

TRANSCRIPT

## Defense Writers Group

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**Lt. Gen. Raymond:** I really do appreciate very much the opportunity to come and chat with you and highlight Air Force operations and discuss Air Force operations. These are operations that are global, they're multi-domain, they're multi-functional, and they're accomplished by our total force airmen. In fact, we're the most integrated total force in the Department of Defense.

Today's global security environment drives an absolute insatiable appetite for everything that our Air Force contributes to the joint force, and it's clear that air power is critical in fighting and winning today's wars. Let me just go over a couple of statistics with you.

**DWG:** Before we continue let me say a couple of things for the group, then we'll continue just as you were.

Good morning, everybody, thank you for coming in, and thank you in particular to our guest Lieutenant General John W. Raymond who goes by Jay. General Raymond is the Air Force's Deputy Chief of Staff for Operations. We do appreciate him making time on short notice to come and visit with us. We have 60 minutes, we're on the record, and the General is going to make a brief opening remark and then I'll call on each of you individually.

Sir, sorry for the interruption. As you were.

**Lt. Gen. Raymond:** For those I didn't meet, hello, and I'll shake your hand when we're done. But thanks again for being here.

Today approximately 24,000 airmen are deployed around the globe; another 71,000 are forward based; and 205,000 airmen support global operations from their home station to defend the

homeland, operate remotely piloted aircraft, control our nuclear space and cyber forces, and provide rapid and global mobility. All of these are critical to responding to the five challenges that we currently face.

One of those forward based airmen assigned in Belgium and his family were wounded in the terrorist attacks in the Brussels Airport. We keep them in our thoughts and our prayers, along with all of those that have been impacted by these extremely tragic events.

Capitalizing on the responsiveness and agility of air power, we are actively taking the fight to Daesh in Iraq and Syria and wherever terrorism metastasizes as evidenced by recent strikes in Somalia, Yemen, and Libya. We continue to train and provide operational support to Afghanistan National Defense Forces and Security Forces in Afghanistan.

Let me just go over a little bit of the tempo that we're doing. In Iraq and Syria the Air Force has flown over half of the 87,000 sorties and conducted nearly 67 percent of the nearly 11,000 airstrikes. On average, Air Force aircraft conduct about 25 strikes per day. Their strikes have destroyed more than \$500 million in cash used by ISIL to pay their fighters and to fund their operations, reducing the salary of those fighters by about 50 percent. Additionally, our attacks on the fuel infrastructure have reduced their fuel revenue by approximately 30 percent. The Air Force has also flown 90 percent of the nearly 24,000 tanker sorties and the vast majority of approximately 10,450 ISR sorties since the beginning of August of 2014.

As you can see, our Air Force is fully engaged in today's fight, and 25 years of sustained combat operations have come at a cost to full spectrum readiness. Although we are highly ready to continue the fight against Daesh, today less than 50 percent of our Air Force is ready for the full spectrum combat operations.

Our Air Force remains the world's premier Air Force, operating in integrating operations in air, space and cyber. However, our closest pursuers are rapidly closing that gap. We must balance the modernization of our fleet for the future, while maintaining that full spectrum readiness for today.

The bottom line has been our Air Force is fully engaged in every region around the world and in every mission area across the full spectrum of military operations.

I want to thank each of you again for being here, and I want to, it's nice to meet most of you. I've met some before. And I look forward to your questions.

**DWG:** Thank you, sir.

I'd like to actually begin with readiness which you mentioned in your opening statement there. As you said, the Air Force has less than 50 percent of its units fully ready for full spectrum operations right now. What does that mean in practical terms for the other 50 percent? The 50 percent that is not fully ready. What are the shortfalls there? What are they not able to do that you want to get them able to do?

**Lt. Gen. Raymond:** I think you have to look at the heart of your question, what are we ready for? And clearly if you look at what we're doing today in the fight against Daesh, we're highly ready for that. Our airmen and our capabilities are fully prepared to take the fight to Daesh as we're doing day to day.

What we're not seeing though today in this fight is having to use the full spectrum of skills and capabilities that we might need in the higher end fight. We're not operating in contested air space. We're not having to fight and gain entry. We're not having to gain and maintain air superiority. We have that. And those are some of those areas that require additional training to be able to hone those skills.

**DWG:** And how long do you anticipate it will be before you get back to --

**Lt. Gen. Raymond:** For across the whole Air Force, if you look at it for the Air Force as a whole, we have made readiness a priority for us and we have funded our flying hours to the maximum level that we can fund it. Weapon system sustainment dollars at the maximum level. We've put a down payment on growing our force and clearly focused a couple of thousand bodies in this budget going into maintenance manpower. That will take some time for those forces to mature and grow. And we're anticipating for across the whole Air Force it will take between eight and ten years from the time that we set the conditions of having those resources, growing those people, and then having the time to be able to do that, conduct that high end training like we do at Red Flags [inaudible].

**DWG:** So a long term problem.

**Lt. Gen. Raymond:** It is.

**DWG:** Good morning, sir. Down in Orlando the Chief told us the Air Force is kind of struggling to figure out the nuanced definitions of EW, EA, and cyber. But you're operating every day. So tell us how you sort it out, who's doing what, what's your level of effort, and where you see that headed.

**Lt. Gen. Raymond:** It's a great point and it's something that our Chief has tasked us to do.

As the A3, one of the things that we're focusing on is how do you operate in, through and from cyber? The Chief has given me and my team the task to lead the effort to look at where the Air Force wants to be in ten years in the mission areas that you talked about. How do you operate in, through and from cyber to get at the five core missions that the Air Force does -- the air and space superiority, global mobility, strategic attack, ISR and C2? We have a team put together right now, putting those thoughts together. Everything from how do you organize, train and equip, all the way down to the tactical level. How do you command and control in a multi-domain environment? How do you embed this into an air operation center? Again, to command and control those multi-domain operations? And all the way down to how do you map it into that center?

We have made great progress in that over the course of my career in the space business, and my background in space operations. We have integrated space into the fight better than, more effectively than anybody else in the world. It provides us great advantage. We're now trying to leverage the lessons that we've learned in the space business and integrating that into the fight to accelerate that effort.

**DWG:** I was actually thinking about more like the pods and jamming and things that you're doing in actual operations in the Middle East. Is it just not a taxing environment for you? You don't really have to do very much? Or --

**Lt. Gen. Raymond:** It's something that we clearly are focused on, we have the capability to do. But as you said, the environment that we face today gets to the first question on full spectrum readiness. We're not having to use all the skills and capabilities that we have to operate in the environment that we find ourself in today.

**DWG:** How do you practice those? How do you get your guys not to lose their EW edge?

**Lt. Gen. Raymond:** We have very strong training programs. We do, as you know, we funded in this budget more training opportunities out at Nellis. We're looking at what kind of training capabilities do you have to have on the ranges to be able to operate in a fifth generation Air Force? We've made investments in that. We train, we have the high end training. Our challenge is to have the time to be able to go and do that training because of the demands of the current fight.

**DWG:** Thanks so much.

**Lt. Gen. Raymond:** Thank you, John.

**DWG:** Good morning, sir. I wanted to ask you about Syria, the fight against ISIS. What sort of interaction does the USA force have at the moment with their Russian counterparts?

**Lt. Gen. Raymond:** I missed the first part of your question. Can you just repeat that?

**DWG:** Sure. I wanted to know what sort of interaction the UAS force has with their Russian counterparts in Syria?

**Lt. Gen. Raymond:** As you know, the U.S. and Russia have entered into a Memorandum of Agreement that focuses on deconfliction for safety of flight inside Syria. As part of that MOA, it mandates phone calls and we do two phone calls a day out of our air operation center to work that deconfliction focused on safety of flight I the air.

**DWG:** And it seems the Russian counterparts have a rather sophisticated missile defense system there at the moment. And I assume they are cooperational. How does it work? Do they warn you? I mean the radar is for, I'm not an expert at that. But as far as I understand, those radars, or one radar is constantly working and they will paint you, right? And this is sometimes

considered as a threat essentially by aviators in the air. So how does that work? What do you do to deconflict even further?

**Lt. Gen. Raymond:** We, as I mentioned, what we do with MOA is we worry about safety of flight, deconfliction for safety of flight in a congested airspace, if you will. That's the focus of our efforts with deconflicting with Russia.

**DWG:** Do you share information about areas where you fly, where they fly --

**Lt. Gen. Raymond:** We do not share specific information of where we fly or what our force [inaudible].

**DWG:** Thanks.

**DWG:** You say your career's been in space operations, and you came in uniform in the middle of the Reagan administration. For those of us who were covering this back then, everything in space [inaudible] military, seemed to largely be done by the military. Then all of a sudden you started having, you know, the spy, you know, the military would never release photographs because we'd give away what sort of visual acuity they had. Now with Google Earth and with everything else, a lot of what used to be reserved solely for the military is now going out in the commercial world. So over the course of your career how much of space that the Pentagon uses has gone from it's ours, to oh, we're leasing it, or we're borrowing it, and where it's going to be in 10 or 20 years? What sort of areas of expertise in space will have to remain the preserve of the military that you won't want to subcontract out?

**Lt. Gen. Raymond:** That's a great question, and it's something that I've been focused on my entire career.

Since the end of Desert Storm in 1991, really we began what some have described as the first space war, really the first war where we integrated those national level capabilities into the fight. We have focused very intently on integrating those capabilities to great advantage, and we do that today to create advantage for our service.

The space domain though has changed significantly. You'll hear three words that we use to describe space. It's much more congested. The Air Force tracks about 23,000 objects in space a day. We keep, we provide conjunction assessment and warning to make sure that nothing collides in space. If anybody's seen the movie Gravity, you've seen that play out in the movies. We provide warning across the world to keep that from happening.

The other part of space is the other C, so it's congested and it's also contested. That's because we have used it to our great advantage. Others have looked at that advantage and said how do we deny them those capabilities?

And then the third C, and that's everything from low end reversible jamming to high end kinetic direct [inaudible] ASATS which you saw visibly in 2007 when they shot down one of their satellites.

The third C is competitive. The space strategic environment is changing significantly. I can tell you in my last job I commanded the 14<sup>th</sup> Air Force and the Joint Functional Component Command for Space. If I recall correctly, don't quote me on the exact numbers. I might not have this exactly right. But last year, there are satellites that are called cube sats that are about a cube about this size. They can stack them up and build three of them together. I think, if I recall, there are about 15 that were launched a couple of years ago.

The trends of that satellite business show those numbers going up into the multiple thousands, which would provide operational utility for the military and utility for the average person around the world.

In fact, there was a young student at Cornell that built a science project that had a canister of about 180-something chip sets in it that was going to deploy -- about the third of the size of a credit card.

So what we have to keep in our military is we have to have the ability to, space capabilities fuel our American way of life and they fuel our American way of war. We need to make sure that we can continue to do that. We rely very heavily on commercial to do that, but there's also a core set of capabilities that we have to have. The ability to command and control our forces without fail; the ability to detect against missile warning, provide missile warning without fail. And we've leveraged commercial industry in areas like communications. Where about 60-80 percent of our communications today go over commercial [inaudible] satellites.

**DWG:** Okay, but us journalists like to simplify, then exaggerate.

So when you came in, how much was military owned? How much is military owned today? And where do you think it's going to be in 20 years? Just a --

**Lt. Gen. Raymond:** I don't have what it was back then. I will tell you, today we are leveraging the commercial industry to a great advantage. I would see that would continue, and as this new space segment emerges in small satellites I think there's greater opportunities to go forward.

One of the things that we did out at Vandenberg, we stood up a commercial integration cell on the Joint Space Operation Center floor. So if you go out to Vandenberg and you go to what we would kind of refer to as the AOC for Space, you'll see a commercial cell right there with commercial operators which allows us to share information more broadly, allows us to have better awareness of the space domain that we both operate in. And it's to both of our benefits.

**DWG:** I'm with Stars & Stripes. Can you tell us a little bit more about the [inaudible]? Are they still in Brussels or have they been evacuated to Germany or to the U.S.?

**Lt. Gen. Raymond:** Out of privacy concerns for the family, what I would say is it's an officer that is assigned in Belgium. It's an active duty service member and five dependents, and they remain hospitalized, and I'll just kind of leave it at that out of privacy concerns for the family.

**DWG:** Can you say in Belgium or whether they've been transferred or evacuated?

**Lt. Gen. Raymond:** They remain in the same hospital they were in after the attacks.

**DWG:** Okay. And then if I could just ask, earlier you gave [inaudible] Air Force [inaudible] 11,000 airstrikes. Do you by chance have a breakdown by airframe of how each platform contributed to that number of strikes?

**Lt. Gen. Raymond:** I don't have that with me. We have that. The Air Force uses all of its aircraft that we have in theater to do that. Everything from, over the course of the conflict, everything from F-15s to F-22s to A-10s to B-1s to RPAs and we use all of those aircraft to meet the demands of the mission at hand. I have that, I just don't have it with me.

**DWG:** Austin, then --

**DWG:** At a speech last month Secretary Carter said that the budget request would invest more in munitions because he said we're running low on the munitions that we use against ISIS the mot. Can you give us some color on what that actually means for the Air Force? And are you concerned at all about not having smart bombs, [inaudible]?

**Lt. Gen. Raymond:** If you look at the weapons that we're using in theater, almost 100 percent of the weapons that we use are precision-guided weapons. Either laser guided or GPS guided. And the vast majority of those are GPS guided precision weapons that strike very very accurately, that allow us to conduct the campaign that we're conducting today extremely precisely, and those are the weapons that we're using in great abundance.

We are concerned about that. We think we have, we clearly have what we need to accomplish the near term efforts, but we're looking, and have had efforts in place to expand the procurement of those weapons for future needs.

**DWG:** Is that a capacity, industrial base issue?

**Lt. Gen. Raymond:** It is. And we've gone to the company that makes those and they're upping their capacity to build those for us.

**DWG:** Would that be Boeing or --

**Lt. Gen. Raymond:** Stand by. Can I get that for you and follow up?

**DWG:** Sure.

**DWG:** Good morning, Phil Stewart, Reuters.

I have a million questions for you to start off with, on Syria to start with. If you can give me an update on where, how many aircraft are still from Russia in the country operating? Where do you see their air operations going?

**Lt. Gen. Raymond:** Since the cessation of hostilities we have seen a reduction in aircraft from Russia. I don't have the specific numbers that are there. We have seen a reduction. They still have significant capability that remain in Syria. They still have not only their aircraft but surface-to-air missiles that were discussed earlier, and radars within [inaudible], but there has been a reduction.

**DWG:** And [inaudible], the U.S.-led coalition operating in Syria. It's been criticized roundly for the last year after being [inaudible], not having enough strikes or not having enough coalition activity, or you pick. I'm wondering, do you think that the, at the pledging conference that Secretary Carter went to earlier this year there were a lot of [inaudible] from allies to do a lot more. I know after the Paris attacks there was a big ramp up for a little while of French strikes. But at the same time, as one of my colleagues [inaudible] recently wrote, the actual number of munitions being dropped has fallen.

I'm sort of wondering, is there any kind of trend that we can look for as far as coalition [inaudible] in the air war? Or is everybody kind of holding their fire ahead of Mosul? What's going on?

**Lt. Gen. Raymond:** First of all I don't think you can just the effectiveness of the campaign on the number of airstrikes. There's more to it than just numbers. And if you look at the way we conduct operations, we conduct operations jointly. And this campaign is an air-ground operation. So you can't, our CFAC in theater, Lieutenant General Brown, works very closely with the CJTF commander to synchronize air operations with ground operations. So those numbers are going to continue to ebb and flow.

For example, the decrease in monthly weapons expenditures, I've heard reports back from November, is largely due to the successful retake of Ramadi and some other operations in Syria and Northern Iraq, and you're going to see those ebb and flow as the war ebbs and flows.

But I would caution you, don't look just on the number of strikes; and if you look at what we have done here recently, again, with what I highlighted in some of my opening comments, being able to strike at their oil infrastructure and reduce their revenue by 30 percent. If you look at the cash reserves that we've been able to destroy. That's had a really significant impact in clearly building momentum for coalition forces.

**DWG:** And as far as the strengthened coalition?

**Lt. Gen. Raymond:** I was just in theater a couple of weeks ago touring Air Force units and met great coalition partners that are there with us in a strong coalition.

**DWG:** Can you give me a sense of how many strikes have been carried out by the Sunni [inaudible]?

**Lt. Gen. Raymond:** I don't know that number off the top of my head.



**DWG:** For those of us at the table who don't have security clearances, is there something else that we can look to besides number of airstrikes, numbers of munitions dropped, to get a sense for how effective or intense this air war is?

**Lt. Gen. Raymond:** I think the air war, I think you just have to look at operations that have been ongoing. Look at what's happened in Ramadi. Look at what has happened recently in Shadadi. You have to, when you look at this atmosphere you can't look at it as just kind of a counter-insurgency. You also have to look at it as kind of a quasi-state and you get a source of power from how much land and resources. When you look at that, you can see pretty significantly that those have been --

**DWG:** Hi, sir. Are you involved with the Y-Band AOA that's going to go on?

**Lt. Gen. Raymond:** I am not the requirements guy on the Air Staff. I have space expertise, obviously, but I am not a requirements expert. So I'm not directly involved.

**DWG:** Do you know who's going to lead it from the Air Force side?

**Lt. Gen. Raymond:** That will be a combination of Air Force A5 which will be the Requirement Directorate under Lieutenant General Mike Holmes, and then working closely with the Principal Deputy Space Staff under [inaudible].

**DWG:** Okay.

**Lt. Gen. Raymond:** In very close partnership with Air Force Space Command.

**DWG:** From your space background, as Mark has said, can you give us a perspective on how you feel the Air Force should procure SATCOM over the next 20 years? How much of it should you keep in house? What specific capabilities should you keep in house, and what do you feel you should subcontract to industry?

**Lt. Gen. Raymond:** If you look at the range communication spectrum, you have everything from commercial satellites which have a level of security, but not much security after that. And then on the high end you have the Advanced EHF satellites and the MilStar satellites that they're replacing that provide assured command and control for our presence, for our nuclear forces.

And then as I talked about the domain becoming more contested, clearly there is a need for increased protection levels, and there's protected wave form activity that's going on at the first [fly] on our wideband WGS satellites. And then we'll transition to commercial satellites as well, to provide the low [ball] connection above just the encryption. But I think you'll see us using the full spectrum. We'll continue to use commercial satellites to meet the bandwidth demands that we see, and we must have the assured command and control capability that our nation relies on.

**DWG:** Good morning, sir. To follow up on Mosul, there were some reports this morning that the Battle for Mosul had begun. I'd be interested to ask if you have any details on U.S.

contributions to that. There have been some reports that ground forces have already begun to seize towns on the periphery. What can you tell us about that?

**Lt. Gen. Raymond:** I'd just say that coalition airstrikes continue to support the indigenous forces on the ground to degrade and defeat Daesh. We have struck Daesh in the Mosul area more than any other area this month, this year, and during the entire air campaign.

**DWG:** Any details on specific --

**Lt. Gen. Raymond:** I'm not going to go into details on specific operations that may or may not be occurring.

**DWG:** And you can't confirm that this battle has started?

**Lt. Gen. Raymond:** I will just say that coalition airstrikes continue to support the indigenous forces on the ground.

**DWG:** And just separately, you may have seen a report that the Associated Press put out yesterday about statements from a series of European security officials that ISIL has trained 400 fighters, deployed them to Europe to do the kind of strikes that we saw in Brussels this week. They seem to indicate that this was indicative of a larger shift of ISIL strategy away from one of attacking where it is now and one of spending more time attacking beyond its immediate so-called caliphate. I wonder if that's a trend that you've noticed as well, and whether you can sort of speak to what might have caused that.

**Lt. Gen. Raymond:** I think it's clear, as I mentioned, if you look at the five challenges that we face as a nation, they're becoming global, trans-regional, multi-domain, multi-functional, and clearly Daesh is a trans-regional threat. As we have success and build the momentum against Daesh in Iraq and Syria, they will go to relief [valves] if you will, like we have seen them do in Libya. The value that air power brings to the fight is that the responsiveness and flexibility of air power allows us to strike and target and defeat ISIL wherever they may pop up their head. And so it's not, I'd say you have to look at this not just as an Iraq-Syria problem, but a trans-regional problem. That's exactly what we're doing.

**DWG:** Have the Air Force's contributions changed or been modified at all now that there is this seemingly greater focus on Europe where the Air Force cannot do airstrikes?

**Lt. Gen. Raymond:** The Air Force continues its focus on combating this enemy wherever it may pop up its head. You've seen that in recent strikes in, obviously in Iraq and Syria where the core part of the cancer is, if you will. You've seen us do those strikes where it's metastasized in its form or other forms of terrorism. As I said, in Yemen, in Somalia, in Libya. We continue to use air power to degrade this enemy and defeat terrorists wherever we can.

**DWG:** General, good morning. I've got a follow-up for you if I could, and then a question.

The follow-up is you mentioned earlier the Air Force family, the officer and his family. I wanted to make sure we had it right. The initial news release went out that said he was part of a NATO command out of the Netherlands. You said he was out of Belgium. Did he base in Belgium--?

**Lt. Gen. Raymond:** I'm sorry, JFC Brunssum.

**DWG:** Okay. The actual question, you mentioned Yemen in your opening statement. A big series of airstrikes there this week. Can you put any meat on the bone in terms of how that played out, who and what was involved? Some more detail than we have?

**Lt. Gen. Raymond:** No, I would just say that, as I said earlier, this is a trans-regional fight. We will respond with air power, both manned and unmanned aircraft, integrating, bringing the full capabilities of the United States Air Force to be able to defeat this adversary wherever they go.

**DWG:** Can we say what was a mix of two, was it fighters? Who was involved [inaudible]?

**Lt. Gen. Raymond:** I can try to get you those details, follow-up with you.

**DWG:** Thank you.

**DWG:** Sir, you talked in your opening remarks about sort of adversaries closing the gap with some of their capabilities. I keep hearing those comments. How close are some of our higher end adversaries actually to closing that gap? And what are some of the areas that are kind of at the highest risk?

And then you also talked about the training aspect and how 50 percent of our forces are not fully prepared to fight in the complete spectrum. How is that kind of affecting the ability of our adversaries to catch up to us?

**Lt. Gen. Raymond:** On the, it is clear that, I don't think you can look at just one specific area and say -- you have to look broadly across all of our capabilities to see which, where folks have made advances and that. I would tell you, as I mentioned earlier in the space capabilities, that domain has become more contested as we have become more reliant on those capabilities. I think you can say the same thing in cyber, the cyber domain continues to be contested. If you look at where we see the strategic environment, the global environment going in the future, you see clearly anti-access challenges that we have to face, and that's why it's so important that we have the new modern capabilities like we're developing, like the B-21 which can hold at risk any target anywhere on the globe and penetrate that to great effect, like we're seeing why it's so important for F-35, why it's so important for KC-46. So we need to modernize our forces to be able to meet those challenges of a shrinking technology, yeah.

**DWG:** So in terms of --

**Lt. Gen. Raymond:** On the readiness question that you asked, we have the world's best Air Force, and it is, with the best capabilities and I will tell you with the best airmen that operate and maintain and secure those capabilities in the world. There's no, it's clear that that's the case.

We are, if you look at what we're doing in theater today, we're doing it very effectively, very precisely. We're clearly taking the fight to Daesh, building momentum. That comes as opportunities to train at the high end, multi-domain, full dimensional fight. We're still the best in the world and I'm very confident of that.

**DWG:** And you talked about the need to modernize [inaudible] the B-21 and all that. Are you worried about sort of recent budget constraints or as you keep some of the older platforms like the A-10, are you worried about the Air Force's ability to stay on track with those programs?

**Lt. Gen. Raymond:** WE have got to modernize our Air Force to meet the demands of the future. That is clear. It is clear that air power is critical to the success in any war that we may face, and it is clear that the Air Force that we have today needs to be modernized to be able to have that success in the future.

**DWG:** We talked a little bit about the [inaudible] space assets and General Hyten talked about it a couple of weeks ago. [Inaudible]. I'm wondering, as an operations guy, what do you see you need in space to counter those threats? And how are we doing that? And then what do you see as the current level of risk and how do you alleviate any risk to an incidental space [inaudible]?

**Lt. Gen. Raymond:** First of all, let me be very clear. We do not want to fight a war that extends into space, and one of the ways you don't fight that war is be prepared to do that. In my opinion, like a commander responsible for operations in the domain, there's two must-haves. You must have the ability to have a level of domain awareness or space situational awareness, and we are working hard to do that. We're working international partnerships to do that. We have data sharing agreements with international partnerships. We have worked very closely building partnerships with the intelligence community to share data more broadly. So domain awareness or space situational awareness I would say is a critical piece of that and we'll work with that.

The other piece of this is you have to have the ability to command and control the forces. We're putting a lot of effort into developing the ability to command and control in a multi-domain approach to integrate all the capabilities that we have in all three of our domains that we operate in -- air, space and cyber -- to great effect.

**DWG:** Is there a specific program [inaudible]?

**Lt. Gen. Raymond:** On space situational awareness, for example, the Space Fence which is being constructed out in the Pacific at Kwajalein is absolutely critical. It will enable us to see many more objects in low earth orbit and provide us better situational awareness of that domain.

On the command and control capability there's two things I would highlight. First, you may all have heard about a concept called the Joint Interagency Combined Space Operations Center, the JICSPOC. That really gets at building unity of effort between, two things. It really focuses on doing experiments and building unity of effort between DoD space and the intelligence

community; and two, providing more data to that center and experimenting with that data to see how best to command and control in the contested domain.

Then there's another program called the Joint Space Operation Center Mission System, JMS, which is a command and control capability for space that's going to replace a system called SPADOC, the Space Defense Center, which was designed in the '80s, implemented in the '90s, and that program is absolutely critical to us going forward as well.

**DWG:** I have another space question for you. I guess I wonder, there's been a lot of work in the past to develop an International Code of Conduct for Space, and I know there have been efforts that still kind of, it's still [inaudible] I guess.

How important from your perspective is creating some level of [inaudible] operation in space at an international level? How important is that? And is there enough urgency behind doing that [inaudible]?

**Lt. Gen. Raymond:** I think it's important and I think we're working closely with the State Department who has the lead on that for [inaudible] to work towards that end.

One example, I talked about the proliferation of these cube sats. As I mentioned earlier we have, we track all those objects that are in space. 23,000 objects that we track in space. We can track on average about a 10 centimeter object, a softball-sized object. Those objects are moving very fast, about 17,500 miles an hour. If you start having some smaller objects, they're harder to track, and if proliferation of those objects continue, I think it's going to be important to have a conversation in the future on how best to develop some standards and how to deal with [inaudible].

**DWG:** And is that --

**Lt. Gen. Raymond:** That's one example.

**DWG:** And just in terms of the international side of it, international issues but also the commercial side of it as well, and I understand that there's an effort to encourage industry to kind of self-regulate or develop some [inaudible] as well. But what role does DoD have in encouraging industry to follow those certain --

**Lt. Gen. Raymond:** We've worked very closely with industry, and one of the things that we have done pretty significantly over the last, or we focused on pretty significantly over the last several years, is developing these partnerships with commercial [inaudible]. Imagine having a commercial cell in our command center that does command and control for space capabilities. It's something that we're keenly focused on.

Also, I talked about it in the JICSPOC experimentation, working very closely to open partnerships with the intelligence community.

And the third thing that I have not talked as much about but is absolutely critical, is developing partnerships with our allies. In the past, space has been a benign environment. We really haven't had to have the partnerships that we have today. That's clearly not the case today. We value those partnerships, we're working very hard to develop those partnerships with our closest partners and have done so to a pretty good effect here over the last several years.

**DWG:** [Inaudible].

**Lt. Gen. Raymond:** I do.

**DWG:** [Inaudible] -- confidence levels [inaudible] being able to ensure [inaudible] in space [inaudible] that we're going to [inaudible].

**Lt. Gen. Raymond:** Again, I am not the acquisition guy. I'm the operator. OCX is I think a really important command and control capability for us to get to GPS-3 which will provide us and our nation great advantage and added protection for our precision, navigation and timing signal. My understanding is there was just a review done and it went pretty well from what I've been told, and we're going to continue down the path of working with OCX. I'm hopeful and from what I've heard on the review, we're hopeful that it's going to materialize and we'll be able to provide the command and control capability we need for those GPS satellites.

**DWG:** [Inaudible] perspective, [inaudible], how confident are you that [inaudible]?

**Lt. Gen. Raymond:** We take the protection of our space capabilities extremely, we put a lot of emphasis on this. We focus our cyber protection team efforts on these capabilities. It's an area that they we're putting a lot of effort on and I'm confident that we've got the right focus to be able to maintain our ability to assure that access to those space capabilities and safe command and control of those capabilities.

**DWG:** In your opinion and with your background in space, is there something more that we can be doing to [inaudible] I guess the [inaudible]?

**Lt. Gen. Raymond:** One of the things that I'm encouraged about is, first of all, General Hyten is a superb leader at Air Force Space Command and is doing some great work. Today when we build command systems or satellites we build independent systems for every satellite. We kind of custom build the C2 capability for every satellite. He's kicking off an enterprise ground approach, looking at a new way of doing business. I think that holds great promise. I think it will allow us to enhance our protection. I think it will allow us to distribute our command and control more broadly, and I think it's something that will be very important for our country going forward.

**DWG:** A couple of follow-ups. On the preferred munitions, what's the situation with the other members of the coalition? Are they also running low on the preferred munitions? And are we having to do kind of a lend-lease arrangement here where we're supplying from our stocks?

**Lt. Gen. Raymond:** We do have relationships with our coalition partners for those supplies. They are using those weapons as well, and again, it's something that we're managing very closely to make sure, and we're not concerned, again, as I said, that we have the supplies to do what we need to do today, but we're making sure that we replenish those to take care of potential future operations.

**DWG:** I'm sorry, was your answer that yes, we are supplying coalition and allies with --

**Lt. Gen. Raymond:** We do supply coalition partners with --

**DWG:** Is that kind of a they'll pay us back later? Or is it just provision of --

**Lt. Gen. Raymond:** No, we get reimbursed.

**DWG:** And my other question. In the past we've had a number of exercises that we do in the Middle East, the Emirates, [inaudible], Jordanians.

**Lt. Gen. Raymond:** Right.

**DWG:** Do we still do that? Or --

**Lt. Gen. Raymond:** We do.

**DWG:** -- the total effort now on --

**Lt. Gen. Raymond:** We do that. It's important that we continue to build partnerships and important that we build capabilities, and we do that not just in the Middle East but around the globe. We do that building partnerships or training Afghan forces to fly B-29 aircraft, for example. We partner with our coalition partners in exercises around the globe, and it's something that we'll continue to do and continue to focus on.

**DWG:** Are you able to take people who are doing anti-Daesh operations and put them into the exercises so they don't, we don't have to bring lots of people over from the States or elsewhere? Or is it still the old method where you deploy somebody from stateside, they get that training and later they come and deploy and do real work?

**Lt. Gen. Raymond:** The forces that we have in theater are focused on fighting Daesh.

**DWG:** Okay.

**DWG:** I'd like to switch over to Europe for a second. Rapid deployment is happening there as well. I know President Petro Poroshenko from Ukraine will be here next week and I know the country hasn't been getting weapons like they've asked for, but they've been asking for more exercises. And I know the Army is prevalent in [inaudible] and that's pretty much on the Army. But I know that they've also wanted to build up their training with the Air Force. The last time

the Air Force went over there for an exercise was the California National Guard in 2011. That was well before the crisis happened.

So is there any plan to train with their Air Force? Are our Air Force units thinking of possibly training with the Ukrainians or their counterparts coming here for some training?

**Lt. Gen. Raymond:** We continue to do what we call TSP deployments to theater. As you know, we've deployed F-22s recently to Europe. We just brought back, just had 12 A-10s in theater visit numerous countries to continue to develop that [inaudible]. It's a high priority for the Air Force. It's a high priority for [inaudible].

**DWG:** So there's no plan to actually work within the country, though?

**Lt. Gen. Raymond:** I will have to get back to you on that. I just don't have it at my fingertips.

**DWG:** I would like to clarify a point about Russia and Syria. I might have misarticulated myself while asking the question. I actually have no idea how the Russians operate and I wanted to know if their air defense, missile defense systems actually track you, track the U.S. Air Force while we were there or not? They just switch it off?

**Lt. Gen. Raymond:** I would say the Russians have air defense capabilities in theater and they have not, not just air defense capabilities, but the Russian capabilities they have in theater have not had any impact on our ability to continue operations in Iraq and Syria.

**DWG:** You don't consider their presence a threat?

**Lt. Gen. Raymond:** No, we take their presence very very seriously, but we have not had any, they've not had any impact to our operations in Iraq and Syria.

**DWG:** Thank you.

**DWG:** Yes, sir, you mentioned 23,000 softballs traveling up there at 17,500.

**Lt. Gen. Raymond:** Let's continue. That's things that we track.

**DWG:** Right, that was the lead in to my question which goes well, if you can't track anything smaller than that, and you've made mention in the past how you've had to actually move satellites out of the way when these things are incoming. So if you can't track anything smaller than that, how often do satellites get hit? Space assets get hit by smaller ones that you can't track? And what damage does that do? And is there any level of protection that these satellites have, or are they basically out there saying if you hit me I'm dead?

**Lt. Gen. Raymond:** Estimates are that there's about half a million objects that are too small for us to track. And an object going 17,500 miles an hour, a very small object going 17,500 miles an hour --



**DWG:** Well it's a bullet.

**Lt. Gen. Raymond:** -- can do some pretty serious damage.

**DWG:** Right.

**Lt. Gen. Raymond:** I don't have at my fingertips the numbers, but it's happened in the past where objects have, have collided with, we've had, back in 2009 we had two satellites collide that caused about 3,000 pieces of debris. Since that time we've stepped up and done all, ramped up our collision avoidance and --

**DWG:** Were those two of our satellites?

**Lt. Gen. Raymond:** It was one of our satellites and another country.

The challenge is that of the satellites that are on orbit, the protection measures that we have would be to maneuver. And as you mentioned, we on average, on average over the last couple of years, about once every three days based on the warning that we provide, a satellite maneuvers to avoid from potential collision. That's once every three days. Usually about three times or so a year the International Space Station maneuvers to avoid from hitting debris. It's a significant concern. Some of the satellites that we have on orbit, you don't have the ability to maneuver.

**DWG:** Right.

**Lt. Gen. Raymond:** And it's --

**DWG:** But none of them are armored in any way --

**Lt. Gen. Raymond:** No.

**DWG:** -- to any degree, or made more resilient against such strikes. You've got to stay out of the way.

**Lt. Gen. Raymond:** You've got to stay out of the way.

**DWG:** You've got to stay out of the way.

**DWG:** Yes, sir. Just to go back to Brussels for a second, one of the most common points of analysis since the attack is that it's yet another demonstration of the very poor levels of information and intelligence sharing within Brussels, but across Europe in general. That perhaps even U.S.-European intelligence sharing could be stronger. I wonder if you agree with that assessment, and whether you think there are any changes that could be made to help prevent something like this from happening again. Certainly with the kinds of operations the Air Force is involved in in Iraq and Syria.

**Lt. Gen. Raymond:** I would not agree with that assessment [inaudible]. What I will comment on though is the importance of intelligence to this fight. This is not, this is not a fight where you have tanks that are going over the open desert that are very easy to track and to find. This is an enemy that blends in with the population, blends in with civilian infrastructure. It's an enemy that isn't afraid to die and blow themselves up for, to wreak terror and havoc. It requires significant levels of intelligence. We're understanding that enemy and adversary better, but it's clearly a fight that's going to require significant intelligence efforts going forward.

**DWG:** [Inaudible] looking at potential fighter moving out of Syria, which seems to me the most common point of exit, getting into Europe and elsewhere, through Libya or getting directly into Europe. Do you think there is more that the Air Force could be doing to share, or has anybody approached the Air Force about--?

**Lt. Gen. Raymond:** The Air Force works very closely with our partners to combat this enemy wherever it may be.

**DWG:** Phil Stewart.

**DWG:** Just a quick update first on the North Korean satellite. Did you ever get a determination of whether it was going to stay in orbit forever or what it was exactly?

**Lt. Gen. Raymond:** North Korea launched a satellite. It's in low earth orbit. It continues to tumble. It's not in a stable orbit. Satellites that are in low earth orbit typically don't stay up forever. They'll degrade and reenter over time.

**DWG:** Do you have any [inaudible] what it was? Anything at all? Is it functional in any way?

**Lt. Gen. Raymond:** I do not think that it's functional.

**DWG:** And on Iran's space, proposed or planned space launch, I've heard --

**Lt. Gen. Raymond:** Let me back up on that. The satellite is clearly in a non-stable orbit. Let me just leave it at that. It's in a non-stable orbit.

**DWG:** As opposed to what? [Inaudible], you're not predicting whether it's going to fall out of orbit over time is what you're saying.

**Lt. Gen. Raymond:** It will. All satellites in orbit will fall out of orbit over time.

**DWG:** Okay. But you won't predict how long.

**Lt. Gen. Raymond:** It depends. There's lots of variables on how long that takes. It depends on how high it is, there's all kinds of factors that go into that.

**DWG:** And then Iran. What's your sense of Iran's space launch and how concerned are you about it?

**Lt. Gen. Raymond:** Clearly countries around the world continue to develop space capabilities. The thing that's concerning with, probably the thing that's concerning is the ability to put a satellite on orbit is the same capability you would need to be able to use that as a harmful missile, and that's the concerning part of it. But we track it, we'll track that capability as it's launched, we'll protect our nation, we'll protect the allies around the world. But the concerning part to me is that the rocket they use to launch the satellite could be used as a dual-use purpose.

**DWG:** [Inaudible] launches?

**Lt. Gen. Raymond:** I do not.

**DWG:** We are out of time, so we'll need to wrap things up here, but I want to say thanks again for coming in and meeting with us. We appreciate your time and your thoughts.

**Lt. Gen. Raymond:** I really appreciate the conversation. Thank you for the opportunity to be here. I hope I have an opportunity to do it again in the future. And thanks for what you do. I appreciate it.

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