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The Air Force Turns 50: Is It Ready for the Future?

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Heritage Foundation Lectures

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BAKER SPRING: Later this month, the Air Force will celebrate the 50th anniversary of its existence. In recognition of this upcoming event, we have organized a panel, not to recount the many successes of the Air Force in its history, but to discuss where the Air Force should be going. This is a difficult task because the Air Force has been, and is today, a highly successful organization. As the adage goes, "If it ain't broke, don't fix it."

The temptation, therefore, is to assert that everything is fine with the Air Force as an organization. Such thinking can be very dangerous to any organization because it betrays a willingness to ignore indications that changes should be made that will better allow the organization to meet new challenges. On the other hand, the risk also exists of tinkering with an organization in such a way that it starts to lose touch with the core values that define its existence and serve as its foundation. Thus, the purpose of today's panel is to explore how the Air Force, as it prepares to celebrate its 50th anniversary, can properly balance the needs for constancy and change as it faces the future.

We have chosen three retired Air Force officers who are known for "thinking outside the box." Each will address a particular aspect of the Air Force's future.

Lt. General James A. Abrahamson is the former Director of the Strategic Defense Initiative Organization. He was Director from 1984 to 1989, following which he retired from the Air Force. Prior to his service at the Strategic Defense Initiative Organization, he served as Associate Administrator at NASA, where he directed the Space Shuttle program. He obtained his undergraduate degree in aeronautical engineering from MIT and a masters in aerospace engineering from the University of Oklahoma. As a fighter pilot, General Abrahamson flew 49 combat missions in Vietnam. His military awards include the Air Force Distinguished Service Medal, the Legion of Merit with two oak leaf clusters, and the Air Medal with oak leaf cluster, just to name a few. Following his retirement from the Air Force, General Abrahamson joined the Hughes Aircraft Company, and later the Oracle Corporation. He currently is Chairman and CEO of International Air Safety, a company that invests in emerging technologies that are of benefit to civil aviation. General Abrahamson will speak on the future of the Air Force and emerging technologies.

Lt. General Bradley C. Hosmer is the former Superintendent of the Air Force Academy, a position he held from 1991 until his retirement in 1994. Prior to his service at the Air Force Academy, General Hosmer served as Inspector General of the Air Force. He also served as President of the National Defense University from 1986 to 1989. General Hosmer has also commanded the fighter training wing at Holloman Air Force Base, the operational fighter wing at Moody Air Force Base, and fighter Air Division at George Air Force Base. He has operational experience in a wide variety of fighter aircraft. General Hosmer received his undergraduate degree from the Air Force Academy and has a masters from Oxford. Since his retirement, he has been a private consultant and advisor. General Hosmer will speak on maintaining the high quality of Air Force personnel.

General Charles Horner entered the Air Force through the ROTC program at the University of Iowa, where he graduated in 1958. During his career, he commanded two tactical fighter wings, two air divisions, the Air Defense Weapons Center, and the 9th Air Force. In connection with the latter command, he directed all U.S. and allied air operations during Operations Desert Shield and Desert Storm. General Horner retired from the service as the Commander in Chief of North American Aerospace Defense Command, U.S. Space Command, and Air Force Space Command, a major combatant command. He has over 5,500 flying hours in a variety of fighter aircraft and flew 111 combat missions in Vietnam. His military awards are too numerous to list. Suffice it to say that he has received the Defense Distinguished Service Medal, the Air Force Distinguished Service Medal with two oak leaf clusters, the Silver Star with oak leaf cluster, and the Legion of Merit. General Horner will discuss the future of Air Force roles and missions.

LT. **GENERAL JAMES A. ABRAHAMSON:** My job is to talk about taking advantage of emerging technologies to improve our combat capabilities. Always when we're looking ahead here, I'm reminded that there was at least one historic commission that was established to project and to plan for the future. This commission was called in the 1890s by the Lord High Mayor of London, and the mission of that commission was to project the future growth of the city so that it could be properly planned for and executed and done all in an orderly way.

The commission met, and after some very brief discussions examining the problems, they rushed in horror to the Lord High Mayor and told him that he had to stop every activity that he was attempting to facilitate growth for the city. They had looked at the traffic problem, and like today's cities, they found it insoluble. But that traffic problem had some different dimensions. They were not so much concerned with the number of carriages or lorries that were plying the streets, but they were concerned with the number of horses that were pulling those carriages and lorries. As you can imagine, cleaning up the refuse, the droppings from the horses, and removing it all from the city was a monumental task. The commission could see no way to improve this situation—this logistics task. Obviously they didn't have some of our logistics planners from the Air Force today. So they just couldn't see that it made any good sense at all to allow any further growth.

Of course, the commission had utterly failed to conceive of the horseless carriage, which at that time was already in incubation and would soon make the whole problem irrelevant. I think that's the history of many these kinds of attempts to look ahead.

So, thus reminded of the dangers of prognosticating, I still attempt to carry out my mission to postulate a view of the emerging technologies and to try to stimulate your imagination and your comments about adapting to those technologies. I hope the result will not have the character of the problem the Lord High Mayor's commission was worrying about.

The first question is, what emerging technologies? I believe there are only two that we need to think about: the intersection of advanced computing, advanced software, and advanced telecommunications which we sometimes call the information highway, the information revolution, or something similar and, number two, everything else. Put another way, I hope that I won't be unreasonably provocative when I assert that all

that has happened and may happen in the near future to new materials and engines to improve the speed and efficiency of jet aircraft, or all that has happened to new materials to improve aerodynamics or structures or even radar reflectivity of aircraft, has a significantly lesser impact on the future of the Air Force and the future of managing conflict than all of this revolution in information handling.

Similarly, since I'm also a space type, all that's happened to rocketry to make it more effective, more predictable, more safe, more efficient, and thereby given us in the Air Force and this nation a leadership role in space—all these important advances pale in comparison to the potential and the implications of the information revolution.

For a couple of examples to back this up, I would like to move to things that many of you know very well that are in the civil side of our industry. For example, boutique versus mass production. Take the impact of truly modern CAD/CAM—computer automated design and computer automated manufacturing—in mass production, and let me just focus on the automobile business because Hughes gave me a wonderful opportunity to watch the biggest automobile maker in the world in action.

It used to be important that they have long stretches of production or blocks of manufacturing, all aimed at a single model so they could benefit from the learning curve, keep getting the price down, things that we all know. How many in this audience were in procurement, just out of curiosity? Maybe you could tell me the number of times you calculated a learning curve and then began to use that to set a price and to debate and negotiate with the contractors on either side. Maybe you were a contractor debating with the Air Force, or vice versa, but you focused on the importance of advancing along these curves. They became something that had a living relevance all their own.

Well, the degree of automation that is now nearly available produces immediate savings for proper computer-designed automobiles. The design flows immediately and electronically down to the flexible milling, stamping, and welding machines, and those machines don't require significant setup times. We don't have all the same kinds of problems that we used to have. In other words, the production line can now start at a low price point on the learning curve. In fact, the learning curve isn't a learning curve; it's a step function, and it's flat. It will start at levels that it used to take many units of manufacturing to achieve.

Thus, a proper information connection between the advanced automated design team and the modern automated manufacturing line makes automobile manufacturing fairly indifferent to the size of the production run. Or, put another way, we are soon ready to implement small-lot-size manufacturing at the same cost level and efficiencies that we formerly achieved only with long production runs. In fact, I'm aware that General Motors has, for the last five years, looked very seriously at a complete change in the way they manufacture their cars and sell their cars. They haven't fully implemented it, but they have done test runs in creating boutique production runs as part of their sales strategy.

My question—and our challenge—is, if we're nearly at that point in automotive manufacturing, why can't we get close to it in aircraft manufacturing, where the limits of our budget processes and the advancing rate of technology make this kind of a strategy an imperative for our future? Look at the debate that's going on now about the number of F-22s that we might be able to have.

Let me add another element to the existence theorem that goes along with my assertion here. The Air Force should carefully examine the way Boeing is restructuring, automating and dramatically improving its information highway between design certification and the production line at their commercial aircraft company. This initiative promises lower cost, increased safety, and reduced production lead times, and it will introduce a level of what Boeing calls reusable engineering so they can be highly responsive to all of their different customers' requests to modify and change their basic Boeing aircraft models.

Look at a different kind of commercial equivalent today: a commercial sales organization. Just take a brief tour of a modern software or computer company's commercial sales operation. First, it's global. It has to respond to different business cultures, different languages. It may have a campaign or a product that is storming in Europe and can't get off the ground in Japan, or many other sensitive variables that have to be tracked and checked and examined all the time. The vice president for sales has his or her quarterly sales goals, and they are very real and have to be met.

These are usually organized into several categories. One is resales to existing customers, and there you have a couple of categories. These include resales to existing or former customers, some of whom are highly satisfied, some of whom are unhappy, and all of whom are still candidates for new sales. Current ongoing sales negotiations is another category of customers, some of whom may require a senior executive visit or a senior commitment of some kind in order to get a signature on that contract. A third group may be hot prospects which, with the right sales contact, the right technician may suddenly turn into a negotiation and a signed contract. And perhaps most important of all are the longer-range group of prospective customers who are being wooed for the next quarter or the quarter after that.

The vice president for sales has very limited resources, but I can assure you that that sales executive has a hot computer program supporting him and that this computer program is bringing in the information from what might be 10,000, 20,000 contacts that are being maintained around the world. It is still delegated, and action is taking place at lower levels; but at the vice presidential level, they're examining that whole picture very, very carefully at the same time they're doing an analysis of what might be five to ten thousand calls every day into their support organization.

Maybe some of you or your associates hang on the phone waiting to get in to some of these organizations. They're getting requests for educational support: How do you solve a problem? What's the status on certain bugs that are being fixed? And they have to be fixed right now, because the customer's payroll system may be broken, and people have to be paid, receiving their checks electronically starting in one hour. That's battlefield timing if you think about it. Perhaps I don't need to go further, but doesn't this sound like an integrated command and control system?

There are literally thousands of these command, control, communications, and intelligence networks and computer-aided decision operations today throughout the structure of international business. They work 24 hours a day, seven days a week. They are efficient and they are reliable. My contention here is not a denial of the classic Air Force problem with command, control, communications, and intelligence systems; it's an assertion that these systems can be built today, mostly with commercially available software and low-cost desk-top computers.

If you'll permit me to revisit my old days in SDI, we were plagued by a group of scientists opposed to the concept of missile defense. They were able to call on the Luddite viewpoint that even if SDI sensor systems could be built and weapons systems could be built that could knock out the missiles as they went, the command and control portion could not. Their evidence was the old air defense advanced warning system, with its few but highly publicized problems. In reality, that would have been, with the architectures that we were developing, the easiest part of the development process, particularly if it were now to take place with the kinds of commercially available systems that are out there. Modern high-capacity, interconnected systems that make massive amounts of information available can be built to operate reliably and effectively.

There is one "system of systems" that staggers the imagination. It is so capable and so pervasive that I think it adds to my set of existence theorems that this can be done. That's the World Wide Web. Companies have local area networks of their own where millions of people around the world with all kinds of different equipment, different access systems, are crowding on and getting information at rates that we have never been able to manage before.

Structured and programmed properly, these systems do work. In reality, the command and control part of SDI, even back in the early days, was being designed as a flexible, distributed system with great capacity. Now, with the explosion of commercial network products, sophisticated agent software, security software, interactive search engines, and very capable compression and decompression algorithms, we have the kinds of tools available to change our whole information perspective: in real time, at every level of operation on the battlefield, to logistics support to day-to-day maintenance operations to finding the right people to bring in to make these systems work.

Unfortunately, this isn't always timely. If you think about the RAND study on chemical weapons in Iraq, did that information get to the decision-makers at the right time? That's a big debate. It might not have changed the need to make the attack; but when we decided to take out Saddam Hussein's chemical weapons supply, we clearly did not have all of the information easily and simply available to the command and control elements.

We have more effective graphic presentations in a video game than we often have in today's command and control systems. Our kids go down to the corner and go into the virtual reality laser store and get information for decisions that is compelling and powerful and comprehensive. Why can't we deliver that kind of pertinent information to the cockpit, to the command and control area, to the logistics support area, and do all of these things in the same compelling way?

I can tell you, finally, that these don't cost that much, if we decide that there are better ways to procure and build these systems. I think of the leadership in the Air Force today and the leadership in the Defense Department, starting with Dr. Perry, deciding to get rid of milspecs. Those were some of the right steps, but we have to go further.

I would like to close by outlining the lesson I learned from Larry Ellison, the really pioneering and unpredictable founder of the Oracle Corporation—a very powerful, very imaginative guy. He and I were strategizing how we would introduce the Oracle interactive multimedia server. In a gratuitous comment I made to him, I said, "We certainly don't want to do this the way we've done it with the military's software-intensive sys-

tems. We don't want to have hundreds of programmers out there working and grinding, trying to make this work."

He smiled at me. He had a little twinkle in his eye, and he said, "How many do you think we should start with, Jim?" I thought about it, and I said, "Well, we need good architects. Maybe we ought to have twenty." And he looked at me and said, "You're right. This is so important, we can't afford to do it the way the military has done it in the past. We'll have three."

He was right. We built the system. We started it with three. We built slowly and increased it. We were in the black because I went out and got some good contracts for us; but because he had the right development team, we got it out in an incredibly short period of time with just a few people, and more capable than any challengers that were around at that point.

So that is my answer to the question, and I hope I've shaken your trees just a little bit. I'm not saying that stealth is not important, but we couldn't have done stealth without information management and advanced computer systems. I'm not saying that we don't need fast fighters, but do we need them to go an extra half mach faster? Do we have to buy new ones? Why don't we go in and take the thing that is really holding back the fighters today and say, let's upgrade the electronics; let's give it a modern capability, the kind our kids have when they play their computer games. Our forces deserve nothing less.

LT. GENERAL BRADLEY C. HOSMER: My assignment is to deal with keeping air warriors in the Air Force, the best air warriors in the world. It's a substantial challenge, and it's quite a contrast with Jim's topic because we're down to the mud here.

The nature of the challenge in keeping first-class air warriors engaged and involved in the Air Force has taken a turn to more difficult circumstances. If you back off to see the woods instead of the trees, as I will do briefly with you, I think you could say that the people who have this primary task in the Air Force—which is all Air Force people—are facing a more difficult problem than we faced during the Cold War. That's not a novel announcement. I think the difficulty, though, is substantial.

For at least three years now, the Air Force has lived in an era marked with fewer units in the field, geometrically increased deployment times away from home station, and chronic turbulence—some internally imposed by the Air Force, some imposed by outside events. So the troops see a thinner blue line, they see more time away from home, and they see continued instability. Perhaps we can see that picture better than they can by backing away and looking at that whole forest.

I think it's fair to say that in the coming decades, we're going to experience at least these points:

- There will be an apparent absence of a major military threat to the U.S. or its interests, a general lack of interest by the U.S. citizenry writ large concerning U.S. security and defense matters and the military.
- We will experience this continued effort to sustain a substantial standing military force in peacetime, which is unnatural for the United States.

- We'll experience high work loads in the military for at least two reasons. One of them is that the military will continue to be the chosen lever to work on many foreign policy issues—military issues other than war, military operations other than war. The second reason is that the budgetary parsimony of the federal government will keep the U.S. military on very lean rations.
- We will see an increased use of technology both on the tooth side and on the tail side. I think General Abrahamson begins to unfold how extraordinary that potential is.
- And we'll see a national culture which probably will continue to see the warrior culture as a strange, unnatural, and perhaps unnecessary group of people. This divergence between the national typical culture and the warrior culture, I think, we will continue to face, perhaps in stronger terms than we have it today.

Therefore, it seems to me that world-class warriors in this coming decade will need to be pretty unusual people. They'll need to be technically talented. They'll carry unusual responsibility early in their careers. They'll have to be skilled leaders and commanders. They will still serve at personal risk, although it will be a different kind of risk than during outright wartime—in some cases. They'll need to tolerate very high duty demands and long periodic absences from family. And they'll have to accept sacrifices to serve in the Air Force. That's a point of view that their high school classmates and their fraternity brothers will find very strange. Also, they'll not be paid what they're worth. Those same high school classmates and fraternity brothers will think that's even stranger.

Many Air Force people today would probably see what I just said as a good description of today's Air Force. They would think it sounds very familiar. For many in the Air Force, it is already true. Moreover, for the young troops who have never known a different Air Force, for those whose service includes only this period of post-Cold War turbulence, it's wearing a little thin. They don't have a stable Air Force to look back on. I think the strain is beginning to tell on people for whom this is the only Air Force they know. What's become clear is that the high-stress Air Force of today, as experienced in the field especially, is not just a transition to a calmer future. That's what I thought at first. We can now see that it's not so. This is the future. We're not going to return to that earlier, less turbulent world.

So the real problem is how can the Air Force remain filled with world-class air warriors as this truly high-demand lifestyle stretches on past the foreseeable future? The points that follow are not a guaranteed solution, but I think they do go a long way toward helping with this problem.

First, I think the Air Force needs to identify and proclaim the common core purpose of all Air Force members. What is the core function of the Air Force? It is the final answer to the question, "What is the point of having an Air Force?" The answer should be clear to the recruit. It should be clear to his mother and father and younger siblings. It should be clear to his first sergeant. It should be clear to his squadron commander.

We do not really have such a clear, discrete statement today. Work began on this problem over a year ago with the long-range planning effort that General Fogelman set up. That start was very useful, but it got outranked for attention by more urgent issues in that work, and I think it bears returning to. I think if we had that clear, simple core

purpose, well stated and explicit, it would dissolve many of the frustrations that impede the work of our air warriors today.

For example, having a core purpose that is simple but not simplistic would provide a focus for the loyalty of Air Force warriors: a focus on loyalty to the service as a whole instead of loyalty to individual trade crafts and specialty skills like tankers or special operations or civil engineering. This is a classic problem many of us have struggled with. It's the "stovepipe" problem within the Air Force. That single, discrete statement of what all Air Force people are about would go a great distance toward resolving the frustration that our warriors experience with the stovepipes.

The core purpose can help with another problem, and that is Air Force instability. The persistent turbulence can really be damaging, especially for those young troops who have known nothing else and don't have a stable Air Force to look back on. Knowing what our core purpose is and knowing that the purpose of the Air Force stays fixed can be a powerful antidote against the change and the turbulence. It can help our troops understand what is fixed and what is permanent about their service. Knowing what the Air Force is about is a basis for loyalty to that purpose and to the institution as a whole.

General Howard Leaf made an excellent suggestion a year ago. He noted that we do have an appropriate term for all serving Air Force members: airmen. The joint world is made up of soldiers, sailors, airmen, and marines. But we stopped using the term airmen in the Air Force a long time ago when we made airman a designated enlisted grade. The use of the term airman for an enlisted grade preempted its use for other purposes. Howard Leaf suggested that we stop using airman as a rank and thus recoup the term so that we in the Air Force can all be airmen, just as everyone in the Army is a soldier and proud of it. Sailors are sailors—all of them. That common designator is a nice symbol that would get us a step closer to understanding that we do have a common, core purpose in the Air Force that is the same across the entire force.

Second, the Air Force should pull out the stops to build strong, tight units at the squadron and wing level. Strong units stimulate the right kind of loyalties. They establish unit cohesion as it exists today in only the very best units. I'm talking about achieving what the very best commanders and best units can achieve today, but across the entire operating Air Force and the supporting Air Force everywhere.

How can the Air Force achieve this? By truly preparing people for leadership duty, building a pipeline to command that takes in average people and turns out reliably superb commanders. The Air Force should expect and require highly effective command from the shop floor and the flight of four and the missile crew on up. Put a lot more authority in the hands of commanders and trust them. Let them go and insist they lead strong, tight units.

In this same vein of developing strong units, I think we need to develop a better approach to personnel evaluations. Many innovative systems have come forward in the last seven to ten years, and some of them are in use in highly respected military services. They have some maturity by now. They add reality; they add credibility and fairness; and I think this step would go a long way in helping us.

Finally, I suggest that the Air Force basic course, which was put on the table as a serious project last October, needs to be made a really strong experience in the Air Force. Squeezing pennies out of this program would be extremely shortsighted. It's an excel-

lent step in the right direction toward unit cohesion and giving air warriors an excellent beginning in the foundation points that I'm referring to.

Third, make service the drumbeat of life in the Air Force. Service is the final answer to the question, "Why am I here? Why am I doing this?" We know we can't pay people what they're worth. We should be pleased about new benefits, and we should be distressed at losing benefits, but we should not talk as though these things are the reason why people join or leave the Air Force.

The reason to join is service, and the reason why new personnel initiatives are good is that they make better service possible. For many years, like all the services, we've had to use certain market actions to encourage people with certain skills to stay. I don't mean to suggest that all that should go away; bonuses for specific skills and other market practices at some level are probably unavoidable. But somehow I think we crossed a line by adding more incentives. There's a point where you can do more of that and then ballyhoo the benefits as good deals or reasons for staying around, and it has a whiplash effect.

For example, we flirted recently with the practice of only volunteer assignments for aviators under 15 years of service. This seemed in some areas to encourage a mindset that a pilot is in the Air Force because of the good deals, and when the good deals dry up, the pilot might as well leave: There's no point in staying. I think too much talk is focused on "me" things instead of "we" things—a really bad focus. The reason to stay is service, and we need to say that over and over and over.

Fourth, I believe we should make a virtue of the differences that exist between the warrior culture and today's civilian culture. I think we should talk freely about them. My conviction is that our civilian peers and our civilian masters really admire and respect those who voluntarily put service before self and honor the need for a strong, ethical compass in what they do, and whose lives depend on strong mutual trust and knowing how to develop it in units.

We have to say it right. I think we have to say that we are this way because competence in the profession of arms demands it, and that if we've picked a profession that requires a certain kind of conduct and character as the price of entry, then it follows we should have it. We're not saying A is better than B; we're saying the profession simply demands that kind of conduct.

Finally, I think we could use a little help on this at the national level. For most of the history of this nation, we defined ourselves by what we were against. During the Cold War we were against communism. We've now run out of enemies. We need to define ourselves in terms of what we're for as a nation. The loyalty of our air warriors to their units and their sense of service to their nation can be more compelling if it's tied to a national purpose worth the name.

I've said a lot more about the climate of Air Force organizations than I have about preparing individuals. That emphasis accurately reflects my own conviction that the character of our units outweighs all other factors as the key to the performance of our people. We enjoy superb people. I think we will continue to. We'll get more than our share of quality youth from the country. The real issue is what we do with them and what we give them in the way of units in which to serve.

GENERAL CHARLES A. HORNER: I want to talk about what the Department of the Air Force must do now in order to remain and be the primary provider of air power for our national defenses, to take a key role and an equal role in justifying and defining strategies for the future, and understand what it means by its self-proclaimed ownership of military space.

With regard to the national security environment, it's going to be difficult to define. Brad had a good point there about what we stand for and not against. Certainly there are things that need to be done right now. The Cold War is over. We need to divest ourselves of Cold War weapons, forces, and strategies. We are doing that to some extent, so it isn't a question of are we going to do it. It's a question of the pace at which we do it, and obviously that is not within our own determination. It involves a lot of things, such as arms reduction talks with Russia.

But it is important, because neither Russia nor the United States in this era of declining budgets can afford to maintain nuclear forces designed to destroy one another. There are emerging modes of warfare which we have not accounted for, and we saw it in Desert Storm. Desert Storm was the first war where we found ballistic missiles being used and also the potential for the use of nuclear, biological, and chemical warheads in a non-Cold War, non-strategic sense.

I think we have to match our strategy for the future with that emerging threat, because it's not going to go away. While we are busy in our debates about what the roles and missions of the various forces are and what jobs will be expected of them, there's no doubt about it: It is a growing list, and often it's driven by *The Washington Post* or *The New York Times* rather than the strategic interests of the nation. But I do think that we must be always capable of handling a major conflict. That's the first and foremost task for which we must prepare our military forces, and that certainly goes for air power.

Finally, we cannot ignore the lessons of the revolution in military affairs. People define those lessons as it suits their own programs, so there's a lot of prostitution of the truth going on, but there are four fundamental facets which characterize air power and military forces in general:

- First of all, you have to have complete knowledge of yourself, the environment, and the enemy.
- You have to be able to control the environment in which you fight.
- You have to be able to act rapidly, both in the strategic sense of getting to the fight and then rapidly in the operational, tactical sense once the fight is joined.
- And you have to have decentralized execution. That goes with rapidity.

What is the Air Force primarily concerned with? Obviously, first and foremost is control of air and space, and in some areas we're in very good shape. Certainly in terms of control of air, we can do it both passively with systems like the B-2, the F-117, and the F-22, and actively as in Desert Storm with the F-15 and the AIM-7 missile and over Bosnia with the F-16 and the Advanced Medium Range Air-to-Air Missile (AM-RAAM). In the future it will be the F-22 and the AMRAAM. I think those are wise investments, because certainly the F-22 is going to buy us 20 years of air dominance.

With regard to control of space, while you cannot discuss that subject from a classified or unemotional standpoint with many people, I do think that with our vast space surveillance capabilities and the legacies left from the Cold War, our nation's in better shape than almost any other nation, and we must continue that effort. In terms of controlling our own air space, our major weakness in this country is our inability to defend against ballistic missiles and ballistic projectiles. Remember that Saddam Hussein had two guns capable of firing large distances, and they were prototypes; we can expect to see similar systems that could have intercontinental range.

Two questions have to be asked. First, what is the mission with regard to overall air defense? And that leads to debates with other services, debates within our own doctrine. Second, too often we define our answers in terms of single point systems. We must look at this problem overall and define "systems of systems," as Admiral Bill Owens used to talk about, and ask where the Air Force fits in and where there's room for other services to participate.

With regard to projection of power, the Air Force is in excellent shape with regard to the rapidity of our forces, our ability to move very quickly into an area of conflict. That goes both in terms of our long-range aviation and in terms of our theater aviation. Obviously, we must always pay attention to logistics. Logistics is the weak link and can be the Achilles heel in our mobility, but I think we are in excellent shape for sustaining deployed air operations.

We also suffer a problem, from the national security standpoint, for all our forces in that our land forces have become very reliant upon our air mobility because it satisfies many of their shortcomings. The problem is that they require huge logistics sustainment, and over-reliance on air mobility can be dangerous. I recall that when the 82nd Airborne showed up in Desert Shield, we had no other ground forces except for a couple of Saudi Arabian National Guard armored car companies, but the 82nd Division's forces were not sustainable and would have been prisoners or killed in action if the Iraqis had come south.

With regard to our reserves, there's no doubt about it: The Air National Guard and Air Force Reserves are models for all of the services. I think the Marines do an excellent job in this area. But we must get on with that, because with regard to projection of forces, the Army must define what the role of the Army forces are, both in the Guard and Reserve and in the active forces, and they've been reluctant to do that because it does involve trade-offs in terms of the size of the active force.

Our weakness in air power is clearly that the Air Force has lost vision as to what the Air Force is all about: long-range, heavy bombardment. We underfund our bomber force. We have an old and increasingly older bomber force, and we've hobbled it with Cold War missions. As a result, for example, the B-1 was unusable during Desert Storm because all it could carry were nuclear weapons and 500-pound bombs. Certainly, the B-2 force is too small in size and must grow, but those are the challenges for power projection.

Information operations was listed by Ron Fogelman as one of the keynotes for the Air Force, and obviously it goes with modern warfare, whether it be land, sea, air, or space. But I think that as never before, air operations require tremendous knowledge because of our ability to strike precisely. It must be woven into our strategy, and I would say that we really have trouble in this area. We have not fully learned, for exam-

ple, how to use the Joint STARS ground surveillance aircraft in combination with stealthy aircraft such as the F-117 and sensor fused munitions or GPS direct attack munitions. The Air Force has a long way to go in learning how to use what it already owns and operates, and then making that available to the unified commands.

Rapidity in terms of change of doctrine, organization, and tactics is fundamental, and we have a problem here because we have a lot of constraints on our ability to change, security classifications being one of the major ones. If we do not practice in peacetime the way we intend to fight in wartime, particularly in things like information operations, then we will not fight that way in wartime; we will not change because the person that goes to war goes to war with the people he knows and has practiced what he knows, and he's not about to create a new environment within which to fight the battle. So it is fundamental that we do much more in terms of exercises and in terms of discussions and opening up the books with regard to information warfare.

We have a significant weakness in our national security agencies. While they are wonderful organizations in and of themselves, as a unit and as a function interacting with military forces, they have severe problems. Obviously I give high marks to Ken Minihan at NSA because over the years they have been there when we've exercised, and they have mechanized their information in such a way that it is usable by the forces deployed to a theater. But we must do more of that, and it's going to require a lot of selflessness on the part of agencies which often define themselves by turf and control.

In joint combined operations, there are pluses and minuses. In air power combined operations, I think we have a tremendous plus. During the Gulf War, we did not have a problem operating a combined environment, due largely to the top cover provided by President Bush and Secretary Cheney, who were working in cooperation with the other political leaders so there wasn't any "watch the Americans, see what they're up to" kind of thing. But more than that, air power is task organized rather than organizationally organized. You sit down and decide what you want to do, and then divide up the workload and go out and do it. There is also a great deal of commonality on equipment and tactics and procedures; and if course, during the Gulf War the biggest plus we had on air operations was that everybody spoke English because English is the language of aviation.

With regard to air, land, and sea operations, they are now or should be considered equal, not one subordinate to the other. Goldwater-Nichols should provide us the means to mix them properly given the threat, given the job to be done, given the environment and all those factors, so I think Goldwater-Nichols has had far greater benefits than even its founders envisaged.

Of course, our weakness in the U.S. is jointness, and that's true in most countries. It isn't the case with the budget battle in Washington so much, because when you do deploy to the field, you deploy with what you have on hand. You don't do a lot of positioning for doctrine or roles and missions or budget reasons. But we have a case where we have air power operating on a Desert Storm level of doctrine and land power operating on a Fulda Gap level of doctrine. The question is: Can all the services accommodate a rate of change which allows them to work side-by-side at the same advanced level of doctrine to stay in step to achieve the benefits of things like the revolution in military affairs? It's a question of the ability to change, the willingness to change, and the competency with which that change is executed.

For the Air Force, I see three challenges. The Air Force has done an excellent job under Ron Fogelman of trying to define its vision for the future. But when the Air Force speaks of its vision, that vision—in this town and elsewhere, Leavenworth or Coronado—becomes dogma and is tainted. Air power needs visionaries from outside the Air Force. It needs things like the Air Power Caucus, which has risen in Congress. It needs organizations like The Heritage Foundation which will look to what's best for the nation and, if in fact that is an air power solution, articulate that boldly and firmly.

All our national security departments, whether it be the Department of Defense or various agencies, must accommodate to the change in warfare. The Cold War is over. We need to maintain what's good in what we've done in the past, but we must seek change and must be able to accommodate change together. There has to be sort of a lockstep effect or else one person gets out of step and you get things like the Quadrennial Defense Review, which finds itself in bureaucratic lockup because the people are talking past one another. They cannot agree on strategy or threat or anything else, so what they do is wind up defending their own programs. As a result, the taxpayers and the nation are the people who suffer.

Finally, I'm concerned about the Air Force's self-proclaimed ownership of military space. Not that they haven't done a good job; they've been wonderful masters of space, but the funds for our defense tend to be divided up at about a third, a third, and a third. While that is a myth, there is empirical evidence that says it's true. The problem, then is how do you grow in space and air power, because I think Desert Storm proves without a doubt that the air and space forces are where the gold is to be mined. It doesn't say that land power or sea power are not important, but it does say that we need to be able to grow in these two areas and perhaps change the mix of how we do things. If the Air Force clings to its ownership of space, the trade-offs will be made between air and space when, in fact, they probably should be made elsewhere.

I also believe that the doctrine of space is completely different from the doctrine of air. Just as air is different from land or sea, space is different from air. As a result, we will miss the ability to figure out how to employ space in the future. In some ways, I feel the Air Force is much like the Army was in 1920, desperately trying to hold onto the Army Air Corps. But I'm not going to be worried about the solution, because one thing about airmen and space geeks is they always find a way to succeed.