

Billy Mitchell Chapter Support to San Antonio STEM

February 2016

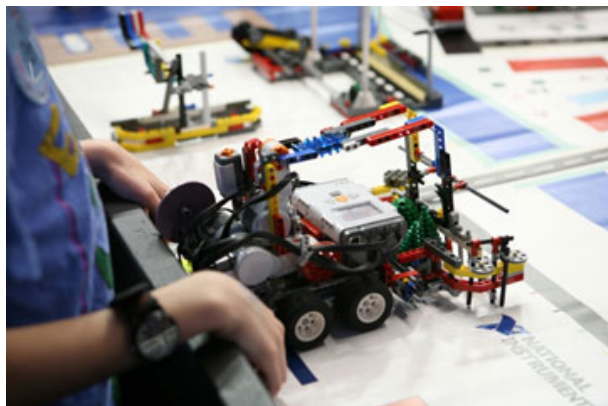
By Kent Namikas, BMC – AOC Programs Co-Chairman

The BMC continues to support the STEM program in San Antonio, TX. On 16 January, 2016, at the request of Mr. Chuck Barksdale, Technology Applications Instructor, Hector Garcia Middle School, the following chapter members volunteered to spend their Saturday supporting an internationally recognized FIRST LEGO League Alamo Qualifier robotics event at the school.

Mr. Sam Smith, Kerberos International
Ms. Cassandra Smith, Kerberos International
Mr. Kent Namikas, Joint Electronic Warfare Center
Mrs. Linda Namikas, 346th Test Squadron
Mr. Sam Roberts, AOC Mountain-Western Director
Mr. Tony Larweck, Joint Electronic Warfare Center



For the last several months teams of children from grades 4th-8th accepted the challenge to design, build and program LEGO MINDSTORMS® robots to accomplish complex robotic tasks. On that Saturday, 16 January they competed in the regional Qualifier. The tasks that needed to be accomplished by the robots were a part of the Green Program “Trash Trek” where the student’s robots are challenged to accomplish various trash and recycling tasks on a large and fairly complex board which required precision maneuvering and program executions. The robots had to perform various activities and actions such as retrieve items while avoiding various hazards and penalties to obtain points. BMC members served in various support functions and as referees and judges for these team events. Besides being judged on how well their robot could accomplish the tasks on the board, they were also judged on the technical design of



their robots, their overall understanding of the “Green Earth” program and how well they conformed to the core values of the organization. There were over 30 teams and several hundred students participating. In the end, four teams were selected to move on to the next competition. In addition to providing judging and referee support, the BMC also provided a \$2000 initial grant funds months earlier for this event. Not only did the students learn how to design and program robots, they also learned to work as part of a cohesive team.

In addition to participating in the robotics event, BMC members acted as instructors for the STEM students. At the request of Ms Candace Schantz, the Science Department Coordinator at the Hector Garcia Middle School, the following members of the BMC chapter returned to the school the following Friday to teach electromagnetic spectrum (EMS) principles to over 600 8th grade science students.

Mr. Kent Namikas, Joint Electronic Warfare Center
Mr. Ross Vincent, Joint Electronic Warfare Center
Mr. Jason Winn, LGS Innovations
Mr. Sam Smith, Kerberos International

Our four BMC instructors taught seven hour long blocks. They began each block by explaining how electromagnetic waves are formed and demonstrated through hands-on mechanisms how larger antennas are used for low frequency signals while small antennas are used for high frequency signals. They also covered principles of polarity, propagation, diffraction, refraction and reflection ending the hour block with the Doppler Effect and other EMS applications. The students and school teachers agreed that the highlight of the class was when our chapter members demonstrated live electromagnetic transmissions via use of a small receiver attached to a laptop and a projector to show both spectrum analyzer and oscilloscope style displays. They had the students transmit on a handheld radio to demonstrate the sine wave of the transmission along with modulation when they talked on the radio. They also demonstrated frequency changes on the spectrum analyzer by selecting different channels on the radio. The teachers expressed their sincere gratitude for the support provided by the members of the Billy Mitchell Chapter.



Finally - An interesting side note on how the STEM program supports student growth; one of the judges for the FLL Robotic event, and one of our youngest AOC members, is not only a current Electrical Engineering student at UT Austin, but also attended the same Hector Garcia Middle School in the 8th grade. She stated that one of the very reasons that she got interested in the field of EE was from a demo that the Joint Electronic Warfare Center (JEWEC) did at her school several years earlier in which they set up a SATCOM platform and demonstrated how it worked.