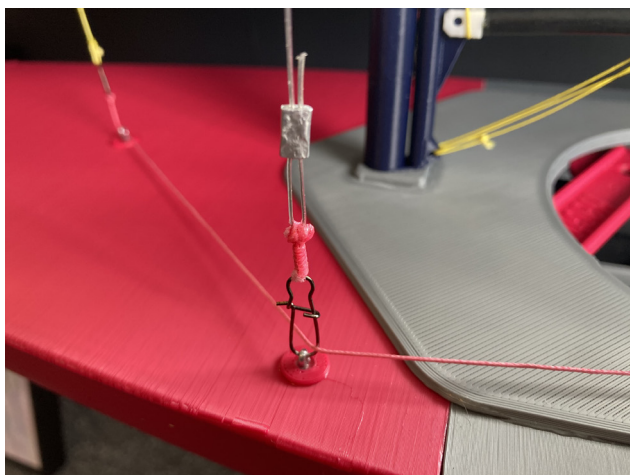
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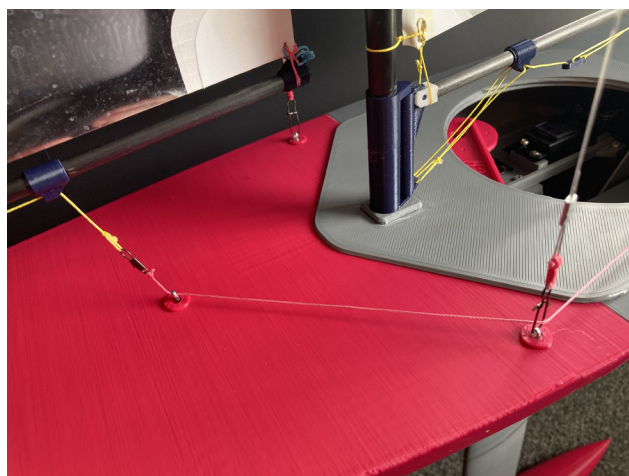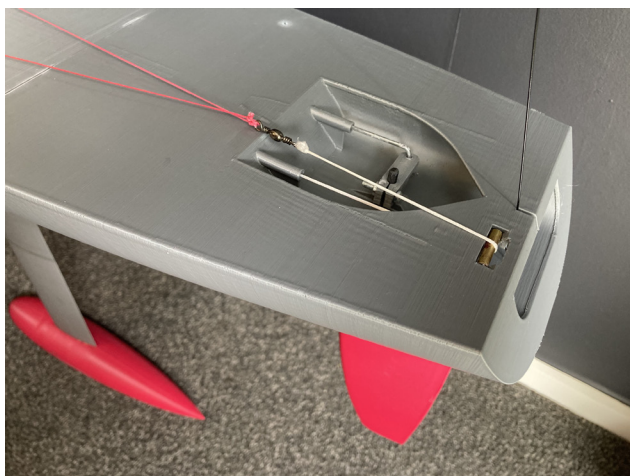
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Useful Images

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