Lieutenant General Robert Otto

AFA - Air and Space Technology Exposition

"ISR Roadmap"

17 September 2013

Lt. Gen. Otto: It's an honor to be with you all here today. I am under absolutely no illusions of my position after following General Welsh, probably the best speaker I've ever heard. He had me laughing, crying, motivated, excited, all in the same speech. And every time I've heard him talk of course he's been the same way, so just a tremendous leader for our Air Force. We're extremely privileged to have him. There are some tough fiscal problems facing really all of the services, but certainly the Air Force. It's going to take some innovation to overcome all of that.

I'm actually reminded of a guy, Steve, who went to a dog breeder. He bought a dog. It was going to be ready in about a week and he was five weeks old, six weeks old. He came back, the dog breeder was supposed to deliver the dog. The dog breeder said I'm sorry, Steve, but the dog's dead. Steve said hmm, sorry about that, can I get my money back? The breeder said well, that's the bad news. I've already spent the money. So my friend Steve said well, then give me the dog. The breeder said why would you want a dead dog? He said just give it to me. I'm going to plan on holding a raffle. We'll raffle off the dog. The breeder said you can't raffle off a dead dog. Steve said sure I can, I just won't tell anyone that it's dead. Give me the dog.

In fact he did go about his business and he met up with the breeder about a month later. The breeder said how did things go? Steve said not bad, I sold 500 tickets at $2 a ticket. I made a profit of $998. The breeder was amazed. He said, didn't anyone complain? Steve said yeah, just the guy that won the raffle, and I gave him his $2 back.

I like that story, because in tough times, you've got to have innovative solutions and I think there are some solutions out there that we can harness.

The Chief talked about Show Time Sutterfield. How many people saw the Chief? Okay.

One of the guys there in the F-22 was Show Time Sutterfield, and he was telling the story about how he intercepted a Predator and came underneath it and then told the guy to go home and he did. What he didn't mention was the way that Huey came about was one of our outstanding ISR Airmen, a young lady out at Digby I had the privilege of meeting . That's because she characterized the environment, she knew where she needed to be listening, she heard it, then she sent out the message. So lost in some of these

stories is the in-depth work that goes on in order to make them a reality. I just thought that was worth bringing out to all of you today.

There are tough times ahead for ISR. The Air Force is celebrating its 66th Birthday. What I want to do with you today is talk a little bit about the beginnings and talk about how we can apply some lessons from those times.

You think about reputedly the wisest man in the world who was Solomon. He said there's nothing new under the sun. We have been here before. I believe that we can learn from the past.

So what I'd like to do is talk top level about our ISR strategy and then what it will be like for the next ten years. It gets us to 2023 and a decision advantage. Then finally I'd like to highlight some of our Airmen who are exemplars in our ISR enterprise. Then hopefully we'll have a little bit of time for some questions and answers. It won't be death by PowerPoint. I've got eight slides in the deck, and seven of those are pictures.

If you'll go to the first slide.

Some of you may recognize this young character here on the left hand side. That's Thaddeus Lowe. The beginning of airborne ISR probably begins with this gentleman. He was the Army aeronaut who piloted a balloon up to about a thousand feet 17 miles from here, actually, at Falls Church. He used Morse Code to send down the observations of the positions of the Confederate lines so Union artillery could then fire on the Confederates.

That sounds a little bit primitive until you realize that we do something very similar today in Afghanistan. Look at pictures on the right hand side. Those are balloons, aerostats today. They occupy every regional command in Afghanistan. And they help us take out the bad guys every single day. So we've got exquisite cameras and sensors, of course today. They replace the cigar smoking guy with binoculars, but you have to recognize that while some things change in ISR, some things will stay the same.

Next slide.

I would tell you that the history of Air Force ISR is somewhat parallel to the history of a single unit and that would be the 1st Reconnaissance Squadron, the Air Force's oldest flying unit. They just celebrated their 100 year anniversary this year. Is there anyone here from the 1st? Mike Blackman, the squadron commander of the 1st. They can trace their art from the Army Air Corps' earliest beginnings to today. They saw action, and that's

what the picture is, in Black Jack Pershing's chase of Poncho Villa who's the dude with the bandoliers there in the second picture in Mexico in 1916. They used eight JN-3 Jenny fight planes and a 90 horsepower engine to chase Pancho Villa across the border.

From there they fought in World War I. They were using French airplanes at the time, two-seaters. And they fought with distinction over the Marne and St. Mihiel and the Meuse Argonne regions.

They transferred to the famous SR-71 kind of in the middle of the picture there, in the 1960s. The Blackbird of course gained critical ISR in Vietnam and famously traveled from London to Los Angeles in three hours and forty-eight minutes.

We've made some incredible strides since then. In fact the mighty Predator can travel that very same distance in two days, nineteen hours and fifty-eight minutes. [Laughter].

So today from Beale the 1st Reconnaissance Squadron trains crews in the U-2 and the Global Hawk, preparing them to meet our high altitude ISR requirements.

The U-2's most famous moment, of course, I think was probably the Cuban Missile Crisis and the U-2 was really quite a smoking gun from the United States. I'm going to put that in context a little bit later.

But the story of the 1st RS is the story of Air Force ISR basically in this sense. From humble beginnings the exquisite technology of today's platforms that you see on that slide and sensors, we can learn a lot from our past. Or put differently, history is a conversation with the past about the future.

So we as Air Force ISR facing shrinking budgets, we're facing a smaller Air Force. There's no question that's a challenge but it's also an opportunity.

If you can go to slide three.

A lot of times when you see budget slides they start at World War II and I thought it would be instructive to take you to prior to World War II and I want to focus you on that timeframe, 1920 to 1940 which I would vaguely describe as the inter-war years, after World War I. World War I, the budget was 22 percent of our GDP and then it fell to 2 percent afterwards. By 1921 the country's really looking at the Great Depression, so that era between the wars is what I Want to talk about a little bit more because to me the innovation between the wars is where we can learn something.

Go to the next slide.

Upper left hand corner. The Under Secretary talked about this a little bit yesterday. You guys recognize the picture of the person there in the upper left hand corner, right? Billy Mitchell.

So Mitchell bombs the Ostfriesland. Throughout World War I and in that post-war period the U.S. strategic strategy put a lot of faith in sea power. It was the Navy's job to defend the coast. That's important because up until the mid-1920s the Navy had always done coastal defense and it was a highly desired mission. Why? Because there was a lot of money that was being poured into it and in that very tight defense budget that was a mission area that they wanted to hold onto. Billy Mitchell had just returned from World War I and he thought that air power could do this job and foresaw the aeronautical era and thought, of course, that air power should be independent of the other services.

He saw this coastal defense as an opportunity and argued that the Air Force could do better than the Navy. He even boasted to Congress that he could sink their battleship, right? And so he spent the next year training and innovating and pushing his crews and of course in 1921 they towed the Ostfriesland out over the water and the Navy said we'll give you two shots on target. So they had their first shot that just hit the water, and then two that hit the deck and the combination of things, they sunk the Ostfriesland in 21 minutes.

So important to note, by the 1930s the Air Force had taken over coastal defense, right? So there's the first one up in the upper left.

If you look in the center of that slide you see the Air Corps Tactical School. Mitchell's theories would later be studied and tested and improved upon through this Air Corps Tactical School, and it was the first effort to formalize doctrine for air power. So up until that time there really wasn't much that was written. They didn't have text or doctrine when they started this and it was just based off the experience of the pilots flying in World War I. But this tactical school was created to use air power in initially to support ground troops. But by 1929 the school was investigating ways that air power could influence future combat and even independent of that ground support role. So it shifted its emphasis from reviewing the past to focusing on the future.

They were heavily influenced by Mitchell's ideas, certainly, and developed a doctrine of strategic bombing to paralyze the enemy's strategic infrastructure.

So I'm not here to argue whether that doctrine was perfect. It certainly required alteration. But it also led to the creation of our bomber force that we used against Germany and against Japan and was a solid basis for the development of our modern air power theories.

So by the end of World War II some 80-plus percent of the Air Force generals had come from the Air Corps Tactical School.

So most of you got Billy Mitchell. I don't think many of you would get the character in the upper right hand corner. That is Lieutenant William Friedman. He saw five months of action under General Pershing's staff in France in the radio intelligence section and he saw enough during that timeframe to realize that our capabilities in terms of cryptography and intercepting of communications were poor and desperately needing work. So despite the fact that he had a shoestring budget, he spent about the next 20 years recruiting and training and developing our young analysts. He heavily recruited math majors and he looked for people straight out of college and he didn't have to pay them much. He looked into the right methods of effectively decoding the enemy transmission and also of securing our own. He set up radio intercept stations all around the world and he borrowed IBM tabulating machines to help in their calculations. So from a very small work force he and his team worked to decipher Japan's most complex codes. You can see the purple machine there in the middle of that picture.

Their strides were significant. They started calling his team Magic. They were famously able to decode the Pearl Harbor attack message before it happened, but of course they didn't get it to the right people in time. That makes you think of that Dr. Strange movie with Peter Sellers and he says, what good is it if you don't tell anybody?

But it laid the ground work for the Navy's success at the Battle of Midway which was what, just months, less than a year after Pearl Harbor. Six months after Pearl Harbor.

So Freedman and his team -- The point is they provided a decision advantage that commanders repeatedly enjoyed during World War II.

If you go back to the budget slide, the next slide, we look at that again and look at that period. There's no question that we face immense challenges fiscally these days, but look at that time. That force operated on a shoestring budget and I think we can be inspired by these lessons in our history. Mitchell's audacity and vision, and the Air Corps Tactical School laying the doctrinal foundation of the future, and William Freedman's

methodical approach to build the intellectual capital to deliver a decision advantage, and that theme will reside through where I think we need to go in intelligence, surveillance reconnaissance.

So we have opportunities ahead. The Chief talked about winning the fight, strengthening the team, shaping the future.

Next slide.

For the Air Force what that's going to mean for us is full spectrum awareness, world class expertise, and delivering decision advantage.

What I want to do is spend some time talking about that.

We tried to capture the Air Force's vision in absolutely as few words as we could. I think we've got it down to eight unless you count the hyphenated term, and then it would be nine. But the rationale was to force us to our essence. We believe the essence is full spectrum awareness, world class expertise, and delivering decision advantage. So I'd like to talk about what we mean when we talk about those things.

First of all, full spectrum awareness. There's no question that right now Air Force ISR provides unprecedented awareness of the operational environment, whether that's the tactical, the operational, the strategic level commanders and our decision-makers. Our vision for 2023 is an Air Force enterprise that seamlessly ingests the data from an even wider expanse of sensors and sources and then swiftly conduct multi-INT and all-source analysis so that we can deliver that decision advantage to the warfighters.

That full spectrum awareness prior to conflict will enable our Airmen to develop a comprehensive picture of the operational environment and understand what normal is. Just like that young lady that I told you about up at Digby. Then in coordination with the entire intelligence community, develop a better understanding of adversaries' intentions and capabilities.

After the conflict starts, during military operations, that full spectrum awareness provides the knowledge that leads to the informed decisions and ideally we want to compress that observe, orient, decide and act or OODA Loop. That's full spectrum awareness.

World class expertise. Our Airmen, which is Big A, active duty, Guard, Reserve, civilians, are the engine that powers ISR. For that vision to become a reality, of course, we've got to watch the organization, the training, the education and the equipping

to execute those assigned missions. All domains. Geographic regions. Phases of conflict. So that that world class expertise is an integral part of the air component and the joint operations.

To do that our analysts have to be masters of threat characterization and of analysis and of collection and of targeting and of operations intelligence integration. That last part is something that we'll continue to focus on. They've got to lead the way in the development of the TTPs that are going to compress that OODA Loop, because at the end of the day that's what gives us that actionable intelligence for kinetic or non-kinetic targeting, for that matter.

Finally, delivering a decision advantage. The fundamental job, I think, of Air Force ISR Airmen is to provide the commanders at every level the knowledge they need to prevent surprise, command forces, make decisions and employ weapons. So maintaining the decision advantage empowers the leaders to protect our friendly forces and hold targets at risk across the depth and breadth of the battlespace. That's at ground, sea, air, space and cyberspace -- across all the domains. So enabling the commander to apply deliberate and discriminate and deadly kinetic and non-kinetic combat power.

To put it more bluntly, and to give you an example of what we mean by decision advantage. I talked about the Cuban Missile Crisis earlier on. Think about that. It was 14 October 1962. The U-2 flies over Cuba. We actually did 400 sorties, ISR sorties of different types. Not all by the U-2. But the U-2 took the photos of intermediate and medium range Russian nuclear missiles on Cuba. They were analyzed a day later on the 15th of October and presented to the President on the 16th of October. So you can see the decision cycle that we were dealing with in the '60s and how we're able to compress that today. But in it we offered irrefutable proof of the offensive weapons, and really those images stole the show in the Oval Office, also at the United Nations, on TV to the American people. Of course that marked the beginning of those 13 days in October that people have made movies about.

President Kennedy was given a decision advantage by the U-2 and the superb analytics provided by the photo interpreters and that's exactly what we're shooting for here.

To get to full spectrum awareness, world class expertise, delivering a decision advantage, if we go to the next slide, we have some priorities. I'll spend some time talking about these.

The first one is we need to rebalance and optimize our integrated ISR capabilities. The fact is that we have a force who has grown up in permissive environments. It's the fight that the nation has asked them to carry on. They have done an incredible job. Truly incredible. But as we decrease the amount of our forces fighting in these permissive environments, we have to take a look at our ISR assets and ask if they are the appropriate mix to fight in the future environments. Right now I would tell you the mix is not where it needs to be.

We are over-invested in permissive ISR, and we have to transform the force to fight and win in contested environments. That does not mean that we will abandon our ability to fight in a COIN or a counter-terrorism fight. Certainly the counter-terrorism fight will continue. We will, however, seek a more balanced fleet of both manned and unmanned platforms that are able to penetrate denied airspace and provide unprecedented levels of persistence across a range of military operations.

Unmanned aircraft are going to feature prominently in this future. We have a more comprehensive document. This is a paid commercial. Our RPA Vector that we've been working on and it will be published fairly soon that will give more specifics about where we're going with respect to remotely piloted aircraft.

Optimizing ISR capabilities also means paying attention to targeting. And there's no question one of the lessons from Operation Odyssey Dawn which was the Libya operation. It showed us that our targeting enterprise is not where it needs to be. That capability needs improving. We're already working to improve it. We're adding manpower, we're improving training, we're working to satisfy both the air and the joint force targeting requirements. We believe that targeting is the critical enabler for full power and we're committed to getting that right.

The second priority, normalize cyber ISR, space ISR, and HUMINT operations. Since 9/11 we have greatly improved our space and cyber capabilities to fight and win the nation's wars. These capabilities will increase in importance. It was mentioned by the Chief, space is an increasingly congested and contested domain, no question about it. So ISR for space is becoming more important, even as we need to find better ways to exploit ISR from space. And we need to leverage the experience of our people and develop a cadre of ISR professionals that can answer the unique questions associated with these increasingly congested and contested domains.

I spoke about the cyber domain this morning. Really my message was how big a role intelligence plays. There are many INTs that

are involved in that -- HUMINT, SIGINT, OCINT, GEOINT. All form offensive and defensive cyber operations. It's manpower, it's man hour intensive, and developing that full picture of target networks and actors and capabilities is neither quickly accomplished nor easily produced. So the very core of a large specialized cyber team conducting an [on-net] operation you're going to have significant involvement of intelligence, surveillance and reconnaissance assets.

In addition to the space and cyber domains we're going to place increased emphasis in HUMINT operations. The Air Force needs essentially do not always match up with the intelligence community priorities. So if you think of the national priorities versus Air Force priorities. But they are essential to paint a complete intelligence picture of the combatant commander and to service our OT&E requirements. So HUMINT will be integrated with technical ISR, both to enable technical collection and be enabled by [inaudible].

The third priority is we want to strengthen our integration, collaboration and partnerships. In the future we're not going to be able to spend our way to victory. The Under Secretary gave us the Churchill quotation yesterday and there's no question the budgets we've enjoyed over the past 12 years are a thing of the past, but threats are going to be increasingly complex and they're going to cross national combatant command and cyber boundaries. But the neat thing is those challenges are not unique to the United States. So it's clearly our view that international partners can yield access to intelligence and capabilities that we might not otherwise be able to obtain.

If we form these strong relationships, that is an opportunity to expand the regional effects and influence strategic events. So I believe that the intelligence and information sharing will be the initial step that leads to a broader and more comprehensive relationship between nations, and the key is we have to understand what we can and cannot get or share with our partners as we structure that future force.

We're going to improve our ability to share information in all security environments. The complaint I most often hear from our coalition partners and I'll admit that most of my discussions is that we don't share enough and we do need to work to make that better.

That's not going to happen overnight, but it is in our self-interest for the United States and we will endeavor to do more of it and to be better at it.

The next one, revolutionize analysis and exploitation. We did debate, do we use the R word here? Revolutionize is a pretty strong term. Here's kind of the argument.

Because we have invested so much in the fights in Iraq and Afghanistan, we've been fully invested, some of our conventional skills in ops, intel, targeting and ISR mission planning have atrophied. So our ISR Airmen have done what the nation has asked of them, but we really need to return to basics and teach our force about fundamental analytic tradecraft that's going to be necessary as we rebalance to strategic priorities.

Our analysts will rely increasingly on automated architectures, on tools and knowledge management systems. I can show you charts of the data ingest that we've got and it's an exponential curve and the Chief talked about the cost curves. So we just can't continue the current model where increasing amounts of data are met with increasing numbers of analysis. So as we face budget cuts we are clearly going to have to rely on automation and technology to help us scale this problem and leverage the machines to sort the raw data, and then let our people decipher what the data means. So kind of cue it up for the analyst who can then make the judgments.

Finally, we want to make sure that our systems and tools and architectures are compatible with the broader intelligence community so we can both contribute to and receive from our service and intelligence partners. Leveraging each other's investments I think is one of the best ways to control costs. We're committed to it while advancing our ability to deal with more complex data.

Then of course having that be in a format that can be used by coalition partners will be another very difficult challenge for us as we move forward.

Then finally, developing and taking care of our team of ISR Airmen. No question, Airmen are the power behind Air Force ISR. There's no question they're our most important asset. We can have the most exquisite, the most technologically advanced sensors and platforms, but if we can't interpret the data or make sense of what they're providing in a timeframe that is responsive to the joint warfighter, then those sensors and platforms are sub-optimized.

So to ensure that we meet the needs of the nation, we're going to need Airmen who are masters of the operational art. We need Airmen proficient in all those areas I talked about before -- analysis, collection, targeting, integration across the domains -- air, space, and cyber. Yet what we've seen so far is the

demand for ISR since 9/11 has been insatiable. We had one famously CAP, RPA CAP on 9/11. We've got 62 today, building to 65. And we're still meeting 70 percent I think of the COCOM requirements.

So the point is the more we build the more the requirement goes up. We'll never meet it. And to meet the needs downrange, we've been on a high OpTempo. Some 70 percent of our intel officer, 65 percent of the enlisted force, have deployed, many multiple times. Our airborne linguists and airborne ISR operators have deployed in their airframes on a one-to-one deploy-to-dwell ratio for some time. So ensuring the health of that force is one of my highest priorities.

What I want to do is, as we talk about taking care of our Airmen, I also wanted to mention some of our exquisite Airmen. If you can go to the next slide, I just want to point out a couple.

Starting on the upper right hand side. Captain Kyle Bressette is a weapons instructor in the 19th Weapons Squadron at Nellis Air Force Base. He has played a key role in making Air Force ISR ready to fight in contested environments. He was deployed out to the CAOC and he led a joint Navy and Air Force operation in the Arabian Gulf. They built and coordinated what at that time in the CAOC mission was the largest ISR collection operation to date. Cross domain, integrating coalition partners, layering national ISR, and executing that plan over a four week period. The operation characterized various threats and answered priority intelligence requirements of the combatant commander.

So the joint AirSea Battle strategy, that information was briefed to the CFAC who then briefed that plan to the CENTCOM Commander and that ISR strategy then developed by Kyle or at least under his leadership, allowed us to understand the TTP and characterize the threat.

At the end of the day this is one of those Airmen you go, this person, you pour more rocks in his ruck and he's told to march on.

Senior Airman Michael Miday is out in Osan. He's a geospatial analyst. He's responsible for building and maintaining all the target folders. He was rich in tech savvy before he came in. He had a couple of years of college and, actually he had a Bachelor's degree before he came into the Air Force. He taught himself computer skills and he used those programming skills to create an automated program that aids his targeting shop in constructing the combat mission folder. In the old days it would take about 30-35 minutes to create a folder, and he created some tools that would allow some automation and did that in five

minutes. What happens the other 25 minutes? That is a compressed OODA cycle, OODA Loop for our forces. Just incredible work from him.

Then there's one other Airman that I wanted to highlight, but you don't see his picture in the middle of that screen. Due to the recent and sensitive nature I just don't think it's appropriate. But I did have a chance to meet this Airman and coin him, and I wanted to tell you what he did.

You're probably familiar with the incident, I don't know how you couldn't be. A couple of weeks ago our embassies throughout the Middle East were closed throughout the week. You see on the map the red dots. Those are the ones we closed. The warning that prompted that action came from the 70th ISR Wing and specifically from a Senior Airman. He is a 1N3 which is a cryptologic linguist, and part of his job is sifting through just droves of data and determining what's relevant, and then translating that data into useful information for our decision-makers. And so that Senior Airman was doing what he does every day. But the idea that a Senior Airman is leading a team of people. He's the one that checks their work to make sure that it is right, and there's just volumes of material in a language that at most one or two in this room could read or speak, and he was in charge because he was the best.

So with so much information, the reality is we had to trust him to get it right. Nobody's checking his work. He is the checker. But that happened to be the day when he was at the right place at the right time doing his job perfectly and providing that decision advantage that we talked about not just to the Air Force but to the entire nation.

He alerted his leadership and the alert made its way all the way of course to the Secretary of State and to the President of the United States. They didn't know the name of the Senior Airman who put two and two together, but thank you for that Senior Airman and also to Mike and to Kyle.

If you ask me why I'm optimistic about the future, it's the same reason our Chief is. It's because of the people that we have doing this business that are just exquisite. It's not just those Airmen, but it's Airmen like them who are winning the fight and making our team strong.

I always say it's an honor to serve. It's clearly an honor to serve with them.

I would say to all of you, you've been very patient listening to me pontificate. We got started late, but I think we might have

just a couple of minutes for some questions and answers if there's something that I can, any questions I can answer for all of you.

Okay, more questions that we've got time for.

What are you going to do with the ISR assets returning to CONUS after 2014?

I'm going to assume that we're talking iron here more than some of the people. We've got lots of plans for the people. It's really interesting, this idea that we are going to have bring down some of our permissive capabilities in order to invest in the more contested, highly contested environment. So as we look at where we're going to build, I see the Air Force building up to 65 CAPs as we promised, and then sustaining that through 2014 but then we're going to have to figure out what is the number of CAPs that we're going to maintain. My argument would be we can't afford to keep all of those capabilities so we're going to have to bring some of that down.

For those that we do bring back, I think there will be more than enough demand for the forces. So the ones that we do keep active, if you think about the counter-terrorism fight will be ongoing, you think about the demands of the various COCOMs, I think there will be more than enough work to keep the forces that we do have busy. It will be more in a situation of there's more demand than we can supply. How much can we as a nation afford to supply to the problem.

Another question. Can you describe how the ISR agency units will integrate into cyber warfare capabilities at U.S. Cyber Command? Will this be intelligence personnel embedded in network warfare squadrons or intelligence squadrons supporting network warfare squadrons or both?

The answer is yes. I guess this would be my take. Right now as you all know we have forces under 24th Air Force and we have forces under the ISR Agency and then they come together as an integrated team, and presented as an integrated team to U.S. Cyber Command. And that is certainly a model that we can go down. As we build up forces we're building another 1264 Airmen into that force. Some in 24th Air Force and some in the Air Force ISR Agency. The question is, do we have to create more units? Most certainly in either the 24th or the ISR Agency you'll see some units created. Could those units be co-joined? That's certainly one of the things that we are looking at at the enterprise level.

When the Chief spoke just a little bit ago talking about Air Force organization and he spoke about space, cyber, ISR, that fits into that category. So actively under review is what I would say.

In a budget restricted environment we will not be able to afford all of the ISR capabilities that we want. Where do you think we should accept risk?

I think the place to take risk is in the permissive environments, and what we need to work through as a department is our holistic capabilities towards that. If we talk about foreign internal defense, you're thinking AFSOC and their capabilities. Clearly AFSOC is invested both in the COIN and the counter-terrorism. We will stay involved in the counter-terrorism, we'll support the COIN through '14. Then we have to evaluate from that point where these hard choices we're going to have to make on how much force structure we're going to have.

The notion is we have a force structure that is almost certainly smaller, that can respond to contingencies from the highly permissive through highly contested is really where we want to get as we talk about 2023, ten years hence. So we've got some work to do to balance that force.

What is the plan for the Global Hawk Block 30 within the next three years?

That's a grenade, pull that baby on the table.

The Air Force proposed last year that we would divest of the Global Hawk Block 30s and we were asked by Congress to finish the buy-out on those and to continue to operate those. That's the guidance that we are working on right now and that the Air Force continues to wrestle with. This is another area where both platforms are contributory to our defense, and then can we afford to have both. Our answer has been that we can meet the requirements with the U-2. Then we've been told, this is all last year's data, of course, to continue to operate those. That's where we are in that musical.

For ISR to work there is a need for digital bandwidth, efficient wave forms. I can't understand that world. Is the Air Force holding onto old analog wave forms with Rovers and other? Why is the Air Force holding on to old analog wave forms, Rovers and other? Did I get that right, whoever was asking that question?

On these sorts of things you don't start off with the present. It's like why are you operating on three year old or five year old or ten year old technologies? Because that's where you

started. Then it takes a period of transition. Then with the available money we're going to try to organize for investments and have our Rovers do an effective [balancing]. They've been pretty effective. Can they be more effective? No question.

So in our rack and stack of requirements, things that we have to go against and then the money available to go against them, then going to a different wave form for the Rovers has not hit our list yet. That's the short answer on where we are.

Can we get a preview of the RPA [roadmap]? Slow, non-stealthy RPAs to what?

We plan on doing a roll-out of the RPA roadmap once it has been approved by the Chief. And we'll be excited to invite all of you back and hold that discussion. Frankly, it's probably worthy of a session in and of itself. So I look forward to that opportunity to engage with you all.

In the Vietnam War U.S. forces failed to be checked. Underground tunnels? Coming into Saigon ISR capability was very vulnerable to detect, which is the Korean theater. Do you have any idea on this?

I'd be shooting from the hip if I answered that question right now. I've got to go study tunnels and our ability to characterize it. But what I would tell you is if you look at the path of technology there have been some I'll call them analog examples to that where we've wondered can we go after this? Can we do homemade explosive detection? Can we detect, I can't say this one in this forum, but other things? We've been able to characterize sensors to go against those problems.

So I am excited about the ability of the United States or its partners to be able to conquer some, I'll say some tactical and even operational problems through our ability to integrate technology in the force. I would be optimistic on this particular problem, that we'll be able to come up with a solution.

Currently we have our Airmen follow a well-something approach to analysis -- a well-rounded approach to analysis, sort of a jack of all trades. Are you going to make them become more threat specific experts?

I think we need a mix. First of all we're doing a, bottom up review is probably not fair, but we've got a ground up emphasis on analysis and what do we need to change as we look at contested environments. And I don't want to jump and hazard a guess what that solution is except to say it involves different skill sets

than what we have been training for towards permissive environments here, and the [improvements] that we're talking about.

But I do know that this kind of is a principle, that it is very helpful to have some regional expertise of people who have studied a particular theater, studied particular threats, and have that deep analytical expertise. Then there are other analysts, all-source analysts, that are going to need to be trained in research techniques and the writing techniques so we can quickly call information from multi-source, all-source and multi-INT in order to put that into a group and integrate the product on a timeline that can affect the current fight.

That's really our challenge, when we think of the analyst within the distributed common ground system, where we need to go.

So it's going to be a mix throughout the ISR enterprise, and then we need to get those together within the ISR enterprise.

The last question that I have here, and maybe you all have some others, is how are you going to normalize human intelligence operations, and how will you integrate this with a platform type ISR?

I don't know -- I'll answer the second part first. I don't know that we will integrate it into platform type ISR, but normalizing human intelligence, we had given up this capability for a number of years, so we are growing it back. We're in a crawl stage, then we'll get to the walk and eventually to run.

Where I see some value in human intelligence, because there are some categories of priority intelligence requirements that are very difficult to access any other way. So those are the sorts of things that human intelligence is designed for. They're things that you've got your national level priorities and those may not be -- the things we need to go against an air force may not be on that scale. So if we're trying to predict what do we build towards? Well, what do we think potential adversaries are building towards, and then how do you discern what that information is? So there are some areas like that within the air domain that may not reach to the national level priorities and we need to have some human intelligence experts working on priorities like that.

So that's where I see us putting some emphasis in the future.

I think I have managed the time to completely run out right here at the end. What I do want to say is thank you to all of you in this room that are involved in the intelligence, surveillance,

reconnaissance business. It’s certainly been a pleasure to work with many of you. I think that the enterprise is on a basically healthy footing. I think we have some decisions to make here in the next couple of years, but as General Welsh says, that’s not a problem. That’s actually exciting for all of us, and it’s exciting because of who we get to work with. So thank you all for what you do.

# # # #