Ottawa Carleton Educational Space Simulation

BUSINESS AND OPERATIONS PLAN

2001-2002

Our mission is to learn about space and related sciences through experimentation and simulation, and to educate other youths of all ages in these fields through fun and interactive demonstrations and activities.

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Executive Summary

The Ottawa Carleton Educational Space Simulation runs a 72-hour simulated space mission every year. We also run an Elementary Education Program and a Planetarium Program to educate youths about space in a classroom environment. The program is managed by two Mission Commanders, two EEP commanders, and two Planetarium Commanders. The financial expectations of the program this year is about $100 dollar surplus. Unfortunately, the capital is needed immediately for the construction of the Habitat, whereas the money will arrive slowly over the course of six months. Our space requirements are as follows: for the Habitat we estimate that a room of 40' by 40' would required; for Mission Control we estimate that a room 20' by 20' would be adequate. Our timeline is as follows:

5 December 2001	Fundraising committee meeting.
7 December 2001	Move into facilities at Albert Street.
10 December 2001	Start of 2001 EEP Program.
14 December 2001	Habitat plans finished and submitted.
31 December 2001	Plans approved by Board and Fire Marshall.
31 March 2002	Completion of Habitat construction.

As a possible solution for long-term sustainability of the Organization, a resumption of summer camp is being considered.

1. ***Mission Statement:***

Our mission is to learn about space and related sciences through experimentation and simulation, and to educate youth of all ages in these fields through fun and interactive means.

2. ***The Program***:

The Ottawa-Carleton Educational Space Simulation is a student-run program with three primary functions: The Mission, the Elementary Education Program, and the Planetarium Program.

I. **The Mission**:

Each year our seventy-two hour simulated space mission takes us to a different planet or moon in the solar system. The Mission usually takes place in March. Significant advance research, planning and preparation, taking several months, is required in order to ensure that a realistic simulation occurs each year. During the mission, six astronauts live inside our Space Habitat, called the 'Hawking.' For seventy-two hours, the astronauts are sealed inside the Habitat, and have no contact with the outside world other than through Mission Control, just as if they were truly on another planet. The Habitat communicates by way of radio headsets, cameras, and computer chat programs with our Mission Control, located in a separate room. A mock planetary surface is constructed outside of the Habitat itself but still within the sealed room. Depending upon the destination, the planetary surface could be covered in craters, or perhaps have a volcano. Throughout the mission, the astronauts go outside the habitat on EVAs (extra-vehicular activities, i.e. spacewalks). They retrieve simulated surface samples and run chemical and biological experiments upon them. Inside the Habitat, they run various social, biological, chemical, and psychological experiments. These experiments are designed by the students, and have included:

-The effects of gravitational forces on goldfish;
-The effects of colour on thought;
-Experiments with magnetic fields;
-The effects of isolation on language.

All data are monitored by a team in Mission Control. As with a real space mission, not everything can be predicted. The mission is full of simulated emergencies which are controlled by a separate team. These can range from simple things such as meteor showers and earthquakes to power failures and decompression of parts of the Habitat. Mission Control and the Astronauts must therefore work carefully together to solve all problems that arise.

The mission is the highlight of the year for most of the Space Simulation members. This activity requires months of planning and the high school students acquire knowledge about space and other areas of science and technology in order to accurately simulate the mission. They also develop a wide variety of skills including leadership and teamwork. Furthermore, technological knowledge and skills are required to program the software packages, most of which are not commercially available. Some of the other skills acquired include carpentry, plumbing, audio-visual equipment wiring, robotics, computer programming, planning, public relation experience, problem-solving and time management skills.

II. **Elementary Education Programs**:

The year-round portion of the Space Simulation is known as the Elementary Educational Program, but in fact it consists of two separate services:

a) The Science Sessions are hosted by the Space Simulation for a wide selection of elementary-level classes from across the region. During each session, groups of children from kindergarten to grade eight learn about

space science and space travel from the student members of the Simulation. They learn about the laws of physics and kinetics using hands-on demonstrations, including the use of a student-built hovercraft. They learn about the structure of the atom and about electricity through experiments at an electrostatics station. They are taught about the Canadian contribution to science in space. They also learn, through demonstrations, about the effects of the cold temperature of space, and the other physiological and psychological problems which astronauts must overcome to live and work in such a hostile environment. These programs are truly unforgettable and inspiring experiences for the elementary classes.

b) The Mini-Missions are miniature replicas of the Ottawa-Carleton Educational Space Simulation's seventy-two hour annual simulated space mission in March. In April and May, elementary students, generally from grades five to eight, spend a day conducting a mission to another planet or moon in the solar system under the direction of Ottawa Carleton Educational Space Simulation members. Half the class spends half the day in Mission Control, overseeing the mission, and then switches with the other half of the class, taking command of the Habitat. Thus all the students see both ends of a Space Mission, complete with simulated emergencies, Extra-Vehicular Activities in bulky space suits, and psychological, biological, physical, and chemical experiments in the Habitat. Results and reports are relayed to Mission Control minute by minute, testing the communication and problem solving skills of both groups, especially when technical problems arise. The astronauts must devise creative and effective solutions, often with no outside help from Mission Control. The students invariably come away from the Mini-Missions with a little more wisdom, and talk about their experiences for weeks.

For a cost breakdown of the Elementary Education Program, please see the spreadsheet below, section 4.

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III. **Planetarium**:

The third function of the Ottawa-Carleton Educational Space Simulation is the planetarium visits that we conduct to elementary schools across the Board. During a planetarium visit, we set up our inflatable planetarium and each elementary class attends a twenty-minute session in the planetarium where they are taught basic astronomy, the Greek myths behind some of the constellations, and the effects of light pollution. During the 2000-2001 school year, we visited sixteen schools, and presented this program to approximately five thousand elementary students.

3. *Management Structure*

The Ottawa-Carleton Educational Space Simulation has an efficient management structure. While each participant plays a key role in the success of the Space Simulation, there are four types of managing positions: Teacher Advisor, Mission Coordinators, Elementary Education Program Coordinators, and Planetarium Coordinators.

The Teacher Advisor supervises the club's meetings and work sessions. She or he is the main contact between the Board and the students, as well as being a key player in the continuation of the Elementary Education Programs and the Planetarium visits. In addition to this, the advisor provides the required supervision during the Mission, and provides support to all the student coordinators. Finally the teacher advisor is in charge of acquiring corporate funding for the Space Simulation.

The two student club co-heads, the Mission Co-Coordinators, are in charge of running and organizing all the meetings and work sessions and the simulated space mission, as well as ensuring the continued success of the program.

The two Elementary Education Program Coordinators are in charge of planning the visits from the schools and confirming attendance. In addition to this, they must ensure that the Elementary Education Programs have sufficient staff from the club.

Finally, the two Planetarium Coordinators are in charge of running the Planetarium visits, and ensuring that there are students to staff all the visits.

Aside from the management positions, there are a number of Directors. The Technical Operations Director is in charge of supervising the use and maintenance of all physical devices. This ranges from Camera & Communication Systems, to the Habitat's structural integrity. The other key director is the Media Director. This individual acts as Public Relations officer, coordinating media visits, recruiting new members, and increasing public awareness of the program.

4. *Financial Summary*

OCESS Financial Plan 2001-2002					
	Source	Number	Revenue/cost per unit $	Total $	
Revenue					Comments
	Planetarium Visits	16	125	2,000	3 completed as at November 30.2001
	EEPs – Half-Day	10	100	1,000	Scheduling to commence December 10, 2001
	EEPs – Full Day	5	125	625	Scheduling to commence December 10, 2001
	Corporate Sponsors	2	1,000	2,000	We currently have no sponsors. Goal is to obtain one or two by the end of January 2002.
	Planned Revenue			5,625	
Expense					
	Habitat Construction	1	4,000	4,000	One time Capital Cost, we will build components as we amass enough money from our revenue. Current year habitat expenses will not exceed $2000 unless sponsors are obtained.
	EEPs – Half Day	20	15	300	
	EEPs – Full Day	10	5	50	
	Repair Costs	1	50	50	Onetime cost items, cost varying, average given
	Mission Cost	1	250	250	Includes food, Planetary Surface construction materials, cleaning supplies, equipment for experiments
	Duct or Aluminum Tape	10	6	60	
	New Battery Chargers	2	22	45	
	New Harddrive Scsi Card	1	70	70	
	Hub	1	700	700	This is an upper end cost estimate, it is probably less
	Planned Expense			**5,525**	
Net Revenue (Expense) before Spacecamp				**100**	
Spacecamp					This is money that will not be available to this year, but will be earned before next year. Spacecamp is run as a business, to attempt to pay for the next year's costs before hand, instead of paying as money arrives from the EEP and Planetarium Programs
	Planned Revenue	240	200	**48,000**	We plan to run 8 5-day programs with 30 children per program
	Expense				
	Operating Costs	8	1,250	10,000	Materials, supplies, trips, miscellanneous
	Salaries	1600	8	12,800	Assuming paying 5 employees 8 hours a day, times 5 days a week, times 8 weeks
	Space Rental Costs	2240	1.25	2,800	Assuming cost per foot per annum of $8
	Planned Expense			**25,600**	
	Spacecamp Net Planned Revenue			**22,400**	
Net Revenue (Expense) Including Spacecamp				**22,500**	This will be used to pay for the teacher salary for next year, which is estimated around $15,000.00, and for additional h

Corporate Sponsorship Incentive:
Companies that sponsor the Ottawa-Carleton Educational Space Simulation will be recognized on our website with a text message and/or their logo. They will also have their name and/or logo placed upon our Advertisement Board that is present at all our public functions. We will also design an appreciation certificate, which we will frame and give to each sponsor, which they can display. We also may be given access to local television and newspaper outlets to thank our sponsors.
In years past we have had such sponsors as Nortel, SPAR, CSA, and OCRI. These and other companies are being approached for sponsorship this year. We also accept other forms of sponsorship, such as old hardware donations.
The money raised will be used to contribute to the building of the Habitat, replacing or buying additional computer equipment, and covering the costs of running the mission.

5. ***Space and Access Requirements***:

For the Habitat we estimate that a room of 40' by 40' would required. For Mission Control we estimate that a room 20' by 20' would be adequate. It would be desirable to have a third room, for Elementary Education Programs, which could also be used as extra work space for planning and developing EEP materials, as well as an observation room during the mission. We also require a storage space of approximately of 1050 cubic. Ideally, the facility should have a central location, accessible to public transit.

For the period of time of December 8, 2001 to March 31, 2001 we will need access to our facilities on a daily basis for unpacking and Habitat construction purposes. We estimate an average of two hours a day. We meet for worksessions every Friday from 4:00 until around 6:00 in the afternoon. We will be running EEP programs at these facilities. When this occurs, we will need access from around 7:30 am until around 3:30 PM. During the mission we will be occupying the space on a twenty-four hour basis until it is complete. After the mission, as the habitat construction is finished, we will only need the full-day access on EEP days, and the Friday access once a week.

6. Timeline

These are the current projected deadlines. This is a dynamic section of the business plan and is kept up to date as new deadlines are created. We do not accept meeting deadlines late from our members.

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7 December 2001	Move into facilities at Albert Street.
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7. Projects:

1. Construction of the new Habitat: $4000

Our biggest project this year is to construct a new Habitat in which to carry out the mission. The blueprints for this facility are now complete, and are available in an Autocad format upon request. We are going to need large amounts of Capital Funding, engineering and construction expertise, and construction equipment. Construction of a new Habitat this year is necessitated by requirements to meet new fire and safety codes.

2. Expansion of the Ottawa-Carleton Educational Space Simulation to more Ottawa-Carleton District School Board Schools

The Ottawa Carleton Educational Space Simulation is not a one-school program, although the majority of members are from Lisgar.

Expanding the program into other schools would ensure wider participation. We have begun by approaching the administration and students at a couple of schools each year. A teacher supervisor would be required at each school interested that starts a club. Each school would start its own branch of the Simulation, and hold its own weekly meetings. All the school's members would attend our work-sessions, and work with us on our mission. They would have access to run their own missions or participate in the Lisgar mission if they wished.

3. A new EVA suit: $200.00 estimate

   The EVA suits we currently use are getting old, and improvements or replacements are required. The new suits are currently being designed by our members, who will also build them. A preliminary estimates is $200.00 for the entire project.

4. New Battery Chargers: $26.44 each

   Our current battery chargers are old and are not charging our batteries adequately. Two new battery chargers would greatly ease the mission, and keep the price of more rechargeable batteries low, as each battery would have a longer life.

4. New Scsi Card: $60-$90

   Our file server has a damaged Scsi card, and is therefore no longer functional.

8. *SpaceCamp*

The Ottawa Carleton Educational Space Simulation has run a summer camp for children in the past. We intend to re-start this educational initiative this year. This project would benefit the Simulation in several ways. It would increase public awareness. It would aid us in reaching our goal of educating as many youths as possible about space. Finally, it is the single, largest source of revenue for the Simulation.

The Camp will run in five-day sessions, for eight weeks of the summer. We will have Space Simulation members as employees. They will work eight-hour days, which includes time for setting up and cleaning up. The camp's curriculum will be based upon the grades six, seven, eight and nine science curriculums. We are currently considering offering the camp to children ages nine through thirteen. This will give the students an advantage in their grade nine science course, as we will be covering more advanced topics from the grade nine curriculum. Our goal with SpaceCamp is to challenge the students to learn and work in teams to solve complex problems, while having fun. A brief outline of some of the proposed activities includes: Model Rocket Construction and Launching; Satellite Design and Testing; Space Mission Simulation; Canada in Space, and Our Solar System.

Please see the financial spreadsheet for an estimated cost-breakdown of SpaceCamp. Once we receive approval from the Ottawa Carleton District School Board to run this camp, we will expand upon the financial and educational sections of the SpaceCamp.