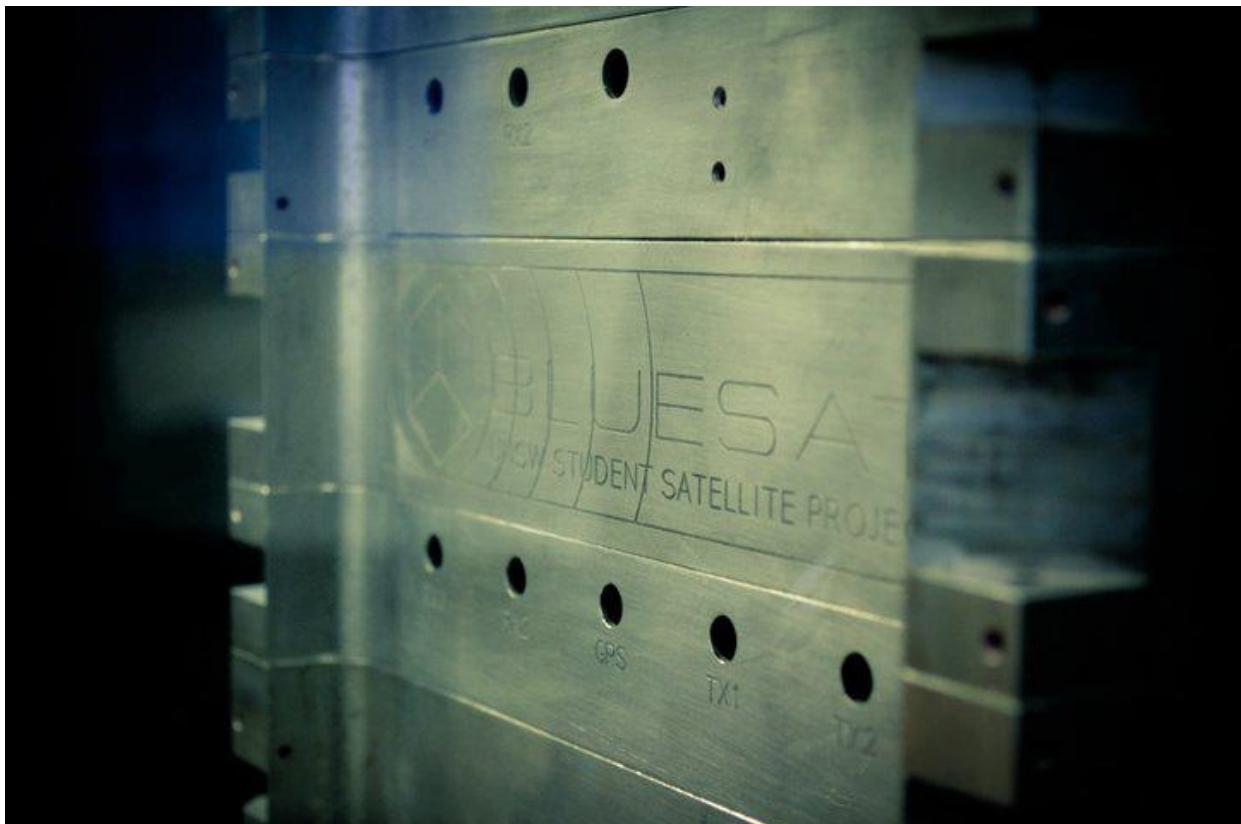


Australia's Undergraduate Space Group

Proposal for Industry Partnership



Presented by

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1 Executive Summary

This proposal introduces the BLUEsat group and outlines the progress that has been made in completing the BLUEsat satellite. It proposes an industry partnership between the BLUEsat Group and company to help fund the launch of the satellite in April 2014. Incentives to sponsor the BLUEsat Group include widespread branding, networking events and student outreach opportunities.

2 Introduction to the BLUEsat Project

The first BLUEsat satellite is an amateur radio satellite that has been entirely designed and built by undergraduate students at the University of New South Wales (UNSW). The satellite was completed in July of 2013.

The BLUEsat Group is rebuilding a flight model of our satellite to undergo a test launch in April 2014, and we are seeking funding to achieve this goal.

Today, the BLUEsat Group is expanding into multiple space engineering projects, each with a time frame of less than 2 years. Our team is primarily made up of talented Electrical, Mechanical and Software engineering students with an interest in space engineering.

The aim of the BLUEsat Group is to:

- Provide UNSW Students with an opportunity to design, build and launch Space Hardware
- Teach students practical design and project management skills in the space-engineering field.
- Raise the profile of BLUEsat, UNSW and its sponsors by successfully launching our first satellite and competing in international Space Design Challenges.



Figure 1 - The BLUEsat Team

2.1 Background Information

BLUESat's first major project was completed under the Warrawal Project. The Warrawal Project was a space educational program arising from the government-funded Australian Space Research Program (ASRP). The aim of the project was to create space-engineering educational opportunities within Australia.

As part of the project, the first BLUESat microsatellite was to have a fully functional model by mid-2013. This deadline was successfully met, with the complete demonstration to the final Warrawal Consortium Conference taking place in July 2013.

BLUESat is now re-building a flight model of the working satellite to undergo a test launch in April 2014. This will become the main objective of the BLUESat Group, in conjunction with preparing to compete in two global space-engineering design competitions.



Figure 2 - Finished BLUESat satellite before the Warrawal Consortium demonstration.

2.2 BLUEsat Satellite Specifications

The BLUEsat microsatellite is an amateur radio satellite based on the original AMSAT design. It consists of an aluminium structure (pictured below) that is broken up into five trays. Four of the trays contain critical system components and the fifth tray carries the payload.

The payload will consist of the Namura Experimental GPS, a small array of sensors and two cameras. One camera will be positioned to photograph the curvature of the Earth and the second camera will face the satellite to document the flight.

Satellite Mass: 9kg

Dimensions: 23x23x23cm (Without Antennas)

23x23x90cm (With Antennas)

Frequencies: 145.95 MHz (Receiving)

436.54 MHz (Transmitting)

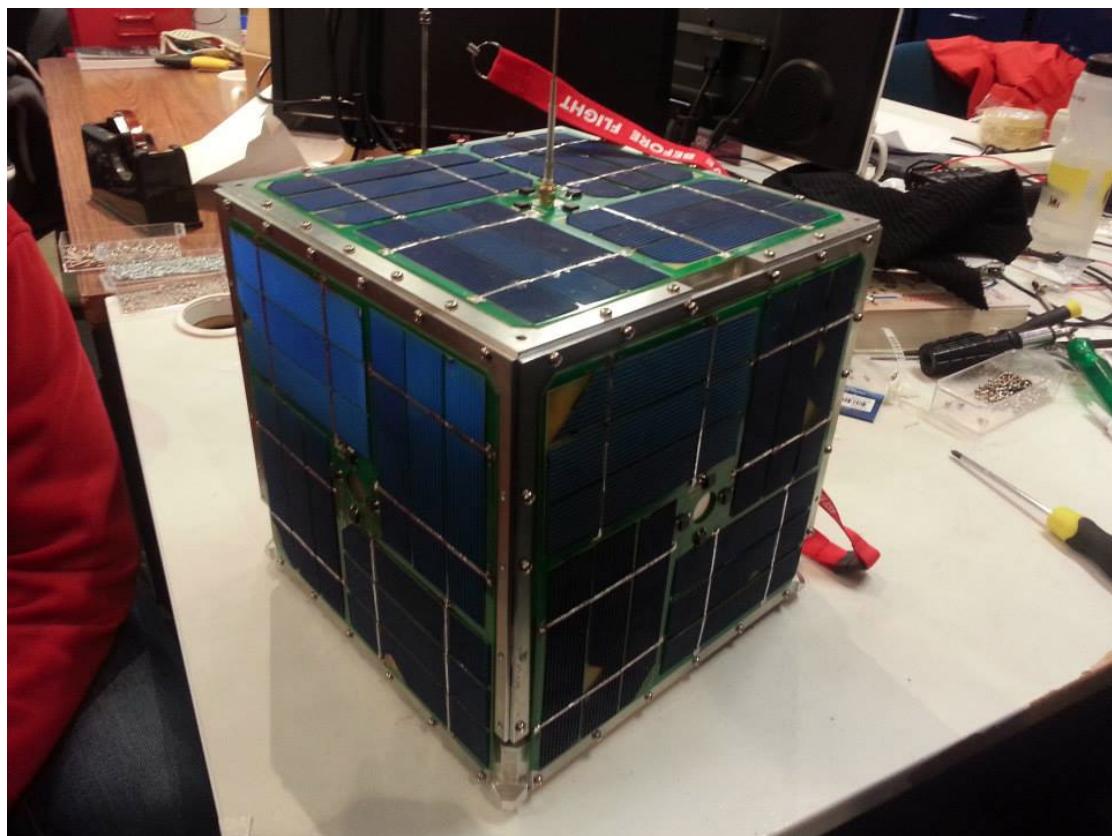


Figure 3 - Finished Satellite Structure

2.3 Future of the Group

With the first satellite project completed, the BLUEsat Group is heavily recruiting and expanding for the future. The Group will focus on undertaking three main projects – the Test Flight for the first Satellite, the Canadian Space Design Challenge (CSDC) and the NASA Lunabotics competition.

2.3.1 Test Flight

In April 2014, a stratospheric balloon launch will completely test the capabilities of the BLUEsat satellite under space conditions. This will allow for an effective telemetry sweep and comprehensive tests of the entire system. It will also provide us with important feedback on the satellite's performance in a radiation environment.

This will make BLUEsat one of the first satellites to reach space that is completely designed and built by undergraduate students.

There are several different flight durations available for the test launch, with longer flights providing a greater scientific and engineering return. Our goal is to test BLUEsat at a height of 40km for 24 hours, however this presents a significant financial investment for a student project.

2.3.2 Canadian Space Design Challenge

The CSDC is a Canadian run CubeSat design competition. The competition calls for the design and delivery of a 3U CubeSat, with 21 months between registration and satellite delivery. The CSDC also requires that entrants participate in high-school outreach and science educational programs in order to increase space-technology awareness in the public community.

BLUEsat has contacted the CSDC administrators with support from the Australian Centre for Space Engineering Research (ACSER). The CSDC has given a positive response, encouraging UNSW to partner with a Canadian University in order to field an entrant into the next cycle of satellites, expected to be delivered in mid-2015.

2.3.3 NASA Lunabotics

The NASA Lunabotics Mining Competition requires university student groups to design and build an un-manned rover designed for operation on the moon. The challenge runs annually, with competitions held at the Kennedy Space Centre in Florida. International universities make up a significant number of entrants each year. Like the CSDC, the Lunabotics competition also requires student groups to perform high school outreach.

The BLUEsat Lunabotics team is currently working on an initial conceptual design, project plan and budget. The aim is to have a semi-functional model by end of Semester 1, 2014 and a rover ready for entrance to the May 2015 competition.

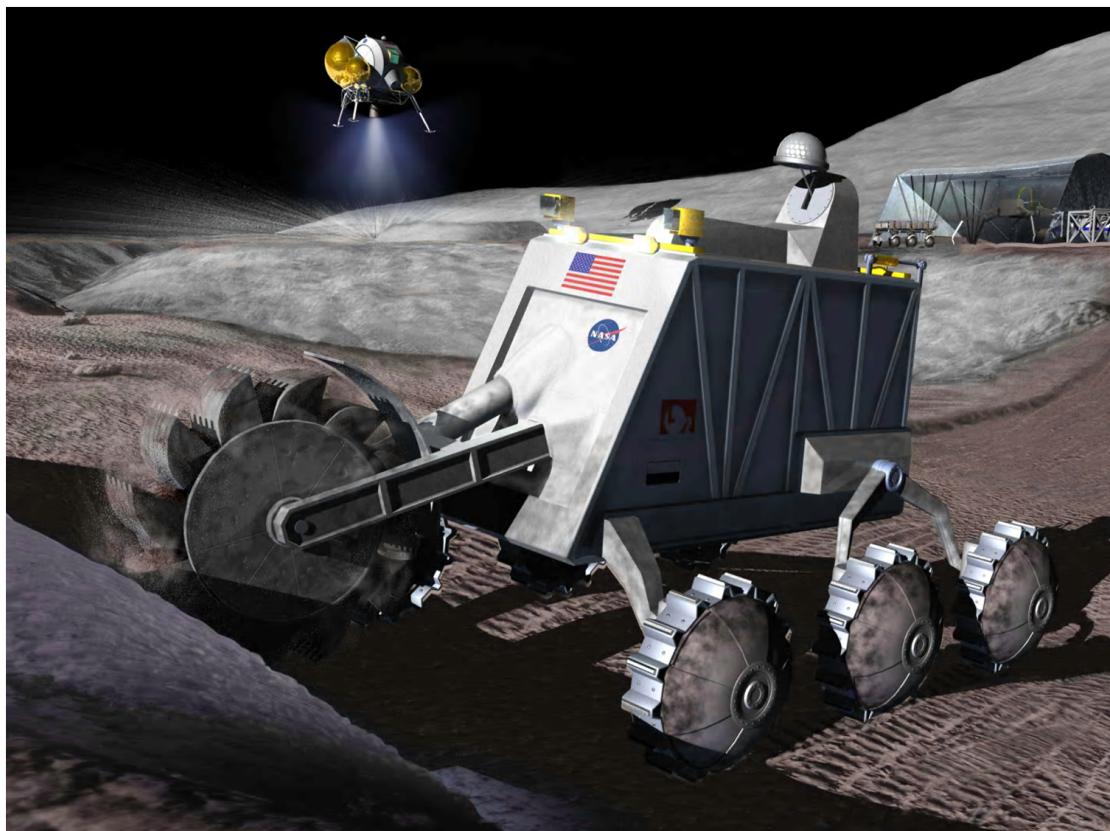


Figure 4 - Concept art for the NASA Lunabotics Competiton

3 Industry Partnership

BLUESat is seeking industry partnership to help fund the test launch of our first satellite in April 2014. The BLUESat Group would like to present gold and silver levels of sponsorship in return for industry partnership. We are interested in cash donations or sponsorship through discounted products. Donations valued above \$1000 towards the project will result in gold level of sponsorship. Smaller cash donations or discounted services will be given recognised as a silver level of sponsorship.

3.1 Sponsorship Benefits

The benefits of the gold and silver levels of sponsorship are outlined below:

Sponsorship Benefits	Silver sponsorship	Gold sponsorship
Sponsor name and logo on BLUESat website	Included	Included
Sponsor name and logo on BLUESat Facebook page	Included	Included
Branding on BLUESat clothing and posters	Included	Included
Branding on all BLUESat materials		Included
Presenting at public BLUESat releases and networking evenings		Included
Recognised in all BLUESat media releases		Included

3.2 Publicity

BLUESat sponsors will achieve significant publicity around UNSW, Sydney and internationally at space engineering design competitions through branding on our Facebook page, website, clothing, posters and publicity material. In the aftermath of our April 2014 balloon launch, we also anticipate significant media coverage (a recent example of this was the article “Satellite Project to Reach New Heights”, published in the Daily Advertiser on September 17, 2013).

3.3 Events

We will be hosting several public releases and networking events in the lead-up to the launch of the BLUESat satellite. Gold sponsors will be invited to make a presentation at the event and meet the team. Silver sponsors will be displayed at the event through the branding on all BLUESat clothing and posters. These events will include:

- Final public unveiling of Satellite Flight Model at UNSW
- O-Week Stalls
- Honeywell Engineering Summer School BLUESat workshops
- Taste of Electrical Engineering BLUESat Soldering Workshop

Further opportunities for publicity are available through the purchase of BLUEsat's name (e.g. The company BLUEsat Project). Please contact us for more information.

BLUEsat Financial Objectives

The BLUEsat project is currently seeking funding for the Test Launch in April 2014. Our financial objectives are outlined below: costs are outlined below:

2014 Launch Costs

The 2014 launch currently presents the most significant investment for BLUEsat. This includes the cost of rebuilding the satellite, purchasing the stratospheric balloon, helium gas, parachute and the support hardware that is required. The total estimated cost is outlined below:

Item	Required Date	Projected Cost
Rebuilding flight model	March 2014	\$4400
Launch cost	April 2014	\$27000
Total		\$31400

A detailed breakdown of these costs is included in Appendix A – BLUEsat Projected Budget.

We have estimated that operating costs for the next two years of the BLUEsat project will be \$85 560 (including 20% contingency). However, this figure does not include optional expenses such as the launch of the CSDC CubeSat and accommodation to attend each of the competitions. Covering these costs would enable BLUEsat to achieve greater international reputation and more exposure for any partnering companies.

4 Final Remarks and Contact Details

BLUESat represents a promising opportunity to forge links between high achieving university students and sponsors from industry. Industry stands to benefit from having their brand associated with a unique and prestigious university research project. A partnership would also provide pathways between **company** and promising students.

Please contact us to arrange a meeting and we can discuss the terms of the partnership.

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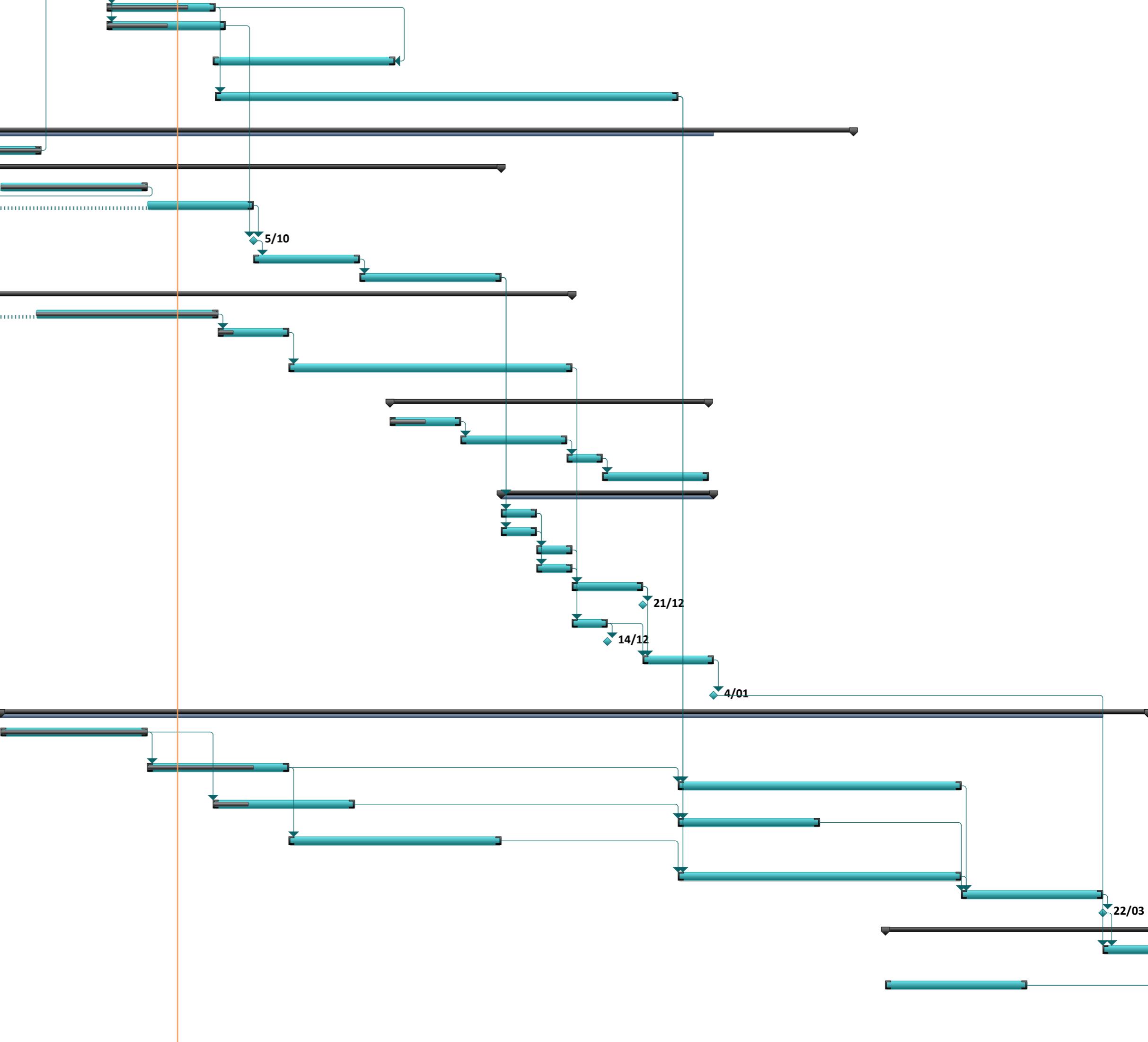
Phone: 0481 394 307

4. Appendices

4.1 Appendix A - BLUEsat Projected Budget

Balloon Launch By April 2014					
Item	Need By	Unit Cost	Quantity	Total	Contingency (+20%)
Raven Aerostar 3990m ³ Balloon	Mar-14	\$5,000	2	\$10,000	\$12,000
Helium Gas	Mar-14	\$1,500	1	\$1,500	\$1,800
Radio Uplink	Nov-13	\$750	1	\$750	\$900
Radio Downlink	Nov-13	\$750	1	\$750	\$900
Balloon Altimeter	Nov-13	\$2,000	1	\$2,000	\$2,400
Balloon Termination Device	Nov-13	\$1,000	1	\$1,000	\$1,200
Payload Recovery Parachute	Feb-14	\$3,000	1	\$3,000	\$3,600
Parachute release device	Dec-13	\$1,000	1	\$1,000	\$1,200
Secondary Power Supply - Lithium Non-Rechargeable 28V 30Ah	Dec-13	\$2,000	1	\$2,000	\$2,400
Recovery Costs	Apr-14			0	
Misc. Launch Hardware	Mar-14	\$5,000	1	\$5,000	\$6,000
Personnel	Mar-14		5	0	
Transport Costs: Personnel + Hardware to Wagga Wagga (Optional)	Apr-14	\$500	1	\$500	\$600
Accomodation (Optional)	Apr-14	200	5	\$1,000	\$1,200
			Total - Base	\$27,000	\$32,400
			Total - With Options	\$28,500	\$34,200

Satellite Flight Model By March 2014					
Item	Need By	Unit Cost	Quantity	Total	Contingency (+20%)
Batteries	Jan-14	\$400	1	\$400	\$480
Passive Components (Resistors, Capacitors etc)	Nov-13	\$500	1	\$500	\$600
Integrated Circuits	Nov-13	\$700	1	\$700	\$840
Custom PCBs (Set)	Nov-13	\$2,000	1	\$2,000	\$2,400
Transmitter Radio + Tuning	Dec-13	\$400	1	\$400	\$480
Receiver Radio + Tuning	Dec-13	\$400	1	\$400	\$480
Mechanical Structure Fasteners (Non-Optional)	Dec-13	\$1,500	1	\$1,500	\$1,800
Mechanical Structure - Labour and tooling (Optional)	Jan-14	\$8,500	1	\$8,500	\$10,200
			Total - Base	\$4,400	\$5,280
			Total - With Options	\$14,400	\$17,280



Project: launchSchedule
Date: Sat 21/09/13

