

Episode_85- B21_Insights_About_Americas_Newest_Bomber

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SPEAKERS

Chris "Jekyll" Brunner, John "Slick" Baum, Mark "Gonzo" Gunzinger

J John "Slick" Baum 00:02

Welcome to the Aerospace Advantage podcast. I'm your host, John "Slick" Baum. Here on the Aerospace Advantage. We speak with leaders in the DOD, industry and other subject matter experts to explore the intersection of strategy, operational concepts, technology and policy when it comes to air and space power. So, if you like learning about aerospace power, you are in the right place. To our regular listeners, welcome back. And if it's your first time here, thank you so much for joining us. As a reminder, if you like what you're hearing today, do us a favor and follow our show. Please give us a like and leave a comment so that we can keep charting the trajectories that matter to you most. Now this week, we're going to talk about one of the hottest topics in defense, America's new bomber, the B-21. It's a highly classified program that's piqued a lot of interest around the world. The ability to strike anywhere on the globe is an incredibly powerful capability. It ties back to the vision of the founding airpower pioneers, but it really wasn't something we could do consistently, until we had the combination of stealth, range and precision munitions. The B-2 is the iconic torchbearer in this lane, but it's going to be joined by the B-21. Soon, and that's what we're here to talk about today. So today, I have Mark "Gonzo" Gunzinger and Chris "Jekyll" Brunner with me for this episode. Both are longtime bomber experts. Gonzo served as a B-52 pilot and Jekyll was a B-1 WSO. They both worked bomber issues on the Air Staff as well as during various assignments. And I know most of our listeners will recognize Gonzo from all the times that we had him on the podcast, but Jekyll is a new team member here at Mitchell. So I want to welcome you both to the show. Gonzo, thanks for coming back.

M Mark "Gonzo" Gunzinger 01:40

Hi Slick, great to be back on the podcast.

J John "Slick" Baum 01:42

And Jekyll, thanks for being here for your first time.

And Jekyll, thanks for being here for your first time.

C Chris "Jekyll" Brunner 01:45

Good morning, slick. Great to be working with you again.

J John "Slick" Baum 01:47

Awesome, likewise, and we'll get a chance to catch up pretty soon. So, Gonzo, I want to start with you. And I'm just going to ask you this basic question. Why do bombers matter these days?

M Mark "Gonzo" Gunzinger 01:58

Yeah. So the fact is, the Air Force provides the nation's only real long range strike forces. Its B-1, B-52 and B-2 bombers literally have global reach with air refuelling, can attack dozens of targets in a single sortie and they really expand options that are theater commanders have to deter or respond to threats. So beyond those bumper sticker words, let me ground the value proposition for our robust bomber force in our national defense strategy. Now, one of the strategy's primary requirements for sizing our military is to ensure that our theater commanders have the capabilities and the forces they need to defeat a peer adversary's fait accompli campaign, and that could include scenarios like a Chinese assault on Taiwan or a Russian invasion of the Baltic states. So what are the CONOPs for doing that? Now, unlike discretionary wars, the past against lesser threats like Iraq, we no longer have the luxury of taking months to assemble an iron mountain of forces in a theater before kicking off a counteroffensive. And multiple wargames have shown that China in particular, may be able to achieve its campaign objectives against Taiwan in less than two weeks, or even sooner if unopposed by an allied intervention. So what is there in our military is force mix that can respond on day one of a crisis to blunt and then halt a Chinese or Russian assault like the kind I described? What forces we have in our military go on the offensive, on the offensive, within hours, and take the fight to an enemy, without waiting weeks, or some cases even months to deploy to a theater engaged in a fight like a lot of our forces do? The answer is airpower, especially long range strike bombers that can respond from inside and outside the theater, including from the United States, to begin striking hundreds of targets every day, with great precision. And let's not forget that China, Russia, North Korea and quite possibly Iran in the future, nuclear powers. We cannot abandon our nuclear deterrence posture in the middle of a fight with China or Russia. And that requires bombers, tankers and other Air Force capabilities that are part of the triad. Bomber requirements for nuclear deterrence are additive to what we would deploy to a fight with China. So to sum all that up, the operational demand for our American bomber force has never been greater. And the consequences of failing to maintain a robust bomber force could frankly be existential.

J John "Slick" Baum 04:41

Yeah, well, I mean, obviously I couldn't agree more Gonzo and that's obviously why you're one of the you know, the leading bomber experts in the world. And you know, another one that we get to work with, Jekyll. Again, just a quick intro that we worked together in the mighty A5 RC in

the mezzanine level by the purple water fountain in the Pentagon. So really fired up to work with you, Jekyll. And first question for you here is for you to give us a report card on the health of America's bomber inventory. I know you've been looking at this for a long time, is it okay? Or is it really time to reset?

C Chris "Jekyll" Brunner 05:10

With regard to asking whether it's time for a reset of the bomber force? I think that's an absolute yes. It's absolutely necessary. The current bomber force is old, B-52 is 60-plus years old, the B-1 is, you know, 30, some years old, and even the B-2 is, you know, 20 plus years old. And it's time to move on to the next evolution of long range strike that is required to get into those environments like Russia and China, where it's a very difficult anti-access/area denial problem that's keeping a lot of our shorter range assets away from the fight, to include even some of our joint forces, like the carriers and carrier aviation. Range is going to be a huge problem in the future. Survivability is obviously a huge problem. The B-21, is designed to combat those two things. Starting with the survivability, being able to penetrate, persist and go after those hard targets that need to be taken out to enable some of the other joint force to operate. The B-52, B-1 simply can't do that. They're too old, they're not survivable. Doesn't mean that they're not useful. They'll be great standoff shooters for some of those scenarios where a target can take a JASM ER or whatever comes next, you know. In the case of the B-52, hypersonics. In the case of the B-1, you know, great LRASM shooter, they've been training to do that for a long time. And the B-2 is still a relevant platform for quite a few more years, until at least the mid 2030s, to be able to go in and penetrate to a certain extent, depending on what theater you're in, you know. In an Iran scenario, it's obviously very useful. And it carries some niche type weapons like MOP that is required for targets not just in that country, but other countries around the world, you know, possibly in North Korea. So it's not that the bombers today are irrelevant and just need to go away. It's just that the threat has evolved. Our adversaries have evolved, and we need to move on to the next level of technology to be able to hold targets at risk, to achieve you know, the US aims in any type of conflict. And the B-21 is the answer on that. The B 21 is going to benefit from being newer, newer technologies with regard to stealth, easier to maintain, newer electronics, higher processing powers, so you're getting better capabilities on the aircraft and you can ever put on a B-2, B-1 or B 52. But like I said, it's, we're long overdue. Should have been done many years ago, instead of waiting to, now we're trying to recapitalize the fleet when we're trying to recapitalize everything else. Financial considerations, you know, aside, now's the time to do this, because your B-21 to important point to remember, it's your dual-capable aircraft, meaning nuclear and conventional. So there's added importance on top of that. Jekyll, I really appreciate that. And thanks for giving us you know, the weapons officer view there. Gonzo, I've got to ask you, how did we get here? You know, if bombers are so important than why is the inventory so small, so old and so fragile?

M Mark "Gonzo" Gunzinger 08:17

Well, I'll tell you Jekyll, you nailed it, you really did. By my calculations, we can fly about 59 sorties after factoring in mission capable rates. That's the entire bomber force. Remember, some of those are going to remain at home to support nuclear deterrence. Some of those would be doing other missions and other theaters. So that's not what a, our commanders in the Pacific would have for a fight with China. But Slick, you asked me why this is. So let's go on a little

journey. The very short answer is the Air Force incrementally retired bombers over the past 30 years, primarily because of pressures on its budget, not because of declining operational demands for them. Now to expand on that a little bit, the first schwack came after Operation Desert Storm, during DOD's 1993 Bottom-Up Review analysis that concluded up to 184 deployable bombers would be needed to support our theater commanders. Now many people forget that deployable word, what I just said. I haven't because I wrote that into the Bottom-Up review report. Now to get 184 deployable bombers, you need to force it numbers in the high two hundreds to account for training birds, maintenance, backup, attrition aircraft and so on. And that didn't happen. The next schwack came after the 1997 Quadrennial Defense Review, which killed momentum that was building at the time time for buying more than 20 B-2s. And the decision not to do that came out of the 1997 Deep Attack Weapons Mix study, which I helped lead along with then-Colonel Hoss Cartwright, who went on to get four stars. So the assumptions behind the warfighting scenarios we studied in '97 were simply not favorable for stealth bombers, plus the 1997 QDR itself was all about meeting the administration's target for reducing defense money by, no surprise, cutting forces and cutting in strength, which is why we who were in OSD at the time called it the Bottom-Up Review "Lite". And so by 1999, the total bomber inventory was below 200 aircraft. That's total inventory, not deployable bombers, and has since dropped 141 total bombers in '22 is, as you said, Jekyll. But again, most of the cuts since then, were driven by the need to free up funding that we use to keep the rest of the force flying and partially funded some upgrades. And that's exactly the case behind the Air Force's decision to retire 17 B-1s that you mentioned, Jekyll, last year. Although the fact is that we nearly flew the wings off the B-1 force in the skies over Afghanistan, Iraq and Syria. T was a major contributing factor. And so that emphasizes the point that too few bombers flown at too high a tempo for too long, years in his case, without replacing them with new aircraft leads directly to a fragile force.

J John "Slick" Baum 11:29

Yeah, and I just want to pile on to that, that last point that you made, because it's so imperative for the American public to think about how we had so many tools in the tool shed being used for things that they weren't designed to, like putting a targeting pod on a B-1 and going out and doing, you know, close air support. Could it be done? Absolutely. The Airmen, you know, were able to innovate and do that. But it's not what, the mission set that it was designed to do, so. And then the end result is obviously we drove those B-1s into the ground. So Jekyll, I've got to ask you, anything else that you want to add on this to what Gonzo said?

C Chris "Jekyll" Brunner 12:05

You know, I think if you look back at how it got to be so old and frail and fragile, is I think there was an advocacy component of this as well. When SAC went away and everything went under ACC, it came at a time when you're trying to bring on F-22 and F-35, and I understand the priorities there. But I think there's also a lot of underestimating what the future was going to be. The bomber force structure we have now is good for now, and lacked a little bit of that forethought into how the global environment is going to change. And really, the advocacy really started coming from Congress, meaning Duncan Hunter seeing this looming gap and kind of China coming out, and then got a little bit pushed more by OSD by the QDR. And I think that's where the real ebb is, he came and General Moseley coming on and seeing what was happening and starting to make a push for recapitalizing the bomber force. But it's gonna get

old if you don't do anything for it. And if you don't have an advocate standing behind there trying to push for funding for different types of programs. Not just sustainment, but modernization as well, because the bombers need to evolve over time. And the targeting pod on the B-1 is a great example that totally revolutionized how we use that airplane. And I think it became a great capability for the joint force as we were prosecuting targets in Afghanistan.

M

Mark "Gonzo" Gunzinger 13:26

Yeah, you know, Jekyll, you scored another shack, if I could use that term. I remember when I was in the Air Staff in the 1990s. The theory, the case, according to the chief at the time was, we're going to recapitalize the mobility force, then we'll do the fighters. Then we'll do the bombers. Well, recapitalize the mobility force, but they ran out of money and didn't do the fighter force, and then didn't buy new bombers at the same time. And of course, they drizzled money towards ISR all along. So now we're faced with a situation where damn near everything needs to be modernized and upgraded simply because they ran out of money. And the Air Force, I agree with you, was not the strongest advocate for more budget to be able to do and execute their plan.

J

John "Slick" Baum 14:15

Now now, isn't it true though, that we were supposed to have a new bomber already fielded by now? There was a program called the Next-Gen Bomber or something like that. Right? So what happened there?

C

Chris "Jekyll" Brunner 14:25

I was part of that back in then XORC, you know, back in 2003. And you know, us three bomber guys were told to put together a long range strike summit. And the summit was hosted by General Moseley, who, like I said earlier, was a good advocate for long range strike and, you know, a new bomber. He got a little bit pushed from some folks in OSD to do this as well. But this was, the problem with this program is it quickly grew in cost and complexity, a lot of it due to requirements creep. You know, you hear people talk about that there was an air-to-air capability put on it, so. This was a platform that was trying to do everything itself. And that just, when you start relying on invention on schedule, and a lot of different things to happen, you know. I guess the B-2 guys used to call, you know, they're hoping for a miracle a day to get everything going, because it's such a revolutionary technology and what they're doing with it, and the same thing kind of panned out. And it got to where it was so expensive. And it was also a SAP program that wasn't shared with too many people. So there wasn't a lot of people behind it. And I think Secretary Gates saw that, and he had trouble, as you've probably heard him say, understanding the need requirement for that technology. And so it kind of led to its cancellation. And then it was supposed to be filled in 2018, and Gates cancelled it in 2009. So that's what's led to the B-21 now. He directed his study to be under, undertaken to determine that need technology requirements, and finally we ended up with the B-21. But the Next-Gen Bomber really succumbed to its own cost and under the weight of what everybody was trying to make it do.

M

Mark "Gonzo" Gunzinger 16:11

Jekyll again, you're you're smack on target. So let me start by saying I had just left OSD at the time the Next-Gen Bomber is killed. He's actually responsible for day-to-day oversight of our military's conventional cables, including the bomber force. So unlike many people, I never believed the Secretary Gates opposed the need for a long range penetrating bomber. Now the Office of Management Budget certainly did. And they actually put out a statement shortly after the NGB was cancelled. That said, on almost a direct quote, a new bomber wasn't needed, and the Air Force could continue to meet the nation's long range strike requirements by sustaining and modernizing its current force. Same old story, same old story that we've heard for decades. Of course, their real intent was to reduce defense spending, not avoid risk by creating a bomber force that is now too fragile. But back to Gates. I always thought his major concern was over the growing cost of the NGB. And concern over what he was told by some of his advisers about requirements that were constantly changing. So I don't think he wanted to pull the trigger and spend billions on the Next-Gen Bomber until he was convinced the requirements were solid, and the department could afford to buy a substantial number of them and not end up with a small silver bullet for us, like we did with the the B-2. So that did lead to a study on the need for new bomber, whether it should be penetrating or standoff, manned, unmanned, etc, etc. And it was co-led by OSD policy, OSD AT&L at the time, P&E, which is now known as CAPE, the Air Force, the joint staff. And that study took a look at every capability attribute of the NGB and other capabilities to, that might be required in a way of a new bomber.

J

John "Slick" Baum 18:15

Gotcha. So, all right, Next-Gen Bomber is killed but the B-52 and B-1 are not getting any younger, and the B-2 is still getting, is really an undersized inventory. So what happened next?

M

Mark "Gonzo" Gunzinger 18:26

Alright, so I just touched briefly on that joint study group and it ended up being called a Tiger Team effort. And their assessment focused on needs and requirements for a new family of systems for long range strike, which could include a new penetrating bomber. It was not about resurrecting the Next-Gen Bomber. I think in all my years in the Pentagon, I've never experienced such a comprehensive, multi-discipline multi-mission assessment of a particular set of capabilities. There might have been some, but not that I participated in, coding DOD's QDRs. The Tiger Team looked at various non-stealthy platforms and weapons for long range strike, penetrating stealthy bombers to weapons they can carry, associated capabilities like electromagnetic warfare systems, the potential for unmanned aircraft to execute long range strikes in contested, and so on. And they didn't stop with existing and potential future Air Force capabilities. It also looked at what the Navy and other services to an extent could provide, in the way of long range strike. And I'm really describing what became several years of work that with multiple layers and levels review all the way to the SecDef. I remember spending many hours briefing Air Force leadership along with the Air Force's Tiger Team lead in this effort, Maj Gen Charlie Lyon. As the months went by though, in the study, it became increasingly apparent that the most combat and cost effective solution was a new penetrating bomber that can also be optionally manned. And by that I mean it can be designed to operate at some point in the future without a crew if required. And as most of our listeners probably know, a new penetrating long range strike bomber program that's now called the B-21 Raider is exactly what Secretary Gates finally approved. And I remember when one senior official reported that Gates

asked why anyone would want anything but a penetrating bomber for our nation's long range strike portfolio at the final decision meeting. So as a B-52 pilot, I will say that that doesn't mean we don't need standoff bombers. Of course we do. And another standoff launch platforms too. But the real capability gap that Tiger Team effort determined was an aircraft that carry large payload of weapons and penetrate deep into contested areas to impose costs on America's adversaries,

C

Chris "Jekyll" Brunner 20:57

it's important to remember that there were two camps in this long range strike fight, that's what I'm gonna call it because it kind of was. There was the camp that wanted a new bomber, or penetrating bomber. And there was the camp that wanted Global Strike, meaning a conventional ballistic type missile, which in you know, in my mind is that's pretty expensive, you know, per effect when you talk when you're looking at cost. And it's going to require exquisite intelligence, which we may or may not have. So what value really is that? The thing with the bomber, what that gives you, having it be survivable, and the ability to penetrate and persist to a point. And that ability to penetrate and persist, you know, depends on theatres, and how long you can hang around in different air defense systems and all that so. But what that brings you is it brings you the capability to go find multiple targets. And when you pair it up with the family of systems, which ended up being, and what you're going to see with, you know, Secretary Kendall's operational imperative with the manned unmanned teaming, I think collaboration is a better word. And you're going to see the B-21 out there looking for the targets that are extremely hard to find and extremely hard to prosecute. And they are the targets that really need to go away to enable a lot of other things to happen. You know, the F-21s, you know, that surface to ship capability that the Chinese have, that are holding carriers back. So to be able to get bring things further forward, the B-21 is going to be that platform, along with family systems, that's going to enable the combatant commander to do that. The other reason why, you know, going back to why you need a large inventory of B-21s, is capacity is just as important as capability, especially when it comes to the terms of dictating the tempo of an operation or a conflict and being able to create multiple dilemmas. And I'll guarantee you a B-21 LO platform with LO cruise missiles or direct attack munitions is going to create more dilemmas than a standoff capability that, like I said, is going to require exquisite intelligence to be able to get it to work to where you need to work, or get the effect that you need to get. And you need to be able to dictate terms to the adversary instead of being dictated to, and I think the B-21 one is going to help you out with that. You know, it's a great, great point there, Jekyll. One thing that I, you know, want to know, is, you know, the requirement is issued, and then there's a competition, which is still largely, you know, secret even today, but who are the players? And when did they downselect to a winner? So the initial players were Northrop, Boeing, and Lockheed, the kind of the big three that's out there. Boeing and Lockheed decided to team at a point. So we had Northrop, maker of the B-2, against Boeing and Lockheed, you know, obviously lots of experience there as well, especially Lockheed and their LO experience. The way I understand it, basic requirements were set in 2010. Summer 2010, Secretary Gates gave them the nod. And then he gave him the go-ahead in December 2010. And the final requirements document was signed in February of 2011. The RCO, which picked up the program, which is really one of the things that is making this program successful, mainly because your decision makers are down to three people. Basically AQ, the chief and SECAF is how it kind of works out, so it's small and allows you to be more agile and move faster. So RCO sent out some tech development contracts in November 2011. Then you had an RFP in July 2014. And then final downselect, was in October 2015. And we all know who won in the end, and it's the B-21 with Northrop Grumman.

J

John "Slick" Baum 24:45

Got it. Now, Gonzo, we all know the B-21 is obviously highly classified. But can you talk to us about the macro factors that were driving the requirements? I know you've written about this before.

M

Mark "Gonzo" Gunzinger 24:56

Sure. Let me just list a number of them that have been released and discussed in public by the Air Force and DOD. First, it's going to be hardened against nuclear weapons effects and designed with the appropriate wiring and nuclear safety and security components, if it's to be nuclear capable. Because those capabilities cannot be reverse-engineered into a bomber or any other modern combat aircraft for that matter. Long ranges, large payload capacity certainly, plus payload should be carried internally to maintain the aircraft's stealth signature. And speaking of stealth, a penetrating bomber must have an outer moored line, special coatings and other design features that reduce energy that can be reflected back to an enemy's search and track radars so it can avoid detection. And to further reduce that probability of detection, the B-21 should be designed in a way that suppresses its signature in the infrared band, which is part of the reason why the B-2 has its engine exhaust position on top and inboard of its trailing edges. So the Air Force has talked about the B-21's modularity and how it's been designed to accept future upgrades as new technologies mature. And that can reduce the cost and time needed to do those upgrades, and further reduces unit cost, which is pretty important if the Air Force has to buy a large number of them. The program intentionally took advantage of mature technologies and probably even components of other programs. So as I've said in the past, I think of the B-21 more as a matter of integration than it is an invention, which the B-2 was when it was first developed. So all that reduces technical risks, development costs, and reduce the development times. Everything we've heard in the Air Force indicates that is now a success story, that B-21 is on track, on time and on cost. And that's very welcome news, considering the troubles that have plagued so many of these other major acquisition programs.

J

John "Slick" Baum 27:03

Yeah, no, that's a great point. And glad to see that the program is on track. Now Jekyll, this is going to be the first US bomber that was, you know, designed in the modern information age. So what do you think that means? When it comes to sensors, processing power connectivity, and the bombers role in the airspace as an information node?

C

Chris "Jekyll" Brunner 27:20

I think the B-21's going to be huge in that role, just because, again, it's the ability to get in, hang out for a while, you know, soak up data and push it out on the net to everybody else to use, to fuse with all the all the other different sources that are out there. I remember my first B-1 days, you know, my information source was the radio, and if I wanted to plot a threat, I'd have to find it on my chart and go from there, and then we moved to a laptop plugged into an extra GPS antenna receiver on the jet. And then we moved into fully integrated data link, and I

think as you get up to the B-21, it's going to be incredible, just because of where it can go and the capabilities it has to get the information on the jet and then back off the jet to everybody else. And again, you know, being part of that long range strike family of systems, kind of similar to the NGAD family of systems, everybody's you know, sharing is the way to go in the future and open mission systems is going to make that happen. I think the jet's going to be a great, it's not going to be a battlespace coordinator, but it's going to be a shooter that is also very much a sensor.

J

John "Slick" Baum 28:25

Now Jekyll, that's all a great point, I think for everyone to realize, you know, for all the bombers, even including the B-2, you know, they were all designed when telephone was a box that was literally screwed to the wall. And now obviously we know with the invention of the smartphone that we've got global connectivity in our pocket. So I think obviously that's what the B-21's gonna be bringing to the fight. Now Gonzo, you know, we've mentioned this before, and you said it earlier that, you know, inventory size has been a major factor with the B-21. And the Air Force says wants over 100 of them. And you know, here at Mitchell, we've argued that we even need more than that. So why does it even matter given, you know, today's mission expectations?

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Mark "Gonzo" Gunzinger 29:01

Yeah, let's talk about the numbers briefly. The Global Strike Command said at least 225 Total bombers are needed to support the national defense strategy and that means the airforce could buy about 150 B-21s or perhaps even more. Assuming the plan's to keep the B-52 in the force to 2050 and eventually retire B-1s and B-2s. Now there have been multiple studies. Maybe this is this mission area is one of the most oversights mission areas in the history of DOD. They range anywhere from 225 up to about 380 bombers, and I led a 2018 directed, National Defense Authorization Act directed study, that took a look at the bomber force and concluded 380 bombers was about right. And that was based on growing our long range strike capacity defeat a second adversary who was seeking to take advantage of our military's engagement in another theater like the Indo-Pacific. That's totally reasonable given China's aggressive posturing in the Indo-Pacific, Russia's invasion of Ukraine and so on. So why have these studies come to the conclusion a larger bomber force is needed? Well, one reason obviously is the large payloads of bombers are going to be absolutely critical to defeating a Chinese fait accompli as I mentioned earlier. Another is a larger bomber force would increase our military's capacity to persist in the battlespace and strike mobile, relocatable targets such as mechanized vehicles, missile TELs, SAM launchers and so on. Plus long range stealthy B-21s will be capable of penetrating a battlespace from multiple avenues attack, and that can impose costs on an enemy by forcing it to defend in depth rather than focus its defenses on a few air avenues of approach along its periphery. No other capability in the US military can do that. Sheer massive size in the Pacific theater is another reason why a larger bomber force is needed. Beyond long ranges of bombers, which can help overcome the tyranny of distance in the Indo-Pacific, a larger bomber force can conduct high-tempo strike-offs across the theater. A bomber, or any other aircraft for that matter can only be in one place at one time. And that's why a larger bomber force is needed, to simultaneously attack hundreds of targets across this

theater, the size of the Indo-Pacific. And that's why I've long supported developing a larger force of more affordable bombers to have frankly smaller payloads than a much smaller force of bombers who carry more weapons per sortie but also cost more.

J John "Slick" Baum 31:44

Yeah, absolutely. And I'm really glad you brought up the threat Gonzo. And that, you know, Chris, I wanted to ask you, the threat environment today is obviously tough when we talk about things like China that Gonzo just described. So I've got to ask you, though. What does it mean for stealth and survivability, and I'm guessing you know, the B-21s stealth is a far cry from you know, gen one stealth like we saw with the F-117 or even what's on the B-2. Any thoughts there?

C Chris "Jekyll" Brunner 32:07

Yeah, and remember, stealth is, it's a couple things. It could be coatings, it could be the design of the aircraft, how the aircraft is shaped. So when you say stealth, it's a lot of things. But it's also being low observable platform is about the sensors you have on the aircraft, it's how you how powerful your processors are, it's how much information you're getting from other sources, because so you can fuse that all that data into a solution that allows you to go around the threats to optimize your signature, so they can't see you for long enough to get to a tracking solution. A lot of people think that stealth makes you invisible. It does not, it just denies the adversary the ability to track you for enough time to be able to get to a launch solution where they could shoot something at you. So it's not going to be a cloaking device. And with regard to where we stand with next generation stealth. Remember, we've been doing this for about 40 years now, it's matured a lot. We've gone from the B-2 of the '90s to the B-2 of today, they've been able to apply a lot of those lessons learned. And that's why you're seeing the mission capable rates and aircraft abilities rates go up, and a lot has been learned as well, from F-22 to the F-35. We're getting very good at it. And I think that the B-21, what you're going to see is just the next evolution of taking an LO platform and make sure that it's survivable, it's maintainable, which leads into the affordable equation, which is really important. That is actually a key a key performance parameter on the B-21 program. So I think with all those three things, the B-21's going to be a great success and like Gonzo was talking about, it's going to be one of your few platforms can actually can go into an area, penetrate, persist, find something, track it, engage it and then get back out.

J John "Slick" Baum 33:58

Well I appreciate that. I'm gonna I got to ask Gonzo this though, you know. Based on that answer, we talked about you know, survivability and things like that. Gonzo, why are we still pressing with a manned penetrating bomber when standoff missiles could execute, you know, essentially the same mission?

M Mark "Gonzo" Gunzinger 34:13

Oh, sure. Ask a standoff bomber pilot that question, thanks. The answer is simply because standoff missiles alone cannot execute the mission. Now, unlike stand-in strikes by stealth

standoff missiles alone cannot execute the mission. Now, unlike stand in strikes by stealth bombers that penetrate contested areas, standoff attacks are less effective against hardened and deeply buried military facilities and highly mobile targets like ballistic missile transporter erector launchers. Long range standoff missiles, cruise missiles hypersonic weapons, pick your flavor, simply can't carry warheads that are large enough and powerful enough to kill very hardened, deeply-buried targets. China, Russia and others are well aware of the physics of that challenge, which is why they are developing hardened and deeply buried shelters at a near fever pace. Plus, our adversaries are mobilizing a lot of their military systems, which is why we see SAMs, command and control nodes, other capabilities are now highly mobile. And that means they can deploy out of their garrisons, shoot their weapons, and move or go into to hide sites before a standoff weapon launcher can receive a targeting cue, launch its weapons, which then must fly over long distances to where that target used to be. A weapon that hits precisely where it's aimed but misses an actual target because it's moved is a win for an enemy. Now on the other hand, penetrating bombers, as you said Jekyll, can receive cues from offboard sensors and then launch shorter range weapons at much shorter flight times to kill more targets before they can move. And that can also reduce time available for an enemy's defenses to find, fix, track and engage an incoming weapon. And again, as you said, let's not forget that manned penetrating bomber has the capability to close its own kill chain if necessary, against targets without external cues, if needed. That's a pretty important capability with operating environments where we can expect intense, widespread communications jamming.

J

John "Slick" Baum 36:15

Yeah, and again I appreciate that. When you were initially talking, I was thinking you know a couple F-18s and pulling nine-plus G's would would fix it but no, you're right. We got to persist and be able to, to flex across the battlefield there. But Jekyll, I want to talk to you about the nuclear mission for the B-21 Why is that so important?

C

Chris "Jekyll" Brunner 36:32

Back when General Welsh, the Chief of Staff of the Air Force, he came out the Barksdale one day and said, you know, you guys are really important because nuclear deterrence is the wallpaper that everything else hangs on. And as we know, the Air Force has two legs, that ICBM leg and the air leg. The air leg is probably one of the most flexible and visible, due to the nature of the bomber itself. It's easy to signal with a B-21 versus an ICBM because you can't see an ICBM or sub. You can see a B-21 get pulled out of a hangar, if you allow somebody to see that, and let them know that the aircraft have been generated. The B-21 is a way to regulate deterrence and escalation. It's the easiest one to do that, you can use different varying levels of it, you can forward deploy a B-21. And just that act alone causes other countries to behave in certain ways. So you can signal, it's very visible. And it's very flexible in that you can even recall the bomber up into the point of prior to weapons release. What the B-21 is going to bring to the nuclear piece is, one, it's going to replace the B-2. and why are those two airplanes important? They're important because they're low observable aircraft, they cause great concern on an adversary's part, because they can penetrate into a country, hold targets at risk, and in this case with nuclear weapons. And that goes to our greater national security strategy and objectives. So the value of the B-21 also is that it's a dual capable aircraft, meaning it can fight that conventional conflict, and the next day, it can turn around and fight a nuclear conflict. So your people are trained to do both. You don't have to have separate sets, which is very cost effective and very efficient. And it's, it's a great value. But the main value from the B-21 and

the nuclear program comes from the fact that I can use it for multiple things, not just nuclear mission like an ICBM, or a Columbia class submarine. Not to point fingers at the Navy, but very expensive programs. And the B-21 is out there doing quite a few things on quite a very wide spectrum of conflict for the United States. And for that reason, if you think of that in that terms, the missions it's going to accomplish and how many different things that it can do. It's a very affordable tool for senior decision makers in the country to be able to exert, you know, influence and force if we need to.

J John "Slick" Baum 39:09

Alright, well, Jekyll, you mentioned something I want to ask Gonzo about. Conventional munitions for the B-21. And Gonzo, I know you've written about a new class of munitions that the B 21 would be able to employ. Can you talk about about that for us?

M Mark "Gonzo" Gunzinger 39:22

Yeah, let's think of the B-21, B-2, and for that matter, the F-35. Their stealthy capabilities allow them to penetrate contested areas and launch weapons closer to targets and aircraft like my non-stealth B-52, and Jekyll yours, your B-1. So that means stealth aircraft like B-21s can use weapons that are smaller, because they don't necessarily require large engines and a lot of fuel to fly long distances after launch. Smaller weapons means that penetrating aircraft can carry more of them per sortie and that means more targets per sortie. And targets per sortie is critical in a campaign against China, where US forces might strike thousands of targets in hundreds of hours. And finally, those smaller weapons on average, cost a lot less than very long range standoff weapons. Now some of those standoff weapons like air launch, hypersonic boost, glide missiles now in development will cost millions of dollars each. And just to drive home the point, the Army's ground launch long range hypersonic weapon, which also carries the hypersonic glide vehicle, is estimated to cost \$40 to \$50 million each. You can't fight a campaign with weapons like that. So Metro released a study recently to assess how the Air Force could maximize its capacity to strike targets in contested areas and over long ranges. We named it affordable LAS, which wasn't a coincidence, and what we concluded is a sweet spot that balances the size, range, warhead size and costs of munitions that can be delivered by stealthy aircraft, including the B-21. And those weapons would have a range somewhere between 40 to 250 nautical miles after launching, costs maybe \$200,000 or less. So the Air Force can afford to buy the many thousands of PGMs that will be needed in a fight with China or with Russia, for that matter.

J John "Slick" Baum 41:21

Now, one thing I have to ask them, we we've talked about capability, capacity, survivability, networking, but the reality is that we have an aging bomber force that is way too small today. So what does it mean for the production ramp requirements? Jekyll, what are your thoughts on that?

C Chris "Jekyll" Brunner 41:37

Yeah. I think with regard to B-21 production ramp requirements, I mean, that's obviously a

Yeah, I think with regard to B-21, production ramp requirements. I mean, that's obviously a closely held secret that I'm not privy to. But maybe there's a couple of analogies that can show you the danger of not buying as fast as you need to to get the iron on the ramp, as soon as you can. You know, the first one is the obvious one, the B-2, you're supposed to buy 132 of those aircraft, ended up with 20 or 21, depending on how you count it there. That does two things. Increases the cost of the aircraft because you don't have a large enough fleet to spread cost over, so it makes it incredibly hard to modernize and sustain, driving up bills. And that's how you get a \$2 billion airplane. I think one of the other good examples out there is the F-35. The Air Force has been very vocal, and we need to replace our fighter fleet at 72 per year. And we're not doing that. And same thing is happening, you're going to drive up sustainment costs over the long run, because you're not buying the fleet size that you intended. And you're also probably making some compromises, such as the F-15EX, to make up for that. And you're buying a less capable platform when you need to move on to the fifth gen-type capability. So my greatest fear with the B-21 is we end up in a B-2 scenario where we say we're going to buy 100. And my opinion, you probably need 150 to 225 of these to completely replace the B-1s and B-2s, just from a capacity perspective that accounts for things such as attrition, which will probably be real in a A2/AD fight. Just have to get over that fact. We've been living in a COIN world for too long, where things aren't being shot down or air bases aren't being attacked. I think you need to factor in the attrition. And I think you need to put up as many guardrails roadblocks, however you want to look at it, on making sure that the aircraft maintains its cost, schedule, performance goals, to keep it affordable, which is a key performance parameter for the B-21, and making sure that you're able to get the 100 minimum on the ramp when we say we can get them on the ramp, and then look at buying even more, faster if we can, because of the need. There is definite need for a long range aircraft. And that's not going to go away.

J

John "Slick" Baum 44:03

I could not agree more. But gentlemen, we are getting tight on time. So I want to get any parting shots. We'll go Gonzo, then Jekyll.

M

Mark "Gonzo" Gunzinger 44:12

Great, let me just recap, if you will, why I think the B-21 is essential. I'm just going to throw out some buzzwords. Larger payloads. Survivability, so it can penetrate not just contested, but highly contested operational environments. Long ranges. Information fusion the cockpit. Designed as a family of systems from the get-go including, potentially, ability to operate with multiple unmanned combat aircraft. Now, low cost, so we can buy a large number of them. Huge factor. Modularity, ability to easily upgrade in the future. Okay, all those buzzwords are exactly what DoD has said that they need in future weapons systems. It's exactly what our combat commanders say they need in the fight.

C

Chris "Jekyll" Brunner 44:59

I think that if I was king for the day, meaning I was the Chief or the Secretary or Secretary Austin, I would make sure that I put continued importance and keep the B-21 as a priority program that needs to be funded. I know that the DOD as a whole is trying to do a whole lot of things, recapitalizing the nuke subs, recapitalizing ICBM, fighter force with NGAD, moving on to some of the manned-unmanned teaming concepts. But I really think the B-21 is a key enabler

to these A2/AD high end fights that we think we could potentially have to go fight and win in the future. The B-21 is your asset that's going to give the policymaker the option to, in a conventional scenario, go after some very high priority targets that are very dear to an adversary's leadership or war effort. And they're very high priority targets that are keeping some of our forces at bay that we need to bring further forward, so that you get more firepower and start creating more and more dilemmas for that adversary to have to deal with. Like I said, the B-21 is absolutely key to that. It's key in the conventional scenario where it's going to penetrate, persist because it's survivable and find those high value mobile targets that need to be taken out amongst other different types of targets. It's very valuable in that nuclear scenario. Think in the nuclear scenario that the B-21 gives the policymaker those options that we talked about. It's very visible. It's a very agile tool that you can use to move around the world, signal intent and resolve this country to follow through on achieving its objectives. And, and I think that's the overall you know, the key to airpower is flexibility, right? And the B-21 is kind of the epitome of flexibility. And it's I think it's absolutely vital to the country.

J John "Slick" Baum 46:58

Awesome. Well gentlemen, I can't say thanks enough for having you both here today. I know this is not the last time we're going to talk about bomber issues, munitions, the future of the Air Force and really appreciate both of your opinions. So Gonzo and Jekyll, thanks so much for being here.

M Mark "Gonzo" Gunzinger 47:12

You bet. Thanks, Jekyll. Any day you can talk about bombers is a good day.

C Chris "Jekyll" Brunner 47:16

All right, good talking to you, Slick.

J John "Slick" Baum 47:21

With that, I'd like to extend a big thank you to our guests for joining in today's discussion. I'd also like to extend a big thank you to our listeners for your continued support, and for tuning into today's show. If you liked what you've heard today, don't forget to hit that like button and follow or subscribe to the Aerospace Advantage. You can also leave a comment to let us know what you think about our show or areas you think we should explore further. As always, you can join in on the conversation by following the Mitchell Institute on Twitter, Instagram, Facebook or LinkedIn. And you can always find us at mitchellaerospacepower.org Thanks again for joining us and we'll see you next time. Stay safe and check six.