

Spitfire Chassis Lever

Assembly Guide



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The STL/CAD files and assembly instructions for these flight controls are released free for personal use on the basis of the Creative Commons Attribution Non Commercial Non Derivative licence. If you wish to use this product in any for-profit activity please contact Phil Hulme at phil@authentikit.org



For more information about this project and the aims and ambitions for the AuthentiKit system see authentikit.org

Introduction

This kit adds a chassis lever to the AuthentiKit Spitfire MkIX or Mk1A set of flight controls. In order to use this control you need two other units.

1. Universal Hub - Upgraded version with full set of inputs
2. A second monitor stand (single arm) for right hand side mounting

Sourcing

For a full list of parts see my document [Spitfire Chassis Lever - Bill of Materials.pdf](#)

The other sourcing option is simkitsupplies.com - see their website for more details. The price should be about ½ what you'd pay to get the components yourself.

Calibration

Caution - before you start printing check the printer settings at <https://authenkit.org/printing-advice> and print the very quick calibration test that you will find in the tools folder, then tweak horizontal expansion settings. **Do not print large parts until both the magnet and bearing are a snug fit but not tight.**

Spitfire YouTube Video Assembly Guide

You will find the flaps lever assembly guide in the Spitfire MkIX YouTube playlist: authenkit.org/youtube

Assembly Steps

1. Cut out the 3 felt pieces using the templates
2. Fit two of the felt pieces (the banana shape) to chassis case base
3. Fit the cork disc to the mClick base
4. Join the mClick lower and upper levers with a micro bearing and M2x8mm screw
5. Put second micro bearing into mClick lever and screw to mClick base with M2x12mm
6. Fit both micro switches
7. Crimp 25cm black wire to lower RHS pin and 25cm green wire to upper RHS pin
8. Crimp 25cm black wire to lower LHS pin and 25cm yellow wire to upper LHS pin
9. Fit lever cap with 4 x M2x12mm screws. Clamp tight. CHECK LEVER MOVES FREE
10. Fit mClick peg into large bearing and both into the toothed cap
11. Screw down the toothed cap with 3 x M4 x 25mm screws. Check for nice friction
12. Toothed cap faces back of chassis - feed black/green wires through upper channel and black/yellow through lower
13. Fit mClick to base with 3 x M4x10mm screws
14. Attach lever extension to lever with M5 part thread screw
15. Joint black wires at central post with additional 10cm black wire
16. WIRING OPTION
 - a. STANDARD: Joint the yellow/green wires at other post and add 10cm yellow wire, then wire to RJ45 as BLACK - BLANK - YELLOW
 - b. ALT: Wire to the RJ45 as BLACK - BLANK - YELLOW - BLANK - GREEN
17. Fit RJ45 (actually easier to joint wires, then fit RJ45 then fit wires into RJ45)
18. Attach slider arm to lever with 4 x M4 x 20mm screws
19. Fit lever to mClick with M4 x 14mm screw
20. Fit magnet to back of case - North towards dimple
21. Fit magnet cover with M3 flange screw
22. Fit indicator stickers or fill with white silicon
23. Drop magnet into indicator - North towards dimple
24. Drop indicator cube into indicator - tiny post upward
25. Fit indicator into recess
26. Fit micro bearing on indicator post
27. Fit lever plate with 3 x M3 x 6mm screws
28. Fit felt to lever plate
29. Fit spring retaining plate with just the rear M4 x 8mm round screw

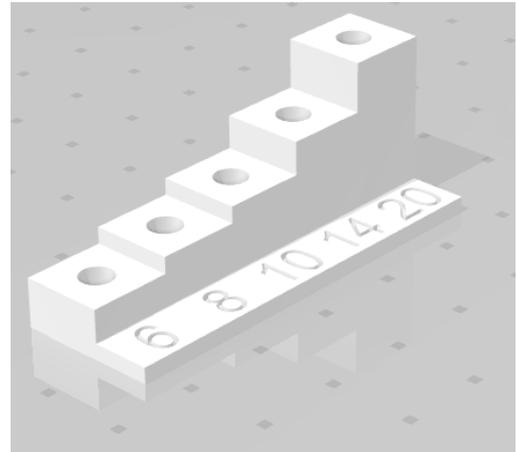
30. Fit spring and carefully compress by holding the plate and tightening the screw
31. Fit the front M4 round screw to the spring retaining plate
32. Fit damper with 2 x M3 x 8mm screws
33. Fit lid with 2 x M4 x 8mm round screws and 2 x M4 x 10mm c/sunk screws
34. Fit the rotation lock screw M4 x 8mm round
35. Fit plate and knurled screw with M4 x 12mm round screw
36. Fit knob and spindle to lever with M4 x 20mm round screw
37. Fit VESA dovetail with 4 x M4 x 8mm screws
38. Fit stickers/apply silicon
39. Fit VESA wedge to monitor stand with 4 x M4 x 10mm c/sunk screws and nuts
40. Fit armlock to allcam monitor stand
41. Connect to the landing gear input of Universal Hub with 1.5m ethernet cable or for alternate wiring connect to the cowl/radiator input - see UniHub Upgrade kit for unihub wiring.

Screws

See this PDF for full details of screws used and where.

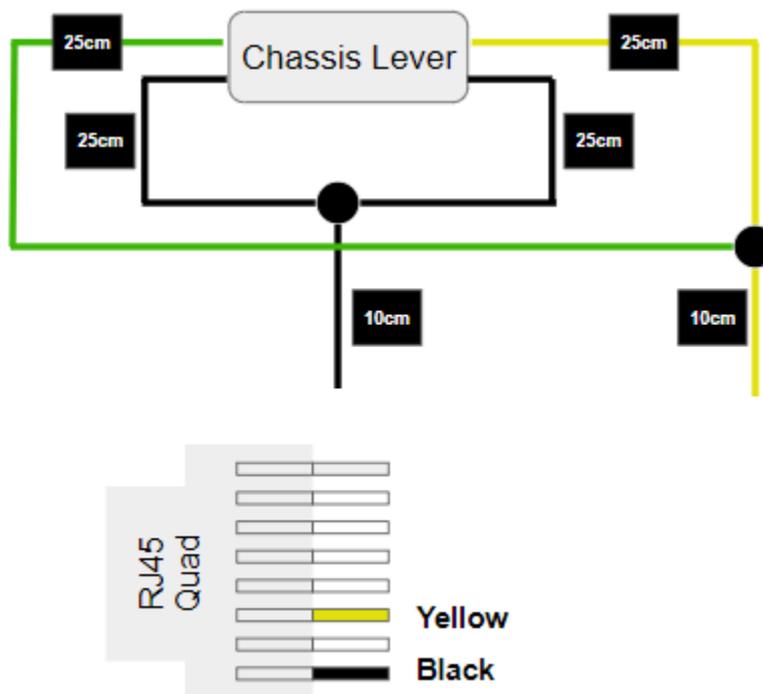
[Spitfire Chassis Lever - Screws Inventory.pdf](#)

You may find it a little fiddly to tell certain screw lengths apart, so to avoid using a 10mm in the back of the MagHall instead of the 8mm it should be, I have included the following test tool in the tools download. It is designed just for M4 screws of length 6,8,10,14 and 20mm.



Wires

Wiring for this project is fairly simple. There is a full size version of this wiring diagram in the PDF that's part of this project. [Spitfire Chassis Lever - Wiring.pdf](#)



Index of all printed parts with printing advice

See <https://authenkit.org/printing-advice> for recommended printer settings to achieve good results.

I'd suggest printing most parts at 25% infill and it should be fairly obvious which face should be down on the print bed. Exceptions to this are documented here.

**No brim and no support on anything by default.
Exceptions explained below.**

The download includes all parts twice. The folder Individual Parts contains every part individually and if you use these you will need to load and orientate each one. For ease the parts have also been grouped into batches and correctly orientated. The batches are sized to fit onto an Ender 3 print bed and grouped by recommended colour.

This control can be printed in four parts.

- Batch_one_black
- Batch_two_black
- Batch_three_black
- Batch_four_silver - print this in grey or silver

See the separate document **Spitfire Chassis Lever Batches.PDF** which shows an image of each batch with parts in recommended orientation and the names of each part.