Tiny Avionics

Test Plan

Version 1.0

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Team 08

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TINY AVIONICS: System Test Plan

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1. INTRODUCTION

1.1 This Document

This document serves as a guide to detailed testing of the Tiny Avionics system and its components.

1.2 Conduct of System Tests

Testing of the Tiny Avionics system shall be conducted by project team members for the initial design, and further testing may be undertaken by future users of the Tiny Avionics system to verify the working condition of their own Tiny Avionics system.

2. REFERENCE DOCUMENTS

2.1 Design Documentation

All design documentation is available on the Tiny Avionics project wiki: https://github.com/rusinek/ECE411_RocketAv/wiki

3.TINY AVIONICS OVERVIEW

3.1 Operational Description

Tiny Avionics is a rocket avionics system for small model rockets. Tiny avionics is designed to be a sellable kit which others becoming interested in amateur rocketry can use. The Tiny Avionics system has sensors for attitude and acceleration during flight with data being processed on board and stored in a memory chip. The data will be retrievable after flight, and can then be processed on a computer and displayed visually.

4.0 PRETEST PREPARATION

4.1 Test Equipment

The following is the list of equipment necessary for testing the Tiny Avionics system.

- Computer with Arduino Software
- Digital Multimeter RadioShack 22-812
- Oscilloscope Tektronix TDS3034B
- Estes model rocket modified to hold Rocket Avionics system
- 0.1 ohm 1% current sense resistor

5.1.4

Test Writer: Aaron Baker						
Test Case Name:		**Power Consumption Benchmark**			**TEST ID #:**	**5.1.4**
Description:		**Checks the engineering requirement: *Must have ample power management to last at least 10 consecutive 30 second flights.* To ensure this requirement is met we need to characterize typical current consumption of the power system while in self-power mode and voltage change of the LiPo. This can be measured by looking at LiPo voltage and current over time.**			**Type:**	**Functional/Requirements**
Tester Information						
	Name of Tester:				**Date:**	
Hardware Version:		**1**			**Time:**	
Setup:		**Microcontroller has been reset. 0.1 ohm sense resistor in series with battery. DMM probes measuring LiPo voltage and resistor voltage.**				
				Expected Output		**Comments**
Test	**Microcontroller**	**Sensor**	**Memory**	**Avg. Current**	**Power Dissipated/10 min**	
"Idle"	Standby	Inactive	Inactive	<5 mA	10 J	
"Pre-launch"	Active	Inactive	Inactive	10 mA	20 J	
"Launch"	Active	Active	Active	40 mA	80 J	
Overall test result:						

5.3.1

Test Writer:									
Test Case Name:		Microcontroller GPIO Functional Test						TEST ID #:	5.3.1
Description:		Verify integrity of ATMEGA32U4 GPIO Pins by driving GPIO pins either high or low and using a probe to check for the expected voltages.						Type:	Functional
Tester Information									
	Name of Tester:							Date:	
Hardware Version:		1.0						Time:	
Setup:		Make sure the board is powered on and all the GPIOs are initialized to be written to.							
Test	GPIO Name	Pin	GPIO State	Probe Point	Expected Result	Pass	Fail	N/A	Comments
1	PB0	U6.8	HI	TP1	3.3V ± 5%				HI = 1; LO = 0
2	PB1	U6.9	HI	JP2.3	3.3V ± 5%				
3	PB2	U6.10	HI	JP2.1	3.3V ± 5%				
4	PB3	U6.11	HI	JP2.4	3.3V ± 5%				
5	PB4	U6.28	LO	LED1.3	2.6V ± 5%				
6	PB5	U6.29	LO	LED1.2	2.6V ± 5%				
7	PB6	U6.30	LO	LED1.1	2.6V ± 5%				
8	PB7	U6.12	HI	TP7	3.3V ± 5%				
9	PC6	U6.31	HI	TP9	3.3V ± 5%				
10	PC7	U6.32	HI	TP8	3.3V ± 5%				
11	PD0	U6.18	HI	U3.11	3.3V ± 5%				
12	PD1	U6.19	HI	U3.13	3.3V ± 5%				
13	PD2	U6.20	HI	U3.14	3.3V ± 5%				
14	PD3	U6.21	HI	TP6	3.3V ± 5%				
15	PD4	U6.25	HI	TP5	3.3V ± 5%				
16	PD5	U6.22	HI	TP4	3.3V ± 5%				
17	PD6	U6.26	HI	TP3	3.3V ± 5%				
18	PD7	U6.27	HI	TP2	3.3V ± 5%				
19	PE2	U6.33	HI	R17.1	3.3V ± 5%				
20	PE6	U6.1	HI	TP10	3.3V ± 5%				
21	PF0	U6.41	HI	TP12	3.3V ± 5%				
22	PF1	U6.40	HI	U2.1	3.3V ± 5%				
23	PF4	U6.39	HI	U3.20	3.3V ± 5%				
24	PF5	U6.38	HI	U3.19	3.3V ± 5%				
25	PF6	U6.37	HI	JP1.2	3.3V ± 5%				
26	PF7	U6.36	HI	TP11	3.3V ± 5%				
Overall test result:									