



SPITFIRE Mk.V

Includes Mk.Vb and Mk.Vc

For Microsoft Flight Simulator (MSFS)



To get full enjoyment of the aircraft in this package, please read this Manual thoroughly and carefully.

The manual and models in this package must not be used for real flight training purposes.

BRIEF HISTORY:

First flown on March 5, 1936, the Supermarine Spitfire is a British single-seat fighter aircraft used by the Royal Air Force and other Allied countries before, during, and after World War II. Many variants of the Spitfire were built, from the Mk 1 to the Rolls-Royce Griffon-engined Mk 24 using several wing configurations and guns. It was the only British fighter produced continuously throughout the war. The Spitfire remains popular among enthusiasts; around 70 remain airworthy, and many more are static exhibits in aviation museums throughout the world.

The Spitfire first went into production in May 1938, and saw first combat against the German Luftwaffe on October 16, 1939.

The Mk.V started equipping fighter units from early 1941.

The basic Mk V was a Mk I with the Merlin 45 series engine. This engine delivered 1,440 hp (1,074 kW) at take-off, and incorporated a new single-speed single-stage supercharger design. Improvements to the carburettor also allowed the Spitfire to use zero gravity manoeuvres without any problems with fuel flow. Several Mk I and Mk II airframes were converted to Mk V standard by Supermarine. The majority of the Mk Vs were built at Castle Bromwich

More Spitfire Mk Vs were built than any other type, with 6,487 built.

(Wikipedia)

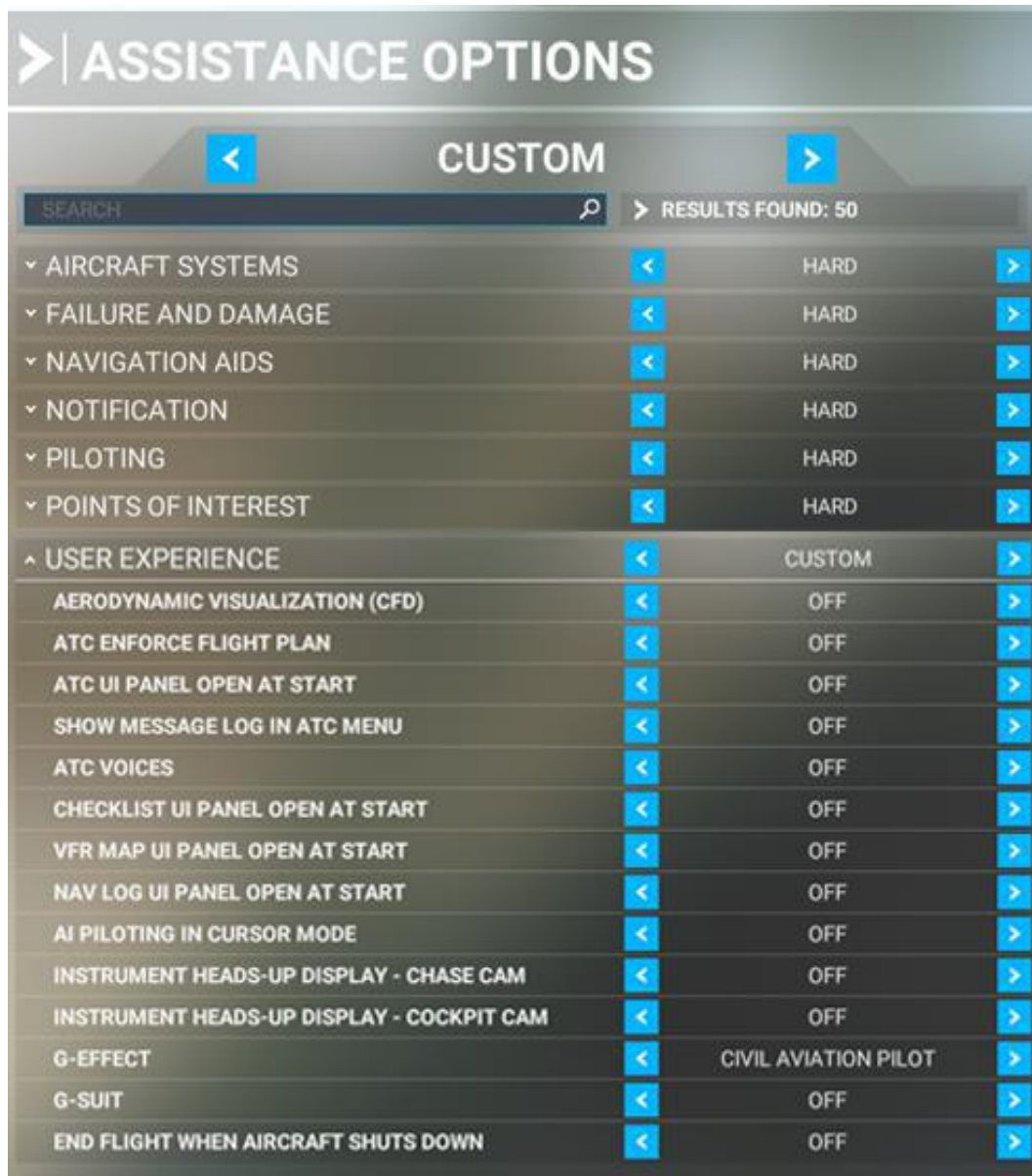
COCKPIT NOTES

1. The Spitfire may **load** with switches in the wrong position and some cockpit animations not working. This is a known MSFS bug. Re-loading the aircraft will solve this.
 2. The Spitfire may also load with rudder trim set to +5 degrees. This should be set to +0 before take off.
 3. There were other small changes in the cockpits as time progressed. All are self-evident in the models and functionality remains essentially identical.
 4. As MSFS is not a combat sim, weapons-related switches etc. are not functional and weapons are covered (MSFS policy). Covers depicted are true to life.
 5. Fully functional **mirrors** are not presently available. The ones on the model will reflect accurately the sky and clouds, but that is all. Ground features, other aircraft and cockpit interior will not show.
 6. **Radios** in use at the time aren't available (although the controls are labelled for interest). Use the MSFS drop-down ATC screen for radio communications.
 7. Known issue: The **Alternator/Generator** switch will only move when the Master Battery switch is moved. This doesn't affect the functionality of the aircraft. We hope to have this solved in an update.
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ASSISTANCE OPTIONS MENU

You can, of course, use any level of assistance in flying the Spitfire that you'd like. However, these are the recommended settings to get the most realistic performance out of the aircraft.

Using full assists will result in a limited flight dynamics profile, and slower handling. Also, some behaviour, such as take-off torque swing, will be mostly absent.



MAIN PANEL



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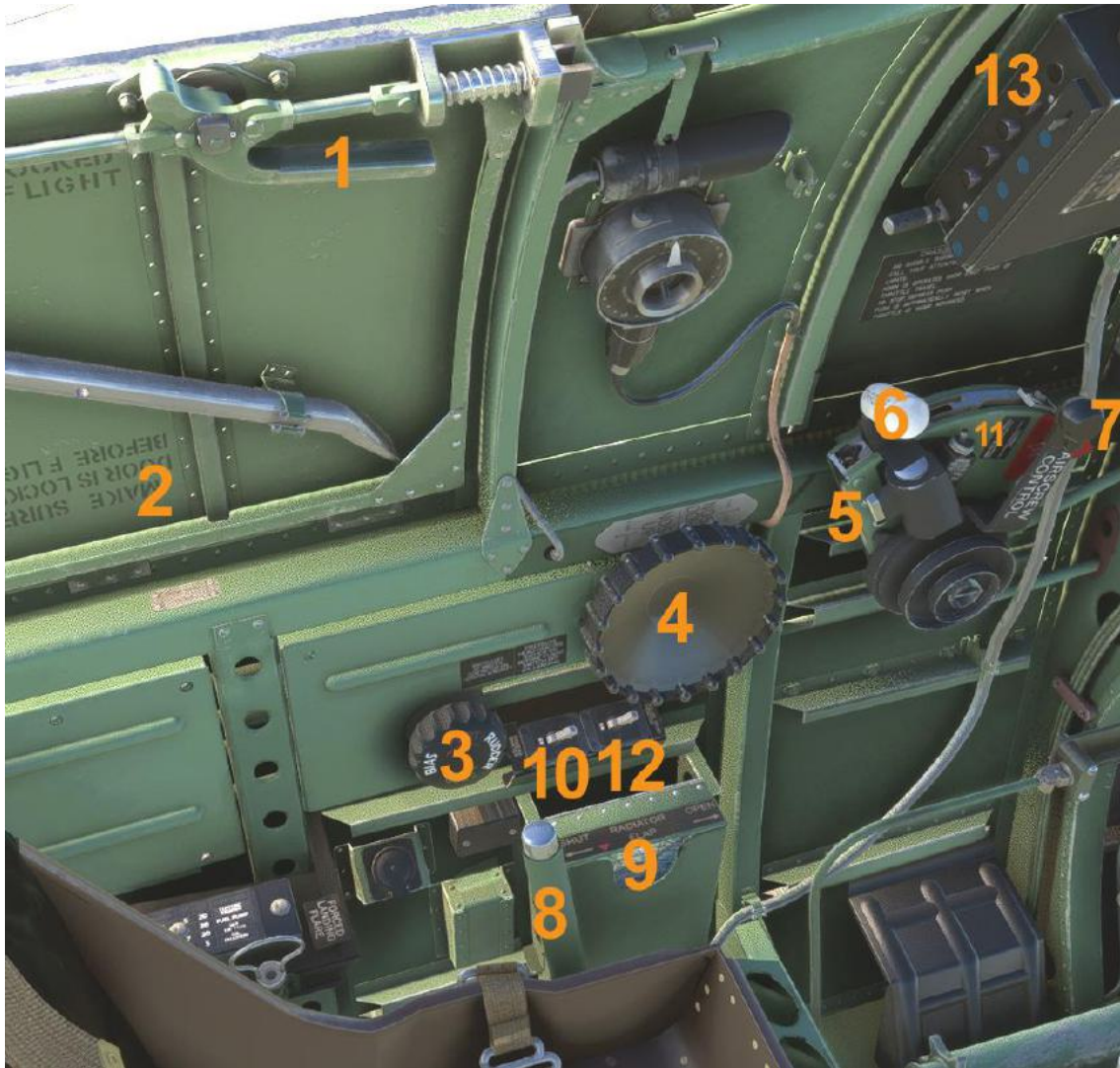
MAIN PANEL CONT'D

* = non-functional

- | | |
|--------------------------------------|---|
| 1. Magneto switches | 23. Oil pressure |
| 2. Oxygen panel | 24. Oil temperature |
| 3. Elevator trim position | 25. Coolant temperature |
| 4. Gear up/down | 26. Fuel bottom tank needle on/off (in reality, the needle would only reveal tank contents as long as button was pressed. In the sim, for convenience the needle will remain enabled until buttons pressed again) |
| 5. Gear lights cover (pull down) | 27. Fuel quantity bottom tank (Imperial gallons) |
| 6. Oxygen altitude selector | 28. Joystick hide/reveal click spot |
| 7. Navigation lights | 29. Cockpit lighting |
| 8. Flaps up/down | 30. Combined starter buttons |
| 9. Airspeed (MPH) | 31. P8 Compass |
| 10. Altitude | 32. Fuel tank valve |
| 11. Altitude adjuster | 33. Priming lever |
| 12. Artificial horizon | 34. Slow-running cutoff (using Mixture) |
| 13. Gyro compass | 35. Fuel pressure pump (above 15000 ft only) * |
| 14. Gyro compass adjuster | 36. Gunsight |
| 15. Vertical Speed (VSI) | 37. Master Battery |
| 16. Turn and slip | 38. Parking brake |
| 17. Voltmeter | |
| 18. Generator (animates with Master) | |
| 19. Fresh air scoop | |
| 20. Propeller RPM | |
| 21. Low fuel pressure light | |
| 22. Boost | |



COCKPIT LEFT



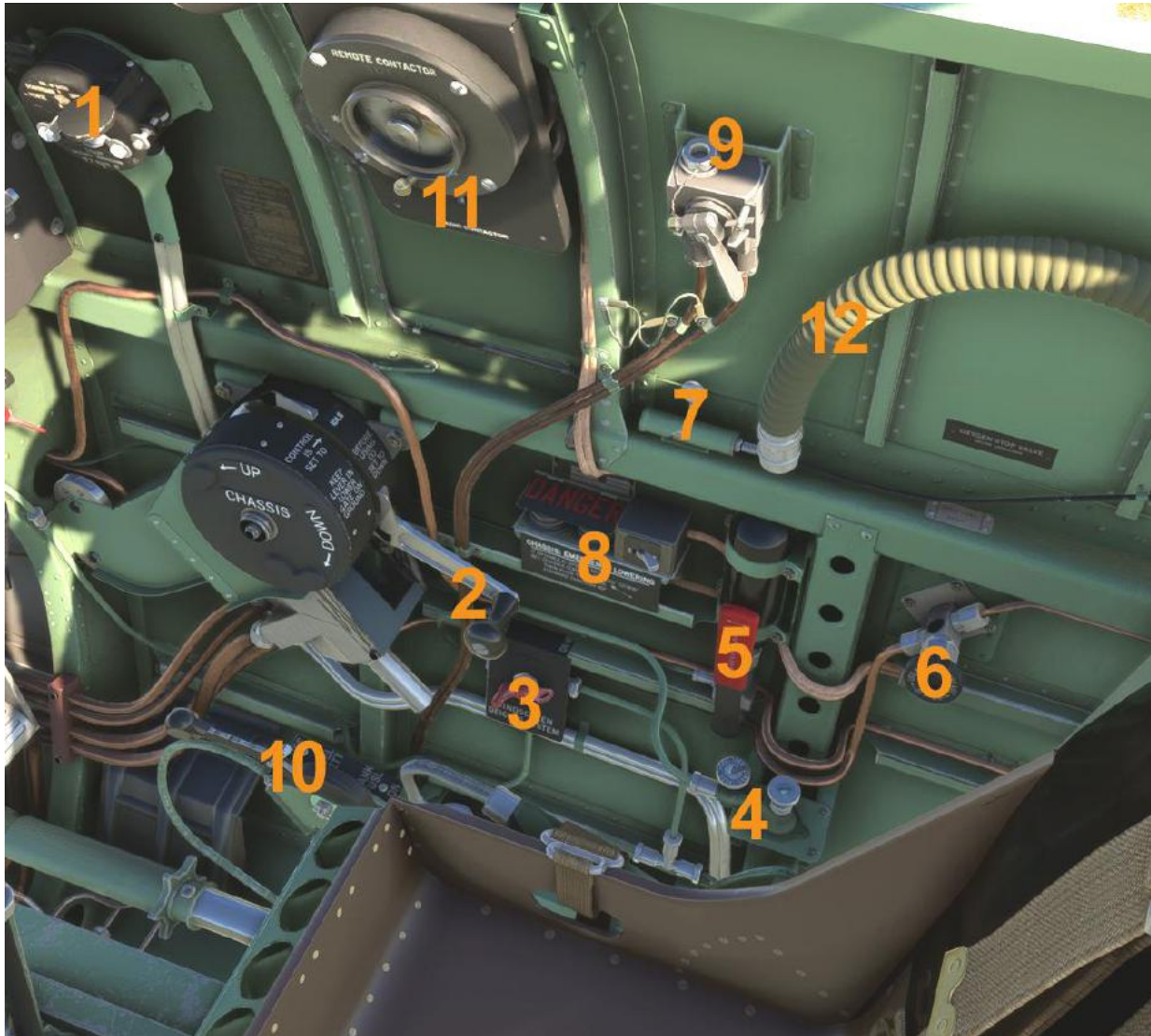
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COCKPIT LEFT CONT'D

1. When canopy is **OPEN** only: Door latch (clicked once, door will open to first position. Clicked again, door will fully open)
 2. When canopy is **OPEN** only: To close door: click door itself. First click will bring up door to first position. Click again to close fully. Canopy can then be opened or closed as needed.
 3. Rudder trim knob. Usually 0 degrees for take-off. **May load at +5 degrees**
 4. Elevator trim wheel
 5. Gear warning horn stop button (will re-set if throttle moved forward again)
 6. Throttle lever
 7. Prop lever
 8. Coolant radiator flap lever
 9. Map case
 10. Gun camera *
 11. Switch to turn of undercarriage indicator light in flight
 12. Pitot heat
 13. Radio (avionics) on/off
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COCKPIT RIGHT



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COCKPIT RIGHT CONT'D

1. Recognition/morse light on/off switch. (In reality, two additional small selectors on the unit enabled steady light if desired, but were too awkward for the model)
 2. Undercarriage position selector (small window will indicate if system active [blank] or [idle])
 3. Deice *
 4. Deice system pressure *
 5. Emergency gear lowering *
 6. Oxygen valve *
 7. Harness release *
 8. IFF/Radio system
 9. Canon re-cocking *
 10. Drop tank controls *
 11. IFF Contactor *
 12. Oxygen hose
-

OTHER CLICK SPOTS



1. Canopy open
2. Canopy close (small button)
3. Pilot visibility (**NOTE:** Pilot will appear when tooltip indicates “YES”. **Pilot must enter aircraft ON THE GROUND.** Click spot will not work once airborne.)

Windscreen De-Icing

Early Spitfires did not have windscreen de-icing. However, as MSFS may coat the canopy with ice when the weather is still flyable, the canopy can be made to de-ice quickly using the settings below.



FLYING THE SPITFIRE Mk.V

The early Spitfires were well known for excellent handling and controllability, and being an exceptionally nice aircraft to fly. Nonetheless, care needs to be taken when taking-off or landing in a crosswind. In flight, some may note that the elevator is more sensitive than in other aircraft.

Flight model settings in MSFS must be set to “**Modern**”.

A. PRELIMINARIES

1. Master/battery switch: ON
2. Magneto switches: OFF
3. Undercarriage selector: DOWN
4. Check undercarriage light is GREEN
5. Flaps: UP
6. Landing lamps: UP
7. Lower fuel tank quantity

B. STARTING ENGINE and WARMING UP

1. Brakes: ON
2. Fuel valve levers: ON
3. Magneto switches: ON (both)
4. Open starter button cover; press starter button until engine fires

Prime the engine, the number of strokes required being as follows:						
Air temperature °C.:	+30	+20	+10	0	-10	-20
Normal fuel:	3	4	7	13		
High volatility fuel:				4	8	15

C. TESTING ENGINE AND INSTALLATIONS

1. While warming up, exercise the airscrew speed control (prop pitch lever) a few times. Also make the usual checks of temperatures, pressures and controls. Brake pressure should be at least 120 lb/sq.in
2. See that the cockpit canopy is open and that the door is set at the first open position.
3. Prop pitch lever: FULLY FORWARD
4. Magneto check: At maximum boost for cruise speeds, check each magneto in turn. Drop in RPM should not exceed 150.
5. Warming up must not be unduly prolonged because the radiator coolant temperature before taxiing must not exceed 100 degrees C.

D. PREPARATION FOR TAKEOFF

1. Drill to memorize is “T.M.P., Fuel, Flaps, and Radiator”
 - a. Trim - Elevator about one division nose down from neutral. Rudder trim fully to starboard (+10 degrees)
 - b. Pitch – Prop lever fully forward
 - c. Fuel – Both valve levers ON and check contents of lower tank
 - d. Flaps – UP
 - e. Radiator shutter – Fully open

E. TAKEOFF

2. Open throttle slowly to the gate (RATED BOOST position: +9.5 boost) (**IMPORTANT**: This is obtained by **not** pushing your sim throttle fully forward. Rather, advance throttle while looking at the boost gauge, and stop throttle movement when boost reaches +9.5).
3. If taking off from a small aerodrome with a full load, maximum boost may be obtained by opening the throttle to the TAKE-OFF BOOST position (**Note**: to do this, just push your throttle all the way forward – this will activate the small red gate ahead of the throttle, and boost will climb to +16).
4. After takeoff, raise undercarriage, and check that the red indicator light – UP – comes on.
5. Do not start to climb before a speed of 140 MPH IAS is attained

F. CLIMB

1. The speeds for maximum rate of climb are as follows:
 - a. Ground to 10,000 ft: 170 MPH IAS
 - b. 10,000 to 16,000 ft: 160 MPH IAS
 - c. 16,000 to 21,000 ft: 150 MPH IAS

- d. 21,000 to 26,000 ft: 140 MPH IAS
- e. 26,000 to 31,000 ft: 130 MPH IAS
- f. 31,000 to 37,000 ft: 120 MPH IAS
- g. Above 37,000 ft: 115

G. CRUISE

2. Maximum range will be obtained at intermediate heights. The recommended speeds are as follows:
 - a. Below 8,000 ft: 180 MPH IAS
 - b. Between 8,000 and 15,000 ft: 160 MPH IAS
 - c. Above 15,000 ft: 150 MPH IAS

Maximum boost not to exceed +4 lb/sq.in.

H. COMBAT MANOEUVRES

3. For combat manoeuvres, climbing RPM should be used

I. APPROACH AND LANDING

1. See that the canopy is fully open, and that the emergency exit door is at the first position (slightly open)
2. Reduce speed to 140 MPH IAS and carry out the Drill of Vital Actions, which must be memorized: "U.M.P. and flaps"
 - a. Undercarriage – DOWN (watch for green indicator)
 - b. Pitch – Propeller lever fully forward
 - c. Flaps - DOWN
3. Correct speeds for the approach:
 - a. Power on: approximately 85 MPH IAS
 - b. Power off: approximately 90 MPH IAS
 - c. Cross wind limit: maximum 20 MPH

J. PARKING AND SHUTTING DOWN

1. After stopping in parking spot, set brakes by pulling brake lever.
2. Allow the engine to idle for a few seconds, then shut down by slow-running cutoff ring.
3. Turn Alternator and Master switches to OFF.

AEROBATICS.

- 13.(1) This aeroplane is exceptionally good for aerobatics. Owing to its high performance and sensitive elevator control, care must be taken not to impose excessive loads either on the aeroplane or on the pilot and not to induce a high-speed stall. Many aerobatics may be done at much less than full throttle. Cruising r.p.m. should be used, because if reduced below this, detonation might occur if the throttle is opened up to climbing boost for any reason.
- (ii) The following speeds are recommended for aerobatics:-
- Looping.- Speed should be about 300 m.p.h. I.A.S. but may be reduced to 220-250 m.p.h. when the pilot is fully proficient.
- Rolling.- Speed should be anywhere between 180 and 300 m.p.h. I.A.S. The nose should be brought up about 30° above the horizon at the start, the roll being barrelled just enough to keep the engine running throughout.
- Half roll off loop.- Speed should be 320-350 m.p.h. I.A.S.
- Upward roll.- Speed should be about 350-400 m.p.h. I.A.S.
- Flick manoeuvres.- Flick manoeuvres are not permitted.

TAKE OFF AND LANDING DISTANCES

For general reference and to help plan flights, here are the real-life recorded take off and landing (with brakes) distances of the Spitfire Mk.Ia and IIa.

These were recorded with Spitfire Mk.II P7280, weighing 6172 lb (prior to flight). Winds not recorded.

Reference image below is of EGKH Headcorn/Lashenden (an excellent version of this airfield, well known to Spitfires, is available for MSFS from ORBX).



A big "Thank you!" to everyone that helped with this aircraft for MSFS - especially to James Foster, Steve Mercer, and John Spurr (beta team), plus Ron (DA40CGDFQ) and Bill (lionheart) over at the FS Think Tank discord forum.

Support:

support@flight-replicas.com

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