BYU

BRIGHAM YOUNG

UNIVERSITY

AIAA Design/Build/Fly Competition
2020-2021 Aircraft Design Report

Contents

I. Executive Summary

Table 1 Summary of major system perfomance factors.

Metric	
	Performance (units)
	Performance (units)

II. Management Summary

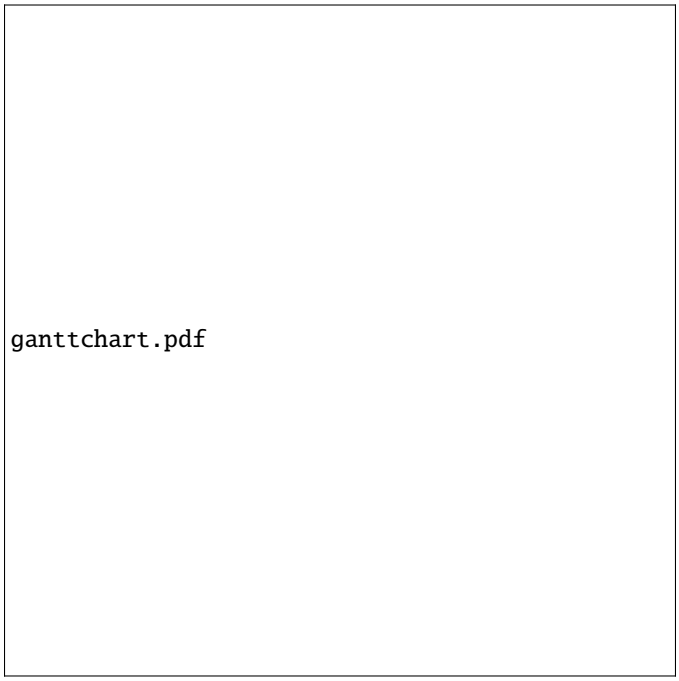

Figure 2 This milestone chart reveals our original plan for major elements of our design process compared to the actual timing of these events.

III. Conceptual Design

A. Mission Requirements

Aerodynamic Requirements

Structural Requirements

Propulsion Requirements

Specialty Requirements

B. Scoring Sensitivity Analysis

C. Concept Weighting and Selection Process

Table 2 Figures of Merit

Factor	Relative Importance (1-5)

Final Concept

Table 3 Weighted decision (Pugh) matrix.

Factor	Weight	Option 1	Option 2	Option 3
Totals				

Figure 3 Here we show a sampling of the design concepts we rejected along the way as we honed in on our final design concept (see figure 4).

Figure 4 Our final conceptual design incorporates the highest scoring options in the decision matrices described above.

IV. Preliminary Design

A. Methodology

B. Trade Studies

C. Estimated Aircraft Performance

Uncertainty Analysis

Lift and Drag

Stability

Mission Performance

V. Detail Design

A. Sizing

B. Structures

C. System Selection, Integration, and Architecture

D. Weights and Balance

Table 4 Weight and Balance table including empty aircraft and each possible configuration.

Configuration	Weight (grams)	CG Location (mm)
Empty		
Config 1		
Config 2		

E. Flight Performance Parameters

F. Mission Performance

G. Drawing Package

The following are drawings including a 3-View drawing with dimensions of all configurations, a structural arrangement drawing, a systems layout/location drawing, and payload accommodation drawings.

Figure Placeholder

Figure Placeholder

Figure Placeholder

Figure Placeholder

VI. Manufacturing Plan

Table 5 Figures of Merit

Factor	Relative Importance (1-5)

Table 6 Weighted decision (Pugh) matrix for manufacturing plan.

Factor	Weight	Option 1	Option 2	Option 3
Totals				

Figure 5 This milestone chart reveals our original plan for major elements of our manufacturing process compared to the actual timing of these events.

VII. Testing Plan

A. Completed Testing

Ground Testing

Flight Testing

B. Planned Testing

C. Test and Flight Checklists

VIII. Performance Results