

Massachusetts Institute of Technology
Unified Engineering
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System Problem 9

Report 2

Date:

Group #

Name 1

Name 2

Name 3

Name 4

Name 5

*You may use your own cover page. However, all the information on this cover page must be included on your cover page.

I. Build**I.3 Build and Manufacturing Schedule****I.3.1 System****I.3.2 Wing****I.3.3 Tail****I.3.4 Payload Accommodation****I.3.5 Propulsion****I.3.6 Landing Gear****I.3.7 (Subsystem)****I.4 Build and Manufacturing Time Estimates and Actuals****I.4.1 System****I.4.2 Wing****I.4.3 Tail****I.4.4 Payload Accommodation****I.4.5 Propulsion****I.4.6 Landing Gear****I.4.7 (Subsystem)****Build and Manufacturing Time Estimates and Actuals**

| | Estimate [hrs] | Actual [hrs] YTD |
|------------------------------|-----------------------|-------------------------|
| Wing | | |
| Tail | | |
| Payload Accommodation | | |
| Propulsion | | |
| Landing Gear | | |
| (Subsystem) | | |
| Integration | | |
| System Total | | |

I.5 Build Status, Problems, and Problem Resolution**I.5.1 System****I.5.2 Wing****I.5.3 Tail****I.5.4 Payload Accommodation****I.5.5 Propulsion****I.5.6 Landing Gear****I.5.7 (Subsystem)**

II. Test

II.3 Test Schedule

II.3.1 System

II.3.2 Wing

II.3.3 Tail

II.3.4 Payload Accommodation

II.3.5 Propulsion

II.3.6 Landing Gear

II.3.7 (Subsystem)

II.4 Test Time Estimates and Actuals

II.4.1 System

II.4.2 Wing

II.4.3 Tail

II.4.4 Payload Accommodation

II.4.5 Propulsion

II.4.6 Landing Gear

II.4.7 (Subsystem)

Test Time Estimates and Actuals

| | Estimate [hrs] | Actual [hrs] YTD |
|-----------------------|----------------|------------------|
| Wing | | |
| Tail | | |
| Payload Accommodation | | |
| Propulsion | | |
| Landing Gear | | |
| (Subsystem) | | |
| Integration | | |
| System Total | | |

II.5 Test Status, Problems, and Problem Resolution

II.5.1 System

II.5.2 Wing

II.5.3 Tail

II.5.4 Payload Accommodation

II.5.5 Propulsion

II.5.6 Landing Gear

II.5.7 (Subsystem)

III. Training

III.3 Training Schedule

III.2.1 System

III.2.2 Ground Crew

III.2.3 Pilot

III.4 Training Time Estimates and Actuals

III.2.1 System

III.2.2 Ground Crew

III.2.3 Pilot

Training Time Estimates and Actuals

| | Estimate [hrs] | Actual [hrs] YTD |
|-------------|----------------|------------------|
| Ground Crew | | |
| Pilot | | |
| Other | | |
| System | | |

III.5 Training Status, Problems, and Problem Resolution

III.5.1 System

III.5.2 Ground Crew

III.5.3 Pilot

IV. System Performance

IV.1 System Performance

****PLEASE NOTE THE UNITS REQUESTED!****

System Performance Against Predicted Goals

| | Design/Predicted/ or Assumed Value | Actual Value |
|--|------------------------------------|--------------|
| Ma - Mass of Aircraft [oz] | | |
| b - Wing Span [in] | | |
| c – Mean Aerodynamic Chord [in] | | |
| Length [in] | | |
| S – Wing Surface Area [in²] | | |
| AR – Aspect Ratio | | |
| W/S – Wing Loading (max weighted) [oz/ft²] | | |
| Aileron Area [in²] | | |
| Stabilizer Area [in²] | | |
| Elevator Area [in²] | | |
| Tail Area [in²] | | |
| Rudder Area [in²] | | |
| Wing Mass [oz] | | |
| Aileron Mass [oz] | | |
| Stabilizer Mass [oz] | | |
| Elevator Mass [oz] | | |
| Tail Mass [oz] | | |
| Rudder Mass [oz] | | |
| Landing Gear Mass [oz] | | |
| Fuselage Mass [oz] | | |
| Number of Servos | | |
| Total Servo Mass [oz] | | |
| Motor Controller Mass [oz] | | |
| Receiver Mass [oz] | | |
| Motor Mass [oz] | | |
| Battery Mass [oz] | | |
| Propeller Mass [oz] | | |
| Motor Gear Mass [oz] | | |
| V_{c,weighted} – Cruise Velocity (max weighted) [mph] | | |
| V_{c,empty} – Cruise Velocity (empty) [mph] | | |
| Re – Reynolds Number | | |
| C_{L,cruise} (max weighted) – Lift Coefficient | | |
| C_{D,cruise} (max weighted) – Drag Coefficient | | |
| D – Drag (weighted) [oz] | | |

| | | |
|---|--|-----------------------|
| P – Propeller Pitch [in] | | |
| D – Propeller Diameter [in] | | |
| P/D – Propeller Pitch-Diameter Ratio | | |
| η_{prop} - Propeller Efficiency | | |
| P_{req} – Required Power (cruise, max weighted) [W] | | Not applicable |
| P_m – Motor power (cruise, max weighted) [W] | | Not applicable |
| RPM – Motor RPM (cruise, max weighted) | | Not applicable |
| I_m – Motor Current (cruise, max weighted) [A] | | |
| η_{motor} – Motor efficiency (P_m / P_{in}) | | |
| V_s – Stall Speed (max weighted) [mph] | | |
| $C_{L,max}$ (max weighted) – Lift Coefficient | | Not applicable |
| R_{min} – Minimum Turn Radius (max weighted) [ft] | | |
| s_g – Ground Roll (max weighted) [ft] | | |
| T_1 – Empty Lap Time [sec] | | |
| T_2 – Pit Crew and/or Repair Time [sec] | | |
| L_3 – Endurance Time [sec] | | |
| Score [sec] | | |

IV.2 System Performance Problems, and Problem Resolution

Appendix

A. Build Log

B. Test Log

C. Training Log

C.1 Ground Crew

C.2 Pilot

C.3 System