

FINANCING A MANNED MISSION TO MARS

Steven McCullough*

INTRODUCTION

Never has the entire world been united, with a common sense of purpose, as it was when Neil Armstrong first set foot on the moon. The entire world stopped to watch as the collective hopes and dreams of mankind were realized a quarter of a million miles away. There have been few other sources of national pride, national identity or sources of optimism as powerful as the Apollo Program.

We live in a time of selfishness and cynicism. We have lost faith in our leaders and our government. The American people and the people of the entire world need something to aspire to, something to hope for, and something to sacrifice for that is bigger than all of us. We need an event that will once again remind us that there is nothing we cannot accomplish if we dream big and work together. This goal must be a challenge so great so as to seem outrageous. It must be inspiring, leaving those who dare to dream of it with a sense of wonder.

This summer I gave talks at local libraries as part of the summer reading series. Because I am not necessarily an inspirational speaker, I was amazed at the awe in the eyes of the children and parents who attended. They found the topic fascinating, and they impressed me with their knowledge of it. Undoubtedly, these are some of the half a billion people who visited NASA's Pathfinder web site in the summer of 1997. The topic of discussion was, of course, Mars. These were talks about the latest scientific findings about the Red Planet. The question was always asked, "When will we send astronauts to Mars?" My answer was, "Whenever we decide we really want to go!"

I believe that a manned mission to Mars should be launched for many reasons, but perhaps the most important is that it is the only challenge that can capture the fascination of the public and provide a much-needed sense of common purpose. But with the enormity of the adventure comes an enormous price tag. While it would certainly provide an opportunity for sacrifice, the resources required to fund the mission could very well preclude the pursuit of other, more immediate needs. Hence, the key to launching a trip to Mars, an endeavor with the potential to help mankind rise above its current malaise, is to find a way to pay for it.

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VYING FOR TAX DOLLARS

Even in a new era of budget surpluses, the clamor for funding of projects and the political in-fighting that results prevent even the most worthy endeavors from receiving appropriations from the United States Congress. Congress still lives in a world of constraints imposed by the Balance Budget Act of 1997 and the rules of Congress known as “Pay-Go.” These rules require that new budget items be offset by cuts to other programs or new revenue sources. This creates an incredible momentum toward inaction. Currently, even items with bipartisan support in Congress and the endorsement of the President cannot get done if they cost so much as to prevent other planned uses of the surplus.

Supposing a few worthy causes could pierce through the political gridlock, who would want to be the one to have to select them? Could any reasonable person suggest that instead of curing cancer or AIDS we should send a mission to Mars, if this was the tradeoff? Unfortunately, in our current political environment, this is in fact the tradeoff. And it does not appear that we will see an end to divided, grid locked governance any time soon.

This political environment requires an enormous amount of political will to be generated before a new idea can get funded. Unfortunately, even the efforts of the Mars Society are unlikely to be able to generate this level of support. But bear in mind, this is because of the huge amount of tax dollars required. Suffice it to say, the fewer tax dollars required, the easier it is to get Congress to act. The key is to minimize the use of tax dollars. If money can be generated from other sources, than the launch of the first manned mission to Mars might occur very shortly thereafter.

RAISING FUNDS THROUGH PRIVATE DONATIONS

Many people are inspired by the thought of sending a mission to Mars, and, if given the opportunity, would donate money to fund the effort. In terms of the mission serving as common purpose, allowing individuals and corporations to give money would create emotional as well as financial commitment. In this sense, people who do fund raisers or sacrifice their own money are working toward the common goal, and become invested in the effort.

One could envision school children selling candy bars with wrappers picturing the launch vehicle, or picking up soda cans along the road, all in an effort to send astronauts to Mars. Parents would be drawn in to help with car washes and bake sales. These grassroots effort could generate excellent publicity for the mission.

What if individuals who donated a certain amount were given an artist’s conception of the landing vehicle, suitable for framing? Grandparents could make a donation and have a plaque reading “(grand daughter’s name) helped enable the first mission to Mars.” Or what if the names of those who contributed were placed on a CD that would fly on the mission and be left on Mars? Taking a cue from the best practices of successful charitable organizations, the possibilities are endless.

NASA, however, is forbidden by the Space Act from accepting any donation with strings attached. The National Aeronautics and Space Act, Pub. L. No. 85-568, As Amended reads, in part:

Sec. 203. (c) In the performance of its functions the Administration is authorized--

(4) to accept unconditional gifts or donations of services, money, or property, real, personal, or mixed, tangible or intangible.

Only a few federal agencies, such as the National Endowment for the Arts, have “solicitation authority.” This is because Congress wants to control the activities of federal agencies by holding their purse strings. If an agency has the ability to raise money from sources other than congressional appropriations, than the agency has the ability to pursue its own goals.

Congress could certainly grant NASA limited solicitation authority to fund a mission to Mars. However, since it is not a professional fund raising organization, one has to question whether NASA would be successful in its efforts.

A private, non-profit corporation, such as the Mars Society, could undertake the task to raise funds for the mission. However, it is questionable whether a private charity that is not endorsed by or affiliated with the U.S. Government can engender the public trust required to generate the magnitude of donations that a mission to Mars would require. People associate NASA and the U.S. Government with space travel, and they will be skeptical of an outside, private entity that claims to be funding a trip to Mars.

The answer may be in a hybrid arrangement. Congress could grant the solicitation authority to a designated, private, non-profit charity with the mandate to raise the money to fund the mission. Along with other restrictions that Congress might impose, such as controls on the types of fund raising techniques that could be employed, Congress could mandate that the charity turn over its moneys to NASA to fund the mission. Congress could also assert the right to appropriate these moneys in the NASA budget, thereby preventing NASA from using them for unintended purposes.

This arrangement would allow the private organization to innovate and effectively raise money, while providing a special status for and control over the organization by the Congress. This would enable it to generate the required public trust.

The only remaining issue would be whether the private charity could raise enough money for even one, \$8 billion mission to Mars. As a benchmark, one could look to the Muscular Dystrophy Association, which is arguably the most effective and the most popular private charity in operation today. According to its tax return (1999 Federal Form 990), MDA raised \$120 million dollars last year. At this rate, it would take a charity raising money for a mission to Mars 66 years to raise \$8 billion. Based on this analogy, it does not appear that sufficient funds can be raised by private donations alone.

RAISING FUNDS THROUGH ADVERTISING AND PROMOTION

To date, NASA and the U.S. Government have viewed the telecast of Space Program events as a public good to be dispensed for free. However, the few events covered by the major networks are interrupted by commercials. The public pays a price in having to sit through commercials and be marketed in return for the opportunity to watch NASA events. Ironically, the networks keep all the revenue from these commercials without ever paying for the programming.

In the case of NASA TV, which is uninterrupted programming straight from NASA, only some cable companies include it with their basic package. This means that the public pays for it in the form of their cable bill.

To the networks and advertisers, there is great value in programming that will attract large audiences. The larger the audience, the more they are willing to pay.

Four networks have agreed to pay \$17.8 billion for the next eight seasons of NFL television rights. That is \$2.2 billion per season. CBS has agreed to pay \$3.55 billion for the television rights to the five Olympiads between 2000 and 2008. A one-minute commercial during the last Super Bowl sold for \$4.2 million. An estimated 125 million Americans, or about 45% of the U.S. population watched the game.¹

An estimated 500 million people witnessed Neil Armstrong's first steps on the moon.² World population has increased 71% since 1969.³ Using a simple extrapolation, as many as 850 million people might watch a landing on Mars. Based on the cost per million of a Super Bowl ad, a one minute commercial at the time of the landing might go for \$28 million.

The idea of advertising in space is not new. It is already occurring. Examples include commercials filmed on the Mir space station and cosmonauts appearing on the QVC Shopping Channel. See Appendix I – Space Advertising.

The amount of programming produced by the mission could be expanded beyond the launch and landing events. The trip to Mars would take at least seven months. During this time, a twice a week television show could be produced highlighting the activities of astronauts and the progress of the mission. To increase viewing, the show might be patterned after the reality-based shows "Survivor" and "Big Brother". This is not to suggest that the astronauts would vote on which crewmember should be blown out of the airlock. Instead, the public might be given the opportunity to vote on the crewmember that gets to take the first step on Mars. This voting might take the form of telephone calls to a "900" number. To increase the number of calls, one caller each week could be chosen at random to earn the opportunity to have a live telephone conversation with the astronauts. While this idea might seem far-fetched, it is a dramatic – and

¹ Columbia Journalism Review, September/October 1998, **Does Money Tilt the Playing Field?** by Lawrence Strauss.

² <http://www.spaceline.org/flightchron/apollo11.html> © Copyright 1998 by Clifford J. Lethbridge

³ *U.S. Bureau of the Census, Current Population Projections* <http://www.census.gov/ipc/www/worldpop.html>

realistic - example of steps that could be taken to enhance the popularity, and the value, of NASA programming.

The private charity that receives the rights grant from Congress could also sell sponsorships to corporations. AT+T might become the official long distance carrier of the mission to Mars, (and supply the telephone links between the crew and their families for free.)

Merchandising could also raise substantial funds. During the Pathfinder Mission, Matchbox began selling miniature replicas of Sojourner and immediately sold out. Action figures might be made of each astronaut. The mission logo might adorn everything from coffee cups to t-shirts. The most popular items, however, could be withheld and would be given only to those who made charitable contributions toward the mission.

Congress should acknowledge that the telecasts of NASA events are not “free to the public” and capitalize on the value of its programming. It could do so by granting the television, merchandising and sponsorship rights for the mission to the private charity raising funds through private donations. This charity would then conduct an open bidding process to sell all or part of these rights. The money raised from the sale of these rights might pay for all or at least a large amount of the mission to Mars.

PUBLIC REACTION TO COMMERCIALIZATION

NASA officials were leery and hesitant when presented with the suggestions listed above. Current law forbids this type of activity, and these officials are concerned about such suggestions being attributed to the agency. Their concern centers on the reaction of the public and the reaction of Congress. Their assumption is that Congress will be concerned about a public backlash: negative reactions about NASA “selling out” or the involvement of advertisers cheapening the higher purpose of the mission.

It can be theorized that there is a breaking point: at some level of commercialization the public’s buy-in to the mission as the accomplishment of a higher purpose will evaporate. Most likely, Congressional support for the mission would wane before this breaking point was reached.

There are examples of the public accepting much more radical promotional activity than that proposed earlier. NASCAR auto racing is surging in popularity despite the fact that the cars and the drivers are covered head to toe by the names of sponsors. Fans are accepting of this practice because the high cost of operating a race team is generally known. Fans understand that without the sponsorships, they would not get to watch the sport. The costs associated with operating a racecar pale in comparison to the cost of a mission to Mars.

In July 2000, a Proton rocket was launched by the Russian Space Agency carrying “Zvezda”, the crew quarters module for the International Space Station. Because of a severe shortage of funds, this launch would not have occurred without a million-dollar payment from Pizza Hut. In return, the Pizza Hut emblem was painted on the side of the launch vehicle. In a

very real sense, this arrangement with Pizza Hut, and the Russian Space Agency's willingness to accept it, saved the International Space Station. (See Appendix I.) Public reaction in the US was non-existent. While some concern was raised in the press, the event received little news coverage, and footage of the launch did not appear on major news networks. It is difficult to determine whether the lack of public response was due to a lack of knowledge or tolerance for the arrangement.

A more moderate example of "institutional" commercialization is the 2000 Sydney Olympics. Television, merchandising and sponsorship rights were sold to fund the event by a private, non-profit entity (the International Olympic Committee). While commercialism surrounds the games, in the eyes of the public, the games themselves remain relatively pure and focused on a higher purpose: the generation of international cooperation through athletic competition and sportsmanship. Restrictions on commercial activity, such as a ban on contestants wearing company logos, help maintain this distinction.

Perhaps the most important step in making a mission to Mars a reality is to discern the public's acceptance of the sale of television, merchandising and sponsorship rights.

THE ALL-PRIVATE OPTION

In the event that Congress is unwilling to endorse an arrangement wherein a mission to Mars is funded through the sale of television rights, another option could be considered: private fund raising and a privately developed and operated mission. A prototype of a private space mission currently exists. TransOrbital, Inc. is soliciting customers for an all-private robotic lunar mission. See Appendix II.

A private charity could raise money for the mission to Mars, including selling television, merchandising and sponsorship rights, as well as the type of sales efforts included in the TransOrbital business plan. The private charity could also contract with one or more aerospace firms to build the spacecraft and manage the mission. There would be some substantial hurdles to clear, however. Because of the enormous cost of the mission and the prospect of failure, potential customers and contractors would be skeptical of the risks involved. While TransOrbital sought to mitigate these risks by purchasing insurance, it is doubtful that this tactic could be employed for a mission to Mars because of the vastly greater financial risk. This increased financial risk is magnified by the liability that comes from including astronauts on the mission. The involvement of the Federal Government, with its immunities from civil suits, would greatly reduce these risks.

Private donations might also be harder to generate without the bona fides of the Federal Government adding credibility to the project. While excluding the government opens up a much wider array of fund raising options, the utilization of aggressive commercialization may preclude the ability to generate donations.

The loss of public donations and the inclusion of aggressive commercialization would likely eliminate public buy-in to the concept that the mission is accomplishing a higher, public

purpose. Instead, it would run the risk of being viewed as an elaborate publicity stunt. As outlined in the introduction, the ability of a mission to Mars to inspire the public might be the most important benefit of the mission, a benefit that is likely to be lost in an all-private venture.

INTERNATIONAL PARTICIPATION

The Soviet Union played an important role in the success of the Apollo Program. As a Cold War adversary, the Soviet Union provided competition and provoked a sense of patriotism in Americans. This added the sense of urgency and part of the sense of common purpose that the program required.

The threat of a military enemy taking control of space no longer exists. Hopefully, the loss of this motivational factor will be offset to some degree by the opportunity for international cooperation. While the desire to cooperate is not as strong of a motivating factor, it brings with it the possibility monetary and/or hardware contributions from other countries. While the combined amount of these contributions would not equal that of the United States, it would be significant none-the-less. These contributions would supplement moneys raised by a private charity.

Another compensating factor for the loss of the Space Race as motivation is the public's strong fascination with Mars. The moon was set as a goal because it was within our reach and because it was a stepping stone to further exploration of the Solar System. In contrast, Mars is viewed as a destination, worthy in its own right as lofty goal. The fulfillment of our collective dream to explore Mars will provide its own momentum.

CONCLUSION

It appears unlikely that a manned mission to Mars will receive authorization and funding because of current budget constraints and competition for resources. Consequently, funding sources other than tax dollars must be located if the mission is to take place.

An impediment to the use of commercialization is the fear of a public backlash; loss of a sense of higher purpose, and the lack of political will that would result. It is likely, however, that the threat of this backlash is overstated. To make commercialization more politically acceptable, its true impact on public opinion must be discerned.

The Mars Society should employ a market research firm to conduct a nation-wide survey. This survey would seek to gage the reaction of the public to a manned mission to Mars and to a menu of tactics for funding the mission:

- Use of a Private Charity to take Public Donations
- Donations from Corporations
- The Sale of Television Rights
- Enhancements to programming such as a twice-weekly television show during the mission

- The Sale of Sponsorships to Corporations
- The Sale of Merchandising Rights
- The Sale of Advertising Space on the Launch Vehicle, Landing Vehicle, Mars Rover and Astronauts' Space Suits

The survey should also put these questions into the context of “If the choice was to use some of these tactics or not go to Mars, would you be more accepting of their use?”

Assuming the survey results indicate strong public support for a mission to Mars and greater acceptance for the use of one or more of the alternative funding tactics, the Mars Society should use this information to formulate a detailed business plan and write legislative language. These would be used to lobby Congress. The desired outcome of this lobbying effort would be the designation of the Mars Society as the private charity with a special mandate from Congress. This mandate would include:

- The raising of moneys to fund the mission to Mars under special restrictions. These would include the type of fund raising tactics employed and the remittance of funds raised back to NASA. Congress would appropriate these funds to NASA for the expressed purpose of executing the Mars Direct plan, or a modified version of this plan that could still be executed at low cost.
- The tactics the Mars Society would be allowed to use would be patterned after the Olympic Committees. They would include:
 - Public Donations
 - Donations from Corporations
 - The Sale of Television Rights
 - Enhancements to programming such as a twice-weekly television show
 - The Sale of Sponsorships to Corporations
 - The Sale of Merchandising Rights

In conclusion, a manned mission to Mars has the potential to fascinate and energize the public. Such a challenge is needed to bring people together and to provide a new sense of optimism. The cost of the mission might be prohibitive, however, unless new ideas are considered. The model outlined above includes a government/private charity partnership in order to take advantage of the innovation of the private sector in terms of fund raising, and the greater ability of a private corporation to negotiate the highest payback for the rights involved. By maximizing this payback, sufficient funds might be raised to fund the mission to Mars without substantial outlays of tax dollars.

ABOUT THE AUTHOR

Steven McCullough is a CPA who graduated from the University of Iowa's Executive MBA program in 1992. Steven is the Executive Director of Iowa Student Loan Liquidity Corp. (www.studentloan.org). Iowa Student Loan is the private, non-profit secondary market for student loans in Iowa. During Steven's tenure, Iowa Student Loan has grown to over \$1 billion

in assets. Steven also serves as the Vice-President of the Board of Directors of the Education Finance Council, a Washington, DC-based trade association of non-profit student loan secondary markets. In both these roles, Steven works with the U.S. Congress and Iowa State Legislature on issues surrounding the financing of higher education.

Steven McCullough is also the author of a fact-based, action/adventure novel titled, "Returning to the Garden: A Novel About Mars", iUniverse.com, 1999. ISBN 0-595-08872-4. For more information, additional copies of this paper or to contact Steven via email, go to <http://marsbook.home.att.net>

APPENDIX I

Space Advertisements

Note: This page is part of Jim Kingdon's space markets page:

<http://www.panix.com/~kingdon/space/advert.html>

Various companies have filmed ads in space or engaged in space-related promotional activity:

1999: Pizza Hut buys an ad on the side of a Proton launcher for about \$1 million: "Pizza Hut buys rights to put logo on Russian rocket", Florida Today Space Online, 30 Sep 1999 and "Pizza Hut in Space", SpaceViews, 1 Oct 1999.

1999: Mir commercial for the More.com online drugstore. "Mir Crew Approaches the End", SpaceViews, 24 Aug 1999.

1998: "Mir cosmonauts pitch pens on U.S. television", 8 Feb 1998. Live appearance on QVC shopping channel. Says that some money went to the Russian Space Agency but doesn't disclose the amount.

1997: "Russian cosmonaut films milk ad on Mir space station", Florida Today Space Online, 21 Aug 1997. The figure of \$450,000 for the ad is mentioned, although it is not clear to me whether that includes the fee for the Russian Space Agency or not.

1996: Final Frontier Beef Jerky was trying to film an ad on Mir, although it didn't seem that anything came of it (last update Apr 1996).

1996: Coke and Pepsi both have space promotion efforts (Coke on shuttle, Pepsi on Mir). According to "Coke, Pepsi take cola wars to space", Florida Today Space Online, May 16, 1996, Coke has spent more than \$750,000 on their effort (which according to them and NASA is real research as well as promotion). According to "Pepsi-Cola and bottling partners launch \$550 million assault on Russian soft drink market", Pepsi news release, 25 Apr 1996, they are spending \$550 million on Russian marketing over 5 years (obviously their space ad is only one part of that). According to "Pepsi goes one up on Coke in space", Florida Today Space Online, May 22, 1996, it is a "seven-figure deal" between Pepsi and the Russian Space Agency. According to "Pepsi Teams Up With Russian Space Agency," Spaceviews, May 1996, Pepsi "is considering plans ranging from orbital billboards to sponsorship of a manned lunar landing" (presumably such consideration was at an early stage). Apparently the ad filmed on Mir was aired for the September 1997 MTV Music Awards, according to "Pepsi Blue", Adbusters Magazine, Winter 1998.

4 Sep 1996: MTV's Music Awards show had an interview with the Mir cosmonauts, according to Florida Today Space Online, 5 Sep 1996. No word on financial arrangements.

About 1993: Columbia pictures was going to pay \$500,000 for an ad on the side of the rocket on the first Conestoga launch. However, the deal was cancelled when the launch date kept slipping--

schedule reliability is important for advertising so that one can coordinate with larger promotional campaigns (CSTS, section 3.10.3.3.3, page 374 and section 3.10.3.6.2, page 377).

An interesting alternative to paint or decals would be to project an image onto the launcher with lighting. Rockets lit up at night are fairly spectacular and this alternative would require few if any design changes or payload penalties for the launcher itself (I saw this suggestion on sci.space.policy, Jan 1998).

About 1960, I heard a rumor which went: "Dan DeLong passed on a story from Ernst Stuhlinger-around 1960, representatives from Coca-Cola met with Von Braun and asked how much a Jupiter rocket cost- \$15 million, Von Braun replied. The Coke guys looked at each other and said, fine, we'll take one [to paint it as a Coke bottle; NASA said no]". Anyone have a more reliable source for this story? Has it been published?

One can imagine launch viewings being an attraction, perhaps somewhat the way that corporate boxes at sports events are. Schedule reliability an issue, obviously. This is done on a small scale by space companies for their employees; another example is a government one, "Delta rocket carries special significance for servicemen", Florida Today Space Online, September 13, 1996.

The leading company in setting up space advertising deals is Space Marketing, Inc. See CSTS, section 3.10.4.4, page 380, or "Mir Watch", Spaceviews, July 1, 1996.

Another category is space billboards (e.g. inflatable corporate logos visible for a few weeks before they reenter), space fireworks, etc. CSTS, section 3.6.5.3.1, page 262, has some good ideas about various sorts of displays that one might devise (synthetic auroras, artificial meteor showers, etc). Haven't seen any careful analysis of costs (CSTS, section 3.6.5.3.3, page 263 makes no attempt to estimate how many people could see a display, and how that would affect what customers are willing to pay). Astronomers are concerned about light pollution; for example see "The Star of Tolerance", International Dark-Sky Association Newsletter, No. 25 (September 1995), and there may be public opposition based on more general grounds too.

APPENDIX II

TransOrbital Lunar Project Solicitation of Interest

TransOrbital Offers the 1st Commercial Space flight to the Moon

A Project Participation Opportunity with a For-Profit Space Venture

Solicitation of Interest

Not only will the 2001 TrailBlazer Project be the first commercial space flight to the Moon; it will also return the first video from the Moon in thirty years. The video will be of very high quality and digitally enhanced, showing the lunar surface details as has never been seen before.

The entire Project is intended to cost a small fraction of what it would cost NASA to complete a similar project.

TransOrbital Inc. has developed a low-cost, video spacecraft project for lunar orbit. TransOrbital's commercially funded robotic spacecraft, 2001 TrailBlazer, will return HDTV video from lunar orbit for use as Internet content and other commercial products. The privately held company has already arranged for a launch aboard the "Strela" launch vehicle. The 2001 TrailBlazer Project is a for-profit Space Venture and will produce high-quality video and other products such as:

- The first advertising opportunity in lunar orbit
- Video with lunar background showing corporate logos on a sub-spacecraft
- Earthrise 2001: A defining video image for the New Millennium
- Final de-orbit video, up to moment of impact
- An atlas of the entire lunar surface for students & planetary scientists
- High-resolution aerial photography of pre-targeted sites on the Moon
- Low-altitude, high-speed video, for Hollywood science-fiction movies footage
- The first deep space email service, from lunar orbit
- Interactive Lunar Flight CD-ROM game made from the photography

The photos from lunar orbit will be very high resolution, utilizing a telescope with an HDTV camera. "We expect to be able to see the tire tracks from the Apollo-era rovers."

Excellent Website and Portal Content

"We want to do for the Moon what Jacques Cousteau did for marine exploration, to go, to see, sell the images as content and repeat it again and again." The Project will provide exceptional long-term content for TransOrbital customers' Internet portals during construction of the spacecraft, the launch, and throughout the space flight to the Moon. This exciting Project can propel customers' portals to the forefront of the Web, as the premiere sites for content, education

and news about space and the Moon. The spacecraft will also provide small cargo delivery service for relics and personal & business cards, to a hard landing on the lunar surface.

The Project will be fully insured against launch and technical failure, assuring the return of deposits in the event of disaster, a welcome feature incorporated into TransOrbital's business plan. TransOrbital is seeking additional associates and customers for products created during the 2001 TrailBlazer Project.

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