Whirlwind Progress Report for AGM 20th November 2022

Engineer's Report

Several factors have impacted on the original build schedule which envisaged having the skeletal cockpit section on display at Kent Battle of Britain Museum for the 2022 season.

Factors outside the WFP control

1 Covid pandemic

2 Brexit

Covid slowed many of our supply chains and restricted access for manufacturing equipment and processes.

Most damaging to the project is the post-Brexit economic climate. The main impact being the 250% increase in the cost of aluminium.

Given the project's limited finances it is essential that the project manages its resources against the scale of economics associated with a one-off build. Set against the project vision of reproducing an as-original whirlwind, not just a shell, and the economies of scale, it became clear that outsourcing the manufacture would not be a viable approach. A management decision was taken that the build would be undertaken in-house. This has allowed far greater progress to be made, not only in the cockpit section, but also in the fuselage in general. While incurring some slippage in the original displayed items timeframe, we are far in advance in overall progress.

A few months were lost due to a technical issue relating to a main outsourced component, only discovered on the green assembly of the airframe. The cost of this re-work has had an impact on the budget for finishing the cockpit section with a cost approaching £600, funds now required for the cockpit skin material.

Current Status

1. All the main cockpit airframe components have been manufactured and assembled in at least a green state.
2. All the airframe sub-assemblies have been manufactured and assembled
    - Four main bulkheads
    - Accumulator tray
    - Rear under fuselage panel and skin
3. All the associated airframe structures have been manufactured, assembled and fitted to at least a green state

- Port instrument bulkhead
- Starboard instrument bulkhead
- Centre instrument bulkhead
- Lower instrument bulkhead
- Cockpit coamings
- Electrical compartment coamings
- Electrical compartment cover and fittings

4. The windscreen assembly is complete and fitted in a green state
    - Windscreen frame
    - Windscreen side panels
    - Windscreen front cover
    - Front and quarter panel transparencies
    - Pilot's mirror and fairing
5. Ancillary equipment has been manufactured and completed and fitted in a green state
- Radio mast and bracket
- Flare tubes
- Flare tube doors and latches
- Hand hold flaps and equipment
- Telescopic access ladder
6. Pilot Seat has been manufactured and fitted
- Operating equipment
- Leather Upholstery
- Torque tubes
- Upper armour
7. Canopy / Coupe The canopy has been outsourced and produced, awaiting fitting.
8. Coupe base plate and trackways have been manufactured and fitted. Work in progress to join coupe and base plate
    - Front roller track and rollers
    - Rear roller brackets, rollers, track.
9. Cockpit fit out. All instruments have been sourced or replicas manufactured. Instruments have been fitted green to all four instrument panels.
    - Control column
    - Rudder bar and pedals
    - Throttle boxes
    - Pitch boxes
    - Undercarriage and flap gate
    - Hydraulic hand pump
    - Elevator trim wheel and pulley
    - Rudder trim wheel and drive sprocket
10. Mk II gunsight manufactured and fitted.
11. Forward fuselage. The armament base plate is complete and fitted.
12. Armament support structure / casting is complete and fitted.
13. Armament air tank is complete and fitted.
14. Replica 20mm cannons are complete and fitted green
15. Drum magazines manufactured and fitted

Work in Progress

16. Work has commenced on the rear fuselage. The upper fuselage skin panels have been rolled, trimmed and drilled. The lower panels have been rolled. Tee and channel stringers have been manufactured and are work in progress. Patterns and castings have been produced for the tail wheel equipment.
17. Completion of the cockpit and forward section. Work is now in progress to disassemble the green build for paint and final assembly.
    - The first stage to complete the airframe structure.

- The second stage to manufacture and green fit the skin panels, paint and assemble.
- Projected costs for the assembly stages and skin material £750 to £1000
- Completion early 2023, delivery to Kent Battle of Britain Museum March 2023

18. Future work
    - Nose fairing planned 2024/5? (non priority)
    - Rear fuselage continuing with expected completion 2023/4. Projected cost of materials for completion £2,500
    - Tail fin / rudder / elevators planned 2024/5 Projected cost of materials £5000
    - Main wing spars planned 2025/6 Material costs at today's prices will require funds in the region of £10,000 to procure the raw billets required for the main and rear spars
19. Costs of Engineering Work in house from October 2020 to October 2022
    - The engineering costs at a commercial rate would be in excess of £400,000
    - Direct sponsorship from Peter and Alma Smith for tooling, equipment and engineering consumables is in excess of £15,000
    - Whirlwind Fighter Project (non-profit) has paid material costs of £6641.18
    - Costs for Design and CAD work is not included
    - Sponsorship form the Kent Battle of Britain Museum is not included

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