

The Next Force

by

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“Spacepower will be as decisive as airpower is today.”
A Tenet of Air Force Space Policy in 1988

Introduction

The purpose of this essay is to generate discussion and critical thinking about the proposition that the Air Force is currently an Air and Space Force on an evolutionary path towards a Space and Air Force. This is certainly the vision offered by the former CSAF/SECAF, General Fogelman and Dr. Sheila Widnall.

This is not a cognitive piece which seeks to lay out the pros and cons of why a Space Force might be our Next Force. Rather, after spending 28 years in space and missile operations, I feel that I have things to say which bear on the future course our Air Force may be taking. Most of what follows are ideas that people have embellished over time. However, I will propose some “outside the box” or even heretical ideas to help achieve the lesson objective.

The framework I have chosen hangs on the structure of seven main points: dreams, visions, leadership, organizations, do-able missions, access and, the significant emotional event which could serve as a catalyst for the creation of the next force. My thesis is that someday the US will recognize the need for a separate space force, and it behooves us to think through the implications and the promise of an almost certain future event.

Why should we care? Because, unless the Air Force accepts and internalizes the spacefaring dream, its chance to choose the right visions and lead the way will be lost. Perhaps our Air Force is at a crossroads where people might have to choose which dream to follow. Visions abound, e.g., just look in the AWC stairwells, but are these visionary enough? Are we training and grooming the right air and space power visionaries today to lead us tomorrow? Will their leadership be relevant in our rapidly changing world where the half-life of any concept of operations seems to be driven by the rapid pace of technology versus the successful assimilation of new ideas. All of us have experienced reorganizations, but do these really matter if we keep organizing in vertical Napoleonic ways versus in a more horizontal, network fashion. Are we advocating for the right programs because out of these three—policies, programs, procedures—only programs ultimately matter since this is where the money is applied? In order to build a bridge into the 21st century, we have to figure out what is do-able

inside the next two budget cycles. Finally, what is the threat? If there is no real threat from space then there may not be a logical need for another force.

Dreams

“It is difficult to say what is impossible. The dream of yesterday is the hope of today, and the reality of tomorrow.”

Dr. Robert H. Goddard

Today our Air Force and airpower theories are built upon the aspirations of those whose dream was to fly. Tomorrow, the Next Force, will be built on the aspirations of those whose dream is “to slip the surly bonds of Earth.” While the history of manned flight is almost 100 years old, certainly the dream to fly preceded the Wright Brothers’ first flight at Kitty Hawk, N.C. in 1903. They subsequently established the world’s first civilian flying school here at Maxwell AFB in 1910. Those early aviators went on to become the pilots of WW I, and barn stormers in the inter-war years. They helped a new generation dream about flight that eventually led to the formation of separate air forces e.g., the RAF in 1918 and the USAF in 1947.

In contrast, dreams about space flight were first expressed in novels through the visionary writings of Jules Verne and H.G. Wells, at least 100 years before the first manned space flight of Cosmonaut Yuri Gagarin in 1961. Jules Verne popularized the genre of science fiction in 1865 with the novel titled *From the Earth to the Moon*. The plot told of the construction of a large cannon constructed in Florida for the purpose of launching men to the moon. Interestingly this dream became reality over 100 years later from almost the same spot and in a very similar manner. Since Jules Verne, a distinguished list of science fictions writers such as, H.G. Wells, John Cambell, Isaac Asimov, Arthur C. Clarke and many others, have helped define the dream of space flight while over time we have watched more of these dreams become reality.

Almost 100 years after Jules Verne another medium enriched the dream of spaceflight. The 3- year run of the initial TV series Star Trek, created by Gene Roddenberry, took us “where no man had gone before.” Star Trek represented space flight in a way that became almost believable to the average person. Consequently, a whole generation was raised on the notion that Starfleet would make it possible for us to live and work in space in the not too distant future. This series became a true cultural phenomena with spin-offs of more TV series, established fan clubs, international conventions, and several major motion pictures. In later years, computer enhanced special effects allowed for the production of the Star Wars Trilogy, Close Encounters of the Third Kind, E.T., and Independence Day nourished the dreams of this generation and continue to build expectations of the promise of space travel.

Visions

“Where there is no vision, the people perish.”

Proverbs 29:18

This trendy quote from scripture is almost prophetic because wherever you look in government or industry you will find a vision statement for that particular organization. Hopefully, these visions or revelations are generated by the leaders, internalized and supported by the followers, and are consistent with long-term goals of a larger group to which that organization belongs. Consider the following visions:

“In the future, when America contemplates engaging somewhere in the world, the USAF will use its space-based assets to provide the NCA with global situational awareness that will allow them to determine where we need to be engaged and what we’re going to face there.”

General Fogleman, 1997

“One hundred years from now, people will look back and wonder how man could ever have managed his affairs on this planet without the tools provided by the space program. That there ever could have been a world without spacecraft will be just as difficult for them to perceive as for us to imagine living in a world without telephones or airliners.”

Dr. Werner Von Braun , 1972

The first quote is General Fogleman’s vision of Asymmetric Warfare where airpower will finally fulfill its vision and become the force of choice for victory in the 21st Century much like the Army was in the last 3 centuries. It is an airpower vision that sees spacepower as a contributor within a seamless vertical dimension (*aerospace*) that extends from the surface of the Earth into Outer Space. It allows for concepts of operation like Decisive Halt that would be carried out by the Air Expeditionary Force (AEF) and enabled by the information-rich space-based forces and sensor platforms. This is a noble vision and may be “do-able,” but it is not meant as a vision of the next force.

The second quote is more visionary for our purposes. Based on his readings of speculative fiction and his love for engineering, young Werner Von Braun dreamed of going to the Moon and even to Mars. The way of achieving his dream was to build V-2 rockets and Saturn V space launch vehicles as a way of advancing that dream by stages to include orbital space stations as fueling points to Moon base as staging points for a manned voyage to Mars and its ultimate colonization. These kinds of dreams and visions Von Braun shared with President Kennedy in 1961, and he convinced Kennedy that we could and should land on the Moon.

Some visionaries who dream of the next force are still playing video games, but the names of others you might know are included in the Appendix.

Leadership

“You can’t talk about the 21st Century without talking about space . . . it is the implementing medium.”

Col (S) Tom Clark,

Leadership is what transforms dreams so they may become articulated as visions, in turn, they become goals shared by a larger group and eventually are translated into a new reality accepted by almost everyone. Leaders within organizations have to be carefully chosen and be in receipt of the best mentoring available. It is probable that the first commander of The Next Force (circa 2025) will be a young lieutenant in the first class of the Air and Space Basics Course in 1999. He or she will cut teeth on the Space Systems Exploitation Exercise taking the first serious stab at teaching Space Campaign planning.

These thoughts may be misguided optimism if the trends reported in Col (S) Tom Clark’s RWP remain constant. In Chapter 2, Tom questions the apparent disconnect between the process the Air Force uses to pick its space leaders from what it uses to pick its air leadership. If we are serious about transitioning to a Space and Air Force then two questions need answers; first, “who leads the current space forces” and second “who will lead the future space forces”? To answer the first question, Tom did a survey of the *space experience* of the space leadership in Air Force Space Command (AFSPC) and compared his data with a similar analysis of *flying experience* in the senior leadership at Air Mobility Command. What he found was a wide gap in functional operational experience from 14 percent in AFSPC to 90 percent in AMC. The good news is that those chosen to lead in AFSPC had a broader experience base than their AMC counterparts, but still the space mission operational experience ranked last, and most of that was actually staff time rather than *stick time*.

Tom’s data shows even though we have had an operational space command since September 1, 1982 a whole generation of potential leaders in space operations has been lost or at least not mentored to assume the mantle of future responsibility. Perhaps the most immediate and serious implication of this trend is our inability to articulate a true space doctrine that is starting to affect the modernization of space forces.

On the surface, it would seem a natural pool of talent for future space leaders would be the astronaut corps. Although AFSPC has tried to integrate Air Force astronauts back into the fold, each year they are gone makes it harder for them to compete with those officers who are getting their institutional tickets punched. No Air Force astronaut candidate has attended the AWC in the last 6 years or graced the stage of Jones auditorium, and none are projected in for the class of 1999.

Organizations

“As to organizational arrangements, one day the term spaceman will mean a military member of the US Space Force, not a creature from another planet.”

Lt Col David E. Lupton, USAF,
Ret.

Historians usually wait until all the history makers have died before they attempt to apply their objective analysis, resulting in an official history of a set time period. Fortunately, one of our leaders, General Tom Moorman, thought it best to document the history of the first 50 years before all the dreamers, visionaries, and leaders passed away. Subsequently, Dr. Dave Spires was commissioned to write *Beyond Horizons: A Half Century of Air Force Space Leadership* describing the Air Force’s role in space in conjunction with the 50th anniversary of the Air Force in 1997. This book will be a source of readings at the Air University until it is replaced by a history of—you guessed it—the Next Force. Chapter 5 titled *Organizing for Space: The Air Force Commits to Space and an Operational Space Command* describes the birthing process which led to the formation of the Air Force Space Command (**AFSPC**). It includes pictures starting with General Hap Arnold and others included in the Appendix to this paper.

The author of this essay was part of the old Air Defense Command (**ADC**) which evolved into the Aerospace Defense Command (**ADCOM**) and finally Air Force Space Command. You can reorganize, change the name and stationary as much as you care to, but the basic institution will resist these efforts. Those who have been part of this process realize that whatever we call Space Command, it is still a Missile Warning Command at heart.

If that were not enough, we have a virtual plethora of space organizations within DoD e.g., the Space Architect, Army Space Command, Navy Space Command, Unified Space Command, and the National Reconnaissance Office. Until the NRO went public in 1996, few people realized that fully half its 4,000-plus people come from the Air Force and almost 85 percent of those are enlisted personnel. All this begs the question of “who speaks for space?” This has become a generic question over time, and one asked by too many authors for us to figure out who asked it first. Regardless, it is still paramount and at the heart of the problem of how best to organize our forces that will eventually evolve into the Next Force. To their credit the leaders recognize this problem and are working the vision piece together. Gen. Howell M. Estes, III (USSPACECOM/CC), Mr. Keith Hall (NRO Director) and Mr. Dan Golden (NASA Chief) meet every 6 months to look at the work of existing integrated product teams to see where cooperation can be leveraged.

All this is good news, but it does not seem to lead to “outside the box” thinking on how best to organize for information based space warfare.

Do-able Roles and Missions

“To defend the United States through control and exploitation of air and space.”

This June 1992 Air Force mission statement is memorable because it incorporates the idea that space is a major medium of operations and an integral part of the institution we know as the United States Air Force. Before this mission statement, the one recognized by most people was something like, “Our mission is to fly and fight and don’t you forget it.” The simple conjunctive word “and” says a lot because it is usually used to connect equal ideas. By combining the separate mediums of air and space allows for the idea of extending combat power throughout the vertical dimension, and allows for evolutionary constructs like Aerospace to emerge and develop new meanings.

The idea of space forces is relatively new and stems from the evolutionary use of the existing space systems in 1991, when they were used as space forces to enhance the combat power of our ground, sea, and air forces in Desert Storm.

Since this watershed event, the traditional five stewardship areas of communications, weather, launch, navigation, and warning are rapidly being replaced by the commercial sector. In the near future, there may be no need for any dedicated military satellite communications systems beyond MILSTAR. The military and civil weather systems have converged into a single system called NPOESS. Navigation has become a worldwide utility that is rapidly slipping away from exclusive military control. Military spacelift beyond the next generation of evolved expendable launch vehicles (**EELV**) may well be purchased exclusively in the commercial marketplace.

Dr. Daniel Hastings, the Chief Scientist of the Air Force, was given a tasker from General Ryan to determine what might some of the “do-able” missions be. As a first cut, he suggest that a missile warning will remain a function that has no commercial counterpart so the Space Based InfraRed system (**SBIRS**) will certainly be a requirement as long as ballistic missiles remain a threat to our forces or our nation. The next concept is to build Space Based Radar (**SBR**) with synthetic aperture radar and moving target indicator capabilities. A program to build these capabilities called Discover II is being sponsored by the Air Force, DARPA, and the NRO. The components for a Space Based Laser (**SBL**) have been tested, and a space-based demonstrator could be fielded by 2010 given a political decision now to proceed down that path. The key to any of these efforts is assured access to space that leads to the idea of reusable lift, and AFSPC has already developed a CONOPS for a space operations vehicle (**SOV**).

The problem is the Air Force top line or where the money will come from. The driver is a shrinking AF Science and Technology budget. Of the \$1.2B S&T budget today only about \$247M is spent on getting us to a Space and Air Force. If space is really an important part of our future, funds can be freed up by asking what capabilities currently done on Earth can be migrated to space.

Access to Space

*“Man will conquer space soon.
What are we waiting for?”*

Launching rockets into space is what people think of when we talk about access to space. Several years ago AFSPC declared that all future launch or spacelift systems must be: capable, responsive, affordable and supportable. Of these four desired characteristics, affordability is what is holding us back. Today, the cost of placing one pound of payload into a standard low earth orbit (about 150nm) is equivalent to the cost of a pound of gold, or about \$5,000. In contrast, a standard airline ticket to travel that far might cost less than \$1/passenger mile. What keeps this cost so high is our continued reliance on expendable, one-time use only, launch vehicles. However, even though the Space Shuttle is a reusable system, it still is our most expensive launch platform. With four operational shuttles and two launch pads, we are only able to perform eight launches per year with a maximum of seven passengers per trip. The ultimate limiting factor is our reliance on chemical propellants and the physical limit of specific impulse that determines the effective thrust per second, hence the lift capability. Payload weight under this paradigm is consistently limited to 2–4 percent of the fueled vehicles launch weight.

Access is also a function of the launch base or spaceport. While there are hundreds of international airports around the world, there are still less than two dozen true spaceports around the world with only three in the US. The latitude of each spaceport limits the initial orbital inclination of each launch, and the number of launch pads restricts the ultimate responsiveness. If that were not enough, the physical infrastructure at Cape Canaveral and Vandenberg AFB are both in need of a serious influx of capital spending to prevent them from rusting away and to update the Apollo-era ground support equipment.

The current Air Force spacelift program is called the Evolved Expendable Launch Vehicle using Russian RL-10 rocket engines and composite structures to cut that cost/pound in half. NASA is working the reusable launch technology piece that could become a follow-on Space Shuttle, and may evolve into a space plane or space operations vehicle. None of these change the basic paradigm of having to haul rocket fuel up the Earth's gravity well. Only “outside the box” ideas like laser-booster spaceplanes, space elevator's on a 200-mile tether, anti-matter drives and anti-gravity generators can overcome the access barriers.

When I was a child my dad would drive my brother and me to the airport to watch planes land and take off. Someday when access to space becomes more routine, parents will take their children to spaceports, and the dream will continue.

The Significant Emotional Event

“The truth is out there.”

From The “X” Files

A few years ago, this author had the opportunity to engage a senior Air Force leader on the topic of a future space force. He was very firm in his conviction that it would only happen as the result of a “*significant emotional event* like the advent of the atomic bomb and its use in warfare.” His argument was the need for a separate Air Force became obvious as a means to deliver the first atomic bombs. Likewise, some future event will cause the dreams of the space cadets to be actualized into a new operational organization whose immediate focus is threat based, either from deep space or from a spacefaring nation in Earth’s orbit.

In all the space studies over the past 5 years, only three possible threat sources have been postulated: extraterrestrial aliens, hazards from asteroids and comets, and the WMD threat posed by rogue nations on Earth. Of these, the second is perhaps the most threatening to our existence as a nation and as a species.

Events like the multiple impacts of pieces from comet Shoemaker-Levy on Jupiter, the human tragedy surrounding the comet Hale-Bop and the appearance of movies like *Deep Impact* and *Armageddon* have certainly made the public much more aware of the threat poised by inanimate objects within our solar system. In the movie *Deep Impact* a reporter discovers that Ele is not the name of another dubious White House intern, but rather an ominous clue that stands for **Extinction Level Event**. The reality of this threat has become obvious to people who overcame the “giggle factor” and really listened to the results of the Planetary Defense panels in the Spacecast 2020 and Air Force 2025 study groups.

Likewise, movies like the blockbuster *Independence Day* and *Men in Black* have reinforced the growing public perception as documented in a 1996 *News-week* poll that UFO’s are real (55 percent) and that our government has covered up the evidence (29 percent). Whatever your beliefs, an unbiased look at the volumes of worldwide sightings suggests that something unexplained is going on in the skies above. These facts beg the question of why the world’s premier air and space force appears to be both clueless and helpless to defend its sovereign airspace.

If this isn’t enough, people still find it incredible that no method of national missile defense exists. So on what have we been spending the national treasure? Imagine the political outcry when one of our great coastal cities is destroyed by a rogue nation whose leadership cares nothing for its people, because we guessed wrongly on the implementation of our “3+3” NMD option.

In an era when we are searching for the next threat, we may want to consider the need for the Next Force to forestall the dire consequences any of these portend.

Conclusions

“In our obsessions with antagonisms of the moment we often forget how much unites all the members of humanity. Perhaps we need some outside, universal threat to recognize this common bond. I occasionally think how quickly our differences would vanish if we were facing an alien threat from outside this world.”

President Reagan,
21 September 1987

The “great communicator” made this remark in context of a speech given to the UN General Assembly on the subject of arms control and world peace. This was the third public quote where the President wondered aloud about a threat external to our planet. If this **significant emotional event** were to emerge would we be forced to call on Astronauts like Bruce Willis or Robert Duvall? Hopefully we would be better prepared, but then all Titan II missiles have been dismantled.

The idea of a space force as the Next Force is not new. Like most new ideas it keeps surfacing in different places and awaits the right circumstances to become part of the status quo. Space is a harsh living environment and the expectations set up by the **dreamers** may be temporarily beyond our genetics and our physical technologies. **Visions** are now cost constrained, but commercial spending on space now exceeds government spending so that the private sector envisions the profit potential and is willing to assume more risk. Only the right **leadership** with the right sets of experiences, to include time on-orbit, can truly show the way by defining the correct doctrine and operational concepts to lead the Air Force into a new warfighting dimension. Napoleon was a great general of land armies, but the legacy of the **organizations** he refined in order to control massed formations is not practical for command and control of space forces. After all, Satellite Command Authority requires only that we hit the ENTER key. In pursuit of these dreams and visions we should not let perfection become the enemy of what is **do-able**. The Air Force must continue to make tradeoffs that result in the steady migration of capabilities to space e.g. SBR. **Access** is the key to space. Here is where our visions need some help. The Air Force needs to become a stronger advocate for a true aerospace vehicle or spacecraft that can operate across the entire vertical dimension, otherwise its stewardship of space will not continue to lead the way.

In the movie *Mr. Holland’s Opus*, Richard Dryfus teaches high school students to play and appreciate classical music. One of his students discovers his attempt at musical composition and asks Mr. Holland, “You wrote this? . . . and he responds . . . Well, I pick at it once in awhile.” My hope is that reading this space opus has caused you to think about “the final frontier” in new and more critical ways.

Live Long and Prosper!

A Partial Appendix of the Dreamers, Visionaries and Leaders

“Earth is the cradle of mankind, but man cannot live in the cradle forever”*

Contributor	Contribution
Jules Verne	France, 1st Science Fiction Author
H.G. Wells	Britain, A Noted Science Fiction Author
Konstantin Tsiolkovsky*	Russia, Father Of Soviet Astronautics
Hermann Oberth	Romanian, Early Rocket Pioneer
Dr. Robert Goddard	Pioneered Liquid Fueled Rockets
Arthur C. Clarke	U.K., Communications Satellite Orbit/Concept
Gen Bernard Schriever	Air Force Systems Command & ICBMS
Sergie Korolev	Russia, Chief Spacecraft Designer
Mr. Gene Roddenberry	<i>Star Trek</i> TV Series & Movies
Dr. Werner von Braun	Apollo Moon Landings
Dr. Peter Glasserv	Solar power from space
Dr. Gerard O’Neill	Physicist, Space Colonies at L4/5
George Lucas	Creator of <i>Star Wars</i> Trilogy
Lt Gen Jerome O’Malley	Air Staff Space Operations
Col Vito Pagano	Space Operations Training
Dr. Carl Sagan	Astronomer, Cornell University
Dr. Carl Builder	Airpower’s Friend and Mentor
Col (Dr.) Pete Worden	Astro Physicist
Motorola Corporation	Iridium Global Cellular Telephone Net
Mr. Roland Emmerich	Produced <i>Independence Day</i> & <i>Stargate</i>
Gen Tom Mooreman	Air Force Space Command
Gen Howell M. Estes, III	A Long Range Vision
Mr. Micheal Snead	Space Infrastructure
Col Mike Mantz	Space Combat Power Theory
Dr. Robert Zurbrin	“Mars Direct” mission advocate
James Tiberius Kirk	Captain, Star Fleet

“May the force be with you!”

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This article has undergone security and policy content review and has been approved for public release IAW AFI 35-101.
