

060917 Air Force Association Mitchell Institute for Aerospace Studies Space Power to the Warfighter Seminar with Colonel DeAnna Burt, Commander 50<sup>th</sup> Space Wing; Colonel David Miller, Commander 460<sup>th</sup> Space Wing; and Colonel Douglas Schiess, Commander 21<sup>st</sup> Space Wing, on “The Space Mission Force.” (For additional information on NDIA/AFA/ROA seminars contact Peter Huessy at [phuessy@afa.org](mailto:phuessy@afa.org)).

MR. PETER HUESSY: Good morning, everybody. On behalf of the Mitchell Institute and the Air Force Association, my name is Peter Huessy and welcome to this the next in our series of seminars on “Space Power to the Warfighter.”

Just a few housekeeping notes. Next week we have three events. John Harvey, who was instrumental in the Schlesinger-Perry Commission Report on Strategic Nuclear Deterrence, will be speaking to us on the 13<sup>th</sup> about the challenges of the NPR. Ambassador Lehman, who worked for President Reagan and also for President George W. Bush, is going to be talking about the extraordinary changes in strategic nuclear force levels that we are now below where we were at the end of the Eisenhower administration. It’s about a 90 percent cut in deployed strategic nuclear weapons. His briefing that he put together when he was at Lawrence Livermore is extraordinary. I urge you to attend. That is on the 15<sup>th</sup>.

Then we have a Space event with Jacques & Associates, Hick and Associates. We have a Space Budget brief, which we did last year, which we are going to do again this year. That is on the 16<sup>th</sup>. Our first speaker is going to be the Secretary of the Air Force, Heather Wilson. Then we’re going to have Congressman Bidel and Congressman Lamborn and Congressman Bridenstine. We’re going to have Todd Harrison from CSIS and we’re going to have Christina Champlain from the General Accountability Office. And we’re going to have a luncheon speaker to be announced. We’re working on that right now.

I want to thank our sponsors that are here today and thank you for your support for the Space program. This is its fourth year. I also want to thank you, General Saltzman, who is here, who is going to be speaking to us later in the year, in November. I want to also say hello to retired General Moorehead who is here today visiting us. And I want to thank our friends from the British embassy that are here today, refugees from their election last night. And they are welcome to be here, thank you for being here.

We are honored today to have three wonderful United States Air Force colonels, with one exception. DeAnna Burt is a Brigadier General Select. Congratulations.

(Applause).

Colonel Burt is Commander of the 50<sup>th</sup> Space Wing at Schriever Air Force Base Colorado. She is responsible for more than 4,200 military Department of Defense civilians and contractors serving at 14 operating locations worldwide in support of 175

communications, navigation and surveillance satellites with their associated systems valued at more than \$66 billion.

Our second speaker is going to be Colonel Dave Miller Jr. He is the Commander of the 460<sup>th</sup> Space Wing at Buckley Air Force Base in Colorado. The wing delivers persistent global infrared surveillance theater and strategic missile warning, and battlespace awareness for combatant commanders and our national leadership.

Our third speaker this morning is going to be Colonel Douglas A. Schiess. He is the Commander of the 21<sup>st</sup> Space Wing at Peterson Air Force Base in Colorado. As the Air Force's fifth largest wing and most geographically dispersed, it consists of a workforce of almost 4,300 officer, enlisted, civilian and contract employees. Spanning the globe, this team provides missile warning, missile defense, space situational awareness, and space control for combat forces and the national command authorities of the United States and Canada.

With that, I would like to welcome our first speaker, Colonel Burt, who also is now General Select. Would you give here a warm welcome?

(Applause).

COL. DEANNA BURT: Okay, so you know what a general select is, right? You're a colonel. I could be in trouble tomorrow and not be a general, so let's not jinx that or talk too much about that. But thank you.

It is an honor to be here this morning. I know in the program we talk a lot about what is the space mission force? So I am proud to be here to honor the airmen of the 50<sup>th</sup> Space Wing as we were the first wing to execute the Space Mission Force construct General Hyten envisioned at the time in what was called the Space Enterprise Vision, now known as the Space Warfighting Construct. So I want to make sure I've got everybody on the same page. What is the Space Mission Force and why did we do it?

First and foremost, it's about force presentation, and how we present forces to the combatant commander, Strategic Command, and how we do that in such a way that we would be prepared for a war that could extend into space? So that involves making sure how we present forces, that they are prepared, they have the resources and the training to do that. In the past, as the three of us have grown up as wing commander, we would do six on, three off, whatever the schedule was, and there never was really any time where we stopped doing ops to slow down and pay attention to advanced training and to think about threats, and to do the things the rest of the combat Air Force frankly does all the time when they do combat to dwell.

So when we looked at this in Space Command, we said we have to find a way to put our operators in a combat dwell cycle. When they're in combat they're on console doing the mission, and that's all they're doing. They're not doing exercises, they're not doing other things, they are purely focused on the space mission.

Then there's a four month period that we call dwell, where we do advanced training. And that advanced training is against a threat. So your weapons system, whether that be a space or a cyber-threat, how are you fighting through that in a contested, degraded and operationally denied environment? That's really the impetus of why we went into the Space Mission Force construct.

I think everyone understands the threats. The Chinese, the Russians, they are building capabilities and have been since about 2007 when the Chinese did their intercept of their own dead satellite. We know more capabilities are coming, so we have to be prepared to fight tonight. We cannot sit back and say we're going to wait until it happens, a Pearl Harbor in space. That's not where we want to be. We have to be ready to fight tonight.

How do we fight as operators? I know there are many acquirers in this room and there are a lot of requirements that get built out of this construct, but as an operator we have to fight tonight with the satellites and the resources that we have. So how do we look at the vehicles that we have and how do we creatively McGyver them? Now I can say McGyver to my airmen and they know what I'm talking about because it's back on TV on Friday nights, and they don't look at me like I'm crazy. Who is this McGyver she's talking about?

But that's the kind of work we want our airmen to think about. So at the 50<sup>th</sup> Space Wing our mission statement is "Commanding space and cyber systems to deliver global combat effects." We say space and cyber because we cannot do our jobs without cyber. So we are very multi-domain focused at the 50<sup>th</sup> Space Wing in looking at both sides of that.

Secondly, our vision statement is to evolve the force, drive innovation, and master space. So evolving the force is about how we create this culture of warfighting. In all three of the wings you're going to hear today, we're all working that problem. How do we get our folks to understand?

So if I'm a fighter pilot I can visualize ID every threats to my weapons system. Can I do that in space? My airmen don't learn that way. That's not how historically in a peaceful environment we have taught our airmen. How do we do that now? What do those threats look like? What can those threats do to me? What regime do they live in: LEO, MEO or GEO, and where do they impact us? And how am I going to fight with that with what I have on-orbit? How would I even know it's there?

Those are the kinds of things we're trying to work through in advanced training and that dwell period to really get our airmen smart. You're going to hear things we've talked about since we were your Airmen. All of us are playing in what's called Space Flag.

There's a little bit of angst about naming it Space Flag because there is no Air

Flag. There's a Red Flag. We want to be in a multi-domain joint fight, that's the way we want to practice and train.

So again, it may change names here in the next little bit, but we have been doing a lot of work with Space Flag. We had our first one a month ago, and now we're getting ready to have the second one coming up either in the August or September timeframe. We're working scheduling. But we've been working hard with the Virtual Warfare Center to look at how do we virtually visualize what we talk about when we talk war in space.

I think you've heard of Rendezvous Proximity Operations, RPOs. I call it shooting watches in space. The kinematics are different than the air domain, but we've got to start thinking that way.

How do we manage, evade and work through those things. How do we make ourselves a harder target? Do we need chaff and flair acquirers in space? I don't know, but those are all the things we're talking about and looking at those concepts and how do we work with the systems we have?

So I'm happy to answer questions if you guys want to talk Space Flag. We did the first one, and our ops group was the one that took the lead on that, but all of the wings participated. So that's kind of really it in a nutshell.

Again, the 50<sup>th</sup> Space Wing was the lead for SMF. We've been in it about a year and a half. I can tell you we've done a lot of shifting of manpower.

I also want everyone in this room to know that Space Mission Force construct came with no additional resources or money. We did that out of hide. That's why driving innovation is the second part of our vision statement, because we really had to look hard at what back shops we had, what overhead we had, where were we going to accept risk to ensure that we had the right crew force and the numbers to get to Space Mission Force construct with this combat to dwell cycle. So we've done that out of hide.

We talk a lot about innovation. We are now working towards automated command and control. All of our weapons systems at the 50<sup>th</sup> have some sort of automation inherently built into them. Historically, in a peaceful environment, that has been our bread and butter and we haven't wanted to give up TT&C, telemetry, tracking and commanding, and some of that basic satellite command and control.

Well, that's about 95 percent boredom, right? That's going through is a satellite hot or cold, what do the subsystems look like? Okay, everything is okay on the out of a limits list, and it all looks good. You can automate all of that until the computer tells the human you have a problem go look at.

That's when the warfighting starts, right? There's an anomaly, what am I doing? Well, we see automation in the 3rd Space Operations Squadron, which flies Wideband

Global System and DSCS, and we have taken a crew of six down to a crew of one. So that manpower has been harvested for other missions within the space mission force that are more important.

When we talk about the Geosynchronous Space Situational Awareness program, GSSAP, in GEO, we talk about bringing on more vehicles. We now are into our fourth GSSAP vehicle. We just ops accepted two more, so we're at a total of four.

Those missions are growing. Where does the manpower come from? Again, it's a zero-sum game. We've got to innovate to find ways to free up that manpower.

It's also happening on the cyber side of the business, as we talk about IT as a service. How do we contract out the day-to-day email and stuff that I hope breaks, because I don't like answering all the emails, so that we can focus on mission system defense? And how would we defend our space mission systems if the Chinese or Russians or someone came after those weapons systems, because they are networked and if you take them down we can't talk to satellites, we can't get the job done. So those are the kinds of things when I talk about innovation that we are doing on the yard at the 50<sup>th</sup> Space Wing, and I'm happy to talk in depth about any of those if you have any particular questions on that.

But with that said I'd like to concede the floor to my brother, Rock Miller, so he can tell you all the great things happening at the 460<sup>th</sup>. Thanks, it's great to be here today.

(Applause).

COL. DAVID MILLER: Good morning, it's good to be here today. I'm humbled by the experience and appreciate the opportunity. Many of you may not know, however, that two former instructors of mine at Weapons School are here.

It's so tough to give a presentation with these people around because at the end of it I already know General Saltzman is going to go. He'll say, "Rock, I don't know what the hell you meant to say, but here's what you said." And Colonel Burt is going to say, "You sort of said this, but not very effectively." So while it's humbling and a good experience to have this forum, it's always a good opportunity to speak to friends and mentors and get their feedback, and I appreciate the time and opportunity that you have taken this morning to be with us.

As Colonel Burt said, I am the Commander of the 460<sup>th</sup> Space Wing. I'm just a guy who is trying to do everything I can to give them the tools, resources and support that about 2,000 folks in the 460<sup>th</sup> Space Wing need to do the job. Our mission set is to provide combat relevant infrared surveillance and warning for America and our allies.

That's a lot of words. Fundamentally what that's about is we provide missile warning for America. In fact, we consider ourselves America's missile warning wing.

So in that regard, I'd like to say, "You're welcome!"

(Laughter).

It is a critical mission set. We really do appreciate it. It has gone through a number of evolutions. What I'd like to go through today is to talk to you about how we got to where we are today in the infrared surveillance and warning business, use the platform for discussion for Space Mission Force to talk about where we need to go tomorrow, and then inform, hopefully, some questions that you might have.

We started this business, actually within months of the Air Force becoming a separate service in 1947, and the discussions began in earnest about the need to go to space. A few years later one of our teams at RAND talked about the need for missile warning as we got into the space race and began to look at the former Soviet Union and the capability that they had from an intercontinental ballistic missile perspective. Within a few years, we had our first missile defense alarm system satellites, or MIDAS satellites, that were on-orbit. So it was about 60 years ago that work started in infrared missile warning.

So we've been at this for a long time. That was the first generation. I think you'd be hard-pressed to say that MIDAS was a super successful effort. I think what you could say is it was, like all rapid prototyping and technology demonstration capabilities. It was built accepting significant risk to respond to a demonstrable threat. There were some good opportunities, and they set the stage for what was the second generation, which was the Defense Support Program.

That started in planning in the '60s. It was launched the year before I was born, the first one, in 1970. We've been doing that business ever since.

The fundamental environment that we were focused on at that time was primarily the Soviet Union and China and the ICBM threat. But we were also focused on the submarine-launched ballistic missile concern that we had. If you take the rough distances and time, which is about 30 or 40 minutes flight time for a ballistic missile to get from those locations to America, and you factor in what America expects from the men and women of the 460<sup>th</sup> Space Wing, which is to say what is happening, where is it coming from, how many of them are there, where they're going, and characterize those capabilities, that's a lot to do in that space of time. Consider that in the submarine-launched ballistic missile world, off the coast of the United States, either on the West Coast or on the East Coast, it's less than half that time.

So we started doing this business -- you know, I guess I'm almost 46 years old now -- a while ago, and that was our second generation. Well, as we got into Desert Storm, we realized that these sensors called the Defense Support Program, are pretty cool and they can do a heck of a lot more than just detect ICBMs and SLBMs. As we ran up to Desert Storm and we realized that the Scud threat that we faced from Saddam Hussein and the Iraqi military, we provided warning of SCUDs threatening U.S. forces and our

allies, and we didn't miss one SCUD that was launched.

That's a big deal. It was such a big deal that we began to look hard at the threats that were proliferating and the ballistic missile capability that was growing across the world. If you look at the map now, and there's actually good maps you can find from NASIC at the unclassified level of what those threat vectors are, you'd see that it seems like many are pursuing what is essentially a poor man's extended long-range artillery.

So in the '90s we built a system called the Attack and Launch and Early Report to Theater. We produced and generated capability off of the backs of super innovative folks from both industry as well as the United States Air Force to make that happen. We consolidated theater support in one location, and provided warning and support and began to look at infrared battlespace characterization. That was generation three, and we fundamentally call that Air and Space Integration, where we began to support the air component as the primary door into the joint task force for combat operations.

Now we're getting into generation four. That started with the onset of the Space Based Infrared System. As you know, we fly DSP still. We got our money's worth out of those birds. They continue to operate way beyond their planned lifetime. I won't tell you how many there are or how long they operated, but they remain a great capability.

We have on-ramped new Space Based Infrared System capabilities both in highly elliptical orbit as well as in geosynchronous orbit. What you have with those sensors is a much more robust scanning and staring capability to provide much more fidelity from an infrared perspective. The good news is, there's a lot of hot things on the Earth. The bad news is there's a lot of hot things on the Earth.

So we look at, how do we do this in a combat relevant timeline, because what General Votel wants from me is not just Scuds and ICBMs. What he wants is battlespace awareness, anything that is hot going on in CENTCOM, let me know. And then you pick up the phone and it's Admiral Harris in PACOM who is saying, "Rock... oh by the way, I want some of that battlespace awareness too."

As you add these lists of requirements up that General Hyten and General Raymond have to provide support with warning and surveillance, it's pretty incredible. And when you come and look at the operations floor at the 460<sup>th</sup> Space Wing, right now my crews are deployed to Schriever Air Force Base you will see a total force team of about 29 folks doing everything that the nation asks for when it comes to missile warning and infrared battlespace awareness.

The simple fact is, like so many of these other mission sets that we have in space, that's your team. There's just nobody else who's doing it. It's not like -- you know, I have the 140<sup>th</sup> Fighter Wing on my base and they have about 24 F-16s and when there's a concern or an issue they need to work they can do a safety stand down.

We don't do that in space. The mission has got to happen. So no matter how

much stress the crews are under, no matter how much we want to push out our space mission force, no matter how much this is a zero-sum game to make it happen, they're going to have to continue to do the mission. That's why we're so humbled and honored to support them every day.

But where SMF has brought us in this culture change that the leadership team has put upon us, is a good one because the threat vectors that we see now and in the future are substantial. Not only do we need to find ways to protect and defend those three constellations that I just described to you that we currently operate, we have a ground link and space segment to each constellation and all of those things are at-risk. Just like Colonel Burt has the Air Force Satellite Control Network spread across the globe because you can't get around the physics of the Earth in order to maintain command and control and operations of those spacecraft, we have to have the same thing, except I have a dedicated network for Space Based Infrared System and the Defense Support Program. There's actually more antennas we have than in the Air Force Satellite Control Network given the effort it takes to do our mission.

So the networks that we command and control are also potentially at-risk. I went to Fort Meade two days ago not because I like Fort Meade. I won't go into too much, but as Colonel Burt said, nobody does anything anymore without thinking about the threat vector from cyber.

And it's not just that. That installation readiness that all of us as installation commanders have the responsibility to prepare for is substantial because it takes a global network to do this. When there's a global network, there's multiple locations where they are, and those things also you have to protect.

It's a privilege and an honor to lead the men and women of the 460<sup>th</sup> Space Wing, but as Colonel Burt said, this was implemented zero-sum. You don't get any more money, you don't get more people today. If you say, what can I do to help you, Rock? I'll tell you. What we need your thought work on is the infrastructure that prepared our combat air forces to be the most dominant combat air forces in the '70s after Vietnam, whether it was training ranges, integrated live. Virtual, and constructive distributed mission operations, large force evaluation training, all of those things that it takes to produce war fighting capabilities in a contested environment, are things that we need to get to in space.

I have the privilege of having Kath Ryan's son in our wing, and he's going to be a super star. He's bright. No matter how much I want him to innovate, if he can't simulate the threat and practice planning and response options, there's only so much innovation is going to do for him. Eventually, this is going to become a discussion on readiness, and I call it the readiness bow wave that's coming in space operations.

We are ready right now to do the job to support and defend this nation from ballistic missile attack, and we're ready to support the Missile Defense Agency and U.S.NORTHCOM commander in missile defense in particular. But the key for me to be

able to do that is to be able to operate through all those threat vectors I just described to you. That's going to require a level of infrastructure and investment that we've got to start talking about today.

And it's going to require a level of people -- I don't even know what it is yet. But that's what Doug Schiess and DeAnna Burt and I are working hard on, is trying to figure out what that looks like. I'm not saying I need a separate Red Flag. That's not it at all. The value of air and space integration has produced the most capable space forces that this world has ever seen. I'm not worried about that.

What I'm more worried about is the American people expect us to be ready for anything. What they value is that we always send America's men and women off with the best capability and the best training. I am telling you there's only so much training I can do with the stuff that I've got right now.

So I'm interested in having a dialogue and a discussion. We're trying to do a hard look at what that takes from a resourcing perspective to make that happen. The good news is you have just about the smartest operators we have ever seen doing this job. They're so much better than I was at their age, and I thought I was pretty good. They're just so much more talented, and they think in ways and on planes that's very impressive.

What we owe them is -- and our fundamental job as leaders is to provide them -- the tools and resources they need to do the job. We're getting to a point where we've got to have a discussion about what that takes. The advanced training piece and the force presentation piece are the two components that the architects of the Space Mission Force came up with, and those are two big things we're working on really, really hard. The force presentation model has to include not just how we do combat to dwell, but it has to include the dedicated architecture and support infrastructure we need to do the advanced training piece.

So with that, I'll yield the rest of my time to my brother Doug. I hear he tells a good joke. My brother Doug Schiess, from the 21<sup>st</sup> Space Wing. I look forward to talking with you and having questions.

(Applause).

COL. DOUGLAS SCHIESS: When we normally do these meetings the 21<sup>st</sup> gets to go first, because it's 21, but I guess with a last name of Schiess I went last. So, any questions?

(Laughter).

I'm happy to be here on behalf of the 4,300 men and women of the 21<sup>st</sup> Space Wing. I'll talk a little bit about what we do in the 21<sup>st</sup> Space Wing and then transition to Space Mission Force.

As you heard during the introduction, we do missile warning, missile defense, space situational awareness and space control. Think of the 21<sup>st</sup> Space Wing as your space wing that does most of what it does from the ground, not with satellites like the 460<sup>th</sup> or the 50<sup>th</sup>. Since I was talking to General Goldfein the other day when we was visiting, we talk a lot about the age of our aircraft in the Air Force. But we do not talk about the age of our radars, and our radars are just as old.

As a matter of fact, we have a piece of equipment at one of our radars in Cavalier, North Dakota that there are only two left. One is operational and the other is in the IBM museum. Sometimes we have to send folks to the IBM museum to take apart that piece of equipment to see what we can use because we can't take the one that is in the radar down because we're doing operation. So that is one of the things that we have problems with with the infrastructure.

We have some great new capabilities coming online with the Space Fence. That's a terrible name for it, but it is a radar that's going to do incredible things for us. It will bring on tens, hundreds, thousands more objects that we will be able to see with that radar that will be out at Kwajalein Atolls. As a matter of fact, our systems may not be able to handle all the information that we we'd be able to get, but it will also help us as we move on to knowing exactly what is in our domain and what is going on (each day ?).

We also are bringing on the Space Surveillance Telescope down in Australia. I was down there a couple of months ago. We have our C-band radar down there. A great relationship with the Australians. We're trying to bring on new technologies, but we're also doing this work with our old technologies.

So right now for missile warning, missile defense, you have folks 24/7 that are doing that mission around the United States, and with our partnership with the British at FAF Flyingdales as well. They have an incredible responsibility for missile warning, like Colonel Miller talked about for his wing. But if we're doing our missile warning by radar, then things are pretty bad because they're getting really close at that point. So hopefully that's not something that we do.

I like to say it's missile warning and missile defense, so it's like that Geico commercial where the bank is being robbed and they say, hey you're a security guard, what are you doing? He says, I'm not a security guard, I'm a security monitor, your bank is being robbed.

That's missile warning. Hey, there's a missile coming. What can you do about it? Nothing, there's a missile coming.

With missile defense we can. We're upgrading most of our radars to be able to provide that information to the shooters that are either in the Army or the Navy. So that's ongoing work. It's really hard to upgrade an old system with old software, and so we are experiencing some delays as we go through that. But eventually we will have the capability -- we already have the capability in some of our radars -- but have the

capability to provide that information.

Those same radars also do space situational awareness, and they provide the combatant commander, General Hyten and right now the Joint Functional Component Commander for Space, General Buck, the capability of what's going on in space. I don't think it's to the level that we need it to be, and that's why we're bringing on other assets with the Space Fence and the Space Surveillance Telescope. We're also bringing on a new radar up at Clear, Alaska, the Long Range Discrimination Radar that will be purely missile defense. We'll do some space situational awareness with it when it's not doing that, but it will be a more powerful radar that will be able to discriminate against targets that are coming from that part of the world.

So those are kind of the things that we're doing in missile warning, missile defense and space situational awareness. One of the huge changes we did in the last year -- actually some people call it back to the future -- we took the space surveillance division of the Joint Space Operations Center and turned it into the 18<sup>th</sup> Space Control Squadron. There are many, many folks that wanted to call it 1-CAC from the time that it was in the mountain. But the historians tell us what squadron it gets to be, and it's the 18<sup>th</sup> Space Control Squadron that is now at Vandenberg.

I like to tell my good friend, Mike Manor when I walk into the JSpOC, how much space do you actually have here now? Because most of it is the 18<sup>th</sup> Space Control Squadron. But that squadron now brings in the integration that we have, and it was seen recently during a conjunction that we had with a DMSP satellite and a Russian satellite.

The DMSP satellite was still operating but could not maneuver, and the Russian satellite was not working at that point. I think three days out the first probability of conjunction or POC that we got was about 43 percent. Those are normally less than one percent, so that got us all a little excited at that point. But seeing the synergies we have with the 18<sup>th</sup> Space Control Squadron being a part of the 21<sup>st</sup> Space Wing, and working out to all the radars to be able to say we're going to do this and then you're going to grab it over here and then we're going to make sure that other folks are taking a look in case something really bad happens, and we're talking to the 50<sup>th</sup>, it was a great example of how we can do things better with Space Mission Force.

So transitioning to Space Mission Force, I'll talk a little bit about space control. It's hard to talk about that in this environment. We are doing things within the Air Force to lower the classification of that area, but it is still highly classified.

Right now we have a defensive space control unit deployed to Al-Udeid Air Base Qatar, and it monitors communications links mostly for remotely piloted airplanes. It is doing that on a daily basis. As a matter of fact, it is getting much better each and every day because of the innovation of young lieutenants and staff sergeants that are finding ways to use their weapons system to get that down.

We've had jamming. Some of that jamming is our own self, we're doing it to

ourselves, but a lot of it is out there with different antennas that people put up, and no one wants their RPA to be jammed and to lose lock when it's doing a combat mission. So those folks are doing that 24/7 out at Al-Udeid.

They also are 24/7 in Colorado Springs monitoring UHF wings, mostly for the Navy. They can do that from there, but they can do it across the globe. And then on the other side we currently have two units deployed to the Middle East. In this environment I can say that one is in Jordan and one is in northern Syria. I can't say much more about what they do, but I can say that we transitioned to the Space Mission Force for that squadron last July.

You might say -- Chris Crawford is here so he knows how this works -- you might say we've been doing the Space Mission Force for years in the 4<sup>th</sup> Space Control Squadron, and its predecessor the 76<sup>th</sup> Space Control Squadron. But the things that we're doing different now is they're on a known cycle and when they do come off that cycle they are doing that advanced training. I'd say that we've gotten so focused on CENTCOM, as Colonel Miller said, we forgot about PACOM. So now we are looking at avenues for PACOM, if we have to go to PACOM to do operations.

But the thing that we're learning there is, we're allowing folks to do more training than they've ever been able to do before because there were concerns about maybe something happening while we're doing that training. So we've broken through some of those nuts and we're able to do more training. Colonel Burt was the Red Flag commander out there last year. We brought out a team and we worked through that.

One of the things that we talked about was Space Flag. Right now, when the 21<sup>st</sup> Space Wing deploys to Red Flag to operate, we are really supporting the air folks. We are not actually getting our own training done at that time.

It is a great environment to get on two C-17s and get out there, but we're actually doing something to help the air guys out, and it's not a lot of great training for us. So we're working through that. How can we do that advanced training?

We need ranges, we need other things, to be able to do that in a much more fidelity environment. But they are doing a great job. As a matter of fact, you might have seen we are now deployed to the most austere location a 21<sup>st</sup> space man has ever deployed to in northern Syria.

I can't say more than that, but you might have seen that we had a staff sergeant that passed away in northern Syria. It was from natural causes, but it showed how long it takes to get someone back from Syria and what that does to a wing. So we got to bring his family in and bring him back home to Colorado Springs, but it shows that there are space wing airmen out at the farthest tip doing the mission, and that we need to remember that. They're not just behind a door somewhere in Colorado Springs, they're everywhere.

So we've done that transition to Space Mission Force and we will continue. The

next step is our Ground Based Radar. Colonel Burt alluded to that.

We can't do it the same way the 50<sup>th</sup> Space Wing does. We have already cut those crews back to the minimum; as a matter of fact, probably farther than the minimum when we went through sequestration and went down to just two folks running those radars at each site. What they do is missile warning and missile defense, but what we really need them also to do is that space situational awareness to a greater level than they have ever done before.

So we are in our trial period. We will go back to General Raymond in the next couple of months, and then we will transition on 1 October. We've taken a look at a lot of different options.

We, obviously, look at what the 50<sup>th</sup> is doing. We look at what the Global Hawk folks do because they are in the same environment where they don't have enough people to say I'm going to now come off my combat time and go into dwell. So we're looking at different crew rotations that would allow them to have their crew time, but then take some days to do advanced training.

One of the things when we talk about culture that we had to do, and it's nothing against any of my predecessors, it was just that we always thought that we were in a benign environment. So I talked to you about those two satellites. Well that was pretty much unclassified or at the secret level. There are many other conjunctions that are at a very high classification level.

None of those radars, except for one, could have had any of that information because they do not have SKIFs. So how do I prepare the next space war fighter to know what's going on if I can't even tell them what the threat is? I can just say, look at this spacecraft number. Okay, that's great, I saw it yesterday, it's still in the same place.

Well, I need to be able to provide that intel, so one, providing intel officers to each of those radars. And then we are in the process where Eglin has a SKIF and in a few weeks we will certify the first SKIF out of Beale Air Force Base, and then slowly followed by Cavalier and Cape Cod and then Clear. We're still working with Flyingdales on how we're going to do that, but we obviously want to be able to put a SKIF out at Flyingdales as well.

So while we talk a lot about that combat to dwell time, it is that culture and it is providing those young lieutenants and staff sergeants the ability to look past -- you know, Colonel Miller and I were at a session yesterday and it was like, yup there's a satellite. It's there again. I'll look at it again in four hours.

No, I need them to be looking, I know what that satellite is. I know what it can do to one of our assets and I know if it does these kind of things that maybe it's getting ready to do something. To do that, we have to change the culture of what they do each and every day.

So again, it's a pleasure to be here. I think the three of us are going to take questions next. Thanks for all you do and I appreciate the time.

(Applause).

MR. HUESSY: We have a few minutes for questions. If you would identify yourself to the speaker and which of the three or all of them you would like to have the question answered.

COL. SCHIESS: All hard questions go to Colonel Burt.

MR. HUESSY: Yes. So, do we have questions here?

MR. : The future of laser crosslinks in AFSPC. Do you have them now and are you looking to use them in the future?

COL. BURT: I would tell you we've been working hard with cross lines within our MILSATCOM community. We do have the ability to talk satellite to satellite. But again, that's more of an acquisition question of where are we going in the future with laser cross links and how do we do that. But I think that is very valuable.

We have learned across the enterprise that it's important to stay engaged with the civil side of the house and the commercial side of the space industry, because again in some cases they are leading in technology and abilities and how we leverage that. We've seen that with Space-X and launch, and that brings down our costs as well on the acquisition side. So definitely the research is there, but today we have some abilities to do cross links with MILSATCOM, but not full laser comms as you were discussing.

MR. WILSON BERZET (ph): Hi, Wilson Berzet, Air Force Magazine. I wonder if you could talk a little bit more about how your forces deploy? It was interesting to hear about how you were in Jordan and Syria. What numbers do your forces deploy in? Do they deploy as a coherent unit or do they attach themselves to other units, and what sort of stress is put on their home units in terms of personnel?

COL. SCHIESS: The 4<sup>th</sup> Space Control Squadron is meant to deploy forward, and so the squadron is built up of what we call UTCs and different unit Type codes for what we have to do and how many we can do. I'll tell you right now, we're bringing on Air National Guard squadrons, one in California and one in Florida and one in Colorado Springs that will help us with that. They deploy as a unit, and so they actually become an expeditionary space control squadron when they're forward.

So we take a major and make him an expeditionary squadron commander, and they bring everything with them that they need, including security forces. The individual that actually passed away in northern Syria was a security forces member, and they go forward. Administratively, they come under an expeditionary operations group over

there, and so it could be an operations group that has F-15s, mobility assets, whatever, and then there's a space control unit that goes through. They are command and controlled through the combined air operations center out at Al-Udeid Air Base Qatar.

I don't know if that answers your question?

MR. BERZET: And about impact on your units?

COL. SCHIESS: What we've seen lately is we're deploying more and more, and once we deploy somewhere we never get to leave. So I think the defensive guys that went to Al-Udeid were supposed to be out there for a two year trial, and they've never come back. I mean, obviously folks have gone back and forth. So what it has done -- and that's why those Air National Guard units are going to come on to be able to help us carry the load for those deployments, especially if you look at we have to eventually maybe go to PACOM to do something similar, or even EUCOM. We are so focused on CENTCOM right now that if we had to go to one of those other organizations, that would definitely take a manpower drain on that unit.

MR. MARK SELINGER: Hi, Mark Selinger with Defense Daily. Colonel Miller mentioned the need for training instructors. Are you on any kind of a timeline or deadline for assessing those needs? And could you maybe give us a (view of what assets you have or do not have ?) ?

COL. MILLER: Sure, Deanna will tell you I was supposed to do that yesterday. I think where we all stand right now is each of us have a different approach, but there's some common threads that we need to do on our dwell side. Doug talked about the awareness of the threat and a focus on what's where, what's it doing, what vector is it on in terms of intent, and what are the possible response options? That's where you begin to translate this from intel to predictive awareness down to TTP development.

I think in each one of those areas all of us are making a lot of progress in getting data, consolidating information and preparing our crews for potential threats. I think that's fair to say for everybody. I think we're making an incredible amount of progress in TTP development: tactics, techniques and procedures, that if something happens what will be our response so that those response options are baked to the extent that they can be.

I think where you get into a challenge -- and I want to be clear that those response options need to encompass, as Colonel Burt said, what we would do perhaps from space - - is there a ground element to this if there's a threat vector that we need to be concerned about from an infrastructure perspective? And then if there's a cyber-concern, how do we ensure that we are prepared for that?

I don't want to imply that it's just on-orbit. I think where the challenge comes is let's take a look at the infrastructure it took for combat air forces. You guys have probably heard of Moody Suter and the work that those folks did post-Vietnam in order

to prepare our combat air forces. The concern at that time was that we went from an air-to-air kill ratio of 10 to 1, I think it was just over 10 to 1 in Korea. I'm looking at General Moorehead because we all kind of work for him still.

Then we got into Vietnam and I think the reports vary but you're getting down to two and a half to one, depending on the engagement. The American people expected our fighter pilots to perform better than that. Frankly, we did too because that's their lives that are at-risk.

I think we put in place a range infrastructure to support them to simulate those threats. We put in place adversary threats -- it's that red force threat aircraft with dedicated personnel, dedicated aircraft in order to simulate those threats. We built the Red Flag and the Combat Training Squadron infrastructure and a range mission assessment, and debrief process with instrumented ranges in order to ensure that when we said we're going to give you the first 10 missions when you go to Red Flag, it's about as real as we could possibly simulate. And there's all the infrastructure that goes behind that.

The acquisition world spins into that. We need to simulate those threats. Well there's a whole infrastructure piece that goes into that. I don't know what that looks like for all of us. What I do know is we don't have that.

So when you say, what does it look like, we don't know that. Right now I think there's great work being done for Space Flag, for the Boeing Virtual Warfare Center. As Colonel Burt said, phenomenal improvements have been made in the ability to simulate.

But we'll know we're successful when we can provide that realistic simulation to our airmen, when it's integrated between the three wings where there is no kidding integration at every step. When Doug maybe provides defense and space situational awareness of something that an adversary is doing to one of my links for SBIRS, and Colonel Burt is providing me awareness on-orbit of what is close to the Space Based Infrared System satellite and our response is coordinated to ensure that everybody understands that we can, no kidding, assess what the response is. I think that we are still needing to develop the requirements for that, and that's why I call it a bow wave.

I think our readiness posture for a benign environment is pretty good in space. What I think we're all wrestling with -- I'll speak for myself -- what I know I'm wrestling with is that is not appropriate to a contested domain. There are positions, people, experts, a professional cadre of test and evaluators that it takes to do this business in a contested domain that we don't have yet.

I'm not indicting anyone, I'm just telling you that it takes more than -- we didn't get here yesterday and we're not going to fix it tomorrow -- it's going to take more than five minutes to come up with that. So what we're doing right now is trying to consolidate those inputs and present those to General Raymond. The good news is as we go through our crew readiness verification process to ensure each SMF cycle is ready, we know our

response up the chain to General Buck first and then to General Raymond, and we have a venue to have these dialogues and say, this is where we need to be and this is where the delta is.

So I don't think it will be some crisis -- you know, you open the paper and you go holy smokes, Rock Miller said that the units aren't ready. That's not what I'm saying. What I'm saying is incrementally we're going to learn more about what it takes to do this business.

The analogs are there with the CAF, but it's not going to be consistent. I don't think we need to double the infrastructure that is needed, necessarily, in term of people and resources and things, but some of it is going to be necessary. Does that make sense to you?

MR. : Along those lines and launching off of what Colonel Burt said about the importance of the commercial space sector and where it's headed, realizing that there are 80,000 Iridium hand-sets in the hands of U.S. military forces, 80 percent of our bandwidth for expeditionary warfare comes from commercial satellites, and given the potential for hosting U.S. military capabilities on commercial satellites, given that there are 60 big GEOs being manufactured today, but 40 of them are being manufactured in the United States, and all of the large LEO constellations are being assembled, integrated and tested in the United States, how can the Space Mission Force construct be expanded to include purposely and deliberately leveraging the commercial space operators function in support of U.S. military advantage now and in the future?

COL. BURT: As I mentioned earlier when we talked about automation, we are learning from industry. That process, we've been talking about that for years. But again, culturally that was our bread and butter and our initial entry position on the crew, and so we've had to rework in the Space Mission Force construct, what do we want our blue suiters doing?

What is war fighting? Where can that manpower be most efficiently used? How can we leverage automation and things that the commercial industry is already doing?

If you work -- I'll give you an Iridium example. If you work at Iridium, you're a guy walking around there Monday through Friday nine to five, the rest of the time you're carrying a beeper and you're the on-call guy. When the satellite breaks it calls you.

That's unheard of in our business, right? But we have automated down to a single guy in 3SOPS doing that for WGS and DSCS. We are planning to move out with that in MILSTAR and AEHF, and we're doing the same with GPS. That will all happen in about the next year timeframe.

All that automation existed in the ground system, so it's not like SMC didn't give us that automation. We've had it, we culturally just didn't want to activate it or push it because we wanted those entry level crew positions. We've now refocused that because

we see where the manpower is needed.

So I think we're going to continue to learn from industry when it comes to that. As far as using commercial capability and how we augment U.S. forces with commercial satellite capability, my personal opinion is I think you get something very similar to CRAF. On the air side of the business we go and get commercial aircraft, reserve aircraft, CRAF, to support the transport of troops and other things, and we have written agreements. I think particularly in the MILSATCOM business, which I live in at the 50<sup>th</sup> I think that's where we're going to end up.

How do we quickly lease and have agreements that military forces, if denied on one frequency, can move quickly to another commercial entity? Now what that drives for the acquirers in the room, is a multi-band frequency receiver. Right now we build single band receivers. We build from receiver to satellite to ground system, a single frequency receiver. You name it, from MILSTAR, AEHF, WGS, DSCS, you name any system you want, there's a single receiver for that particular satellite constellation. There's not a multi-band receiver.

That's what we're going to need as military forces. And again, as satellite operators we do not have the ability to control that, that's a user-equipment, receiver-equipment piece. The war fighters on the ground are going to have to demand that.

But in an area like PACOM where to me MILSATCOM is going to be the long pole in the tent, trying to bring forces by carrier strike group over the Pacific to fight in the Pacific is going to be tough. MILSATCOM is going to be the long pole in the tent and how are you going to ensure our forces have command and control of those forces?

It's going to be MILSATCOM and it's going to be a combination of military and commercial capability. So how do we start to work that problem now and get those multi-band receivers that allow the operator to hop based on what's being contested. But that's where, I think, are the opportunities for us to grow.

MR. HUESSY: One more.

MS. : Could you take a bit more about the new technology that you need and artificial intelligence and data, what kind of role they have?

COL. BURT: I don't have -- someday they're going to find artificial intelligence to replace wing commanders, so I'm not really a fan. I'm kidding. I really don't -- we haven't stepped into artificial intelligence. What I will tell you what we're exploring at the 50<sup>th</sup> Space Wing is we're talking big data in support of mission system defense.

So when we talk about the cyber threat that all three of us have identified, some of the things we talk about are, how do we defend our precious mission systems? We've been very focused as a DoD on our SIPRNET and NIPERNET, our unclassified and classified email networks. But how do we get to individual weapons systems?

We know that our weapons systems are linked and they are connected. That gives us our advantage in the battlespace, that we're able to seamlessly communicate across wide spaces of the Earth. So with that said, that's obviously an Achilles's Heel that the enemy would want to go after. How do they get into those weapons systems?

So how do we defend our mission systems? We started doing that in what we call our man-to-man defense. We have mission defense teams. We are the pilot to the pilot for the cyber squadron initiative.

Basically we have the same tool that the 24<sup>th</sup> Air Force uses, but it's stripped down to only be the defensive capabilities. We put that into a lap top function, connected our mission systems, and have cyber operators sitting on that system watching the traffic and building the day-to-day patterns of life, as well as understanding the key cyber train on that weapons system. Well man-to-man defense is pretty manpower intensive. I don't have a lot of three deltas and 17 delta cyber guys to do that.

And as we also stand up the cyber mission force on behalf of the DoD we have a lot of requirements to fill those teams first. So with that, we started to talk about how to get to a Big Data solution. How do we take all the data coming from those systems and take it off board of those mission systems and analyze it in a centralized cyber defense operations center that would allow a smaller footprint of personnel, but would also allow us to see across the enterprise of everything happening on the installation?

So I understand in the space business it's not just the mission system. I don't do anything without power in my SCADA. I don't do anything without telecommunications and some of those things, as well as HVAC, because if the computer gets overheated it turns itself off.

So there's a lot of defensive work from an installation commander perspective, as well as a mission system that we need to figure out how to deal with. We're hoping this Cyber Defense Operations Center, leveraging Big Data technology that's happening quite frankly out there everywhere in commercial industry, and how we start using those ideas -- we have an RFP out. I think somebody was mentioning to me it's like 25 questions that lays out what we're trying to look for and the ideas we're trying to get from industry to actually let a contract to try to build an initial capability with the Cyber Defense Operations Center.

So that's one way we're trying to leverage Big Data and some of the automation and things that are coming. Artificial intelligence, again, I think there's probably people out there in the acquisition community thinking about that, but personally at the 50<sup>th</sup>, at our level and what we have today, we're not there yet.

MR. HUESSY: Thank you very much, colonels. We are moving upstairs in a few minutes, so if you are coming to our session upstairs please join us very quickly. On behalf of the Mitchell Institute and ROA and NDIA and AFA, thank you Colonel Burt.

Thank you Colonel Miller. Thank you, Colonel Schiess. Would you all give them a warm round of applause?

(Applause).