

Re: Global wireless hotspot

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- *From:* Willie.Mookie@xxxxxxxx
 - *Date:* Tue, 29 Jan 2008 10:18:40 -0800 (PST)
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On Jan 29, 4:24 am, Ian Parker <ianpark...@xxxxxxxx> wrote:

On 29 Jan, 00:42, Willie.Moo...@xxxxxxxx wrote:

On Jan 28, 2:57 pm, Ian Parker <ianpark...@xxxxxxxx> wrote:

BTW – The decision to have a small number of Saturn flights (LBJ) and the decision to completely cancel Saturn and go for the Shuttle are decisions of a completely different nature. The one is comprehensible on cost grounds, the other completely incomprehensible. You go for new systems when you are flush with cash.

– Ian Parker

ITs incomprehensible because you refuse to accept the notion that Nixon's goals in space were not what yours are. His goal was to in effect twiddle the thumbs of the civilian space program – keeping our technical capacity while not doing something that would create problems because of space development.

I believe that all the problems that Nixon and Eisenhower saw, were actually opportunities for greatness that we sidelined, and we may pay

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the ultimate price.

There is always risk in change. There is certainty in no change. That certainty is called death. Think about it, total lack of change is a feature of something that is dead. Life entails accepting and dealing with the change life brings you. Hiding away and lying to yourself about the world, may seem like the easier way, but it foregoes the pain of growth by avoiding growth and ceding the growth to others.

Now the US has powerful means at its disposal to create disparities between itself and the rest of the world – in economics and technology and so forth. So, the US can in this way export this propensity for death. So, rather than lose out to others who might challenge us in space – we see space programs fail – and with it the idea that space is useful for anything is undermined – so what is the result of that?

Obvious

The whole world dies with us.

And that's what we are seeing surrounding us today.

And people without a thing to lose – will do anything – including flying planes into buildings, or spending their lives getting their hands on a loose nuke, and setting it off in the center of a powerful city.

In the end, we will have created the very problems we hoed to avoid by our inaction. And we would have avoided these problems had we accepted the challenges of growth and worked through them.

Its stil not too late. Later perhaps than when I started writing this in the 1990s. The loose nukes can still be brought under control. Enhanced proliferation goals can still be propose. The world can

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still be united under a program to do a manned grand tour of the solar system using nuclear pulse rockets fueled by cold war weapons.

Once, God forbid, the loose nukes go off in our cities – once the Chinese unload their debt – then the US is down for the count for a generation at least – and the Chinese will be holding all the resources – and we will find it very difficult to move forward after that.

I think we are talking slightly at cross purposes.

Well, you started out saying that it didn't make sense what Nixon/Johnson did after the moon landing. So, that's what I'm talking about. It made perfect sense given that they didn't want the nation to waste gobs of money on what was termed in the record – 'space stunts' – sort of gives you an idea of where their mind was.

I am talking about
how you spend a fixed sum of money.

Given that you want the public to one day demand that sum equal zero – then you understand why they did what they did.

The Shuttle in fact cost a lot
more than keeping Saturn ever would

You're only counting a fraction of the cost.

While it is absolutely true that developing an efficiently operating fleet of Saturn Vs with a reusable nuclear thermal upper stage, and reusable boosters, flown every week for \$100 million – would be less expensive than developing and flying a fleet of Space Shuttles every three months would give us much more bang for the buck. The Saturn V fleet would put up 6,240 metric tons while the Shuttle Fleet puts up at most 120 metric tons in a year – you are not counting the costs of having this much capacity – this includes;

1) the cost of the payloads – at \$10,000 per kg
Shuttle payloads: \$1.2 billion
Saturn payloads \$62.4 billion

2) the cost of failures far from home –
Shuttle disaster – instantaneous 'crash'

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Apollo 13 disaster – 4 days of live TV coverage

3) the cost of success far from home

Shuttle crews: 28 astronauts in LEO/year

Saturn crews 300 astronauts to the moon and beyond

4) the cost of public enthusiasm

Shuttle operations – hohum we've been in orbit for 50 years

Saturn operations – hotdamn we're going to Mars and beyond

5) the cost of high volume operations

Shuttle operations – small aerospace dependent on subsidy

Saturn operations – large aerospace independent of subsidy

An operating Saturn V fleet – with reusable stages, and adequately maintained launch infrastructure to keep it flying cheaply would mean we'd spend 50x as much money on payloads. Those payloads would be far more capable than anything the Shuttle could do. It would involve far more astronauts farther from home. It would excite public enthusiasm, and who knows what damned new idea from any one of the hundreds of astronauts. To get a feel for this, consider the impact of just one man on America who had an astounding vision – Joseph Smith. He founded the Mormon religion. With just a few days in space, lunar module pilot Edgar Mitchell had a religious revelation and founded the Noetic Institute. Alan Bean became a professional artist to capture the 'feel' of his journey. Others became ministers and underwent religious conversions. These are hard boiled top gun pilots and genius engineers all rolled into one. And of the handful that went to the moon, fully half underwent significant emotional changes as a result of their journey.

What do you think having over 300 people a year flying to the moon and beyond on multi-year missions would do to our culture? It would make the mess Joseph Smith stirred up seem like a walk in the park – and that's just ONE aspect. Another difficulty would come from any settlements off world – where people were independent of Earth. They would be beyond Earth's ability to monitor or reach out and touch them, but they'd have the capacity to touch Earth. Consider the 365 ft tall Saturn V sitting on Earth to shoot at the moon. Now contrast it with the 30 ft tall LEM sitting on the Moon to shoot at the Earth. Large numbers of people far from Earth will see things differently. A good percentage will come back and revolutionize the way we all think with new ideas and perspectives. This will wreak havoc on the way things are. This will be the easily handled problem. Less easily handled are those that don't come back. The space equivalent of mountain men and trappers in early American history. These folks will live off the land, and have huge technical knowledge and capacity – and won't be predictable or controllable in any way. If you think

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Osma bin Laden is hard to catch, and that an airplane flying into a building is disaster – you haven't seen some crazy person or group hiding out in the asteroids chucking pieces at Earth for some damned fool reason. And this is just the trouble we can think of sitting here on Earth before it all gets started. Who knows what the hell might happen down the road?

What we spend in space is a direct response to public demand. NASA wouldn't exist if it weren't for public outcry to do something about Sputnik. Well the Soviet Union is no more, and their ability to do anything shocking in space is severely reduced. So, as a nation, privately, expert opinion is, we don't want space stunts to drain our economy for more important things like paying for regime change. So, what would you rather have? Lots of payloads carrying lots of people far from Earth doing exciting things, that inspire the public to demand more in space? Or a few payloads doing the same things you've done for the last 50 years – that are so boring that when there's a disaster there's a public outcry – why are we doing this? Of course, if important new literature, artwork, religions are spawned by a handful of astronauts who have skated across the solar system and back to Earth, if important new supplies of strategic materials and energy are derived from space based assets, the loss of a ship or crew would be mourned and seen as the necessary price to pay for progress – but if they're doing the same old thing and going no where fast, and very expensively – its a different story – leading to a different result.

Building a shuttle kept the NASA infrastructure going doing things close to Earth while minimizing the costs of space travel. They did this because they didn't see the benefits derived from space travel. They didn't know how the US could use these 'costs' to take the leading position in the world as the gateway to the frontier – they didn't know how to meet the challenges they saw. So, lacking the vision to realize the benefits associated with the costs, and lacking the nerve to realize the 'costs' and challenges can be met, and not realizing no change is the greatest cost of all to a growing society – they made the choice they did.

have done. In terms of philosophy,
yes standing still is suicidal. In fact the Shuttle has allowed ESA to
very much close the gap. In fact ESA/Soyuz will actually be IN ADVANCE
of America.

Now, I'm answering your original question – why Nixon and LBJ worked across two administrations to end the Saturn and start-up the Shuttle. This sort of thing you mention is not something they foresaw. In fact, I think there is clear evidence that following the first woman in space and the first space walk, the CIA worked diligently to undermine the Russian space launch capability. That was far cheaper

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than getting ahead and staying ahead for America. So, in that context, it was likely that Nixon and LBJ thought once we undermine the one space faring nation that is drawing us into this space race, we can slack off and not worry about anyone doing anything in space for a generation or two – because none of the people then could see any real benefit from space research.

If I had a large/medium sized pot

You don't so why even say this? You say this because it makes you feel better. Its nothing but mental masturbation. Get some money – then you can talk.

I would have developed
nuclear and ion propulsion for the upper stages.

Absolutely – read the EMPIRE reports from the early 1960s. Why do you think the thrust of the NERVA engine matched the thrust of a J2? Take a 33 ft diameter SII stage – remove the bulkhead between the hydrogen and oxygen tank, replace the five J2 engines with a single NERVA engine – fill it with hydrogen – and no oxygen – and you have a dandy nuclear third stage for the Saturn V that weighs as much as a SIVB – 167 metric tons of hydrogen and 95 metric tons of structure – with an ISP of 950 seconds – and a payload of 109.6 tons.

http://en.wikipedia.org/wiki/Saturn_V

Stage m0 mp m1

1. S1C 300.0 4492.0 4792.0
2. S2 95.0 942.0 1037.0
3. SIVB 34.0 228.0 262.0
4. IU 4.5 0.0 4.5
5. payload – – 109.6

With an ISP of 420 seconds and propellant mass of 228.0 tons – and a total mass of 376.1 the fourth stage of the Saturn V is;

$$\begin{aligned} V_f &= 420 * 9.82 * \text{LN}(1/(1-(228.0/376.1))) \\ &= 4,124.4 \text{ m/s} * \text{LN}(1/(1-0.60622)) \\ &= 3,843.8 \text{ m/s} \end{aligned}$$

with a nuclear upper stage

SIVN 95.0 167.0 262.0
IU 4.5 0.0 4.5
payload – – 109.6

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With an ISP of 950 seconds and a propellant mass of 167 tons – and a total mass of 376.1 the nuclear stage of the Saturn V is;

$$\begin{aligned} V_f &= 950 * 9.82 * \text{LN}(1/(1-(167.0/376.1))) \\ &= 9,329.0 \text{ m/s} * \text{LN}(1/(1-0.44403)) \\ &= 5,476.5 \text{ m/sec} \end{aligned}$$

This is enough to take 109 metric tons and deposit it one way on the moon or mars– and by proper design of the nuclear reactor, power the moon base once its there. With a supply of water, and a nuclear reactor, its possible to get oxygen to breath and hydrogen fuel to fly back –

Note that the SIVB empty masses 34 tons – and the the Skylab massed 77.1 metric tons. Several configurations of 'wet' habitats were studied. That way the living volume would be used to store propellant.

And SIVB modified for habitation – but also carrying around 38 tons of hydrogen – and that hydrogen is burned off first for trans lunar, or trans planetary injection – would increase delta vee by

SIVN 95.0 205.0 300.0
IU 4.5 0.0 4.5
payload – – 71.6

$$\begin{aligned} V_f &= 950 * 9.82 * \text{LN}(1/(1-(205.0/376.1))) \\ &= 9,329.0 \text{ m/s} * \text{LN}(1/(1-0.54507)) \\ &= 7,347.6 \text{ m/sec} \end{aligned}$$

A translunar injection is 3.7 km/sec and a lunar landing is about 1.8 km/sec – so, the nuclear stage can deposit an SIVB on the lunar surface. The 'wet hab' can deposit a nuclear stage and return. It can send an expedition anywhere in the inner solar system – and land – or enter orbit and return.

Building these stages to sustain re–entry – and reuse – allows a regular service between the Earth, moon and mars.

Once you have a GW of nuclear space power – you can do a lot with it. You can power nuclear thermal rockets, you can power nuclear electric systems, you can process water into oxygen and hydrogen, you can power a lunar or mars base, you can power an ion rocket.

To LEO would of course have been non nuclear. A smaller pot and just solar powered ion drives.

A square kilometer of solar collectors is needed to produce 180 MW –

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I think you exaggerate the impact that America now haws.

America is losing influence because America didn't meet the challenge when they had a chance to take unquestioned leadership role. Kennedy wanted America to lead the world in space, and spread freedom and prosperity throughout the world. He was assassinated. When his brother ran and won the votes to get the nomination after his brother was killed – he too was killed. After America landed on the moon, NASA was killed as well – and that chapter of American history was put behind us – only to live on in fiction – and be increasingly marginalized by science fiction genres that bear very little relation to the 'hard' sci-fi that gave rise to real astronauts and real space travel.

ESA has had a relatively small pot, but a pot which is consistent year in year out. ESA money has on the whole been well spent.

Depends on what you want to do. No one has made fundamental improvements in technology along the lines of the EMPIRE study, no one has re-created the Saturn V, or its variants. No one has even thought to go back to the moon. No one has stood up and said it is in their national interest to spend 5% or so each year of their nation's budget developing new frontiers off-world. No one has given a clear convincing reason to be in space in a big way. So, no use of off-world resources is contemplated in the future, and the vast resources of the worlds available to us does not impact the conciousness of those who worry about the survival of industrial society in the future.

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