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Could The U.S. Military Lose Its Connection To Space?

Eric Tegler | Aviation Week & Space Technology

Sep 5, 2016

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The American military leverages and relies on an uninterrupted flow of data, communications and sensing like no other. The use of space-based assets to facilitate intelligence, surveillance and reconnaissance (ISR), precision navigation and targeting, and command and control is extensive, and the information is distributed widely to commands and platforms as well as devices. This space-enabled toolkit is powerful. And like many tools whose use is so pervasive, there is a tendency to take ...

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Mark Lincoln

on Sep 4, 2016

Worst case scenario? In a major war those space based assets are coming down or getting EMPed into uselessness.

Of course everyone might decide not to provoke attacks on their assets by attacking other's assets.

There was a tacit agreement to not use chemical weapons in WWII.

"This space-enabled toolkit is powerful. And like many tools whose use is so pervasive, there is a tendency to take this asset for granted. But lately the military is asking, "What if it got interrupted?"

Does the word "impotent" ring a bell?

"How would U.S. forces fight and operate without information clarity?"

Ever see a fish out of water?

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jimbo0117

on Sep 6, 2016

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A major war with who? China? Russia? The world's major powers are too interconnected and interdependent economically now. In a war with the U.S. China would immediately lose over half of their GDP, and the same would go for the U.S. They're not willing to risk that, and neither are we.

The average U.S. consumer wouldn't be able to go to the store and buy themselves a new iPhone. I mean, can you imagine the social upheaval! *sarcasm*

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Changey

on Sep 6, 2016

Your argument is historically irrelevant. Similar was said in 1914 and 1939. War is a down payment of future riches in the eyes of many delusional world leaders of the past, present and future.

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wally@wallyrobe...

on Sep 5, 2016

Just imagine the GPS constellation neutered.

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peterjpeirano@m...

on Sep 5, 2016

Nice thought. Back to paper maps, compasses, astronavigation, etc.

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Mark Lincoln

on Sep 6, 2016

"Nice thought. Back to paper maps, compasses, astronavigation, etc."

Been there, done that.

No one is bringing down Capella, Rigel, Aldebaran or Polaris. The Earth's GPS satellites reliably, though you might have to wait till noon for a time hack.

The batteries on a map never go dead.

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colonelshoe

on Sep 7, 2016

oh god no!
post it notes on the dashboard.....trying to hold a map on the steering wheel.....

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brovane

on Sep 6, 2016

It would be very difficult to attack the space based GPS satellites since they sit at a high orbit, 12,000+ miles above Earth. The network itself is redundant with more satellites than are needed.

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DTRT

on Sep 6, 2016

There's more than one GPS system. The USA has the current GPS constellation, and are developing a new additional constellation that is designed to be much more robust in resisting jamming. The Russians also have a sat nav system called "GLONASS" and others (not Russians) can certainly use it too and the latest generation sat-nav receivers use both the US and Russian satellites. The Chinese also have a regional sat-nav system that they are expanding for global use for deployment in 2020, and the EU also is developing its own sat-nav system in 2020. India, France, and Japan are also developing regional systems.

So it would take an absolutely massive and massively successful space attack to take out the dozens if not hundreds of nav satellites.

Plus, most of the critical military nav systems, including many munitions terminal guidance systems, utilize inertial navigation systems (INS) and terrain-recognition systems coupled

with and calibrated by sat-nav systems .. so that even if every sat constellation were instantaneously rendered inop (an extremely unlikely scenario), these systems will still know where they are and how to get to their destination.

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[jthoeg@bio.ku.dk](#)

on Sep 5, 2016

There is only one response to this very real threat: The Free World needs to stay ahead (far ahead) technologically and in terms of organization both in preparing for war/conflict and for actually fighting to win when/if it should happen. The "happy days" of post Berlin wall and reconciliation are gone. There are many that deep in their hearts would like to see the "democracies" go down. Said somebody high in the US Government durin the Cubam Missile crises: "what is it about the free world that pisses everybody off?".

So the US and not least its allies needs to get themselved together and press ahead with pursuing technological breakthroughs and rapidly introducing them into our military. This is not preparing for war but acting to prevent it. You can only negotiate and move diplomatically from a position of strength. look at hostry. Say how the allies (UK and the US) overcame e.g. the u-boat threat by rapid advances in radar and other means. This was a game to the death and it was won. China, Russia, and whatever powers that threaten the free world needs to know that if they challenge, they will miserably loose the duel. This will cost. It will cost a lot. But that is always the price for freedom. Europe (I am sad to say) seems again to sleep happily while the threat is ever escalating. So sorry friends across the Atlantic!

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[Zack63](#)

on Sep 6, 2016

"what is it about the free world that pisses everybody off?"

-- Jealousy

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[rkapo7](#)

on Sep 6, 2016

The joke surrounding the above article is it will not matter how much the USA spends. Surely in recent times the message is starting to get through to the **EVO PDR Tools Demo** "penthouse dwellers" a clever potential enemy will normally very quickly create a simple cheap countermeasure to whatever they spend there \$5+ billion on. World War two was a typical example. The AXIS in terms of technology was well ahead of the USSR in terms of technology in all areas but within one to two years an unprepared USSR quickly found counters in all areas. The end result was about 85% of the superior AXIS technology was inoperable at any one time and even in the Air the USSR quickly produced cheap effecteve aircraft to counter the initially far superior AXIS aircraft. The end result being there ended up far more Russian Air Aces at the end of the war than in any other nation. The \$5billion might give the USA an advantage as an agressor over lesser third world adversaries but agianst nations such as Russia and China it will quickly and cheaply be countered. In simple terms we are back to MAD. Just accept it and negotiate agreeemnts to avoid it all getting out of hand. You can't win every argument. Live with it. Personally I think the Russians have the correct approach. Put in place simpler mobile systems and alternate less effective systems that can't be countered. e.g. Instead of relying on GPS install inertial navigation in most weapons systems etc. Lesser systems that can't easily be countered. Or systems of a lesser nature that can only be located effectively and put out of action by troops on the ground. Time a few "penthouse dwellers" understand n most "basement dwellers" are far more ingenious than they like to think they are.

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[Zack63](#)

on Sep 6, 2016

Except the current US military strategy is "precision strikes", to minimize collateral damage. Can't do that without complicated technology.

While I agree the Russians are quite scrappy in their military they don't play by the same rules US do.

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[DTRT](#)

on Sep 6, 2016

The Russians "won" on the eastern front in spite of themselves, and having the luxury of only one front to fight on at the same time. They "won", but at the cost of 27 million killed (a large portion of whom were their own civilians) - more than six times the German military losses in Europe ... and about 27 times the combined European losses of the US,

UK, France, Netherlands, and Norway. And most of the Russian's major cities and towns west of the Volga River were leveled and rubble-ized.

That's "winning"?

Oh, and of course, the Russians were greatly aided by a constant stream of war supplies from the Americans, Canadians, and Brit merchant marine across the North Atlantic on the "Murmansk Run", and of course the Russians were greatly aided by the Allied invasions of North Africa, Italy, and eventually France and the Netherlands on the western front.

And then after all that, being victorious in their Great Patriotic War, the Russians botched the Cold War and lost it completely, with their Union of Soviet Socialist Republics crumbling in 1991, a shadow of itself from the decade before.

That hardly constitutes the "correct approach".

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Morbius

on Sep 6, 2016

The next war will be fought with the weapons and assets that are in inventory and will not likely last long enough that future production will be possible. There will be no time to bring mothballed aircraft into action and there will be no time to build new satellites and launch them.

SpaceX booster reusability could be a partial solution. All SpaceX would need to redirect and/or finish is second stages currently in production for the stored inventory of landed first stages to launch rapidly. If the military has satellite "spares" on hand, SpaceX might be able to launch them within days to weeks. The replacement satellites do not need to be technology wonders but rather, sufficient to restore an advantage to the U.S. and literally nothing more.

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markos777

on Sep 6, 2016

With SpaceX planning over 30 launches a year, there is no need to blame China for anything. Who is behind each satellite? What exactly for? Can they be hacked, one by one or in a cluster? Talking about terrorist attacks on the ground waiting for the same thing in space? Just the clutter of space junk will stop any nation doing anything, not even scientific space exploration. The real solution ... ?

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DTRT

on Sep 6, 2016

I cannot imagine that our military leaders are going to divulge what we are doing to both defend our space assets and destroy those of any potential enemies.

Electronics can be hardened against EMP as well as natural phenomena such as solar storms, and electronic and other countermeasures can certainly be employed by satellites just as they are by aircraft and ships. Just as we have anti-ballistic missile systems that can detect and destroy ballistic missiles in space, I would expect such systems or similar ones can be adapted to detect, track, and take out the so-called "killer satellites".

There are lots of things the public should never know about.

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smurfiest

on Sep 6, 2016

If we every get in a war where people are taking down satellites there will be no winners- everyone on the planet will be a loser. It is highly likely that so many key GPS and surveillance satellites will be disabled by EMP, killer satellites or jamming that the systems and tactics will be effectively disrupted, What the AF needs to do is figure out how to fight without the gadgets-assuming there is still something left to fight over at that point. What we see here is the AF getting tired of the current wars and going back to what it knows best, the cold-war mentality of constant threat of doomsday, an expensive and fruitless contingency to plan for.

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DTRT

on Sep 6, 2016

See my comment above - the answer isn't to chuck the electronics ... the answer is in multiple redundancy and adding even more nav electronics capability (as in INS and terrain recognition).

The Cold War was hardly "fruitless" - we (NATO) clearly won. And in doing so we prevented

both conventional and nuclear annihilation of Europe and North America, while keeping the Soviet imperialists in check. While still building and maintaining the worlds biggest and most successful economies as the Russians imploded theirs.

Cheap, and totally "fruitful".

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Changey

on Sep 6, 2016

All I know is humans have found a way to fight on land, sea and air over the last few thousand years. Finding a way to fight in space with the same deadly results isn't much of a leap. At this stage of weaponry, the AF has to assume space will be as contested as any other arena.

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Mark Lincoln

on Sep 6, 2016

"The Cold War was hardly "fruitless" - we (NATO) clearly won. And in doing so we prevented both conventional and nuclear annihilation of Europe and North America, while keeping the Soviet imperialists in check. While still building and maintaining the worlds biggest and most successful economies as the Russians imploded theirs. Cheap, and totally "fruitful".

Agreed. The winning strategy was developed before many realized just how grim the Cold War would be. Containment worked; and the inherent inefficiency of communism, and ineptness of one party rule coupled with the understandable paranoia of the Soviets led to that nation and the system it fostered in other nations imploding.

The great irony of the Cold War is that the only Communist nations left are the one's we engaged in Hot Wars during the Cold War. PRC, Korean War; Cuba (a hot little covert war during the 1960s); Laos, (a extremely hot covert war in the 196s and 70s); Vietnam.

Capitalism is slowly winning in China, Cuba, Laos and Vietnam. North Korea will implode.

The decisive battles of the Cold War were won early and without combat. Our enlightened attitude to the conquered, the Marshall Plan, and the Berlin Airlift, which really impressed the Russians who knew they could never have done it. An example of Victory Through Airpower that cheered and inspired the world.

We always got the best results from building our allies up rather than trying to bring them down. Russian allies down. During the critical phase 1945-1955 we eschewed the prerogative of the conqueror and behaved with benevolence.

"Our policy is directed not against any country or doctrine but against hunger, poverty, desperation, and chaos. Its purpose should be the revival of a working economy in the world so as to permit the emergence of political and social conditions in which free institutions can exist."

- Gen. George C. Marshall, the "Marshall Plan" speech, 1947

General Marshall was accused of treason and assisting the cause of international Communism, in a speech before the Senate by Joe McCarthy on June 14, 1951.

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vkess1

on Sep 6, 2016

There is already GPS back-up in place for the Air Force. Same one used by the SR-71 but with highly upgraded electronics. The problem is that it is not widely available for the the rest of the military.

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NorEastern

on Sep 6, 2016

To believe that major powers will not be able to knock down any satellite in any orbit while tempting will ultimately be wrong. US warfare is highly dependent on satellite communications. There is no substitute because very high flying planes working as satellites can also be shot down. GPS will also be destroyed as well. The only possible working solution is to launch small "cube" micro-satellites by the dozens as needed. It makes perfect sense to spend \$40 million to bring down a \$1 billion dollar satellite, but it makes absolutely no sense to use that same missile to bring down a \$2 million micro-satellite.

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smurfiest

on Sep 6, 2016

Afghanistan is proof the cold war never ended and that we never really "won", You can hardly pick up a copy of the NYT without a story about the russian threat to you-name-it, if we "won" why all the angst? Where is the peace dividend? We are still preparing for an all-out nuclear war when that scenario is not plausible anymore due to China's dependence on exports and Russia's dependence on customers for it's natural gas in europe. Dragging more plans for warfare in space into the mix opens another can of worms best left alone.

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[Mark Lincoln](#)

on Sep 6, 2016

"Afghanistan is proof the cold war never ended and that we never really "won", "

The people we are fighting are the ones we backed against the Russians.

"You can hardly pick up a copy of the NYT without a story about the russian threat to you-name-it,"

I read it every day and while the problems Putin causes are covered so are the weaknesses of Russia. The Russian economy is in the tank right now.

"Where is the peace dividend?"

We got the peace dividend via the defense cuts of George Herbert Walker Bush's administration. We did not resign from the world and have insisted upon a prominent military role in the world.

"We are still preparing for an all-out nuclear war when that scenario is not plausible anymore. . ."

Aside from the right in the Soviet Union and the United States most folks in the world learned from the Cuban Missile Crisis that all-out nuclear war had given way to Mutually Assure Deterrence. Note that EVERY other nuclear power has adapted a minimal deterrent force.

"Dragging more plans for warfare in space into the mix opens another can of worms best left alone."

The question posed by the article asks if we are not too dependent upon space based assets, do we need more, how may we protect them.

We won the Cold War decisively. There is no Soviet Union. There are few and feeble "Communist" governments left. The most powerful is China and it's "Communists" are stuffing their pockets with - and exporting to safe havens - their Capitalist profits.

The Cold War was in large part the creation of a paranoid monster, Joe Stalin, and a lesser degree paranoid Capitalists who both correctly argued communism was a poor economic model and at the same time indulged in paranoid fantasies that evinced the incipient omnipotence of communism.

Read some of the articles in Av Week from the 50s through the 80s. There were constant predictions that the end was neigh.

I have somewhere, stored with other less than exemplary science fiction works a revealingly sincere book by the late Phyllis Schlafly entitled "Strike From Space" which I picked up at a John Birch Society bookstore around 1969. It predicted the imminent annihilation of the United States by a Soviet first strike. Meanwhile Dick Nixon was working on Détente with Russia and buddying up to Red China.

We won. We won BIG. That Russian Oligarchs are buying up luxury condos around Central Park and in London says it all.

Ever since it was created the USAF has busied itself trying to devise arguments for more, more roles, more arms, more programs, and above all more money.

The Air Force won the battle with the Army for the lion's share of the Defense Space Franchise and now it is trying to get more. At the same time competing communities in the Air Force trying to get more money for the Strategic Bomber franchise, the ICBM franchise, and the Tactical Air franchise.

We saw China humiliate Obama by playing it's traditional role as the Middle Kingdom, making him use the servants stairs to get out of Air Force One. This article just an example of the Air Force acting out it's traditional desire, getting the big portion at the budget table.

There is a boogymen lurking to cripple us in space, but don't worry: "We've used information from space to coordinate activities quickly, identify targets quickly and hit them with precision," affirms Winston Beauchamp, deputy undersecretary of the Air Force for space. "That's a capability that has been the sole province of the U.S. and its allies. But it is not the case anymore. Others have invested in both replicating our capabilities where they can and taken steps to deny us the use of space to enhance our operations on the ground. Much of what we are doing now is responding to the second of those things."

Wait! Did he say not to worry or worry? Never mind, send money.

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[smurfiest](#)

on Sep 7, 2016

Afghanistan is a mess today because of our tinkering during the cold war, it is a remnant of that era that will haunt us for many years to come—and cost us lives and money too. Russia was the core of the soviet union and according to the MSM is still our primary threat, so I'm not sure why anyone thinks some victory has been won. We still have wildly disproportionate defense spending and now have an astronomical intel and homeland security budget as well, there has been no peace dividend. The navy wants new boomers, the AF wants new ICBMs and LRSBs, looks like the cold war days to me. Again, not thrilled that we now have to build weapons for a new battleground in space, would like to see an effort to NOT do that instead.

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aaalexandre

on Sep 7, 2016

The US has already lost and is still loosing. Soyuz, RD180 are among the stones in the US shoes!

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Mark Lincoln

on Sep 8, 2016

"Afghanistan is a mess today because of our tinkering during the cold war, it is a remnant of that era that will haunt us for many years to come—and cost us lives and money too."

- smurfiest

Everybody meant well.

Jerry Ford saw Afghanistan as a cheap way to vex the Russians by aiding an existing insurrection against a Soviet client state on the Soviet border.

Ford's program ended up working too well and Carter saw escalation as a means of showing he was tough on communism.

The Soviet invasion resulted in hysteria in the American right which led Reagan to act in a fashion which seemed reasonable to him. Don't forget the error was bipartisan with Democrat Charlie Wilson working to provide the cheerleading and funding in Congress.

Reagan and the House of Saud had an idea. Not only would they support the Afghan Mujahideen, they would arrange safe haven bases for them and their families in Pakistan.

The final step seemed brilliant to them. A covert operation manned primarily by Saudis and funded and armed in part by the USA, would be run into the Islamic Republics of the Soviet Union to instigate insurrection. Cover would be given by support for the Mujahideen and their bases.

Then the Soviet Union disappeared. Support for the Mujahideen and the covert operation against the Soviets ended.

The Mujahideen became in part the Taliban.

The covert operation succeeded in Chechnya, and meanwhile some of the largely Saudi members became obsessed with the presence of American soldiers in The Kingdom (Saudi). That organization became known to us as Al-Qaeda.

Lesson 1: Do not organize and arm religious fanatics, then unleash them on the world.

Jerry Ford was faced with a Soviet Union making advantage of the immense damage to US influence in the world caused by the self-inflicted Vietnam War. All he intended to do was meddle with a weak regime on the Soviet border by minimal aid to the Mujahideen. (Please note Mujahideen can be translated as Jihadist, we preferred to see them as "freedom fighters").

The hapless Jimmy Carter saw increasing aid as a means of dealing with critics at home while further vexing the Russians.

Ronald Reagan had the support of extremely conservative religious elements in America and saw no danger in Saudi right wing religious fanatics. Moreover he really was afraid of the Soviet Union and saw as good anything which might harm the "Evil Empire."

None of them intended to bring down the Twin Towers.

Anyone familiar with the history of Afghanistan might have informed any of those Presidents of "The Great Game," and how the British and Russians fared in their efforts to occupy Afghanistan.

Lesson 2. Don't Just Do Something, Stand There, is often wise advice.

a historian might even have told them of how Alexander the Great invaded Afghanistan, fought his way to India, and when it came time to return west chose to avoid Afghanistan and go by way of the Persian Gulf coast.

The man who needed the lesson most was George W. who plunged us, not surrogates, into Afghanistan then forgot about it and went on to other games in his middle-east sandbox.

"When you're wounded and left on Afghanistan's plains,

And the women come out to cut up what remains,

Jest roll to your rifle and blow out your brains

An' go to your Gawd like a soldier."

- Rudyard Kipling, The Young British Soldier

Lesson 3. If people have acted a certain way with a degree of success, chances are they will act in a similar way in the future.

Lesson 4. Outsiders who get involved in Afghanistan usually regret their action.

What we see as freedom may not be what they see as freedom.

When observing the actions of the Taliban never forget Pausanias's exhortation to his officers as he had them fed the luxurious banquet prepared for King Xeres before the Spartan victory over the Persians at the Battle of Platea. "How far the Persians have traveled, to rob us of our poverty!"

We are stuck in Afghanistan and will have to aid the urban, modern, Afghan minority against the majority rural, traditional Afghans for the foreseeable future.

But we can't fight their battles forever. Luxuriant aid led to immense corruption which led to corrupt leaders who could only benefit as long as we are there. Those corrupt leaders have no interest in seeing victory as we would leave, with our aid, as we did when the Soviets left.

Such is our Afghan conundrum: If we stay it costs us far more than it can benefit us; If we leave the traditionalists will probably win.

"All dun, go home."

- sign placed at the base of the toppled Sadaam Hussein statue a few days after the conquest of Iraq.

Good advice, but we had other plans.

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isaacsairport@g...

on Sep 10, 2016

Is X-37 a possible 'Space Fighter' to deter or fight a war in space?

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