United States Army Operational Test Command Podcast Series: OTC and High School Robotics

(Intro Music)

Interviewer [0:14]: Welcome to the United States Army Operational Test Command Podcast Series. Many OTC soldiers and civilians donate their time to volunteer for a variety of causes in the evenings and on weekends in order to give back to their communities. Some OTC personnel use their specialized knowledge to lend a helping hand to local high school robotics teams. In this episode, I talk with OTC Transformation and Technology Directorate Gail Scholl and electronics technician Pete Tenajero about OTC employee involvement with the robotics program at Shoemaker High School.

(Music Interlude)

Interviewer [1:15]: We're going to talk today about the robotics program, how OTC has helped the local high schools. So just tell me, what is OTC's involvement and who have we helped?

Gail Scholl [1:25]: Let me start with some of the history. When our directorate formed, I found that OTC was involved with mentoring the local Shoemaker High School. I hadn't known about it before then. And it was transferred to our responsibility because we have the engineers of OTC in TTD. Since that time, we've been involved each year with providing some mentor support and some other encouragement to the team. We also, about four years ago, helped a similar high school in Sierra Vista form a club of their own called the NERDS (N.E.R.D.S.) and our IOW Test Directorate actually supports and mentors that group, and they've been very successful also in the FIRST robotics program.

Interviewer [2:20]: Just tell me first, what exactly is a high school robotics program? What do they do?

Pete Tenajero [2:24]: First off, the idea behind the FIRST Robotics is to enrich the science and technology area for the kids. As they're growing, it gives them something to be interested in, you know, especially those that like math or engineering, or it gives them something to look at, something they can put their hands on and say, "Wow, I can do something with this high-level math I've been learning," because it takes that to put a robot together.

There's different robotic programs, but the primary one that we support, and the primary one I think it's the biggest in the United States, is the FIRST robotics. And what they do is they have a kickoff in the first weekend of the year, and then they give you a task. Okay? And you're going to have a competition against all the other teams that compete, but your task

is, whatever the task is that they give you for that year, you have six weeks to design and build a working, functional robot to do that task. The students have to come up with that idea. "Okay, here's what we need you to do." And the students have to think, "Wow, what do we need? How are we going to make this robot?"

And where the mentors come in—the engineers, me as a technician, and others—is that they don't have all the knowledge to get those ideas from paper or from their head onto an actual functional thing. So, okay, we go and help them as far as we give them direction and advice, whether it be, you know, how to figure, you know, using their math, how they've learned. "Okay, here's your math and this is how you figure, okay, the weight and the size, and how this is going to balance, and how this is going to work." They start seeing how the math and science classes start fitting into what they're doing on the robotics. So, they get more interested and they're more willing to want to get into the higher classes and therefore go into college, instead of just saying, "Oh, school's boring. I'm just going to hurry up and get out of school and have fun."

Interviewer [4:32]: So the robotics program really helps the student out in the long run and it teaches them a lot of things. What does it do for the OTC personnel? How does it help them?

Gail Scholl [4:42]: It's wonderful to have our engineers getting to do hands-on work. And they're not in any way building the robot, they're working with the students and through the students, but to see the ideas come to light, sometimes in the work that we do for the government takes a long time and you're working through large contractors and it's not quite that immediate response that you get from an excited group of teens that are working to build something. So that's very invigorating for the mentors that are involved. Many are parents, so they have teenage children, and that gives a good contact with the teens of today that are entering into those fields. We also get a chance to share some of what we've learned as professionals about working as a team. And US FIRST robotics is good at encouraging not just the technical side of robot building, but the whole working as part of a professional team development.

In fact, it's been amazing at times what happens in the competitions because you have teams helping other teams to the extent that you might even be in the finals of the competition—and this has happened—where a critical piece isn't available to the opponent and the opposing team will give whatever's needed or they'll help a team build a robot if it didn't arrive in shipment or something because you learn that it's better to help others than to win the competition. You win by being part of a better team. And that's just a wonderful sharing to give. Hopefully, they carry that with them into the workforce. So they

aren't focused just on themselves and their accomplishments, but what they accomplish working as a team.

Interviewer [6:37]: So you said US FIRST Robotics, is that the governing organization that sponsors these competitions?

Gail Scholl [6:43]: One of the big competitions that we've chosen, the high school has chosen to participate in. And as Pete said, it's international and it's a very large one. Uh, it was sponsored, initiated by NASA working also with Dean Kamen. Uh, if you've seen the Segways, he's the inventor of the Segway. Yeah, right. And also a lot of medical devices, the IV pump and such that's used. So he's a great inventor, but he's decided to dedicate a large part of his life now to helping the nation get focused on the excitement of science, technology, engineering, and math. It's not just the sports stars that get that kind of acclaim. It can be sort of the nerds of high school that are really proudly praised for what they can accomplish as a team. And it's exciting. The competitions are like sporting events in the positive sense of being supported by the community and by many attendees.

Interviewer [7:49]: Walk me through, what do they do at a competition?

Gail Scholl [7:51]: It's usually three days. They would arrive on Thursday and set up, set up their pits, and then Friday go into runoff competitions. And what's different I found about the competitions is that you are teamed with other teams in each match. So I might be teamed with teams 20 and 62 one time, and the next match or a couple of matches, my next competition, I may be competing against one of those teams and paired up with someone else on my side. A high school team has to quickly assess the strengths of their new partners, and they know some of the skills of the opposing partners and quickly put a strategy together. "You're good at shooting, we're good at protecting, we're good at something else. How can we put that together to win this match?" And you team up with someone else. And by the end of the preliminary runs, you've opposed and teamed, I think, at least once with every other team there. So you go through these runoffs and at a certain point, they've determined the top scoring, how the team standings [are], and then there's an interesting part in the competition where the top eight teams get to select their alliance partners. So they've been looking for the past day and a half, who are the best teams out there, and they will select teams that they want to partner with. And they go into the finals. And so you might still have a chance to be in the final competition as long as you're one of the better scoring, but not best scoring groups. And that part's exciting too. You don't know until the end who you might team with and what their strengths are and what your robot might bring to that final scoring event to help win.

Interviewer [9:47]: How long has OTC been involved with the robotics program at Shoemaker and at the other high school as well?

Gail Scholl [9:53]: At least eight years with Shoemaker. I believe it was one year before I got involved, and I've been involved for seven years. And with Fort Huachuca, it would be four. I want to say four. Their fourth year of competition. They won the regional award their first year as a rookie team. So, I mean. And that's something else. At these competitions, while winning is important, it is not the most important. The most important things you can get are some of the awards, the Chairman's Award, for being a very strong team, having goals set, and encouraging involvement by the community, and getting the students very involved in the activity and such. There's an image award that Shoemaker's won because our team has been very professional in its appearance and their attitude and how they work together as a team. They don't take it as a goof-off time, they take it very seriously and really perform professionally, and they've been recognized for that. Um, web design awards, um, other awards, and those count a lot at those award ceremonies. So again, doing a great job of design and innovation is important, but it's not all that matters.

Interviewer [11:15]: Now the students, because of their experiences with the robotics program, do a lot of them pursue college degrees in these fields because of their time spent as a student on the robotics team?

Pete Tenajero [11:27]: Yes, definitely. Um, I have been with three or four years with Shoemaker High School. And Gail's been here longer, so she's seen more of it. But just from what I've seen, I've seen kids, and I'm in there mentoring with them, and if I'm not doing anything other than watching them, I'm still in there with them. And I've seen kids come in there that really didn't care. Didn't care about their grades, didn't care about anything. And they go in there and little by little, it's like, "Hmm, this is interesting." And one in particular that just graduated last year, really didn't care about school at all. At all. And he's now in community college and plans on going forward when he gets finished with that. He's already got a plan made up. And this was somebody that's like, "Oh, you know, everybody just knew he was going to hurry up and get out of school and do nothing with himself." But with robotics, he got excited and said, "You know, I want to do something." We've had two other students that were in Shoemaker robotics that have come in as interns in OTC and TTD here, and they're both pursuing engineering degrees.

Interviewer [12:35]: So this, in a way, helps OTC recruit and let people know about OTC.

Gail Scholl [12:40]: Yes, it does.

Interviewer [12:41]: Do you notice some of the other teams that compete in the competitions, do they also have mentors, not necessarily military organizations, but from other independent organizations?

Gail Scholl [12:51]: They do. And it's a very strong part of the program is encouraging that kind of partnering, whether it's academic community, uh, industry, or volunteer groups, if you want to call us that. There's a lot of partnership. NASA, the Army's not that big into it perhaps, but the large technology companies because they benefit. They get employees too, potential recruits.

Interviewer [13:21]: And for all OTC personnel, it's volunteer only. They don't get any pay for it. They just...

Pete Tenajero [13:26]: No, it's volunteer on our own time, nights, weekends.

Interviewer [13:30]: What made you two get involved in the program? What was your connection? What did you personally benefit from doing the mentoring with the robotics programs?

Pete Tenajero [13:39]: Uh, I have a son that started in LEGO robotics when he was in fourth grade. And it stopped there because the middle school he was in said, "Y'all are too busy learning how to go from class to class. We can't have the robotics here." And there is a middle school program, but a lot of middle schools can't afford it and they just don't do it. So when I came to OTC and my son was already planning on going to Shoemaker because he heard about the program over there. And he heard about it because OTC had gone to his school and demonstrated a robot when he was in elementary school. So we didn't even know it was OTC at that time, but very, very interested in the robotics. And every time he changes his mind on what he wants to do when he gets older and goes to college, it's, it's more advanced, whatever his decision has been. He's gone from a computer, he wanted to be a computer tech, and then he decided he want to be a computer engineer. And now he's looking at biochemical engineering.

Gail Scholl [14:42]: Uh, my involvement started as an assigned task. I mean, the responsibility was assigned to TTD when we were first forming, and I can't say that I welcomed it because it was a big chore and a big burden. Uh, it means that for six weeks while the build session is on, that my engineers, those that were volunteering, would need to spend a lot of time focused on the high school, uh, in their volunteer time. Uh, but I saw the excitement it brought to them and how much they enjoyed the time with the students, and so it became easier year by year to encourage that involvement, encourage new people to get involved. Uh, and there's also some benefit to OTC when the students come back and both at Huachuca and here and bring to OTC and the community, like they've done

with Civic Leaders' Day, information about what the high school is doing and how OTC is able to help. Um, we'd like to think that someday more and more of the military community schools would have programs like STEM, which is Science, Technology, Engineering, and Math, that give the right curriculum. So when students move from one school to another, they can find the robotics competition or one of the high science and technology classes and not wish for what they had at one location.

Interviewer [16:15]: So what, just in closing, what would you say to people that are thinking about getting involved in the robotics program or that want to pursue some type of science, math, uh, degree and then career field? What advice would you give them?

Pete Tenajero [16:30]: I think as a, as an adult, as far as volunteering and helping, it is a lot of work, but it's exciting. It's fun. You know, uh, like Gail says, you see the students there and and you're trying to walk them through a step that they're stuck on. And all of a sudden you see the lights turn on. It's like, "Wait, this makes sense. I got it. I understand." And and they're able to go on and run with it. So it's, it's rewarding, you know, in a way that you you feel good. You know, it's just, it's very exciting. From the student's standpoint, I don't know. I think the excitement initially gets them in there, then they decide they want to learn. It's not just, "Oh, we're playing a game. I want to learn how to do something."

Gail Scholl [17:22]: One of the things that I see is a need for technology-focused employees in the future. And I need to do all I can to develop means of intake for people with that kind of interest and background. This is one such program, there are others where if we just catch a few people over the years, a few students that then graduate and want to stay with our Army team supporting technology, sometimes that's enough to make all of our efforts worthwhile in that way, in addition to what we get from seeing the students develop. But I need to get technology people, and they don't grow on trees. I mean, it's tough.

Interviewer [18:07]: And you think the robotics really helps students get involved that might not have a previous...

Gail Scholl [18:11]: That might not have a previous or that might have an interest in science, but I need to know that they have good work methods. And if they've gone through a rigorous program like the robotics program, that helps me bring them in as intern applicants, and I'm much more encouraged then to take them through their college years and perhaps make them full-time employees. Uh, it's something good on a resume. If I see that competition, especially if supported by some of the things like the Chairman's Award and other things that can result, that's a very positive light on a resume. Very much so.

Interviewer [18:50]: Okay, great. Is there anything else that you two would like to add?

Gail Scholl [18:53]: We always could use money. We can use mentors and materials and marketing and money. Four things that we can always use, but, uh, there are many opportunities for people to volunteer their time because they need not only the technical engineers, they need to understand how to go out to the community and solicit funds appropriately. They need to do good advertisement within the school. They need to do spirit and have ways to build a true team that's not just a group of engineers building a robot, but it's the whole thing that goes together.

(Outro Music)

Interviewer [19:48]: That concludes this episode of the United States Army Operational Test Command Podcast Series. If you enjoyed this episode, please visit https://atec.army.mil/operational-evaluation-command/oec-news/ to download more OEC podcasts. Thanks for listening.

(Music Fades Out)