TROY UNIVERSITY | BEST Robotics

BEST ROBOTICS
WIREGRASS BEST
DOTHAN • ALABAMA

2022 Competition

MADE ORDER™
BEST ROBOTICS

November 5, 2022
Trojan Arena

Troy University
Troy, AL

Welcome

TROY University's BEST Robotics Planning Committee would like to welcome all students, teachers, coaches, mentors, parents, and sponsors to the 2022 TROY University BEST Robotics competition. The mission of BEST is to inspire students to pursue careers in science, technology, engineering, and mathematics through participation in a competitive robotics program that fosters knowledge, teamwork, and communication. Students learn to work through the engineering design plan, develop strong communication skills, effective leadership and teamwork abilities, understand the entrepreneurial process and comprehend the global business environment.

The theme of this year's competition is "Made 2 Order". Students are afforded the opportunity to design, build and test robots to plan and perform the operations at a fulfillment center including moving order boxes into appropriate locations, finish the assembly of Squeaky, also known as the Field Robot, use the team construction Team Robot to control the Field Robot, and use the Field Robot to collect Robot parts to fulfill orders.

TROY University BEST is excited to serve as a hub for 10 teams comprised of more than 100 middle and high school students.

On behalf of TROY University BEST Robotics, and with sincere gratitude, we extend a special thank you to all of our sponsors for making TROY University BEST Robotics possible.

Good luck teams!

------- ***TROY University BEST Robotics Planning Committee***

OFFICE OF THE GOVERNOR

KAY IVEY
GOVERNOR

STATE CAPITOL
MONTGOMERY, ALABAMA 36130

(334) 242-7100
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STATE OF ALABAMA

November 5, 2022

Greetings:

On behalf of the State of Alabama, I would like to welcome you to the Wiregrass BEST Robotics Competition held in collaboration with TROY University BEST Robotics Competition on Saturday, November 5, 2022 at the Trojan Arena.

The State of Alabama is proud to host this exciting event and welcome you with true Southern hospitality. I would like to congratulate the teams who are competing at this year's competition. I encourage you to continue your education and to make service to the state and nation a priority in your life. You represent America's bright and shining future.

Upon completion of the event, many of you will return to your homes. I wish you a safe and pleasant journey.

Again, welcome to the Troy University BEST and Wiregrass BEST Robotics and best wishes for a memorable event.

Sincerely,

Kay Ivey

Kay Ivey
Governor

KI/pb/aw

Office of the Chancellor

216 Adams Administration Building
Troy, Alabama 36082

334-670-3200
334-670-3774 FAX

TROY UNIVERSITY

October 26, 2022

Dear Participants, Family, and Friends:

It is my pleasure to welcome each of you to the Troy University Wiregrass BEST Robotics Competition. TROY places a high value on the disciplines of science, technology, and mathematics. These areas are vital to the continued growth and progress of our region, state, and nation.

For 135 years, Troy University's mission has been to prepare leaders for Alabama, originally in education, and today in all disciplines and areas of service. Our founding motto, "Educate the mind to think, the heart to feel, and the body to act" is as true today as it was in 1887, and it captures perfectly the spirit of this competition.

Today's participants may one day develop technologies that will change our lives. Maybe dozens of groundbreaking ideas will have their genesis at the Troy University Wiregrass BEST Robotics Competition. Regardless, we want all competitors to have fun and enjoy their day at Troy University!

Sincerely,

Jack Hawkins, Jr.

Jack Hawkins, Jr., Ph.D.
Chancellor

Wiregrass BEST Robotics
BOOSTING ENGINEERING, SCIENCE, AND TECHNOLOGY
www.wiregrassbestinc.org

Welcome Parents, Teachers, Students, and Community Members:

Happy 30th Anniversary, BEST Robotics. BEST is 30 years old this year, and we are so excited to have elements back in play from our founders Ted Mahler , and Steve Marum that helped them create BEST 30 years ago.

On behalf of the Wiregrass BEST Robotics Board of Directors, we welcome all of you to our 2022 Game Day Made 2 Order. We are excited to collaborate with TROY University BEST for another game season and are very happy to see what the students from both hubs have created.

Today is the day you will see the students' products and what they accomplished over the 56 days; they had to develop a robot that is to create another robot that will move on a track up and down the field.

We invite you to enjoy this day and look at all the exhibit booths, talk with all the students, and see what they have learned from this experience. For any social media post, we ask you to use the hashtags #BEST30th, #thanks2BESTRobotics, #Made2Order2022, and #BESTRobotics2022.

Again, my board and I welcome you, and we hope you will enjoy your day here at the Trojan Arena.

Sincerely,

Stephen L. Tsukuda

Stephen L. Tsukuda
Executive Director
Hub Director

Game Day 2022

Saturday, November 5, 2022

8:00 AM – 10:00 AM	**Registration –** *Trojan Arena Lobby*
8:30 AM – 9:30 AM	**Compliance Check-in** – *Pit/ Trojan Arena Floor*
9:30 AM	**Drivers/ Spotters/ Mentors Meeting -** *Pit/ Trojan Arena Floor*
10:00 AM	**Opening Ceremony** **- Welcome** **- Pledge of Allegiance** **- National Anthem** **- Recognition of Sponsors** **- Parade of Robots**
10:30 AM – 12:30 PM	**Competition Matches** **Seeding Rounds** ***[5 matches per team]***
10:30 AM – 4:00 PM	**Team Exhibits Fair –** *Trojan Arena Lobby*
12:30 PM – 1:00 PM	**Lunch Break**
1:00 PM – 2:00 PM	**Competition Matches** **Continue Seeding Rounds** ***[5 matches per team]***
2:00 PM – 2:30 PM	**Competition Matches** **Wild Card Match** ***[1 match]*** *Top 4 Project Engineering Notebook teams (not among the top robot performing teams.)*
2:30 – 4:00 PM	**Competition Matches** **Semi-Final Rounds** ***[3 matches per team]***
4:00 PM – 4:15 PM	**Break**
4:00 PM	**Team Exhibits may be dismantled**
4:15 – 5:30 PM	**Competition Matches** **Final Rounds** ***[3 matches per team]***
5:30 PM – 6:00 PM	**Break**
6:00 PM – 7:00 PM	**Awards Ceremony**

2022 Participating Teams
BEST Award Competition

School	School System	Team Number
CA3L (Pike County Schools Center for Advanced Academics and Accelerated Learning) **Mentor: Ms. Kim Sellers**	Pike County	**2254**
St. Paul's Episcopal School **Mentor: Dr. Stacey Burt**	Alabama Independent School Association (AISA)	**2279**
Straughn High School **Mentor: Mr. Stephen Bowen**	Covington County	**2271**
Thurgood Marshall Middle School **Mentors: Ms. Patricia Radford & Ms. Stephanie Williams**	Conecuh County	**2267**

TROY UNIVERSITY | BEST Robotics

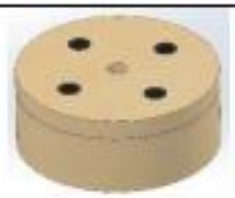
2022 Participating Teams
Head-to-Head Competition

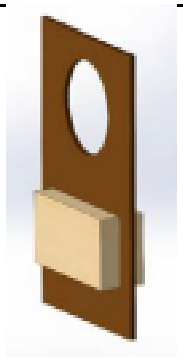
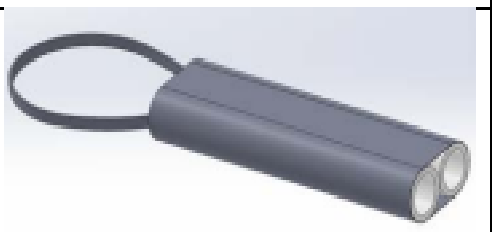
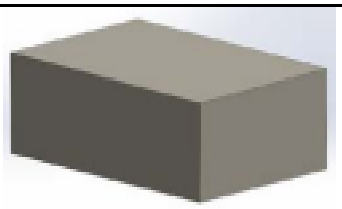
School	School System	Team Number
Abbeville High School **Mentor: Ms. Tiffany Roy**	Henry County	**2251**
Clark-Shaw Magnet School **Mentors: Ms. Susan Johnson & India Collier**	Mobile County	**2280**
Escambia County High School **Mentor: Ms. Stephanie Buitron**	Escambia County	**2275**
Kinston School **Mentor: Ms. Kelly Flowers**	Coffee County	**2276**
South Dale Middle School **Mentor: Ms. LaVaughn Thayer**	Dale County	**2278**
Zion Chapel School **Mentor: Ms. Kimberly Braisted**	Coffee County	**2269**

2022 Participating Teams

Team Number	Team Name	Sponsor	Competition Type
1351	Ridgecrest Christian School	Greg Summerlin	BEST Award
1352	Houston Academy	Andrew Kirk/Jeanne Davis	BEST Award
1354	Faith Academy	Sara Lecroy	BEST Award
1355	Ashford High School	Kayla Martin/ Donya Holland	BEST Award
1356	Beulah Middle School	Danielle O'Connor	BEST Award
1358	Andalusia Elementary School	Shanna Davis	Head to Head Competition

Game Pieces and Starting Locations

Item	Quantity (per team)	Starting Location	Image
Field Robot Game Pieces			
Field Robot Wheel	4	Spotter Area	
Field Robot Arm	1	Spotter Area in Field Robot Arm Area	
Field Robot Battery	1	Spotter Area	
Order Fulfillment Game Pieces			
Wheel	2	Mounted Adjacent to Track	
Large Motor	2	Mounted Adjacent to Track	
Small Motor	2	Mounted Adjacent to Track	

Servo Assembly	4	Mounted Adjacent to Track	
Battery	2	Mounted Adjacent to Track	
Controller	1	Mounted Adjacent to Track	
Spool	1	End of Track	

Field Layout

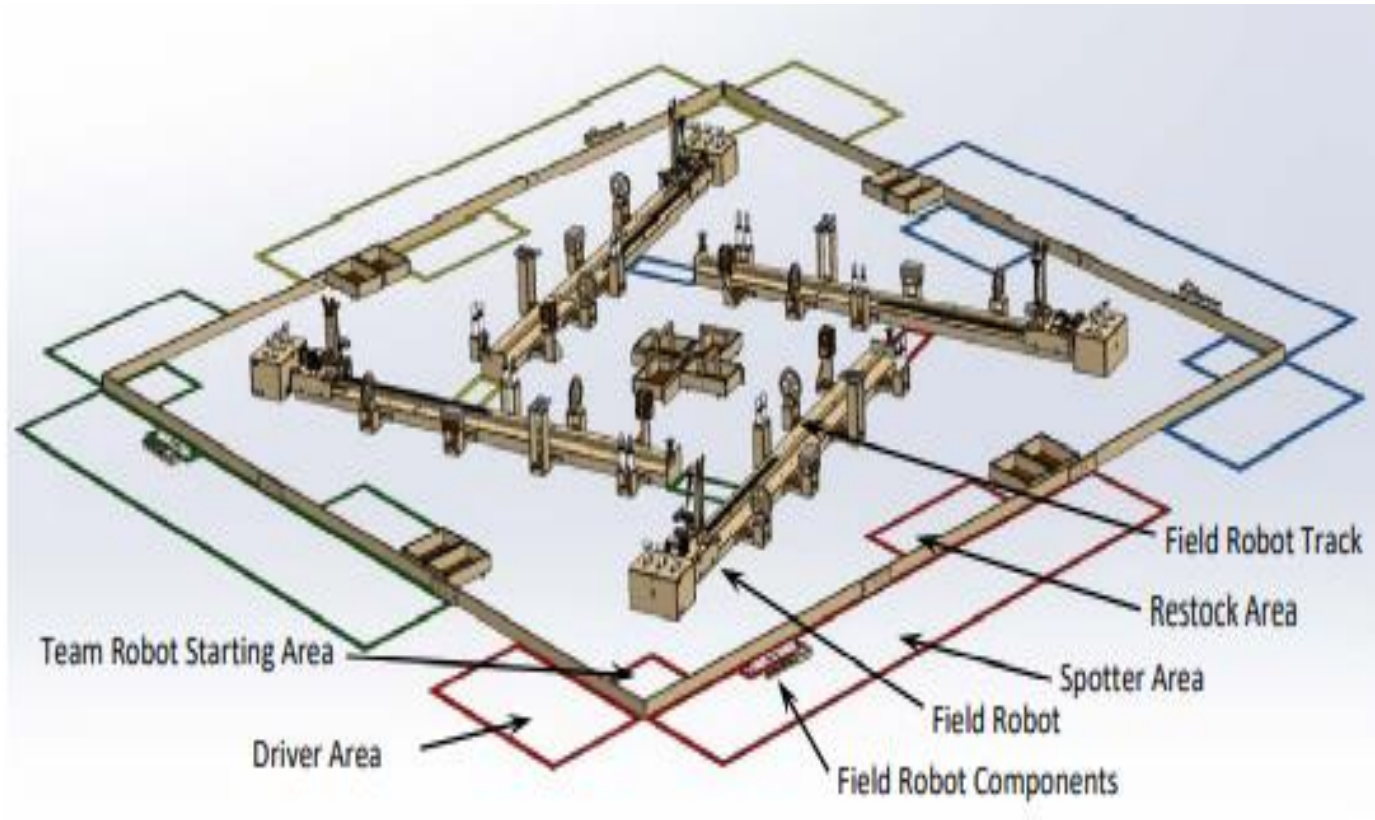


Figure 3.1 Game Field

How to Score Points

Perform operations at a fulfillment center:

- move order boxes into appropriate locations
- finish the assembly of Squeaky, also known as the Field Robot
- use the team construction Team Robot to control the Field Robot
- use the Field Robot to collect Robot parts to fulfill orders.

Table 3.4 Scoring Summary for Order Boxes

Game Piece	Per Quadrant Count	Points for Box within 6 ¼ " of the Team's Track	Total Points Available
Order Box (No handle)	2	5	10
Order Box (with handle)	1	10	10

Table 3.6 Scoring Summary for Order Fulfillment Game Pieces

Game Piece	Per Quadrant Count	Points Inside an Order Box	Total Points Available
Wheel	2	30	60
Large Motor	2	30	60
Small Motor	2	30	60
Battery	2	30	60
Servo	4	20	80
Controller	1	30	30
Spool	1	20	20

Bonuses

3.7.2.1 Fulfilled Orders Bonus

There are 6 types of orders that can be fulfilled by your team for additional points. Each order requires a unique quantity of fulfillment items inside an order box. To be considered a valid fulfilled order, only those items/quantities specified in Table 3.7 may be in the order box.

Table 3.7 Scoring Summary for Fulfilled Orders

Order Fulfillment Game Piece	Per Quadrant Count	Order Type					
		Full Robot	Spares	Arm Build	Upgrade	Expansion	Drive
Wheel	2	2	1				2
Large Motor	2	2	1				2
Small Motor	2	1	1	1		1	
Battery	2	1	1		1	1	
Servo	4	2	1	2	2	2	
Controller	1	1	1		1		
Points for a Fulfilled Order		100 pts	50 pts	20 pts	25 pts	25 pts	25 pts

3.7.2.2 Field Robot Assembly Bonus

a. A point multiplier is applied to the fulfillment game pieces inside an order box when one of the Field Robot Assembly configurations indicated in Table 3.8 has been satisfied.

b. Table 3.9 shows the point values of fulfillment game pieces inside an order box when the Field Robot Assembly bonus multiplier is applied.

Table 3.8 Field Robot Assembly Bonus Multipliers

Field Robot Assembly Component	Assembly Config 1	Assembly Config 2	Assembly Config 3
Wheel	2	2	4
Arm	1	1	1
Battery		1	1
Fulfillment Piece Bonus Multiplier	1.2x	1.3x	1.4x

Table 3.9 Fulfillment Game Piece Point Values With Each Bonus Multiplier

Fulfillment Game Piece	Points for Game Piece Inside an Order Box			
	Points without Bonus (For Reference)	Points With Assembly Config 1 Multiplier (1.2)	Points With Assembly Config 2 Multiplier (1.3)	Points With Assembly Config 3 Multiplier (1.4)
Wire Spool	20	24	26	28
Wheel	30	36	39	42
Large Motor	30	36	39	42
Small Motor	30	36	39	42
Servo Board	20	24	26	28
Battery	30	36	39	42
Controller	30	36	39	42

Thank you to all of the generous sponsors of

TROY University BEST Robotics

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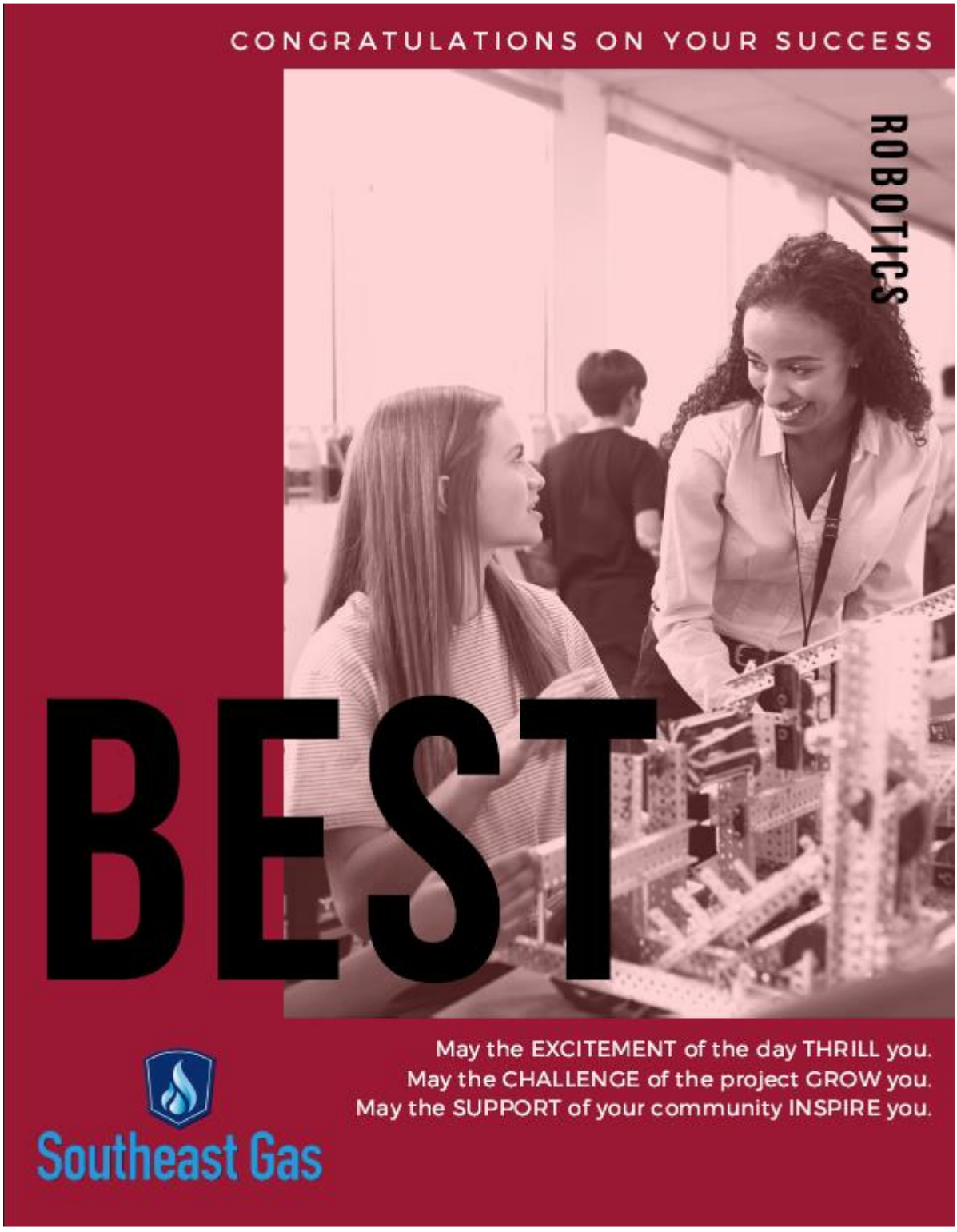
CONGRATULATIONS ON YOUR SUCCESS
ROBOTICS
BEST
May the EXCITEMENT of the day THRILL you.
May the CHALLENGE of the project GROW you.
May the SUPPORT of your community INSPIRE you.
Southeast Gas

Best wishes as you continue your successful path!

ACCESS
VIRTUAL LEARNING

Thank you to all of our sponsors and supporters of TROY University BEST Robotics!

ACCESS VIRTUAL LEARNING

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BEST Robotics

Planning Committee

Name	Affiliation	Committee
Mrs. Faye Allen	Program Coordinator, Southeast Alabama Regional Inservice Center College of Education	Game Field Assembly Hub Logistics/ Awards
Dr. Robin Bynum	Executive Director of Educational Outreach Professor College of Education	Hub Logistics/ Awards Volunteers/ Judging
Dr. Shannon Dadd	Assistant Professor, Teacher Education College of Education	Volunteers/ Judging
Dr. Hyung Jae (Chris) Chang	Associate Professor Computer Science College of Arts and Sciences	Volunteers/ Judging Software Support
Mr. Tom Dreilinger	Director, eLearning Alabama College of Education	Volunteers/ Judging Software Support
Dr. Shirley Farrell	Assistant Professor College of Education	Volunteers/ Judging
Dr. Fred Figliano	Associate Dean College of Education	Game Field Assembly Volunteers/ Judging
Mrs. Margaret Folmar	Program Development Consultant Southeast Alabama Regional Inservice Center College of Education	Hub Logistics/ Awards Recruitment of Teams
Dr. Byungkwan Jung	Assistant Professor Department of Computer Science College of Arts and Sciences	Software Support
Dr. Long Ma	Assistant Professor Department of Computer Science College of Arts and Sciences	Kit Assembly/ Software Support
Ms. Jennifer McLeod	Departmental Secretary, Southeast Alabama Regional Inservice Center College of Education	Hub Logistics/ Awards Kit Assembly/ Software Support
Mrs. Jessica Moran	Instructor, Troy City Schools	Game Field Assembly
Dr. Charisse Snell	Alabama Technology in Motion Specialist Troy University, College of Education	Volunteers/ Judging Software Support

Good luck to all teams!

Thank you to all of the generous sponsors of

Wiregrass BEST Robotics

Board of Directors

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Greg Cumbie – Consumable Kits
Doug Hicks – Returnable Kits
Matthew Monday – PR and Fundraising
Brittany Patton – Field/Referee Director
Glenn Waterworth – Field Director
Michael Cox
Everrett Chretien
Rebecca Chretien
Tanner Stewart