From Dairy Farm to Fighter Pilot: More With Veteran Bobby Hollingsworth

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Robert J. Marks:

Greetings and welcome to Mind Matters News. I'm your host, Robert J. Marks. We've been talking to Major General Bobby Hollingsworth about his life and views. And he's a retired major general from the United States Marines, where he did things like fly fighter planes, and I want to talk about that. Bob, how did you get started down the path of becoming a fighter pilot? I do know that you have a undergraduate degree in electrical engineering from... Where is it?

Bobby Hollingsworth:

The Ole War Skule.

Robert J. Marks:

The Old War Skule.

Bobby Hollingsworth:

They can't call it that anymore because that's politically incorrect because the name came from where all the people that was going to school joined one of the fights that occurred, and it was the wrong one.

Robert J. Marks:

I remember. They used to call it the War Department in the United States, and now it's the Department of Defense. They had to change it to the-

Bobby Hollingsworth:

It sounds better.

Robert J. Marks:

It sounds a lot better than the Department of War as opposed to the Department of Defense. So you got your degree in electrical engineering. You wanted to be a pilot since you was a little kid, right?

Bobby Hollingsworth:

Two years old.

Robert J. Marks:

Two years old. You actually remember that?

Bobby Hollingsworth:

I remember it like it was yesterday.

My uncle, who was an F6F Hellcat pilot in World War II, flew missions all over the Pacific. He came back... And I was two years old when he came back. He had his navy uniform on with his wings of gold. And I was two years old, and my folks made a picture of me looking up at him, a little towheaded,

blonde-headed kid, looking up at him in just amazement. And that day I knew I wanted to be a fighter pilot just like him.

Robert J. Marks:

Really?

Bobby Hollingsworth:

I knew it from then on.

Robert J. Marks:

Now, that's interesting. You were attracted by the reputation as opposed to the experience. You probably hadn't flown yet, right?

Bobby Hollingsworth:

At two years old? No, I hadn't.

Robert J. Marks:

No, you hadn't. But it was looking up to somebody as kind of a hero, and, "I want to be like that."

Bobby Hollingsworth:

Sure.

Robert J. Marks:

Okay.

Bobby Hollingsworth:

It was just an inspiration to me. It gave me the entree for the rest of my life, the way I planned it. And of course, God opened a lot of doors for me as I went through this thing. But yeah, I remember I lived around the country. My dad, after he came back from World War II, he was a dairy farmer, and we had cows.

Robert J. Marks:

Dairy farm, that's a hard life, man.

Bobby Hollingsworth:

Every morning-

Robert J. Marks:

You've got to get up-

Bobby Hollingsworth:

... 4:30 every morning-

Robert J. Marks:

... at 4:30 in the morning, go milk the cows.

Bobby Hollingsworth:

Those cows have got to be milked twice a day. Otherwise, they get sick, they get infections and those sorts of stuff. But that was also our source of income, because we bottled the milk and we delivered it. We had a milk delivery thing. And that's a whole other story. But because of that, those cows have got to be milked twice a day. So you've got to be there in the morning, you've got to be there in the night, every day, seven days a week.

Robert J. Marks:

No vacations.

Bobby Hollingsworth:

No vacations.

Robert J. Marks:

Okay.

Bobby Hollingsworth:

So anyway, you learn a pretty good worth ethic there. You don't necessarily like what you're doing because shoveling cow poop twice a day is not the most fun thing in the world.

Robert J. Marks:

The interesting thing is that the people I work with that have been raised on farms have the most incredible work ethic. My uncles, my father were raised on a farm. Astonishing work ethic.

Bobby Hollingsworth:

Absolutely.

Robert J. Marks:

Yeah.

Bobby Hollingsworth:

I mean, it's amazing the discipline that you acquire from just having to do things on a routine basis-

Robert J. Marks:

Whether you like it or not.

Bobby Hollingsworth:

... day after day. That's right. It is what it is. But that's a whole other story about that. But we lived way out in the country. I like to say we lived so far in the country they used to have to pipe sunshine to us, because-

Robert J. Marks:

I've never heard that. Okay.

Bobby Hollingsworth:

We lived on a dirt road. It wasn't a gravel road. When I was a kid, it was a dirt road.

Robert J. Marks:

Oh, yeah.

Bobby Hollingsworth:

And then we got gravel on the road and we thought, "Whoa, man, we've moved up town here." And then finally, when I was about five or six, REA came in and put in electrical power lines, and we had electrical power. Because when I was a kid, we had a well that my dad dug. We had no internal plumbing. We had an outhouse, and we took baths in a number three wash tub, heated on a wood stove.

Robert J. Marks:

Oh, we did too. My grandparents lived in a similar place, and we used to have a tub, and there was this hierarchy. The oldest person bathed first. The second one came in, the water was dirty. After he was done, the third one came in, it was really dirty. And then the young kid came into this tub of mud and had to take a bath. That was similar to what you were talking about?

Bobby Hollingsworth:

Except there was only four of us.

Robert J. Marks:

Oh, there were only four.

Bobby Hollingsworth:

My mom and my dad, and my sister and myself. It wasn't that bad.

Robert J. Marks:

So did you go through the hierarchy every time?

Bobby Hollingsworth:

Oh, yeah. Oh, yeah. Mom first, dad second, me next, then my sister next.

Robert J. Marks:

Oh, okay.

Bobby Hollingsworth:

But anyway, when we got electricity, boy, man, what a change in life. And my grandkids, they can't even relate to that, not having an indoor toilet and all that stuff.

Robert J. Marks:

Oh, heck, they can't relate to not having a cell phone. And I tell you, I can't relate to not having GPS. I can't relate to not having the internet. So yeah, we just get numbed by familiarity.

Bobby Hollingsworth:

Yeah. That's a whole other story about our military. We've become so dependent upon electronics that we've lost some of the skills that we need, because they aren't going to always be available.

Robert J. Marks:

Well, this is a little side note, but I was talking to a guy that was doing research for the Air Force, and they're worried about loss of GPS while they're flying, because what if you lose the GPS? So they came up with technology, I think was rather clever, they have stored in their computer maps. And so they have a camera, and the camera takes a picture of the terrain and does a matching with the maps inside so they know exactly where they are so it isn't dependent on GPS. So the military, at least I know in that sense, is aware of the necessity of pushing away from technology and doing other stuff.

Bobby Hollingsworth:

Yeah. But the thing that helped me along from an intellectual perspective is, because we lived so far in the country, we had a bookmobile. We didn't have a chance to go to the library downtown. So a bookmobile would come by once a week, and we'd get a book.

Robert J. Marks:

Okay, a bookmobile, just for those of you... I don't think most of the younger listeners have been in a library in the last five years. I know I haven't been in a library. But you used to have to go to the library to do books. And some of the more remote places, they used to take all of the books and put them on kind of a truck, and they called it a bookmobile. And they would go around and they would visit people, and you could come out and you could grab a book. I mean, that concept is so foreign today. It's gone like the buggy whip factory. It just doesn't exist anymore.

Bobby Hollingsworth:

But what that did for me, it gave me a whole window to the world that I didn't have available to me. And so I read books about all kinds of things that I'd never even heard of before. And here I was in Louisiana, but I used to read books about hockey because I'd never heard of it. I said, "What is this game? What is it about hockey that's so attractive about it?" And I read it and I understood what the game was. But those are the kind of things that the world got open to me a little bit as I was growing up through the bookmobile. And now everybody's got a computer. When I talk to my grandkids now, "Why do you need a book? You can get everything you need on a computer."

Robert J. Marks:

You're right. Yeah, with Kindle and all this stuff. Sure.

Bobby Hollingsworth:

It's pretty phenomenal how we've come along technologically to do that. But we don't need to lose sight of the basic skills of reading a book and understanding how to use a compass and how to navigate with a compass and a map. Those are still basic skills that... You've got them on a computer and you don't need them. But it may not always be there.

Robert J. Marks:

My wife is concerned about that. I say, "It's on the web, it's in the cloud. You're okay. You don't have to worry about it." She says, "But what if it goes away? I want a hard copy." like our tax returns, I say, "I have it on my computer." She says, "No, I want a hard copy, just in case we lose it." I think that there's probably some truth about that, but I wonder if it's overkill. I don't know.

Bobby Hollingsworth:

Well, neither do I, but it's just something we need to be prepared for, to understand that the things we have today that are given to us by the good Lord that make our lives so simple are incredible, and we should be thankful to him every day for those things. But at the same time, the Lord giveth, and if the Lord takes them away, we'd better be ready to have some kind of a lifestyle based on that. But going back to following my career and how I wanted to continue to be a pilot, I used to read books all the time about flying and so forth. And of course, flying back in those days, that was in the early fifties when I was growing up, and it wasn't near as sophisticated as it is today. But at the same time, it always intrigued me. And I remember in the late fifties when I was in high school and so forth, at Barksdale Air Force Base, which is a hundred miles west of us, they had the B36 was the big bomber at that time. And it had pusher turboprops behind the wing. There were six engines on there. And it would shake the earth when-

Robert J. Marks:

Behind the wings?

Bobby Hollingsworth:

It was behind the wings.

Robert J. Marks:

I think I remember pictures of that. That's interesting. What was that called again?

Bobby Hollingsworth:

It was a B36.

Robert J. Marks:

A B36. Okay.

Bobby Hollingsworth:

But I used to watch those things. And I don't know if kids do this anymore, but I used to lay on my back and look at the clouds and picture the formations that the clouds brought. I guess you'd call it dreaming about things that you'd never seen before.

Robert J. Marks:

Did you think about the clouds forming shapes that were familiar in any sense?

Bobby Hollingsworth:

Oh, yes. Yeah.

Robert J. Marks:

There's a great line in Hamlet where Hamlet's lying on his back and they're looking at the clouds and somebody says, "It looks like this." And he says, "No, me thinks it is like a weasel." That's a famous Hamlet quote where he's looking at the clouds. So you did that?

Bobby Hollingsworth:

I did that.

Robert J. Marks:

You looked at the clouds and saw pictures.

Bobby Hollingsworth:

And then I would look up and see those... You could hear those B36's coming from 30 miles away because they'd start shaking the ground.

Robert J. Marks:

Oh my gosh. Really?

Bobby Hollingsworth:

It was incredible. I'd watch them come over and I would just marvel at those big silver things. They looked like a B29 was, it was a big ol' silver thing. It was just beautiful. But anyway. I continued all that dreaming about all that stuff. And then when I was going to high school, the things that interested me most was physics. I never took chemistry, but physics and all the mathematics, trig and solid, and all the algebras and all that stuff, that was-

Robert J. Marks:

That's good stuff.

Bobby Hollingsworth:

That fascinated me.

Robert J. Marks:

If you have the blessing of enjoying mathematics, that stuff is incredible.

Bobby Hollingsworth:

It is.

Robert J. Marks:

It's so mentally satisfying.

Bobby Hollingsworth:

Yeah. And then I think I told you this story earlier. When I went to college, went to LSU, the first year you just go through what they call junior division. You just had to take normal subjects. You had to take English, you had to take chemistry, you had to take physics, you had to take history and so forth. But the

second year, you had to go tell them what you wanted to do. You'd talk to a counselor and say, "I'd like to..." Because you had to go choose your school.

Robert J. Marks:

That was the way I did too.

Bobby Hollingsworth:

Engineering-

Robert J. Marks:

My undergraduate degree.

Bobby Hollingsworth:

... business, law, whatever you wanted to do, you had to get focused in those areas. And so the counselor asked me, "What do you want to do?" I said, "I want to fly airplanes." "Well, we don't teach people to fly airplanes here. What do you want to do here at LSU?" And I said, "To fly airplanes I have to have a piece of paper that says I'm a graduate of college."

Robert J. Marks:

Oh, was that right?

Bobby Hollingsworth:

Yes.

Robert J. Marks:

And who did you take that sheet of paper to? Military or..?

Bobby Hollingsworth:

Well, yeah, you had to have it to the military before they would accept you as a pilot

Robert J. Marks:

Gotcha.

Bobby Hollingsworth:

And so I said, "All I want is that piece of paper so I can show that." "Well, what do you want to study while you're here? What do you want that piece of paper to say on there?" I said, "That I graduated." I mean, that's how naive I was, I guess. But anyway, the guy says, "Airplanes? You want to fly airplanes? Why don't you go down and talk to those people down at the engineering school and see what they'd recommend for you?" So I wandered down there and talked to the counselors in the engineering school, and the guy says, "Well, what do you want to major in?" I explained it to them again. "I need a piece of paper that says I'm a graduate of college so I can go fly airplanes."

Robert J. Marks:

Wow. You had tunnel vision, didn't you?

Bobby Hollingsworth:

I did. Yeah. I mean, since two years old.

Robert J. Marks:

Wow.

Bobby Hollingsworth:

So anyway, the guy says, "Oh, man, where do we get these people?" He says, "Well, airplanes have electricity in them. Why don't you go down to the electrical engineering department and tell them you want to be an electrical engineer." So I did. I went down and said, "I need a degree." The guy says, "It's got electricity on airplanes. I'd like to get a degree." They always got a chuckle out of this.

Robert J. Marks:

They also have moving parts, so mechanical would've worked too.

Bobby Hollingsworth:

But as it turns out, all the curricula that I had to take to be an electrical engineer, thermodynamics and vector analysis, all the mathematics and so forth, fit right in with learning how to fly. Because when I got to flight school, I had all this stuff. I knew exactly all the principles of what made things work.

Robert J. Marks:

Because work when you fly, you have to look at the vector of the wind. You have to look at the direction you're going, how you point your plane, and you have to do all of those vector calculations, right?

Bobby Hollingsworth:

Well, yeah. And you got good viewing. But I knew how they worked because I studied it in college. Like when you fly on along straight and level, in steady state, except you're moving, your thrust is greater than the drag. Your movement gives you the lift that overcomes gravity. And if you want to change any of those things, if you increase your angle of bank, you reduce that vector that causes you to balance gravity.

Robert J. Marks:

Oh, so you're looking at the force vectors on your plane is one of those things you're looking at? Yeah.

Bobby Hollingsworth:

I mean, this is what helped me understand flying better than anything else, especially when it got into air combat maneuvering and so forth, and doing... Well, even in bombing, area ground bombing. It made me understand all this stuff. And most people probably never even thought about it, but when you're flying formation, if you have to make a correction, you have to make three corrections. Let's say you're in formation and your airplane starts to accelerate beyond the speed of that other one, you've got to pull the power back-

Robert J. Marks:

Okay. Formation. You mean you're flying next to... Like the Blue Angels in a way?

Bobby Hollingsworth:

Yes. Right.

Robert J. Marks:

Okay.

Bobby Hollingsworth:

You pull the power back because you've already started accelerating beyond faster this guy. So you've got to stop the acceleration, and then you've got to back it off to move back into formation, and then you've got to add power again to stabilize it. And that occurs with movement of the airplane. There's three corrections that you always have to make, and you always have to just continually think about all those things.

Robert J. Marks:

Wow.

Bobby Hollingsworth:

And pretty soon, you don't have to think. You program your brain as you just recognize this and you just do it. Your motor skills are developed so that you don't have to think, "Okay, I've got to do this. I've got to do that." It just happens.

Robert J. Marks:

It's got to be almost like a muscle memory in a way.

Bobby Hollingsworth:

Or brain memory.

Robert J. Marks:

Brain memory, okay.

Bobby Hollingsworth:

And at the same time, you've got to have your eyeballs constantly moving because you've always got to watch this guy, you've got to watch your navigation, you've got to be reading your knee board and where all your maps and stuff are, and you've got to be getting your weapon systems all ready to deliver. And if it's weather, there's a little thing called vertigo that as soon as you get into weather, if you don't concentrate 100% on your instruments, your brain just flips and says that, "I don't know which way is up."

Robert J. Marks:

That's the reason pilots have different levels of skill. You have visual flight rules, and then you have instrument flight rules. And the instrument flight rules are the ones that let you overcome the vertigo and trust your instruments and not your senses.

Bobby Hollingsworth:

It's just a whole other skill set. But that's the wonder of flight school. I mean, they learned it the hard way as to how to teach people this stuff, because we had a lot of accidents. But by the time I was coming along, they had developed the skill sets for instructors that could articulate what you needed to do and what you needed to be thinking about. And since you're going 360, 400 miles an hour, you've got to be thinking four to five minutes ahead of what's happening right now, because that's where you're going to be. And so you've got to always be anticipating. It's a wonderful exercise for the brain.

Robert J. Marks:

Well, I had an uncle that wanted to be a pilot, and this was back before the Air Force. I think they called it the Army Air Corps or something like that. And they didn't let him in because his eyeballs weren't good enough. You have to have an incredible sense of sight. You also have to have an incredible ability of reaction. In fact, you have very good sight. And I also know another person that has good sight, and that was Chuck Yeager. I have my heritage in West Virginia, and there they have Chuck Yeager Airfield.

Bobby Hollingsworth:

Absolutely.

Robert J. Marks:

And it's really funny because they took a mountain... There's no flat places in West Virginia. They took a mountain and they kind of made it flat on top. And boy, when you land in Chuck Yeager airport, you hit the brakes quick, because if you don't hit the brakes quick enough, you go off the other side of the mountain. But Chuck Yeager was supposed to have these incredible eyeballs.

Bobby Hollingsworth:

He did. He did. He was phenomenal.

Robert J. Marks:

And you were also blessed with good eyeballs. In fact, if you look at the movies Top Gun and Maverick, Maverick and Iceman, I think, played by Val Kilmer, they both had these extraordinary visions. Your name was Hawk, just like a hawk can see for miles and see a speck on an egg a thousand miles below. And so what's your eyesight? What was your eyesight in your vision?

Bobby Hollingsworth:

20/20 is a normal, perfect vision.

Robert J. Marks:

Yeah.

Bobby Hollingsworth:

And mine would run 20/10. So I could see just a little bit better than the average person.

Robert J. Marks:

Okay.

Bobby Hollingsworth:

And that's really key. Because there's a couple of things that you... Again, in flying, you learn these things. But you've got to program your brain, because sometimes, if you're looking in the cockpit, some people will look out of the cockpit and their eyes don't refocus on infinity, because that's what you've got to look at out there. Because what you're trying to do is detect any motion of anything out there. But your eyes had to be focused on infinity to really be able to have the best accommodation of those things. And so it was a skill set that you had to learn of looking in the cockpit, looking out of the cockpit, and you had to make that transition very quickly. And at the time, especially when you're in weather, your eyes are constantly moving on all the other instruments, cross-checking everything. And again, I just can't say enough about the flight training that I received in the Navy. One of the things that they used to emphasize time and time and time again... They'd put you under a bag, so it was no visual reference to anything, and then they would start killing instruments, especially your attitude gyro that gave you your primary focus. And so you had to go needle, ball and airspeed. So you just had three little things.

Robert J. Marks:

Okay, needle, let's go through them one at a time.

Bobby Hollingsworth:

A needle is an indicator in there that gives you your angle bank.

Robert J. Marks:

Okay.

Bobby Hollingsworth:

The ball is just a ball, like a level in the airplane that gives you your slip or your yaw in the airplane.

Robert J. Marks:

Gotcha.

Bobby Hollingsworth:

And then of course, your airspeed and altitude... I didn't say altitude, but you've got to constantly look at your altitude, because if it perceptually starts to move, you're already too late. You've got to anticipate those moves. And how we anticipate that move is, there's another instrument we call a vertical speed indicator, and it's a real sensitive instrument. As soon as your vertical speed starts to deviate, it starts to move. And so you've got to look at that, and then you've got to go back up and cross check everything else and make sure that every movement that you make all coordinates together to do what you've got to do. And don't forget the three movements. So everything you have to do once, you've got to do two more times to get it back on. Because let's say you're starting to sink, now you've got to move the nose back up. You've got to move the nose back up to stop the sink to get back to where it was. And then when you get back to where it was, you've got to have the nose movement to put it back to where it's level.

Robert J. Marks:

Gotcha. So you had to do all of this just with those three pieces of instrument?

Bobby Hollingsworth:

That's right. And that's why the Navy and the Air Force are so good in teaching. And simulators have really come a long way to be able to teach you this stuff in a simulator, because it's less expensive than taking an airplane out, and it's not near as dangerous.

Robert J. Marks:

Yeah. This is interesting. I used to work with a guy at University of Washington, and his name was Tom Furness. They called him the grandfather of virtual reality. But there's so much great technology that the DOD starts. They started self-driving cars when they had their unmanned races across the U.S. I don't know exactly the course they did. They were the ones that started GPS. They started the internet. And another thing they started was virtual reality. And the purpose of that was for pilots so that they would have heads up display so that you could actually... When I used to smoke, I used to put my cigarettes on the dashboard. And at night I could see the reflection of it in the window. And that's kind of like heads up display. You see the reflection of all the instruments in the window. And that was a really big thing. Anyway. He was the one that started virtual reality. And also, in terms of the training of the pilot, they put you in this little booth and it simulates you actually flying. Like you were saying, it saves a lot of money, right?

Bobby Hollingsworth:

Oh, yeah. And they became so sophisticated that not only are you doing what you're doing in relationship to the world, but they got so sophisticated with the computer programs, that they could program another fighter or a ship that was moving in the water and you could go land on the ship and so forth. And so you'd do that stuff before you went out and did it. And so when you got there, it was a piece of cake.

Robert J. Marks:

Okay.

Bobby Hollingsworth:

Well, not a piece of cake, but you were somewhat familiar with it.

Robert J. Marks:

Yeah. Colloquialisms. I had a Korean student. He came with me with a problem. I said, "That's a piece of cake." He says, "That is not a piece of cake." So we have to be careful with our colloquialisms there. Yeah. That's kind of funny. So you started flying the fighter planes. I think you mentioned to me that there was a difference between Army, Navy and Marine pilots, that they're different breeds. Is that true?

Bobby Hollingsworth:

Well, yeah, because the different cultures of all the services. Each of us bring our own methods of war fighting to the program. The Air Force is very... And this has changed several times over the years, but the Air Force used to be big, blue sky stuff, high, go down and shoot down airplanes. And then the primary focus of the Marines in the way we used airplanes was to provide what we call heavier artillery, movable artillery, because it allowed us to locate where the fight was and put bombs on the bad guys really close to where the good guys were.

Robert J. Marks:

Oh, okay. So this is, for example, D-Day. When the two forces were meeting each other, you had to drop bombs on the Nazis and not kill the invaders.

Bobby Hollingsworth:

Well, there's three operational terminology that used. Strategic bombing, operational bombing, and then tactical bombing. Tactical bombing is happening right now.

Robert J. Marks:

I see.

Bobby Hollingsworth:

Operational bombing is what you want to happen two or three days from now. And strategic bombing is where you're reaching way out behind the lines and destroying logistical capabilities for the bad guys. So the tactical portion is right up close, right next to the troops.

Robert J. Marks:

It's right now.

Bobby Hollingsworth:

Right now. And where you've got troops that are in combat and you want to put steel on the enemy and destroy them. The Marines, we focused on that, that was our whole reason of entry. Every Marine is a rifleman. Everything that we did as pilots was to support that guy with that rifle. That was our whole mental thought. Anything else we did was fluff.

Robert J. Marks:

So you were a major general in the Marines?

Bobby Hollingsworth:

Yes, sir.

Robert J. Marks:

Were you an expert with the rifle? All Marines?

Bobby Hollingsworth:

I'm going to tell you this, and this is a confession.

Robert J. Marks:

Okay. Confession. I should put up a barrier and offer you absolution.

Bobby Hollingsworth:

I did not go to the basic school, which is where we developed all of our skills and where we got all of our qualifications that we said, "Okay, you're an expert rifleman. You're a sharpshooter, or you're a marksman." That was the three categories. The need, when I got out of flight school, was for jet pilots to

be in Vietnam. And so basic school is at Quantico, Virginia. That's where all the officers go through to get their six months training of how to be a ground officer. I skipped all that because they needed pilots and they sent us to Vietnam pretty quick.

Robert J. Marks:

I see. Okay.

Bobby Hollingsworth:

And so I didn't go through all that ground training that some of the other people did. Was I a good shot? Yeah, I was a pretty good shot, but I was never ever one of those guys that practiced a lot. When I was a kid, I used to shoot squirrels in the eye. My dad, if I-

Robert J. Marks:

That's because of your good eyeballs, right?

Bobby Hollingsworth:

Yeah. And it's a whole trigger pull thing. The squeeze.

Robert J. Marks:

There is a correlation between being able to shoot a squirrel in the eye and being a good pilot. You have to have the motor control for your arms, and you have to have the eyes in order to do the shooting.

Bobby Hollingsworth:

My dad used to really fuss at me if I didn't hit him in the eye.

Robert J. Marks:

Are you serious?

Bobby Hollingsworth:

Serious as a heart attack.

Robert J. Marks:

Oh my gosh. What kind of rifle did you use?

Bobby Hollingsworth:

I had a little JC Higgins 22 bolt action.

Robert J. Marks:

A 22? Wow. Okay. Bob, I'm really impressed.

Bobby Hollingsworth:

Don't be impressed, because that was so many years ago. I wish I could replicate that now, but I can't. But that's what happens when we grow older. We have to choose our things that we can do better-

Robert J. Marks:

Right. Yeah, exactly.

Bobby Hollingsworth:

... that don't require so many motor skills.

Robert J. Marks:

Exactly. Wow. Okay. Interesting.

Bobby Hollingsworth:

But anyway, the whole concept of this thing about the difference between the pilots, navy guys, their biggest thinking is to protect the fleet. Okay?

Robert J. Marks:

Right.

Bobby Hollingsworth:

So they have interceptors.

Robert J. Marks:

Oh, I see.

Bobby Hollingsworth:

And then they use their airplanes to go out and bomb other ships that are threats to the fleet, but that's where their concentration is. Where ours is on the individual Marine, the Navy is on protecting the fleet. Now, the air forces, they're strategic. That's where the whole concept of-

Robert J. Marks:

Soften them up behind the lines.

Bobby Hollingsworth:

Destroy their logistics capabilities, and do that. Now, let's take it, for example, I have some really good friends that are Air Force guys that were A-10 drivers now. The A-10 mission-

Robert J. Marks:

What is an A-10?

Bobby Hollingsworth:

It's a Warthog, they call it the Warthog. And it's got a 30 millimeter cannon in the front of it. It's a Gatling gun that shoots about 2000 rounds a minute, a 30 millimeter-

Robert J. Marks:

An this is on an aircraft?

Bobby Hollingsworth:

It's on an aircraft. The gun itself is about this big round, about two and a half foot in diameter, and it's right in the front of the airplane, and it is a tank killer, and it carries lots of bombs. It's a straight wing airplane, so it's slow. And one of the things that we always talk about flying fighters is, "Speed is your friend." Because when you've got speed, you can exchange that energy there for other things. Turning, yanking, banking, moving, trying to outmaneuver somebody that's shooting at you.

Robert J. Marks:

That's interesting. Speed is your friend. Okay.

Bobby Hollingsworth:

Yeah. Well, we always said, "Speed is life." Whereas the A-10, it's an airplane that's a slower airplane, but carries lots of bombs, and it's an ideal close air support airplane. And it's terrific. It's time killing machine on Earth today. And the Air Force has been trying to get rid of it because they don't like that mission, but they saw how good and effective it was for the Army, especially in the Iraq War. That airplane was phenomenal for close air support, and it still is. And you see that they keep trying to get rid of it. Fairchild built the airplane, and they kept trying to get rid of it, and they're still trying to get rid of it. That's because their focus is different. Their focus is not primarily close air support. Now they're good at it and they do it, but they do it mostly with the A-10. Does the F-16 have the capability? Yeah. Does the F-15 have the capability? Yeah. But that's not where their focus is. Their focus is that high altitude stuff, killing bad guys or dropping interdiction bombs behind the... You remember in Vietnam, the big thing was the 105's, they call it the Thud.

Robert J. Marks:

The Thud?

Bobby Hollingsworth:

The Thud. Yeah. It was the Thunder Chief. The Thud was its little nickname for it, but it was a Mach 2 plus airplane, and it was designed to carry a nuclear weapon, to deliver a nuclear weapon behind enemy lines. But when Vietnam started out, we had a lot of Thuds, we had tons of them. So the Air Force used it for strategic bombing up north. There was a place called Thud Ridge up in North Vietnam that was up in Route package 6. And the Air Force had come in there and get a lot of Thuds shot down because it was not designed for that mission, because they started hanging racks of bombs on the outside of the airplane, which slowed it down and gave it a less maneuverable capability.

Robert J. Marks:

Gotcha.

Bobby Hollingsworth:

And so it was more susceptible to SAMS, service-to-air missiles coming up and hitting that. And you couldn't dodge them as good as you need to, and you couldn't also dogfight as good as you need to.

Robert J. Marks:

Yeah, I was asking you about that. Are there still dogfights?

Bobby Hollingsworth:

That's another concept that was probably more fun than anything else that you ever did, because-

Robert J. Marks:

You consider dogfights fun?

Bobby Hollingsworth:

It's the most exhilarating thing. Well, you talked about the movies Maverick and Top Gun. You saw the A-4's in there. You saw the F-14's. I used to fly those A-4's at Top Gun all the time. We'd go down and support Top Gun's graduation because we'd provide them dissimilar air. The A-4 Skyhawk was very similar in maneuverability to the MiG-21, except we had a better row rate. But ours was 720 degrees per second. You can do two L-Round rolls in a second.

Robert J. Marks:

What's an L-Round roll?

Bobby Hollingsworth:

Well, just flip it over twice.

Robert J. Marks:

Oh, okay.

Bobby Hollingsworth:

You just go full rudder... I mean, full stick, and you go pew, pew. You'd turn 360 degrees twice in one second.

Robert J. Marks:

Okay. While you were moving forward?

Bobby Hollingsworth:

Yeah. Right. But the MiG... And that's how we could do better in a lot of the dogfights than the MiG, because the MiG was slow as well. And if a MiG got behind you for some reason, we could turn and yank and the MiG could not turn quick enough to keep in phase with us. And then as he starts coming around again, you'd whip and go back this way, and he's here, and pretty soon you're back behind him. Two or three turns.

Robert J. Marks:

So you're using the capabilities of your enemy, the lack of capabilities-

Bobby Hollingsworth:

The lack of capability.

Robert J. Marks:

... in order to beat them.

Bobby Hollingsworth:

And that's what a dogfight is all about. But let me say this. Today, mostly, it's all beyond visual range. Our missile technology has increased so much that you don't find that the engagements are like the old time dogfights in World War I and World War II and in Korea and in Vietnam, because now our missile capability is so far advanced that you can have a guy behind you, you can pick him up on your radar, you can launch a missile, that missile will leave, go forward and go back.

Robert J. Marks:

Go right over your head. It'll go forward over your head and-

Bobby Hollingsworth:

And kill him.

Robert J. Marks:

... get him behind you.

Bobby Hollingsworth:

Yeah. Now see, we didn't have that capabilities with missiles before. And now, the old-

Robert J. Marks:

But they have that capability also, don't they?

Bobby Hollingsworth:

Yes. Yes. I don't think theirs is quite as good as ours, but they're developing it pretty rapidly. And again, a whole other technology development that's changed the face of war fighting, especially in aviation, is a stealth. Because now it's harder for the bad guys to pick up you-

Robert J. Marks:

Oh, the stealth technology.

Bobby Hollingsworth:

... because the radar hasn't caught up with the capability of you to be stealthful. And that's a design issue. It's a skin issue, how they develop a-

Robert J. Marks:

I actually did research on that, by the way.

Bobby Hollingsworth:

Oh, did you?

Robert J. Marks:

Yeah. The stealth bombers, first of all, they have flat. They have flat sides. And the reason for that is because the reflection is more like a mirror as opposed to a scattering, which goes in all directions. The other thing was the absorption... And this is what we worked on. The artificial intelligence was actually

designing the dielectric coating of the wings so that there was more absorption than there was reflection.

Bobby Hollingsworth:

That's correct.

Robert J. Marks:

And this was really interesting technology.

Bobby Hollingsworth:

And they had some issues with it. You remember the B-2 was at the Whiteman Air Force Base. When it would get in the rain, it would degrade the capability of the skin to disperse radar.

Robert J. Marks:

Oh, I never thought of that. That's right, because the water got on, it screwed up the dielectric and it didn't operate as designed.

Bobby Hollingsworth:

I think they've perfected it now, because that was a real weakness to start with. But I think they've gone a long way. The F-35's are that way. The F-22's have got all this sophisticated stuff. Their design is such that they're just really, really difficult to pick up a radar. But again, their radar's getting better and better and better, as is ours. But then as soon as you have to launch a weapon, whether it's opening the bomb bay doors to drop a bomb out of it or to open up compartment to let a missile go out of it, you're exposing more of a radar signature. And so that's why now they do it very quickly. That thing goes out of there quicker than you can back down and closes it back up. So if they get you with one sweep, then you'd close back up and you disappeared again.

Robert J. Marks:

That's fascinating stuff.

Bobby Hollingsworth:

I mean, it is fascinating. But right now, from a perspective on the fifth generation airplanes that are out there now, dogfighting is sort of secondary. It's something that's nice to know how to do-

Robert J. Marks:

Technology is taking over.

Bobby Hollingsworth:

... but you pray that you never have to do it because you don't want it. You have the capability to reach out and touch them before you ever see them.

Robert J. Marks:

Let me ask you this. This is kind of a new topic, but Elon Musk, who is a genius entrepreneur-

Bobby Hollingsworth:

Incredible.

Robert J. Marks:

A friend of mine Discovery Institute, George Gilder said, "He's a great entrepreneur, but he's a retarded thinker." He thinks, for example, that we are simulations, at least this was a previous understanding of what we are. We're simulations much like a computer simulation of a human being. And there's other strange things. But I think he has some great ideas. I don't know if we're ever going to make it to Mars. That's going to be really great if we are able to do that. But if you look at his accomplishments with Tesla and SpaceX and X now, the platform... One of the greatest names for a company, The Boring Company, which is the one that makes tunnels. What a great name for a company, The Boring Company. But anyway. He came out, and this was recently-

Bobby Hollingsworth:

Which hasn't been too successful, by the way.

Robert J. Marks:

Oh, it hasn't been successful?

Bobby Hollingsworth:

No, because see, they were going to put that all underground, that high-speed train from Los Angeles to San Francisco, and they've spent billions of dollars on that, and it's still

Robert J. Marks:

It still ain't working.

Bobby Hollingsworth:

It ain't out of the box.

Robert J. Marks:

Okay. Well, we'll see what happens to The Boring Company. But one of the things that Musk said is that the current fighter planes, he was talking about, I think the F-35's, they cost about a hundred million dollars each. That's the current price of them. And he said, really, with the advent of drone technology, that maybe we should be spending our money on drones instead of fighter planes. Do you have any opinions about that?

Bobby Hollingsworth:

I have opinions about it, but I don't have the technical expertise to explain to you exactly what my thinking is versus what reality is. Because what we as human beings always think about is, we feel like we're infallible, and we're necessary part of any machine to make it work to its peak. But when you start thinking about the human resource requirements in an airplane, the weight that it costs, the space that it costs, can you exchange that for some other technology that would make the plane better? Now, the thing that we always think about, and I think about this all the time, is from a pilot perspective, I always think that I've got to be in control. Now, when you put drones in control, somewhere, somebody's controlling something.

Robert J. Marks:

Well, I think the drones are still under manual control. It's just that they're playing a video game.

Bobby Hollingsworth:

Yeah. You've saved all that weight in the airplane. You've saved all that space in the airplane. You don't have to build a cockpit that can look out. It can be a-

Robert J. Marks:

You don't have to worry about G-forces, which was a big thing in the movie Maverick, that I took an issue with.

Bobby Hollingsworth:

And it's still a big deal. The F-16 was such a capable airplane. You could out-G your body very quickly.

Robert J. Marks:

Did you ever feel the effects of that while you were flying, the G's?

Bobby Hollingsworth:

Oh, yeah. But the thing of it is, the airplanes that I flew, they never had those kind of capabilities, over-Ging your airplane. The airframe itself would reach limits before your human body did.

Robert J. Marks:

Right. Gotcha.

Bobby Hollingsworth:

But then the more sophisticated that they got and the speed increase with the F-16's and the F-15's and so forth, the airframe would outperform what the body could take.

Robert J. Marks:

Gotcha. Interesting. So one of the things that's always worried me about drones, I used to worry that if you had a thousand drones coming at you, what could you do? You would have to come up with some autonomous cannon to shoot them, bang, bang, bang, bang. Then somebody pointed out that if there was an EMP from a nuclear explosion that fries all the electronics... So if you are being-

Bobby Hollingsworth:

everything.

Robert J. Marks:

On everything, and everything. But the military, now Russia and China and the United States have what I would call an EMP cannon, which is an EMP focus that can actually be focused on a swarm of drones. And it strikes me that this is just like bug spray, that you would go shhhhh and all of those drones would fall out of the sky because they would all be fried. Now, the people that are in favor of the drones come along and they say, "Well, we can harden them." But if they harden them, that's going to be more weight. And so there's going to be-

Bobby Hollingsworth:

There's trade-offs in everything you do.

Robert J. Marks:

Yeah, there's trade-offs, and there's always this-

Bobby Hollingsworth:

But we're getting into an area that's pretty classified at this point in time.

Robert J. Marks:

Oh, you think so?

Bobby Hollingsworth:

Oh, yeah.

Robert J. Marks:

Yeah. I imagine that's true. Okay. Bob, we've been going for quite a while, so let's call this off. But I want to continue, because next time I want to talk about some of your work at the Pentagon and some of the things you did there. And I think it's very interesting because you were really an advocate for people in the reserve. And you also had some challenges with your faith, and I wanted to talk about that too. That to me is very fascinating. We've been talking to United States Marine, Major General Bobby Hollingsworth about his life and experience, and it's fascinating. And we'll continue next podcast. Until then, be of good cheer.

Announcer:

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