

## **Diabologic: Dark Side of the Moon**

by Frank Dolinar

When aging boomers think “Dark Side of the Moon”, we hear Pink Floyd’s unforgettable music.

Today is July 19, 2009 and tomorrow is the 40<sup>th</sup> anniversary of the Apollo 11 landing on the moon. Forty years ago, I found myself riveted to late night news showing live video from the moon as Neil Armstrong took that one small step. I thought that step should have begun the great human adventure into the final frontier. Didn’t exactly work that way. The economic burdens of the Viet Nam war anchored our manned space program to Earth for well over a decade, and we never truly regained the enthusiasm.

We have achieved a lot of benefit from the space program, but for many people it’s not quite real, particularly the civilian space program run by NASA. Because of that, NASA has problems getting the resources it needs to do the job it has been given. NASA has been given responsibility for the civilian space program, but gets insufficient funding and authority to do its job – putting it in an odd position.

Many people in this country think that the space program is too expensive, misunderstanding just how small NASA’s budget is (I suspect they don’t understand the difference between a million and a billion), and that a dollar spent on NASA has, historically, returned about twenty dollars to the US economy in terms of new technology and spin offs. If you doubt this, look at NASA Tech Briefs. When we add in the commercial applications, the positive impact of technologies derived from the space program is staggering.

CNN would not be possible without geosynchronous communications satellites.

As the shuttle program comes to its end, never having reached its stated goal of inexpensive space flight, the US is trying to design a replacement – apparently by resurrecting a new lift vehicle from the ashes of the Saturn V, without the expertise, supply chain, or blueprints from the Apollo program.

It’s not just the US and the erstwhile Soviet Union any more. That’s not even the half of it. Today, there are more players committing time and money to achieving a presence in space. Russia, the European Union, China, India, and even Iran and the Phillipines, are jumping into the fray. Plans are afoot for new manned space programs, lift vehicles, launch complexes, orbital stations, and partnerships. History tells us that not all of these governments play well together. How many of those new space stations will be armed?

Then there is the young private space program represented by Scaled Composites, SpaceX, and Virgin Galactic. They think that the commercial promise of space greatly exceeds the time, money, and effort it will take to get to orbit – and beyond.

Sounds like there will be lots of traffic. But the proposed traffic is slowed, perhaps even confounded by all that litter on the road, in the form of orbital debris (aka space junk). Since the Sputnik I was launched in 1957, about 2500 satellites have been launched and followed into space by 34,000 bits of debris, 13,000 of which are still in orbit. Each bit must be identified and tracked so the next launch can avoid being hit and damaged by some stray bit of junk.

Earlier this month, NASA announced that it already has plans to de-orbit (i.e. destroy) the International Space Station in early 2016. The space station won’t even be completed until sometime next year.

Despite this, impatient, amateur, space fans yearn for another frontier -- a manned mission to Mars.

Getting into space continues to be expensive and risky. Costs increase with with distance and daring. There’s a lot of junk in orbit, in the lanes we need for launches. Every launch generates more trash in orbit. We’re going to destroy one of the biggest and potentially most useful bits of technology we’ve ever created (the space station). We don’t have infrastructure (trash collecting spacecraft) to clean up the orbital debris. Our plans for going back to the moon are, as yet, indeterminate with a time frame that pretty much assures us that when we land we’ll be greeted by the Chinese. And despite all of this we want to go to Mars.

I’m not a rocket scientist, but I think there’s a better way.

First, to NASA, don’t de-orbit the space station, expand its role.

Build a working infrastructure in near Earth orbit. Build high thrust space tugs (to clean up the junk).

Go back to the moon as soon as possible to establish permanently manned bases. There’s so much we can do from the moon: research bases, fabrication facilities, communications, radio astronomy (on the side away from Earth), mining, and a jumping off point to the rest of the solar system. Until we have permanent manned bases on the moon, it makes no sense to send manned missions to Mars or anywhere else.

A deliberate, considered approach to space, building structure and function as we go, will regain the enthusiasm, and in the process reap enormous scientific, cultural, and economic benefits. I’m sure NASA’s scientists and planners know this.

And Pink Floyd’s “Lunatic” plays on.